

PanelMate Series Product Manual

NOTE: The product addressed in this manual is no longer supported by Eaton Electrical. This manual has been supplied for documentation purposes only. If you would like to specify a new product, you can do so by calling your local Eaton Electrical distributor or (800)809-2772.

Eaton IDT, Inc.
P.O. Box 6166
Westerville, OH 43031-6166
(614) -3282

Table of Contents

Chapter 1

Introduction.....	1-1
How to use this Manual	1-2
Typographical Conventions	1-3
Manual Organization	1-3

Chapter 2

Overview	2-1
Benefits.....	2-2
Product Description	2-4
PanelMate Online System	2-4
DOS-based Configuration Software Package	2-5
Special Features of the Configuration Mode Package	2-5
Template Mode	2-7
Variable-Sized Template Mode	2-8
Graphics Mode	2-9
Run Mode.....	2-10
System Overview Field	2-11
Hardware Description	2-13
Editing Standards	2-13
Data Fields	2-13
Option Window	2-14
Help Pages	2-14
Fonts and Font Redefinition	2-15

Chapter 3

How to Successfully Develop Your Application	3-1
Basic Steps for Creating a Successful Application	3-2
Defining the Scope of the Project	3-2
Defining the Page Layout	3-3
Enhancing Operator Performance	3-4
Gathering Information for Configuration	3-5

Chapter 4

Hardware Checkout Overview	4-1
Unpacking.....	4-2
Attaching the PanelMate Series 4000 (Model 4200) Keyboard	4-5
Check System Health	4-6
Connect AC Power	4-9
Attach Audio Feedback Kit	4-10
Attach Security Keyswitch	4-10
Power Up the Unit	4-10

Execute the System Diagnostics	4-10
Execute Diagnostics	4-11
Enter the Serial Transfer Mode	4-12
Enter the Network Transfer Mode	4-13
Display System Configuration Information	4-14
Enter Run Mode	4-14

Chapter 5

Installation in an Industrial Enclosure	5-1
Installing the PanelMate Series 2000 (Model 2400) in an Industrial Enclosure	5-2
PanelMate Series 2000 (Model 2400) Enclosure Sizing	5-2
Install PanelMate Series 2000 (Model 2400) in an Enclosure.....	5-6
Install the Mounting Collar.....	5-7
Install the Pushbutton Actuator Kit.....	5-10
Install the Replacement Pushbutton Caps	5-10
Installing the PanelMate Series 2000 (Model 2600) in an Industrial Enclosure	5-11
PanelMate Series 2000 (Model 2600) Enclosure Sizing	5-11
Install PanelMate Series 2000 (Model 2600) in an Enclosure.....	5-15
Install the Mounting Collar.....	5-16
Installing the PanelMate Series 2000 Color (Model 2700) in an Industrial Enclosure	5-19
PanelMate Series 2000 Color (Model 2700) Enclosure Sizing	5-19
Install PanelMate Series 2000 Color (Model 2700) in an Enclosure	5-23
Install the Mounting Collar	5-24
Installing the PanelMate Series 3000 in an Industrial Enclosure	5-27
PanelMate Series 3000 Enclosure Sizing	5-27
Install the PanelMate Series 3000 in an Enclosure	5-31
Installing the PanelMate Series 4000 (Model 4500) in an Industrial Enclosure	5-32
PanelMate Series 4000 (Model 4500) Enclosure Sizing	5-32
Install the PanelMate Series 4000 (Model 4500) in an Enclosure.....	5-36
Install the Mounting Collar	5-37
Installing the PanelMate Series 4000 (Model 4200) in an Industrial Enclosure	5-40
PanelMate Series 4000 (Model 4200) Enclosure Sizing.....	5-40
Install the PanelMate Series 4000 (Model 4200) in an Enclosure.....	5-45
Install the Mounting Collar.	5-46
Connect AC Power	5-49
Connection to a Serial Printer	5-49
Connection to a Personal Computer.....	5-50
Serial Port Termination	5-50
Connection to the Fault Relay	5-51
Connection to the Audio Output.....	5-51
Connection to the Security Keyswitch.....	5-51

Chapter 6

Online Operation	6-1
Power-up Sequence	6-2

Execute Normal Power-up Diagnostics	6-2
Determine if the Unit Should Enter the Transfer Mode	6-3
Check for Executive Firmware	6-3
Check User Configuration Compatibility with Executive Firmware	6-3
Check for Presence of Installed Drivers	6-4
Determine Power-up Mode	6-4
Run Mode Operation	6-6
Page Title Line	6-6
System Overview	6-6
Default Control Button Labels	6-8
Call a New Page	6-9
PLC Page Selection	6-9
Host Display Window	6-9
Call the Directory.....	6-10
Operator Input	6-10
Alarms	6-11
Alarm Summary Page	6-12
View or Acknowledge Alarms	6-13
Password Protection.....	6-13
Lost Password Recovery	6-15
Setup Page	6-16
Change Password A or Change Password B	6-16
Log-in Password A or Log-in Password B	6-17
Set Date and Time	6-17
Log-out Password A and Log-out Password B	6-17
Display System/Configuration Information	6-17
Enter Off line Mode	6-17
Fault Relay	6-17
Fault Relay and Online System Errors	6-17
Fault Relay and Communication Errors	6-18
Fault Relay and Alarms.....	6-19
Fault Relay and Loss of Power	6-19
Remote I/O	6-19
Errors During Run Mode	6-19
Communication Errors	6-19
System Errors	6-22

Chapter 7

Regular Maintenance	7-1
Regular Maintenance	7-2
Monitor Adjustments	7-2

Chapter 8

Troubleshooting Guide for the PanelMate Series System	8-1
Problems with the Monitor	8-2

Problems with the TouchPanel	8-2
Problems with the Control Buttons	8-2
Problems with Audio Output	8-3
Problems with the Fault Relay	8-3
Problems with a Printer	8-4
Problems when Transferring Memory	8-4
Problems with the Real-Time Clock	8-4
Communications Problems using the Generic Protocol	8-5
Specific Error Messages	8-5

Chapter 9

Initialization of the Configuration Software Package.....9-1

Overview	9-2
Personal Computer Hardware Requirements	9-2
Running the Setup Installation Program	9-3
Starting the Configuration Software Package	9-3
Configure a PanelMate 2000 Application	9-4
Configure a PanelMate 2000 Color Application	9-4
Configure a PanelMate 3000 Application	9-4
Configure a PanelMate 4000 Application	9-4
Edit Utility Parameters	9-4
Display Help Page	9-8
Exit to Dos	9-8
File Naming Conventions and File Management	9-9
Non-VGA Hardware	9-9

Chapter 10

Basic Steps for Creating a User Configuration 10-1

Overview of the Process	10-2
Step One Create a User Configuration	10-2
Step Two Transfer Files to the PanelMate Unit.	10-4
Word and Bit References..	10-4
Word References	10-4
PLC Bit References	10-7

Chapter 11

The Main Menu.....11.1

The Main Menu	11-2
Develop a Configuration	11-2
Transfer Information..	11-2
Perform File Management	11-2
Verify a Configuration	11-3
Convert a Configuration	11-4
Return to Product Selection	11-8

Chapter 12	
The User Configuration Editor	12-1
The Develop Configuration Menu	12-2
Edit an Existing Configuration	12-2
Create a New Configuration	12-3
The Configuration Editor Menu	12-4
Display Configuration	12-6
Select International Font	12-6
Merge Configuration	12-7
Chapter 13	
Directory Editor	13-1
Before You Start Configuring Pages	13-2
Functions of the Directory Editor	13-2
Enter Directory Editor	13-3
Access the Page Editor	13-3
Protection	13-3
Page Title	13-4
Swap	13-5
Move	13-5
Copy	13-5
Delete	13-5
Memory Free	13-5
More	13-6
Exit	13-6
Chapter 14	
Page Editor	14-1
Configuring the PanelMate unit	14-2
Page Layout	14-3
Page Editor Main Menu	14-4
Page Editor in Template Mode	14-5
Edit a Template Definition <F1>	14-5
Add a Template <F2>	14-6
Move a Template <F3>	14-6
Copy a Template <F4>	14-7
Delete a Template <F5>	14-7
Access the Variable-Sized Template <F6>	14-7
Memorize <F7>/Recall <F8> Template	14-8
Save <F9>	14-8
Exit the Template Mode <F10>	14-8
Page Editor in Variable-Sized Template Mode	14-9
Overview	14-9
Variable-Size Template Mode	14-9
Edit an Existing Variable-Sized Template <F1>	14-10

Add a Variable-Sized Template to the Page <F2>	14-10
Edit Parameters <F3>	14-10
Redraw <F4>	14-10
Template Mode <F6>	14-10
Show Font <F7>	14-10
Identify a Variable-Sized Template's Origin Cell <F8>	14-11
Save <F9>	14-11
Exit the Variable-Sized Template Mode	14-11
Page Editor in the Message Mode	14-11
Page Editor in the Symbol Mode	14-11
Page Editor in the Character Mode	14-11
Page Editor in the Window Mode	14-12
Save the Page	14-13
Exit the Page Editor	14-13
Parameters Editing Functions in the Variable Sized Template Mode	14-13
Parameters Editing	14-13
Direct Editing Functions (Hot Keys)	14-14

Chapter 15

Indicator Template and Indicator Variable-Sized Template Editors	15-1
Functions of Indicator Templates..	15-2
Template Size	15-3
Character Size	15-3
Device Name	15-3
Template Definition Table	15-3
Control Button Definition Table	15-7
Editing Existing Templates	15-8
Exit the Indicator Template Editor	15-8
Gathering Information for Configuration	15-8
Functions of Indicator Variable-Sized Templates	15-10
Device Name	15-10
Type	15-10
Height...	15-11
Width	15-11
Indicator Definition Table	15-11
Editing Existing Variable-Sized Templates	15-13
Exit the Indicator Variable-Sized Template Editor	15-13
Gathering Information for Configuration	15-13

Chapter 16

Readout Template and Readout Variable-Sized Template Editors	16-1
Functions of Readout Templates	16-2
Template Size/Character Size	16-3
Decimal Places	16-3
Device Name	16-3

Units	16-3	
Value 1 Expression	16-4	
Value 2 Expression	16-4	
High Alarm Expression	16-5	
Low Alarm Expression	16-5	
Deadband Range	16-6	
Alarm Acknowledgment	16-6	
Control Type	16-6	
Numeric Control Definition	16-7	
Control Button Definition Table	16-8	
Editing Existing Templates	16-9	
Exit the Readout Template Editor	16-10	
Gathering Information for Configuration	16-10	
Functions of Readout Variable-Sized Templates		16-
12 Readout Length..	16-12	
Character Size	16-12	
Decimal Places	16-12	
Device Name	16-13	
Direction	16-13	
Foreground /Background Intensity or Color		16-13
Value Expression	16-13	
High Alarm Expression	16-14	
Low Alarm Expression	16-14	
Deadband Range	16-15	
Alarm Acknowledgment	16-15	
Control Type	16-15	
Numeric Control Definition	16-16	
Control Indicator Position	16-17	
Control Indicator Display	16-17	
Control Button Definition Table	16-18	
Editing Existing Variable-Sized Templates	16-19	
Exit the Readout Variable-Sized Template Editor	16-20	
Gathering Information for Configuration	16-20	

Chapter 17

Bar Template and Bar Variable-Sized Template Editors		17-1
Functions of Bar Templates	17-2	
Template Size	17-3	
Device Name	17-3	
Units	17-3	
Maximum Calibration	17-4	
Minimum Calibration	17-4	
Value 1 Expression	17-4	
Value 2 Expression	17-5	
High Alarm Expression	17-5	

Low Alarm Expression	17-6
Deadband Range	17-6
Alarm Acknowledgment	17-6
Control Type 17-7 Numeric Control Definition. . 17-7 Control Button Definition Table . 17-9	
Editing Existing Templates	17-11
Exit the Bar Template Editor .	17-11
Gathering Information for Configuration	17-11
Functions of Bar Variable-Sized Templates . 17-13 Bar Direction . . 17-13 Bar Height and Width. 17-13 Bar/Erase Intensity or Color.. . 17-14 Device Name.....	17-14
Maximum Calibration	17-14 Minimum Calibration . . 17-14
Value Expression	17-14
High Alarm Expression	17-15
Low Alarm Expression	17-15
Deadband Range 17-16 Alarm Acknowledgment. 17-16 Control Type . 17-16 Numeric Co	
Control Indicator Display	17-18
Control Button Definition Table	17-19
Editing Existing Variable-Sized Templates	17-21
Exit the Bar Variable-Sized Template Editor	17-21
Gathering Information for Configuration	17-21

Chapter 18

Display Template and Display Variable-Sized Template Editors	18-1
Functions of Display Templates	18-2
.....	
Template Type.. 18-3 Message Expression. 18-3	
Test Display	18-4
Control Button Definition Table	18-4
Editing Existing Templates	18-6
Exit the Display Template Editor	18-6
Gathering Information for Configuration	18-6
Functions of the Display Variable-Sized Template	18-8
Display Length	18-8
Direction	18-8
Message Expression	18-9
Test Message	18-10

Global Displays	18-10
Control Indicator Position	18-10
Control Indicator Display	18-10
Control Button Definition Table	18-11
Editing Existing Variable-Sized Templates	18-12
Exit the Display Variable-Sized Template Editor	18-12
Gathering Information for Configuration	18-12
Chapter 19	
Message Library Editor	19-1
Message Library	19-2
Register References Within Messages	19-4
Clock and Calendar Access	19-8
Save <F9>	19-8
Exit the Message Library Editor	19-8
Gathering Information for Configuration	19-8
Chapter 20	
Table Template Editor	20-1
Functions of Table Templates	20-2
Template Size	20-3
Device Name	20-3
Parameter Tag	20-3
Current Value Tag	20-3
Edit Value Tag	20-3
Units Tag	20-4
Password Protection	20-4
Table Entry Definition Table	20-4
Parameter Column	20-4
Value Expression Column	20-5
Dec. Pt.	20-5
Input Value Expression Column	20-6
Target Word Address Column	20-6
Editing Existing Templates	20-6
Exit the Table Template Editor	20-6
Gathering Information for Configuration	20-7
Chapter 21	
Trend Template Editor	21-1
Functions of Trend Templates	21-2
Template Size	21-3
Device Name	21-4
Units	21-4
Trigger Type	21-4
Maximum Calibration	21-4
Minimum Calibration	21-4

Value 1 Expression	21-5	Value 2 Expression	21-5
Interval Expression	21-6		
High Alarm Expression	21-7		
Low Alarm Expression	21-7		
Deadband Range	21-8		
Alarm Acknowledgment	21-8		
Control Type	21-8		
Numeric Control Definition	21-9		
Control Button Definition Table	21-11		
Editing Existing Templates	21-13		
Exit the Table Template Editor	21-13		
Gathering Information for Configuration	21-13		

Chapter 22

Graphic Editors22-1

The Graphic Editors	22-2		
Character Editor	22-2		
Edit	22-3		
Font	22-4		
Copy	22-5		
Delete	22-5		
Show Font	22-5		
Restore	22-5		
Save	22-5		
Exit	22-5		
Symbol Editor	22-7		
Parameters Editing Functions	22-10		
Parameters Editing	22-10		
Direct Editing Functions (Hot Keys)	22-10		
Graphic Variable-Sized Template Editor	22-12		
Device Name	22-12		
Symbol Definition Table	22-13		
Control Button Definition Table	22-15		
Exit the Graphic Variable-Sized Template Editor	22-16		
Gathering Information for Configuration	22-17		

Chapter 23

Defining System Parameters23-1

Edit System Parameters	23-2		
Startup Page Number	23-2		
Audio Output	23-2		
Inactivity Periods	23-3		
Redefine Double High Font	23-3		
Redefine Quad Font	23-4		

Fault Relay De-energize on Alarm	23-4
Host Display Window	23-4
Immediate Page Change	23-4
Remote Mode Change	23-5
Page Status Line Display	23-5
Control Bit Reset	23-5
Bit Zero After Com Fault	23-6
Retry Delay	23-6
Page Password Timeout	23-6
Passwords	23-7
Password Overwrite	23-7
Password Protection	23-7
Exit	23-7
Second Page of Table	23-8
Remote Alarm Acknowledge	23-8
Remote Silence Alarm Horn Bit	23-8
Remote Enable Fault Relay Bit	23-9
Remote Sending of Passwords	23-9
Page Change Register	23-9
Reset Clock	23-10
First Page of Table	23-10
Exit	23-10

Chapter 24

PLC Name and Port Parameters Table.....24-1

Edit PLC Name and Port Table	24-2
Use	24-2
Network ID# (PanelMate Port Parameter)	24-3
Data Bits	24-3
Stop Bits	24-3
Parity	24-3
Baud Rate	24-3
Electrical (Elect.)	24-4
Unsolicited Device	24-4
Generic Protocol	24-5
Name	24-5
ID# (PLC Name Table)	24-5
Port	24-6
Model	24-6
Default PLC Name Field	24-6
Screen Scan Delay	24-6
Alarm Scan Delay	24-6
Message Scan Delay	24-7
CSI Scan Delay	24-7
Trend Scan Delay	24-7

Remote I/O Configuration	24-8
Block Transfer Addressing	24-9
Active Rack Table	24-9
Active Block Transfer Table	24-9
Custom Serial Interface	24-10 CSI Edit . . 24-11
CSI Copy	24-12
Data Highway 485	24-13

Chapter 25

System Online Labels Editor	25-1
--	-------------

System Online Labels (Online Label Alternatives)	25-2
Miscellaneous Soft Keys 1	25-3
Miscellaneous Soft Keys 2	25-3
User Entry Soft Keys	25-4
Setup Page	25-4
Error Messages	25-4
Miscellaneous Text	25-5
Display System/Configuration Information	25-5
Alarm Text	25-5

Chapter 26

Print Documentation	26-1
----------------------------------	-------------

Print Documentation	26-2
---------------------	------

Chapter 27

Transfer Editor	27-1
------------------------------	-------------

Overview	27-2
Transfer Information Menu	27-3
Download Configuration to VCP Unit	27-4
Upload Configuration from VCP Unit	27-5
Download Executive Firmware to VCP Unit	27-6
Download Network Executive Firmware to VCP Unit	27-8
Download Driver to VCP Unit	27-9
Download Option to VCP Unit	27-10
Read System Information from VCP Unit	27-12
Place VCP Unit in Transfer Mode	27-13
Place VCP Unit in Run Mode	27-13
Return to Main Menu	27-13
Serial Transfers	27-14
Preparing to Transfer	27-14
Download Configuration to VCP Unit	27-15
Upload Configuration from VCP Unit	27-16
Download Executive Firmware to VCP Unit	27-17
Download Network Executive Firmware to VCP Unit	27-18
Download Driver to VCP Unit	27-20

Download Option to VCP Unit	27-21
Read System Information from VCP Unit	27-22
Return to Main Menu	27-22
Allen-Bradley Data Highway Network Transfers	27-23
Preparing to Transfer	27-23
Download Configuration to VCP Unit	27-28
Upload Configuration from VCP Unit	27-30
Download Network Executive Firmware to VCP Unit	27-31
Download Driver to VCP Unit	27-33
Download Option to VCP Unit	27-34
Read System Information from VCP Unit	27-36
Place VCP Unit in Transfer Mode	27-37
Place VCP Unit in Run Mode	27-38
Return to Main Menu	27-39
Allen-Bradley Data Highway Plus Network Transfers	27-40
Preparing to Transfer	27-40
Download Configuration to VCP Unit	27-46
Upload Configuration from VCP Unit	27-47
Download Network Executive Firmware to VCP Unit	27-48
Download Driver to VCP Unit	27-50
Download Option to VCP Unit	27-52
Read System Information from VCP Unit	27-53
Place VCP Unit in Transfer Mode	27-54
Place VCP Unit in Run Mode	27-55
Return to Main Menu	27-56
Allen-Bradley Remote I/O Network Transfers	27-57
Preparing to Transfer	27-57
Download Configuration to VCP Unit	27-63
Upload Configuration from VCP Unit	27-65
Download Network Executive Firmware to VCP Unit	27-66
Download Driver to VCP Unit	27-68
Download Option to VCP Unit	27-70
Read System Information from VCP Unit	27-71
Place VCP Unit in Transfer Mode	27-72
Place VCP Unit in Run Mode	27-73
Return to Main Menu	27-74

Chapter 28

File Management	28-1
The File Management Menu	28-2
Copy a Configuration	28-2
Rename a Configuration	28-3
Delete a Configuration	28-4
Return to Main Menu	28-4

Chapter 29

Troubleshooting the Configuration Software Package29-1

Miscellaneous Error Messages	29-2
Configuration Software Startup Error Messages	29-2
Program/File Load Error Messages	29-3
Help Page Error Messages	29-4
Disk Access Error Messages	29-4
File Name Error Messages	29-6

Chapter 30

Allen-Bradley PLCs30-1

Memory	30-2
Possible Configurations	30-2
Serial Communication to One PLC	30-2
Data Highway Connections Using Serial Communication Modules	30-3
Multiple Data Highways Using Serial Communication	30-4
Direct Connection to Data Highway 485	30-5
PLC-3 Data Access	30-6
PLC-5 Data Access	30-8
SLC 500 Data Access	30-10
Allen-Bradley Modules	30-10
Cabling	30-12
Communications Parameters	30-13
Modules for PLC Data Highway Connection	30-14
Modules for the PanelMate Data Highway Communication	30-16
Modules for Serial Connection	30-18
Modules for PanelMate to Data Highway Plus Connection	30-19
Modules to Connect PanelMate to Data Highway 485	30-21
Allen-Bradley Word and Bit References	30-22
PLC-2 Word and Bit References	30-22
PLC-3 Word and Bit References	30-23
PLC-5 Word and Bit References	30-23
SLC 500 Word and Bit References	30-27
Allen-Bradley Remote STS and EXT STS Errors	30-34

Chapter 31

The Accelerati/On Interface 31-1

Possible Configurations	31-2
Direct Data Highway Connections	31-2
Multiple Data Highway Connections	31-3
Serial and Direct Data Highway Connections	31-3
Direct Data Highway Plus Connections	31-4
Multiple Data Highway Plus Connections	31-4
Serial and Direct Data Highway Plus Connections	31-5
Direct Data Highway and Data Highway Plus Connections	31-5

Remote I/O Connections	31-6
Serial and Direct Remote I/O Connections	31-6
Cabling	31-7
Communication Parameters	31-8
Modules for SLC 5/02 Remote I/O Communication	31-8
Diagnostic Indicators	31-9
Allen-Bradley Word and Bit References	31-10
Data Highway and Data Highway Plus	31-10
Remote I/O	31-10
Active Racks	31-14
Block Transfers	31-15
Unsolicited Messages	31-20

Chapter 32

Custom Serial Interface for the Toledo Digital Indicator32-1

Possible Configurations	32-2
Cabling	32-2
Communications Parameters	32-3
CSI Configuration	32-4
Digital Indicator Configuration	32-8
CSI Word and Bit References	32-9

Chapter 33

Eaton PLCs33-1

Memory	33-2
Possible Configurations	33-4
Direct	33-4
Multiple	33-5
Cabling	33-5
Communications Parameters	33-6
CPU20	33-6
CPU25 and CPU50	33-7
D200 P R4C	33-9
Eaton Word and Bit References	33-10
Register and Device References	33-10
CPU20 PLC ID Number Setting	33-11
CPU25 and CPU50 PLC ID Number Settings	33-11
D200 PR4C PLC ID Number Settings	33-12

Chapter 34

General Electric PLCs34-1

Memory	34-2
Possible Configurations	34-4
Direct	34-4
Multidrop	34-5
Cabling	34-5

CCM2.....	34-6
Series Five	34-7
Series Six and Six Plus	34-8
Series 90	34-9
Communications Parameters	34-9
PLC ID	34-10
Switch Settings .	34-10
CCM	34-10
CCM2.....	34-12
CCM3.....	34-13
1/O CCM.....	34-13
General Electric Word and Bit References	34-15
GE Series Five PLC Word and Bit References.....	34-16
Series Six Word and Bit References	34-17
GE Series Six Plus Word and Bit References.....	34-23
GE Series 90 PLC Word and Bit References	34-41
Chapter 35	
Generic Protocol	35.1
Hardware Interface to PI-Cs	35-2
Method of Operation	35-3
PanelMate Configuration - Octal vs. Decimal	35-4
Generic Protocol Format.....	35-5
Frames	35-6
Task Blocks	35-7
Task Codes	35-8
Block Check Calculation	35-15
PLC Name and Port Parameters Editor	35-15
Checking the Communication Link	35-16
Generic Protocol Driver Development.....	35-16
Overview 35-16	
Establish Communication Link 35-17	
Implement Generic Protocol Frames 35-18	
Communications Using Task Blocks 35-21	
Main Program Functions 35-25	
Chapter 36	
MitsubishiPLCs	36-1
Memory 36-2	
Mitsubishi A Series Memory Ranges 36-3	
Mitsubishi FX Series Memory Ranges 36-6	
Mitsubishi FXo Series Memory Ranges 36-8	
Possible Configurations 36-10	
Direct 36-10	
Network (Mitsubishi A Series only) 36-11	

Cabling	36-12	
Communications Parameters	36-14	
AJ71 C24 Computer Link Module	36-15	
Mitsubishi Word and Bit References	36-19	
Chapter 37		
Modicon Controllers		37.1
Memory	37-2	
Possible Configurations	37-2	
Direct	37-2	
Multiple PLCs on a Single Modbus	37-3	
Cabling	37-4	
Communications Parameters	37-5	
984 and 584 Modbus Ports	37-5	
884 Modbus Ports	37-6	
Micro 84/J375 Modbus Adapter	37-7	
484 PLC/J474 Modbus Communication Interface	37-9	
Modicon Word and Bit References	37-11	
Modicon Micro 84,184, 384 and 484	37-12	
Modicon 584, 884 and 984 Register, Input and Coil References	37-13	
Chapter 38		
Omron PI-Cs		38.1
Memory	38-2	
Possible Configurations	38-5	
Direct	38-5	
Network	38-6	
Cabling	38-6	
Communications Parameters	38-8	
Communication Module	38-9	
Omron Word and Bit References	38-11	
Chapter 39		
Reliance AutoMate PLCs		39-1
Memory	39-2	
Possible Configurations	39-3	
Direct	39-3	
Serial Communications Card	39-4	
Cabling	39-5	
Communications Parameters	39-5	
Serial Communications Card	39-6	
R-Net Gateway	39-6	
Reliance Word and Bit References	39-8	
Chapter 40		
Siemens PLCs		40.1

Memory	40-2
Possible Configurations	40-4
Direct Connection	40-4
Multiple Connection	40-4
Cabling	40-5
Communications Parameters	40-5
Siemens Word, Byte, and Bit References	40-6

Chapter 41

Square D PLCs. .41-1

Memory	41-2
Possible Configurations	41-2
Direct	41-2
Network	41-3
Cabling	41-3
Communications Parameters	41-4
Thumbwheel Switches	41-5
DIP Switches	41-5
Square D Word and Bit References	41-8

Chapter 42

Texas Instruments PLCs 42-1

Memory	42-2
Possible Configurations	42-5
Direct	42-5
Direct with DCPM	42-5
Direct with DCU	42-5
Cabling	42-6
Communications Parameters	42-7
Dual Communication Port Module TI 500 Series	42-7
Serial Interface Port TI 435 PLC	42-8
Data Communication Module TI 405 Series	42-10
Data Communication Unit (DCU) TI 305 Series	42-12
Texas Instruments Word and Bit References	42-20

Chapter 43

Toshiba PLCs..... 43-1

Memory	43-2
Possible Configurations	43-3
Direct	43-3
Multiple	43-3
Cabling	43-4
Communications Parameters	43-5
Link Port	43-7
Toshiba Word and Bit References	43-7
Register and Device References	43-8

Chapter 44	
Westinghouse Numa-Logic PLCs	44-1
Memory	44-2
Possible Configurations	44-3
Direct.....	44-3
Cabling	44-3
Communications Parameters	44-4
Westinghouse Word and Bit References	44-5
Appendix A	
Default Font Directory	A-1
Appendix B	
Detailed Specifications	B-1
PanelMate Series 2000 (Model 2400) Specifications	B-3
Main Processor	B-3
Monitor	B-3
Environment	B-3
Power Requirements	B-4
Serial Ports	B-4
Fault Relay	B-4
Audio Output	B-4
Security Keyswitch Input	B-4
Other	B-4
PanelMate Series 2000 (Model 2600) Specifications	B-5
Main Processor	B-5
Monitor	B-5
Environment	B-5
Power Requirements	B-6
Serial Ports	B-6
Fault Relay	B-6
Audio Output	B-6
Security Keyswitch Input	B-6
Other	B-6
PanelMate Series 2000 Color (Model 2700) Specifications	B-7
Main Processor	B-7
Monitor	B-7
Environment	B-7
Power Requirements	B-8
Serial Ports	B-8
Fault Relay	B-8
Audio Output	B-8
Security Keyswitch Input	B-8
Other	B-8
PanelMate Series 3000 Specifications	B-9

Main Processor	B-9
Monitor	B-9
Environment	B-9
Power Requirements	B-10
Serial Ports	B-10
Fault Relay	B-10
Audio Output	B-10
Security Keyswitch Input	B-10
Other	B-10
PanelMate Series 4000 (Model 4500) Specifications	B-11
Main Processor	B-11
Monitor	---B-11
Environment	B-11
Power Requirements	B-12
Serial Ports	B-12
Fault Relay	B-12
Audio Output	B-12
Security Keyswitch Input	B-12
Other	B-12
PanelMate Series 4000 (Model 4200) Specifications	B-13
Main Processor	B-13
Monitor	B-13
Environment	B-13
Power Requirements	B-14
Serial Ports	B-14
Fault Relay	B-14
Audio Output	B-14
Security Keyswitch Input	B-14
Other	B-14

Appendix C

Configuration Creation Checklist	• • • • C-1
--	-------------------

Configuration Creation Checklist	C-2
----------------------------------	-----

Appendix D

Installation Guidelines	D-1
-------------------------------	-----

Overview	D-2
Physical Installation Considerations	D-2
Environmental Considerations	D-5
Wiring Considerations	• • • • D-7

Appendix E

Software Menu Hierarchy.....	E-1
------------------------------	-----

Editor Structure Hierarchy	E-2
Editor Structure Hierarchy with Key Chapter Cross Reference	E-3

Appendix F

International Font Characters F-1

Font Selection F-2

Font Character Cell Representation F-2

Appendix G

Worksheets G-1

Appendix H

ISA Symbols H-1

ISA Symbols H-2

Appendix I

Set Electronics Module Utility I-1

Set Electronics Module Utility 1-2

How to Run the Set Electronics Module Utility 1-2

Chapter 1

Introduction

In this chapter, you will learn:

- How to use this manual
- Which notational conventions are used
- How this manual is organized

How to use this Manual

Welcome to the Eaton IDT PanelMate Series Product Manual. The manual contains everything you need to know about the assembly, screen configuration, installation, operation, and maintenance. Your PanelMate Series will either have a 10 page or a 30 page capacity. The terms PanelMate Series and PanelMate unit will be used to describe features common to the PanelMate Series 2000, PanelMate Series 2000 Color, PanelMate Series 3000, and PanelMate Series 4000 products. Any features unique to the PanelMate Series 2000, PanelMate Series 2000 Color, PanelMate Series 3000, or PanelMate Series 4000 will be noted as such.

As a new user of the PanelMate Series, you will want to get acquainted with how the PanelMate unit works and how it is used before you begin configuration of your own control system. It is recommended that you take time now to read Chapter 2, Overview. Once you have an understanding of what you can expect from the PanelMate unit, you can proceed through the manual, using it as a guide for assembly, configuration, installation, operation, and maintenance. To make the manual more readable, information about the PanelMate unit interaction with specific programmable controllers (PLCs) is segregated into chapters. After you have become accomplished at configuring screens and have placed the PanelMate unit in operation, this manual will become a reference book for regular maintenance, troubleshooting, and repair.

This manual is written for system engineers, plant engineers, plant maintenance personnel and Eaton IDT personnel; any persons who may be involved in configuring screens, or installing and maintaining a PanelMate unit. This manual is not written for plant personnel who will be using the PanelMate unit to control factory operations. The task of informing plant operators how to use the PanelMate unit in specific situations is left to those who configured the screens. However, parts of Chapter 11 may be used for overall guidance in training plant operators.

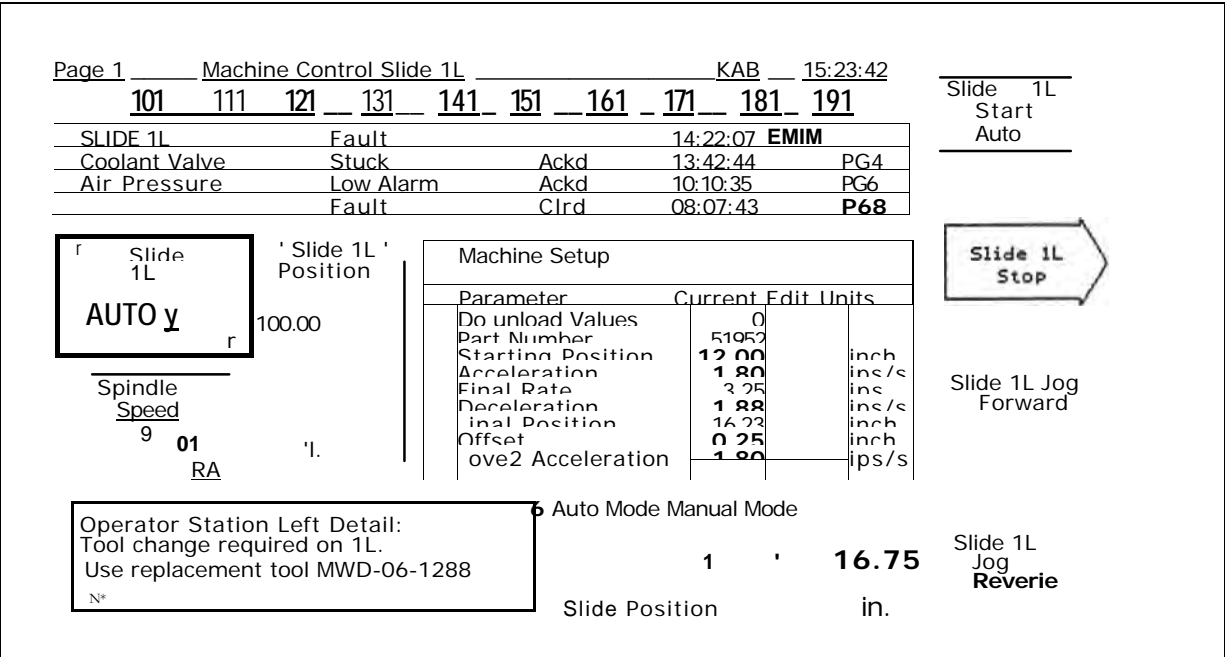


Figure 1-1 Example Page

Typographical Conventions

Certain typographical conventions are used consistently in this manual. They include:

< >	Delineates a specific key on the Configuration Keyboard
<Return>	Refers to the enter/return key on the Configuration Keyboard
Cursor	Refers to the up, down, right and left arrow keys located on the numeric keypad of the Configuration Keyboard
[j	Delineates a PLC word or bit reference
PLC	Abbreviation for programmable logic controller
ISA Symbols	Set of graphic symbols conforming to the Industrial Society of America standards
VCP Unit	Refers to the PanelMate Series system

Manual Organization

This manual is divided into four parts:

- Part 1 - Overview & Installation Part
- 2 - Configuration Software Part 3 -
- Utilities Part 4 - Communications

In addition, there are nine appendices:

- Appendix A - Default Font Directory
- Appendix B - Detailed Specifications
- Appendix C - Configuration Creation Checklist
- Appendix D - Installation Guidelines Appendix E -
- Software Menu Hierarchy Appendix F -
- International Font Characters Appendix G -
- Worksheets Appendix H - ISA Symbols Appendix I
- Set Electronics Module Utility

The manual is written as an instruction manual for beginning users and as a reference manual for more experienced users. Each chapter leads with learning objectives that present the main topics of the chapter. By scanning the learning objectives, a beginner will get a preview of the chapter, while an experienced user will be able to quickly determine if the chapter contains the information that is sought.

Chapter 2

Overview

In this chapter, you will learn:

- The benefits of the PanelMate unit
- The words we use to describe the PanelMate unit
- How easy it is to configure screens
- How the PanelMate unit works

Benefits

The Eaton IDT PanelMate unit provides an economical and flexible alternative to hardwired operator control panels. Using a single serial connection to a PLC, the PanelMate unit can replace individual control devices such as pushbuttons, selector switches, indicating lights, thumbwheels, analog meters, message display units, and digital readouts, as well as all of the associated wiring and PLC I/O modules. With the graphics option, the PanelMate unit provides the functionality previously performed by CRT-based devices; however, the PanelMate unit gives you control, which was a capability that CRT-based devices lacked. The Eaton IDT PanelMate unit is capable of replacing over 500 hardwired devices, yet it is economical to use even if only a handful of points are being controlled or monitored. The benefits are even greater if subsequent changes are made to the operator's panel.

In addition to replacing conventional panel-mounted controls, operator message units, and controller faceplates, the PanelMate unit also works as an alarm annunciator and logger. Critical PLC control operations can be monitored constantly, and abnormal conditions reported on the screen and on a hardcopy printer.

The Eaton IDT PanelMate unit offers advantages over hardwired devices similar to the advantages provided by PLCs over conventional relay control systems. You have the flexibility of being able to quickly construct or alter operator controls without coordinating the purchase and fabrication of a panel that contains a variety of devices from different vendors. Control panel wiring is eliminated, and the cost and lead time of developing an operator interface is reduced. Adding a control function later is simple and costs virtually nothing. Solid-state technology provides inherent reliability advantages over mechanical control devices. Additionally, no special training or computer programming skills are required for screen configuration or online use because the PanelMate unit uses the same kind of logic and terminology as conventional control panels and PLCs.

The key to easy system integration is the PanelMate unit DOS-based configuration software with a family of editors. These easy-to-use integrated editors smoothly guide you through an uncomplicated fill-in-the-blank process. No special training is required because the PanelMate unit configuration editors guide you in arranging pre-stored templates on the page and defining each template's individual operating characteristics. In the PanelMate unit, you can configure symbols to customize your pages for even more effective communication to plant personnel.

After configuration, the PanelMate unit self-documenting feature provides hardcopies of the current configuration for your records. This capability makes generating complete documentation of the control system quick and easy. The DOS-based package can be used for backup or easy transfer of the configured pages to other PanelMate units.

Besides eliminating PLC I/O to the control panel, the microprocessor-based PanelMate unit can also relieve the PLC of the burden of translating data from engineering units, comparing values against alarm limits, and generating ASCII alarm messages, giving you more room in the PLC for control logic. This means you can reduce the load on the PLC for other application requirements at no increase in price. Savings are also achieved by reducing the PLC programming that is required for the control system.

The PanelMate unit also improves operator performance compared to conventional control panels. The PanelMate unit reduces the number of sensory inputs that the operator is subjected to at any one time. It can also be used to set priorities for the operator's attention. Alarm messages are also provided in the same viewing area as all the controls for fast operator recognition. Just four or five multi-function control buttons (depending on your PanelMate unit) and a sealed, quick response keypad replace hundreds of buttons and switches found in typical control panels. The use of multi-functional control buttons improve operator performance by providing only appropriate input options. In an application which requires full-travel pushbuttons for control input, the PanelMate Series 2000 has an option which utilizes 22.5 mm pushbutton control buttons.

Once in the Run Mode, the PanelMate unit displays control information simply, clearly and quickly for instantaneous operator action. Since the PanelMate unit can be used with all major brands of PLCs, it can become your plant's standard man/machine interface, thereby reducing your training costs and improving operator performance.

In addition to its serial communication abilities, the PanelMate unit is available with an optional AcceleratI/On interface. This feature allows direct connection to Allen-Bradley Data Highway, Data Highway Plus, or Remote I/O networks without the need for a separate interface module. AcceleratI/On provides an increase in PLC-access speed while reducing overall equipment costs.

The PanelMate unit benefits include:

- Reduced cost and lead time of engineering configuration
- Eliminates extensive I/O wiring
- Flexibility to easily change control function
- Control operations can be monitored constantly and can be easily adjusted
- Reduced load on the PLC, along with reduced PLC programming
- Reporting of alarm conditions, including a hardcopy printout
- Exceptionally easy-to-use configuration editors
- Easy connection to all major brands of PLCs
- Available AcceleratI/On interface permits direct connection to Allen-Bradley Data Highway, Data Highway Plus, or Remote I/O networks.

Product Description

The Eaton IDT PanelMate video control panel is a compact, rugged operator interface device for use with PLCs. The PanelMate Series 2000 and PanelMate Series 3000 uses an industrial-grade 9-inch gray scale CRT and a unique set of graphic templates to display the status of PLC variables in an easy-to-read fashion. The PanelMate Series 2000 Color uses an industrial-grade 9-inch color CRT and the PanelMate Series 4000 uses an industrial-grade 14-inch color CRT and both units have the graphic templates as well. Operators can also control or adjust PLC operations directly from the PanelMate unit using the built-in membrane keys. The Eaton IDT PanelMate unit is designed for easy mounting in a variety of industrial enclosures, including consoles, standard racks, and floor or wall-mounted panels. The PanelMate Series 3000 is less than six inches in depth and can be mounted in areas requiring minimal space. The entire front bezel of all the units is gasketed and completely sealed against dust, dirt, oil, and moisture, making the PanelMate unit ideal for use in harsh NEMA 4 or NEMA 12 applications. The PanelMate Series 2000 and PanelMate Series 2000 Color units are designed to mount in a 12-inch deep enclosure. The PanelMate Series 4000 is designed to mount in an 16-inch deep enclosure. Stainless steel options are also available and are designed for NEMA 4X requirements.

The PanelMate unit's DOS-based configuration software is structured with a few principal sections accessible directly from the Main Menu. Additional built-in features, functions, and editors are available within each software section. The product documentation and on-screen status messages and help pages assist users to rapidly enter and exit the sections needed for display creation and online operation.

The Eaton IDT PanelMate unit consists of three basic components: the front panel assembly, monitor housing assembly, and electronics module assembly.

The front panel assembly contains the TouchPanel and the Control panel. The monitor housing assembly contains the CRT which attaches to the shelf on the rear of the front panel.

The electronics module assembly contains the power supply and three circuit board slots. The unit ships with a video board in the top location, a processor board in the middle location, and the bottom slot open. Note that the PanelMate 4000 Series will have five control buttons.

The PanelMate unit will have either 10 pages or 30 pages of memory depending on the model.

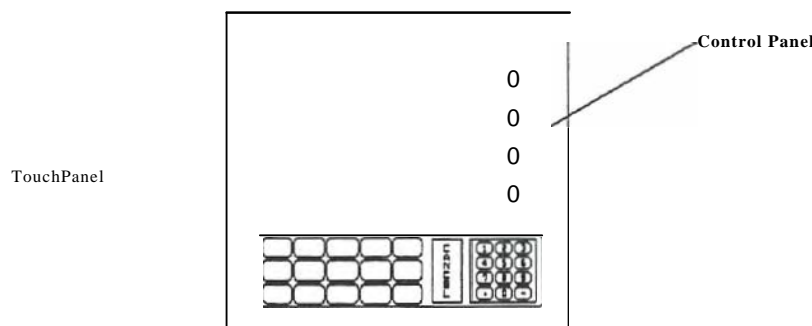


Figure 2-1 PanelMate Front View

DOB based Configur~°a-dc'.. ~ackaq

The Eaton IDT PanelMate unit makes designing your PLC-based control systems easy. The

PanelMate unit uses templates, or fixed graphic shapes and formats, to present information to the online operator, thus providing a proven, standard method of presentation. The DOS-based Configuration Software consists of menus, editors, option windows and spreadsheets. The spreadsheets and editors are used to configure the pages that make up the online system.

The PanelMate Configuration Package consists of the following major menus, editors and spreadsheets:

- Main Menu
 - Configuration Editor
 - Directory Editor
 - Page Editor
 - Template Editors
 - Message Library Editor
 - System Parameters Editor
 - PLC Name and Port Table Editor
 - System Online Labels Editor
 - International Font Selection
 - Print Documentation

In PanelMate units with the Graphic Option, the following additional editors are provided.

- Character Editor
- Symbol Editor

These editors provide the additional flexibility of custom user-defined graphics. Graphics can be configured to display online animation based on PLC data. The complete Editor Structure Hierarchy is shown in Appendix E. Refer to Chapter 9 for requirements for your personal computer to run the DOS-based Configuration Software.

Special Features of the Configuration Mode Package

The PanelMate editors are designed to be easy and straightforward to use. All editors have several features in common, so that no additional learning is required to move from editor to editor. These features are described below in alphabetical order.

Cursors

The PanelMate unit uses four cursors when operating on a color personal computer. Only one cursor will be visible on the screen at any one time. All cursors are controlled by the arrow keys. The four cursors are:

Cell Cursor	a white border surrounding a blank cell or template when it is selected
Field Cursor	a green bar that highlights a cyan field when it is selected
Character Cursor	a small white block that appears in the selected character field when the EDIT mode is selected
Insert Mode Cursor	a half-size version of the character cursor that appears in the selected alphanumeric field when <Ins> is pressed

Cursor Moves

All cursors can be moved using the arrow keys.

Note NUMLOCK must be OFF

In the Page Editor, the cell cursor moves one cell at a time, regardless of the size of the template it is marking, e.g., two cursor moves are required to move across a double-wide Indicator Template. **Error**

Messages

When you attempt to do something that is not allowed, an error message will be printed at the bottom of the screen and an error tone will be generated on the attached speaker. To cancel the error message, simply continue with the correct keystroke.

Field Colors

In the Directory Editor and all template editors, an entry field will display the following colors: cyan

a closed field

green the field that is currently selected for viewing or editing

blue a selected field that can be edited: i.e. a green field will become blue

Function Keys

In the editor screens, a menu at the top of the screen shows the functions of the <F1> through <F10> keys. An example is shown below.

F1=TEMPLATE	F2=VS-TEMP	F3=MESSAGE	F4=SYMBOL	F5=CHARACTR
F6=WINDOW	F7=	F8=	F9=SAVE	F10=EXIT

Figure 2-2 Page Editor Main Menu with Graphics Option

The <Return> key is always used as a toggle to the editing mode. Press <Return> to open the field (the selected field will change from green to blue), make changes, additions, insertions and deletions as necessary, and then press <Return> to close the field. You must close before you select another field.

The <Esc> key is used to close a field and revert to the previous value.

The <F10> is always used to exit from the editing screen that is currently displayed. Pay attention to prompting messages, as they may remind you about saving changes before exiting.

<Ctrl> <m> is used to insert a carriage return within a text string.

<Alt> <t> is used in non-VGA systems to toggle the screen up and down to view a section of the full screen display while in the Page Editor.

<Alt> <F1> is used to call a help page anytime a "HELP" is displayed in the upper right corner of the screen.

Template Mode

The Eaton IDT PanelMate unit uses pre-defined functional templates to represent indicator lights, digital readouts, analog (level) meters and message display panels. The six primary template types are called the Indicator, Readout, Bar, Display, Table, and Trend templates.

The screen is divided into 15 template cells. A template is positioned and defined with the use of function keys, arrow keys and screen prompts.

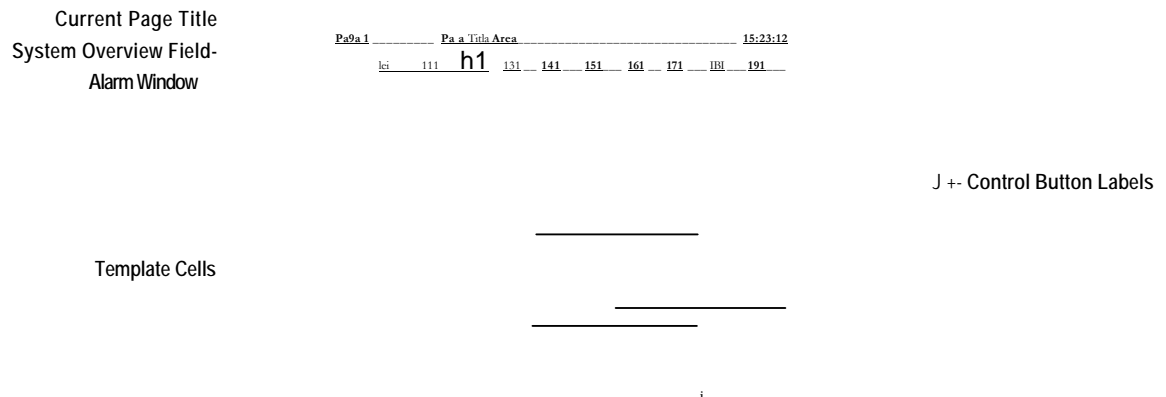


Figure 2-3 PanelMate Series 10 Page Layout

The type of template chosen determines the way in which PLC data will be displayed and the information you need to provide to define its operation. The definition data will usually include the device name for the template (e.g., "BACKWASH PUMP 1" or "KILN 27 TEMPERATURE"), the PLC locations to be monitored, the associated color or gray scale intensity and status messages to be used to represent different conditions, and any high and low alarm limits to be considered. Each template also allows you to define control functions which will be available to the operator, such as the ability to start a motor or adjust a setpoint value.

Depending on your model, your PanelMate unit will allow up to 10 pages or 30 pages with 15 templates per page. Any combination of template types may be grouped on a single page, allowing you to tailor the layout of the controls to the needs of your particular application.

A single template may be used to represent a number of hardwired devices. As a simple example, an Indicator template with control functions might replace three indicator lights (Running, Stopped, Tripped) and two pushbuttons (Start, Stop).

When defining the operation of a template, you can indicate that certain conditions are to be recognized as abnormal or alarm conditions. In the above example, the "Tripped" condition is abnormal. The Eaton IDT PanelMate unit watches for these conditions, even when the page containing that template is not being displayed. If that condition occurs, an alarm message will be printed in the 4-line alarm window automatically built into every screen. The message tells the operator the device name, type of fault and time of occurrence, as well as which page the template is on. In addition, an overview field (also built into every screen) indicates graphically the pages which contain alarm conditions. A dedicated alarm summary page provides a complete listing of all current faults.

Vall

In addition to the standard templates which operate in the 3 x 5 template cell area, the PanelMate unit also uses variable-sized templates. These special templates are variable in size and, therefore, can be used to create pages with greater density. Variable-sized templates are the elementary part components of the standard templates. The four primary variable-sized templates are called the Indicator, Readout, Bar, and Display.

The PanelMate Graphics Option includes advanced text capabilities and custom graphics. Within the Variable-Sized Template Mode, you may choose to add a variable-sized template and access one of these editors, or you may select one of the following editing features:

- Character Editor to create custom characters A primary feature added with the Graphics Option is the ability to create a Symbol. The Character Editor provides the means to define the bit-map associated with a specific character. The character may be edited on the same page that it will be used. In this manner, you can view the character in its normal size and position, along with an expanded 8 x 16 character matrix representing the current bit-map of the character.
- Symbol Editor which is placed on the screen in relation to each other. Symbols are created and edited within the Symbol Editor and are stored in the Symbol Library. Each Symbol has a defined origin and may be placed on a page relative to this origin. Symbols may be used on numerous pages and numerous times on a single page. After a Symbol has been created in the Symbol Editor and saved in the Symbol Library, it may be added to a page within the Page Editor by adding a graphic variable-sized template and entering the symbol name. Note that the Symbol may simply be used as a static element. By configuring a Symbol, it is transformed from a static state to a dynamic state. Similar to the indicator templates, a symbol can display the status of five different conditions. If desired, five different symbols can be displayed (one at a time) when the corresponding conditional expression is true.
- Window Mode as a window, and allows the following operations to be performed on the contents of the window: Move, Copy, Delete, Memorize, Recall. Note that only Variable-Sized Template Mode elements and text are affected.

With the Graphics Option enabled, a fifth selection, Graphics, is added to the Variable-Sized Template Editor. The Graphics Variable-Sized Template Editor uses your custom created symbols to be used as one of five visual states. You can also configure up to four control buttons for each Graphic Variable-Sized Template. If you have a PanelMate Series 4000, you can configure up to five control buttons for each Graphic Variable-Sized Template.

Run Mode

Once a display configuration is completed in the Configuration Software Package, it can be downloaded to the online system. The Eaton IDT PanelMate unit is ready to be connected to a PLC. The PanelMate unit can be easily used with all major brands of PLCs and intelligent control devices. A single serial cable is required to connect the PanelMate unit with a programmable controller, host computer, or intelligent device. The PanelMate unit can also be used with different types of devices simultaneously. Two independent serial communication ports are standard equipment.

In addition to its serial communication abilities, the PanelMate unit supports the optional AcceleratI/On interface. With this feature, the PanelMate unit can communicate to an Allen-Bradley Data Highway, Data Highway Plus, or Remote I/O network without an Allen-Bradley interface module.

On power-up, the PanelMate unit performs system diagnostics. If a failure should occur, an indication of the problem will be displayed. After power-up diagnostics are completed, the system display configuration is loaded into working memory.

The initial page will be drawn and the control button labels will appear. The control buttons and TouchPanel may be used to call another page.

Any template that displays a small arrow in the lower left-hand corner of the template is defined for control by the operator. Units which have the graphics option can also be defined for control. You may select the position and placement of the arrow, and can choose to view the arrow on a continuous basis or only when the variable-sized template is selected.

Before any control change can be made to a particular device, that template or variable-sized template must be selected. To select a particular template, press the area of the TouchPanel that corresponds to the location of the template on the screen. A template cell area may contain more than one variable-sized template. To select a variable-sized template, press the associated TouchPanel area. If the desired variable-sized template is not initially selected, press the associated keypad area repeatedly to step through the variable-sized templates located within the template cell area. If the template or variable-sized template is defined for control button input, the corresponding control button labels will appear when it is selected. The operator can then press the appropriate control button (to start or stop a motor, for example), or press the large cancel key to disarm the control buttons. All control buttons provide momentary operation control. Therefore, the designated PLC bit will be set to ON or 1 when the button is depressed, and will reset to OFF or 0 when the button is released.

If the template or variable-sized template is defined for numeric keypad input, the control button labels will prompt you to enter the new value. All numeric operator inputs require at least two keystrokes. This prevents any accidental entries that could occur by pressing the wrong key.

All alarm conditions designated in the PanelMate unit editors are constantly monitored. When an alarm condition occurs, an alarm message is automatically configured and printed on the current page and to a printer, if configured. The four most recent alarm messages will appear in the alarm window on the current page. Each alarm message will include:

- Device name
- Nature of the alarm (e.g., high, low)
- Time of the event being reported
- Page number listing the device

The Alarm Summary Page is automatically compiled by the PanelMate unit as the alarm conditions occur. The 50 most recent alarm messages can be viewed on the Alarm Summary Page at any time. The PanelMate Series 2000, PanelMate Series 2000 Color, and the PanelMate Series 3000 supports 50 alarms. The PanelMate Series 4000 supports 100 alarms. The PanelMate unit will request updates from the PLC for data on the current display page and for all alarm points.

System Overview Field

The System Overview field is located between the page title line and the alarm window. The field provides the status of the pages. A page may be blank, configured or in alarm and is designated as follows:

Blank	This page has no information on it. (medium intensity foreground on a low intensity background for grayscale PanelMate units and white foreground on a black background for color PanelMate units)
Configured	This page is configured and all devices are operating normally. (no intensity foreground on a high intensity background for grayscale PanelMate units and black foreground on a green background for color PanelMate units)
In Alarm One or more	devices on this page are in an alarm condition. (medium intensity foreground on a blinking high intensity background for grayscale PanelMate units and white foreground on a blinking red background for color PanelMate units)

If the PanelMate unit has 10 pages of memory, the STANDARD display mode can be selected to show the status of pages 0 through 9 consecutively. Refer to figure 2-4. The system can also be configured to display in the FIFO (First-In-First-Out) mode.

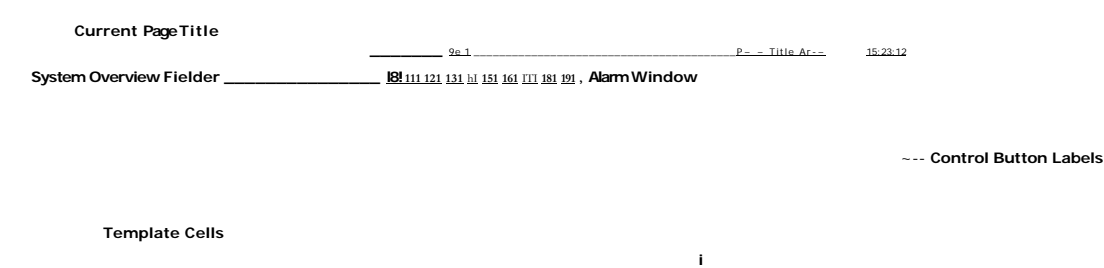


Figure 2-4 PanelMate Series 10 Page Layout

In the FIFO mode, only those pages that are in alarm will be displayed. The first page that goes into alarm will be displayed on the left side of the line. As each new page goes into alarm it will be displayed to the right of the last page number which went into alarm.

This allows you to determine the sequence in which the alarms occurred. When all of the alarms are reset (go out of alarm) on a page, the page number is removed from this field and any remaining page numbers will be shifted to the left.

If the PanelMate unit has more than 10 pages and only pages 0 through 9 are configured, the unit will work like a 10-page system and can be selected for STANDARD or FIFO display page mode. If pages 10 or greater are configured, the system will only operate in the FIFO mode. The FIFO mode can display up to 12 pages that are in alarm. See figure 2-5. This field can only display 12 of the possible 30 pages that could be in alarm. Internally, the units will maintain a queue for all pages in alarm. If more than 12 alarms exist, a "+" will be displayed in the extreme right of the field to indicate additional pages are in alarm.

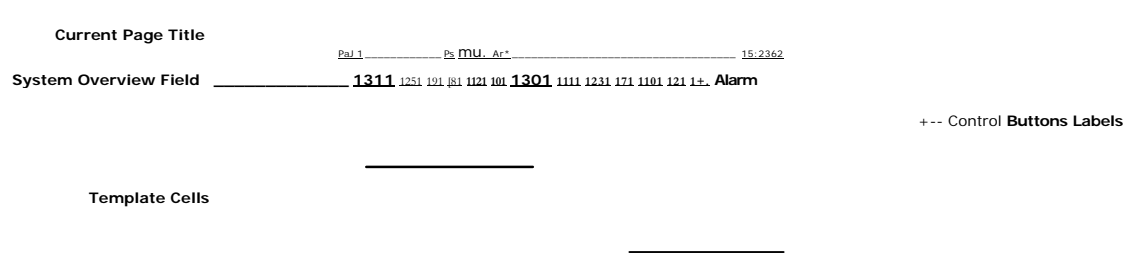


Figure 2-5 PanelMate Series 40 Page Layout

If a page receives a new alarm and it is already displayed on the System Overview field, it will not be re-displayed by putting it at the end of the FIFO queue. Therefore, the display may not provide a true sequence of alarms indication.

Hardware Description

The PanelMate Series 2000 features a 9-inch VGA CRT with four level gray scale. The PanelMate Series 3000 features a 9-inch EL display with four level gray scale. The PanelMate Series 2000 Color features a 9-inch VGA CRT with eight colors and the PanelMate Series 4000 features a 14-inch VGA CRT with eight colors as well. All PanelMate units will display 80 columns by 30 lines. Characters are 8 pixels wide by 16 high. The monitor's pixel resolution is 640 X 480 for the PanelMate Series 2000, PanelMate Series 2000 Color, and the PanelMate Series 3000. The monitor's pixel resolution is 800 x 600 for the PanelMate Series 4000. Four shades of gray are displayed in the PanelMate Series 2000 and PanelMate Series 3000: No intensity (Black), Low intensity (Bright Black), Medium intensity (White), and High intensity (Bright White). Eight colors are displayed in the PanelMate Series 2000 Color and the PanelMate Series 4000: WH (white), CY (cyan), MG (magenta), BL (blue), YE (yellow), GR (green), RD (red), and BK (black).

Editing Standards

The editors of the Configuration Software Package have consistent methods for entering or changing information.

Data Fields

In any Configuration Software editor screen, areas which can receive numbers, addresses, or other data are called fields. On a color personal computer, these are green rectangular areas which may or may not already contain data. One of the fields on a page or menu will be highlighted green. You may move among fields by pressing the arrow keys, thus changing which field is highlighted. To open a field for data entry, press the arrow keys to highlight the desired item and then press <Return>. A field will turn blue while open (darker than cyan). After entering data, press <Return> again to close the field. The <Esc> key may be pressed during data entry to cancel any changes and revert to the old values and close the field.

When a field which allows text entry is open, one character in the field will be flashing. This is the location of the character cursor. The cursor is the place where characters will be entered or changed. The left and right arrow keys will move the cursor within the field.

Some numeric fields will allow you to increase or decrease their value with the up and down arrow keys while open. Some fields will present a menu of options for you to choose from (see Option Window below).

When changing a data field or making a choice that has a small number of defined alternatives, you will see an option window. This menu is shown below.

- WINDOW NAME -

FIRST OPTION
SECOND OPTION
THIRD OPTION
FOURTH OPTION
FIFTH OPTION SIXTH
OPTION SEVENTH
OPTION EIGHTH
OPTION

Figure 2-6 Option Window

When the menu appears, the currently selected option is highlighted in a different color from the other lines. The arrow keys may be pressed to highlight any option in the list. When you have highlighted the desired option, the <Return> key is pressed to make the selection.

The window will display all potential options. The cursor will move over any option that is not currently accessible due to the interaction of other choices made during configuration.

The following rules apply when highlighting an option:

- The up, down, left, and right keys move the highlight in their indicated directions.
- The <Return> key will select the highlighted option.
- The <Esc> key will exit without selecting an option and revert to its old value.

Any other keys will cause the error message "WRONG KEY. TRY AGAIN." to be displayed.

Help Pages

The various editors of the Configuration Utility provide help pages to aid application development. You may press <Alt> <F1> whenever the word "HELP" appears in the upper-right corner of an editor screen.

Fonts and Font Redefinition

The PanelMate unit character set contains four fonts: standard, double high, quad, and graphic. Each font may contain up to 128 characters. A character cell is 8 pixels wide by 16 pixels high. Characters in the normal font are one character cell in size. Double high characters are two character cells high and one wide. Quad characters are two cells wide by two high. Normal font includes the standard alphanumeric character plus some blank characters. These blanks may be modified to add letters for international languages if the user desires. Graphic font is used to create the online systems basic page structure. For example, it contains the characters with the rounded corners that create the template image. The Double High and Quad fonts each have a-z, A-Z, 0-9, the period, and the minus sign.

If the online system contains the graphics option, the developer can arrange characters together to create custom symbols. All 126 characters of the Double High font and the Quad font, the last 26 characters of the Graphics font, and 10 characters of the Normal font can be redefined for this purpose.

Chapter 3

How to Successfully Develop Your Application

In this chapter, you will learn:

- The Basic Steps for Creating a Successful Application
- How to Plan Screen Layouts
- How to Enhance Operator Performance
- How to Gather Background Information
- How to Improve Operator Performance

Basic Steps for Creating a Successful Application

Creating a successful application requires upfront planning. Include the PanelMate unit in the planning process at the same time the decision on the PLC is being made. Remember you are developing a control SYSTEM. All the components must interface together to create the system.

The basic steps to project success are:

- Defining the Scope of the Project
- Defining the Page Layout
- Enhancing Operator Performance
- Gathering Information for Configuration

Defining the Scope of the Project

The process begins by first defining the scope of the project. It is important to work with the operators and supervisor to define what decisions they make, what actions they take and the information that they need to make their decisions. Operators use the system. Include operator participation in the upfront planning and testing of the implementation. If you allow the operators to become a part of the team and incorporate their feedback in developing the control system, you will have satisfied operators and a successful project.

Note the use of the term information and not data. Information will allow decisions to be made more quickly than just providing raw data.

In order to maximize the performance of any operator interface connected to a PLC over a network or highway, it is necessary to keep network traffic to a minimum. You can greatly improve the performance of the PanelMate unit and the network by grouping your PLC registers consecutively in PLC memory.

Defining the Page Layout

Once the scope of the project and the amount of network traffic is minimized, a Strategy for Page Implementation must be resolved. This includes defining how many pages will be used and the page layout for each individual page. Plan the implementation strategy BEFORE you begin to configure your pages.

Make your pages consistent. Group control functions on pages so that operations that are performed together are grouped together. Also, do not hesitate to make individual pages look dissimilar so the operator can easily distinguish pages without having to read the page title.

Simplify wherever possible. Eliminate confusion and strive for rapid visual comprehension. Do not overcrowd the screen. Provide summary information not raw data. Provide information by exception and make exceptions obvious.

Use bar graphs to quickly communicate approximate values relative to full scale. Bars placed side by side representing different variables can rapidly express comparative values (higher than, lower than). Numbers take longer to read and interpret than bars graphs. Use numbers when exact values are required. Displays with both bar graphs and numbers can nicely complement each other.

An operator generally does not need a detailed photographic representation of a machine or process. Typically, simple representation is all that is important. An operator typically prefers good diagnostic messages and machine/process restart instructions over a pretty picture.

Carefully use activity and limit animation. Activity refers to showing something in operation without showing exact position or state. Animation refers to representing a real moving device's exact state. An operator needs accurate information. Before attempting to animate, determine if it is important that the operator actually see the simulated motion. Attempt animation if and only if the PanelMate unit can receive actual sensor data to confirm position, rate of motion, etc. Typically, attempting to

constantly maintain the real-time information required to accurately animate a screen, places a large burden on the control system (including PLC and network communications). If you cannot provide accurate information, do not animate. Operators need information they can trust, not inferences, or they will not trust any information they receive from the system.

Use activity to show operation by changing symbol shape, intensity or color changes, or blink. Remember to provide information by exception. If a display area always blinks, it will not be perceived as important, and may even appear as a distraction.

Raw data must be transformed into useful information before an operator can perceive and identify an event on the screen.

In addition to text description and symbols, attributes such as color, intensity, and blink can offer an important means to communicate to operators. These attributes should be used as a highlight; the display should be understandable before they are added to enhance perception. Create standards and use them. The PanelMate standard for alarm conditions is medium intensity foreground on a high intensity background with blink for a grayscale unit and a red background with a white foreground with blink if you have a color unit. For alert or caution indication, try using high intensity foreground on medium intensity background with blink for a grayscale unit and use a yellow background with a black foreground if you have a color unit. Blink is an attention-getting visual device. It should be reserved for drawing the operator's attention during other-than-normal operation or when operator action (such as data entry) is required.

Enhancing Operator Performance

Selection of Intensities or Colors	<p>Be consistent. Use the same intensities or colors to designate the same conditions throughout the system.</p> <p>For PanelMate Series 2000 or PanelMate Series 3000 alarm conditions, we suggest using medium intensity foreground on high intensity background with blink. For "caution" conditions, use high intensity foreground on medium intensity background with blink. For a "normal off" condition, try using a high intensity foreground on a no intensity background.</p> <p>For PanelMate Series 2000 Color and PanelMate Series 4000 alarm conditions, we suggest using a red background with a white foreground with blink. Use green for "on", "normal", or "OK" conditions and for "caution" conditions, use a yellow background with a black foreground. For a "normal off" condition, try using a black background with white foreground characters.</p> <p>Character Always use the largest size characters that will fit in the template.</p>
Sizes	
Device Names	<p>Use upper and lower case characters; they are easier to read than all upper case. Be very descriptive in the device name, as this will be the field printed in alarm messages. Left-justify the device name to make placement consistent for the operator.</p>
Control Button Labels	<p>Use upper and lower case characters; they are easier to read than all upper case. Be very descriptive so that it is easy to determine which template's control button labels are on the screen. For example, for a start button, use the label "Start Motor 2" instead of "Start".</p>
Control Button Positions	<p>Group buttons together near the middle of the screen. The only exception to this would be when you wish to purposefully separate a critical function from other control functions.</p>
Page Layouts	<p>Templates that require the same types of operator control (such as stop/start) should have their control buttons consistently placed in the same positions (e.g., stop is always the second button and start is always the third button).</p> <p>Group controls on pages so that operations that are performed together are grouped together. Also, make pages look dissimilar so the operator can easily distinguish page changes without referring to the page number.</p>
Audible Feedback	<p>Use It! Feedback for operator input greatly improves operator performance.</p>
Mounting Position	<p>Mount the PanelMate unit at eye level.</p>
Monitor Adjustments	<p>Reduce potential eyestrain by adjusting the monitor's contrast for the ambient lighting of the online PanelMate unit.</p>

Automatic	Use this feature to avoid accidentally leaving the control buttons armed for an extended length of time.
Cancel	
Leave	There is no reason to power down the PanelMate unit during normal operation. The PanelMate unit is designed to be used as part of your control system, and is expected to perform as reliably and consistently as your PI-Cs or control panel devices.
PanelMate	
Running	

Gathering Information for Configuration

The final task before sitting down with the Configuration Software Package is to gather all the background information you will need. Chapters 13 through 21 describe the editors used in the PanelMate unit and each chapter will have a worksheet to support the "Gathering Information for Configuration" section. Appendix G contains copies of all the worksheets which may be copied for repeated use.

Chapter 4

Hardware Checkout Overview

In this chapter, you will learn:

- How to set-up the PanelMate unit for checkout
- How to attach the Audio Feedback Kit
- How to attach the optional Security Keyswitch
- How to check system health
- How to set the real-time clock

Unpacking

Report any damage to the carrier who delivered the equipment and immediately call the Eaton IDT Customer Support Group at (614) 882-3282 (the Interstate Commerce Commission has a time limit on reporting concealed damage). Check packing cartons for all items shown on the packing list.

Carefully remove all equipment from the packing cartons and inspect all parts for damage in shipment. Keep the cartons and packing materials for future shipment.

On the following pages, there is a checklist for the PanelMate Series 2000 (Model 2400), PanelMate Series 2000 (Model 2600), PanelMate Series 2000 Color (Model 2700), PanelMate Series 3000, PanelMate Series 4000 (Model 4500), and PanelMate Series 4000 (Model 4200). Please check to be certain that all items are present for your PanelMate unit.

PanelMate Series 2000 (Model 2400)

- 1 PanelMate Series 2000 (Model 2400) unit 1
- Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers
 - 16 #8 nuts, 16 #8 washers
 - 2 two-terminal connectors
 - 1 three-terminal connector
 - 1 Cutout/torque drawing

If you ordered Replacement Pushbutton Caps as an accessory, they will be packaged separately:

- 4 Mounting Rings
- 12 Pushbutton Caps (4 red, 4 black, and 4 green)

If you ordered a Pushbutton Actuator Kit as an accessory, it will be packaged separately:

- 4 22.5mm pushbutton actuators (4 black) 2
- Mounting standoffs

PanelMate Series 2000 (Model 2600)

- 1 PanelMate Series 2000 (Model 2600) unit 1
- Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers
 - 16 #8 nuts, 16 #8 washers
 - 2 two-terminal connectors
 - 1 three-terminal connector
 - 1 Cutout/torque drawing

PanelMate Series 2000 Color (Model 2700)

- 1 PanelMate Series 2000 Color (Model 2700) unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers
16 #8 nuts, 16 #8 washers
 - 2 two-terminal connectors 1 three-terminal connector 1 Cutout/torque drawing

PanelMate Series 3000

- 1 PanelMate Series 3000 unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers
16 #8 nuts, 16 #8 washers
 - 2 two-terminal connectors 1 three-terminal connector 1 Cutout/torque drawing

PanelMate Series 4000 (Model 4500)

- 1 PanelMate Series 4000 (Model 4500) unit
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers
18 #10 nuts, 18 #10 washers
 - 2 two-terminal connectors 1 three-terminal connector 1 Cutout/torque drawing

PanelMate Series 4000 (Model 4200)

- 1 PanelMate Series 4000 (Model 4200) Main unit (Video and Electronics Module) with Cable 1 TouchPanel
- 1 Hardware Manual
- 1 Shipping kit (plastic bag) containing:
 - 1 Packet of mounting nuts and washers 16 #10 nuts, 16 #10 washers 12 #8 nuts, 12 #8 washers
 - 2 two-terminal connectors
 - 1 three-terminal connector
 - 1 Cutout/torque drawing

If you ordered a Mounting Collar Kit as an accessory for a PanelMate Series 2000 (Model 2400, 2600, or 2700), it will be packaged separately:

- 1 Mounting Collar
- Packeted mounting hardware:
 - 16 #8 nuts, 16 #8 washers
- 1 Cutout/torque drawing
- 1 Gasket

If you ordered a Mounting Collar Kit as an accessory for a PanelMate Series 4000 (Model 4500 or 4200), it will be packaged separately:

- 1 Mounting Collar
- Packeted mounting hardware:
 - 22 #8 nuts, 22 #8 washers
- 1 Cutout/torque drawing
- 1 Gasket

If you ordered a Support Kit as an accessory for a PanelMate Series 2000 (Model 2400, 2600, or 2700), it will be packaged separately:

- 1 Transfer Utility with manual
- 1 Packet of mounting nuts and washers containing:
 - 16 #8 nuts, 16 #8 washers
- 1 Packet with 2 two-terminal connectors
- 1 Packet with a three-terminal connector
- 1 Cutout/torque drawing
- 1 22.5mm security keyswitch (with 2 keys)

If you ordered a Support Kit as an accessory for a PanelMate Series 4000 (Model 4500 or 4200), it will be packaged separately:

- 1 Transfer Utility with manual
- 1 Packet of mounting nuts and washers containing:
 - 18 #10 nuts, 18 #10 washers
- 1 Packet with 2 two-terminal connectors
- 1 Packet with a three-terminal connector
- 1 Cutout/torque drawing
- 1 22.5mm security keyswitch (with 2 keys)

If you ordered an Audio Feedback Kit as an accessory, it will be packaged separately:

- 1 Speaker with 24-foot connecting cable attached

If you ordered a Serial/Parallel Interface as an accessory, it will be packaged separately:

- 1 Serial/Parallel Interface

If you ordered a Serial Transfer cable as an accessory, it will be packaged separately:

- 1 Serial Transfer cable

Attaching the PanelMate Series 4000 (Model 4200) Keyboard

Note If you have a PanelMate Series 4000 (Model 4500), disregard this procedure. To attach the keyboard to the PanelMate Series 4000 (Model 4200), you must follow the procedure below for proper grounding.

1. Plug the keyboard cable into the keypad.
2. Ensure that the keyboard metal clamp is over the braided shield area of the cable.
3. Place the star washer between the keypad standoff and the keyboard cable metal clamp.
4. Place the flat washer next to the keyboard cable metal clamp.
5. Tighten the screw to secure the keyboard cable.

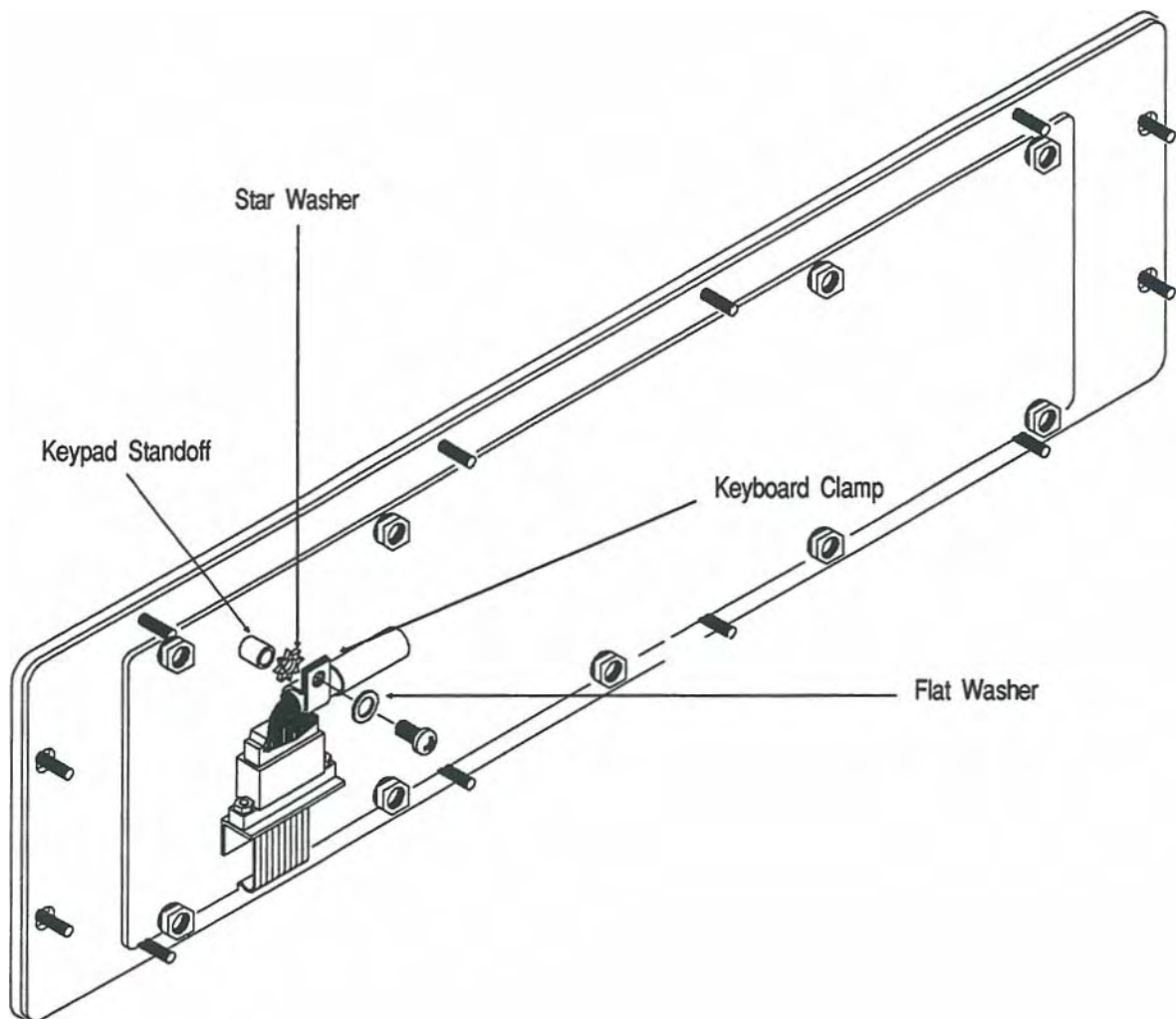


Figure 4-1 PanelMate Series 4000 (Model 4200) Keyboard

Check System Health

You may wish to test your unit before you install it in your industrial enclosure. This section outlines the steps required to set-up the PanelMate unit on a work surface for check-out before

installation. You will be performing the following procedure: 1. Connect to AC Power.

2. Attach the optional Audio Feedback

Kit. 3. Attach the optional Security Keyswitch. 4. Power Up the Unit.

5. Execute the System Diagnostics

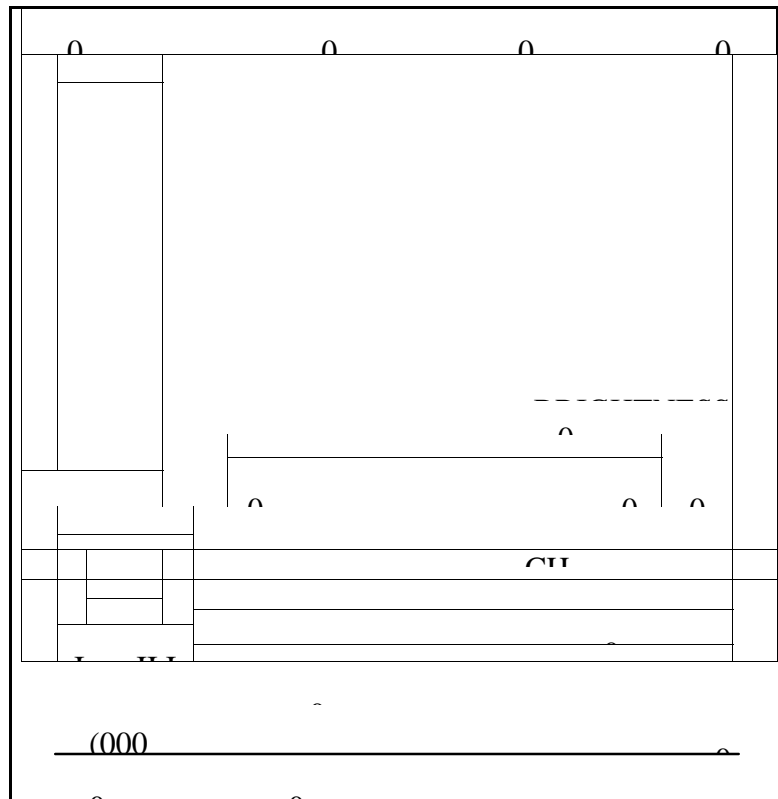
Set Date and Time

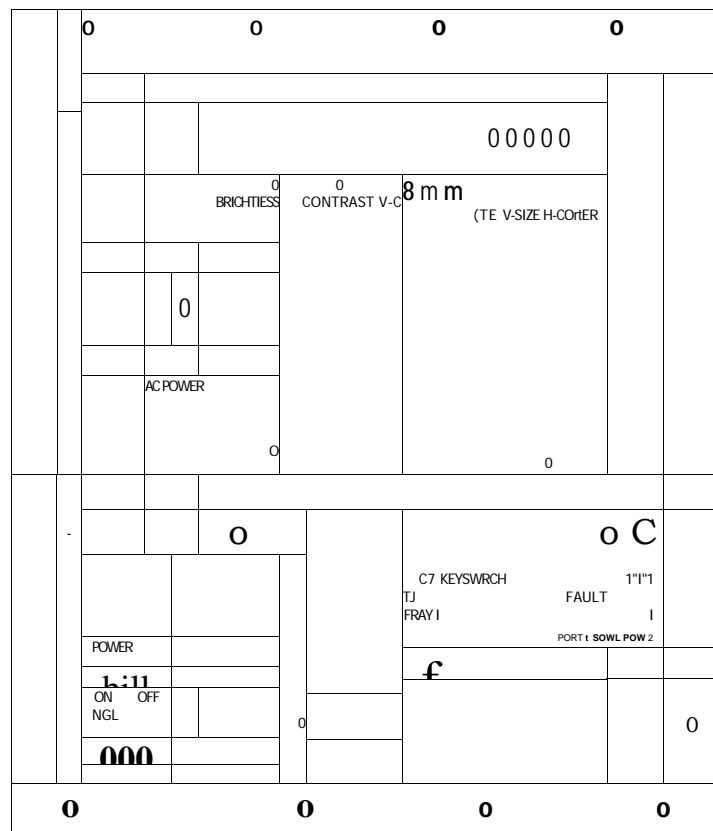
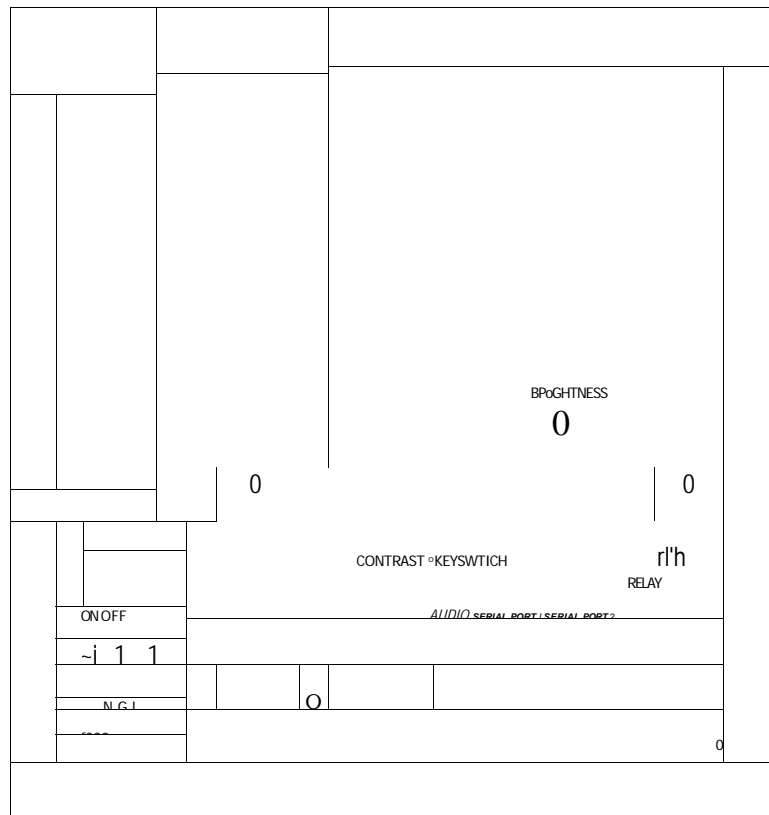
Perform Display

Tests Perform

Keypad Test

Check the Audio Output, Fault Relay and Test Battery





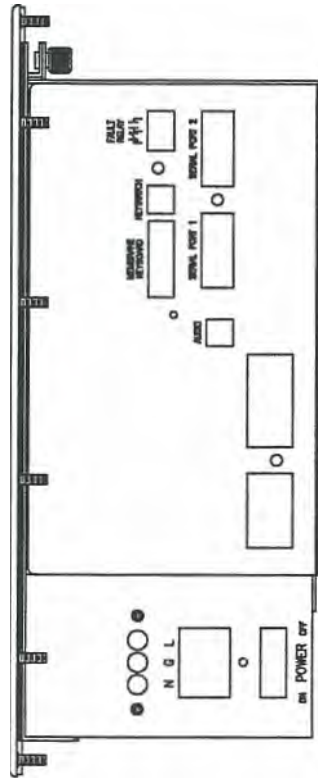


Figure 4-5 PanelMate Series 3000 Side View

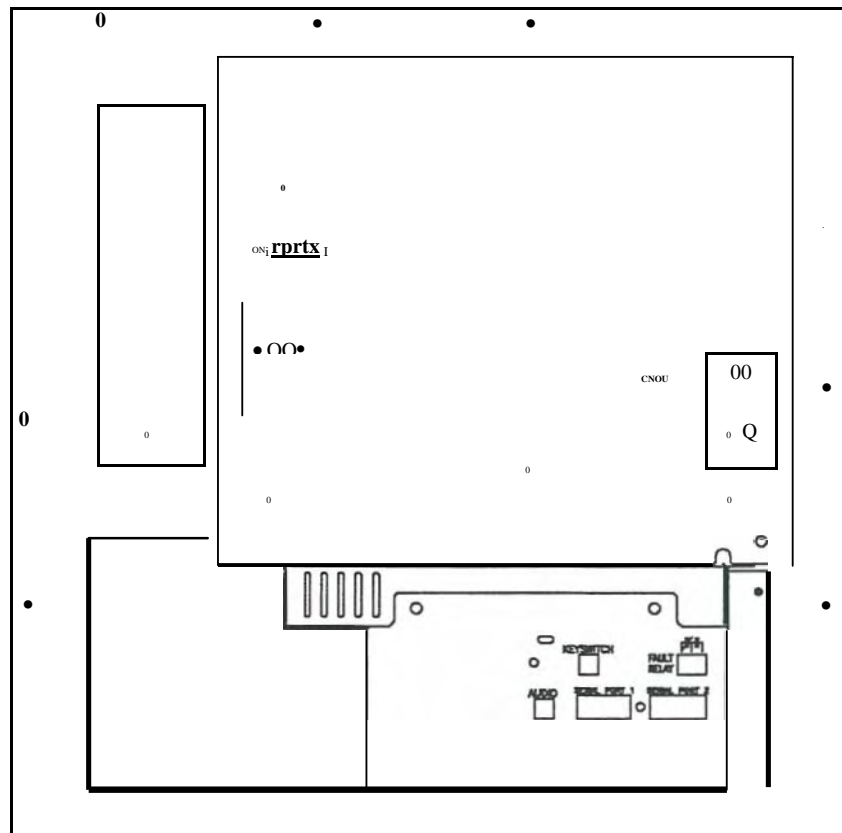


Figure 4-6 PanelMate Series 4000 (Model 4500) Rear View

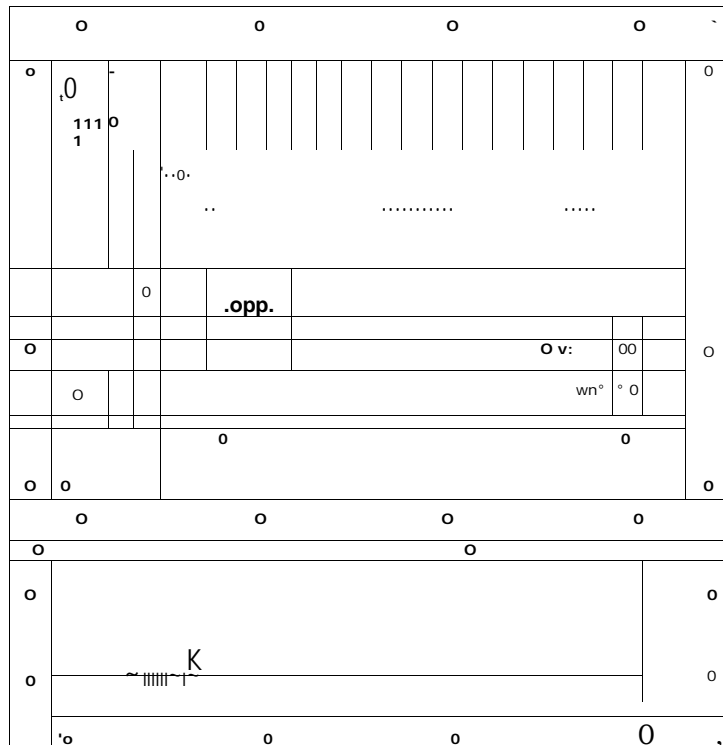
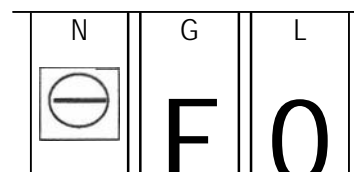


Figure 4-7 PanelMate Series 4000 (Model 4200) Rear View

Connect AC Power

The AC power terminals and power switch are located at the back of the PanelMate unit. (The AC power terminals and power switch are located on the side of the PanelMate Series 3000.) Make sure the rocker switch is in the OFF position. Remove the protective cover. Connect your AC power with user-supplied wiring. (Note that if you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the monitor and the Electronics Module require individual power connection.) The PanelMate unit is auto-sensing and will automatically adjust to operate at either 110V AC or 220V AC. Replace the protective cover over the AC wiring.

Note It is recommended that power, noise, and surge protectors be used when the PanelMate unit is installed in areas where the power quality is poor.



N - Neutral - White Wire (typical)
 G - Ground - Green Wire (typical) L -
 Line (Hot) - Black Wire (typical)

Figure 4-8 Terminal Block

Attach Audio Feedback Kit

The Audio Feedback Kit is an optional accessory to the PanelMate unit.

To attach the speaker to the unit, simply remove it from the shipping box and connect the cable to the two-terminal connector which plugs into the terminals labeled "AUDIO". The connector is shipped in a small plastic bag.

Attach Security Keyswitch

The Security Keyswitch is an optional accessory to the PanelMate unit which is located in the Hardware Support Kit.

To attach the Security Keyswitch to the unit, simply unpackage it and connect it with user-supplied wiring to the two-terminal connector which plugs into the terminals labeled "KEYS WITCH". Note that this is a contact closure and voltage should not be applied. The connector is shipped in a small manila coin envelope.

Power Up the Unit

Switch the power on. (Note that for the PanelMate Series 2000 Color and the PanelMate Series 4000, you must power up the monitor and the Electronics Module.) The PanelMate unit will return to the state it was in when the unit was powered off. If the PanelMate unit was in the Run Mode, you must select Offline Mode from the Setup Page to execute the diagnostics listed in the following sections. The PanelMate unit performs internal diagnostic checks. You may also hear the monitor "crackle" - this is normal. The screen will first display a listing of the diagnostic checks as it executes them. If there is a failure, see Chapter 8, Troubleshooting

Guide for the PanelMate Series System, for assistance.

After the unit completes the diagnostics, proceed to the next section.

Execute the System Diagnostics

Once the diagnostics are completed, the system will be in the Off line Mode. The screen will display five choices.

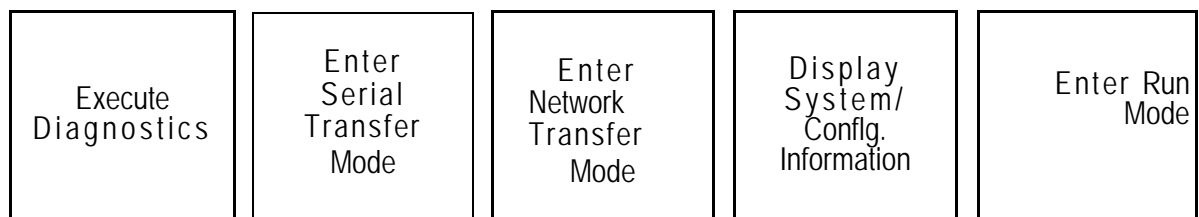


Figure 4-9 Off line Mode Menu

Select the template labeled "Execute Diagnostics" with the TouchPanel mounted below the CRT and then depress the control button labeled "Execute". A new page of choices will appear. One can execute Set Date and Time, Display Test, Keypads Test, Tone, Relay, and Battery Test, and System Status by selecting the appropriate template and then depressing the control button labeled "Execute".

Setting Date and Time

1. Select Set Date and Time and press the control button labeled "Execute". A new page will be displayed.
2. Select Set Date and press the control button labeled "Execute". The right hand control buttons will change and numeric entry will be enabled. Use the numeric keypads to enter the month, day of the month and the year using the format MM-DD-YY. Be sure to use the minus key between the numeric values. By pressing the bottom control button, the new date will be entered. If the date is already correct, press the <Cancel> key to exit.
3. Select Set Time and press the control button labeled "Execute". Use the numeric keys to enter the time as HH-MM-SS with the hours in the 24-hour format. For example, 2:45:11 PM should be entered as 14-45-11. Again be sure to use the minus key between numeric values. Pressing the bottom control button will enter the new time. If the time is already correct, press the <Cancel> key to exit.
4. Press the <Cancel> key and then the bottom control button labeled "Exit" to proceed.

Perform Display Tests

Select Display Test and press the control button labeled "Execute". The new page will display four (4) tests that can be run. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the tests displayed will be Intensity Check, Solid No Intensity Screen, Solid High Intensity Screen, and Dot Pattern. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the tests displayed will be Color Check, Solid Black Screen, Solid White Screen, and Dot Pattern. Select a test and press the control button labeled "Execute". To leave a test, press <Cancel>.

Perform Keypad Test

Select Keypad Test and press the control button labeled "Execute". As a key is pressed, it will be identified on the page display. Use this test to verify keyboard operation. Test the <Cancel> key last as it will exit the test mode.

Check the Audio Output, Fault Relay and Test Battery

Selecting this template cell and pressing the control button labeled "Execute" will bring seven (7) new test selections. If you have connected the optional Audio Feedback Kit, follow the onscreen instructions to test the Low, Medium, and High Audio Tones. The Fault Relay may also be tested. You may also call a screen to test the Real-Time Clock Battery Test results.

System Status

Select System Status and press the control button labeled "Execute". The new screen will display the PowerUp Diagnostic Results.

Test Completion

This completes the internal System Health Checks which are available for unit check-out. You should turn the power switch OFF and then disconnect the source of AC Power before removing your wiring.

Enter the Serial Transfer Mode

To download, upload, or read system information over a serial port, the online unit must be in the Serial Transfer Mode. The PanelMate unit will remain in the ready state until the Configuration Software has initiated the transfer. Configuration files, drivers, executive firmware, and options can be downloaded to the PanelMate unit. The configuration file loaded in the PanelMate unit can be uploaded to the personal computer.

Note that you may refer to the Display System Configuration Information screen before or after a transfer to verify configuration names, executive firmware versions, options, or drivers currently loaded in the system.

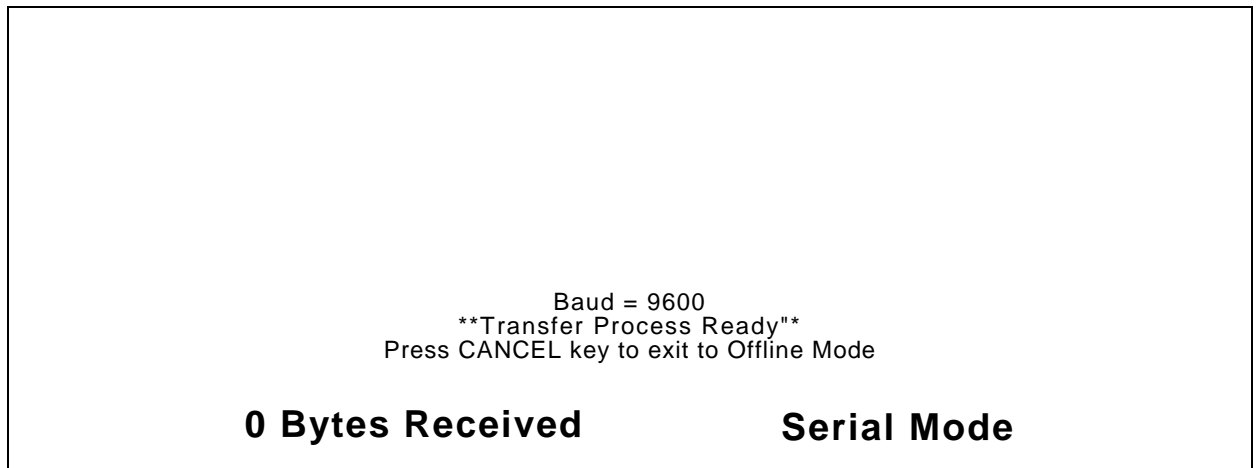


Figure 4-10 Serial Transfer Screen

Since the PanelMate unit is modular, the electronics module may be removed and transported to your personal computer to transfer files. The Serial Transfer Mode is the default state of the electronics module when power is applied.

You may change the default communication rate in the PanelMate unit from the Configuration Software. (The default is 9600 baud.) When transferring information, the PanelMate unit uses port 1.

Enter the Network Transfer Mode

Note The Network Executive Firmware and the network driver must be downloaded using the Serial Transfer Mode before you can transfer over a network.

To download, upload, remotely place the PanelMate unit into Run Mode, or read system information over a remote network, the online unit must have the Remote Transfer option installed and be in the Network Transfer Mode. The PanelMate unit will remain in the ready state until the Configuration Software has initiated the transfer. Configuration files, drivers, executive firmware, and options can be downloaded to the PanelMate unit. The configuration file loaded in the PanelMate unit can be uploaded to the personal computer. The PanelMate unit can also be remotely placed into Run Mode. For more information on remotely placing the PanelMate unit in Run Mode, refer to the Place VCP Unit in Run Mode section in the Transfer Editor chapter in the PanelMate Series Product Manual.

Note that you may refer to the Display System Configuration Information screen before or after a transfer to verify configuration names, executive firmware versions, options, or drivers currently loaded in the system.

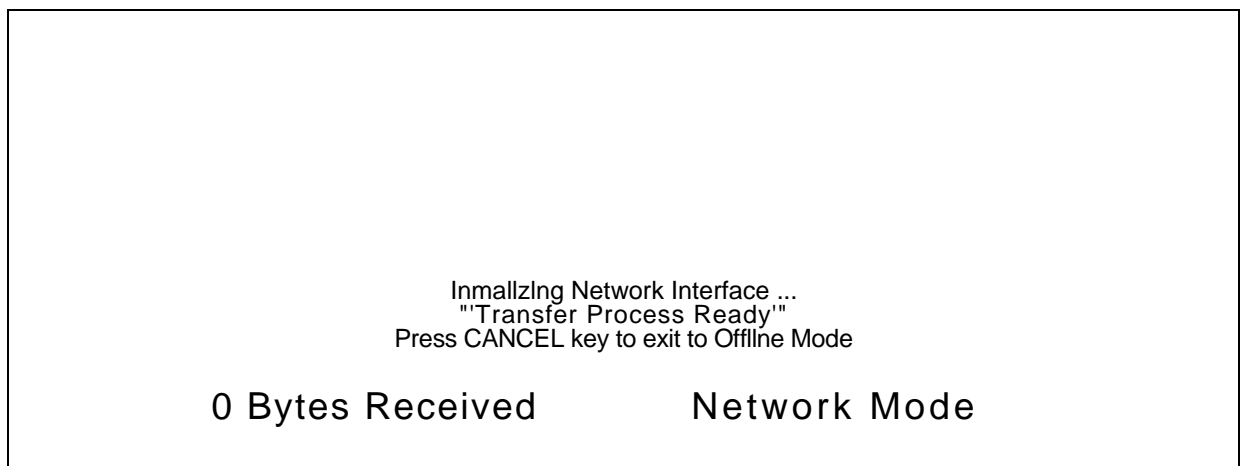


Figure 4-11 Network Transfer Screen

This selection will display the current configuration information from the PanelMate online unit.

USER CONFIGURATION	
Name:	FILE1.PC2
Version:	XXX Date/Time:
06/23/94 07:45	
Free Bytes:	40932 Used Bytes: 24064
Options:	30 Page, Graphics
EXECUTIVE FIRMWARE	
Company/ID:	Eaton IDT, Inc.
Product:	PanelMate 3000
Version:	XXX Model B: 30 Page:
Network:	None
Options:	Graphics
INSTALLED DRIVERS	
Generic	(Version X.XX)

Figure 4-12 System Configuration Display

Note If your PanelMate unit will be performing network transfers or if your configuration requires multiple installed drivers, check the model field of the Display System Information screen (accessed from the Offline Menu) or the Read System Information screen (accessed from the Transfer Editor Menu). If a model other than B or E is displayed, a hardware upgrade to your PanelMate unit will be required. If a hardware upgrade is needed, call the Eaton IDT Customer Support at (614) 882-3282.

Enter Run Mode

The Run Mode allows you to display the configuration downloaded to the PanelMate unit communicating to the PLC of your choice.

If the Remote Transfer option is installed, you can remotely place the PanelMate unit into Run Mode from your personal computer.

Note If the value in the Remote Mode Change field in the System Parameters table is configured as IMMEDIATE, DEFAULT, or ACCEPT, you may also remotely place the PanelMate unit into the Network Transfer Mode from your personal computer. For more information on remotely placing the PanelMate unit into the Network Transfer Mode, refer to the Place VCP Unit in Transfer Mode section in Chapter 27, Transfer Editor.

To exit the Run Mode, select "Enter Offline Mode" from the Setup page. To go to the Setup page, select "More Buttons" from the default control buttons, then select "Setup Page".

Chapter 5

Installation in an Industrial Enclosure

In this chapter, you will learn:

- How to install the PanelMate Series unit in an industrial enclosure
- How to connect AC Power
- How to connect a Printer to the PanelMate Series unit
- How to connect to the Fault Relay
- How to connect to the Audio Output
- How to connect to the Security Keyswitch
- How to install the two-inch Mounting Collar
- How to install the Pushbutton Actuator Kit (Model 2400 only)
- How to install the Colored Replacement Pushbutton Caps (Model 2400 only)

Installing the PanelMate Series 2000 (Model 2400) in an Industrial Enclosure

The PanelMate Series 2000 (Model 2400) is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 2000 (Model 2400) in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation. The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

Review the PanelMate Series 2000 (Model 2400) Outline and the PanelMate Series 2000 (Model 2400) Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

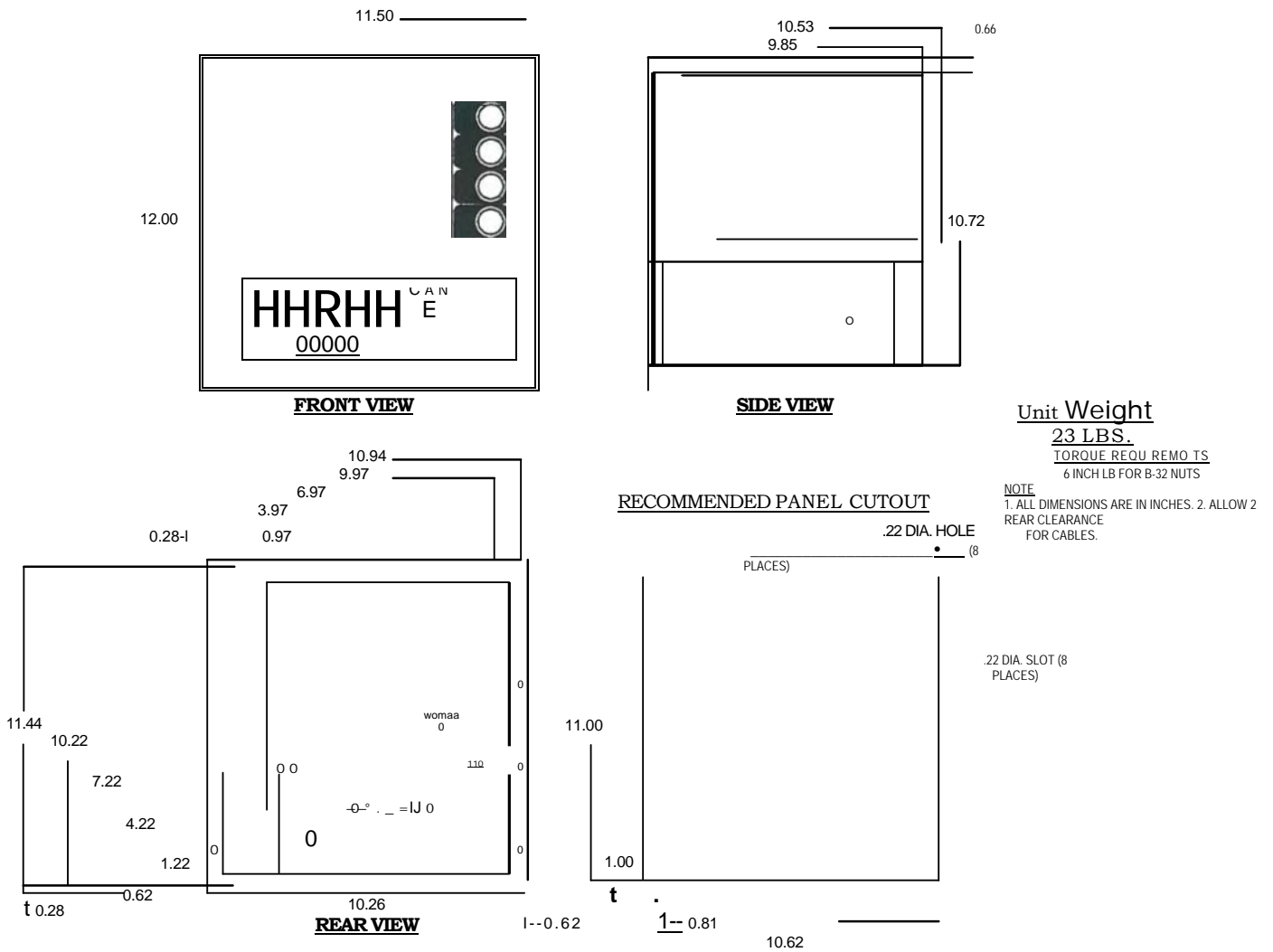


Figure 5-1 PanelMate Series 2000 (Model 2400) Outline

Make cutouts in the enclosure as show in figure 5-2. Disassemble the PanelMate unit using the following procedure:

1. Go to the back of the unit. Remove AC power and disconnect any other connectors.
2. Unplug the Monitor Housing Assembly video/power cable from the Electronics Module Assembly. This cable disconnects power and the video signal to the CRT.
3. Remove the Monitor Housing Assembly. Do this by turning the outboard quarter-turn fasteners counter-clockwise. The CRT section is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module Assembly. Do this by turning the inboard quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to dis-engage the front panel keypad connector. Then lower the assembly down to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel Assembly in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

6. Re-attach the Electronics Module Assembly. Do this by engaging the front slot of the Electronics Module Assembly on the mounting flange on the Front Panel Assembly. Bring the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Housing Assembly. Slide the CRT section into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video/power cable from the CRT to the Electronics Module.
8. You may now re-connect AC power and any other connectors.

Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Series 2000 (Model 2400) and allows mounting a unit into a 10-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 5-6. Check to see if the mounting collar will fit, then remove. Attach the PanelMate unit to the mounting collar with the 16 nuts and washers provided with the PanelMate Series 2000 (Model 2400) Mounting Collar Kit.

Caution

Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 8 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 16 nuts and washers.

Mount the PanelMate unit's front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Housing Assembly and Electronics Module Assembly.

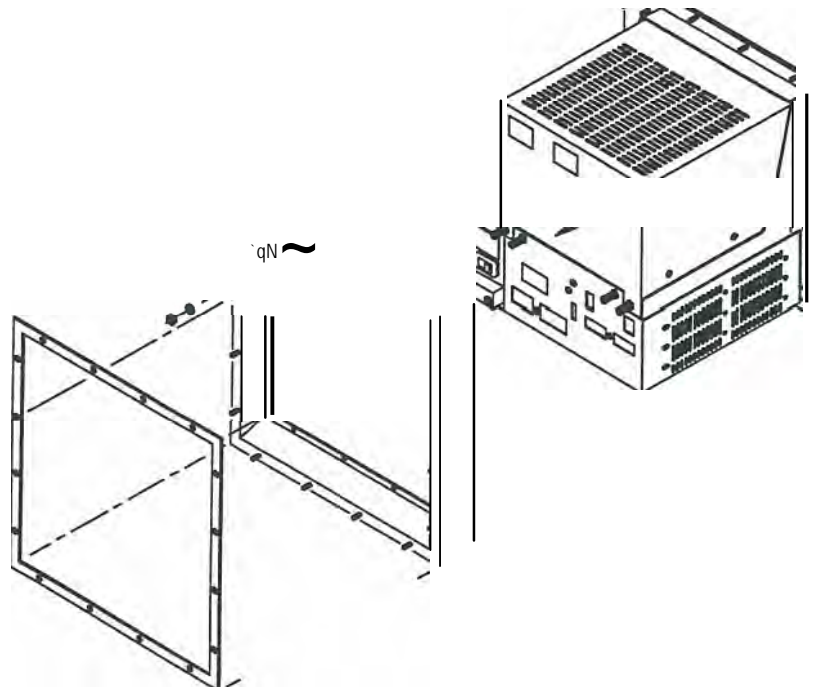
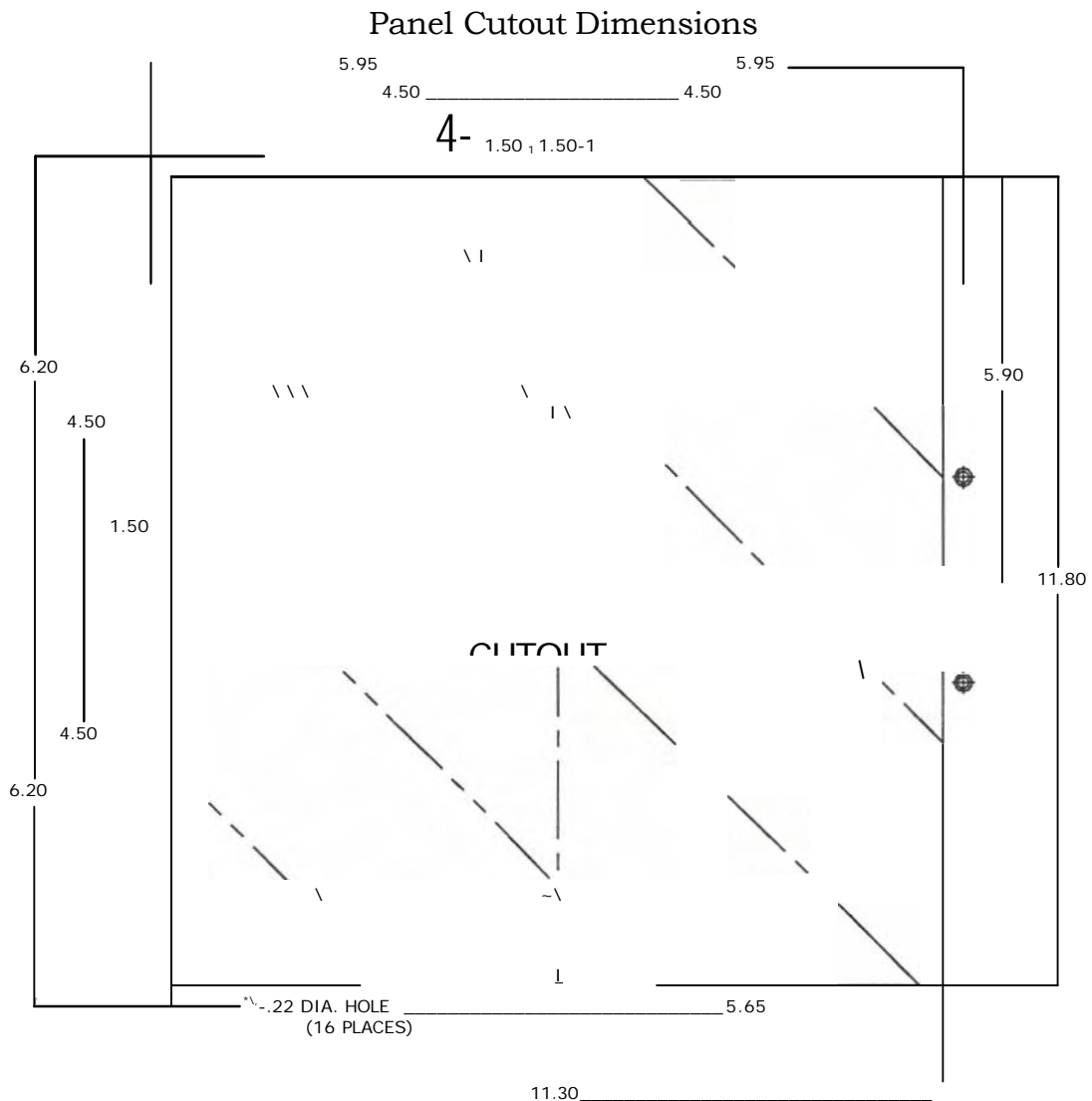


Figure 5-4 PanelMate Series 2000 (Model 2400) Mounting Collar Assembly



Torque Limits for Steel Studs

CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

8 INCH-POUNDS FOR #8-32 NUTS

Note: All units are in inches.

Figure 5-6 PanelMate Series 2000 (Model 2400) Panel Mount Collar

Install the Pushbutton Actuator Kit

The Pushbutton Actuator Kit is an optional accessory. The kit is used to convert a PanelMate Series 2000 (Model 2400) with membrane control buttons to 22.5mm full travel pushbuttons. To install kit first remove the control button membrane keypad from the unit by removing the mounting nuts and hardware and disconnecting the cable. Discard the used nuts and washers. Attach the standoffs to the front panel and secure them. Insert the 22.5mm pushbutton from the front of the panel and tighten the mounting nut from behind. Re-attach the membrane keypad and tighten with the two new #8 washers and nuts provided. Re-connect the cable.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

Install the Replacement Pushbutton Caps

The Replacement Pushbutton Caps is an optional accessory.

The kit contains four each of the black, red, and green pushbutton caps, and four each of the front panel ring. The ring is designed to accept a single installation of a colored cap -- it cannot be removed without damage. Finalize your color selections and then insert the caps in the rings to create your four assemblies.

To mount them on your unit, carefully unscrew the existing ring/cap from the pushbutton operator from the front side of the front panel. Note the orientation. Carefully align the new ring/cap and tighten the assembly. If properly oriented, the pushbutton will operate smoothly -if not, repeat the assembly process and rotate the ring/cap until a smooth fit is obtained.

Installing the PanelMate Series 2000 (Model 2600) in an Industrial Enclosure

The PanelMate Series 2000 (Model 2600) is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 2000 (Model 2600) in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation. The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

PanelMate Series 2000 ;1~ #l'

oanre 'izing

Review the PanelMate Series 2000 (Model 2600) Outline and the PanelMate Series 2000 (Model 2600) Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

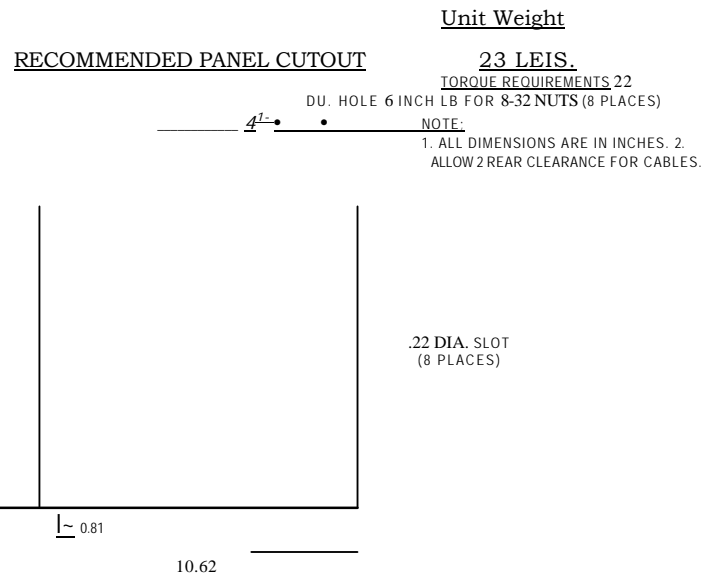
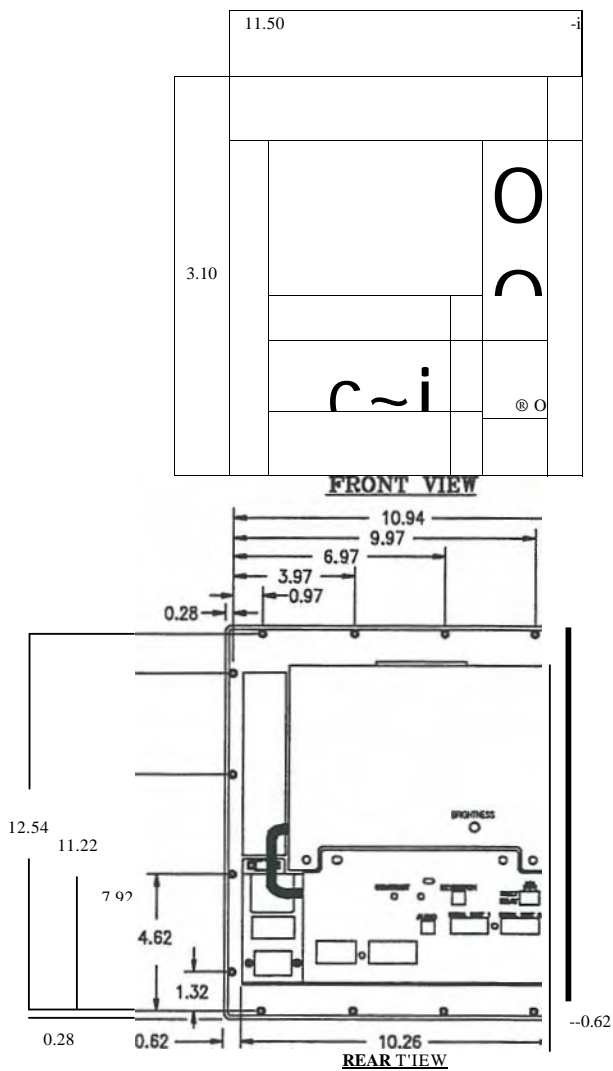


Figure 5.7 PanelMate Series 2000 (Model 2600) Outline

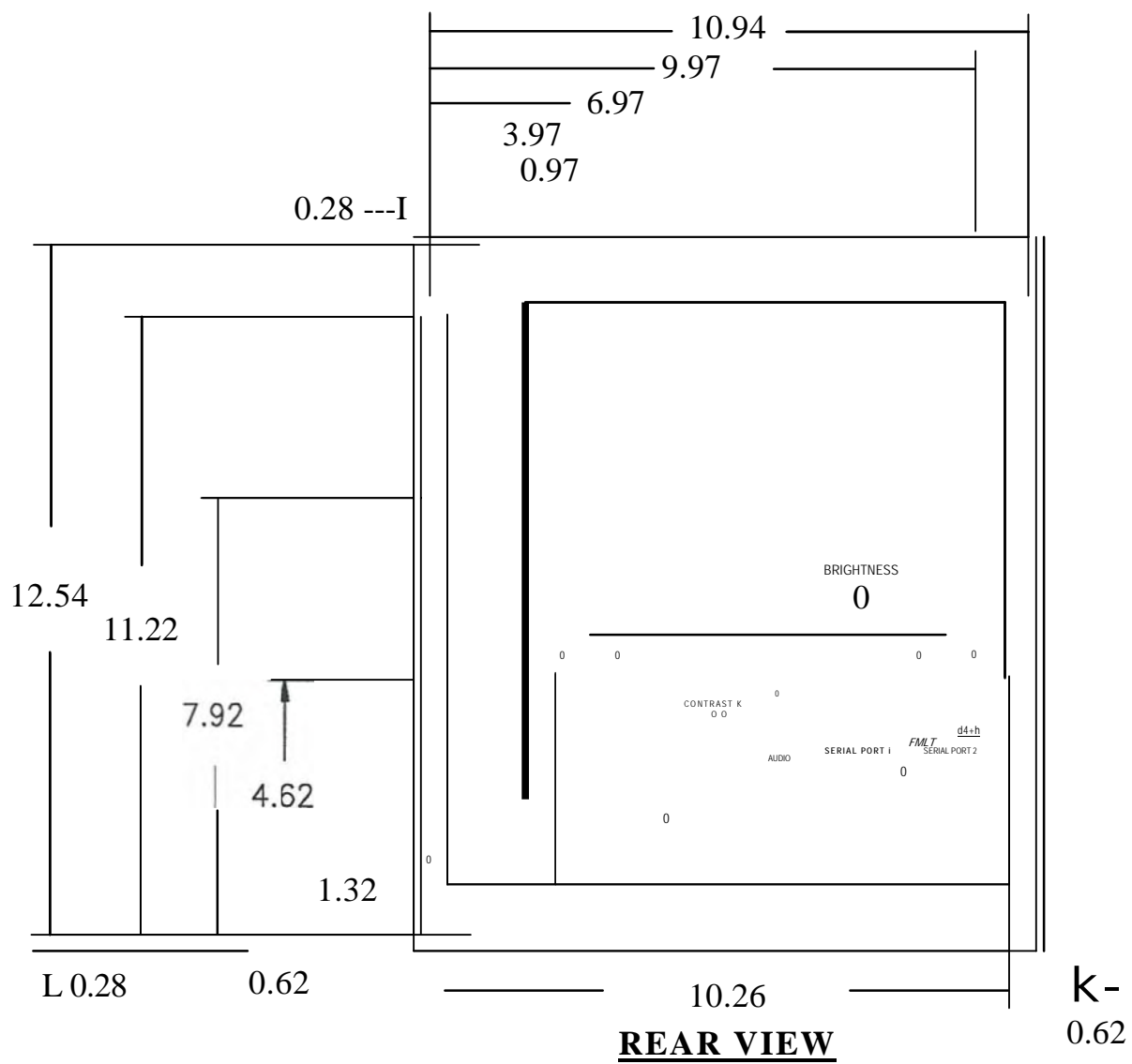


Figure 5-9 PanelMate Series 2000 (Model 2600) Rear View

Install PanelMate Series 2000 (Model 2600) in an Enclosure

Make cutouts in the enclosure as show in figure 5-8. Disassemble the PanelMate unit using the following procedure:

1. Go to the back of the unit. Remove AC power and disconnect any other connectors.
2. Unplug the Monitor Housing Assembly video/power cable from the Electronics Module Assembly. This cable disconnects power and the video signal to the CRT.
3. Remove the Monitor Housing Assembly. Do this by turning the outboard quarter-turn fasteners counter-clockwise. The CRT section is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module Assembly. Do this by turning the inboard quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to dis-engage the front panel keypad connector. Then lower the assembly down to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel Assembly in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

6. Re-attach the Electronics Module Assembly. Do this by engaging the front slot of the Electronics Module Assembly on the mounting flange on the Front Panel Assembly. Bring the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Housing Assembly. Slide the CRT section into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video/power cable from the CRT to the Electronics Module.
8. You may now re-connect AC power and any other connectors.

Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Series 2000 (Model 2600) and allows mounting a unit into a 10-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 5-12. Check to see if the mounting collar will fit, then remove. Attach the PanelMate unit to the mounting collar with the 16 nuts and washers provided with the PanelMate Series 2000 (Model 2600) Mounting Collar Kit..

Caution

Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 8 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 16 nuts and washers.

Mount the PanelMate unit's front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Housing Assembly and Electronics Module Assembly.

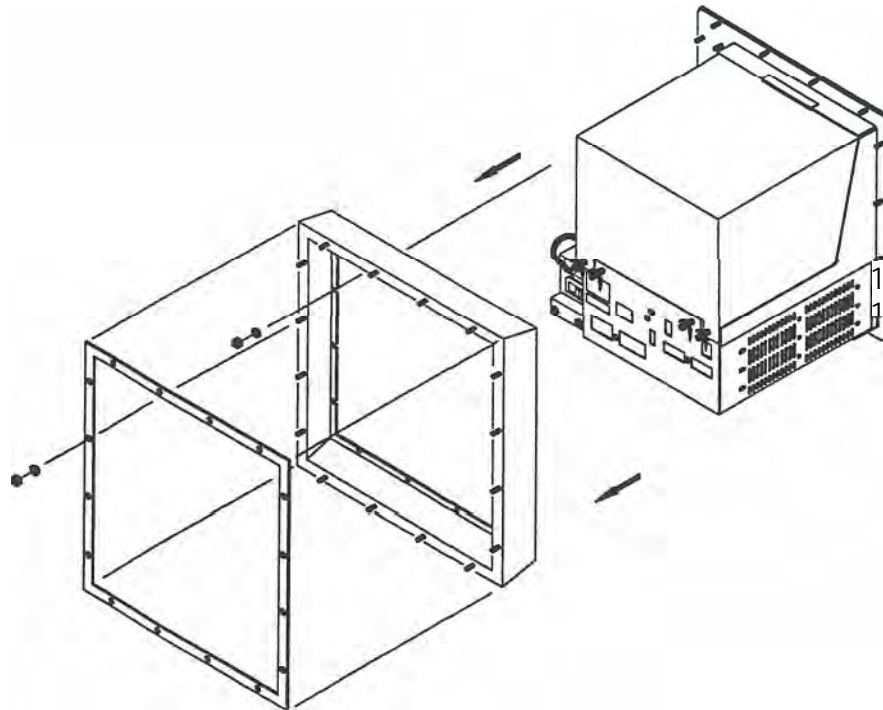


Figure 5-10 PanelMate Series 2000 (Model 2600) Mounting Collar Assembly

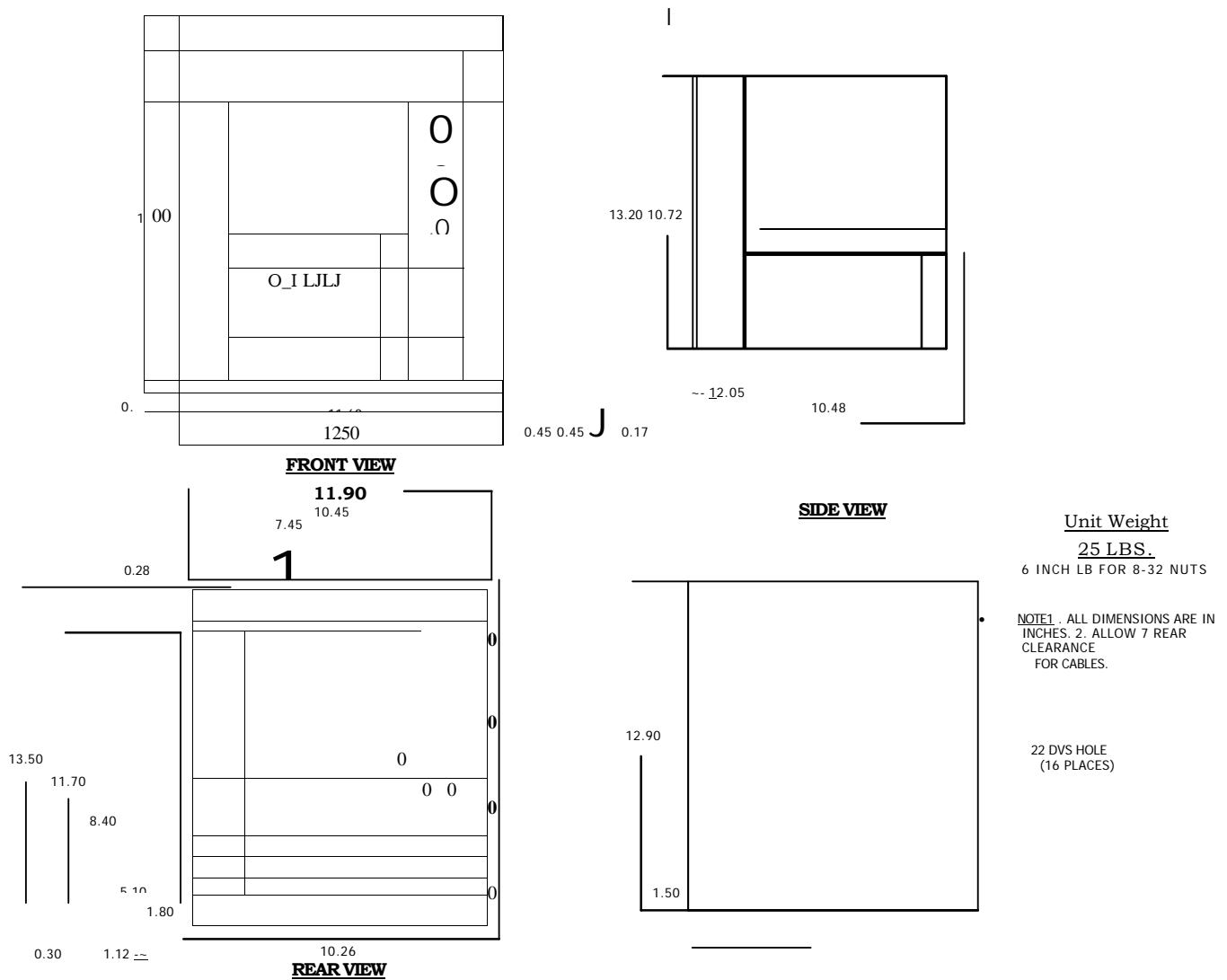
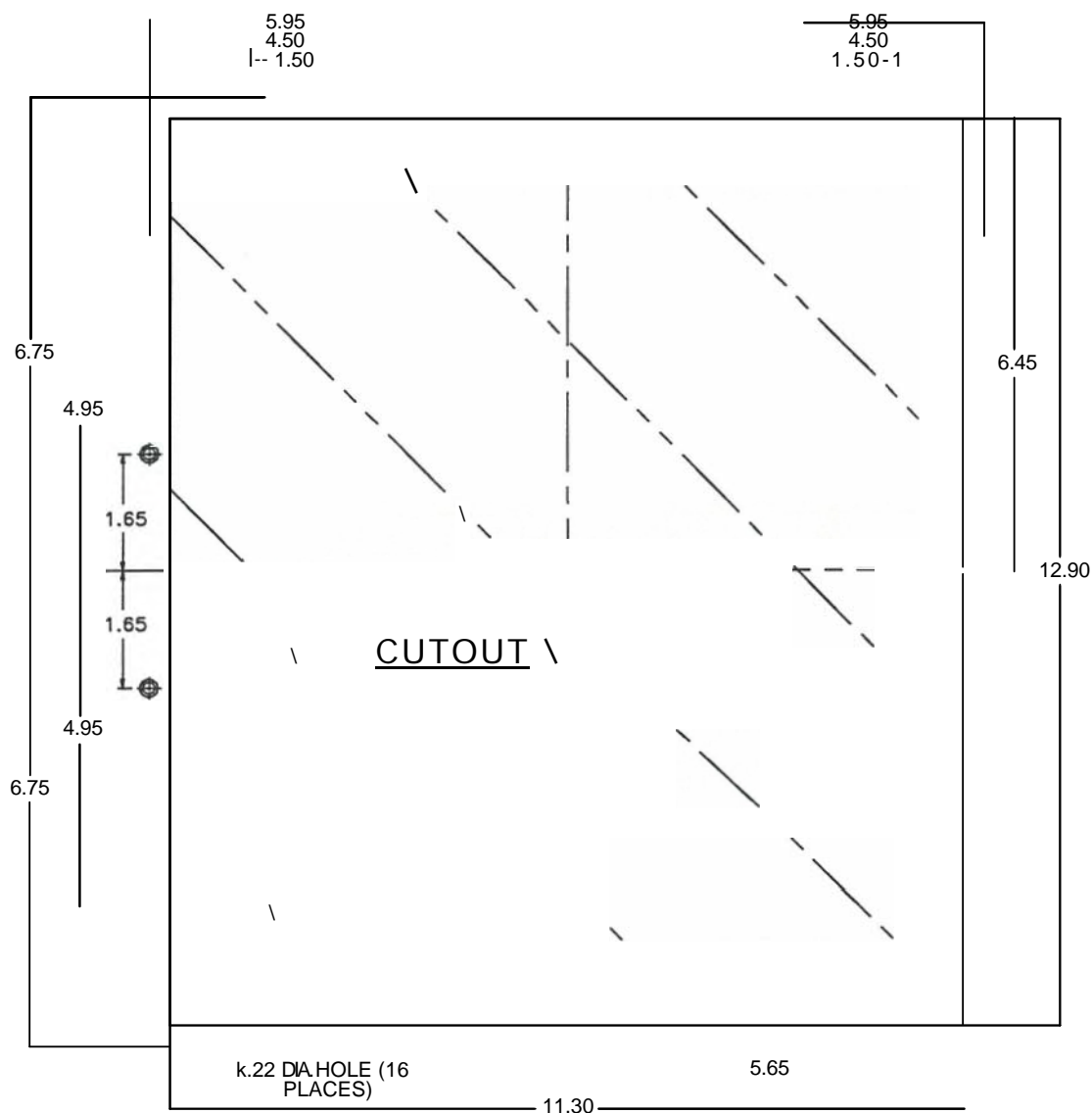


Figure 5.11 PanelMate Series 2000 (Model 2600) with Collar Outline



CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

8 INCH-POUNDS FOR #8-32 NUTS

Note: All units are in inches.

Figure 5-12 PanelMate Series 2000 (Model 2600) Panel Mount Collar

Installing the PanelMate Series 2000 Color (Model 2700) in an Industrial Enclosure

The PanelMate Series 2000 Color (Model 2700) is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 2000 Color (Model 2700) in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 2.

PanelMate Series 2000 Color (Model 2700) Enclosure Sizing

Review the PanelMate Series 2000 Color (Model 2700) Outline and the PanelMate Series 2000 Color (Model 2700) Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

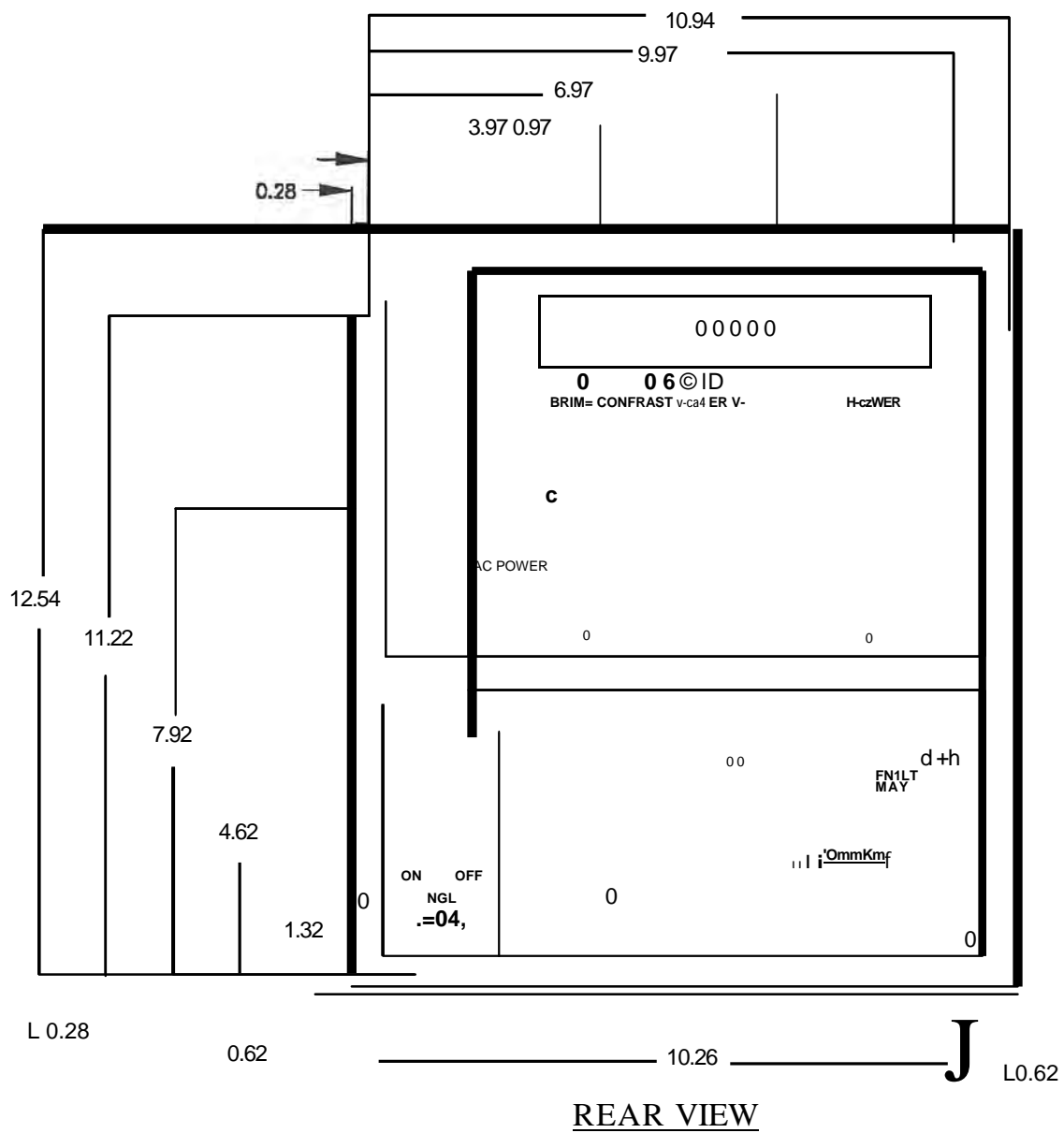


Figure 5-15 PanelMate Series 2000 Color (Model 2700) Rear View

Make cutouts in the enclosure as show in figure 5-14. Disassemble the PanelMate unit using the following procedure:

1. Go to the back of the unit. Remove AC power from both the Electronics Module and the monitor housing.
2. Unplug the Monitor Housing Assembly video cable from the Electronics Module Assembly. This cable disconnects the video signal to the CRT.
3. Remove the Monitor Housing Assembly. Do this by turning the outboard quarter-turn fasteners counter-clockwise. The CRT section is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module Assembly. Do this by turning the inboard quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly away from the front panel to dis-engage the front panel keypad connector. Then lower the assembly down to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel Assembly in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 6 inch-pounds.

6. Re-attach the Electronics Module Assembly. Do this by engaging the front slot of the Electronics Module Assembly on the mounting flange on the Front Panel Assembly. Bring the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Housing Assembly. Slide the CRT section into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable to both the Electronics Module and the monitor housing.
8. You may now re-connect AC power and any other connectors.

Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Series 2000 Color (Model 2700) and allows mounting a unit into a 10-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutouts for the mounting collar as shown in figure 5-18. Check to see if the mounting collar will fit, then remove. Attach the PanelMate unit to the mounting collar with the 16 nuts and washers provided with the PanelMate Series 2000 (Model 2700) Mounting Collar Kit.

Caution Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 8 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 16 nuts and washers.

Mount the PanelMate unit's front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Housing Assembly and Electronics Module Assembly.

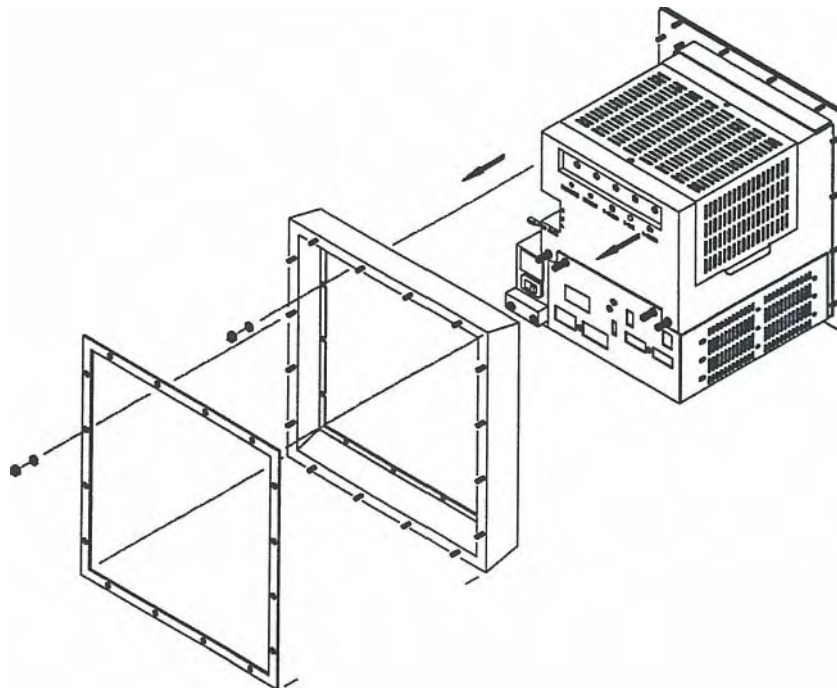


Figure 5-16 PanelMate Series 2000 Color (Model 2700) Mounting Collar Assembly

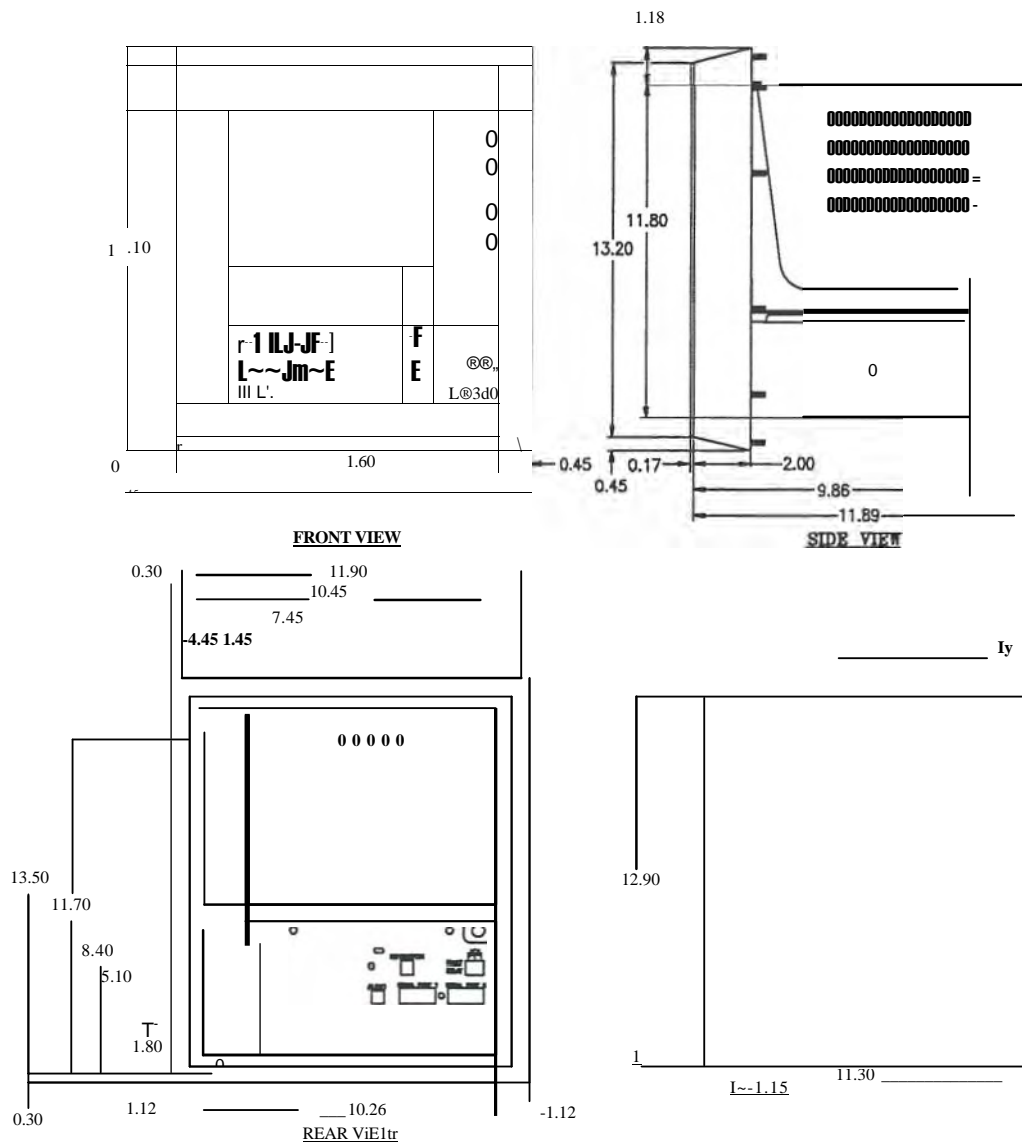
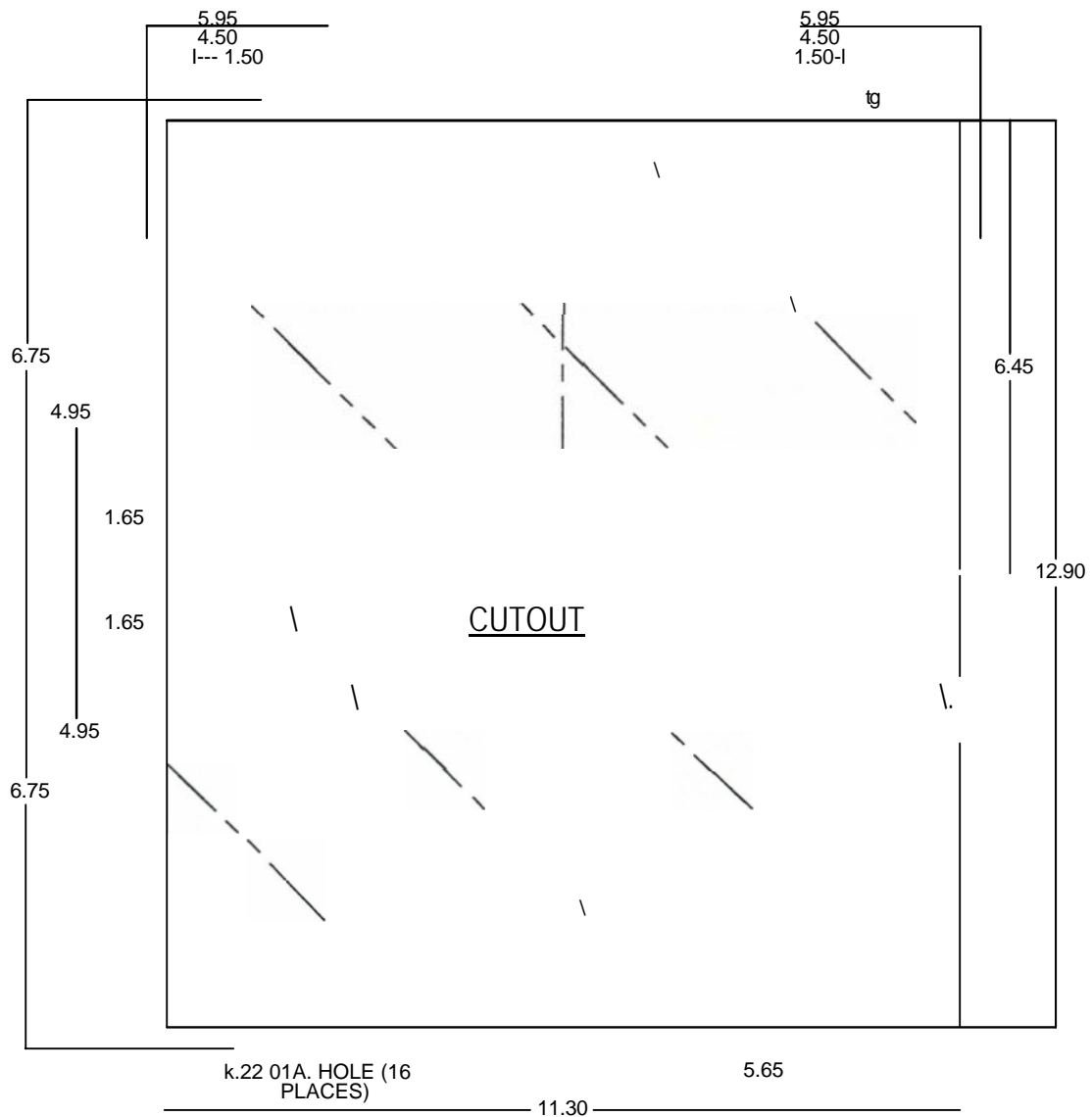


Figure 5-17 PanelMate Series 2000 Color (Model 2700) with Collar Outline



CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

8 INCH-POUNDS FOR #8-32 NUTS

Note: All units are in inches.

Figure 518 Panel Mount Series 2000 Color (Model 2700) Panel Mount Collar

Installing the PanelMate Series 3000 in an Industrial Enclosure

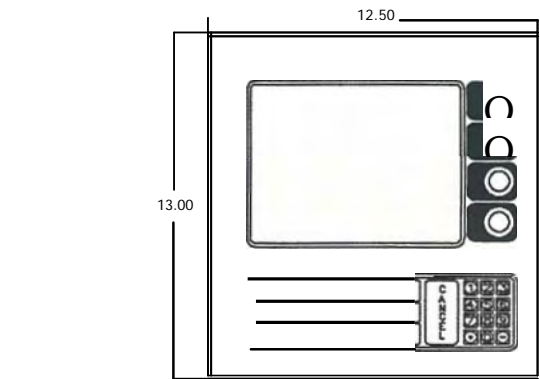
The PanelMate Series 3000 is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 3000 in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 4.

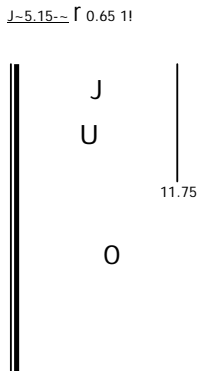
PanelMate Series 3000 Enclosure Sizing

Review the PanelMate Series 3000 Outline and Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate Series 3000. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

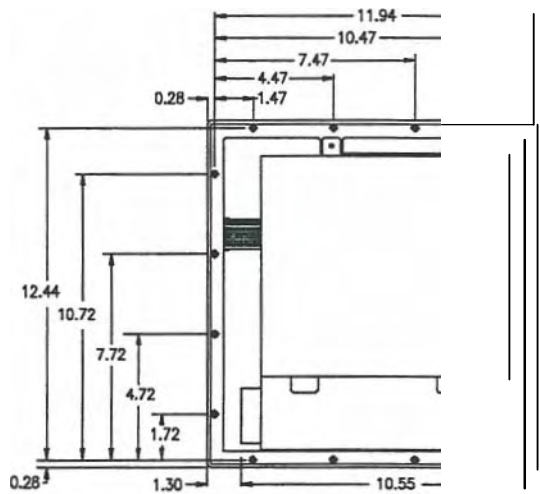


FRONT VIEW



SIDE VIEW

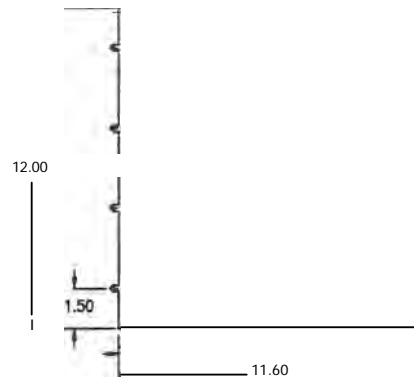
Unit Weight 15 LBS.
TORQUE REQUIREMENTS
 7 INCH LB FOR 18-32 NUTS



REAR VIEW

RECOMMENDED PANEL CUTOUT

22 DIN. HOLE
 (8 RACES)

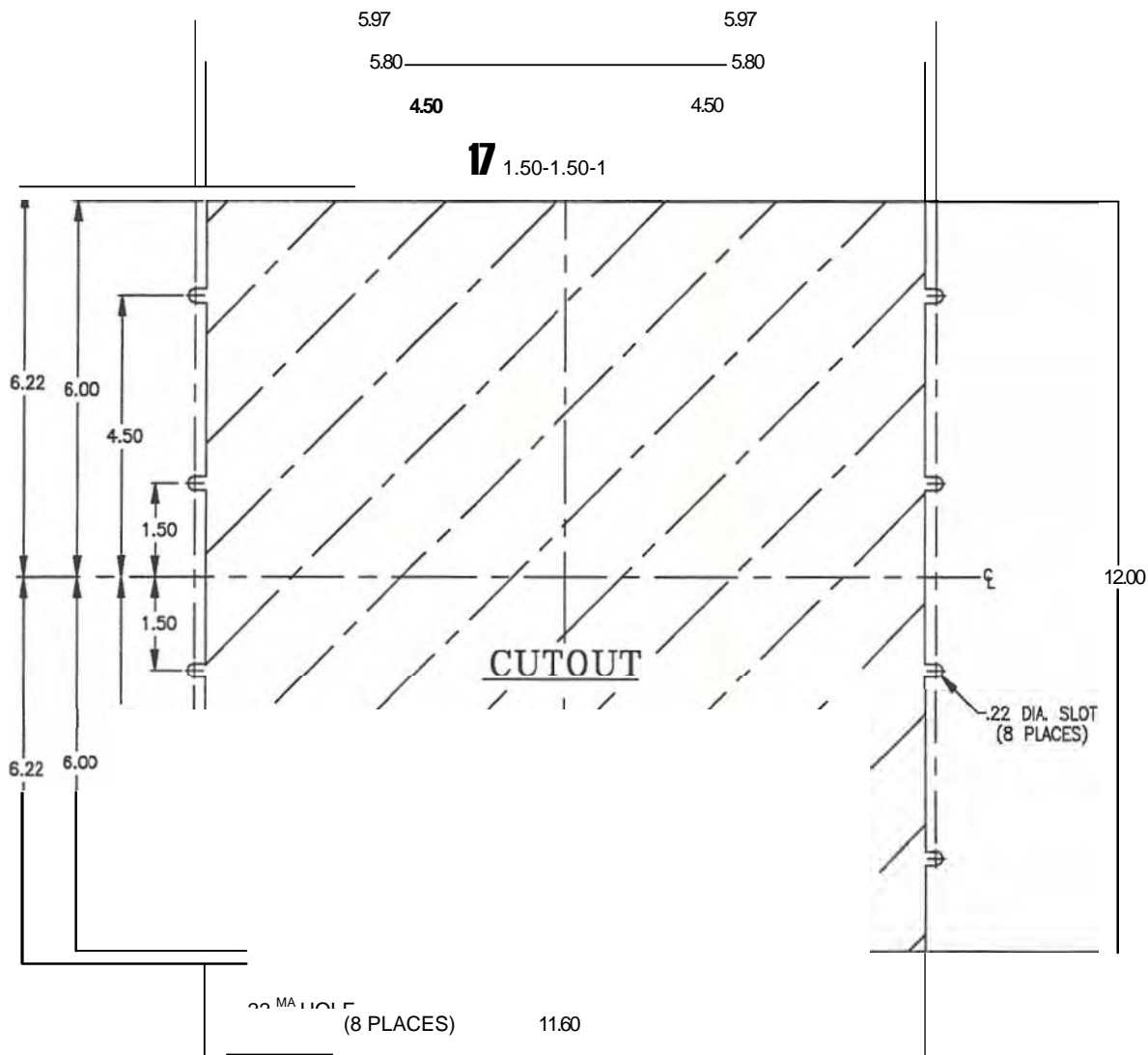


.22 DIAL SLOT (a
 RACES)

1. ALL DIMENSIONS ARE IN INCHES. 2.
 ALLOW 2" SIDE CLEARANCE FOR
 CABLE.

Figure 5-19 PanelMate Series 3000 Outline

Panel Cutout Dimensions



Torque Limits for Steel Studs

CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless.

7 NCH-POUNDS FOR #8-32 NUTS

Note: All units are in inches.

Figure 5-20 PanelMate Series 3000 Cutout and Torque Limit

T_{ce}P Gw'ec ;ep-ies

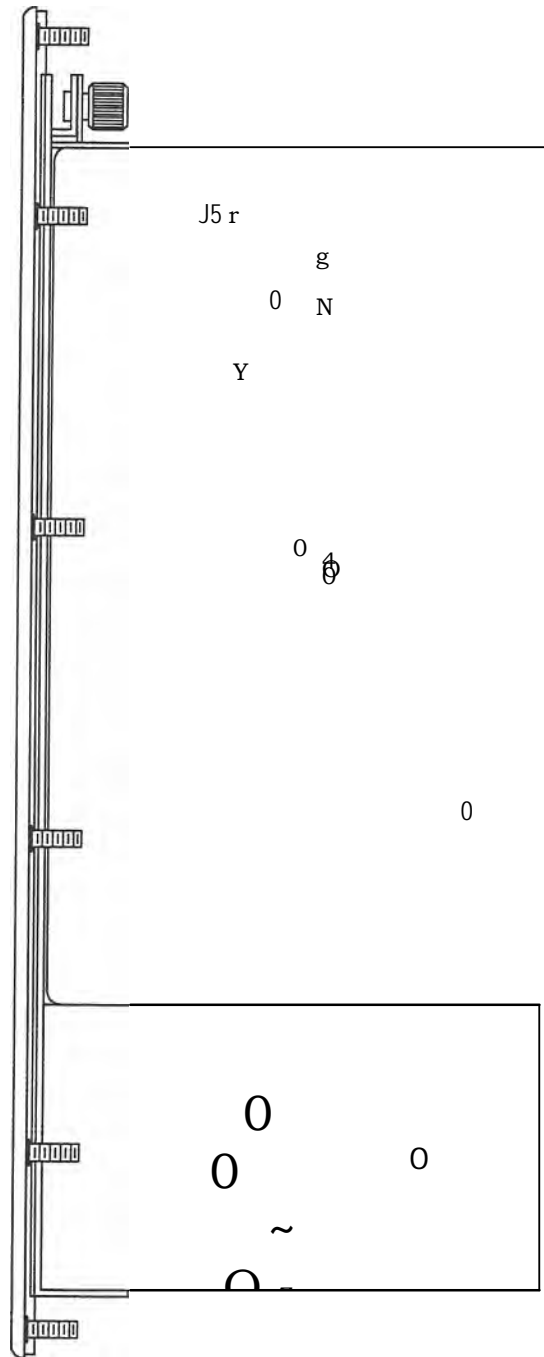


Figure 5-21 PanelMate Series 3000 Side View

Install the PanelMate Series 3000 in an Enclosure

Make the cutouts in the enclosure as show in figure 5-20. Disassemble the PanelMate Series 3000 using the following procedure:

1. Go to the side of the unit. Remove AC power and disconnect any other connectors. 2.

Unplug the keypad cable from the membrane keyboard connector.

3. Remove the Electronics Display Assembly. Do this by turning the captive fasteners counter-clockwise. Support the weight of the assembly by holding the bottom of the unit, then gently tilt the top of the assembly and lift upward. Store in a safe location.
4. From the front, insert the Front Panel Assembly in the cutout and fasten it with the sixteen #8 washers and nuts that are supplied with the unit.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 7 inch-pounds.

5. Re-attach the Electronics Display Assembly. Do this by engaging the front slots of the Electronics Display Assembly on the mounting flanges on the Front Panel Assembly. Raise the unit up to a horizontal position and slide the captive fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the captive fasteners clockwise to lock in place.
6. Re-attach the keypad cable to the membrane keyboard connector. 7.

You may now re-connect AC power and any other connectors.

Installing the PanelMate Series 4000 (Model 4500) in an Industrial Enclosure

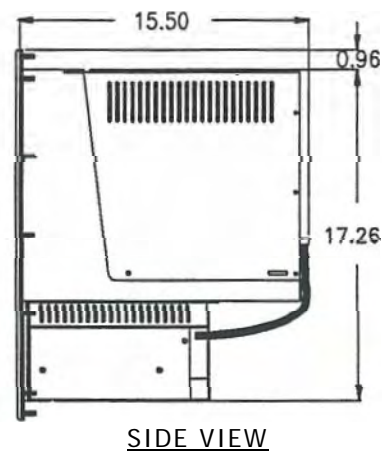
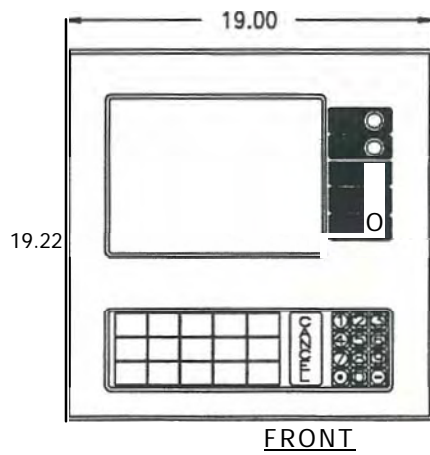
The PanelMate Series 4000 (Model 4500) is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 4000 (Model 4500) in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 4.

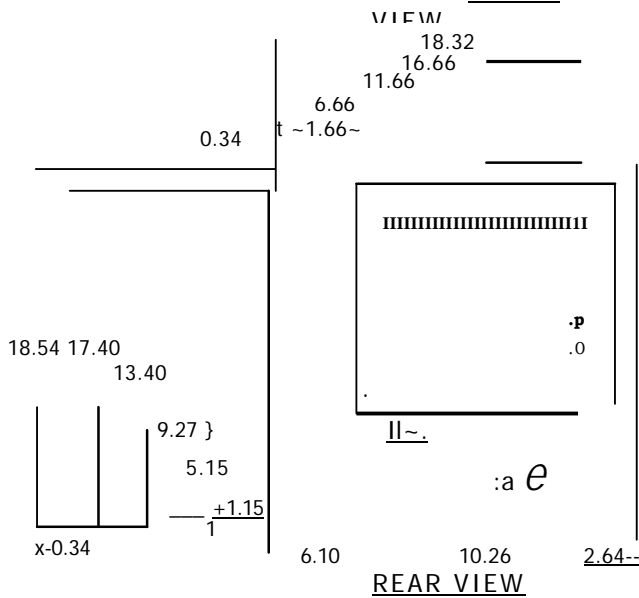
PanelMate Series 4000 (Model 4500) Enclosure Sizing

Review the PanelMate Series 4000 (Model 4500) Outline and Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate Series 4000 unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.



Unit Weight
55 LBS.
TORQUE REQUIREMENTS
 20 INCH LB FOR 10-32 NUTS



RECOMMENDED PANEL CUTOUT
 25 DIA. HOLE f
 (18 PLACES)

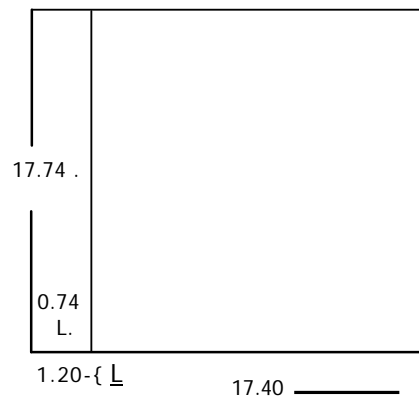
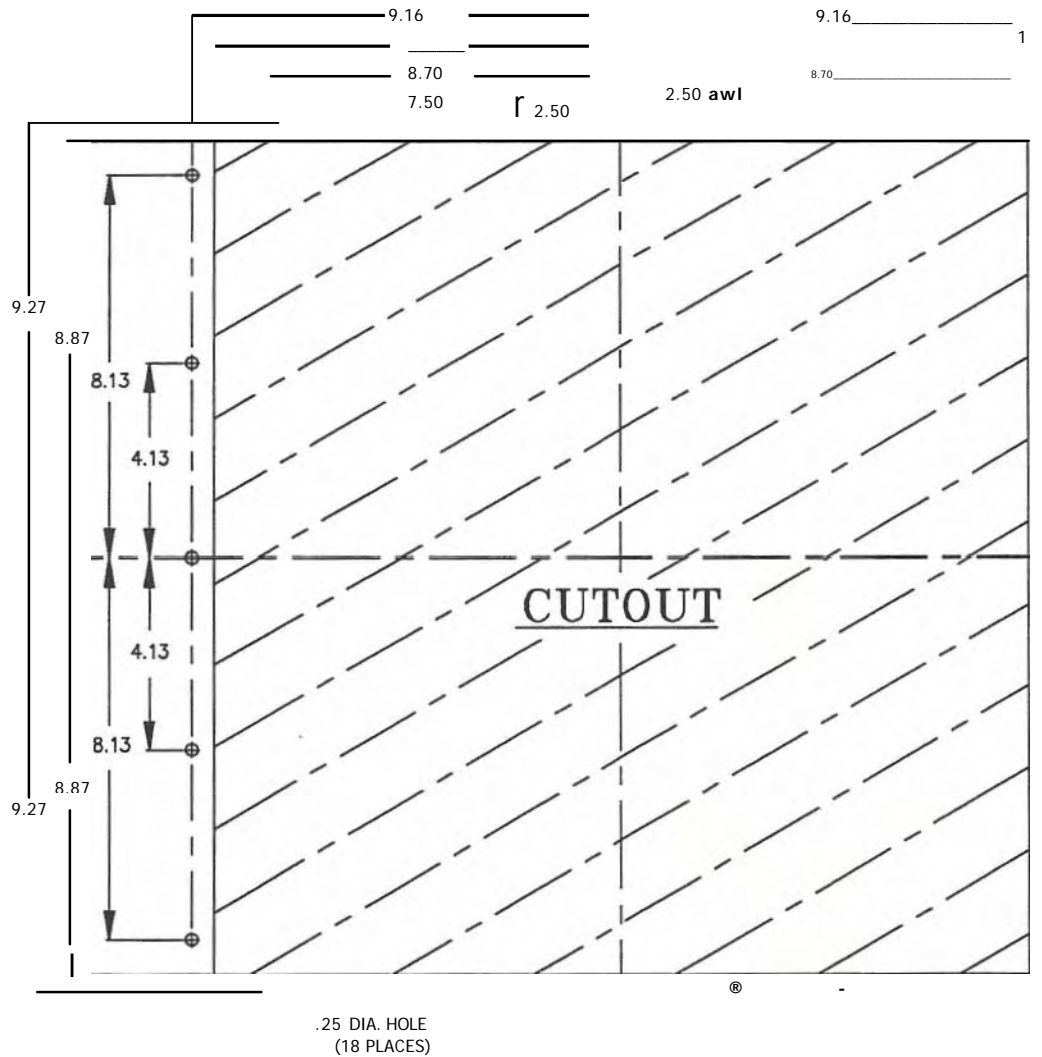


Figure 5-22 PanelMate Series 4000 (Model

Panel Cutout Dimensions

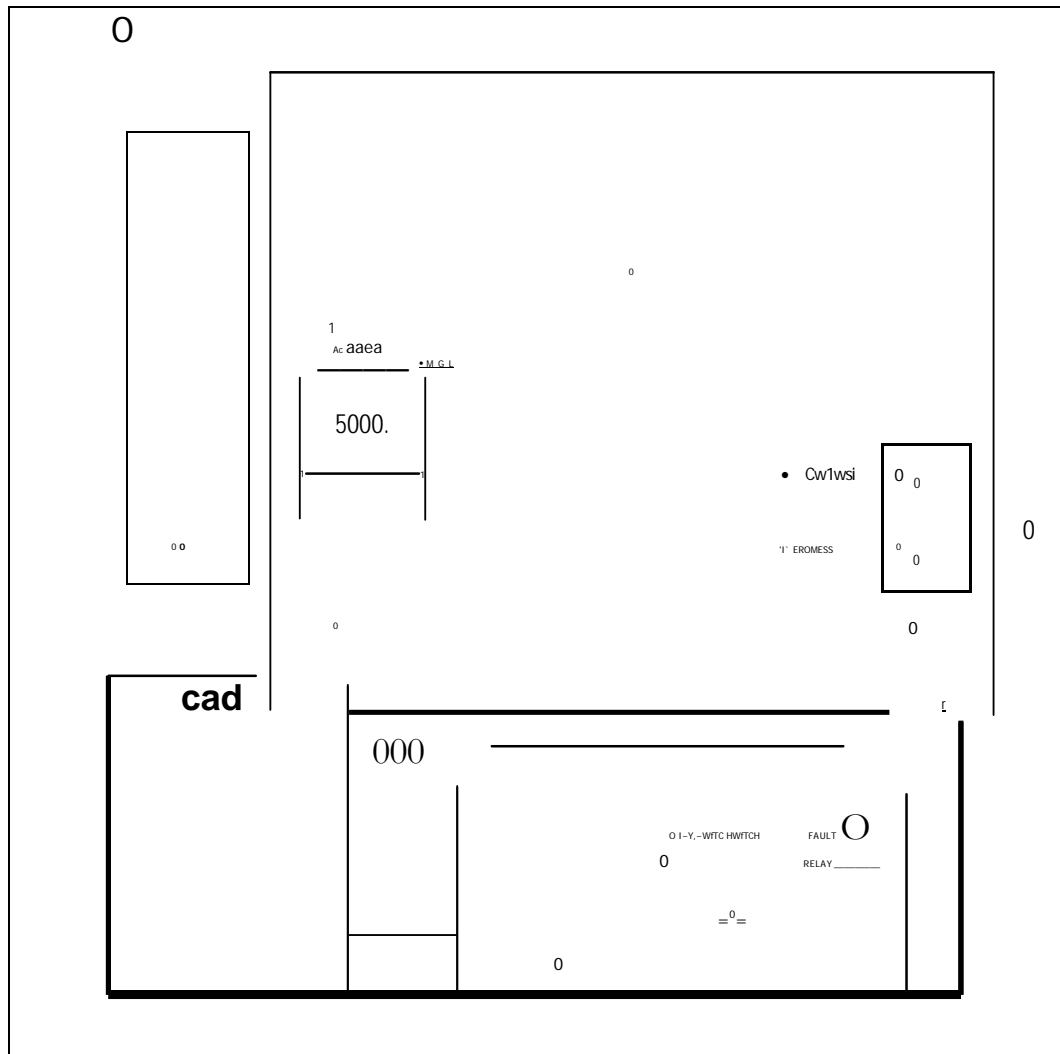


CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped from the welded steel studs.

20 INCH-POUNDS FOR #10-32 NUTS

Note: All units are in inches.

Figure 5-23 PanelMate Series 4000 (Model 4500) Cutout and Torque Limits



REAR VIEW

Figure 5-24 PanelMate Series 4000 (Model 4500) Rear View

hss E II "L re PanelMate ~, eries 4000 Model 450x :i ~nl an Enclosure

Make the cutout in the enclosure as shown in figure 5-23. Disassemble the PanelMate Series 4000 (Model 4500) using the following procedure:

1. Go to the back of the unit. Remove AC power from both the Electronics Module and the monitor. Disconnect any other cables.
2. Unplug the Monitor Housing Assembly video cable from the Electronics Module Assembly. This cable disconnects the video signal to the CRT.
3. Remove the Monitor Housing Assembly. Do this by turning the outboard quarter-turn fasteners counter-clockwise. The CRT section is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module Assembly. Do this by turning the inboard quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to dis-engage the front panel keypad connector. Then lower the assembly to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel Assembly in the cutout and fasten it with the eighteen #10 washers and nuts that are supplied with the unit.

CAUTION Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 19 inch-pounds.
6. Re-attach the Electronics Module Assembly. Do this by engaging the front slot of the Electronics Module Assembly on the mounting flange on the Front Panel Assembly. Raise the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Housing Assembly. Slide the CRT section into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable from the CRT to the Electronics Module.
8. You may now re-connect AC power to both the Electronics Module and the monitor.

Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Series 4000 (Model 4500) and allows mounting a unit into a 16-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 5-27. Check to see if the mounting collar will fit, then remove. Attach the unit to the mounting collar with the 22 nuts and washers provided with the PanelMate Series 4000 (Model 4500) Mounting Collar Kit.

Caution

Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 23 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 22 nuts and washers.

Mount the front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Housing Assembly and Electronics Module Assembly.

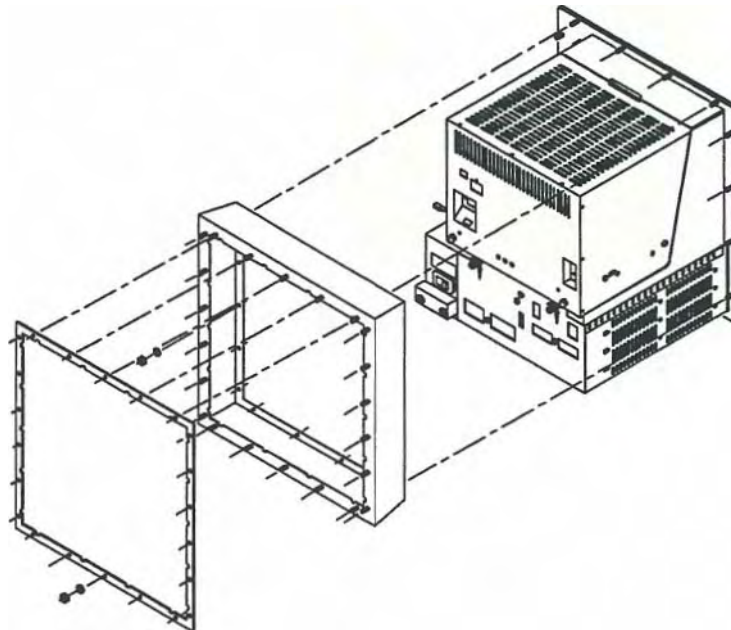


Figure 5-25 PanelMate Series 4000 (Model 4500) Mounting Collar Assembly

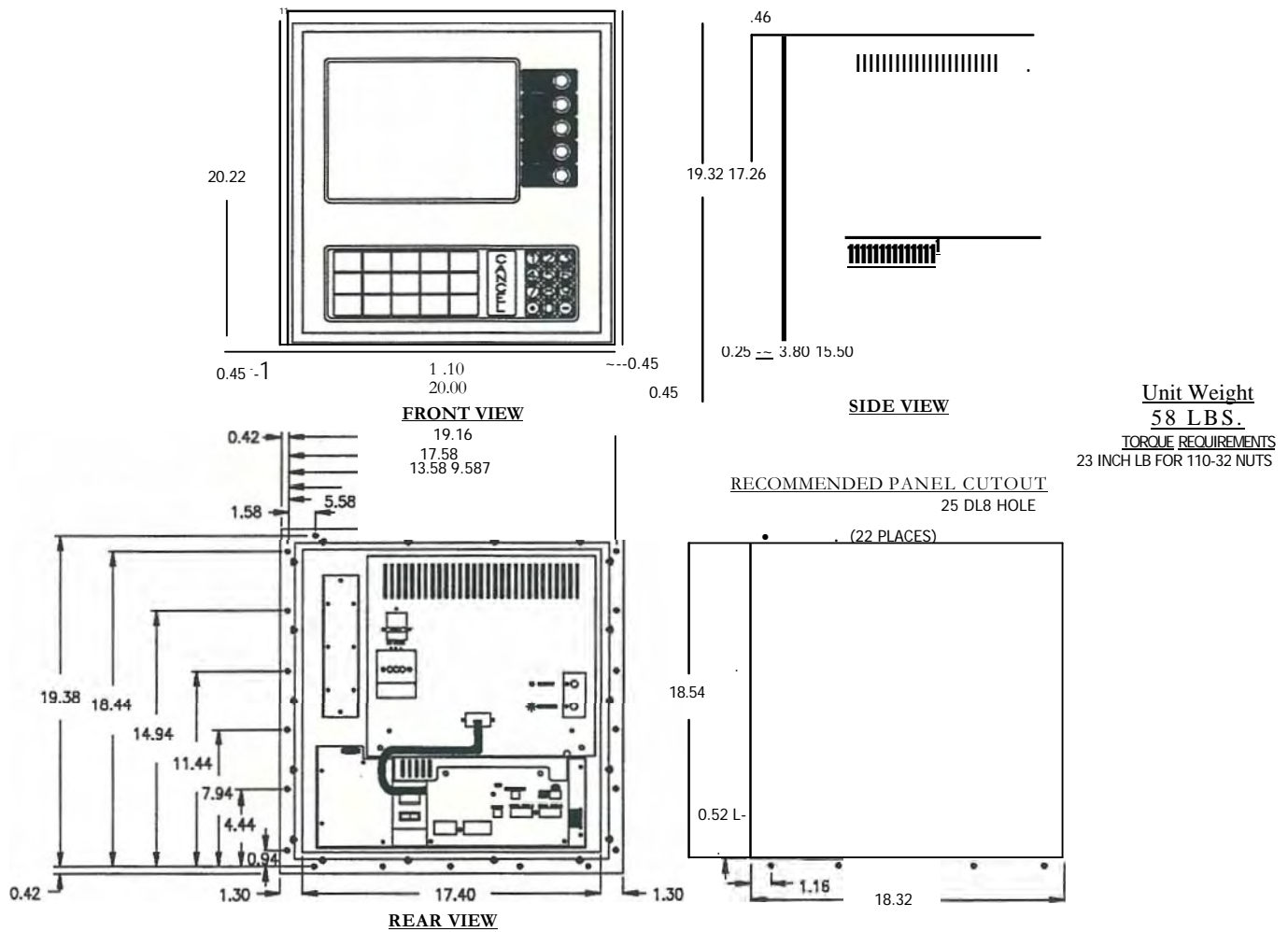


Figure 5-28 PanelMate Series 4000 (Model 4500) with Collar Outline

Technical drawing of a rectangular plate with dimensions and hole locations. The plate has a total width of 18.32 and a total height of 18.54. The drawing shows a central rectangular area with a width of 9.16 and a height of 9.27. This central area is divided into four quadrants by a vertical centerline and a horizontal centerline. The quadrants are filled with diagonal hatching. The distance from the left edge to the centerline is 4.58, and from the right edge to the centerline is 4.58. The distance from the top edge to the centerline is 4.635, and from the bottom edge to the centerline is 4.635. There are 22 holes in total, arranged in a grid. The holes are located at the intersections of the centerlines and at the intersections of the centerlines with the edges of the central area. The holes are labeled with a diameter of .25 DIA HOLE (22 PLACES). The drawing also shows a dimension of 9.56 for the distance from the centerline to the edge of the central area. The overall dimensions are 18.32 by 18.54. The drawing is labeled with 'CUTOUT' in the center.

CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped from the welded steel studs.

Note: All units are in inches.

Installation in an Industrial Enclosure

Installing the PanelMate Series 4000 (Model 4200) in an Industrial Enclosure

The PanelMate Series 4000 (Model 4200) is designed to be used on the factory floor, mounted in an industrial enclosure. This section contains the information about installing the PanelMate Series 4000 (Model 4200) in an enclosure and the installation of the various options which may be purchased. If you will be using any of the accessories, please refer to the sections of this chapter that provide specific information about each of the accessories before proceeding with installation.

The instructions in this section are based on the assumption that you have already verified unit operation by performing the system health tests defined in Chapter 4.

PanelMate Series 4000 (Model _____ ~ncl

Review the PanelMate Series 4000 (Model 4200) Outline and the ~~PanelMate Series 4000 (Model 4200)~~ Panel Cutout and Torque drawings shown on the following pages. Use this information to determine the enclosure size for your application. If the PanelMate Series 4000 (Model 4200) will be used in a PanelMate Series 2900 enclosure, the cutout will have to be modified as shown in figure 5-30. There are a number of factors to consider when selecting an enclosure in which to house the PanelMate Series 4000 unit. Although designed to withstand harsh environmental conditions, you must not expose the unit to conditions which are beyond the detailed specifications found in Appendix B. Appendix D contains guidelines concerning enclosure sizing and temperature specifications taken from enclosure manufacturers.

In order to provide for convection cooling, we recommend a minimum 6-inch clearance above and 6-inch clearance below the unit when installed in an industrial enclosure.

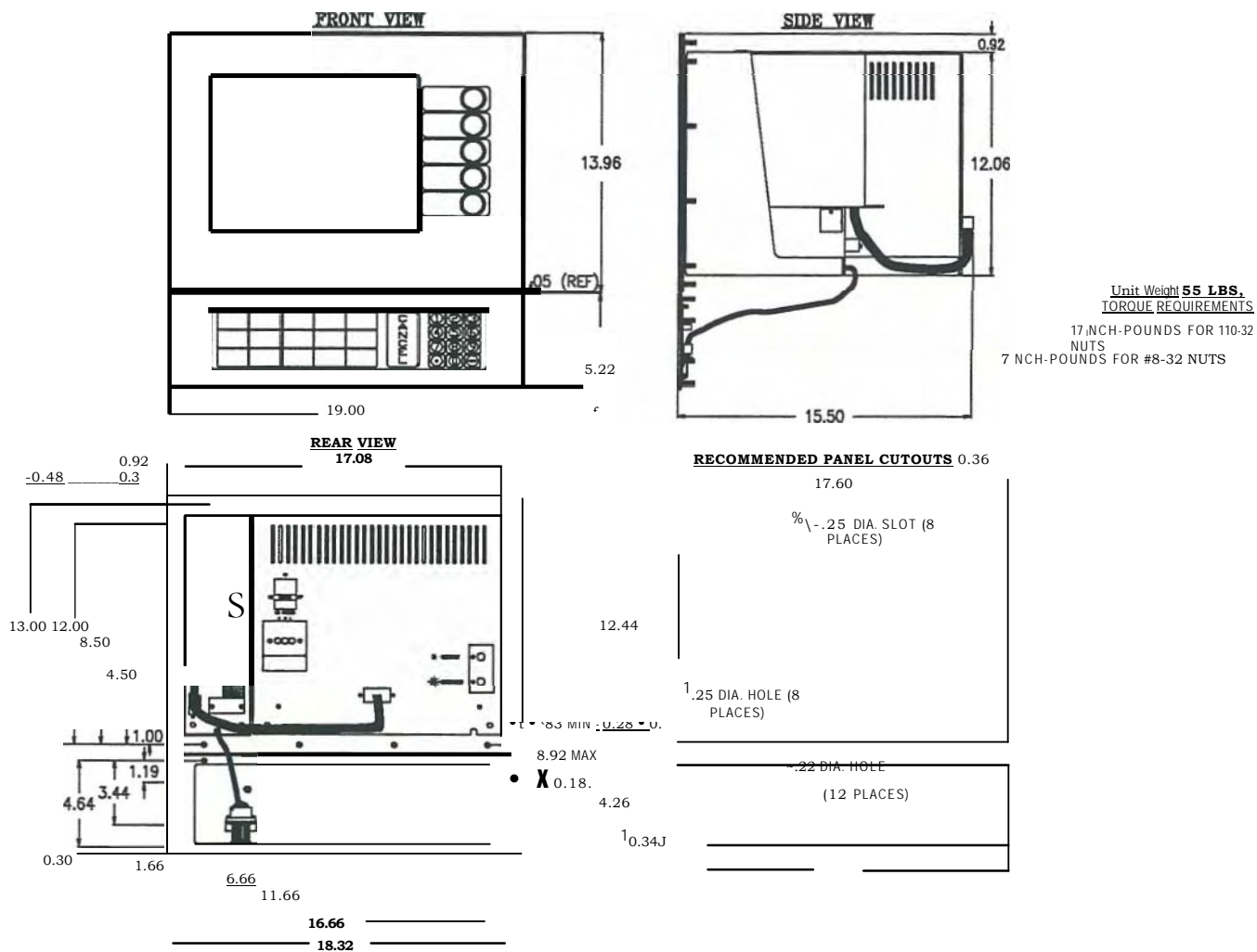


Figure 5-28 PanelMate Series 4000 (Model 4200) Outline

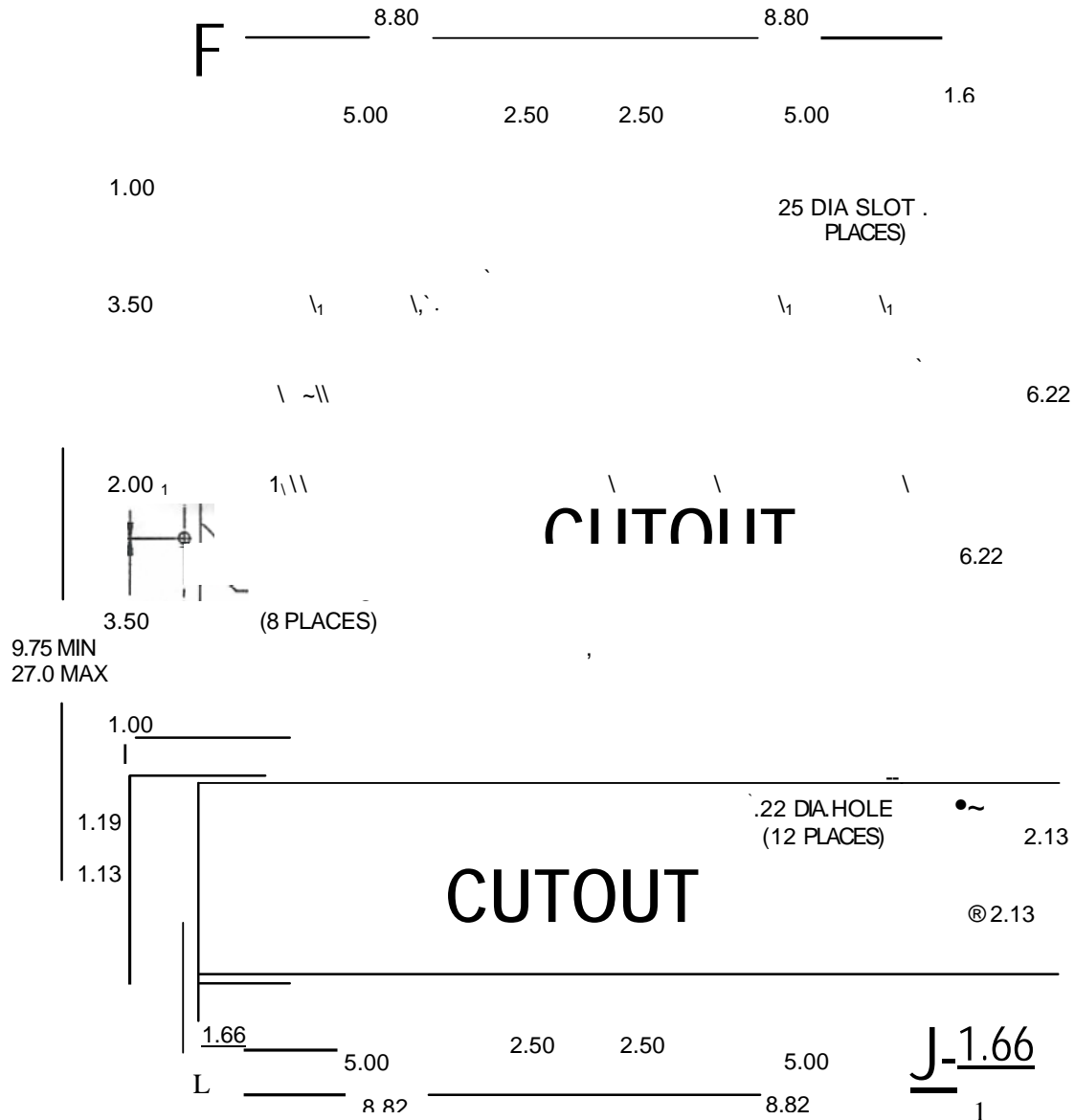


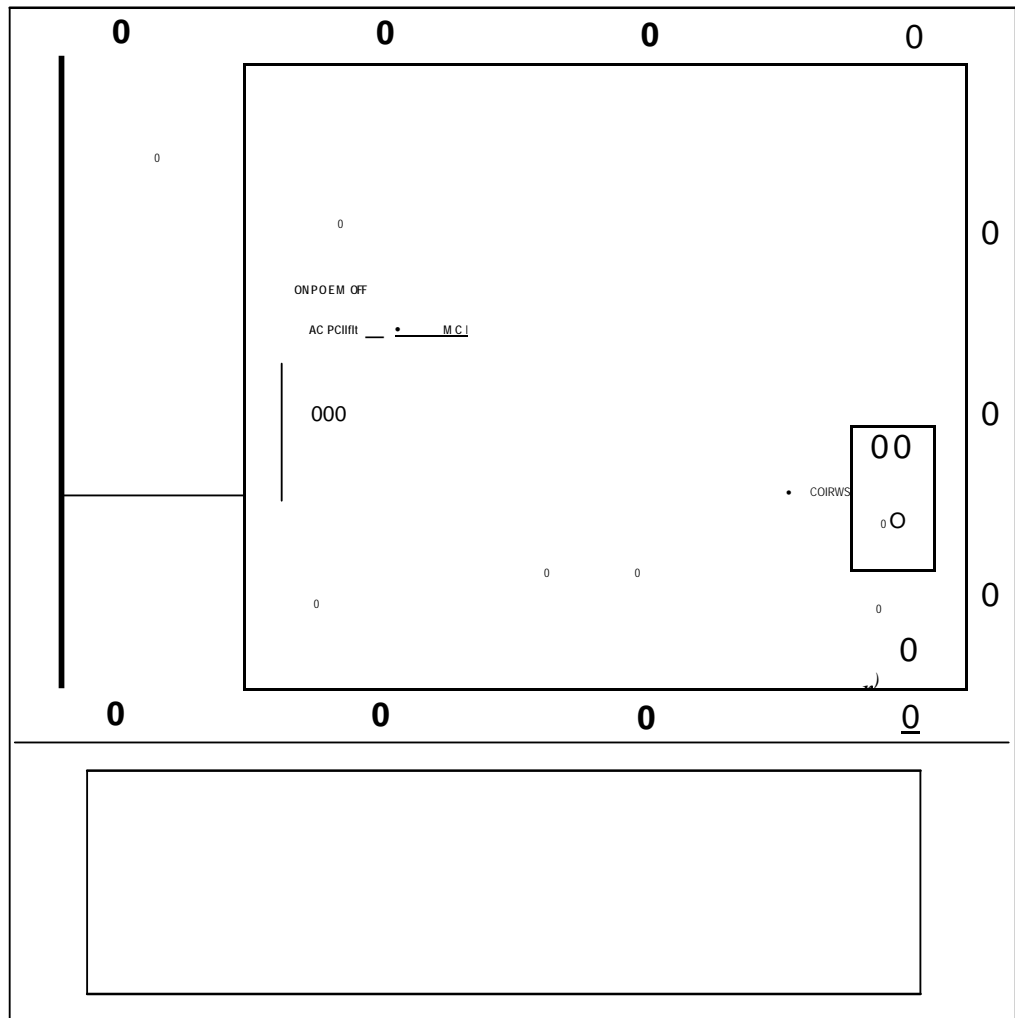
Figure 5-29 PanelMate series 4000 (Model 4200) Cutout and Torque Limits

[illegible]

17 INCH-POUNDS FOR #10-32 NUTS 7 INCH-POUNDS FOR #8-32 NUTS

Series 2900 cutout, the cutout may need to be modified. If the existing cutout was made to the minimum dimensions for a PanelMate Series 2900, then at least .05 inches should be removed from the top and bottom of the PanelMate Series 2900 cutout. In this case, the monitor and electronics will need to be removed from the front panel assembly before mounting the unit into the cutout. If the maximum of .22 inches is removed, the unit can be mounted without disassembly.

Figure 5.30 DanellMate Series 1000 (Model 1200) Output and Torque Limits for a DanellMate Series 2000 Output



REAR VIEW

Figure 5-31 PanelMate Series 4000 (Model 4200) Rear View

ries 4000 (Mc

Make the cutout in the enclosure as shown in figure 5-29. Disassemble the PanelMate Series 4000 (Model 4200) using the following procedure:

1. Go to the back of the unit. Remove AC power from both the Electronics Module and the monitor. Disconnect any other cables.
2. Unplug the Monitor Housing Assembly video cable from the Electronics Module Assembly. This cable disconnects the video signal to the CRT.
3. Remove the Monitor Housing Assembly. Do this by turning the outboard quarter-turn fasteners counter-clockwise. The CRT section is now disconnected and will slide out. Store in a safe location.
4. Remove the Electronics Module Assembly. Do this by turning the inboard quarter-turn fasteners counter-clockwise. Support the weight of the assembly by holding the knurled fasteners, then gently pull the assembly toward you to dis-engage the front panel keypad connector. Then lower the assembly to clear the mounting flange on the front panel. Store in a safe location.
5. From the front, insert the Front Panel Assembly in the cutout and fasten it with the eighteen #10 washers and nuts that are supplied with the unit.

CAUTION

Care must be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. Do not exceed 19 inch-pounds.

6. Re-attach the Electronics Module Assembly. Do this by engaging the front slot of the Electronics Module Assembly on the mounting flange on the Front Panel Assembly. Raise the unit up to a horizontal position and slide the quarter-turn fasteners into their mounting holes on the front panel tray. Complete the assembly by turning the quarter-turn fasteners clockwise to lock in place.
7. Re-attach the Monitor Housing Assembly. Slide the CRT section into the front panel tray and ensure the top lip overlaps the front panel lip. Turn the quarter-turn fastener clockwise to lock. Finally re-connect the video cable from the CRT to the Electronics Module.
8. You may now re-connect AC power to both the Electronics Module and the monitor.

Install the Mounting Collar

The Mounting Collar Kit is an optional accessory to the PanelMate Series 4000 (Model 4200) and allows mounting a unit into a 16-inch deep enclosure. Two versions are available: standard painted finish or stainless steel. The kit consists of a collar, mounting hardware, gasket, and a cutout/torque drawing.

To install the kit, first make the panel cutout for the mounting collar as shown in figure 5-34. Check to see if the mounting collar will fit, then remove. Attach the unit to the mounting collar with the 22 nuts and washers provided with the PanelMate Series 4000 (Model 4200) Mounting Collar Kit.

Caution Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, but not tightened to the point where the threads are stripped or the gasket is rendered useless. Do not exceed 23 inch-pounds.

Attach the gasket to the mounting collar. This is most easily done by placing the unit, with the collar attached, face down on a work surface. Take care to prevent scratching the front panel of the unit. Align the outside edge of the gasket even with the outside edge of the collar with the page edge facing the collar. Attach the gasket by stripping off a small section of the paper protecting the adhesive on the gasket. Carefully attach the gasket to the collar, uncovering the adhesive a few inches at a time.

Insert the assembled collar in the panel and fasten the collar to the panel with 22 nuts and washers.

Mount the front panel to the collar and then mount collar to the enclosure. Finally, attach the Monitor Housing Assembly and Electronics Module Assembly.

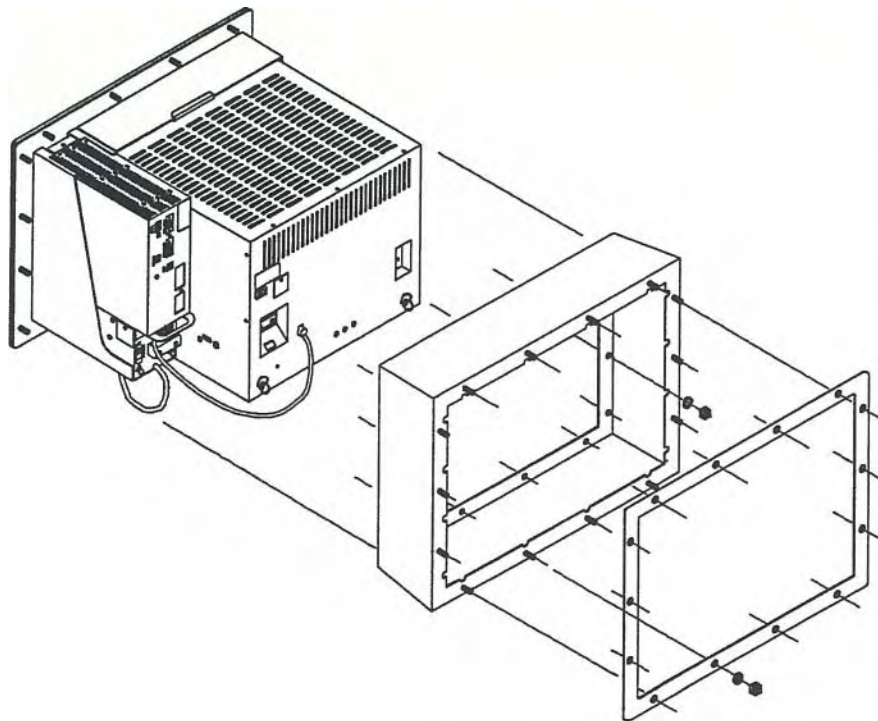


Figure 5-32 PanelMate Series 4000 (Model 4200) Mounting Collar Assembly

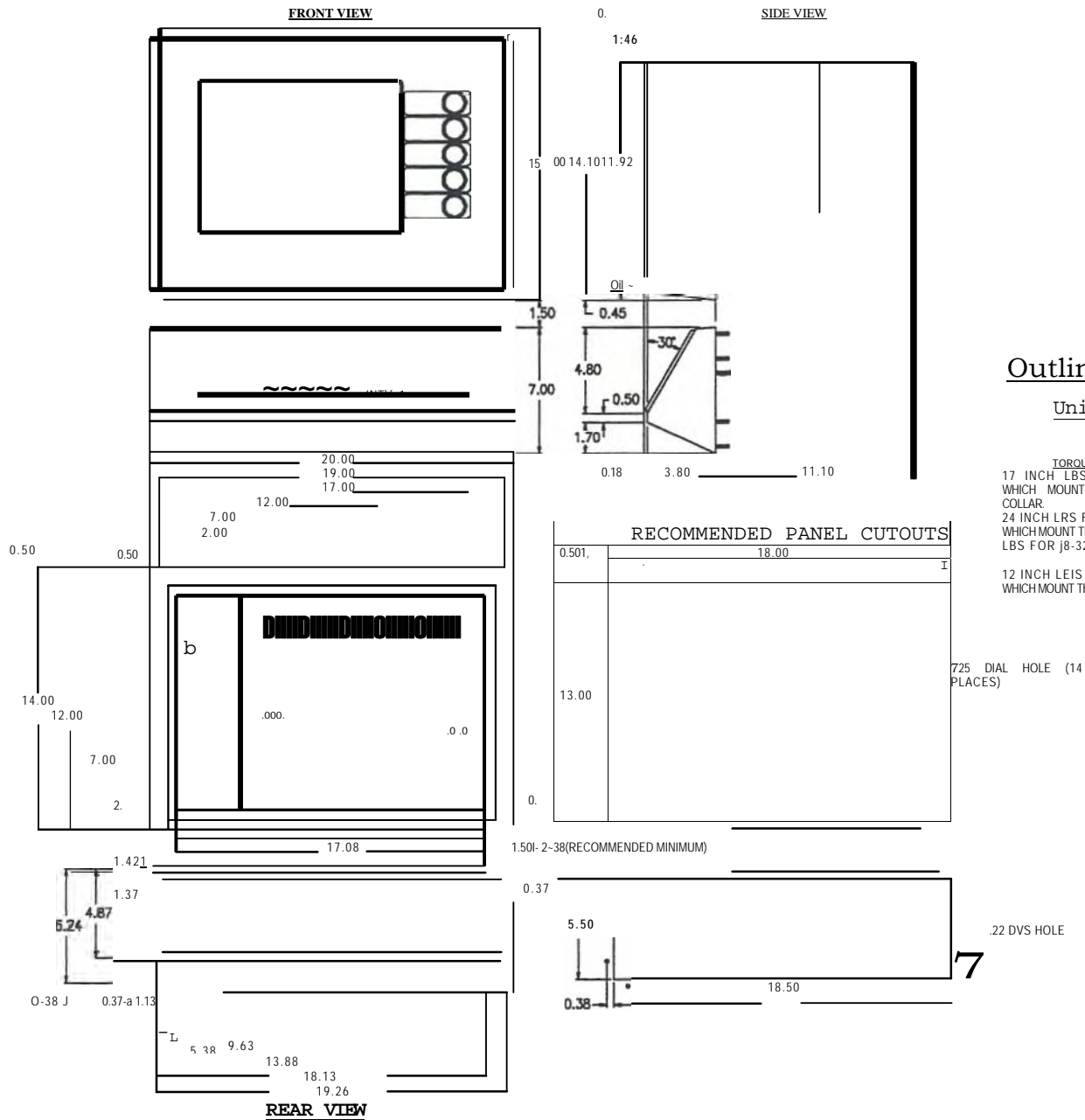
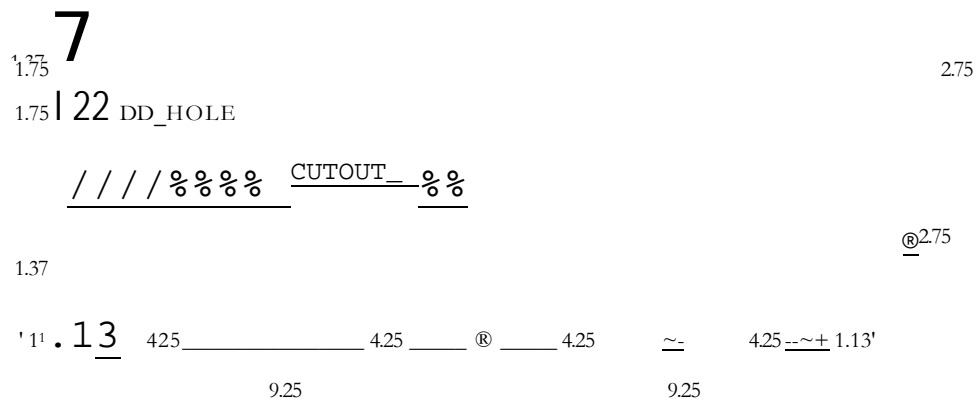
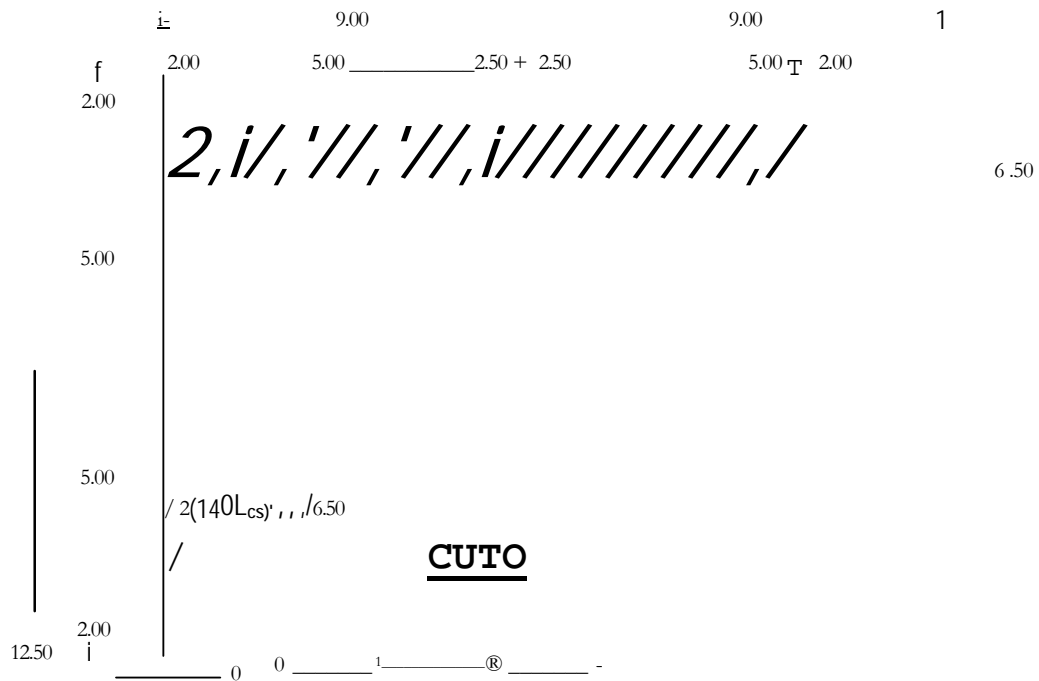


Figure 5-33 PanelMate Series 4000 (Model 4200) with Collar Outline



CAUTION: Care should be exercised when tightening the nuts. The fasteners must be tightened enough to obtain a proper seal, yet not be tightened enough to strip the threads from the welded steel studs. The following torque limits should not be exceeded.

24 INCH-POUNDS FOR #10-32 \UTS
12 INCH POUNDS FOR #8-32 BUTS

Note: All units are in inches.

Figure 5-34 PanelMate Series 4000 (Model 4200) Panel Mount Collar

Connect AC Power

The AC power terminals and power switch are located at the back of the PanelMate unit. (The AC power terminals and power switch are located on the side of the PanelMate Series 3000.) Make sure the rocker switch is in the OFF position. Remove the protective cover. Connect your AC power with user-supplied wiring. (Note that if you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the monitor and the Electronics Module require individual power connection.) The PanelMate unit is auto sensing and will automatically adjust to operate at either 110V AC or 220V AC. Replace the protective cover over the AC wiring.

Note It is recommended that power, noise, and surge protectors be used when the PanelMate unit is installed in areas where the power quality is poor.

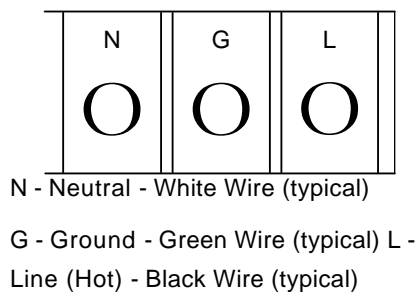


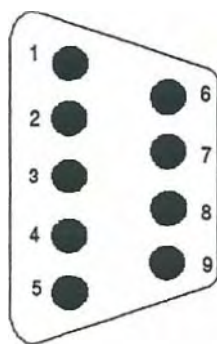
Figure 5-35 Terminal Block

Connection to a Serial Printer

Serial Port 1 may be used for a printer, for PLC (or Host) communications, or for connection to a personal computer for upload or download. Serial Port 1 is the only port which may be used for connection to a Serial Printer.

Selection of Port 1 for a Serial Printer must be done with the DOS-based Configuration Software. See Chapter 23, PLC Name and Port Parameters Table, for more information.

Ports are DB9S (Sockets)



- | | |
|---|----------------------------------|
| 1 | RS422 Transmit Data (+) (Output) |
| 2 | RS232 Receive Data (Input) |
| 3 | RS232 Transmit Data (Output) |
| 4 | RS422 Receive Data (+) (Input) |
| 5 | Signal Ground |
| 6 | RS422 Transmit Data (-) (Output) |
| 7 | RS232 Request to Send (Output) |
| 8 | RS232 Clear to Send (Input) |
| 9 | RS422 Receive Data (-) (Input) |

Connection to a Personal Computer

The PanelMate unit connects to a personal computer to transfer information. You may purchase the serial transfer cable from Eaton IDT. This accessory includes a 9-pin to 9-pin

cable for connection between a PanelMate unit and a personal computer. It also includes a 9-pin to 25-pin adapter to permit connection to your personal computer. The cable has the following pinouts.

PanelMate Series DB-9P	Personal Computer DB-9S	PanelMate Series DB-9P	Personal Computer DB-25S
2 RD	RD 2	2 RD	2 TD
3 TD	TD 3	3 TD	3 RD
5 GND	GND 5	5 GND	7 GND
7 RTS	RTS 7	7 RTS	5 CTS
8 CTS	CTS 8	8 CTS	4 DTS
Shield	Hood	Shield	Hood

Figure 5-36 Serial Transfer Cable

Serial Port Termination

The PanelMate unit is sent with 220 Ohm internal termination between the RS422 RD(+) and RS422 RD(-). If circumstances require, this termination can be removed. See figure 5-37 for additional information.

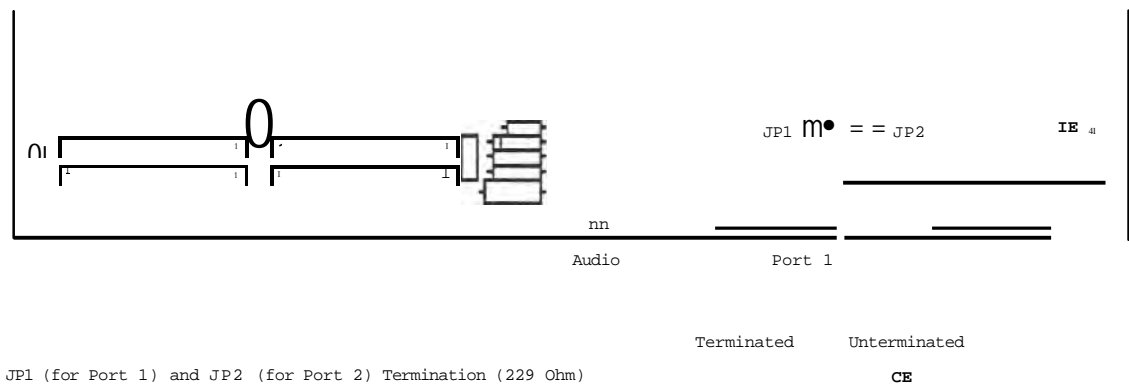


Figure 5-37 PanelMate Processor Board

Connection to the Fault Relay

The fault relay may be wired in normally open or normally closed configuration. It is a Form C contact, rated for 2 amps at 110V AC, 2 amps at 220V AC, and 2 amps at 28V DC resistive load.

During normal operation, the fault relay will energize after entering Run Mode. Whenever the PanelMate unit detects a communication error or system failure, the fault relay will be de-energized. It is also possible to de-energize the fault relay whenever an alarm condition occurs. You can set the fault relay to de-energize on alarms by using the System Utility. See Chapter 22, Defining System Parameters, of the PanelMate Series Product Manual for more information.

Connection to the Audio Output

The Audio Feedback Kit is an optional accessory to the PanelMate unit.

To connect the speaker to the PanelMate unit, simply remove it from the box, mount it, and connect the speaker to the connector labeled "AUDIO" on the back of the unit.

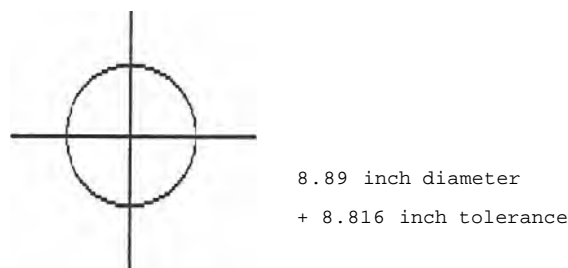
The speaker is an 8-ohm, 2 Watt unit with an attached 24 foot cable.

Audio output for operator input and alarms is selected in the System Parameters Table. See Chapter 22, Defining Systems Parameters, for more information.

Connection to the Security Keyswitch

The Security Keyswitch is an optional accessory to the PanelMate unit. It is included in the Hardware Kit.

The Key Operated Selector Switch mounts in a 0.89 inches [22.5mm] hole. The approximate depth of the contact block into an enclosure is 2.22 [57mm] inches.



Allow 1.18 inches horizontal spacing and 1.97 inches vertical spacing between centers of other standard pushbuttons.

Figure 5-38 Keyswitch Diameter

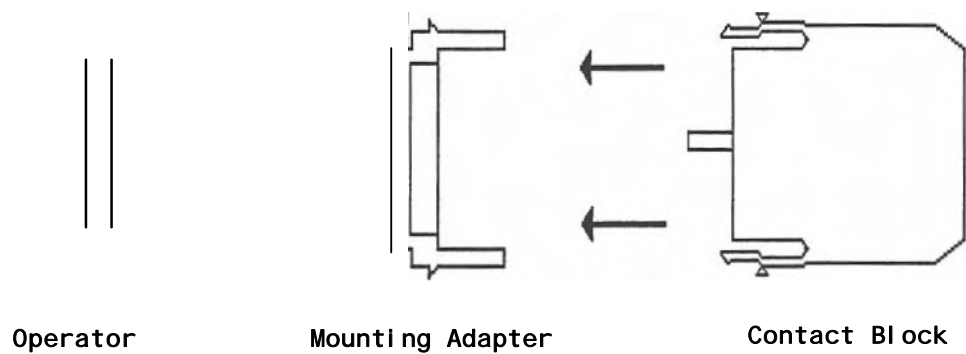
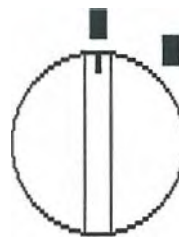


Figure 5-39 Keyswitch (Side View)

To assemble the keyswitch, gently push the mounting adapter onto the operator with the white locking lever facing upward. Note that the word TOP is embossed on the black rim on the end of the operator. To lock the mounting adapter to the operator, slide the locking lever toward the 1 on the mounting adapter. To connect the contact block to the mounting adapter, squeeze the pads on the top and bottom and push into the mounting adapter. Slide the contact block into slot 1 or slot 2 only. When attached properly, the print should be facing outward.

Once assembled, you can insert the key and turn clockwise to enable entry in the PanelMate unit. When the key is returned to the center position, it disables entry into the PanelMate unit. The key can be removed in the center position.



Center - Key Removal Position
Right - Entry Enabled

Figure 5-40 Keyswitch (Front View)

Minimum spacing when mounting with other Eaton Cutler-Hammer 22.5mm switches is 1.18 inches [30mm] center to center horizontal spacing and 1.97 inches [50mm] center-to-center vertical spacing.

The contact closure to enable the security keyswitch input circuit should be in the range from 0 Ohms (a short) to 50 Ohms maximum. Note that voltage should not be applied to the contact closure.

Chapter 6

Online Operation

In this chapter, you will learn:

- What happens when you power-up the PanelMate unit
- What happens when you enter the Run Mode
- What to do if an error occurs during startup
- How the Run Mode operates
- What to do if something goes wrong during Run Mode
- What error messages from the PanelMate unit mean

Power-up Sequence

On power-up, the PanelMate unit performs the following sequence of operations: 1.

Execute normal power-up diagnostics

2. Determine if the unit should enter the Transfer Mode 3.

Check Executive Firmware

4. Check User Configuration compatibility with Executive Firmware 5.

Check if required Downloadable Drivers are installed

6. Determine if the unit should enter the Run Mode or Offline Mode The

following sections describe each of these events more fully.

Execute Normal Power-up Diagnostics

Normal system power-up diagnostics include test of:

- Video Frame Buffer
- Character Cell RAM
- Watchdog
- DRAM
- Real-Time Clock Battery
- Real-Time Clock
- Serial Ports 1 and 2

Each test will be displayed on screen with a PASSED or FAILED message. If the Video Frame Buffer or Character Cell RAM fail it may not be possible to display a failure message. In the event this type of failure, an alarm tone pattern will be generated which will indicate the actual failure. See Chapter 8, Troubleshooting Guide for the PanelMate Series System, for additional information.

The diagnostics will be performed in approximately 20 to 30 seconds.

If there are failures, you may be able to continue if they are not fatal errors. You may receive the message:

```
Non-Fatal Self Test Diagnostic Failure Occurred.  
Press CANCEL key to continue.
```

As soon as you press the <CANCEL> key, the unit will continue with the system boot-up.

If there is a fatal error, you will receive the following message:

```
FATAL Self Test Diagnostic Failures Occurred.  
VCP Unit System HALTED.
```

The system will be completely halted. The only way to reset the system is to cycle power. If this occurs, contact your local distributor.

Determine if the Unit Should Enter the Transfer Mode

The unit will check an internal setup register to determine if it is required to enter the Transfer Mode. It will also test for the presence of the selection keypad. If the keypad is not connected, the power-up sequence continues. The unit assumes it is not installed in a panel and should go into the transfer mode and prepare for communication with a personal computer. The Transfer Mode is explained in Chapter 27, Transfer Editor.

Check for Executive Firmware

The unit will run a self-test for the completeness and integrity of the Executive Firmware. If healthy, the power-up sequence continues.

If there is a failure, the following message is displayed:

```
Executive Firmware is not completely loaded. Download  
of new Executive Firmware is required. Press CANCEL  
key to enter the Offline Mode.
```

You must download new Executive Firmware to continue.

Check User Configuration Compatibility with Executive Firmware

The unit checks that a complete User Configuration is stored in the unit. The compatibility of User Configuration with the Executive Firmware is then verified. If they match, the power-up sequence continues.

If they are incompatible, the following error message is displayed:

```
Incompatible Executive Firmware and Configuration versions.  
Download of new Executive Firmware or new Configuration is  
required. Press CANCEL key to enter Offline mode.
```

Check for Presence of Installed Drivers

The unit checks to ensure the proper drivers are installed.

Note The Executive Firmware will not permit an incompatible version of a driver to be installed.

Determine Power-up Mode

The unit will determine which mode to select: Offline Mode or Run Mode. The unit will return to the operating mode it was in before power was removed. When power is applied, it will attempt to return to that mode. Each of the modes will be explained in the following sections.

Offline Mode Initialization

Initialization to the Offline Mode will display a screen which allows four selections: Execute Diagnostics, Enter Transfer Mode, Display System/Configuration Information, and Enter Run Mode. The diagnostic tests are explained in the Execute the Systems Diagnostics section in Chapter 4. The Transfer Mode is explained in Chapter 27, Transfer Editor.

Run Mode Initialization

The following message will be displayed:

Please wait entering Run Mode

At this point in the initialization, the integrity of the Executive Firmware and integrity of the User Configuration has been verified. The proper driver is also known to be installed. The PanelMate unit will display the Loading Status Screen while performing the following initialization procedure outlined below. The time to complete the initialization depends upon the complexity of the configuration. The complexity of the user configuration is determined by the density of the pages, number of alarm conditions, and the number of control bits which must be initialized in the PLC(s).

The Loading Status Screen displays the name, date, and time of the configuration being loaded, the component that is currently being loaded, the percentage of the configuration that has been loaded, and the percentage of the usable free memory (based on the largest contiguous block). Refer to figure 6-1.

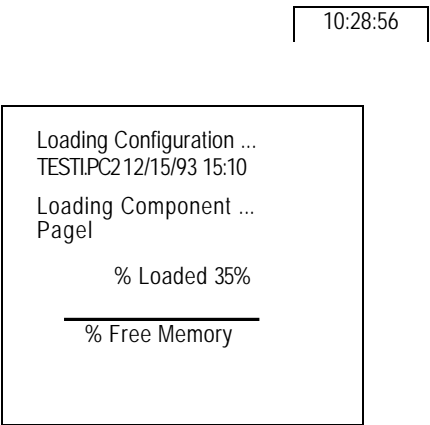


Figure 6.1 Loading Status Screen

The following steps outline the run mode initialization procedure: 1.

Load System Parameters

2. Load PLC Name and Port Table 3.

Load Message Library

4. Load Page Passwords/Titles

5. Load System Online Labels

6. Load Symbol Library

7. Load Normal Character Font

8. Load Graphic Character Font

9. Load Double-High Character Font 10.

Load Configuration Pages

11. Create the Run Mode data base from Page Component files and verifies all expressions and PLC references

12. Allocate DRAM memory

13. Load Quad Character Font

14. Creating Block Reads

15. Begin PLC communications and energize the Fault Relay

16. Control bit resets; every control bit reference in a PLC will be written to zero. Also send remote bits (Enable Fault Relay, Passwords, etc..) to PLC(s)

Note If PLC communications are not valid, the communication retry process could be lengthy.

Note To users of Generic Protocol, at this step, the PanelMate unit will prepare messages with task code 67 for each PLC bit reference in the system configuration. At this time, the host computer should be prepared to request the information from the PanelMate unit. 17.

Send the status of the Hardware Selection (Security) Keyswitch

18. Update the Startup page information and display

19. Remote send of Startup page information to PLC

Note If a configuration is too large to fit in the PanelMate unit, the PanelMate unit will attempt to go online indefinitely, displaying the Loading Status screen. The Loading Status screen states each portion of the configuration as it is being loaded. It is suggested that the Configuration Verifier (accessed by the "Verify a Configuration" selection from the Main Menu) be executed on every configuration before downloading to a PanelMate unit for online operation.

Run Mode Operation

The online system performs three basic tasks: Screen Updating, Alarming, and Remote Operations. Screen Updating refers to the updating of the currently displayed page based on changes to reference values. Alarming refers to the determination of alarm conditions, and whether to display them on screen or send them to a printer. Remote Operations refers to receiving or sending Remote bits such as Silence Alarm Horn or Automatic Page Change to or from the PLC.

During the Run Mode, up to four separate scans may be occurring, all can be scanned at a user-specified rate. The scans are Page Scan, Alarm Scan, Message Scan, and Custom Serial Interface (CSI) Scan.

The Page Scan scans for only the references on the currently displayed page to provide current status. The Alarm Scan scans for all alarm and System Parameters Table references, no matter what page is currently being scanned. The Message Scan scans for references in the message library and global messages. The CSI scan reads references no matter what page is currently being displayed as data may be passed through to PI-Cs even if not being currently displayed.

Proper Run Mode operations will only occur if a programmable controller or other intelligent device is properly communicating with the PanelMate unit. In Run Mode, a variety of operations will take place; some are related to the display functions of the PanelMate unit, and some are related to the operator input functions. The following sections describe the Run Mode functions of the PanelMate unit.

Page Title Line

The top line displays the page title of the currently displayed page. It also displays the time of day in 24 hour format. Additionally, the status of the Hardware Security Keyswitch, Password A, and Password B are displayed on the line by the letters K, A, and B respectively. The letter will be displayed if the password is valid for operator entry.

System (Overview

The System Overview is located between the page title and the alarm window.

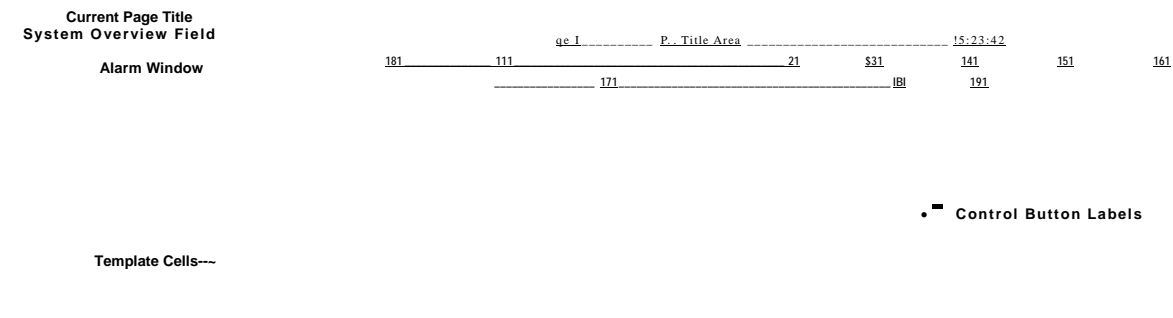


Figure 6-2 PanelMate Series 10 Page Layout

The display attributes of the page numbers provide the following information to the operator:

Active Page If you have a grayscale PanelMate unit, the number is no intensity foreground on a medium intensity background. If you have a color PanelMate unit, the page number is black foreground on green background. (All devices on this page are operating normally.)

Not Configured If you have a grayscale PanelMate unit, the number is low intensity foreground on a no intensity background. If you have a color PanelMate unit, the page number is white foreground on a black background. (This page has no information on it.)

Page in Alarm If you have a grayscale PanelMate unit, the number is no intensity foreground on a blinking high intensity background. If you have a color PanelMate unit, the page number is white foreground on blinking red background. (At least one device on this page is in an alarm condition.)

Some online units have the capability to create up to 30 pages (numbered 00-29). If no information is on pages 10 or greater, the Page Banner will look exactly as shown in figure 6-2. If any or all of the pages numbered 10 or greater have been configured, then the Page Banner will appear similar to the following figure. Note that the PanelMate unit's page banner will show only the pages in alarm; therefore, if pages 10 or greater are configured, the PanelMate unit will use the First-In-First-Out (FIFO) method to show only the latest pages in alarm. If no pages are in alarm, then no page numbers will be displayed.

Note that the "+" in the right corner of the overview field signifies that there are more than 12 pages in alarm.

Current Page Title P 0 f _____ Pa a Title.oru _____ 16:23:42

System Overview Field ----- 1311 1251 191 181 1121 181 1381 1111 P31 171 1101 121 1+, Alarm Window -

--+

4-Control Buttons Labels

Template Cells

Default Control Button Labels

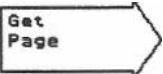
The default control button labels will appear when the system powers up in Run Mode, when the <CANCEL> button is pressed, or when operator input is completed, or when the automatic cancel feature takes effect.

Note "Silence Alarm Horn" will always appear even if there are not any alarms.
"Enable Fault Relay" only appears for communications errors and alarms.

Silence
Alarm
Horn

Enable
Fault
Relay

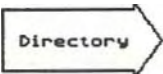
View or
Acknowledge
Alarms



Press "Get Page" and the following control buttons will appear.

More
Buttons

set
Alarm
Page



Press Page
Number Below

Press the control button labeled "More Buttons" and the following control buttons will appear.

Note "Change Online Labels" only appears if any of the system online labels have been changed and the user can toggle between the standard and user-defined labels.

Note "Host Display Window" only appears if selected in the System Parameters Table.

More
Buttons

Change
Online
Labels

Host
Display
Window

Setup
Page

Call a New Page _____

The first page to appear when entering Run Mode will be Page 0, unless you have defined a different start-up page when editing the System Parameters Table. From the default control button selections, select any other page by performing the following tasks:

1. Press the control button labeled "Get Page". The control button labels will change. Control button 3 will access a page title directory.
2. On the numeric keypad, press the number of the page you wish to select. The new page will appear immediately. If you press the number for the page you are already on, the page is not re-drawn. Press <CANCEL> to remain on the current page and return the control buttons to their default labels.

Note If pages 10 or greater on a PanelMate unit are configured, then a two digit number will have to be entered to select a page. For example, page number 1 will be entered as 01.

The PanelMate unit has the capability to monitor a register in the PLC and change the page shown on the screen automatically.

The Page Change Register field (described in Systems Parameters Table Editor) holds the reference used to select which page to place on the screen. When a valid page number is in this register, if a control element or template is not selected in the current page, that page will be recalled to the screen. If control is currently selected on the PanelMate Series 2000 and PanelMate Series 3000, the right end of the Page Banner blinks high intensity, indicating a change in the page register. If control is currently selected on the PanelMate Series 2000 Color and PanelMate Series 4000, the right end of the Page Banner blinks yellow, indicating a change in the page register. Once control is relinquished, the page referenced in the register will be recalled.

Note If the "Immediate Page Change" field in the System Parameters Table Editor is set to Y, the page will change immediately regardless if control is selected.

When using the Generic Protocol, it is possible for a host computer to send data to the PanelMate unit for display in an extra page called the Host Display Window. See Chapter 35 for further information about this feature. If the host has sent data to the Host Display Window, the left end of the Page Banner will be blinking.

Call the Directory

A directory of the page titles is automatically created by the PanelMate unit as you configure your system. If you need to refer to this list of page titles while in Run Mode, press the control button labeled "Get Page" from the default control button selections. The control button labels will immediately change. Press control button 3, labeled "Directory", to view the directory.

To exit from the directory, press any page number or <CANCEL>.

Some online units have 30 pages available for configuration. The directory is called exactly the same as previously described if pages 10 or greater are left blank. If any or all of pages 10 or greater have been configured, then the control button labeled "Directory" will operate as a toggle between the directory of pages 0-14 and 15-29. The directory of all 30 pages cannot be shown on one page. After pressing the control button labeled "Get Page", the label "Directory" will appear. Press the control button labeled "Directory" to display the directory of pages 0-14; press the control button labeled "Directory" again to display the directory of pages 15-29.

Oper for Input - _____

All operator input requires at least two keystrokes. This prevents any accidental entries that could be made by mistaking a control button or numeric key.

Any template or element that displays a small arrow in the lower left-hand corner of the template can be controlled by the operator.

Before any change can be made to a particular template, that template must be selected. To select a particular template, press the TouchPanel to move the white box cursor to the location of the template on the screen.

If the template requires control button input, the corresponding control button labels will appear when the template is selected. Press the appropriate control button. If the wrong template is selected before the control button is pressed, simply use the selection keypad to make the right choice. If no selection is wanted, press <CANCEL>.

The PanelMate unit's control buttons provide momentary input. When the button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

If the template requires numeric keypad input, the label of control button 3 will read "Change Value" when the template is selected. The control button labels will immediately change to read "Clear" and "Enter New Value". Use the numeric keys to write the value onto the screen, then press the control button labeled "Enter New Value" to transmit the value to the PLC. If the wrong number is written before the control button is pressed, simply press "Clear" and try again. If no selection is wanted, press <CANCEL>.

The PanelMate unit's commands for control button and numeric input will not overwrite PLC ladder logic, only PLC data memory.

When variable-sized templates or optional graphics are used, a given template cell area may contain more than one control point. When the membrane is initially touched, the first control point that lies within the indicated template cell area is selected, and is identified by its flashing control indicator. If this is not the desired control point, a subsequent pressing of the same membrane will step to the next variable-sized template in a top-to-bottom, left-to-right search pattern within the cell area. The selection process will cycle and recycle through all of the elements with controls lying within the selected cell area.

Alarms

All alarm conditions that you designate in the PanelMate unit's template editors are constantly monitored. When an alarm condition occurs, an alarm message is automatically configured by the PanelMate unit and printed in the 4-line alarm window. The same message will also go to a printer if you have configured a printer in the PLC Name and Port Editor.

Alarm conditions can be selected for audible alarming. The Alarm Horn can be silenced two different ways. The Alarm Horn can be silenced by pressing the control button labeled "Silence Alarm Horn" from the default control button selection. The Alarm Horn can also be silenced remotely by setting a bit in the PLC. See Chapter 23, Defining Systems Parameters, for more information on configuring the Remote Silence Alarm Bit. The PanelMate unit can also set a bit in the PLC when the control button "Silence Alarm Horn" is pressed. This can allow one operator to silence all Alarm Horns on all the PanelMate units on a network.

The alarm message always includes:

- the device name
- the nature of the alarm (high alarm, low alarm, or the alarm condition label)
- the time of the event being reported
- the page the device is displayed on in the PanelMate unit

Additionally, the following attributes also apply to alarm messages, depending on the condition being reported:

New alarms	If you have a PanelMate Series 2000 or a PanelMate Series 3000, the alarms are displayed as no intensity text on high intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the alarms are displayed as white text on a red background.
Acknowledged	If you have a PanelMate Series 2000 or a PanelMate Series 3000, the alarms are displayed as no intensity text on a medium intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the alarms are displayed as yellow text on a black background. The abbreviation "Ackd" will appear in the message in front of the time.
Cleared, not acknowledged	If you have a PanelMate Series 2000 or a PanelMate Series 3000, the alarms are displayed as high intensity text on a no intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the alarms are displayed as red text on a white background. The abbreviation "Clrd" <u>will appear in the</u> message in front of the time.
Cleared and Acknowledged	The message will disappear from the screen. TM-message that gets sent to the printer will include the abbreviation "Clrd" in front of the time.

The four most recent alarm messages appear in the alarm window of the current page.

Alarm Summary Page

The Alarm Summary Page is automatically created by the PanelMate unit as alarm conditions occur. In the PanelMate unit, the 50 most current alarm messages can be viewed on the Alarm Summary Page at any time. The PanelMate Series 2000, PanelMate Series 2000 Color, and the PanelMate Series 3000 supports 50 alarms. The PanelMate Series 4000 supports 100 alarms. As new alarms occur, the oldest alarms will be removed. For example, if 50 alarms have occurred and then one more occurs, the 50th alarm will be removed and the new alarm will be added to the beginning of the Alarm Summary Page. The page indicator for the page which contains the removed alarm will still blink until the alarm condition has been cleared.

To get to the Alarm Summary Page, press Get Alarm Page from the default control button selections. The Alarm Summary Page will appear immediately, displaying the most current 26 alarm messages. If there are no alarm messages to display, the page will be blank.

To view the alarms beyond the most current 26, use the control buttons labeled "Scroll Up" and "Scroll Down". These buttons move a small, white block cursor that marks the start of a specific alarm message. When the block cursor is scrolled down past the last message on the screen, the messages beyond 26 appear. This block cursor is also used to mark individual alarm messages for acknowledgment.

To return to any other page in the system, press the control button labeled "Get Page", and enter the page number using the numeric keypad.

View or Acknowledge Alarms

To acknowledge alarms in the alarm window located on each page, press the control button labeled "View or Acknowledge Alarms" from the default control button selections. The control buttons will immediately change and a small, white block cursor will mark the most current alarm, located at the top of the alarm window.

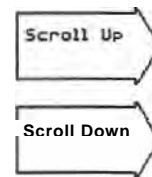
To acknowledge alarms in the Alarm Summary Page, press the control button labeled "View or Acknowledge Alarms". The control buttons will immediately change and a small, white block cursor will mark the most current alarm, located at the top of the page.

These control button labels will appear:

The following paragraphs apply to all alarms, regardless of whether you are viewing the alarm window or the Alarm Summary Page.

To acknowledge a single alarm, move the block cursor using the "Scroll Up" or "Scroll Down" buttons to mark the alarm. Then press the control button labeled "Acknowledge Selected Alarm" to acknowledge.

To acknowledge all new alarms, press the control button labeled "Acknowledge All Alarms". It does not matter where the block cursor is located. This action acknowledges all new alarms, whether they are actually in view or not.



Acknowled9
Salactad
Alarm

Acknowled9
All
Alarms

The alarms can also be acknowledged remotely. Once the Alarm Acknowledge Bit (defined in the System Parameters Table) is set, all alarms will be acknowledged.

The PanelMate unit is also capable of setting a bit in the PLC when the "Acknowledge All Alarms" control button is pressed. The Remote Alarm Acknowledge Bit is also defined in the System Parameters Table. This capability, along with the ability to remotely acknowledge all alarms, can be useful in allowing one operator to acknowledge all alarms on a network of PanelMate units from a single system.

Password Protection

Passwords can be used to restrict access to certain functionality when the PanelMate unit is in the Run Mode. The PanelMate unit supports many levels of password protection. A great deal of flexibility is provided so it is important to define an implementation scheme before configuring your passwords. There are three levels of protection: Password A, Password B, and the Keyswitch. Passwords A and B are configured in the System Parameters Table and are up to 8 digits in length. (Passwords can be enabled or disabled to permit or prohibit change during online operation.) A Keyswitch can be attached to a removable terminal block to provide another level of protection.

Note Leading zeroes are not supported when configuring Password A and Password B in the System Parameters Table.

Passwords can be used in the following areas in the Run Mode and must be enabled for entry each time they are selected:

Templates with Numeric Entry selected:

Readout Template

Readout Variable-sized Template

Bar Template

Bar Variable-sized Template

Table Template

Enter Offline Mode

Set Date and Time

The following combinations of Password Protection are available:

None

Key Only

Key and A

Key and B

Key and (A or B)

A Only

B Only A

or B

Password protection can also be invoked to protect access on a Page-by-Page basis. Once a Page Password is logged-in, then access to a page remains active until it is logged-out. While logged-in, the operator can change pages and return to this page until logged-out. Password A and B can be logged-out manually or a user-defined time period can expire which will log-out all passwords. If the timeout occurs, the operator retains access to the current page.

Page Passwords are accessed in the Setup Page. This page is accessed from the default page by selecting the control buttons labeled "Get Page", "More Buttons" and "Setup Page". The letters K, A, and B will appear to the left of the time of day clock on the top line of each page to indicate when the Keyswitch, Password A, and Password B are enabled for entry.

The status of the passwords and keyswitch when used as Page Passwords may be transmitted to a PLC by setting the appropriate address in the System Parameters Table. This feature can be useful when implementing the Page Protection concept when a Page Change is sent from a PLC.

The two-position 22.5 mm keyswitch is included in the optional Support Kit. The terminals on the PanelMate unit require contact closure to enable entry. Multiple keyswitches, PLC relay contact outputs, and hard contact outputs from other devices, such as magnetic strip badge readers, may be used in combination to create the contact closure signal.

Passwords A and B are downloaded within the User Configuration to the PanelMate unit. These values may be used at system start-up or they may be defined to overwrite current passwords which reside in the system.

Password Protection can be implemented in many ways. Examples of usage are defined below:

- Offline Mode protected with Keyswitch and Password A
- Set Date and Time protected with Keyswitch and Password B
- Page 9, the machine parameter page, protected with Keyswitch
- Reset Part Counter Readout Template protected with Password A
- Operating Temperature Setpoint Readout Template protected with Password B

Lost Password Recovery

It is not possible to determine the passwords in an online unit, however, it is possible to recover if a password is lost. There are two techniques which may be used.

If the User Configuration had the Password Overwrite set to Y, you can simply use the Transfer Utility to upload the configuration from the PanelMate unit to a personal computer and then download it to the PanelMate unit. This will cause the system to revert to the original passwords which were set in the configuration. If the Offline Mode selection is password protected, you must remove the Electronics Module Assembly from the front panel to automatically invoke the transfer mode.

If the User Configuration has the Password Overwrite set to N, you must use the DOS-based Configuration Software to upload the configuration. Next, modify the configuration and set the Password Overwrite bit to Y and enter the new passwords. Finally, download the new configuration to the PanelMate unit.

Setup Page

The Setup Page is accessed from the default control buttons. The Setup Page provides selection of the following features while the online unit remains in the Run Mode.

- Change Password A
- Change Password B
- Log-in Password A
- Log-in Password B
- Set Date and Time
- Log-out Password A
- Log-out Password B
- Display System/Config. Information
- Enter Offline Mode

To access a feature, use the TouchPanel to select a template then press the control button labeled "Execute."

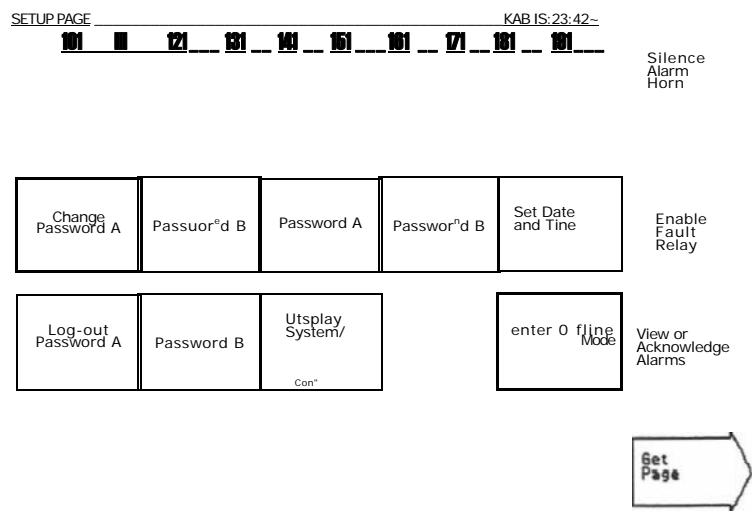


Figure 6-4 Setup Page

This selection permits you to change a software password. You will be prompted to Enter the Old Password, Enter the New Password, then Re-enter the New Password. If the ability to change the passwords in the online mode is not desired, you may select N for the Enable Password Change field in the System Parameters Table.

Log-in Password A or Log-in Password B

This selection permits you to Log-in a valid page password. The password remains enabled until you Log-out or the Page Password Timeout period expires. See Chapter 23, Defining System Parameters, for additional information.

Set Date and Time

This selection permits you to enter the Set Date or Set Time field. Use the numeric keypad to enter the appropriate value. Use the minus key to separate numeric values. Note that the time is entered in 24-hour (military) format. This selection can be password protected.

Log-out Password A and Log-out Password B

This selection permits you to Log-out of a page password by pressing the control button labeled "Execute".

Display System/Configuration information

This selection will display the current User Configuration, Executive Firmware, and Installed Drivers.

Enter Offline Mode

This selection will remove the online unit from the Run Mode and place it in the Offline Mode. The Offline Mode permits access to the following: Execute Diagnostics, Enter Transfer Mode, Display System/Configuration Information, or Enter Run Mode. This entry may be password protected.

Fault Relay

The Fault Relay is a relay contact output with normally open and normally closed contacts. At power up, the PanelMate unit performs system diagnostics. If diagnostics are passed, the fault relay is energized (enabled). The unit begins communications to PLCs. Four events can cause the fault relay to de-energize: online system error, communication error, alarm (if this feature is selected), and loss of power.

Fault Relay and Online System Errors

Proper operation of the system is monitored to ensure that all internal processes are active and functioning normally. If a system error is detected, the fault relay is de-energized, the system is halted and an error message is displayed at the bottom of the screen. See the System Errors section in this chapter for more details.

Fault Relay and Communication Errors

Integrity of the communication link to the PLC (or Host Computer) is monitored by ensuring that proper responses are received for each transmission that the PanelMate unit makes. If a communication attempt fails, the PanelMate unit will re-transmit a request several times before reporting a communication error. When a communication error is detected, the fault relay is de-energized and an error message is displayed at the bottom of the screen. Communications with operational PLCs will continue.

When a communication error exists, the continual re-transmission of messages may begin to slow system response. Every PLC write transmission is sent, then re-tried and then discarded. The frequency of the re-transmission gradually decreases to five minutes if requests continue to fail over a prolonged period of time. This feature effectively prevents failing requests from slowing network communications. If the operator inputs control buttons faster than the transmission rate of the network during communication errors, the PanelMate unit will buffer PLC writes in order to ensure that all control commands are processed. When the communication error clears, the buffered control button writes will be sent in rapid succession.

Note If blank templates appear on the screen, a communication error has occurred. The operator should not attempt to perform control with blank templates as this may cause control buttons to be buffered in the PanelMate unit. Buffered control buttons may be sent in rapid succession when the communication error clears and may result in undesirable control system operation.

Note The System Parameters Table permits the selection of setting all referenced control button bits to zero when the Enable Fault Relay control button is pressed. The System Parameter Table field is called Bit Zero After Com Fault. See Chapter 23, Defining System Parameters, for more information.

The data at the time of a communication failure will remain on the current page. All data from other PLCs which are communicating correctly will be displayed as usual. If the communication error continues to exist and you select a different page, then no data from the PLC with errors will be shown on the newly selected page. For example, if the page contains a readout template, no numerical data from the PLC with the communication errors will be shown. Once the communication problem is corrected and the control button labeled "Enable Fault Relay" is pressed, the fault relay will be energized and the page will be re-drawn. Any references to a PLC which are not communicating will not be re-drawn until valid communications have resumed. If the communication error still exists, the fault relay will be de-energized and a communication error message will be displayed on the bottom line of the screen.

Note Pressing the control button labeled "Enable Fault Relay" may still cause invalid information to be displayed. For example, if an expression for a bar template value contains a reference to a PLC which is communicating and also to a PLC which is not communicating, the bar will be updated on the screen even though invalid data may appear on the screen.

When communications have been re-established, the relay remains de-energized until the operator presses the control button labeled "Enable Fault Relay".

Fault Relay and Alarms

The System Parameters Table (see Chapter 23, Defining System Parameters) permits the selection to have the Fault Relay De-energize on Alarm. A Y (Yes) selection will cause the fault relay to de-energized when an alarm condition is detected. A N (No) will not associate the fault relay with alarming.

Fault Relay and Loss of Power

A loss of power will cause the fault relay to de-energize. If the online system was in the Run Mode before the loss of power and power is restored, it will_ return to the Run Mode.

Remote I/O

If communication errors occur on the remote I/O link, control bit write information entered in the PanelMate unit may cause control bits to be sent to the Accelerati/On board memory and not transmitted to the PLC. When the Remote I/O link is re-established all of the new control bit information is sent to the PLC. Buffered control bit information will be sent when the communication error clears and may result in undesirable control system operation.

Errors During Run Mode

During Run Mode operation three basic conditions are checked: proper communications with PLC or host computer and Custom Serial Interface Drivers, proper operation of the microprocessor, and proper operation of the Executive Firmware. The first check is classified as a Communication Error. The two types of Communication Errors are local errors and remote errors. The last two checks are classified as System Errors. The following sections expand upon these errors.

Communication Errors

The PanelMate unit is a video control panel that can interface with a single PLC or multiple PLCs on a network. It provides predictable fault responses with the occurrence of communication errors. A communication error is a major fault in most control systems. It indicates a breakdown in communication between the PanelMate unit and a PLC. It is the Control System Designer's responsibility to define how the operator should respond to an error.

The PanelMate unit provides two indications when a communication error occurs: an error message is written to the bottom of the screen and the fault relay is de-energized. The fault relay is provided for both local annunciation to an operator and to send hardwired feedback to a PLC.

Once a communication error appears, the operator should first note the page status. The data is a snapshot in time of the last valid communication. The next action is to try to clear the error by pressing the control button labeled "Enable Fault Relay". This restarts attempts at communications and energizes the fault relay. If the condition causing the error no longer exists, the screen is updated with dynamic information. If the error remains, the fault relay is de-energized again and the communication error message is written to the screen. If values could not be read due to the lack of communications, then templates will be displayed as blank.

If blank templates appear on the screen, it means that communications have not re-established. The operator should not attempt to perform control with blank templates because the actual state of the machine or process cannot be determined. If the operator continues to press control buttons, data may be sent faster than the communication link which is in error can handle them. The PanelMate unit may buffer the control requests until communications have re-established. This may result in control bits being sent to a PLC in rapid succession which may cause undesirable operation of the control system.

Communication errors can be cleared by pressing the control button labeled "Enable Fault Relay" or changing pages provided the reason for the error no longer exists.

Integrity of the communication link to the PLC (or host) is monitored by ensuring that proper responses are received for each transmission that the PanelMate unit makes, according to the specific protocol in use.

Communication problems can include:

- Broken or incorrect cabling to the PLC
- PLC or interface card failure
- Incorrect setting of PLC interface card switches

- Removal of a PLC from the active network
- Attempt to access a non-existent PLC address

- Attempt to write to a protected PLC address
- Too much traffic on a PLC network

The PanelMate unit will try to re-transmit a request several times before reporting that a communications error has occurred. Unlike Systems Errors, Communication Errors do not halt the PanelMate system. The PanelMate unit continues to re-transmit requests indefinitely, even after an error has been reported.

The frequency of the re-transmission gradually decreases to five minutes if requests continue to fail over a prolonged period of time. This feature effectively prevents failing requests from conflicting with other communications.

The two types of Communication Errors are local errors and remote errors.

Local errors are reported on the bottom of the screen as follows:

Loc: X on N via P O R

where

X	is an internally generated communication error code which indicates the nature of the problem. Refer to table 6-1 for the error code listing and description.
P	N is the PLC name in the PLC Name and Port Table
O	is the port
R	is the operation being performed
	is the reference

Remote errors are reported on the bottom of the screen as follows:

Rem: X on N via P O R

where

X	is a generated communication error code from a remote device. Refer to your PLC user manual for more information on this error code.
P	N is the PLC name in the PLC Name and Port Table
O	is the port
R	is the operation being performed
	is the reference

Note If you are using Allen-Bradley PLCs for Data Highway or Data Highway Plus, a complete set of error codes can be found in the Allen-Bradley Publication 1770-6.5.16, November 1991. Take note of the hexadecimal error code and consult the Allen-Bradley publication. If the remote error code is FOXX (hex), then the XX represents the Allen-Bradley EXT STS (extended status) error code. The EXT STS codes are found in the EXT STS Codes for Command Code OF (hex) table. Other remote error codes are found in the Remote STS Error Codes table.

When a communication error is reported, the fault relay is de-energized, but the system continues to operate. Other PLC transmissions will be attempted and processed. Transmissions which have failed will be re-attempted until normal communication is re-established. Each time the error is detected, the message will be reprinted at the bottom of the screen (and the relay will be de-energized). The data at the time of a communication failure will remain on the current page. If a different page is selected, no data from the PLC with errors will be shown. For example, if the page contains a readout template, no numerical data from the PLC with the communication errors will be shown. The numerical area will be blank. All data from other PLCs which are operating correctly, will be displayed as usual. Once the communications problem is corrected and the Enable Fault Relay control button is pressed, the page will be re-drawn. Any templates or elements which reference a PLC which is not communicating will not be re-drawn until valid communications has resumed.

When the error is corrected, the relay remains de-energized until the operator presses the "Enable Fault Relay" control button, which appears on the default selections when a communications error occurs. This also clears the message from the bottom of the screen. (The button label disappears once the button has been pressed.)

Note Invalid information may still be displayed. For example, if an expression for a bar element value contains a reference to PLC which is communicating and also contains a reference to a PLC which is not communicating, the bar element will be updated on the screen, even though invalid data may be in the data base.

System Errors

During Run Mode operation, two basic conditions are checked in the PanelMate unit: proper operation of the CPU and proper operation of the system software.

Proper operation of the microprocessor is monitored by a Watchdog Timer. If a microprocessor error is detected, the fault relay is de-energized, the screen will display "Watchdog Timeout. Press Cancel Key to Continue", and the system is halted.

One possible reason for the Watchdog Timeout error could be related to the power. Check to make sure that the PanelMate unit is properly installed. If problems still occur, call your local distributor for more information.

Proper operation of system software is monitored to ensure that all internal processes are active and functioning normally. If a system software error is detected, the fault relay is de-energized, and the system is halted.

An error message is displayed at the bottom of the screen:

Sys: X 0 P (P) (P)

where

X a system error code which indicates the nature of the problem. Refer to table 6-1 for the error code listing and description.

0 is the operation being performed

P is an internal error code. This error code may appear more than one time.

Note If these error messages appear please call your local distributor

Error Number	Description	Possible Cause
0	Undefined error.	
1	Software module not found or corrupted.	
2	Out of memory.	
201	Bad or missing communication card.	
244-246	Read/write error.	Cabling is wrong. RS232/RS422 converter is bad or missing. Excessive noise on communication line.
253	Acknowledge not received from the remote device or remote device did not reply to request in allotted amount of time.	No communication, PLC is busy, invalid network ID, or wrong communication parameter. VCP unit could be receiving too many unsolicited messages.
1000	Internal system error code.	Invalid configuration. Bad PLC Name and Port Table
1001	Serial port buffer overrun.	PLC is locked in transmit mode. PLC is transmitting too much data.
1002	Error on input.	Wrong communication parameters. Intermittent hardware failure.
1003	Error on output.	Wrong communication parameters. Intermittent hardware failure.
1100	Device descriptor cannot be generated.	Out of memory or module cannot be found.
1101	Device cannot be opened.	Missing module. Serial controller or VO board is bad. Missing or bad hardware. Interface board is not installed.
1102	Expected data was not received.	Communication has been established. VCP has started to read data, but has timed out. (This error is usually followed by a 1202 or 1702 error.)
1103	Support process cannot start.	Out of memory, module is corrupted, or module cannot be found.
1104	Device cannot be opened.	Missing module. Serial controller or VO board is bad. Missing or bad hardware. Interface board is not installed.
1125	Framing error.	Wrong communication parameters.
1126	Parity error.	Wrong parity.
1127	Overrun error.	Wrong communication parameters or no communication.
1128	Hardware break.	Grounding, shield, or termination problem.
1150	Data Highway, Data Highway Plus, and AcceleratI/On error - the AcceleratVOn card has detected an error during its memory diagnostics.	
1151	Data Highway, Data Highway Plus, and AcceleratVOn error - the AcceleratVOn card would not restart.	

Table 6-1 Local and System Error Code Descriptions

Error Number	Description	Possible Cause
1151	DH-485 - destination buffer not big enough to receive message.	
1152	DH-485 - message too big to transmit.	
1153	Data Highway, Data Highway Plus, and AcceleratVOn error - the AcceleratVOn card has no transmit buffers available.	The AcceleratVOn card is receiving unsolicited data (MSG's) too fast.
1153	DH-485 - received NAK from destination	Normally received if destination has too many outstanding requests.
1154	Data Highway, Data Highway Plus, and AcceleratVOn error - the AcceleratVOn card would not respond to the interface software's command.	AcceleratVOn card hardware failure.
1154	DH-485 - timeout, no response from destination after 3 retries.	Invalid ID or PLC type.
1155	DH-485 - duplicate node detected.	Two devices on highway have same network ID (node #).
1156	DH-485 - data link is not active (link timeout). VCP unit is not passing token.	Missing or bad cable. Noise on communication line.
1157	DH-485 - application timeout (destination active, but not responding).	
1158	DH-485 - VCP unit has not received token from previous node.	Network communications is disrupted. The cable was disconnected from the VCP unit or the previous node has dropped off the network. (This error is usually followed by an 1156 error.)
1200	Communication active but remote device responded with negative acknowledge. (NAK)	Noise on communication line or wrong parity.
1201	Communication active but remote device responded with negative acknowledge. (NAK)	Noise on communication line or wrong parity.
1202	Acknowledge not received from the remote device or remote device did not reply to request in allotted amount of time.	No communication, PLC is busy, invalid network ID, or wrong communication parameter. VCP unit could be receiving too many unsolicited messages. (This error is driver dependent.)
1203	VCP unit rejected communication from PLC.	Noise on communication line or wrong parity.
1250	Could not establish link with Square D PLC.	
1250	Could not synchronize with Westinghouse PLC.	
1250	Reliance AutoMate gateway not configured.	No communication, PLC is busy, or invalid network ID. VCP unit is unsuccessfully trying to reconfigure. Reliance gateway module. Dipswitches are configured wrong. Power loss to gateway module. Intermittent error.
1250	Channel prematurely closed by GE CCM.	VCP unit too busy to close channel.

Table 6-1 Local and System Error Code Descriptions (cont.)

Error Number	Description	Possible Cause
1250	Communication to GE with SNP was out of sync.	VCP unit too busy to accept reply or noise/cable problems.
1251	Open channel request was refused by GE CCM.	GE CCM card is too busy to open channel. Noise on communication line to GE or wrong parity.
1251	Reliance AutoMate processor not found in destination slot.	
1251	VCP unit cannot set privilege level in GE PLC (SNP).	Communication error while trying to set privilege or other device has set privilege.
1252	More than one Reliance AutoMate processor in the rack.	
1700	Communications out of sync.	Duplicate token, noise, or busy device causes VCP unit to timeout and PLC responds to previous request.
1701	A reply was received for which there was no request issued.	Scan delays are too large.
1702	Acknowledge not received from the remote device or remote device did not reply to request in allotted amount of time.	No communication, PLC is busy, invalid network ID, or wrong communication parameter. VCP unit could be receiving too many unsolicited messages. (This error is driver dependent.)
1703	Internal system error code.	
1705	This interface does not support any unsolicited requests from a remote device.	
1706	Received an unsolicited command that is not supported.	
1707	The remote device memory type is not supported.	
1708	Cannot write to read only reference.	
1750	Siemens follow-on telegrams are not supported.	PLC sending too much data.
1750	Block transfer not detected on remote VO.	
1750	Data Highway and Data Highway Plus - does not support PLC-3 address format.	
1750	Generic Protocol octal register reference invalid.	
1750	DH-485 - VO word number out of range.	
1751	Remote VO - rack is not active or configured.	
1751	Data Highway and Data Highway Plus - symbolic word and addressing mode is not supported.	
1751	Too much data in Generic Protocol.	Greater than 60 words in data transfer.
1752	Remote I/O - PLC is in test or program mode.	
1752	Data Highway and Data Highway Plus - symbolic file and addressing mode is not supported.	

Table 6-1 Local and System Error Code Descriptions (cont.)

Error Number	Description	Possible Cause
1753	Remote I/O - remote rack is in a faulted condition.	
1754	Remote VO - communications not active.	On a PLC-3, if communications do not recover on the VCP unit, check the revision of the EPROM on the AcceleratVO card. The revision must be 05 or greater (PIN 85-00285-05 or 85-00307-05).
1755	Remote VO - block transfer count is too small.	
1761	Allen-Bradley error code 01 - remote device could not take message.	Not enough memory in an older PLC 5/15 and/or 51250. Too much traffic on device.
1762	Allen-Bradley error code 02 - remote device does not acknowledge.	VCP unit is communicating properly on the highway, but the remote device cannot be found. (Wrong network ID.) Remote device is bad or missing.
1763	Allen-Bradley error code 03 - unrecognized response from remote device.	Duplicate token holder detected or general network error.
1764	Allen-Bradley error code 04 - local port is disconnected. (Data Highway Plus only)	Not passing token. VCP unit is disconnected from highway or improperly connected. Noise on communication line.
1766	Allen-Bradley error code 06 - duplicate node detected.	Two devices with the same network ID (node #).
1767	Allen-Bradley error code 07 - station is off-line.	
1768	Allen-Bradley error code 08 - hardware fault.	
1774	Allen-Bradley error code OE - VCP unit received duplicate transaction number.	Communications out of sync.
2000-2002	Internal system error code.	Driver corrupted. (Re-download driver.)
2100	Internal system error code.	Configuration and driver could be incompatible.
2101	Invalid reference. Cannot parse.	(Check PLC reference syntax.)
2102	Invalid reference. Cannot parse.	(Check PLC reference syntax.)
2103	All PLC references in current block are invalid.	Check all references to same memory area.
2105	Could not update database via block read.	Possible hardware problem. Internal data structure corrupted.
2106	Could not update database via unsolicited request.	PLC sending unsoliciteds to VCP memory area that does not exist.
2107	Remote interface supports only one block read.	
2120	Invalid bit write register.	GE CCM or TI Host link bit write registers are invalid.
2200	Unsolicited request failed. Connection not established with remote device yet.	PLC is sending unsolicited data before VCP unit is ready to receive it.
2201	Inconsistent local address.	Network ID and interface board ID do not match.

Table 6-1 Local and System Error Code Descriptions (cont.)

Error Number	Description	Possible Cause
2500	Invalid separator.	Check PLC references.
2501	Invalid reference. Cannot parse.	Invalid character in PLC reference.
2502	Invalid reference. Cannot parse.	Not enough characters in network address or PLC reference.
2503	Invalid reference. Cannot parse.	Too many characters in network address or PLC reference.
2525	Network address component out of range.	The network ID or PLC ID configured is out of range.
3000-3005	Internal system error code.	Driver is corrupted. (Download new executive firmware/drivers.)
3006	Cannot write to unsolicited reference.	A reference associated with a name in the unsolicited device field is being used in a control button or numeric entry field.
3025	Network address (PLC ID field) is invalid or out of range.	
3050-3055	Internal system error code. Data buffer corrupted.	Baud rate is too slow.
4100	Invalid network ID.	
4101	Invalid network ID.	
4102	Not enough network ID levels specified.	
4103	Too many network ID levels specified.	
4104	Invalid network ID.	

Table 6-1 Local and System Error Code Descriptions (cont.)

Error Number	Description	Possible Cause	Possible Solution
101	Internal system error.	Out of environment space. The mode argument is invalid.	Add shell command to config.sys and increase environment size. Increase the amount of RAM available or do not run TSRs, other programs, or device drivers.
102	Interface card software missing or bad path.	A-B Interchange Software not properly installed or is corrupt.	Reinstall A-B Interchange Software.
103	Interface card software bad.	A-B Interchange Software is corrupt.	Reinstall A-B Interchange Software.
104	Not enough memory is available to initialize interface card.	Out of low memory (lower 640K of RAM)	Increase the amount of RAM available or do not run TSRs, other programs, or device drivers. See the DOS manual to optimize memory usage.
105	KT card could not be initialized.	KT card could not be initialized for unknown reasons.	Exit the Configuration Software or the Transfer Utility software and run startkt.exe command as described in the PanelMate Series 1784-KT Card Option Data Sheet. If the card initializes correctly, the problem is a shortage of memory. Increase the amount of RAM available or do not run TSRs, other programs, or device drivers. See the DOS manual to optimize memory usage. If the card fails to initialize, there will be an error message displayed. See the STARTKT Initialization Error Code Table in the PanelMate Series 1784-KT Card Option Data Sheet.
106	SD card program error.	Configuration software not properly installed or is corrupt.	Reinstall Configuration Software.
107	SD card bad port and/or memory address.	Port address does not match the switch settings on interface card. Port address in conflict with other memory in computer.	Check that the dip switch settings on interface card and the port address selected match. Select a different port address.
108	SD card memory error.	SD card memory in conflict with other memory in computer. SD card may be defective.	Select a different memory setting. Replace and test with a known good interface card.

Table 6-2 Interface Card Error Code Descriptions

Error Number	Description	Possible Cause	Possible Solution
109	SD card processor failure.	SD card may be defective.	Replace and test with a known good interface card.
10A	SD card error.	SD card may be defective.	Replace and test with a known good interface card.
10B	SD card software module not found.	Configuration software not properly installed or is corrupt.	Reinstall configuration software.

Table 6-2 Interface Card Error Code Descriptions (cont.)

Note For any 176X error codes, refer to Table 1, Local and System Error Codes Descriptions, for more information.

Note For any error codes below 101 or any error codes that are not a 176X error code, refer to the PanelMate Series 1784-KT Card Option Data Sheet sent with your 1784-KT option disk for more information.

Chapter 7

Regular Maintenance

In this chapter, you will learn:

- What regular maintenance the PanelMate unit requires
- How to make adjustments to the CRT

Regular Maintenance

Very little regular maintenance is required to keep your PanelMate unit in perfect running condition.

The face of the unit should be cleaned, whenever needed, with any common, non-abrasive cleaning product.

Every 3 to 6 months, run all the system health checks that are provided in the system. These include the Display Tests, Membrane Keypads Test, and Relay and Battery Tests. Refer to Chapter 4 for directions on running these system health checks.

It is best to mount the PanelMate unit in a closed industrial enclosure. However, if the PanelMate unit is operating in a dusty environment and is unprotected (e.g., mounted in a control panel whose door is often left open), periodically use forced air to blow off any dust that may have accumulated on the circuit boards. Be sure to disconnect power before conducting this procedure.

There are no user replaceable fuses or batteries in the PanelMate unit.

Monitor Adjustments

If you have a PanelMate Series 2000 (Model 2400 or Model 2600), you will have the following monitor controls:

- CONTRAST The CONTRAST control will increase or decrease the contrast of the screen.
- BRIGHTNESS The BRIGHTNESS control will increase or decrease the brightness of the screen. This should be the first control checked if no picture appears.

If you have a PanelMate Series 2000 Color (Model 2700), you will have the following monitor controls:

- BRIGHTNESS The BRIGHTNESS control will increase or decrease the brightness of the screen. This should be the first control checked if no picture appears.
- CONTRAST The CONTRAST control will increase or decrease the contrast of the screen.
- V-CENTER The V-CENTER control will adjust the vertical location of the screen.
- V-SIZE The V-Size control will increase or decrease the vertical size of the screen.
- H-CENTER The H-CENTER control will adjust the horizontal location of the screen.

If you have a PanelMate Series 3000, you will not have any monitor controls.

If you have a PanelMate Series 4000, the following monitor adjustments are located on the rear of the monitor.

CONTRAST	The CONTRAST control will increase or decrease the contrast of the screen.
BRIGHTNESS	The BRIGHTNESS control will increase or decrease the brightness of the screen. This should be the first control checked if no picture appears.

If you have a PanelMate Series 4000, the following monitor adjustments (from left to right) are located on the front of the monitor. To access the adjustments, the monitor must be removed from the enclosure.

V-SHIFT	The V-SHIFT control will adjust the vertical location of the screen.
V-SIZE	The V-SIZE control will increase or decrease the vertical size of the screen.
H-SHIFT	The H-SHIFT control will adjust the horizontal location of the screen.
H-SIZE	The H-SIZE control will increase or decrease the horizontal size of the screen.

Chapter 8

Troubleshooting Guide for the PanelMate Series System

This section of the manual is provided to help you determine if problems you are having with the PanelMate unit can be readily solved on your own or require help from Eaton IDT's Customer Service Department.

Please try all recommended solutions of your problem before contacting your local distributor.

Problems with the Monitor

No picture on the screen

Make sure the power is switched ON.

Make sure your power source is actually supplying power to the PanelMate unit.

Screen is distorted, off-center, or dull

Refer to the Monitor Adjustments section of Chapter 7 and attempt to correct problems. If this does not correct the problems, call your local distributor.

Single message on a black screen that says "press any membrane key to resume display"

This is normal operating procedure when the System Parameters Editor has been set for Automatic Screen Blanking. To disable this feature, set Screen Blanking Inactivity Period to OFF (refer to Chapter 23).

Watchdog timeout message on a screen that says "Watchdog Timeout. Press Cancel key to continue"

A watchdog timeout error may indicate a problem with PanelMate hardware or it may be related to AC power. If problems persist, call your local distributor. Please have the unit's serial number ready for the distributor who serves your call.

Problems with the TouchPanel

Keyboard does not work at all

Check the integrity of the cable and connectors.

One or several membrane keys do not work

Use the Membrane Keyboard Test to check if the keys are sending a signal to the PanelMate unit (refer to Chapter 4, Execute the System Diagnostics).

Problems with the Control Buttons

One or several buttons do not work

Use the Membrane Keyboard Test to check if the keys are sending a signal to the PanelMate unit (refer to Chapter 4).

Problems with Audio Output

No sound is produced at all

Check the System Parameters Editor to make sure you have the audio output set for either LOW, MED, or HIGH volume (refer to Chapter 2).

Check the connection of the speaker to the PanelMate unit.

Check the integrity of the speaker cable.

If you have purchased your own speaker, make sure it is an 8-ohm speaker. Go offline and run the audio tests (refer to Chapter 5).

Sound is only produced for operator input or alarms

Check the System Parameters Editor to make sure you have the audio output set correctly (refer to Chapter 23).

Problems with the Fault Relay

Fault relay is not energized at start of Run Mode operation

View the PanelMate unit screen to check for system or communications errors that may be reported (refer to Chapter 6).

Use the fault relay health check to make sure the relay is working properly (refer to Chapter 5).

If you are using Generic Protocol, make sure your host is not polling the PanelMate unit before it has a chance to energize the relay.

Fault relay de-energizes when an alarm occurs

This is a normal operation if you have used the System Parameters Editor to set this feature. Use the System Parameters Editor to disable this feature (refer to Chapter 23).

Problems with a Printer

Printer will not work at all

Check to make sure the printer cable is connected to Port 1.

Check the Port Parameter Table. Make sure Port 1 is selected for PRINTER use.

Verify that all communications parameters match between the PanelMate unit and your printer. Check to make sure the printer is ready; if the printer is out of paper or off-line, it will not work. Check the integrity of the cable and connections. Verify that the cable is wired properly. Check the integrity of the PanelMate communications port by restarting the system (power off, then re-power), and noting the report of the power-up diagnostics. **Note** If you are using a parallel printer, you must use the optional serial-to-parallel converter.

Problems when Transferring Memory

Cannot make a PC (Personal Computer) transfer at all

Make sure that the cable connecting the PC serial port to PanelMate Serial Port #1 is the one sold by Eaton IDT.

Check the integrity of the PanelMate communications port. Do this by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics. Make sure you are connected to the PC serial port selected in the Utility Parameters Editor.

Cannot download from the PC

The file you are attempting to load from the PC may be corrupted. Re-save the configuration to the PC, then try to transfer the configuration again.

Problems with the Real-Time Clock

The time is inaccurate following a power disruption

This is a symptom of a dead or low battery. Check the integrity of the battery. Do this by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics.

Communications Problems using the Generic Protocol

PanelMate unit does not respond at all

Verify that the host is using the frame format exactly as specified in Chapter 35, Generic Protocol. Make sure that the cable connecting the host to the PanelMate unit is properly wired.

Verify that you have properly set the communications parameters on the host to match the parameters of the PanelMate serial port.

Check the integrity of the PanelMate communications port by restarting the system (power off, then re-power) and noting the report of the power-up diagnostics.

Specific Error Messages

Error encountered during initialization of data structures

Return to the Configuration Mode and check the PLC Name and Port Editor. Especially verify all Network ID numbers and the default PLC. A default PLC must be named, even if you are using one PLC.

Error in memory checksum calculation

This error message indicates that all or part of the system configuration memory is corrupted. Most commonly, this error is displayed after improperly exiting a system editor. To correct this error, recalculate the checksum by entering and exiting the editor as normal.

Errors identified by audible tones when message display is not possible

For certain fatal startup errors which do not permit fault messages to be displayed on the screen, the PanelMate unit will generate special alarm tones to an alarm horn connected to the Audio port. If the real-time clock is inaccessible, a 1000 Hz tone will be generated in the following repeating pattern: .5 second tone, .5 second pause, .5 second tone, 3 second pause.

If the video subsystem has fatal errors, an alarm tone pattern is generated to indicate the actual failures. A 1000 Hz tone with .25 seconds duration indicates a test has passed. A 800 Hz tone with .5 second duration indicates a test has failed. A 3 second pause occurs at the end of the tone sequence. The tests are performed in the following order:

- Serial Port 2
- Serial Port 1
- Real-Time Clock (Timing)
- Real-Time Clock Battery
- DRAM
- Watchdog
- Character Cell SRAM
- Frame Buffer SRAM

Chapter 9

Initialization of the Configuration Software Package

In this chapter, you will learn:

- The hardware requirements of the personal computer which runs the software package
- How to run Setup
- How to start the Configuration Software Package
- The file naming conventions
- Compatibility with various personal computer platforms

Overview

The PanelMate Configuration Software Package is a collection of integrated editors which run on an IBM PC or compatible computer. The package creates application software for the PanelMate online system, allowing you to perform the following tasks:

- Create and edit a complete configuration, including pages, message library, system parameters and PLC connection information.
- Document a configuration.
- Check memory requirements of a configuration when running online.
- Perform file management operations on configurations.
- Download a configuration to the PanelMate system. The software will also upload and store a configuration from a system.
- Remotely perform network functions if the Remote Transfer option was purchased.

Note Configurations created on earlier versions of the Configuration Software may be used on the latest version of the Configuration Software provided they are read into the Configuration Software and saved.

Personal Computer Hardware Requirements

The PanelMate Configuration Software will operate on DOS-based computers (IBM PC and compatibles) running DOS version 3.1 or later. The software is not designed to operate under any other operating system designed for the IBM PC, such as UNIX/XENIX or OS-2. The

software is not designed to run under Microsoft Windows. The software will run on PS/2 hardware. The Configuration Software, without any remote network boards installed, requires a minimum of 640K RAM in your system and requires over 540K free base memory in DOS to operate. The software must be copied from floppy diskette and loaded onto a hard disk. It requires approximately 4 1/2 MByte of hard disk. There should not be any terminate, stay-resident (TSR) programs running with the software. If memory problems occur, verify that a large amount of memory is not being used by TSR programs or device drivers in your **config.sys** file. If you find statements similar to "device=emm.sys" in your **config.sys** file, use a text editor to comment the line out (i.e., insert REM at the beginning of the line), then reboot your computer.

The software will operate with color, monochrome, gas plasma, or LCD monitors or displays. Although color may be used in the prompts in the Configuration Software, the screen images for the pages will be developed in gray scale for the PanelMate Series 2000 and the PanelMate Series 3000 and the screen images for the pages will be developed in color for the PanelMate Series 2000 Color and PanelMate Series 4000. If you have a PanelMate Series 2000 or PanelMate Series 3000, the online system will display in four shades of gray. If you have a PanelMate Series 2000 Color or PanelMate Series 4000, the online system will display in eight colors. In order to support gray scale on a personal computer, the blink attribute cannot be accessed. If you select blink, it will be functional on the online unit, but will not be functional on your personal computer.

The software was designed for use with computers having VGA video adapters and operating in Graphics Mode. VGA (and SVGA) video adapters provide What-You-See-Is-What-You-Get (WYSIWYG) with four levels of gray or eight levels of color on monochrome and color monitors. The software will function with non-VGA video adapters such as MDA, HGC, HGC+, HIC, CGA, MCGA and EGA. However, these monitors require use of Text Mode. As a result, configured pages may not appear exactly as they will on the PanelMate online system, which uses a VGA monitor. Non-VGA video adapters support limited functionality which is defined in the last section of this chapter.

Note The Rendition II Graphics Adapter Board is not supported by the PanelMate software since the board does not support CGA, EGA, or VGA standards.
The software is shipped on 3 1/2" (high density 1.44M) floppy diskettes.

Running the Setup Installation Program

The Configuration Software Package contains an installation program named Setup. Setup is on the diskette labeled "Configuration Software". Setup will automatically create the directory structure and load the software on your hard disk. The default directory is C:\VCP>. You can enter a new pathname if desired.

To install the Configuration Software Package on your hard disk, insert the diskette labeled "Configuration Software" in your personal computer. If the DOS prompt, C:\>, is visible, then type:

```
A: <Return>
```

With the A:\> prompt visible, type:

```
SETUP IDT
```

Follow the instructions that are displayed on the screen.

Note If you are installing the Configuration Software Package on a partitioned disk, make sure the partition is physical. A logical partition will not be recognized.

Starting the Configuration Software Package

If the default pathname was used to install the software, at the C:\> prompt, type: CD

```
\VCP <Return>
```

Otherwise, type:

```
CD \pathname <Return>
```

where pathname is the directory defined during the setup installation.

At the C:\VCP> prompt or C:\pathname> prompt, type:

```
PMC <Return>
```

If you are using an LCD laptop or other personal computer unit which may startup in a color video mode and are experiencing problems viewing the cursor, go to DOS and type "MODE BW80" to attempt to set the display to a black and white mode. If this does not correct the problem, consult the laptop manual.

The Product Selection Menu will appear as shown in figure 9-1. To create a configuration for your PanelMate unit, you must select one of the configuration entries below.

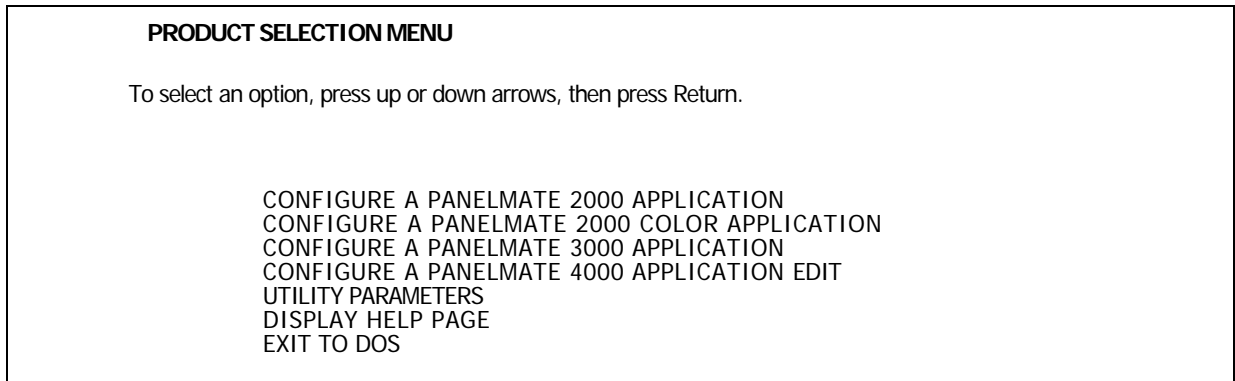


Figure 9-1 Product Selection Menu

Configure

2000 Application

This selection allows you to develop grayscale configurations for the PanelMate Series 2000. After making this selection, the Main Menu will appear. Refer to Chapter 11, The Main Menu, for more information.

Configure a PanelMate 2000 Color Application

This selection allows you to develop color configurations for the PanelMate Series 2000 Color. After making this selection, the Main Menu will appear. Refer to Chapter 11, The Main Menu, for more information.

This selection allows you to develop grayscale configurations for the PanelMate Series 3000. After making this selection, the Main Menu will appear. Refer to Chapter 11, The Main Menu, for more information.

Configure a PanelMate 4000 Application

This selection allows you to develop color configurations for the PanelMate Series 4000. After making this selection, the Main Menu will appear. Refer to Chapter 11, The Main Menu, for more information.

This selection allows you to set up various operating parameters of the Configuration Software.

Directory Names (Paths)

The first page of the Utility Parameters Editor contains the DOS directory names and paths for the Configuration Software. The defaults are set to the C:\VCP subdirectories which are the defaults automatically created by the Setup program when the software is installed on your personal computer.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2= F7=MORE F8=	F3= F8=	F4= F9=	F5= F10=EXff
Directory Names/Paths				
Configuration Directory			C:\VCP\ONUNE\cfg\	
Executive Firmware Directory			C:\VCP\ONUNE\firmware\	
Downloadable Driver Directory			C:\VCP\ONUNE\driver\	
Character Font Directory			C:\VCP\ONLINE\font\	
Temporary Directory			C:\VCP\ONUNE\ A:	
VCP Unit Options Drive				
Configurations				
Automatic Save Every 10 minutes				
Automatic Backups YES				
Backups YES				

Figure 9-2 Utility Parameters Editor (Page 1)

The default subdirectories shown in figure 9-2 are explained below. Note that these subdirectory names can be changed if desired.

The default Configuration Directory is C:\VCP\ONLINE\CFG. The CFG directory contains all the user configuration files which have the extensions .PC1, .PC2, .PC3, .PC4, .PC5, .PC6, .BK1, .BK2, .BK3, .BK4, .BK5, .BK6, .SV1, .SV2, .SV3, .SV4, .SV5, and .SV6.

Note You may wish to change the Configuration Directory to a floppy disk drive to keep your files transportable from PC to PC. An example of a valid directory is A:\Screens\.

The default Executive Firmware Directory is C:\VCP\ONLINE\FIRMWARE. The FIRMWARE directory contains the Executive Firmware Modules for the PanelMate unit.

The default Downloadable Driver Directory is C:\VCP\ONLINE\DRIVER. The DRIVER directory contains the various PLC drivers which must be downloaded to the PanelMate unit.

The default Character Font Directory is C:\VCP\ONLINE\FONT. The FONT directory contains the character cell representations for the Normal, Graphics, and International Character fonts.

The default Temporary Directory is C:\VCP\ONLINE. The temporary directory is used to store interim saves made during the configuration process before the final save of the user configuration is made. The directory is created at startup and deleted when the software is exited.

Note If you wish to use a RAMDISK to improve performance, you must reserve a minimum of 132K of memory for this purpose.

The PanelMate Options Drive defaults to drive A. The Options Drive will be read when an option is being installed on the PanelMate unit.

Automatic Saves

The automatic save feature provides automatic periodic saves of your user configuration to protect against catastrophic personal computer failures such as power outages. The feature can be turned off or set to 10, 20, or 30 minutes. The default value is factory shipped at 10 minutes.

If enabled, this feature automatically creates a save file (.SV1, .SV2, etc.) on a periodic basis. If the Configuration Editor is exited by user command, then the save file is deleted. If the Configuration Editor is exited abnormally (by power failure for example), then a SV file is created which contains the last saved work. This file can be copied to a PC file and then edited.

The save time period is the time from the last save until the Save Routine is armed. When the Save Routine is armed, it requires two conditions to be fulfilled before the save takes place. First, an interim save of a component file of the user configuration must occur. (If nothing has been saved, then the Save Routine will not take place.) If an interim save has occurred, the second condition is that the keyboard must be inactive for 10 seconds before the save will take place. Once the two conditions are met, the Save Routine takes place and the timing period restarts.

Note If a previous version configuration is read into the current Configuration Software and you enter the Display Configuration screen, the proper version is displayed. If an autosave occurs, the version is changed to the current Configuration Software version.

Automatic Backup

The Automatic Backups feature when enabled will create a backup file when a user configuration is opened for editing. The default is YES for backups. Although not recommended, the setting can be changed to NO to turn it off and save disk space.

Backup is explained in the following example:

When you start editing, two files exist: File.BK1 (revision 4) and File.PC1 (revision 5). (Revision refers to the fact that you have modified the file and revised it a number of times.)

Next you open File.PC1 (revision 5) to begin to edit it. As you edit the pages and save them, a file is created in the temporary directory (revision 5+). When you have completed the editing, you perform a Save Configuration. The following sequence of events occur automatically:

Delete File.BK1 (revision 4)

Rename File.PC1 (revision 5) to the name File.BK1

Save the temporary file to File.PC1 (revision 6)

The end result is that there are two files: File.BK1 (revision 5) and File.PC1 (revision 6).

If an error was made during the editing process and stored as revision 6, you can go back to the old revision 5 to begin the editing process over again.

Display Backups

The Display Backups feature will show the backup files when the configuration directory is displayed. The default is set to display the backup files. It can also be de-selected.

The second page of the Utility Parameters Editor can be accessed by pressing <F7> at the first page. This page selects ports on the personal computer (see figure 9-3). The upload/download device selection determines which port will be used to upload or download files to the PanelMate unit. Serial Ports 1 through 4 (COM1 through COM4), 1770-KF2/DH, 1770-KF2/DH+, 1770-KF2/Rem I/O, 1784-KT, 1784-KT/Rem I/O, 5136-SD/DH, 5136-SD/DH+, or 5136-SD/REM I/O may be selected. The default is the first serial port available on the personal computer (usually COM1) or NONE if no serial ports exist. For more information on the remote network selections, refer to Chapter 27, Transfer Editor.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2= F7=MORE	F3= F8=	F4= F9=	F5= F10=EXIT
Documentation Device LPT1				
Upload/Download Device COM 1				

Figure 9-3 Utility Parameters Editor (Page 2)

The documentation device selection defines the printer port or file on the personal computer. The printer can be used to print documentation of the configuration. Parallel Ports 1 through 3 (LPT1 through LPT3), Serial Ports 1 through 4, and User Specified File (File) may be selected. The default is the first parallel port available on the personal computer (usually LPT1). If no parallel ports exist, then the default is the first COM port available (usually COM1). If no serial ports exist, then the default is NONE. If a serial port is selected (COM1 through COM4), you must configure the Baud Rate, Data Bits, Stop Bits, and Parity for the port. (The default for the COM ports is 9600, 8, 1, and None.) If File is selected, a new Documentation Directory field is displayed for you to enter the directory for your file. The default directory (C:\VCP\ONLINE\print) is created when the Configuration Software is installed.

Note When File is selected and Print Documentation is selected from the Configuration Editor Menu, a screen will appear so you may specify the print documentation filename before you enter the Documentation Menu. Refer to Chapter 26, Print Documentation, for more information.

Press <F7> to toggle between pages. Press <F10> to exit the Utility Parameters Editor.

Display Help Page

This selection will display a page which explains how you select help pages in the software. When help is available, HELP will appear in the top right corner of the screen. Press <Alt> <F1> to access the help page. To exit a help page press <F10>.

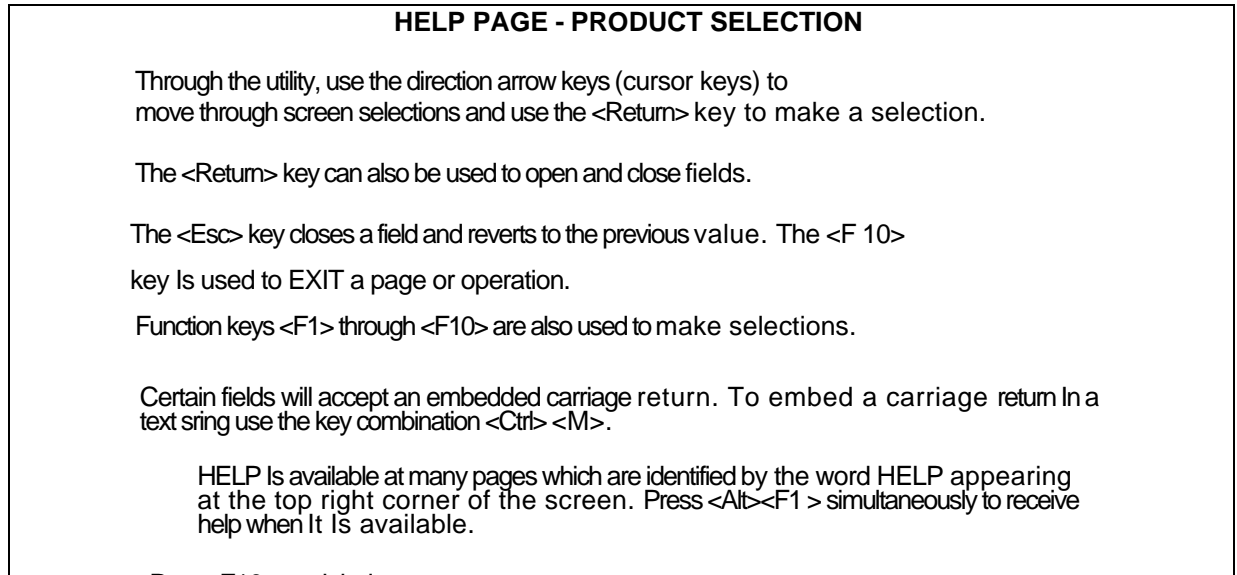


Figure 9-4 Help Page

Exit to Dos

This selection will allow you to exit from the Configuration Software and return to the DOS operating system.

File Naming Conventions and File Management

Each saved configuration is stored on the personal computer under a name you chose. The filename extensions for configurations for the PanelMate Series are listed below.

Product	Number of Pages	File Extension
PanelMate 2000	10	.PC1
PanelMate 2000	30	.PC2
PanelMate 2000 Color	10	.PC5
PanelMate 2000 Color	30	.PC6
PanelMate 3000	10	.PC1
PanelMate 3000	30	.PC2
PanelMate 4000	10	.PC3
PanelMate 4000	30	.PC4

The Configuration Software package can also be configured to perform Automatic Saves and Automatic Backups. See the Edit Utility Parameters section in this chapter for a detailed explanation. If these features are selected, then backup files with the extensions, ".BK1", ".BK2", etc. and save files with the extensions, ".SV1 ", ".SV2", etc. may be created.

Use this Configuration Software Package to rename files. Do **not** use DOS. The Configuration Software not only changes the DOS filename, but it also changes the internal structure of the file so that it contains the proper name for display on the online unit. DOS copy will only change the external DOS filename. See Chapter 28, File Management, for additional information.

Non-VGA Hardware

The Configuration Software was designed for use with computers having VGA video adapters and operating in Graphics Mode. The software will function with non-VGA monitors such as MDA, HGC, HGC+, HIC, CGA, MCGA and EGA. However, these monitors require use of Text Mode. As a result, configured pages may not appear exactly as they will on the PanelMate online system, which uses a VGA monitor. You can edit existing configurations but you cannot add variable-sized templates nor symbols.

VGA Graphics Mode can display 80 columns by 30 lines of characters just like the PanelMate unit Text Mode can display only 80 columns by 25 lines. All non-VGA monitors will default to Text Mode. For this reason, if you are using a non-VGA monitor you will not be able to see either the top three or bottom three lines of a page during configuration. The software will detect when it is running on a non-VGA Graphics Mode system and will run a special modified version to display screens. A special toggle mode is available to permit access to the entire display. Use <Alt>b to toggle the screen.

CGA, EGA, HIC and MCGA video adapters do not support WYSIWYG. These video adapters will support 4 levels of gray. Certain laptops and other units may start up in a color video mode even when connected to a monochrome monitor. However, the cursor and other display items may not be seen because of indistinguishable shades of gray. If this occurs, exit to DOS and type "MODE BW80". This will set the system to black and white (monochrome) mode. Re-enter the Configuration Software. If this does not improve visibility, then consult the manual for the personal computer to seek other solutions.

MDA, HGC and HGC+ video adapters support monochrome monitors. They do not support WYSIWYG. You can edit but you cannot add variable-sized templates nor symbols. All adapters support 3 levels of gray (black, normal, high) and some support 4 levels of gray (black, dim, normal, high). If only 3 levels of gray are supported, the low (LO) and medium (MD) intensities may have the same appearance on the personal computer, although they will function properly on the online unit

Some character fonts which are standard with the VGA format are not available with non-VGA. In these cases, the closest graphic representation will be substituted. Non-redefined double high font and quad font will be displayed in the following manner:

VGA REPRESENTATION			NON-VGA REPRESENTATION	
CHARACTER	DOUBLE HIGH	QUAD	DOUBLE HIGH	QUAD
a	a	a	a	a _{LJ}
D	D	D	D	
5	5	5	5	5 _{LJ}

Figure 9-5 Character Fonts

Graphic characters will be represented by periods (.). International Font characters will be represented by asterisks (*).

Note Non-VGA hardware will permit the editing of variable-sized templates but will not support adding them to a page.

Chapter 10

Basic Steps for Creating a User Configuration

In this chapter, you will learn:

- What steps you should follow for creating a configuration
- What information should be gathered before starting a configuration
- How to make the best use of the PanelMate unit

Overview of the Process

This chapter is written for a new user of the PanelMate unit. It is an overview of the steps required to create a new User Configuration and to transfer it into a PanelMate online unit.

Step One Create a User Configuration

The first three steps should be done before you run the PanelMate Configuration Software Package.

1. You must determine the features that will be found in your unit. Is it a 10-page or is it a 30-page? Have you purchased the Graphics Option? Have you purchased the Custom Serial Interface (CSI) Driver for this unit?

Note If you are not sure of the features of your PanelMate unit, then you should develop for a 10-page unit with NO options.

2. You must select your PLC Brand and Model. You should also determine the Network ID# for the PanelMate unit and the Network ID# for the PLC(s) if this is applicable for your installation.
3. You should review the Word and Bit Reference section which is at the end of this chapter. This section and the chapter for your brand and model of PLC should be reviewed before you begin configuration. It is best to understand the format for PLC references before you begin a configuration.

4. Run the PanelMate Configuration Software Package. 5.

Select "Develop a Configuration."

6. Select "Create a New Configuration."

7. To the prompt "Use an existing configuration as a base", answer no by pressing <N>.

8. Complete the fill-in-the-blank spreadsheet with your choices and enter a name for your configuration. Then press <F1> to enter the Configuration Editor.

If you need further information, see Chapter 12.

9. The first editor you select should be Edit PLC Name and Port Table. Select this item and press <Return> to complete this spreadsheet.

In the Port Parameter section, you should define the following:

- a) Select your PLC type in the USE field for the port which you will used to communicate to the PLC.
- b) Enter the PanelMate Network ID# in the field adjacent to the port which you just configured, if applicable.
- c) Enter the remainder of the communication information.

In the PLC Name Table:

d) Enter a tagname (up to 6 characters) for the PLC in the NAME field. If multiple PI-Cs are on the network, enter names for them also.

e) Define the ID# for each PLC entered.

f) Match the PORT field to the port you selected in the Port Parameter Table. g)

Enter the correct MODEL for each PLC entered.

h) Determine which PLC will be the primary PLC for communications. Enter this name in the DEFAULT PLC NAME field. This will reduce the amount of typing required to reference this PLC.

Note You must enter a default PLC name.

Exit the PLC Name and Port Table by pressing <F10> and then <Y> to save the new table. If you need further information, see Chapter 23, PLC Name and Port Parameters Table. 10. Now from the Configuration Editor Menu choose "Enter Directory Editor."

11. Next select a page to edit. Use the cursor keys in the Page No. column to choose a page number and then press <Return>.

If you need further information, see Chapter 13, Directory Editor.

12. Create your pages using the various Page Editors (Chapter 14). Save each page as you exit the Page Editor and return to the Directory Editor.

13. Once your pages are complete, you may wish to select other product features such as the volume for alarm tones, setting of the startup page number and password values. To adjust these settings, select "Edit System Parameters." When complete, press <F10> to exit.

14. Finally select "Exit Configuration Editor" by pressing <F10>. Type <Y> to save the configuration. When the file naming screen appears type <Return> to save the file under the previously defined name.

15. Select "Return to Main Menu."

Now that the User Configuration is complete, you must download it to the online PanelMate system to test it.

Step Two Transfer Files to the PanelMate Unit

First, power-up the PanelMate unit. Place it into the Transfer Mode. Then connect the configuration cable between your personal computer (COM1) and the PanelMate unit (Port 1.) Use the following procedure to first download your brand PLC Driver and then your User Configuration.

1. At the Main Menu select "Transfer Information."
2. Select "Download Downloadable Driver to PanelMate." Then select your brand PLC and start the download by pressing <F1>= Start.
3. If you are installing options into the PanelMate unit, insert the Option Diskette into the floppy drive. Select "Download Option to PanelMate." Choose the Option then press <F1> =Start. Repeat this step if multiple options must be installed.
4. Finally select "Download Configuration to PanelMate." Enter the name of your configuration and then press <F1 >=Start.
5. When complete select "Return to Main Menu."

6. To end your session, select "Return to Product Selection" then select "Exit to Dos."
You are now ready to test online with your PLC. Disconnect the cable between the personal computer and the PanelMate unit. Connect your PLC communication cable. From the PanelMate unit front panel choose the Enter Run Mode selection and test your configuration.

Word and Bit References

Word References

A single format for referencing PLC words is used throughout the PanelMate template editors. Whenever you need to refer to a specific PLC word in any expression, the following format is required.

[plcnam,word#format]

Note *plcnam*, and *#format* are optional fields

where

plcnam, The 6-character (or less) name of the designated PLC, as defined in the PLC and Port Parameters Table, followed by a comma. Consult Chapter 23, PLC Name and Port Parameters Table, for more information regarding this name. If this name is omitted, the default PLC name is assumed. (The default PLC is defined in the PLC Names and Port Parameters Editor.) This field is optional.

word The actual PLC reference number of the word to be read or written, using the addressing nomenclature of the PLC defined by the *plcnam*. Consult the specific PLC section for more information about word reference numbers.

#format The 3- or 4-character code that specifies the format to be assumed for the data being read or written, preceded by a number sign (#). If this format is omitted, default formats will be used.

The formats that the PanelMate unit recognizes are: **S16**

Signed, 16-bit integer where the number can range from -32768 to 32767; the high order bit is the sign.

U16

Unsigned, 16-bit integer where the number can range from 0 to 65535.

S32*

Signed, 32-bit integer where the number can range from -2,147,483,648 to 2,147,483,647; the high order bit is the sign.

U32*

Unsigned, 32-bit integer where the number can range from 0 to 4,294,967,295.

BCD3

3-digit binary-coded decimal number where the number can range from 0 to 999.

BCD4

4-digit binary-coded decimal number where the number can range from 0 to 9,999.

BCD6*

6-digit binary-coded decimal number stored in two contiguous registers, three digits per register, where the number can range from 0 to 999,999.

BCD8*

8-digit binary-coded decimal number stored in two contiguous registers where the number can range from 0 to 99,999,999.

BIN3

3-digit decimal number where the number can range from 0 to 999.

BIN4

4-digit decimal number where the number can range from 0 to 9,999.

BIN6*

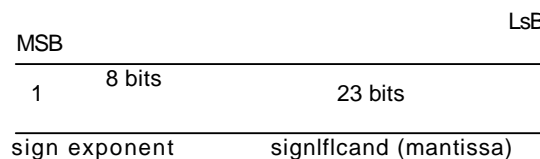
6-digit decimal number stored as two 3-digit numbers in two contiguous registers where the number can range from 0 to 999,999.

BIN8*

8-digit decimal number stored as two 4-digit numbers in two contiguous registers where the number can range from 0 to 99,999,999.

FP

32-bit value stored in four consecutive bytes where the number can range $\pm 1.20 \times 10^{-4}$ to 3.40×10^4 using the single-precision IEEE format. The PanelMate unit stores the bits as shown below.



When the number of significant digits in a value exceeds the number of digits for display, the value is displayed in exponential notation provided the length of the value field is greater than or equal to 5 for positive numbers and greater than or equal to 6 for negative numbers. The exponential format is $[-]n.nnnE-nn$ for negative exponents and $[-]n.nnnE nn$ for positive exponents.

Note that 7 significant digits, not including the sign or decimal point, are valid. If the field is larger than the 7 significant digits, the additional information may be erroneous.

If the floating point format is specified and the data in the registers is an invalid IEEE floating point value, the value $6E-39$ will be displayed.

* When specifying these data formats, the address specified for *word* defines the first of the two registers in the pair (i.e., the one with the lower reference).

Note that when sending values to the PLC, the PanelMate unit will delete any high order digits beyond the range allowed.

Also note that BCD and BIN formats do not inherently support negative values. Expressions can be used to scale values in the PanelMate unit so that the operator enters and reads negative numbers, but a positive integer will be read from or written to the PLC.

PLC Bit References

A single format for referencing PLC bits is used throughout the PanelMate template editors. Whenever you need to refer to a specific PLC bit in any expression or control button definition, the following format is required:

[plcnam,bit]

Note *plcnam*, is an optional field.

where

- plcnam, The 6-character (or less) name of the designated PLC, as defined in the PLC and Port Parameters Table, followed by a comma. Consult Chapter 23, Defining System Parameters, for more information regarding this name. If this name is omitted, the default PLC name is assumed. (The default PLC is defined in the PLC Names and Port Parameters Editor.) This field is optional.
- bit The actual PLC reference number of the bit to be read or written, using the addressing nomenclature of the PLC defined by the *plcnam*. Consult the specific PLC section for more information about word reference numbers.

Chapter 11

The Main Menu

In this chapter, you will learn:

- How to Develop a Configuration
- How to Transfer Information
- How to Perform File Management
- How to Verify a Configuration for Run Mode
- How to Convert a Configuration

The Main Menu

The PanelMate Configuration Software Main Menu contains six selections. The following sections will give a brief description of each selection.

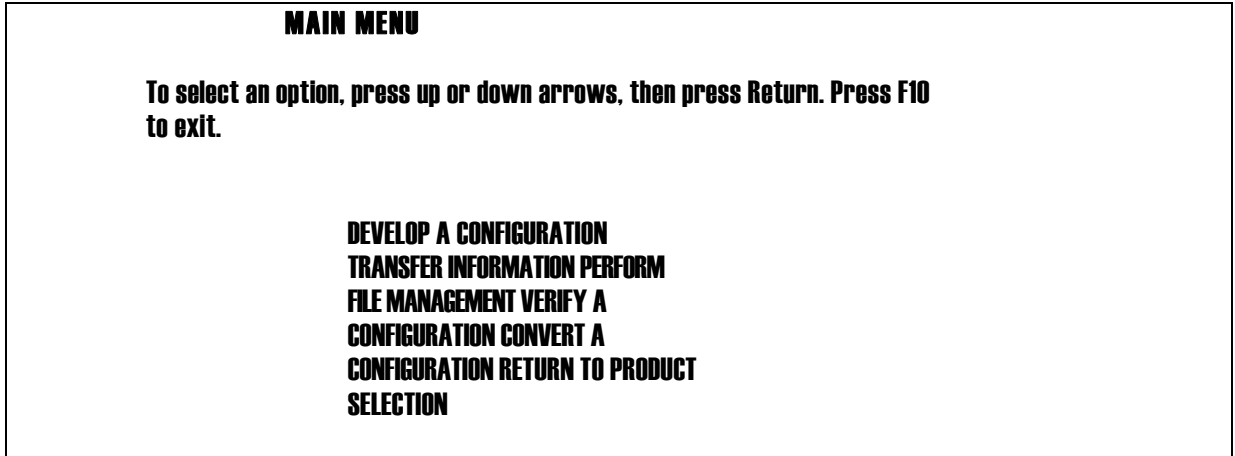


Figure 11-1 Main Menu

Develop a Conf ____ [ON

This selection allows you to create a configuration for use on a PanelMate system. The configuration will include system parameters, PLC connection information, and display pages containing templates, variable-sized templates, and static text. Information about this selection is found in Chapter 12, The User Configuration Editor.

Transfer Information

This selection allows you to transfer a configuration, executive firmware, options, or a driver from the development computer to a PanelMate system. You may also transfer a configuration from an online system and store it on disk on your computer. In addition, you may read the system configuration information from the PanelMate system and display it on the development computer. Information about this selection is found in Chapter 27, Transfer Editor.

Pet

This selection allows you to copy, rename, and delete entire configurations. Information about this selection is found in Chapter 28, File Management.

Verify a Configuration

This selection allows you to determine if a configuration will fit in the memory of a PanelMate online unit and if all PLC references are valid. Three functions are performed:

- Determine validity of the PLC Name and Port Table
- Run a parsing check of all expressions (i.e., verify all PLC references are valid)
- Estimate the amount of DRAM memory required to run the configuration

Note The Configuration Verifier allows unsolicited references to be entered, but does not include them in the block read memory calculation.

After invoking this option, you will be asked to select the DOS filename for the User Configuration you wish to size. Depending upon the size and complexity of the configuration, it may take from 10 seconds to 3 minutes or more to complete this function. A typical screen image is duplicated below.

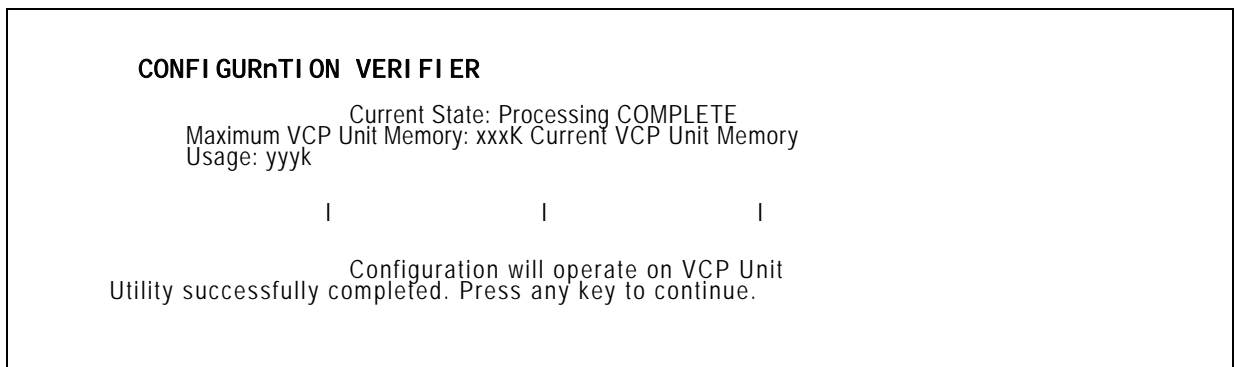


Figure 11-2 Sample Configuration Verifier Screen Display

The current state will update as each individual process is executed. The bar graph display is updated to indicate the memory requirement estimate. If no problems are found, you will receive the following message.

Configuration will operate on VCP Unit.

Utility successfully completed. Press any key to continue.

If a problem is found during the parsing check of expressions, error messages will be displayed to indicate where the problems are located. This is a very helpful debugging tool and it is **strongly recommended** to be executed before attempting to go to Run Mode. It is also recommended that Configuration Verifier be executed for merged configurations to ensure the validity of the PLC Name and Port Table and all PLC references.

If the configuration is too large, one of two error messages will be displayed. The first message will state the configuration will not operate on the VCP unit because it is too large. The other message states the configuration may not operate. Because the Configuration Verifier function approximates memory usage, there is a range of memory calculation which can only be confirmed by actually downloading to the PanelMate unit. If the configuration is too large to operate on the PanelMate unit, you can edit the configuration to better utilize memory.

Convert a Config _____

This selection will allow you to perform two functions. You can add options (page, graphics, etc.) to a configuration or you can convert files to be used on different units in the PanelMate Series.

The Conversion Menu Screens will allow access to the Conversion Editor, Configuration Options Editor, and the Conversion Table Editor. Figures 11-3 through 11-6 show the Conversion Menu screens for the PanelMate Series units.

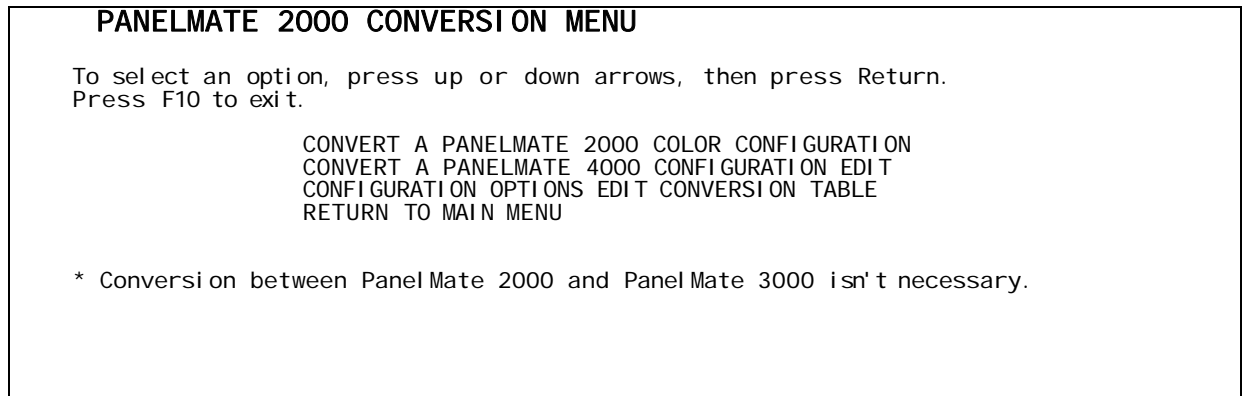


Figure 11-3 PanelMate Series 2000 Conversion Menu

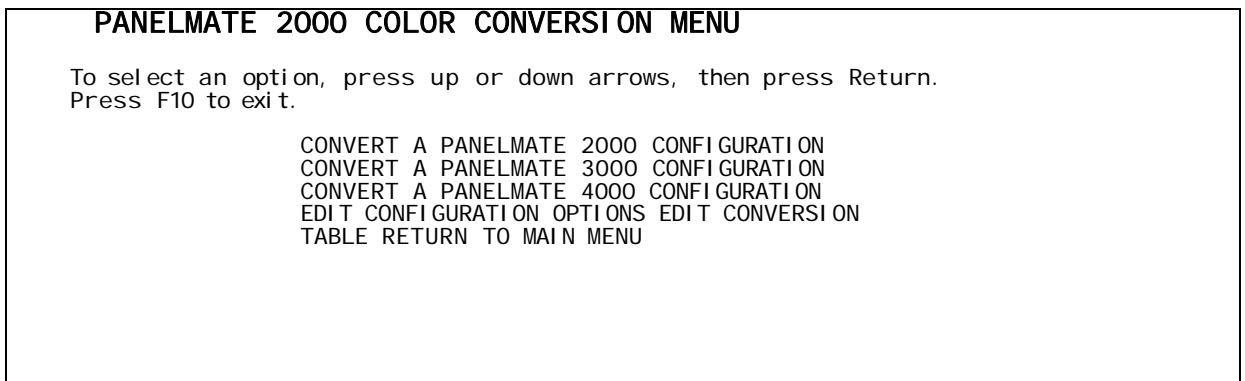


Figure 11-4 PanelMate Series 2000 Color Conversion Menu

Preface

Eaton IDT, Inc. has prepared this manual for use by Eaton IDT personnel and customers. The information contained within is the property of Eaton IDT and shall not be reproduced in whole or part without written approval from Eaton IDT.

The material in this manual is for informational purposes only and is subject to change without notice.

Eaton IDT, Inc. assumes no responsibility for any errors that may appear in this manual.

The following are trademarks of Eaton IDT, Inc. and are not to be reproduced nor used in any fashion without written approval from Eaton IDT. All rights reserved.

PanelMate®

TouchPanel™ PanelMate

Series™ PanelMate Series

2000™

PanelMate Series 2000 Color'

PanelMate Series 3000™

PanelMate Series 4000™

IBM-PC, IBM-XT, and PS/2 are registered trademarks of International Business Machines Corporation.

Microsoft is a registered trademark of Microsoft Corporation.

Windows is a trademark of Microsoft Corporation.

MODBUS is a trademark of Modicon, Incorporated.

Series Six, Series Six Plus, and Series 90 are trademarks of GE Fanuc Automation.

OS-2 is a registered trademark of Microsoft Corporation.

Any reference to trademark and/or copyrighted material is unintentional. ©

Eaton IDT, Inc., 1995

Printed in the USA

PANELMATE 3000 CONVERSION MENU

To select an option, press up or down arrows, then press Return.
Press F10 to exit.

CONVERT A PANELMATE 2000 COLOR CONFIGURATION
CONVERT A PANELMATE 4000 CONFIGURATION EDIT
CONFIGURATION OPTIONS EDIT CONVERSION TABLE
RETURN TO MAIN MENU

* Conversion between PanelMate 2000 and PanelMate 3000 isn't necessary.

Figure 11-5 PanelMate Series 3000 Conversion Menu

PANELMATE 4000 CONVERSION MENU

To select an option, press up or down arrows, then press Return.
Press F10 to exit.

CONVERT A PANELMATE 2000 CONFIGURATION CONVERT A
PANELMATE 2000 COLOR CONFIGURATION CONVERT A
PANELMATE 3000 CONFIGURATION EDIT CONFIGURATION
OPTIONS EDIT CONVERSION TABLE
RETURN TO MAIN MENU

Figure 11-6 PanelMate Series 4000 Conversion Menu

Conversion Editor

The Conversion Editor performs the actual file conversions between different PanelMate units. The file conversion process consists of altering colors and grayscale intensities. If converting a PanelMate Series 4000 to a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, the the fifth control button and messages 101 through 500 will be deleted.

The File Selection menu is shown below.

CONVERSION EDITOR - FILE SELECTION

F1=ENTRY F2= F3= F4= FS=
F6= F7= F8= F9= F10= EXIT

PanelMate 4000 Name
Include the file extension
PanelMate 2000 Name
Do not include the file extension

Directory: C:\VCP\ONLINE\cf9\

FILE1.PC2 FILE2.PC2 FILE3.PC2 FILE4.PC2 FILES.PC2

Figure 11.7 File Selection Menu

When valid filenames are entered, an Alert Window is displayed, warning you of items which will be altered or deleted. Figures 11-8 through 11-11 will show the Alert Windows for the PanelMate Series units.

Caution! Configuration will be altered!

PanelMate 2000 Color to PanelMate 2000
Foreground and background colors will be converted to intensities

PanelMate 4000 to PanelMate 2000
Foreground and background colors will be converted to intensities All
5th control button definitions will be deleted Messages 101-500 in the
Message Library may be deleted
Press any key to continue

Figure 11-8 PanelMate Series 2000 Alert Window

Caution! Configuration will be altered!

PanelMate 2000 to PanelMate 2000 Color
Foreground and background intensities will be converted to colors

PanelMate 3000 to PanelMate 2000 Color
Foreground and background intensities will be converted to colors

PanelMate 4000 to PanelMate 2000 Color
All 5th control button definitions will be deleted Messages
101-500 in the Message Library may be deleted
Press any key to continue

Figure 11-9 PanelMate Series 2000 Color Alert Window

Caution! Configuration will be altered!

PanelMate 2000 Color to PanelMate 3000
Foreground and background colors will be converted to intensities

PanelMate 4000 to PanelMate 3000
Foreground and background colors will be converted to intensities All
5th control button definitions will be deleted Messages 101-500 in the
Message Library may be deleted
Press any key to continue

Figure 11-10 PanelMate Series 3000 Alert Window

Caution! Configuration will be altered!

PanelMate 2000 to PanelMate 4000
Foreground and background intensities will be converted to colors

PanelMate 2000 Color to PanelMate 4000 No alterations to the configuration

PanelMate 3000 to PanelMate 4000
Foreground and background intensities will be converted to colors
Press any key to continue

Figure 11-11 PanelMate Series 4000 Alert Window

Configuration Options Editor

The Configurations Options Editor allows you to add the Graphics, Page, CSI, Modicon Modbus, and DH-485 options in a configuration.

Note Options cannot be removed.

The screenshot shows a menu titled "CONVERSION EDITOR - FILE SELECTION". At the top, there are five function key assignments: F1=SELECT, F2=, F3=, F4=, and F5=, followed by F6=, F7=, F8=, F9=, and F10=EXIT. Below these, there is a field for "Configuration Name" with a text entry line and the instruction "Include the file extension". Further down, the "Directory:" is set to "C:\VCP\ONLINE\cfg\". At the bottom, five file names are listed: FILE1.PC2, FILE2.PC2, FILE3.PC2, FILE4.PC2, and FILES.PC2.

Figure 11-12 File Selection Menu for Conversion

The screenshot shows a menu titled "CONVERSION EDITOR - EDIT OPTIONS". At the top, there are five function key assignments: F1= CONFIG, F2=, F3=, F4=, and F5=, followed by F6=, F7=, F8=, F9=, and F10=EXIT. Below these, there are several options: "Pages: En", "Graphics Option: Im", "Custom Serial Interface Option: INO I", "Modicon MODBUS Option: INO I", and "DH-485 Option: INO I". At the bottom, the "Configuration Name" is set to "FILE1.PC1".

Figure 11-13 Edit Options Menu for Conversion

Conversion Table Editor

The Conversion Table Editor will allow you to set up the conversion tables for converting a grayscale configuration to a color configuration or vice versa depending on the product conversion you choose. Figures 11-14 and 11-15 show the conversion tables for altering grayscale intensities and colors.

For color to grayscale conversion, any of the eight colors may be mapped to any of the four intensities. The default conversion table is shown below. After changing any of the values, you can return to the default values by pressing <F1>. If the foreground and background attributes of text, templates, or variable-sized templates are mapped to the same intensity and the default values are selected, the PanelMate unit will ensure the object will not disappear by

using the following conversion.

Foreground/Background Color

Black/Blue
Blue/Black
Green/Cyan
Cyan/Green
Red/Magenta
Magenta/Red
Yellow/White
White/Yellow

Foreground/Background Intensity

None/Low
Low/None
Low/Medium
Medium/Low
Medium/High
High/Medium
Medium/High
High/Medium

CONVERSION EDITOR - CONVERSION TABLE				
F1=DEF	TABLE	F2=	F3=	F4=
F6=	F7=	F8=	F9=	F5=
				F10=EXIT
Color to Gray Scale Table				
	Black	m		
	Blue	EM		
	Green	m m		
	Cyan			
	Red			
	Magenta	m		
	Yellow			
	White			

Figure 11-14 Color to Gray Scale Conversion Table

For grayscale to color conversion, any four intensities may be mapped to any of the eight colors.

CONVERSION EDITOR - CONVERSION TABLE				
F1=	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Gray Scale to Color Table				
	None	Im		
	Low	IGRI		
	Medium	LEI!		
	High	MIII		

Figure 11-15 Gray Scale to Color Conversion Table

Return to Product Selection

This selection will allow you to exit the Main Menu and return to the Product Selection Menu.

Chapter 12

The User Configuration Editor

In this chapter, you will learn:

- How to begin creating a new user configuration
- How to edit an existing user configuration
- How to display a configuration
- How to select international fonts
- How to merge configurations

The Develop Configuration Menu

The Develop Configuration menu contains three selections: Edit

an Existing Configuration

This selection allows you to edit a configuration previously saved on the hard disk of the DOS-based computer. The configuration will include system parameters, PLC connection information, and display pages.

Create a New Configuration

This selection allows you to create a new configuration that did not exist before. You may use an existing configuration as the basis for the new one.

Return to Main Menu

This allows you to return to the Configuration Software Main Menu.

Use the up and down arrows to highlight the desired utility section and then press <Return>. The selections are explained in the following pages.

Edit an Existing Configura

This section allows you to edit a configuration previously saved on the hard disk. The configuration will include system parameters, PLC connection information, and display pages.

After choosing this option, the software will display a list of the configuration files presently on the hard disk in the Configuration Directory entered in the Utility Parameters Editor. You may select a file name by typing it (including extension) and pressing <Return>. You may also press the <Fl> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the cursor to the desired name and press <Return> to select it. Selecting a name by either method will place you in the Configuration Editor.

The filename extensions for configurations for the PanelMate Series are listed below.

Product	Number of Pages	File Extension
PanelMate 2000	10	.PC1
PanelMate 2000	30	.PC2
PanelMate 2000 Color	10	.PC5
PanelMate 2000 Color	30	.PC6
PanelMate 3000	10	.PC1
PanelMate 3000	30	.PC2
PanelMate 4000	10	.PC3
PanelMate 4000	30	.PC4

The Configuration Software package can also be configured to perform Automatic Saves and Automatic Backups. See the Edit Utility Parameters section in Chapter 9 for a detailed explanation. If these features are selected, then backup files with the extensions, ".131<1 1", ".BK2", etc. and save files with the extensions, ".SV1 ", ".SV2", etc. may be created. Configurations are automatically saved when the Autosave feature has been enabled. If you are entering a filename and wish to exit this editor, press <Esc> to dose the field, then press <F10> to exit If you are selecting a filename and using the arrow key to select a filename, press the <F1> key labeled "Entry". If the filename field is open, press <Esc> to dose the field, then press <F10> to exit

This section allows you to create a new configuration that did not exist before. The configuration will include system parameters, PLC connection information, and display pages.

After choosing this option, the page screen will display the prompt:

```
Do you want to use an existing configuration as a base for this
configuration?                               Press Y or N.
```

You may use a configuration already stored on the hard disk as the basis for the new configuration you will create. After making changes or additions to the configuration, you will save it under a new name of your choice.

If you answer the prompt with a "Y", the software will display a list of the configuration files presently on the hard disk. You may select a filename by typing it (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list With this method, use the arrow keys to move the cursor to a desired name and press <Return> to select it.

Refer to the previous section, Edit an Existing Configuration, for information on filename extensions for 10 page configurations, 30 page configurations, automatics saves, and automatic backup files.

If you answer the prompt with an "N", the software will display an Initialized Configuration Option screen like the following:

INITIALIZED CONFIGURATION OPTION				
F1=CONFIG	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Pages: <u>101</u>	Custom Serial Interface Option: <u>NO</u>	DH-485 Option <u>INO</u> |		
Graphics Option: <u>NO</u> |	Modicon MODBUS Option: <u>NO</u>			
Configuration Name:				
Do not include the file extension				
Directory: C:\VCP\ONLINE\cfg\				
FILE1.PC2	FILE2.PC2	FILE3.PC2	FILE4.PC2	FILE5.PC2

Figure 12-1 Edit Options Menu for Conversion

This screen is used to name the configuration and to set up the optional features which will be available in the configuration. To enable a feature, use the arrow keys to highlight the Pages, Graphics, Custom Serial Interface, Modicon ASCII, or DH-485 fields, then press <Return>. A menu will appear to allow feature selection. For example, if Pages is chosen, a menu will allow you to choose between 10 pages or 30 pages. Use the arrow keys again to highlight your choice, then press <Return>.

Note Options can be added to a configuration using the Configurations Options Editor (explained in Chapter 11), but options cannot be removed.

Note If a configuration is created containing an optional feature, that feature must be available in the PanelMate online system which receives and executes the configuration.

After setting up optional features, enter the name of the new configuration. To do this, highlight the Configuration Name field. Press <Return> and enter the name (no extension), then press <Return> again to close the field.

Enter Configuration Editor

When all information regarding optional features and configuration name is correct, press <F1> to enter the Configuration Editor.

The Configuration Editor Menu

After deciding whether you will edit a new or an existing configuration, the software will display the Configuration Editor menu which contains the following options:

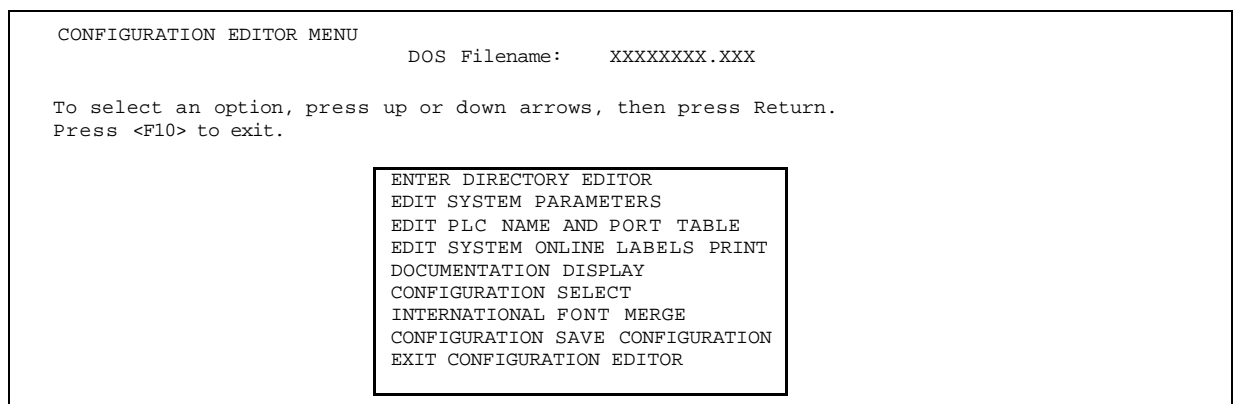


Figure 12-2 Configuration Editor Menu
Enter Directory Editor

This selection allows you to select display pages for editing. You may also copy, swap, move, and assign password or keyswitch protection to pages. Information about this selection is found in Chapter 13, Directory Editor.

Edit System Parameters

This selection allows you to edit general system parameters used during the online system's Run Mode. Information about this selection is found in Chapter 23, Defining System Parameters.

Edit PLC Name and Port Table

This selection allows you to set communication port parameters, PLC device names and ID numbers, Allen Bradley Remote VO parameters, and Custom Serial Interface setup. Information about this selection is found in Chapter 24, PLC Name and Port Parameters Table.

Edit System Online Labels

This selection allows you to change the labels which appear during the online system's Run Mode. Information about this selection is found in Chapter 25, System Online Labels Editor.

Print Documentation

This selection allows you to send documentation of the configuration to a printer connected to the computer. Information about this selection is found in Chapter 26, Print Documentation.

Display Configuration

This selection allows you to list all the possible component files in the configuration, which files presently exist, sizes of the files, all display page titles, and the amount of free configuration memory remaining.

Select International Font

This selection allows you to select 10 additional characters within the Normal font containing international characters.

Merge Configuration

This selection allows you to merge parts of other configuration files to the configuration which is currently being edited or created.

Save Configuration

This selection allows you to save the configuration to disk on the DOS-based computer. You will be prompted for a DOS filename for your configuration. The default name is the name selected when the Configuration Editor was first entered.

Exit Configuration Editor

This selection prompts you to save the configuration before returning to the Develop Configuration Menu.

Display Configuration

This selection will show the component file sizes for the configuration which is currently being edited.

- Press <F7> to view pages 15-29 on a 30-page system. Press <F10> to exit and return to the Configuration Editor Menu. If a backup file (.BK1, .BK2, .BK3, .BK4, .BK5, or .BK6) is downloaded, the Display Configuration Menu will display the file extension as .PC1, .PC2, .PC3, .PC4, .PC5, or .PC6.

DISPLAY CONFIGURATION					
F1=	F2=	F3=	F4=	F5=	
F6=	F7=MORE	F8=	F9=	F10=EXIT	
Name: DISPLAY.PC2			Product: PanelMate Series 2080		
Version: X.XX		Free Memory: 46109			
Options: 30 Pages					
Name	Size	Name	Size	PageTitle	
*System Parameters	53	*Page 0	1692	PageTitle	0
*PLC Name and Port	307	*Page 1	1228	PageTitle	1
* Message Library	663	*Page 2	1014	PageTitle	2
*Page Titles	259	*Page 3	3208	PageTitle	3
System Labels	8	Page 4	0	PageTitle	4
Symbol Library	8	Page 5	8	PageTitle	5
Normal Font	0	Page 6	0	PageTitle	6
Graphic Font	0	Page 7	8	PageTitle	7
Double High Font	0	*Page 8	740	PageTitle	8
Quad Font	0	*Page 9	912	PageTitle	9
		Page 10	0	PageTitle	10
		*Page 11	575	PageTitle	11
		Page 12	8	PageTitle	12
		*Page 13	432	PageTitle	13
		*Page 14	99	PageTitle	14

Figure 12-3 Display Configuration Menu

Note If a previous version configuration is read into the current Configuration Software and you enter the Display Configuration screen, the proper version is displayed. If an autosave occurs, the version is changed to the current Configuration Software version.

Select International Font

This selection allows you to choose an International Font from a menu. The International Font is chosen by entering the DOS filename for the font such as French1 or German1. Once selected, a help page with a sample of the font automatically displays on a VGA system. An International Font adds 10 additional characters to the Normal Font. Typically, these characters are the unique characters of a language (such as vowel forms). By typing the appropriate recall key, an international character cell can be placed anywhere a Normal Font character may be displayed. See Appendix F for International Font Character details concerning the character cell representations for the fonts.

This feature is designed to permit the online display of international languages. This feature is available on all units; the Graphics Option is not required. Due to the lack of printer standards, it is not possible to print out the redefined character cells. This impacts online report generation, alarm messages and print documentation where the character cells are replaced by spaces.

If the Graphics Option is selected, it is possible to redefine the International Font character cells by using the Character Editor.

On a VGA system, the <Alt> <F2> keys will display the help page for International and Line Characters in most editors even when the Graphics Option is not enabled.

Merge Configuration

This editor will allow you to merge parts of other configuration files to the configuration which is currently being edited or created. The current configuration will be the destination file of the merge.

After selecting Merge Configuration, the Source Configuration Name Entry screen is displayed. The software will display a list of the configuration files where the path is determined by the Utility Parameters Editor. The default path is the CFG (configuration) directory. You may select a filename by typing it (including the extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the cursor to a desired name and press <Return>. The configuration selected at this point will be the source configuration of the merge.

An alert window is displayed when a source configuration does not have the same options as the destination file. This information may be viewed by pressing <F6>=ALERT.

MERGE CONFIGURATION EDITOR
F1= F2= F3= F4= F5=
F6=ALERT F7=MORE F8=CUR CFG F9= F10=EXIT
Use arrow and RETURN keys to select component file to merge.
Source Configuration Name: XXXXXXXX.XXXVersion: X.XX

File	Size	File	Size	Page	Title
System Parameters	53	Page 0	1692	Page	Title 0
PLC Name and Port	307	Page 1	1220	Page	Title 1
Message Library	663	Page 2	1014	Page	Title 2
Page Titles	259	Page 3	3208	Page	Title 3
System Labels	0	Page 4	0	Page	Title 4
Symbol Library	0	Page 5	0	Page	Title 5
Normal Font	0	Page 6	0	Page	Title 6
Graphic Font	0	Page 7	0	Page	Title 7
Double High Font	0	Page 8	740	Page	Title 8
Quad Font	0	Page 9	912	Page	Title 9
		Page 10	0	Page	Title 10
		Page 11	575	Page	Title 11
		Page 12	0	Page	Title 12
		Page 13	432	Page	Title 13
		Page 14	0	Page	Title 14
		Page 15	990	Page	Title 15

Figure 12-4 Merge Configuration Editor Menu

Within the Merge Configuration Editor, the source configuration file to be merged is displayed. The cursor may be used to highlight an area for merging. Each component file is merged independently. Component files which are listed but cannot be selected are not available for merging. This situation would occur if the source configuration has the graphics option and the destination configuration does not.

An area is selected by using the arrow keys to highlight the desired field and pressing <Return>.

Note It is recommended that the Configuration Verifier for Run Mode be executed for merged configurations to ensure the validity of the PLC Name and Port Table and all PLC references.

System Parameters

After System Parameters has been selected, press <Return> to close the field and the System Parameters component file will be transferred. If the destination configuration already contains System Parameters, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

PLC Name and Port Table

After the PLC Name and Port Table has been selected, press <Return> to close the field and the PLC Name and Port Table component file will be transferred. If the destination *configuration already contains PLC Name and **Port** Table information*, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Message Library

After the Message Library has been selected, the following prompt is displayed: "Do you want to completely overwrite the file? Press <Y> to overwrite, <C> to continue and merge some messages or <N> to abort." Press <Y> to completely overwrite the destination message library or <N> to cancel the copy. If <C> is pressed, complete the following:

1. The next prompt is: "Enter the first message number to merge: _" This should be a numeric value between 1 and 100 for a 10-page PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000 configuration. For a 10-page PanelMate Series 4000 configuration, the numeric value should be between 1 and 250. For a 30-page configuration, the numeric value should be between 1 and 500.
2. Once the first source message number has been entered, press <Return> to close the field.
3. The next prompt reads: "Source messages are from xxx to message number: _" Enter the last message number in the range to be merged, a numeric value between 1 and 100 for a 10-page PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000 configuration. For a 10-page PanelMate Series 4000 configuration, the numeric value should be between 1 and 250. For a 30-page configuration, the numeric value should be between 1 and 500.
4. The next prompt reads: "Source messages from xxx to xxx will be merged starting at destination message: _" Enter the first message number for the destination of the messages to be merged.
5. Press <Return> to close the field and the messages will be transferred to the destination message library file.

Page Titles

After Page Titles has been selected, press <Return> to close the field and the Page Titles will be transferred. If the destination configuration already contains Page Title information, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

System Labels

After the System Labels has been selected, press <Return> to close the field and the System Labels component file will be transferred. If the destination configuration already contains System Label information, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Graphics Option

When both the source and destination configurations have the Graphic Options, the following areas may be merged.

Note If both of the configurations do not have the Graphics Option, the following areas are not selectable.

Symbol Library (Graphics Option)

After the Symbol Library has been selected, press <Return> to close the field and the Symbol Library will be transferred. If the destination configuration already contains a Symbol Library, a message will appear: "Do you want to completely overwrite the file? Press <Y> to overwrite, <C> to continue and merge some symbols, or <N> to abort." Press <Y> to overwrite the file, <C> to overwrite only unique symbol names, or <N> to cancel the copy.

When <C> is selected, another prompt is displayed. "Do you want to overwrite symbols with common names? Press <Y> to overwrite, <C> to merge only unique symbols or <N> to abort."

Normal Font (Graphics Option)

After the Normal font has been selected, press <Return> to close the field and the Normal font will be transferred. If the destination configuration already contains a Normal font, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Graphic Font (Graphics Option)

After the Graphic font has been selected, press <Return> to close the field and the Graphic font will be transferred. If the destination configuration already contains a Graphic font, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Double High Font (Graphics Option)

After the Double High font has been selected, press <Return> to close the field and the Double High font will be transferred. If the destination configuration already contains a Double High font, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Quad Font (Graphics Option)

After the Quad font has been selected, press <Return> to close the field and the Quad font will be transferred. If the destination configuration already contains a Quad font, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Pages

After a page has been selected, the prompt "Enter the destination page number:" is displayed. 1.

Enter a numeric value (0-9) for a 10-page configuration or (0-29) for a 30-page configuration.

2. Once the destination page number has been entered, press <Return> to close the field and the page will be transferred.
3. If the destination page already contains information, a message will appear notifying you and will ask if you want to overwrite this information. Press <Y> to overwrite the file or <N> to cancel the copy.

Alert <F6>

The Alert window is displayed upon initial entry into the Merge Configuration Editor. It can be displayed at any time by pressing <F6>. The F6=ALERT is only displayed when there is an option difference between the source and the destination files. An example of the window layout is below.

```
Caution! Conflict between source and destination configuration
options! 30 Page to 10 Page
System Parameters - Startup Page may be changed 0.
Message Library - Messages 101 through 250 may not be merged directly. Page
Titles - Page Titles 10 through 29 may not be merged directly.
Graphics to No Graphic
System Parameter= - Redefined double high font will be set to "No". System
Online Labels - Labels defined with characters from any font but the normal
font will be converted to a
Symbol Library - Cannot be merged.
Normal, Graphic, Double High Fonts - Cannot be merged. CSI
Option
PLC Name and Port - Ports defined with CSI will not be merged.
Modicon MODBUS Option
PLC Name and Port      Ports defined with Modicon PLC will not be merged.
DH-486 Option
PLC Name and Port      Ports defined with DH-48S will not be merged.
Press any key to continue.
```

Figure 12.5 Alert Window

More <F7>

F7=MORE is available when the source configuration has the 30-page option. This key will display page information for pages 15-29 on a 30-page system.

Current Configuration <F8>

This will display the destination file information. This information will include the configuration name, version, component file size, and the amount of free memory. Pressing <F8> will toggle between the Current Configuration screen and the Last Status screen. Pressing <F7> will display page information for pages 15-29 on a 30-page system. To return to the Merge Configuration Editor, press <F10>.

MERGE CONFIGURATION EDITOR - CURRENT			CONFIGURATION DISPLAY		
F1=	F2=	F3=	F4=	F5=	
F6=	F7= MORE	F8=STATUS	F9=	F10=EXIT	
Current Configuration Name: XXXXXXXX.XX Version: X.XX					
Name	Size	Name	Size	Page	Title
System Parameters	S3	Page 0	1692	Page	Title 0
PLC Name and Port	307	Page 1	1220	Page	Title 1
Message Library	663	Page 2	1014	Page	Title 2
Page Titles	259	Page 3	3208	Page	Title 3
System Labels	0	Page 4	0	Page	Title 4
Symbol Library	0	Page 5	0	Page	Title 5
Normal Font	0	Page 6	0	Page	Title 6
Graphic Font	0	Page 7	8	Page	Title 7
Double High Font	0	Page 8	740	Page	Title 8
		Page 9	912	Page	Title 9
		Page 10	0	Page	Title 10
		Page 11	575	Page	Title 11
		Page 12	0	Page	Title 12
		Page 13	432	Page	Title 13
		Page 14	0	Page	Title 14
Free Memory: XXXXXX					

Figure 12-6 Merge Configuration Editor - Current Configuration Display The

Current Configuration Last Status

Selecting F8=STATUS from the Current Configuration menu, will display the destination file information including the component file status origins after the last save. From this editor, the cursor is not available and the two valid function keys are F7=MORE or F8=CUR CFG. Pressing <F8> will toggle between the Last Status screen and the Current Configuration screen.

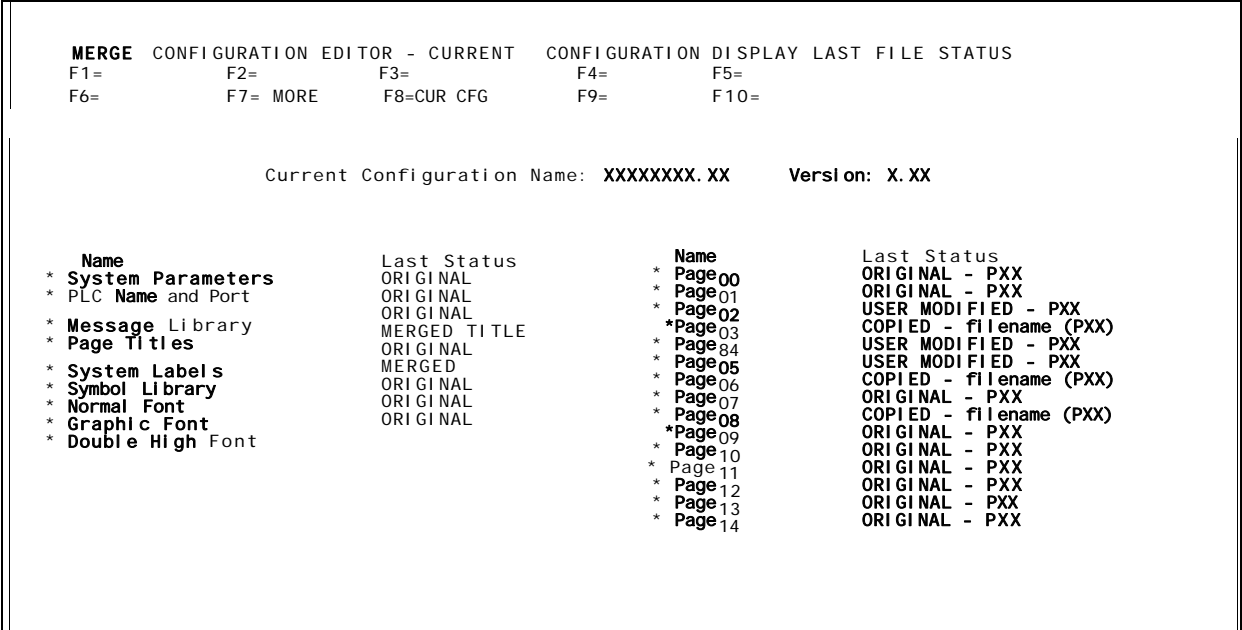


Figure 12-7 Merge Configuration Editor - Current Configuration Display Last File Status

Status codes:

ORIGINAL	The component file has not changed or been entered since the file has been called into memory.
USER MODIFIED	The component file has been saved since initial entry into the merge editor.
COPIED	The component file has been merged from the source file.
MERGED	The Message or Symbol Library component files have been integrated. The files have not been completely overwritten.
MERGED TITLE	The Page Title component file will display this status after a page has been merged into the source configuration.

Note If the Autosave feature is enabled, the component file status will be updated to ORIGINAL.

Chapter 13

Directory Editor

In this chapter, you will learn:

- How to begin page configuration
- How to title pages
- How to enter the Page Editor
- How to check the amount of remaining memory

Before You Start Configuring Pages

As soon as you begin configuring pages, you will need to begin referencing PLC words and bits. For maximum efficiency, you should review the Word and Bit References section in Chapter 10 to become familiar with the way the PanelMate unit expects you to enter these word and bit references.

You should have already used the PLC Name and Port Editor to define PLC names, the types of PLCs you will be using with this unit, the communication parameters for each port, the default PLC, and format information if you are planning to use the Generic Protocol.

Refer to Chapter 24 for information on the PLC Name and Port Editor.

Functions of the Directory Editor

The Directory Editor is used to:

1. place titles on pages
2. access the Page Editor
3. edit titles on pages
4. re-order the pages by swapping them or moving them
5. delete entire pages
6. copy entire pages
7. see which pages are still blank
8. check the amount of free memory
9. select password protection for a page

Note The two fields on the Directory Editor, Page No. and Page Title, are used to perform very different tasks, so it is important to note their functions as you read the instructions. Use the Page No. field to make changes that affect entire PAGES: deleting, copying, and re-ordering. The Page Title field changes JUST THE PAGE TITLE.

The pages are fully defined using the Page Editor which is explained in Chapter 14.

Enter Directory Editor

This editor allows you to select display pages for editing. You may also copy, swap, move, and assign password or keyswitch protection to pages. After making this selection from the Configuration Editor menu, the Directory Editor will be displayed. It looks like the following figure.

DIRECTORY EDITOR

F1=	F2= SUP	F3=MOVE	F4=COPY	F5=DELETE
F6=MEM FREE	F7=	F8=	F9=	F10=EXIT

Page No.	Protection	Page Title
1	NONE	
2	NONE	
3	NONE	
4	NONE	
5	NONE	
6	NONE	
7	NONE	
8	NONE	
9	NONE	

* indicates a non-blank page

Figure 13-1 Directory Editor for a 10-page Configuration

Access the Page Editor

You will want to go to the Page Editor when you want to create or edit pages and add or modify any templates or variable-sized templates. To access the Page Editor, use the cursor arrow keys to select a page number in the Page No. field, then press <Return>.

Protection

The Protection fields can require the operator to use a password and/or the external keyswitch before a page can be called to the screen during Run Mode. There are two software passwords (up to 8 digits) and one keyswitch connector available for protection schemes. Any combination of these three items may be used to protect access to a page. To set page protection, use the arrow keys to highlight the correct field. Press <Return> and the Page Password Protection menu will display all the available combinations. Use the arrow keys to highlight your choice, then press <Return> again.

Page Title

The Page Title fields allow you to assign each page a unique title. This name will be displayed at the top of the page when it is called in Run Mode. To enter or change a page title, use the arrow keys to highlight the correct Page Title field. Press <Return> and enter the name you have chosen for that page, then press <Return> to close the field.

The PanelMate unit will automatically place the title on the correct page. You can verify this by looking at the page in the Page Editor.

Note The online units which have 30 pages require two screens to show the entire directory. The <F7> key must be used in the Directory Editor to show pages 0-14 and 15-29 on a 30-page system.

Edit Existing Titles

Any title can be edited at any time using the following procedure:

- Select the Page Title to be edited (use cursor arrow keys to step through Page # and Page Title fields).
- Press <Return> to enter the edit mode.
- Use the left and right arrow keys to move the cursor over characters without erasing them.
- Type over any characters to change them.
- Press <Backspace> or to erase characters.
- Press <Ins> to enter the insert mode, which will allow you to insert characters at the position of the cursor. Press <Ins> again to get out of the insert mode.
- Press <Return> to close the field or press <Esc> to restore the previous title

To delete a title and start again:

1. Select the Page Title to be deleted, using the cursor arrow keys. 2.

Press <F5> to delete the title.

3. Press <F5> again in response to the prompt that appears at the top of the screen. 4.

You are now ready to place a new title in the field.

You may swap the location of two non-blank pages with the <F2> key. Use the arrow keys to highlight the page number of the first page you want to swap, then press <F2>. Now use the arrow keys to highlight the second page number, and press <F2> again.

Move

You may move a page and its contents, including its title, to a different (unused) page number with the <F3> key. Use the arrow keys to highlight the page number of the page you want to move, then press <F3>. Now use the arrow keys to highlight the new page number, and press <F3> again.

You may copy a page and its contents to a new (unused) page number with the <F4> key. This may be useful when you need to create a page that is very similar to one which already exists. It may be quicker to first copy an existing page and then make changes to it, rather than configuring a new page. Use the arrow keys to highlight the page number of the page you want to copy, then press <F4>. Now use the arrow keys to highlight the new page number, and press <F4> again.

Delete

You may delete a page and its contents with the <F5> key. Use the arrow keys to highlight the page number of the page you want to delete, then press <F5>. To prevent any accidental deletion, the editor will ask you to press <F5> again as a confirmation. At a final prompt, the editor will give you one more chance to avoid deleting the page. Press <Y> if you are sure you want to delete the entire page.

Memory Free

The online units with 10 pages will have 64K of configuration memory. The online units with 30 pages will have 128K of configuration memory.

The <F6> key allows you to determine how much free configuration memory is available.

Configurations with many pages or many templates and variable-sized templates per page will use more memory than those with few pages, templates, or variable-sized templates. After you press <F6>, the amount of free memory will be displayed at the top of the screen. Note that it is possible to create dense pages that can use up the available memory before the total number of pages have been configured.

In order to determine if the configuration will run online, you should also use the Configuration Verifier accessed from the Main Menu. This will determine if there is enough DRAM memory to support the run time communication routines automatically created by the software that will be required when online. To run the Configuration Verifier for Run Mode, save your configuration and return to the Main Menu. Refer to the Configuration Verifier for Run Mode section in Chapter 11 for more information.

More

The <F7> key is only available with 30-page configurations. Press <F7> to display page information for pages 0-14 and 15-29 on a 30-page system. In 10-page configurations, this key has no function.

Exit

You may exit the Directory Editor and return to the Configuration Editor menu with the <F10> key.

Chapter 14

Page Editor

In this chapter, you will learn:

- Page layout
- How to add templates to a page
- How to add variable-sized templates to a page
- The purpose of the Display Editor
- The purpose of the Character Editor
- The purpose of the Symbol Editor

Configuring the PanelMate unit

The Page Editor is used to configure and edit the pages that will be used online. The Page Editor is accessed by selecting a page from the Directory Editor. Upon entering the Page Editor, you must select one of four editing modes: Template, Variable-Sized Template, Message Library, or Window. If you have selected the Graphic Option, then two additional choices will be available: Symbol Editor and Character Editor.

The PanelMate unit uses templates, or fixed graphic shapes and formats to present information to the operator, thus providing a proven, standard method of presentation. The graphical user interface (GUI) standard can be used on every online unit. Templates are configured by using fill-in-the-blank spreadsheets. The Template Mode provides access to the following editors:

- Indicator Template Editor
- Readout Template Editor Bar
- Template Editor Display
- Template Editor Table
- Template Editor Trend
- Template Editor

In order to provide higher screen density, the PanelMate unit also has a Variable-Sized Template Mode. Variable-Sized Templates are templates which are reduced to their smallest elementary components to provide higher density on a screen. Variable-Sized templates (VS-TEMP) are configured by using fill-in-the-blank spreadsheets. This editor also permits the addition and editing of static text and lines. The Variable-Sized Template mode provides access to the following editors:

- Indicator Variable-Sized Template Editor
- Readout Variable-Sized Template Editor
- Bar Variable-Sized Template Editor
- Display Variable-Sized Template Editor
- Static Text and Line Positioning
- Graphic Variable-Sized Template Editor

The Message Library Editor is used to enter messages that appear in Display Templates and Display Variable-Sized Templates.

The Graphics Mode allows custom configuration of character cells and symbols. It also has the ability to perform online animation based on PLC data (Graphic Variable-Sized Templates). The Graphics Mode provides access to the following editors:

- Character Editor Symbol Editor

Page Layout

All active pages in Run Mode have the same basic layout. The page title, created in the Directory Editor, is on the top line of the page. This line contains the page number of the current page, the title, the time and also indication of the status of the passwords. If your online unit contains 10 pages or if your online unit contains more than 10 pages but pages 10 or greater contain no information, the Page Layout will appear as shown in figure 14-1. If your online unit has more than 10 pages and page 10 or greater is configured, the Page Layout will be similar to figure 14-2.

The second and third lines are the system overview field. For information regarding the use of this overview, refer to Chapter 2.

Lines 4 through 7 (four lines) comprise the alarm window. These lines are reserved for alarm messages that are automatically created by the PanelMate unit when an alarm condition is detected. You will be defining the alarm conditions as part of the template and variable-sized template definitions.

One-sixth of the screen, located at the far right, is reserved for labels for the Control Buttons. Except for the indicator variable-sized templates, you can define Control Button usage in the definitions of each type of template or variable-sized template. A single template or variable-sized template can be associated with as many as four Control Buttons on the PanelMate Series 2000, PanelMate Series 2000 Color, and PanelMate Series 3000. A single template or variable-sized template can be associated with as many as five Control Buttons on the PanelMate Series 4000.

To view a template's or variable-sized template's Control Button labels, select that template or variable-sized template with the cursor while in the Page Editor and press <F1>. Note that templates with associated control functions will have a small arrow placed in the lower left corner of the template. Within each variable-sized template editor, the control indicator (arrow) position may be selected.

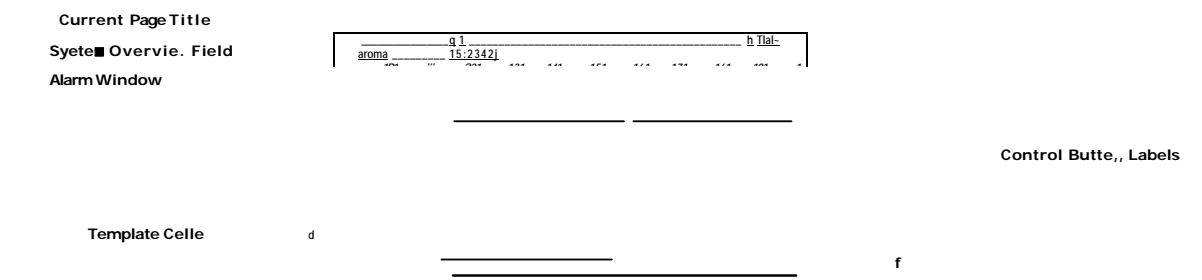


Figure 14-1 PanelMate Series 10 Page Layout

C.rrent Pay. Title
System Overview Field
Alarm Winaaw

Pa	1	ra	Titl	Pras	~s1l	f9I	~al	1121	Iel
00	1211	1-21	11-1	1	T+				

J - Control H.tton. Label.

T..plate Cells _____

Figure 14-2 PanelMate Series 30 Page Layout

The remainder of the screen is divided into 15 cells. A normal-size Indicator or Readout Template is the size of one cell. Therefore, it is possible to place up to fifteen templates on a single page. However, the smallest Bar Template covers two vertical cells and the smallest Display Template covers three horizontal cells. Table Templates and Trend Templates range from 1 to 3 vertical cells tall and 2 to 3 horizontal cells wide. Keep these requirements in mind when planning the arrangement of templates on a page.

Both templates and variable-sized templates may be placed on a page in the PanelMate unit. The size and position of the variable-sized templates and graphics are user-selectable and, therefore, are not restricted by the layout of the 15 cells. Note that variable-sized templates and templates may not overlap or directly border each other. Also, variable-sized templates may not be inserted at another variable-sized template's origin.

Page Editor Main Menu

When the page editor is first entered, the following menu is displayed. An explanation of each item is contained in the following sections.

F1=TEMPLATE	F2=VS-TEMP	F3=MESSAGE	F4=	F5=
F5=WINDOW	F7=	F\$=	F9=SAVE	F10=EXIT

Figure 14-3 Page Editor Main Menu without Graphics Option

F1=TEMPLATE	F2=VS-TEMP	F3=MESSAGE	F4=SYMBOL	F5=CHARACTR
F6=WINDOW	F7=	F8=	F9=SAVE	F10=EXIT

Figure 14-4 Page Editor Main Menu with Graphics Option

Page Editor in Template Mode

The Page Editor in the Template Mode is used to:

1. place new templates on a page (indicator, readout, bar, display, table, and trend templates)
2. access the Template Editors to define the templates
3. move templates from cell to cell on the same page
4. copy templates to another cell on the same page
5. delete templates from a page
6. copy templates from page to page
7. save a page in memory

Press <F1> to enter the Template Mode of the Page Editor. Within the Template Mode, the following menu is displayed. The operation of each item is reviewed in the following sections.

F1=EDIT	F2=ADD	F3=MOVE	F4=COPY	F5=DELETE
F6=VS-TEMP	F7=MEMORIZE	F8=RECALL	F9=SAVE	F10=EXIT

Figure 14-5 Template Mode Menu

Edit a Template Definition <F1>

To make a change or addition to an existing template that you have already defined, use the following procedure:

1. Select the template to be edited by using the arrow keys.
2. Press <F1> to edit the selected template. You will enter the Template Editor spreadsheet which will show the template you have selected. Refer to the appropriate Template Editor (Chapters 15 through 21) for information on how to make changes to the template's definition.
3. Press <F10> to return to the Page Editor.

Add a Template <F2>

To add a new template to a page:

1. Select an empty cell by using the arrow keys to move the cell cursor. Be sure to select a cell that can accommodate the size of template you plan to use. The selected cell is always the leftmost or topmost cell of a template.
2. Press <F2> to add a new template.
3. Select the type of template you wish to add by pressing <1>, <2>, <3>, <4>, <5>, or <6> for Indicator, Readout, Bar, Display, Table, and Trend templates, respectively. You will move immediately to the proper Template Editor which will show the template you have selected. Refer to the appropriate Template Editor for information on how to create the template's definition.
4. Press <F10> to return to the Page Editor.

Move a Template <F3>

Once a template has been placed on a page, it can be moved to any empty cell on the page by using the move function:

1. Select the template to be moved, using the arrow keys. 2.
Press <F3>.
3. Select the new location for the template. Be sure the area you have selected is large enough to accommodate the template. Remember that the cell you select will be the leftmost or topmost cell of the template.
4. Press <F3> again.

Note The new location for a template must be completely blank. Therefore, the move function cannot be used to move a Bar Template up or down, nor can it be used to move a Display Template from side to side. Use <F7> to memorize, <F5> to delete and <F8> to recall for these types of moves. The move function also has limitations with the Table Template.

Copy a Template <F4>

If a number of similar templates are to be used on the same page, it may be easier to fully define the first template, copy it as many times as needed, and then edit the definitions of the copies.

To copy a template:

1. Select the template to be copied, using the arrow keys. 2.

Press <F4>.

3. Select the location for the copy. Be sure the area you have selected is large enough to accommodate the template. Remember that the cell you select will be the leftmost or topmost cell of the template.

4. Press <F4> again.

5. To edit the definition of this template, press <F1>.

6. To make another copy of the same template, start at step 1 again.

Note This function does not keep the copy in memory. Therefore, to copy the same template repeatedly, you must go through the entire copy procedure each time or use the memorize/recall functions.

Delete a Template <F5>

When a template is deleted from a page, the entire definition is also deleted. To delete a template:

1. Select the template to be deleted, using the arrow keys. 2.

Press <F5>.

3. Because this command is irreversible, a prompt will tell you to press <F5> again if you wish to delete the template. Press <F5> again to delete.

4. Another prompt will appear, asking if you are sure. Press <Y>.

Within the Page Editor (template mode), press <F6> to toggle between the Template Mode and the Variable-Sized Template Mode.

Memorize <F7>/Recall <F8> Template

The memorize/recall functions can be used to copy templates from one page to another or to copy a template several times onto the same page. In both cases, the template and its full definition are copied. Therefore, for most efficient use of these functions, fully define the first template, recall it as many times as needed, and then edit the definitions of the copies.

To copy templates using the memorize/recall functions:

1. Select the template to be copied, using the arrow keys.
2. Press <F7> and a prompt will appear at the top of the screen to memorize the template in long term memory.
3. Press <F7> again.
4. Select the new location for this template. This can be done by using the arrow keys to select a cell on the same page, or by exiting the page you are on (press <F10>), selecting a new page, and then selecting the new location on the new page.
5. Press <F8> to recall this template and place the memorized copy in the new location.
Because this template remains in memory, more copies can be made by selecting new locations and pressing <F8> as many times as needed.

The template in memory will remain in memory until a new template is placed there or the Directory Editor is exited.

As a reminder, be sure to select a cell that can accommodate the size of template you are copying. The selected cell is always the leftmost or topmost cell of a template.

Save <F9>

As you edit a page, all of your work is in a memory file that will be cleared when you exit the Page Editor. You must save your work to move it into a file.

To save your page and store the information in a DOS file, press <F9>.

A page may be saved at any time, but be sure to save before you exit the Page Editor. If you exit without saving, your new work on the page will be lost.

=nit she Tern plate

To exit the Template Mode and return to the Page Editor, press <F10>.

Page Editor in Variable-Sized Template Mode

The Page Editor is used to:

- 1. place variable-sized templates on the screen (indicator, readout, bar, display, and graphic variable-sized templates)
- 2. access the variable-sized template editors to define them 3.

place static text and lines on the screen

Press <F6> from the Page Editor - Main Menu Mode to enter the Variable-Sized Template Mode.

Overview

Within the Variable-Sized Template Mode, you may edit an existing variable-sized template, add a variable-sized template to the screen, or place static text or line drawing characters on the screen. You may also select Parameters Editing or the Template Mode.

Page Editing Parameters which may be altered to edit the static text and line characters include: Foreground Intensity or Color, Background Intensity or Color, Background Blink, Font and Cursor Direction.

The PanelMate unit supports four fonts or sets of characters. These are Normal, Double High, Quad, and Graphic. A font is actually a list of 127 characters whose shapes are defined by a pixel-map. The character is arranged in an 8 x 16 matrix of pixels, where you define which pixels are ON or OFF, along with the ON/OFF (Foreground/Background) Intensities or Colors.

Variable-Size Template Mode

Within the Variable-Sized Template Mode of the Page Editor, the following menu is displayed. The operation of each item is reviewed in the following paragraphs. Note that the following sections provide more complete information on several items.

F1=EDIT	F2= ADD	F3=PARAMETR	F4=REDRAW	F5=
F6=TEMPLATE	F7=SHOW FNT			
		FB=IDENTIFY	F9=SAVE	F10=EXIT

Foreground

Background

NO

INTENSITIES

Blink

Font

Normal

Line/Column

[

04

Cursor Direction

Right

Figure 14-6 Page Editor's Variable-Sized Template Mode

Note The <F7> key labeled "SHOW FNT" will only appear if the Graphics Option is selected for the configuration.

Edit an Existing Variable-Sized Template <F1>

To edit an existing variable-sized template, place the character cursor on the origin cell of the graphic variable-sized template. Upon pressing <F1>, the configuration spreadsheet is accessed. This spreadsheet is used to specify online dynamics such as intensity or color, blink, message, and control button definitions.

Add a Variable-Sized Template to the Page <F2>

To insert a new variable-sized template onto the page, press <F2>. The position of the cursor at the time <F2> is pressed, is considered the origin of the new graphic variable-sized template. If there is already an origin of another variable-sized template under the cursor, an error message is displayed. Upon pressing <F2> to add an variable-sized template, a prompt is displayed requesting the variable-sized template type to be configured. Select the type of variable-sized template you wish to add by pressing <1>, <2>, <3>, <4>, or <5> for Indicator, Readout, Bar, Display, or Graphic. Graphics is available only if the Graphics Option has been selected.

Edit Parameters <F3>

This function permits the editing of Graphics Mode screen characters including: Foreground Intensity or Color, Background Intensity or Color, Background Blink, Font and Cursor Direction. These editing functions are further described in Parameters Editing Functions section.

Redraw <F4>

This key refreshes the entire screen when pressed.

Template Mode <F6>

Within the Variable-Sized Template Mode, press <F6> to access the Template Mode. Note that by pressing <F6>, you may toggle between the Variable-Sized Template Mode and Template Mode of the Page Editor.

Show Font <F7>

This selection will only appear if the Graphics Option was selected. The show fonts function displays a page containing the current definition of the Font Directory.

Identify a Variable-Sized Template's Origin Cell <F8>

This function permits you to identify the origin cell of any of the five types of variable-sized templates. Press <F8> to toggle the intensity of the origin cell of each variable-sized template on the page. This function is used particularly in conjunction with the edit function.

Note If a variable-sized template is configured to have the same foreground and background intensity or color, the Identify function will not identify the template.

Save <F9>

To save your page and store the information in a DOS file, press <F9>. A page may be saved at any time, but be sure to save before you exit the Page Editor. If you exit without saving, your new work on the page will be lost.

Exit the Variable-Sized Template Mode

To exit the Variable-Sized Template Mode and return to the Page Editor Main Menu, press <F10>.

Page Editor in the Message Mode

This editor is used to create and edit the text used in the Display Templates and Display Variable-Sized Templates. See Chapter 19, Message Library Editor, for more information.

Page Editor in the Symbol Mode

The Symbol Editor is only available with the Graphics Option. See Chapter 22, Graphic Editors, for more information.

Page Editor in the Character Mode

The Character Editor permits you to create a new character or edit an existing character. The Character Editor is only available with the Graphics Option. See Chapter 22, Graphic Editors, for more information.

Page Editor in the Window Mode

A window is an area of the screen which is to be addressed by certain functions. Static text and all origins within the window's area (as depicted by an intensity or color change) are the targets of the functions. For symbols and variable-sized templates, only the origin cell need be included in the window area to affect the entire shape and configuration.

When the <F6> key (labeled "Window") is pressed, you are instructed to begin defining the window by positioning the cursor at one corner of the window. Next, press the function key indicative of the desired action (move, copy, delete, or memorize). As the cursor is moved, a rectangle of character cells is formed with the cursor itself as one corner and the marked character cell as the opposite. The character cells within the rectangle are highlighted by inverting their intensities or complementing their colors.

At this point, the instructions are dependent on the action selected.

F1=	F2=	F3=MOVE	F4=COPY	F5=DELETE
F5=IDENTIFY	F7=MEMORIZE	F8=RECALL	F9=	F10=EXIT

Figure 14-7 Window Mode Menu

<F3>
MOVE

When the move function key has been pressed, the window is defined and the window itself, as well as the cursor, disappears. In their place, all static characters and all graphics whose origins were included in the window, are now highlighted. At this point, the items selected are treated as an entity. As the direction keys are pressed, a shadow of the selected items moves in the direction indicated. When the shadow is in the desired location, press the <Return> key and the graphics are moved to their new location, if each of the member characters is in a valid location. Note that a group of variable-sized templates being moved may contain several origin cells. The final location after the move will not permit an origin cell to overlap an existing origin location. In such a case, an error message is issued and the shadows remain.

The copy function works exactly as does the move function with the crucial difference that, once the selected items are drawn in their new location, the original copies are not erased. The associated spreadsheets are also duplicated.

<F4>
COPY

<F5>
DELETE

Once the window is defined and the selected graphics are highlighted, three levels of prompts are issued. If all three prompts are answered positively, all trace of the graphics is removed.

<F6>
IDENTIFY

This function is used to identify the origin cell locations of all graphic variable-sized templates currently on the page. This key acts as a toggle to turn the identification on and off.

<F7> MEMORIZE	This function makes temporary copies of the graphics selected in the window. These temporary copies are kept until the Directory Editor is exited or another graphic is memorized. Memorize is used in conjunction with recall.
<F8> RECALL previously	If the memorize function described above has been executed (in other words, there is something in the Memorize buffer), this function copies the memorized graphics to the same page positions as when they were memorized. Initially, only their shadows appear. The procedure, at this point, is the same as it is for the move function.

Save the Page

This function saves the page to the temporary DOS file.

Exit the Page Editor

Press <F10> to exit the Page Editor. This function permits exit back to the Directory Editor with options of either saving or not saving the current page.

Parameters Editing Functions in the Variable Sized Template Mode

Parameters Editing

All static text and lines are placed on the page by moving a character cell cursor to the desired origin cell selected on the 20 x 65 character cell matrix available for each page. An individual character, line drawing character, or static text may be placed in any location on a page. Status lines are present at the top of the Page Editor to identify the current character foreground and background intensities or colors, blink state, font in use, cursor position and direction, and cell location of the cursor. These parameters may be changed in the Parameters Editor by pressing the <F3> key labeled "PARAMETR." The status line format is shown in the following figure.

Foreground	Background	NO	INTENSITIES	Blink	Font	Normal
Line/Column	17/43	Template	Cursor	Direction	|	Right |

Figure 14-8 Status Line Format

Upon entering the Parameter Editing mode, the background color of these fields is changed from white to cyan. Note that the first field's background color is green. This indicates that the field can be selected for editing. Press <Return> to edit the field with the green background, or press a direction arrow key to move and select another field. Upon pressing <Return> at a green field, the background color becomes blue, and the field may then be edited. Press the up and down arrow keys to scroll through the list of options appropriate to that field. When the desired option is displayed, press the <Return> key to select the value. The field's background now reverts to green, and another field may now be selected. When all editing has been completed, press the <F10> key to exit the Parameters Editor and return to the function from which the Parameters Editor was accessed.

Paint Mode

While in the Parameters Editor, an existing static character's intensity or color, font, and/or blink attribute can be modified. Note that Blink is not viewable on the Configuration Software, but will be seen on the online unit. First, adjust the appropriate status line fields to reflect the desired attribute combination, then press the <F2> key labeled "PAINT". Next, by using the arrow keys, position the cursor over the character to be adjusted and press the space bar. The character now has the characteristics displayed on the status lines, and the cursor has moved one character cell in the direction currently indicated on the status line. Press <F10> to exit the Paint Mode and return to the Parameters Editor.

Within the Page Editor Variable-Sized Template Mode, several direct editing functions are provided to reduce the number of necessary keystrokes. For example, when editing the Cursor Direction parameter, one must first select Parameter Editing, then select Cursor Direction, and finally select the desired direction. To reduce the number of keystrokes, specific keystrokes are provided to accomplish specific results. This section contains information on each available direct editing function. The direct editing keystrokes, listed in the Font and Cursor Direction Selection section, are not shown on the page menus.

Cursor Movement

Cursor movements within the Variable-Sized Template Page Editor and Symbol Editor are normally one character movement per arrow key depression. To accelerate cursor movement horizontally, press <Ctrl> <arrow key> to move the cursor five characters. This function is

available at the Page Editor Variable-Sized Template Mode and Symbol Editor. **Font**

and Cursor Direction Selection

The Font and Cursor Direction may be edited as described in Parameters Editing. To reduce the number of necessary keystrokes, the following keystrokes may be used at the Variable-Sized Template Page Editor and Symbol Editor to select the associated parameter.

<Alt> <n>	Select Normal Font
<Alt> <g>	Select Graphic Font
<Alt> <d>	Select Double High Font
<Alt> <q>	Select Quad Font
<Alt> <u>	Set Cursor Direction to Up
<Alt> <w>	Set Cursor Direction to Down
<Alt> <l>	Set Cursor Direction to Left
<Alt> <r>	Set Cursor Direction to Right

Chapter 15

Indicator Template and Indicator Variable-Sized Template Editors

In this chapter, you will learn:

- How Indicator Templates and Indicator Variable-Sized Templates are used
- How to define an Indicator Template and an Indicator Variable-Sized Template
- How to edit existing Indicator Templates and Indicator Variable-Sized Templates
- How to return to the Page Editor

Functions of Indicator Templates

Indicator Templates are designed to be used as the lights and buttons on a control panel are used to indicate the status of devices and to control them, e.g., by turning them on or off. This single editor is used to define all the characteristics of an Indicator Template including its foreground/background intensities or colors, status messages, alarm conditions, and all control functions. The following section describes how each field in this editor relates to the template, and what the appropriate field entries might be. Refer to the figure below as needed.

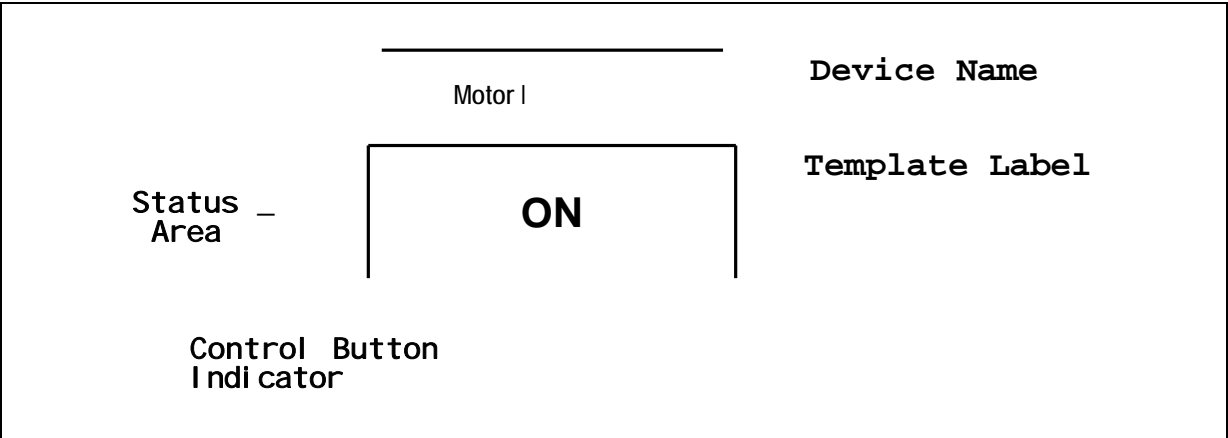


Figure 15-1 Indicator Template

The following figure shows a representation of the Indicator Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections. Note that if you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

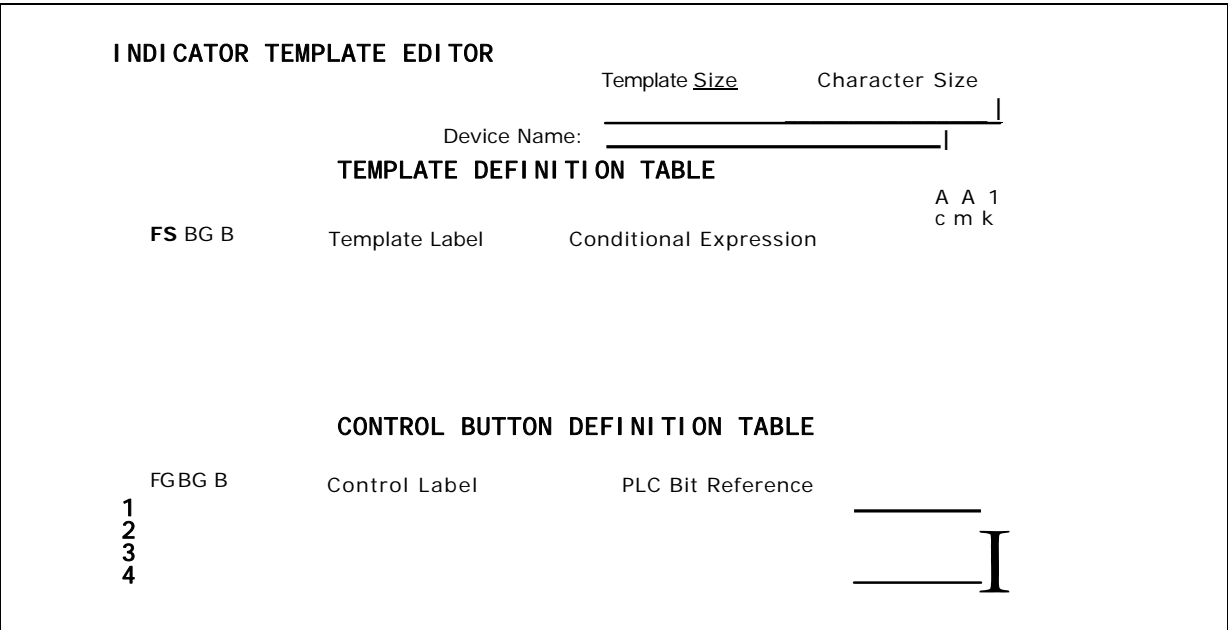


Figure 15-2 Indicator Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. Type the text. Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field, cursor to the field and press <Return>. Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

Option Windows display all possible choices and will cursor over selections which are not permissible choices based upon your current configuration.

To exit the Indicator Template Editor page, press <FI0>.

Template Size

The selections available are NORMAL or DOUBLE-WIDE. Remember that for placing the template on the page, the cell cursor is always the left cell of a double-wide template.

Character Size

This field defines the size of the characters used in the status area of the template. The device name area of the template always consists of normal-size characters. The selections available are NORMAL, QUAD, or DOUBLE-HIGH. For maximum readability, select the largest size that will fit in the template.

Note Redefining the DOUBLE-HIGH or QUAD font will limit the character size selections.

Device Name

This field accepts 22 normal-size characters in 2 lines. Only normal-size characters are used in this field. If you wish to center the device name, use <Ctrl> <m> to insert a carriage return and the space bar to add spaces.

The name used here may be part of an alarm message, so be sure to be as descriptive as possible.

Template Definition Table

In the Template Definition Table, there are five lines that can be filled in to define various states of the device. These five lines have their priorities established so that line 1 has the highest priority and line 5 has the lowest priority. This means that if two lines have conditional equations that solve to true, the configuration of the line with the highest priority will be displayed in the template.

During configuration, line 5 will be displayed on the page as a default. Consequently, if you define a template and leave line 5 blank, which is a perfectly acceptable thing to do, the template appearing in the Page Editor will be "blank". If you have a PanelMate Series 2000 or a PanelMate Series 3000, the template will have the high intensity foreground on medium intensity background device name and a no intensity background outlined in high intensity for the status area. If you have a PanelMate Series 2000 Color or PanelMate Series 4000, the template will have the white on blue device name and a black background outlined in white for the status area.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the status area of the template. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red) .
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color and PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Template Label

This field accepts up to 25 characters. The template itself will limit the number of characters you can use depending on whether you use a normal or double-wide template, and whether you use normal, quad or double-high characters. Be sure to view the template on the editor's screen to assure the correct appearance.

Conditional Expression

The conditional expression placed in this field may be a numerical, logical or relational expression which evaluates to true or false. When a numerical expression is evaluated, if the result is even (least significant bit = 0), the value is false; and if the result is odd (least significant bit = 1), the value is true. When in the Run Mode, if an expression evaluates to true, the template characteristics defined for the line that is true will be used to display the template on the page. If more than one expression is true at the same time, the line with the highest priority will be displayed, with line 1 having the highest priority and line 5 having the lowest priority.

When an expression results in an invalid equation (e.g., division by a value of zero, square root of a negative number, etc.), no value or graphics will be displayed on the screen. If an expression previously resulted in a valid display, but in a later scan resulted in an invalid equation, the previous display will be erased. Also, when an input value expression results in an invalid equation, an error message will be displayed on the screen and no value will be sent to the PLC.

This field accepts up to 70 characters. For information regarding the format for PLC word references, consult the appropriate PLC chapter for your specific PLC brand.

Refer to table 15-1 for a list of operators that may be used in a conditional expression. The operators are listed in order of precedence. Level 1 has the highest precedence and level 14 has the lowest precedence. All operators on the same level are evaluated left to right. Parenthesis may be used to change the order of operation.

The following conditional expression examples are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

[204 06]

The conditional expression could be as simple as a single bit reference. This would resolve to true if the bit is on.

[204 03] & [204 04] & [205 07]

This conditional expression would resolve to true if bit 3 of word 204, bit 4 of word 204, and bit 7 of word 205 are all on.

[35] > 500

This conditional expression would resolve to true if the value of word 35 is greater than 500.

Refer to the appropriate PLC chapter for information regarding the format for specific PLC word references.

Alm (Alarm)

The selections available are Y (yes) or N (no).

This field allows you to designate any line of the template definition as an alarm state. A Y in this field means that if the conditional expression in this line solves to true, an alarm message will be placed in the alarm list and sent to a printer if one is configured.

A Y also designates that this condition will be monitored at all times, regardless of the page that is in view.

Therefore, judicious use of this alarm state is recommended to maximize the response time of the **system**.

Ack (Acknowledge Required)

The selections available are Y (yes) or N (no). If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

Order of Precedence Operator		Operator Name
1	sqr()	Square root
1	abs()	Absolute value
1	log()	Base 10 log
1	nlog()	Natural log
1	sin()	Sine
1	cos()	Cosine
1	tan()	Tangent
1	asin()	Arcsine
1	acos()	Arccosine
1	atan()	Arctangent
2		NOT (bit-wise)
3	exp	Exponential
4	**	Power
	*	
5		Multiply
5		Divide
5		Modulo
6		Subtract
6		Add
7		Shift right
7		Shift left
8		Less than
8		Less than or equal to
8		Greater than
8		Greater than or equal to
9		Equal to
9	<>	Not equal to
10		AND (bit-wise)
11	^	XOR (bit-wise)
12		OR (bit-wise)
13	&&	Logical AND
14		Logical OR

Table 15-1 Operators

Note The results of all trigonometric functions are in radians.

Control Button Definition Table

This Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button; line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all control buttons. Simply leave a line blank if you do not want a control button at that location.

If a control button is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the status area of the template. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or a PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

Editing Existing Template

To edit an existing template, use the cursor arrow keys in the Page Editor to select the template to be edited and press <F1>. The Indicator Template Editor will immediately appear on the screen with the fields filled-in as you last saved them for the selected template.

To exit the Indicator Template Editor and return to the Page Editor - Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When a form is completed, you will have gathered all the information you will need

INDICATOR TEMPLATE EDITOR

Template Size: NORMAL or DOUBLE-WIDE Character Size:

NORMAL or QUAD or DOUBLE-HIGH Device Name (22 char):

Priority FG BG

				Template Label (25 char)	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Functions of Indicator Variable-Sized Templates

Indicator Variable-Sized Templates provide the ability to create high density status displays. One of 10 pre-defined indicators can be used to indicate the status of a device. There are five lines to define the various states of the device. To be a state to information in the PLC, a conditional expression may be entered which evaluates to true. The characteristics defined in the FG, BG and B fields, will be used to display the Indicator Variable-Sized Template. The expression may be as simple as the condition of a single bit in the PLC (true = ON; false = OFF), a value comparison (register > constant), or a Boolean expression of up to 70 characters in length.

The following figure shows a representation of the Indicator Variable-Sized Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections.

INDI CATOR VARI ABLE-SI ZED TEMPLATE EDI TOR

DI spl ay
Area

Devi ce Name
Type
Height
Width

FG Be B

INDI CATOR DEFI NI TI ON TABLE

Al arm Text

Condi ti onal Expre sion

A A 1
c m k

Figure 15-3 Indicator Variable-Sized Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. Type the text. Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field, cursor to the field and press <Return>. Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

To exit the Indicator Template Editor page, press <F10>.

Device Name

This field accepts 22 normal-size characters. This name is only used as part of an alarm message. Therefore, it should be as descriptive as possible.

Type

This field is used to select which style of indicator will be displayed (Outline or Solid).

Height

This field is used to select the height of the indicator as 1 or 2 high. Scroll up or down to the proper value.

Width

This field is used to select the width of the indicator and has a range of 1 to 5. Scroll up or down to the proper value.

Indicator Definition Table

In the Indicator Definition Table, there are five lines that can be filled-in to define various states of the device. These five lines have their priorities established so that line 1 has the highest priority and line 5 has the lowest priority. Therefore, if two lines have conditional expressions that solve to true, the configuration of the line with the highest priority will be displayed on the page.

During configuration, the values in line 5 will be displayed on the page as default values. **FG,**

BG, B (Foreground, Background, Blink)

The Indicator Variable-Sized Template spreadsheet allows independent assignments of both foreground and background intensity and color. Within the spreadsheet, there are fields for assignment of Foreground Intensity or Color (FG), Background Intensity or Color (BG), and Blink (B). If an Outline type is selected, the foreground selects the outline border while the background selects the fill area inside the border. If the Solid type is selected, the background intensity or color defines the solid area.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color and PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Alarm Text

This field accepts 25 normal-size characters. This text will be displayed on the alarm line when the state goes into alarm and to a printer if one is configured.

Conditional Expression

The conditional expression placed in this field may be a numerical, logical or relational expression which evaluates to true or false. When a numerical expression is evaluated, if the result is even (least significant bit = 0), the value is false, and if the result is odd (least significant bit = 1), the value is true. When in the Run Mode, if an expression evaluates to true, the characteristics defined for the line that is true will be used to display the indicator on the page. If more than one expression is true at the same time, the line with the highest priority will be displayed, with line 1 having the highest priority and line 5 having the lowest priority.

When an expression results in an invalid equation (e.g., division by a value of zero, square root of a negative number, etc.), no value or graphics will be displayed on the screen. If an expression previously resulted in a valid display, but in a later scan resulted in an invalid equation, the previous display will be erased. Also, when an input value expression results in an invalid equation, an error message will be displayed on the screen and no value will be sent to the PLC.

This field accepts up to 70 characters. For information regarding the format for PLC word references, consult the PLC chapter for your specific PLC brand.

Refer to table 15-1 for a list of operators that may be used in a conditional expression. The operators are listed in order of precedence. Level 1 has the highest precedence and level 14 has the lowest precedence. All operators on the same level are evaluated left to right. Parentheses may be used to change the order of operation.

Alm (Alarm)

The selections available are Y (yes) or N (no).

This field allows you to designate any line of the variable-sized template definition as an alarm state. A Y in this field means that, if the conditional expression in this line solves to true, an alarm message will be placed in the alarm list and sent to a printer if one is configured.

A Y also designates that this condition will be monitored at all times, regardless of the page that is in view. Therefore, judicious use of this alarm state is recommended to maximize the response time of the system.

Ack (Acknowledge Required)

The selections available are Y (Yes) and N (No). This field will accept a Y or N. If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

Editing Existing Variable-Sized Templates

To edit an existing variable-sized template, use the arrow keys at the Page Editor to move the cursor to the variable-sized template's origin. Press <F1> to edit the variable-sized template, and the editor will immediately appear on the screen. Press <F8> to identify all variable-sized template origins on the page.

Exit the Indicator Variable-Sized Template Editor

To exit the Indicator Variable-Sized Template Editor and return to the Page Editor - Variable-Sized Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the form is completed, you will have gathered all the information you will need for this particular variable-sized template.

INDICATOR VARIABLE-SIZED TEMPLATE EDITOR

Device Name (22 char):

Type (Outline, Solid) _____

Height (1,2) _____ Wi

Priority	FG	BG	B	Alarm Text (25 char)	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

Chapter 16

Readout Template and Readout Variable-Sized Template Editors

In this chapter, you will learn:

- How Readout Templates and Variable-Sized Templates can be used
- How to define a Readout Template and a Variable-Sized Template
- How to edit existing Readout Templates and Variable-Sized Templates
- How to return to the Page Editor

Functions of Readout Templates

Readout Templates are designed to be used as numerical readout devices on a control panel and are used to display a digital value. The PanelMate unit also provides two ways for the operator to change a value.

This single editor is used to define all the characteristics of a Readout Template including the values it displays, its high and low alarm limits, and all control functions. (Note that all the field intensities or colors are fixed for Readout Templates.) The following section describes how each field in this editor relates to the template, and what the appropriate field entries might be. Refer to the figure below as needed.

Indicates Numeric or Button Control

Device Name

Value 1 Expression

Value 2 Expression

Units (not on template if Value 2 is displayed)

Figure 16-1 Readout Template

The following figure shows a representation of the Readout Template Editor. Each of the fields which compose the spreadsheet is reviewed in the following sections.

READOUT TEMPLATE EDITOR

Template Size

Character Size

Decimal Places

1234.567

Device Name

Units

Value 1 Expression

Value 2 Expression

High Alarm Expression

Low Alarm Expression

Deadband Range

Alarm Acknowledgement

1/3 of (High Alarm - Low Alarm)

7

Control Type

Figure 16-2 Readout Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. Type the text. Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field cursor to the field and press <Return>. Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

Option Windows display all possible choices and will cursor over selections which are not permissible choices based upon your current configuration.

To exit the Readout Template Editor, press <F10>.

The selections available are NORMAUNORMAL, NORMAUQUAD, NORMAUDOUBLE-HIGH, or DOUBLE-WIDE/QUAD. Redefining the quad or double-high will limit the character size selections. The maximum number of digits that can be displayed in each combination of template/character size is: normal/normal, 9 digits; normal/quad, 6 digits; normal/double-high, 9 digits; double-wide/quad, 12 digits.

Decimal Places

This field accepts the numbers 0 through 9. This field defines how the number will be formatted on the template.

Device Name

This field accepts 22 normal-size characters in 2 lines. Only normal-size characters are used in this field. Use <Ctrl> <m> to insert a carriage return, and the space bar to add spaces if you wish to center the device name.

The name used here may be part of an alarm message, so be sure to be as descriptive as possible.

Units

This field accepts 9 alphanumeric characters. It defines the type of units that are being displayed to the operator, such as "DegF" or "gals". This field is not displayed on a single-width template when Value 2 is displayed.

Value 1 Expression

Value 1 is the value that will be displayed in the center of the template. This field accepts up to 70 characters. The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parenthesis may be used to change the order of operations.

The following examples of expressions are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

[123]

The expression could be as simple a single word reference. This example references word 123.

([123]*10)+[124]

This is a mathematical expression that includes PLC references and constants that will solve to a value.

[name1,242]+[name2,243]

Also, information from multiple PLCs may be included in the same expression. In this expression, word 242 in PLC name1 is added to word 243 in PLC name2.

Note Refer to Chapter 15 for a list of available conditions and operators.

Value 2 Expression _____

Value 2 is the value that will be displayed in the bottom of the template. It is most often used as the setpoint for the device.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parenthesis may be used to change the order of operations.

This optional field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

High Alarm Expression

The results of the High Alarm Expression are compared to the results of the Value 1 Expression. If Value 1 exceeds the high alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the template is displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include multiple PLC word and bit references. Mathematical and Boolean expressions may be used including multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parenthesis may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Low Alarm Expression

The results of the Low Alarm Expression are compared to the results of the Value 1 Expression. If Value 1 exceeds the low alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the template will be displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include multiple PLC word and bit references. Mathematical and Boolean expressions may be used including multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parenthesis may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Deadband Range

The deadband range is an area below the high alarm value and above the low alarm value that must be crossed before Value 1 is considered to have returned to normal status (go out of alarm). The deadband range prevents multiple alarm messages being generated when Value 1 is hovering around an alarm threshold.

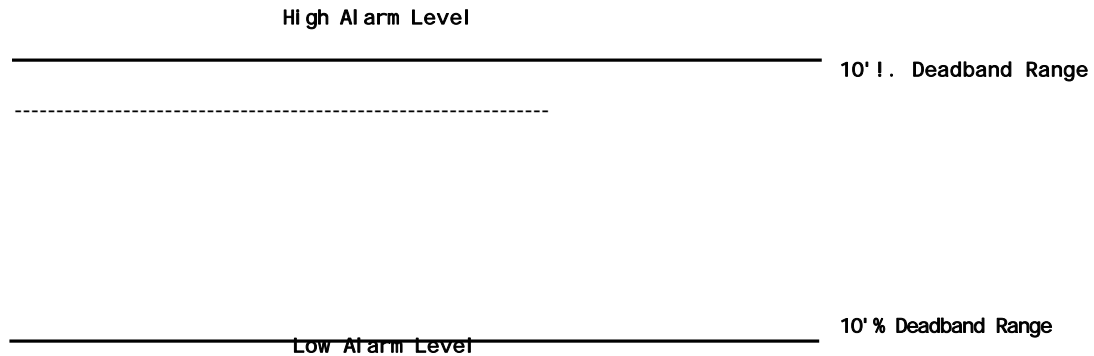


Figure 16-3 Deadband

This field accepts the numbers 0 through 99. These numbers represent the percentage of the high alarm value minus the low alarm value that defines the width of the deadband.

Alarm Acknowledgment

The selections available are Y (Yes) or N (No). If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

Readout Template

The selections available are NONE, NUMERIC or BUTTONS.

A Readout Template may be defined to show a value without the operator being able to control it. For this type of template, select NONE.

Select NUMERIC if the operator will be directed to use the numeric keypad to enter a (setpoint) value. When this selection is made, three new fields will appear on the screen. These fields, Input Value Expression, Target Word Address, and Password Protection are described in the next section.

Select BUTTONS if the operator will be directed to use the control buttons to change a (setpoint) value. It is likely that you will use buttons labeled "increase" and "decrease", or a similar system, to change this value. When this selection is made, a Control Button Definition Table will appear on the screen. This table is described in the next section.

If either numeric or button control is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

Numeric Control Definition

The numeric control definition consists of three entries: the Input Value Expression, the Target Word Address and Password Protection. The Input Value Expression is a mathematical expression that must be performed on the operator's numeric keypad input before the number is stored in the PLC. The Target Word Address is the PLC word reference that will store the result of the Input Value Expression. Password Protection will permit the selection of a layer of security for numeric entry if desired.

READOUT TEMPLATE EDITOR			
	Template Size /Character Size	Decimal Places	
1234.557	Device Name		
Value Expression			
High Alarm Expression			
Low Alarm Expression			
Deadband Range	___ !! of (High Alarm Low Alarm)		
Alarm Acknowledgement			
Control Type	| NUMERIC |		
Control Indicator Position	| |	Control Indicator Display	| |
Input Value Expression			
Target Word Address			
Password Protection			

Figure 16-4 Numeric Control Definition
Input Value Expression

This expression is any mathematical expression that must be performed on the operators input before the number is stored in the PLC. A question mark inside brackets, [?], is used to designate the variable operator input. The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. The < > operators can be used for ranging (see Example 2 below). Parentheses may be used to change the order of operations.

This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field.

Example 1:

$([?]-32) \cdot 5/9$

The operator's input is changed from an entry of Fahrenheit to Celsius.

Example 2:

$[?]*([?]>=0)*([?]<=100)+([?]<0)*[123]+([?]>100)*[123]$

Target Word Address: [123]

The expression in Example 2 will limit entries between 0 and 100 to the PLC register. Entry of any value outside this range will have no effect on the value in the register.

Note Refer to Chapter 15 for a list of available conditions and operators.

Target Word Address

This field defines the location of the operator's input in the PLC, as the result of the Input Value Expression.

This field accepts up to 18 characters.

As an example, to store the result of the Input Value Expression ([?]-32)*5/9 in register 364 as a signed, 16-bit integer, use the following Target Word Address:

[364#s 16]

The example above is shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to the PanelMate unit. The selections available are None, Key only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B. Password protection must be validated each time a template is selected for numeric entry.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all control buttons. Simply leave a line blank if you do not want a control button at that location.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

READOUT TEMPLATE EDITOR

1234.557

Template Size /Character Size

Device Name

Units

Value 1 Expression

Velva 2 Expression

High Alarm Expression

Low Alarm Expression

Deadband Range

Alarm Acknowledgement

Control Type

Decimal Places

1/17 of (High Alarm - Low Alarm)

Buttons

CONTROL BUTTON DEFINITION TABLE

	Fe BG B	Control Label	PLC Bit Reference
1			
2			
3			
4			

Figure 16-5 Control Button Definition Table

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

P

To edit an existing template, use the cursor arrow keys in the Page Editor - Template Mode to select the template to be edited and press <F1 >. The Readout Editor will immediately appear on the screen with the fields filled in as you last saved them for the selected template.

Exit the Readout Template Editor

To exit the Readout Template Editor and return to the Page Editor - Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the form is completed, you will have gathered all the information you will need for this template.

READOUT TEMPLATE EDITOR

Template Size/Character Size: NORMAUQUAD or NORMAUDOUBLE-HIGH or
DOUBLE-WIDE/QUAD

Decimal Places (0-9):

Decimal Name (22 char):

Units (9 char):

Value 1 Expression (70 char):

Value 2 Expression (70 char):

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement:

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection NONE _____ KEY _____ A _____ B _____ A or B

If BUTTONS,

Button FG BG B				Control Label (33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Functions of Readout Variable-Sized Templates

The Readout Variable-Sized Template Editor is similar in function and purpose to that of the Readout Template Editor. Readout Variable-Sized Templates are designed to replace numeric and digital readout devices found on a conventional control panel, and to supply the functionality often provided by CRT-based devices. Displayed values can be scaled by the PanelMate unit without requiring any additional logic in the PLC. The following figure shows a representation of the Readout Variable-Sized Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections.

READOUT VARIABLE-SIZED TEMPLATE EDITOR

Readout Length

Character Size

Decimal Places

1234667890

Device Name

Foreground Intensity

Background Intensity

Direction

Value Expression

High Alarm Expression

Low Alarm Expression

Deadband Range

Alarm Acknowledgement

7 of (High Alarm - Low Alarm)

3

--

Control Type

1

Figure 16-6 Readout Variable-Sized Template Editor

Readout -length

This field defines the size of the field in which the readout is to be displayed.

Character Size

The Character Size is the Font which will be used to display the Readout Variable-Sized Template on the page. Redefining the Quad or Double-High font will limit the character size selections.

Decimal Places

This field accepts the numbers 0 through 9. This field defines how the number will be formatted when displayed.

Device Name

The field accepts 22 normal-size characters. The name used here may be part of an alarm message so be as descriptive as possible.

Direction

The Readout Variable-Sized Template may be displayed in a left-to-right or top-to-bottom orientation. Use the Option Window and press the arrow keys to toggle between the selections of Vertical and Horizontal.

Foreground /Background Intensity or c

These fields allow you to select the foreground and background intensities or colors of the control button. The foreground and background selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities,	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

_SIOn

The Value Expression field accepts up to 70 characters. The calculated value is the value that will be displayed in the Readout Variable-Sized Template.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parenthesis may be used to change the order of operations.

Note that if a value is too large to display in the variable-sized template, a string of Xs (XXXXX) will be displayed for the value. For example, if a readout variable-sized template was defined as three characters in length, but the value to be displayed was four characters, XXX would be displayed for the value.

Note Refer to Chapter 15 for a list of available conditions and expressions.

The results of the High Alarm Expression are compared to the results of the Value Expression. If Value exceeds the high alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the variable-sized template is displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank. The expression entered here may include more than one PLC word or bit reference. Mathematical operations that may be used are multiplication, division, addition and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parenthesis may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and expressions.

Low Alarm Expression

The results of the Low Alarm Expression are compared to the results of the Value Expression. If Value exceeds the low alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the variable-sized template is displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank. The expression entered here may include more than one PLC word or bit reference. Mathematical operations that may be used are multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parenthesis may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and expressions.

Deadband Range

The deadband range is an area below the high alarm value and above the low alarm value that must be crossed before Value is considered to have returned to normal status (go out of alarm). The deadband range prevents multiple alarm messages being generated when Value is hovering around an alarm threshold.

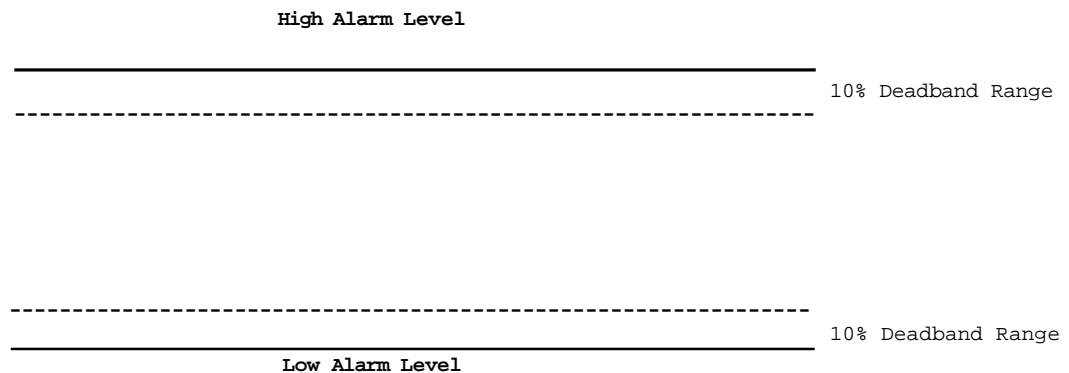


Figure 16-7 Deadband

This field accepts the numbers 0 through 99. These numbers represent the percentage of the high alarm value minus the low alarm value that defines the width of the deadband.

Alarm Acknowledgment

This field will accept a Y (Yes) or N (No). If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

The selections available are NONE, NUMERIC or BUTTONS.

A Readout Variable-Sized Template may be defined to show a value without the operator being able to control it. For this type of variable-sized template, select NONE.

Select NUMERIC if the operator will be directed to use the numeric keypad to enter a (setpoint) value. When this selection is made, three new fields will appear on the screen. These fields, Input Value Expression, Target Word Address, and Password Protection are described in the next section.

Select BUTTONS if the operator will be directed to use the control buttons to change a (setpoint) value. It is likely that you will use buttons labeled "increase" and "decrease", or a similar system, to change this value. The Control Button Definition Table, described in the next section, is used to configure the buttons.

If either numeric or button control is defined, a small arrow will appear, as defined in the Control Indicator fields.

Numeric Control Definition

The numeric control definition consists of three entries: the Input Value Expression, the Target Word Address, and Password Protection. The Input Value Expression is a mathematical expression that must be performed on the operator's numeric keypad input before the number is stored in the PLC. The Target Word Address is the PLC word reference that will store the result of the Input Value Expression. Password Protection will permit the selection of a layer of security for numeric entry if desired.

READOUT VARIABLE-SIZED TEMPLATE EDITOR			
		Readout Length	Character Size
1234567890			Decimal Places
Device Name |			n
Foreground Intensity | Background Intensity |			
Value Expression			
High Alarm Expression			
Low Alarm Expression			
Deadband Range			
Alarm Acknowledgement |		% of (High Alarm - Low Alarm)	
Control Type		| NUMERIC |	
Control Indicator Position		Control Indicator Display M	
Input Value Expression			
Target Word Address			
Password Protection			

Figure 16-8 Numeric Control Definition

Input Value Expression

This expression is any mathematical expression that must be performed on the operator's input before the number is stored in the PLC. A question mark inside brackets, [?], is used to designate the variable operator input. The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. The < > operators can be used for ranging (see Example 2 below). Parentheses may be used to change the order of operations. This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field.

Example 1:
([?]-32)*5/9

|

|

|

|

The operator's input is changed from an entry of Fahrenheit to Celsius.

Example 2:

$[?]*([?]>=0)*([?]<=100)+([?]<0)*[123]+([?]>100)*[123]$

Target Word Address: [123]

The expression in Example 2 will limit entries between 0 and 100 to the PLC register. Entry of any value outside this range will have no effect on the value in the register.

Note Refer to Chapter 15 for a list of available conditions and expressions.

Target Word Address

This field defines the location of the operator's input in the PLC, as the result of the Input Value Expression.

This field accepts up to 18 characters.

As an example, to store a value in register 364 as a signed, 16-bit integer, use the following Target Word Address:

[364#s16]

The example above is shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to PanelMate unit. The selections available are None, Key Only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B. Password protection must be validated each time the variable-sized template is selected for numeric entry.

Control Indicator Position

The Control Indicator fields are used to position the control indicator arrow to the most convenient, visible location near the Readout Variable-Sized Template. The available selections for the Control Indicator Position are: Above, Below, Left and Right.

I-UC-1

The Control Indicator Display field is used to determine if the arrow is always visible, or visible only when the variable-sized template is selected.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all of the control buttons. Simply leave a line blank if you do not want a control button at that location. When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

READOUT VARIABLE-SIZED TEMPLATE EDITOR			
	Readout Length	Character Size	
1234567890		| | Decimal Places	
Device Name	| |	Direction	| |
Foreground Intensity	| |	Background Intensity	| |
Value Expression			
High Alarm Expression			
Low Alarm Expression			
Deadband Range	<i>% of (High Alarm - Low Alarm)</i>		
Alarm Acknowledgement			
Control Type	BUTTONS		
Control Indicator Position			
Control Indicator Display			
CONTROL BUTTON DEFINITION TABLE			
FG BG B	Control Label	PLC Bit Reference	
1			
2			
3			
4			

Figure 16-9 Control Button Definition Table

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selection for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

To edit an existing variable-sized template, use the cursor arrow keys in the Page Editor - Variable-Sized Template Mode to move the cursor to the variable-sized template's origin. Press <F1> to edit the variable-sized template, and the editor will immediately appear on the screen.

d Template Editor

To exit the Readout Variable-Sized Template Editor and return to the Page Editor - Variable-Sized Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the form is completed, you will have gathered all the information you will need for this variable-sized template.

READOUT VARIABLE-SIZED TEMPLATE EDITOR

Readout Length:

Character Size: NORMAL or DOUBLE-HIGH or QUAD

Decimal Places: _____

Device Name (22 char): _____ Direc

Foreground Intensity/Color:

Background Intensity/Color: _

Value Expression (70 char): _____

High Alarm Expression (70 char): _____

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement: Yes or No

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char): _____

Target Word Address (18 char):

Password Protection NONE KEY A B AorB

If BUTTONS,

Button FG BG			B	Control Label (33 char)	PLC Bit Reference (18 char)
1					
2		2			
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Chapter 17

Bar Template and Bar Variable-Sized Template Editors

In this chapter, you will learn:

- How Bar Templates and Bar Variable-Sized Templates can be used
- How to define a Bar Template and Bar Variable-Sized Template
- How to edit existing Bar Templates and Bar Variable-Sized Templates
- How to return to the Page Editor

Functions of Bar Templates

Bar Templates are designed to be used as the analog meters and faceplates on a control panel and are used to indicate a value in analog fashion, with a bar graph. This bar graph can show current value, setpoint, and high and low alarm levels. The current value and setpoint are also displayed digitally. The PanelMate unit also provides two ways for the operator to change the setpoint value.

This single editor is used to define all the characteristics of a Bar Template including the bar's upper and lower limits, a setpoint position, high and low alarm limits, and all control functions. (Note that all the field intensities are fixed for Bar Templates.) The following section describes how each field in this editor relates to the template, and what the appropriate field entries might be. Refer to the figure on the next page as needed.

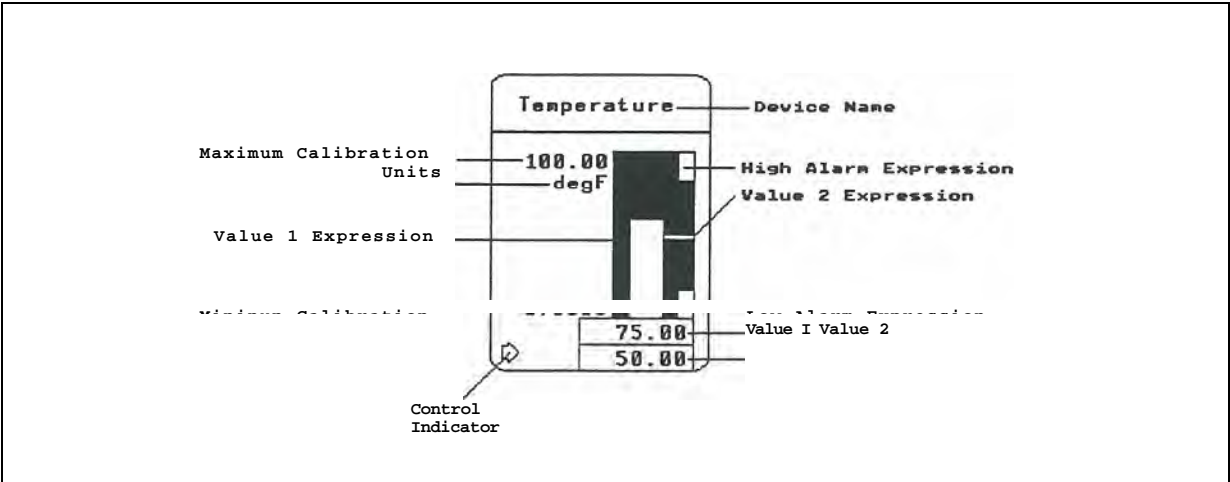


Figure 17-1 Bar Template

The following figure shows a representation of the Bar Template Editor. Each of the fields which compose the spreadsheet is reviewed in the following sections. Note that if you have PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

BAR TEMPLATE EDITOR

Template Size

Device Name

Units

Maximum Calibration

Minimum Calibration

Value 1 Expression

Value 2 Expression

High Alarm Expression

Low Alarm Expression

Deadband Range

Alarm Acknowledgement

Control Type

Bar Chart: 10.000, 0.0000, 500.00, 400.00

Figure 17-2 Bar Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. Type the text. Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field, cursor to the field and press <Return>. Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

Option Windows display all possible choices and will cursor over selections which are not permissible choices based upon your current configuration.

To exit the Bar Template Editor page, press <F10>.

Template Size

The selections available are 2HIGH or 3HIGH. Remember that for placing the template on the page, the cell cursor is always the top cell of the template.

Device Name

This field accepts 22 normal-size characters in 2 lines. Only normal-size characters are used in this field. Use <Ctrl> <m> to insert a carriage return and the space bar to add spaces if you wish to center the device name.

The name used here may be part of an alarm message so be as descriptive as possible.

Units

This field accepts 6 alphanumeric characters. It defines the type of units that are being displayed to the operator, such as "DegF" or "gals".

Maximum Calibration

This is a 6-character field that accepts 6 digits, or 5 digits with a decimal point placed anywhere in the field.

The Maximum Calibration is the value that defines the highest point of the Value 1 bar. This value will appear on the template.

Minimum Calibration

This is a 6-character field that accepts 6 digits, or 5 digits with a decimal point placed anywhere in the field.

The Minimum Calibration is the value that defines the lowest point of the Value 1 bar. This value will appear on the template.

On a 3HIGH Bar Template, note that the PanelMate unit will use the Maximum and Minimum Calibrations to calculate the bar's midpoint and place that value on the template too.

Value 1 Express

:-If you have a PanelMate Series 2000 or a PanelMate Series 3000, Value 1 is the value that will be displayed as a full high intensity bar on the template. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, Value 1 is the value that will be displayed as a full green bar on the template. This field accepts up to 70 characters.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parenthesis may be used to change the order of operations.

The following examples of expressions are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

[123]

The expression could be as simple as a single word reference. This example references word 123.

([123]*10)+[124]

This is a mathematical expression that includes PLC references and constants that will solve to a value.

[name1, 242]+[name2, 243]

Also, information from multiple PLCs may be included in the same expression. In this expression, word 242 in PLC name1 is added to word 243 in PLC name2.

Note Refer to Chapter 15 for a list of available conditions and operators.

Value 2 Expression

If you have a PanelMate Series 2000 or a PanelMate Series 3000, Value 2 is the value that will be displayed as a medium intensity horizontal line to the right of the Value 1 bar. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, Value 2 is the value that will be displayed as a white horizontal line to the right of the Value 1 bar. It is most often used as the setpoint for the device.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parentheses may be used to change the order of operations.

This optional field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

The results of the High Alarm Expression are compared to the results of the Value 1 Expression. If you have a PanelMate Series 2000 or PanelMate Series 3000 and Value 1 exceeds the high alarm, an alarm message will be placed in the alarm list and "ALARM!" will appear on the template (below the device name) in medium foreground intensity on blinking high intensity background. A High Alarm bar is shown in high intensity to the right of the Value 1 Expression Bar. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000 and Value 1 exceeds the high alarm, an alarm message will be printed in the alarm window of the page that is currently in view, and "ALARM!" will appear on the template (below the device name) in white on blinking red. A High Alarm bar is shown in red to the right of the green bar.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include multiple PLC word or bit references. Mathematical operations that may be used are multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Low Alarm Expression _____

The results of the Low Alarm Expression are compared to the results of the Value 1 Expression. If you have a PanelMate Series 2000 or PanelMate Series 3000 and Value 1 exceeds the low alarm, an alarm message will be placed in the alarm list and "ALARM!" will appear on the template (below the device name) in medium foreground intensity on blinking high intensity background. A Low Alarm bar is shown in high intensity to the right of the Value 1 Expression Bar. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000 and Value 1 exceeds the low alarm, an alarm message will be printed in the alarm window of the page that is currently in view, and "ALARM!" will appear on the template (below the device name) in white on blinking red. A Low Alarm bar is shown in red to the right of the Value 1 Expression Bar.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include multiple PLC word or bit references. Mathematical operations that may be used are multiplication, division, addition and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Deadband Range

The deadband range is an area below the high alarm value and above the low alarm value, that must be crossed before Value 1 is considered to have returned to normal status (go out of alarm). The deadband range prevents multiple alarm messages from being generated when Value 1 is hovering around an alarm threshold.

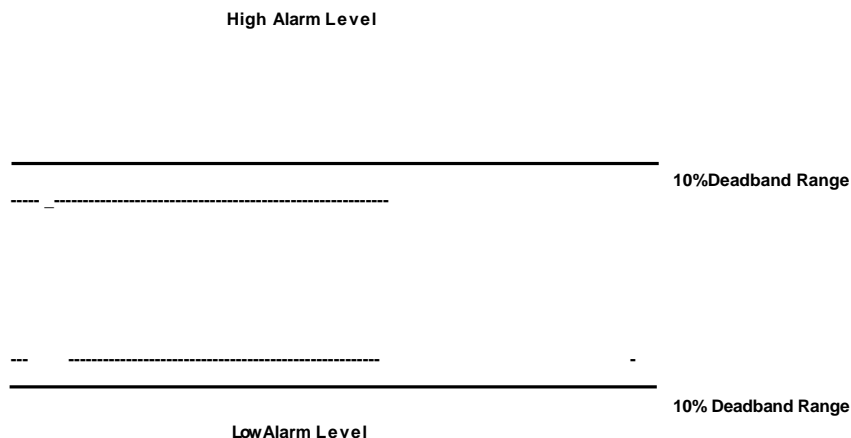


Figure 17.3 Deadband

This field accepts the numbers 0 through 99. These numbers represent the percentage of the high alarm value minus the low alarm value that defines the width of the deadband.

Alarm Acknowr

The selections available are Y (Yes) or N (No). This field will accept a Y or N. If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

Control Type

The selections available are NONE, NUMERIC, or BUTTONS.

A Bar Template may be defined to show an analog graph without the operator being able to control it. For this type of template, select NONE.

Select NUMERIC if the operator will be directed to use the numeric keypad to enter a (setpoint) value. When this selection is made, three new fields will appear on the screen. These fields, Input Value Expression, Target Word Address, and Password Protection are described in the next section.

Select BUTTONS if the operator will be directed to use the control buttons to change a (setpoint) value. It is likely that you will use buttons labeled "increase" and "decrease", or a similar system, to change this value. When this selection is made, a Control Button Definition Table will appear on the screen. This table is described in the following section.

If either numeric or button control is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

Numeric Control Definition

The numeric control definition consists of three entries, the Input Value Expression, Target Word Address, and Password Protection. The Input Value Expression is a mathematical expression that must be performed on the operator's numeric keypad input before the number is stored in the PLC. The Target Word Address is the PLC word reference that will store the result of the Input Value Expression. Password Protection will permit the selection of a layer of security for numeric entry if desired.

BAR TEMPLATE EDITOR	
Template Size	<input type="text"/>
Device Name	<input type="text"/>
Units	<input type="text"/>
Maximum Calibration	<input type="text"/>
Minimum Calibration	<input type="text"/>
Value 1 Expression	<input type="text"/>
Value 2 Expression	<input type="text"/>
High Alarm Expression	<input type="text"/>
Low Alarm Expression	<input type="text"/>
Deadband Range	<input type="text"/> % of (High Alarm - Low Alarm)
Alarm Acknowledgement	<input type="text"/>
Control Type	<input type="text" value="NUMERIC"/>
Input Value Expression	<input type="text"/>
Target Word Address	<input type="text"/>
Password Protection	<input type="text"/>

Figure 17-4 Numeric Control Definition

Input Value Expression

This expression is any mathematical expression that must be performed on the operator's input before the number is stored in the PLC. A question mark inside brackets, [?], is used to designate the variable operator input. The expression entered here may include as many PLC word or bit references as needed, as well as the mathematical operations of multiplication, division, addition and subtraction. The <> operators can be used for ranging (see Example 2 below). Parentheses may be used to change the order of operations.

This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field.

Example 1:

$([?]-32)*5/9$

The operator's input is changed from an entry of Fahrenheit to Celsius.

Example 2:

$[?]*([?]>=0)*([?]<=100)+([?]<0)*[123]+([?]>100)*[123]$

Target Word Address: [123]

The expression in Example 2 will limit entries between 0 and 100 to the PLC register. Entry of any value outside this range will have no effect on the value in the register.

Note Refer to Chapter 15 for a list of available conditions and operators.

Target Word Address

This field defines the location of the operator's input in the PLC as the result of the Input Value Expression.

This field accepts up to 18 characters.

As an example, to store a value in register 364 as a signed, 16-bit integer, use the following Target Word Address:

[364#S1 6]

The example above is shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to the PanelMate unit. The selections available are None, Key Only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B. Password protection must be validated each time the template is selected for numeric entry.

Control Button Definition Table

This Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the control button that is second from the top, etc. If it is not necessary to use all control buttons, simply leave a line blank if you do not want a control button at that location.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

BAR TEMPLATE EDITOR

Template Size

Device Name

Units

Maximum Calibration

Minimum Calibration

Value 1

Value 2

High Alarm

Low Alarm Expression

DQadband Range

Acknowledgement

Control Type

I BUTTONS I

10.000

0.0000

500.00

400.00

~ % of (High Alarm - LOW Alarm) Alarm

CONTROL BUTTON DEFINITION TABLE

F6 B6 B

Control Label

PLC Bit Reference

1

2

3

4

Figure 17-5 Control Button Definition Table Bar

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

Editing Existing Templates

To edit an existing template, use the cursor arrow keys in the Page Editor - Template Mode to select the template to be edited and press <F1>. The Bar Template Editor will immediately appear on the screen with the fields filled in as you last saved them for the selected templates.

Exit the Bar Template Editor

To exit the Bar Template Editor and return to the Page Editor - Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When a form is completed, you will have gathered all the information you will need for this particular template.

BAR TEMPLATE EDITOR

Template Size: 2HIGH or 3HIGH

Device Name (22 char): _____

Units (6 char): _____

Maximum Calibration (6 char): _____

Minimum Calibration (6 char): _____

Value 1 Expression (70 char): _____

Value 2 Expression (70 char): _____

High Alarm Expression (70 char): _____

Low Alarm Expression (70 char): _____

Deadband Range (0-99%): _____

Alarm Acknowledgement: _____

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char): _____

Target Word Address (18 char): _____

Password Protection NONE KEY _____ A B A or B

If BUTTONS, Button

FG

BG

Control Label

PLC Bit

B

(33 char) _____

Reference (18 char)

1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Functions of Bar Variable-Sized Templates

The Bar Variable-Sized Template Editor is similar in function and purpose to that of the Bar Template Editor. With the Bar Variable-Sized Template Editor, you may easily create custom bar graphs using a structured fill-in-the-blank and multiple choice approach similar to the template editors.

Bar Variable-Sized Templates are designed to replace the analog meters and faceplates found on a conventional control panel. They may also be used along with Symbols or Graphic elements to simulate tank fills, pipe flow, conveyors, and other specific applications. Variable-sized templates also allow for definition of high and low alarm levels.

The following figure shows a representation of the Bar Variable-Sized Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections. Note that if you have PanelMate Series 4000, you will have five lines in the Control Button Defintion Table.

BAR VARIABLE-SIZED TEMPLATE		EDITOR	
Bar Direction I	Bar Height Bar	Bar Width	Frame Intensity
Device Name			
Maximum Calibration			
Minimum Calibration			
Value Expression			
High Alarm Expression			Alarm)
Low Alarm Expression			1f. of (High Alarm - Low A
Deadband Range			
Control Type	NON		

Figure 17-6 Bar Variable-Sized Template Editor

Bar Direction

The Bar Direction field determines in which direction the dynamic portion of the bar will move: UP, DOWN, LEFT or RIGHT.

The Bar Height and Bar Width fields allow for user-defined dimensions of the overall bar region. These values are entered as the number of character spaces using the up and down arrow keys.

Bar/Erase Intensity or Color

These fields determine the foreground (write) and background (erase) intensity or color, respectively, of the Bar Variable-Sized Template.

Device Name

This field accepts 22 normal-size characters. The name used here may be part of an alarm message and, therefore, should be as descriptive as possible.

Maximum Calibration

This is a six-character field that accepts six digits, or five digits with a decimal point placed anywhere in the field. The Maximum Calibration is the value that defines the highest point of the displayed bar.

Minimum Calibration

This is a six-character field that accepts six digits, or five digits with a decimal point placed anywhere in the field. The Minimum Calibration is the value that defines the lowest point of the displayed bar.

Value Expression

The Value Expression field accepts up to 70 characters. The calculated value is the value displayed as the bar height.

The expression entered here may include as many PLC word or bit references as needed, as well as the mathematical operations of multiplication, division, addition, and subtraction. Parentheses may be used to change the order of operations.

Note Refer to Chapter 15 for a list of available conditions and operators.

High Alarm Expression

The results of the High Alarm Expression are compared to the results of the Value Expression. If Value exceeds the high alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the variable-sized template is displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include more than one PLC word or bit reference. Mathematical operations may be used. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators. L

The results of the Low Alarm Expression are compared to the results of the Value Expression. If Value exceeds the low alarm, an alarm message will be placed in the alarm list. If you have a PanelMate Series 2000 or a PanelMate Series 3000, the variable-sized template is displayed with medium intensity characters on a blinking high intensity background. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, the template is displayed with white characters on a blinking red background.

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The expression entered here may include more than one PLC word or bit reference. Mathematical operations may be used. You may also enter a single constant value (e.g., 900) as an expression. Parenthesis may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Deadband Range

The deadband range is an area below the high alarm value and above the low alarm value, that must be crossed before Value is considered to have returned to normal status (go out of alarm). The deadband range prevents multiple alarm messages being generated when Value is hovering around an alarm threshold.

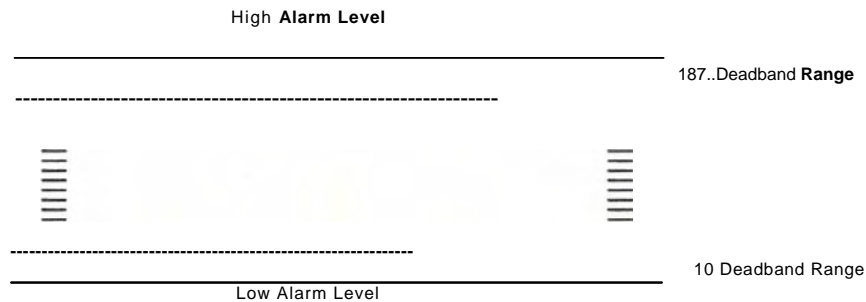


Figure 17-7 Deadband

This field accepts the numbers 0 through 99. These numbers represent the percentage of the high alarm value minus the low alarm value that defines the width of the deadband.

Alarm Acknowledgment

The selections available are Y (Yes) or N (No). If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

The selections available are NONE, NUMERIC, or BUTTONS.

A Bar Variable-Sized Template may be defined to show an analog graph without the operator being able to control it. For this type of template, select NONE.

Select NUMERIC if the operator will be directed to use the numeric keypad to enter a (setpoint) value. When this selection is made, three new fields will appear on the screen. These fields, Input Value Expression, Target Word Address, and Password Protection are described below.

Select BUTTONS if the operator will be directed to use the control buttons to change a (setpoint) value. It is likely that you will use buttons labeled "increase" and "decrease", or a similar system, to change this value. The Control Button Definition Table, described below, is used to configure the buttons.

If either numeric or button control is defined, a small arrow will appear, as defined in the Control Indicator fields.

Numeric Control Definition

The numeric control definition consists of three entries: the Input Value Expression, the Target Word Address, and Password Protection. The Input Value Expression is a mathematical expression that must be performed on the operators numeric keypad input before the number is stored in the PLC. The Target Word Address is the PLC word reference that will store the result of the Input Value Expression. Password protection will permit the selection of a layer of security for numeric entry if desired.

BAR VARIABLE-SIZED TEMPLATE EDITOR			
Bar Direction	|	Bar Height	Bar Width
		Bar Intensity	Erase Intensity
Device Name			
Maximum Calibration			
Minimum Calibration			
Value Expression			
High Alarm Expression			
Low Alarm Expression			
Deadband Range			
Alarm Acknowledgement			
	| % of (High Alarm - Low Alarm)		
Control Type	| NUMERIC |		
Control Indicator Position	Control Indicator Display		
Input Value Expression			
Target Word Address			
Password Protection			

Figure 17-8 Numeric Control Definition

Input Value Expression

This expression is any mathematical expression that must be performed on the operator's input before the number is stored in the PLC. A question mark inside brackets, [?], is used to designate the variable operator input. The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field.

Note Refer to Chapter 15 for a list of available conditions and operators.

Target Word Address

This field defines the location of the operator's input in the PLC, as the result of the Input Value Expression.

This field accepts up to 19 characters.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to the PanelMate unit. The selections available are None, Key Only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B. Password protection must be validated each time the variable-sized template is selected for numeric entry.

Control Indicator Position

The Control Indicator fields are used to position the control indicator arrow to the most convenient, visible location near the Bar Variable-Sized Template. The available selections for the Control Indicator Position are: Above, Below, Left and Right.

The Control Indicator Display field is used to determine if the arrow is always visible, or visible only when the Variable-Sized Template is selected.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button; line 2 corresponds to the control button that is second from the top, etc. If it is not necessary to use all four control buttons, simply leave a line blank if you do not want a control button at that location.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

BAR VARIABLE-SIZED TEMPLATE EDITOR			
Bar Direction	<input type="text"/>	Bar Height	<input type="text"/>
		Bar Intensity	<input type="text"/>
		Erase Intensity	<input type="text"/>
Device Name	<input type="text"/>		
Maximum Calibration	<input type="text"/>		
Minimum Calibration	<input type="text"/>		
Value Expression	<input type="text"/>		
High Alarm Expression	<input type="text"/>		
Low Alarm Expression	<input type="text"/>		
Deadband Range	<input type="text"/> 17 of (High Alarm - Low Alarm)		
Alarm Acknowledgement	<input type="text"/>		
Control Type	<u>BUTTONS</u>		
Control Indicator Position	<input type="text"/>	Control Indicator Display	<input type="text"/>
CONTROL BUTTON DEFINITION TABLE			
	FGBG B	Control Label	PLC Bit Reference
1			<input type="text"/>
2			<input type="text"/>
3			<input type="text"/>
4			<input type="text"/>

Figure 17-9 Control Button Definition Table

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

m q

To edit an existing variable-sized template, use the arrow keys at the Page Editor - Variable-Sized Template Mode to move the cursor to the variable-sized template's origin. Press <F1> to edit the variable-sized template, and the editor will immediately appear on the screen.

To exit the Bar Variable-Sized Template Editor and return to the Page Editor- Variable-Sized Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When a form is completed, you will have gathered all the information you will need for this particular variable-sized template.

BAR VARIABLE-SIZED TEMPLATE EDITOR

Bar Direction: Up, Down, Left or Right Bar

Height: _____

Bar Width: _____

Bar Intensity/Color: _____

Erase Intensity/Color: _____

Device Name (22 char): _____

Maximum Calibration (6 char): _____

Minimum Calibration (6 char): _____

Value Expression (70 char): _____

High Alarm Expression (70 char): _____

Low Alarm Expression (70 char): _____

Deadband Range (0-99%): _____

Alarm Acknowledgement: Yes or No

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char): _____

Target Word Address (18 char): _____

Password Protection NONE KEY _____ B _____ A or B

If BUTTONS,

Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Chapter 18

Display Template and Display Variable-Sized Template Editors

In this chapter, you will learn:

- How Display Templates and Display Variable-Sized Templates can be used
- How to define a Display Template and a Display Variable-Sized Templates
- How to edit existing Display Templates and Display Variable-Sized Templates
- How to return to the Page Editor

Functions of Display Templates

Display Templates are designed to be used like LED or LCD message units or displays. They are most effective when used for informational messages and not as alarm messages. Three independent lines of text can be written in a Display Template, with each line consisting of up to 65 characters. The Message Library will hold up to 100 lines for the PanelMate Series 2000 with 10 pages, PanelMate Series 2000 Color with 10 pages, and PanelMate Series 3000 with 10 pages. If you have a PanelMate Series 4000 with 10 pages, the Message Library will hold up to 250 lines. If your PanelMate unit has 30 pages, the Message Library will hold up to 500 lines. This single editor is used to define all the characteristics of a Display Template including its location, size and all control functions. The following section describes how each field in this editor relates to the template, and what the appropriate field entries might be. Refer to the following figure as needed.

Message Expressions:

Line 1

Line 2

Lane 3

Indicates Button Control

Figure 18-1 Display Template

The actual creation of the message is performed in the Message Library Editor. To access the Message Library Editor, you must exit the Display Template Editor and the Page Editor - Template Mode, then press <F3> to enter the Message Library Editor. The Message Library Editor is discussed further in Chapter 21. The following figure shows a representation of the Display Template Editor. Each of the fields which compose the spreadsheet is reviewed in the following sections. Note that if you have a PanelMate Series 4000, you will have five lines in the Control Buttons Definition Table.

DISPLAY TEMPLATE EDITOR

Template Size

Line

1 2

3

Message Expression

Test Message

CONTROL BUTTON DEFINITION TABLE

FG BGB

Control Label

PLC Bit Reference

1

2

3

4

Figure 18-2 Display Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. T the text. Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field, cursor to the field and press <Return>. Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

Option Windows display all possible choices and will cursor over selections which are not permissible choices based upon your current configuration.

To exit the Display Template Editor page, press <F10>.

Template Type _____

The selections available are 3WIDE, 4WIDE, or 5WIDE. When placing the template on the page, the cell cursor is always the leftmost cell of the template. A 3WIDE template will display a message length of up to 36 normal font characters. A 4WIDE template message length will display up to 49 characters and a 5WIDE template will display up to 62 characters.

Message Expression

This field accepts up to 70 characters. The result of this expression should be a number from 1 to 100 for the PanelMate Series 2000 with 10 pages, PanelMate Series 2000 Color with 10 pages, and PanelMate Series 3000 with 10 pages. If you have a PanelMate Series 4000 with 10 pages, the result of this expression should be a number from 1 to 250. If your PanelMate unit has 30 pages, the result of this expression should be a number from 1 to 500. This number is the number of the message that will be displayed in the Display Variable-Sized Template. If the Message Expression results in a number greater than permitted or less than 0 when running online, the previously displayed message will be erased.

When a message expression results in an invalid equation (e.g., division by a value of zero, square root of a negative number, etc.), no message will be displayed on the screen. If a message expression previously resulted in a valid value, but in a later scan resulted in an invalid equation, the previously displayed message will be erased.

The value of this expression selects which message will be displayed. Note that the lines are numbered 1, 2, and 3 to the left of the Message Expression field. There is one message expression for each line.

If you wish to display a message based on a bit, multiply the bit reference times the message number to produce the message number. For example, to display message #25 when bit [127 14] is on, enter in the Message Expression Field: [127 14]*25

The message expression could be as simple as a word reference (e.g., [253]) or a mathematical expression which would solve to a value corresponding to a message number (e.g., [254]+12). The message expression may contain multiple PLC references. Note that the preceding examples are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

When the Message Expression is true, embedded references are updated on the screen and not sent to the printer. Messages configured for BOTH or PRINTER are sent to the printer when the Message Expression changes and also when changing pages.

Note When going to a new page that has non-global messages, messages set for PRINTER or BOTH will print once for each PLC reference in the message expression.

Note Non-global messages on a page set for PRINTER or BOTH will print when returning from the Alarm Page, Directory Page, Screen Blanking, and when pressing the control button labeled "Enable Fault Relay", since these actions are treated as page changes.

When running online, if the message expression results in a value less than 0 or greater than permitted, then the previously displayed message will be erased.

Refer to Chapter 15 for a list of available conditions and operators.

Test Display

To see something in the Display Template during configuration, you may insert a message number in the test message field. The message corresponding to that number will be displayed on the template line you designated. If there is no message defined for that number, nothing will appear.

Note that when you return to the Page Editor, only Message 1 will be displayed, regardless of the message numbers listed in the Test Display fields. To fully test a Display Template, you must test in Run Mode.

The Message Library, described in Chapter 19, is used to define messages.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all control buttons. Simply leave a line blank if you do not want a control button at that location.

If a control button is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in the field (including a logical NOT).

Editing Existing Templates

To edit an existing template, use the cursor arrow keys in the Page Editor - Template Mode to select the template to be edited and press <F1>. The Display Template Editor will immediately appear on the screen with the fields filled in as you last saved them for the selected template.

ExF~~~

E-

To exit the Display Template Editor and return to the Page Editor - Template Mode, press <F1 O>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The forms provided on the following pages may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the forms are completed, you will have gathered all the information you will need for this particular template.

DISPLAY TEMPLATE EDITOR

Template Size: 3WIDE or 4WIDE or 5WIDE

Line	Display Expression (70 char)	
1		
2		
3		

Control Label Button FG BG B (33 char)				PLC Bit Reference (18 char)
1				
2				
3				
4				

- Note** Use <Ctrl> <m> to insert a carriage return in text fields.
- Note** If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Functions of the Display Variable-Sized Template

The Display Variable-Sized Template Editor is similar in function and purpose to that of the Display Template Editor. Display Variable-Sized Templates are designed to replace LED or LCD message units or display readouts. They are most effective when used for informational messages (e.g., prompting or diagnostic information).

The actual creation of the message is performed in the Message Library Editor. To access the Message Library Editor, you must exit the Display Template Editor and the Page Editor - Variable-Sized Template Mode, then press <F3> to enter the Message Library Editor. The Message Library Editor is discussed further in Chapter 19.

The following figure shows a representation of the Display Variable-Sized Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections.

DI SPLAY VARI ABLE-SI ZED TEMPLATE EDITOR

Display Length

Message M

Direction

Message Expression

Test Message Global

Control Indicator Position

Control Indicator Display

CONTROL BUTTON DEFINITION TABLE

	FS	BG	B	Control Label	PLC Bit Reference
1					
2					
3					
4					

Figure 18-3 Display Variable-Sized Template Editor

Display Length

The Display Length field determines the maximum length of the message which can be displayed. The limits are 65 characters when the message field is displayed horizontally and 20 characters when the field is displayed vertically.

Direction

The Direction field determines the orientation in which the message is displayed. The Display Variable-Sized Template may be displayed in a left-to-right or top-to-bottom orientation. Using the Option Window, press the arrow key to choose between the selections of Vertical and Horizontal.

Message Expression

This field accepts up to 70 characters. The result of this expression should be a number from 1 to 100 for the PanelMate Series 2000 with 10 pages, PanelMate Series 2000 Color with 10 pages, and PanelMate Series 3000 with 10 pages. If you have a PanelMate Series 4000 with 10 pages, the result of this expression should be a number from 1 to 250. If your PanelMate unit has 30 pages, the result of this expression should be a number from 1 to 500. This number is the number of the message that will be displayed in the Display Variable-Sized Template. If the Message Expression results in a number greater than permitted or less than 0 when running online, the previously displayed message will be erased. The value of this expression selects which message will be displayed.

When a message expression results in an invalid equation (e.g., division by a value of zero, square root of a negative number, etc.), no message will be displayed on the screen. If a message expression previously resulted in a valid value, but in a later scan resulted in an invalid equation, the previously displayed message will be erased.

If you wish to display a message based on a bit, multiply the bit reference times the message number to produce the message number. For example, to display message #25 when bit [127 14] is on, enter in the Message Expression Field: [127 14]•25

The message expression could be as simple as a word reference (e.g., [253]) or a mathematical expression which would solve to a value corresponding to a message number (e.g., [254]+12). The message expression may contain multiple PLC references. Note that the preceding examples are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

When the Message Expression is true, embedded references are updated on the screen and not sent to the printer. Messages configured for BOTH or PRINTER are sent to the printer when the Message Expression changes and also when changing pages.

Note When going to a new page that has non-global messages, messages set for PRINTER or BOTH will print once for each PLC reference in the message expression.

Note Non-global messages on a page set for PRINTER or BOTH will print when returning from the Alarm Page, Directory Page, Screen Blanking, and when pressing the control button labeled "Enable Fault Relay", since these actions are treated as page changes.

When running online, if the message expression results in a value less than 0 or greater than permitted, then the previously displayed message will be erased.

Refer to Chapter 15 for a list of available conditions and operators.

Test Message

To view a message on the page during configuration, a message number may be entered into the Test Message field. The message corresponding to this number will be displayed at the variable-sized template's origin. If there is no message defined for that number, nothing will appear.

Note that when you return to the Page Editor, a default message (MessageMessageMessage) will be displayed regardless of the message number listed in the Test Message field.

Global Displays

Normally, only Display Variable-Sized Templates on the currently-visible page are monitored during online operation. The PanelMate unit may also be configured to monitor Display Variable-Sized Templates from pages that are not visible. These variable-sized templates are considered Global. To make a Display Variable-Sized Template global, set the Global field to Y. Any Global Message triggered during online operation will be sent to the printer if they have destination settings of Printer or Both. Global Messages are not sent to the screen if the page where they were configured is not visible.

Global Messages will only print when the Message Expression changes, not when the embedded references change. Note when changing to a page with Global messages, the Global Message will not print. If a hard-coded value (e.g. 100) is placed in the Message Expression, the Global Message will only print once at bootup.

Control Indicator Position

The Control Indicator fields are used to position the control indicator arrow to the most convenient, visible location near the Display Variable-Sized Template. The available selections for the Control Indicator Position are: Above, Below, Left and Right.

The Control Indicator Display field is used to determine if the arrow is always visible or visible only when the variable-sized template is selected.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button and line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all control buttons. Simply leave a line blank if you do not want a control button at that location.

If a control button is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in the field (including a logical NOT).

Editing Existing Variable-Sized Templates

To edit an existing variable-sized template, use the arrow keys at the Page Editor to move the cursor to the variable-sized template's origin. Press <F1> to edit the variable-sized template, and the editor will immediately appear on the screen.

Exit the Display Variable-Sized Template Editor

To exit the Display Variable-Sized Template Editor and return to the Page Editor, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The forms provided on the following pages may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the forms are completed, you will have gathered all the information you will need for this particular variable-sized template.

DISPLAY VARIABLE-SIZED TEMPLATE EDITOR

Direction: Horizontal or Vertical

Message Expression (70 char) Test Message Global

Control Indicator Position: Above, Below, Left or Right

Control Indicator Display: Always or Selected

Button	FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Chapter 19

Message Library Editor

In this chapter, you will learn:

How to add or edit text messages

Message Library

The Message Library Editor is entered from the Page Editor Main Menu. The Message Library defines the contents, the text intensity or colors, and blink characteristics, the character sizes, and the destination of one-line messages. The PanelMate Series 2000 with 10 pages, PanelMate Series 2000 Color with 10 pages, and PanelMate Series 3000 with 10 pages will support a maximum of 100 messages. If you have a PanelMate Series 4000 with 10 pages, the Message Library will support a maximum of 250 messages. If your PanelMate unit has 30 pages, the Message Library will support a maximum of 500 messages. Note that each line of text is totally independent, so care must be taken when making intensity or color and character size selections. It is possible for quad or double-high character lines to interfere with each other. Therefore, be sure to test all message combinations that you expect to use before going online.

F1=	F2=	F3=PREVIOUS	F4=NEXT	F5=
F6=MEM	FREE	F7=	F8=	Fg=SAVE
				F10=EXIT

Figure 19-1 Message Library Editor Main Menu

<F3> =PREVIOUS allows you to scroll back to the previous 15 messages
<F4> = NEXT allows you to scroll forward to the next 15 messages

Each of the fields which compose the Message Library are reviewed in the following sections.

Msg# (Message Number)

All the messages are listed in numerical order. By pressing <Return>, you may enter the Message Number you wish to access in this field to scroll through the listing.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the message text. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Not Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Message Text

Up to 65 characters can be displayed on a full screen width message. The message placement will determine the number of characters used.

Char Size (Character Size)

This field selects the character font for the entire message. The selections available are NORM (normal), DHIGH (double-high), or QUAD.

Destn (Destination)

It is possible to have the message sent to a printer, as well as displayed on the page. The selections available are SCREEN, PRINTER or BOTH.

Note about the representation area

The currently selected message is displayed in the representation at the top of the page. This area also shows a line denoting the width of a 3WIDE, 4WIDE, and 5WIDE Display Template to assist in message alignment. A 3WIDE template will display a message length of up to 36 normal font characters. A 4WIDE template will display a message length of up to 49 normal font characters and a 5WIDE template will display a message length of up to 62 normal font characters. The visual representation area shows where the right edge of the display template will display the last character.

Register References Within Messages

Within the PanelMate unit, users may reference PLC register locations within a message in order to display the numeric register content within the message. Users may employ the following format to display the contents of the registers. You may have up to five register references within a message.

Note that if a value is too large to display in the specified format width, a string of Xs (XXXXX) will be displayed for the value. For example, if a message was defined as three characters in length, but the value to be displayed was four characters, XXX would be displayed for the value.

When the Message Expression is true, embedded references are updated on the screen and not sent to the printer. Messages configured for BOTH or PRINTER are sent to the printer when the Message Expression changes and also when changing pages. Note if a hard-coded value (e.g., 100) is placed in the Message Expression designated as Global, the message will only print once at startup.

General Format Expression

Note A message containing multiple PLC references will print to the screen or printer multiple times -- once for each reference in the message.

\$tw.d(expression)

where-

\$ = format indicator

t = type of numeric display

I Integer display

D Floating decimal point real value display

H Hexadecimal display

O Octal display

B Binary display

F Fixed decimal point real value display

E Exponential display

A ASCII character display

w = total field width including decimal point, negative sign (-), and positive sign (+)

= separator between width of format and the number of decimal places (used with F or E format)

d = number of decimal places (used with F or E format)

Format type D (floating decimal point) permits the decimal point to float in the display depending on the registers value. This contrasts with the format type F (fixed decimal point), which formats a value with a fixed decimal location. Format type F may be useful when creating a column of values.

Note Floating decimal point format type should not be confused with floating point mathematics or floating point data types.

Each format has a maximum number of digits it can display. A number cannot be completely displayed if the format description is too small. The following are the width limits for each format type.

111	=	Largest Integer value width is 11
H8	=	Largest Hexadecimal value width is 8
011	=	Largest Octal value width is 11
B32	=	Largest Binary value width is 32
D65	=	Largest Floating Decimal Point value width is 65
F65.d	=	Largest Fixed Decimal Point value width is 65
E65.d	=	Largest Exponential value width is 65
A	=	Largest ASCII character width is 2. (The least significant 16 bits are used in the following order: high byte, low byte). When using both characters, verify that the PanelMate unit's default format is capable of reading numbers which use the high byte. An alternate word reference format may be necessary, i.e., #U16. d
	=	decimal places

For example, if the message is:

"Current tank level is \$13([123]) gallons.", and the value in register 123 is 567, then the appearance of the message on the screen would be:

"Current tank level is 567 gallons." If

the message is:

"Production rate per press is \$D5([456]/17) units per hr.", and the value in register 456 is 7890, then the appearance of the message on the screen would be:

"Production rate per press is 464.1 units per hr." If

the message is:

"Part name in line1 is \$A([200#U16]) ", and the value in register 200 is 16693, the message will display the following:

"Part name in line1 is A5".

Note With the #U16 format, the PanelMate unit can read and display the ASCII equivalent of 16693.

Decimal-Based Formats

The decimal-based format types are:

1. Integer
2. Floating decimal point real value 3.
- Fixed decimal point real value 4.
- Exponential

It should be noted that all the decimal-based numeric formats are right justified and padded with leading blanks, if necessary. If a value for a decimal format has too many digits for the specified format size, *then the presentation will have "k" placed in it for the width of the format specified in the format code.*

Decimal Place Formats

For fixed decimal point format (F), the number for the total width of the formatted value (w) must be at least one greater than the number of decimal places (d). If negative values will be displayed, "w" must be at least two greater than "d".

For the exponential format (E), the total width of the formatted value (w) must be at least eight greater than the number of decimal places (d).

Binary-Based Formats

The binary-based format types are:

1. Hexadecimal
2. Octal 3. Binary

For binary-based formats, digits will be inserted for the entire width of the format size; there is no blank padding. If a value for a binary format has too many digits for the specified format size, the most significant digits of the value will be truncated until the number will fit in the size specified.

Example:

value = 300	
Presentation with H4 format:	012C
Presentation with H2 format:	2C

The following table shows examples of the different formatting types. The data type, actual data, and visual appearance are shown. The heading on the column for visual appearance marks 13 column locations to help reference the placement of characters.

Type	Data	Columns 21234HZB2012
15	324	324
14	521	5 2 1
12	-8.73	- 9
13	7321	* *
14	824.67	825
D7	421.45	421 . 450
D4	23.45	2 3 . 5
H3	255	0 F F
H5	-255	F F F 0 1
H2	300	2 C
O4	54	0066
O3	88.45	1 3 0
O1	21	5
B9	100	001100100
B4	86	0 1 1 0
F5.1	523.46	523 . 5
F10.4	253.21	253 . 2 100
F5.2	326.23	* * * * *
F8.3	-43.888	- 43 . 8 8 8
F5.0	397.52	398
E12.3	-324.1	- 3 . 24 1 E+ 0 2
E13.2	0.06734	6. 7 3E - 0 2
E9.0	156.2	2E+ 0 2
D4	999.89	1 0 0 0
D6	6245.21	6245. 2
D1	0.04	0
D1	9.12	9
D4	82345.2	
D3	-1.444	- 1
F7.3	619.52	6 1 9.520
F7.2	619.52	6 1 9. 5 2
F6.2	619.52	61 9 . 5 2
F5.3	619.52	
F5.1	619.52	61 9 . 5
D7	619.52	6 1 9.520
D6	619.52	6 1 9.52
D5	619.52	6 1 9 . 5
D4	619.52	620
D3	619.52	620
E12.4	619.52	6.1952E+0 2
E12.3	619.52	6.195E+02
A	16693	A 5

Table 19-1 Formatting Types

Clock and Calendar Access

The internal clock of the PanelMate unit may be included in messages sent to the screen and/or printer. The Clock and Calendar Access formats are as follows: \$(mon) month

\$(day) day

\$(year) year

\$(hour) hour (24 hour time format)

\$(min) minutes

\$(sec) seconds

\$(time) hour:minute:second

\$(date) month/day/year

\$(clk) hour:minute:second month/day/year

Note:

1. A single message may contain up to five Clock/Calendar and register calls. 2.

Parameter names are not case sensitive.

3. This information is not dynamically updated.

Save <F9>

Press <F9> to save the Message Library without exiting the editor.

Exit the Message Library Editor

To exit the Message Library Editor and return to the Page Editor, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The forms provided on the following pages may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the forms are completed, you will have gathered all the information you will need for the message library.

MESSAGE LIBRARY EDITOR

Msg#	FG	BG	B	Message Text (65 char)	Size	Char Destn

Chapter 20

Table Template Editor

In this chapter, you will learn:

- How Table Templates can be used
- How to define a Table Template
- How to edit existing Table Templates
- How to return to the Page Editor

Functions of Table Templates

Table Templates are designed to display a table of values and accept numeric entry for all of the items in the table. Table Templates may be used for machine setup or recipe entry or for any application requiring the high density display and entry of information. Refer to the figure below.

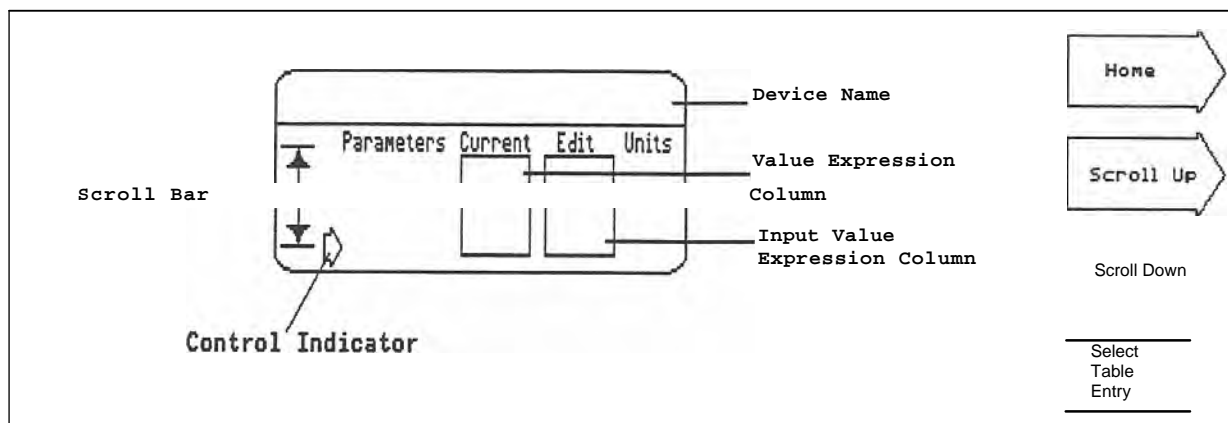


Figure 20-1 Table Template
A template may support up to 50 independent entries. Each entry has a tag name, current value, edit value, and a units field. The template has built-in scroll capabilities to allow you to select the desired entry field. A scroll indicator is built into the left side of the template to indicate "top" and "bottom" which are signified by stop bars and "more" items which are identified by up or down arrows. The control buttons on the right of the screen permit up/down scrolling, return to home or open a selected field for numeric entry. Each of the fields which compose the spreadsheet is reviewed in the following sections. The control indicator at the bottom left of the template indicates control is available for a particular entry. You can configure each entry for numeric entry or just for display.

The following figure shows a representation of the Table Template Editor.

TABLE TEMPLATE EDITOR					
1				N	
Parameters	Current	Edit	Units	Template Size	
				Device Name	
				Parameters Tag	
				Current Value Tag	
				Edit Value Tag	
				Units Tag	
Password Protection					
TABLE ENTRY DEFINITION TABLE					
Value Parameters	Expression	Dec. Pt.	Input Value Expression	Target Word Address	Units

* Press F3 to scroll previous entries, F4 for next, F7 to display.

Figure 20-2 Table Template Editor

Template Size

The selections available are 1HIGH, 2HIGH or 3HIGH and 2WIDE or 3WIDE.

Note The height of the table template determines the number of table entries that may be displayed at one time. One table entry is comprised of one line below the column title line. For a single-high template, two entries may be displayed, for a double-high template, nine entries, and for a triple-high template, sixteen entries.

Device Name

The field accepts up to 65 normal-size characters in two lines. Only normal-size characters are used in this field. Use <Ctrl> <m> to insert a carriage return and the space bar to add spaces if you wish to center the device name. Note that a 2WIDE template will only display up to 48 characters.

Parameter Tag

This field accepts up to 18 normal-sized characters which will display as the title for the Parameter column. Note that a 2WIDE template will only display 12 characters.

Current Value Tag

This field accepts up to seven normal-size characters which will display as the title for the Current Values column. These are the values which are read from the PLC. See the Value Expression section for more information. Note that a 2WIDE template will only display six characters.

This field is only displayed in a 3WIDE template. Up to six normal-size characters will display as the title for the Edit Values column. These values are the operator's input. The Edit Value Tag values are displayed until the table template is re-selected or when the page is first displayed. See the Input Value Expression section for more information.

Units Tag

This field accepts up to five normal-size characters which will display at the title for the Units column.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to the PanelMate unit. The selections available are None, Key Only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B.

Protection is selected for the entire template and not the individual items. Password protection must be validated each time the table template is selected for numeric entry of an Edit Value field.

Table Entry Definition Table _____

The Table Entry Definition Table allows you to configure up to 50 independent display/entry fields. Each item has a separate label, read value, write value and unit descriptor. Line 1 of the table corresponds to the first item, line 2 corresponds to the second, etc. The Sample Template displays only two items to assist in the layout of your text. To view a full online representation press <F7>. You can use the arrow keys on the full view page to scroll the items for test purposes. The editor screen displays the first ten items. You can display the next five entries by pressing <F4> to scroll to the next page of entries. Use <F3> to scroll to the previous five entries.

It is not necessary to use all 50 items. When the PanelMate unit goes online the scroll will stop at the last completed entry. You may leave blank lines in the table and use lines for display purposes only.

Parameter Column

The fields in this column accept up to 18 normal-size characters which is the descriptor for each individual table entry. Note that a 2WIDE template will only display 12 characters.

Note The parameter field information will only be stored to disk if there is a number in the Value Expression Column. For test purposes a 1 may be entered in that column to cause the parameter text to be saved.

Value Expression (

This is the expression for the value that will be displayed in the field. This field accepts up to 45 characters.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parentheses may be used to change the order of operations.

The following examples of expressions are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

[123]

The expression could be as simple a single word reference. This example references word 123.

[(123)*10]+[124]

This is a mathematical expression that includes PLC references and constants that will solve to a value.

[name1,242]+[name2,243]

Also, information from multiple PLCs may be included in the same expression. In this expression, word 242 in PLC name1 is added to word 243 in PLC name2.

Note Refer to Chapter 15 for a list of available conditions and operators.

Dec. Pt.

Open this field and use the up/down cursor keys to select a value from 0-5. This value will position the decimal point for the Current Value field and the Edit Value field.

Input Value Expression Column

This expression is any mathematical expression that must be performed on the operator's input before the number is stored in the PLC. A question mark inside brackets, [?], is used to designate the variable operator input. The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. The < > operators can be used for ranging (refer to the example below). Parentheses may be used to change the order of operations.

This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field. If you wish to limit the range of entry permitted by the operator, an expression can be used. Refer to the following example.

Example: $[?]*([?]>=0)\`([?]<=100)+([?]<0)*[123]+([?]>100)-$

[123] Target Word Address: [123]

The expression in the example will limit entries between 0 and 100 to the PLC register. Entry of any value outside this range will have no effect on the value in the register.

Note Refer to Chapter 15 for a list of available conditions and operators.

If an expression is defined for an individual entry a small arrow will be displayed in the lower left corner of the template to indicate that numeric entry is available while the template is selected.

Target Word Address Column

This field defines the location of the operator's input in the PLC, as the result of the Input Value Expression.

This field accepts up to 18 characters.

As an example, to store a value in register 364 as a signed, 16-bit integer, use the following Target Word Address:

[364#s16]

The example above is shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

Editing Existing Templates

To edit an existing template, use the cursor arrow keys in the Page Editor - Template Mode to select the template to be edited and press <F1>. The Table Template Editor will immediately appear on the screen with the fields filled-in as you last saved them for the selected template.

Exit the Table Template Editor

To exit the Table Template Editor and return to the Page Editor - Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When a form is completed, you will have gathered all the information you will need for this particular template.

TABLE TEMPLATE EDITOR

Template Size 1 or 2 or 3 HIGH, 2 or 3 WIDE

Device Name (22156 char): _____

Parameters Tag (12/18 char)

Current Value Tag (617 char)

Edit Value Tag (0/6 char)

Units Tag (5/5 char)

Password Protection None -Key- **A_13 .A or B**

TABLE ENTRY DEFINITION TABLE

#	Parameters	Value Expression	Dec. Pt.	Input Value Expression	Target Word Address	Units

Chapter 21

Trend Template Editor

In this chapter, you will learn:

- How Trend Templates can be used
- How to define a Trend Template
- How to edit existing Trend Templates
- How to return to the Page Editor

Functions of Trend Templates

Trend Templates are designed to collect, store, and represent data in a manner that provides a historical perspective on how a single data point has changed and some insight on how the data point may behave in the future.

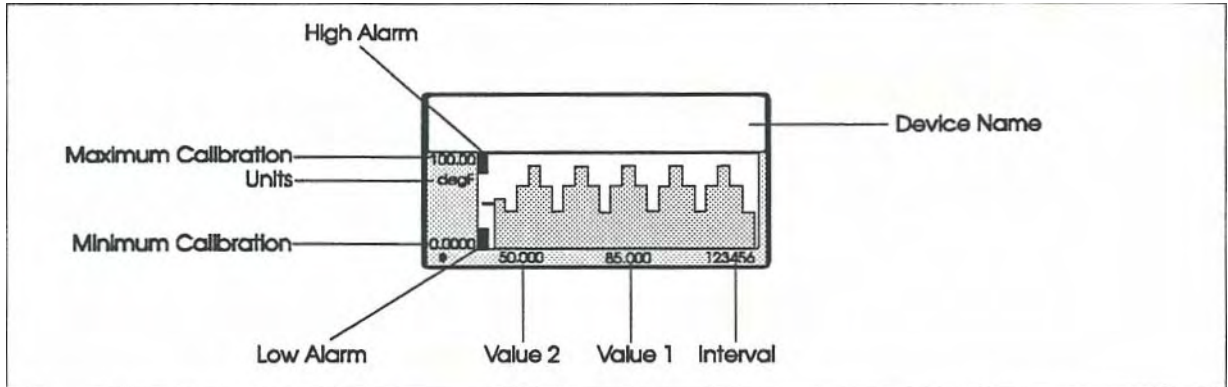


Figure 21.1 Trend Template

This trend graph can show current value, setpoint, and high and low alarm levels. The current value and setpoint are displayed digitally.

This single editor is used to define all the characteristics of a Trend Template including the trend's upper and lower limits, setpoint position, high and low alarm limits, and all control functions. (Note that all the field intensities and colors are fixed for Trend Templates.) The following section describes how each field in this editor relates to the template and examples of field entries.

The following figure shows a representation of the Trend Template Editor. Each of the fields which compose the spreadsheet is reviewed in the following sections. Note that if you have PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Figure 21-2 Trend Template Editor

To edit a text field, cursor to the field and press <Return> to open the field. Type the text.

Press <Return> to close the field or <Esc> to revert to the old value.

Other fields have Option Windows which pop-up on the screen. To edit this type of field, cursor to the field and press <Return>.

Use the cursor keys to scroll through and highlight your selection. Press <Return> to accept the change or <Esc> to revert to the previous value.

Option Windows display all possible choices and will cursor over selections which are not permissible choices based upon your current configuration.

To exit the Trend Template Editor page, press <F10>.

The selections available are 1HIGH/2WIDE, 1HIGH/3WIDE, 2HIGH/2WIDE, 2HIGH/3WIDE, 3HIGH/2WIDE, or 3HIGH/3WIDE.

Note The width of the trend template determines the number of trend samples that may be displayed at one time. For a double-wide template, 16 trend samples may be displayed. For a triple-wide template, 29 trend samples may be displayed.

Device Name

The field accepts up to 65 normal-size characters in two lines. Only normal-size characters are used in this field. Use <Ctrl> <m> to insert a carriage return and the space bar to add spaces if you wish to center the device name. Note that a 2WIDE template will only display up to 48 characters.

Units

This field accepts up to 6 normal-sized characters which will display the value type.

Trigger T\,

The selections available are INTERVAL, DISCRETE, and CHANGE. The selections are explained below.

INTERVAL	The trend value will be sampled when a time period has elapsed. The Interval in conjunction with the Trend Scan Delay designates the time interval between trend samples. The following equation is used to calculate the time interval between trend samples: $\text{Trend Scan Delay} \times \text{Interval} = \text{Sample Rate}$ For example, if the Trend Scan Delay is 2 seconds and the Interval is 3, the sample rate will be 6 seconds.
DISCRETE	A trend value is sampled when an external value (i.e., a bit reference in the PLC) changes resulting in the Interval Expression value to change from false to true.
CHANGE	The trend value will be sampled when the Value 1 Expression (trend value) changes.

Note If DISCRETE or CHANGE is selected, the Interval field will not be displayed in the lower right of the trend template.

Maximum Calibration

This is a 6-character field that accepts 6 digits, or 5 digits with a decimal point placed anywhere in the field.

The Maximum Calibration is the value that defines the highest point of the trend. This value will appear on the template.

Minimum Calibration

This is a 6-character field that accepts 6 digits, or 5 digits with a decimal point placed anywhere in the field.

The Minimum Calibration is the value that defines the lowest point of the trend. This value will appear on the template.

Value 1 Expression

If you have a PanelMate Series 2000 or a PanelMate Series 3000, Value 1 is the value that will be displayed as a no intensity horizontal bar in the lower center of the template. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, Value 1 is the value that will be displayed as a green horizontal bar in the lower center of the template. This field accepts up to 70 characters.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parenthesis may be used to change the order of operations.

The following examples of expressions are shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

[123]

The expression could be as simple as a single word reference. This example references word 123.

$([123]*10)+[124]$

This is a mathematical expression that includes PLC references and constants that will solve to a value.

[name1, 242]+[name2, 243]

Also, information from multiple PLCs may be included in the same expression. In this expression, word 242 in PLC name1 is added to word 243 in PLC name2.

Note Refer to Chapter 15 for a list of available conditions and operators.

If you have a PanelMate Series 2000 or a PanelMate Series 3000, Value 2 is the value that will be displayed as a high intensity bar to the left of the Value 1 bar. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, Value 2 is the value that will be displayed as a white horizontal bar to the left of the Value 1 bar. It is most often used as the setpoint for the device.

The expression entered here may include as many PLC word or bit references as needed, as well as mathematical operations. Parentheses may be used to change the order of operations.

This optional field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Interval Expression

If the trigger type is INTERVAL, the result of the Interval Expression multiplied by the Trend Scan Delay (set in the PLC Name and *Port Table*) determines the trend value sample rate.

The sample rate can range from 1 to 2,147,483 seconds. For example, if the Trend Scan Delay is configured for 2 seconds and the Interval Expression evaluates to 5, the trend will be updated every 10 seconds. If the resulting sample rate is 0, the data collection for the trend template will be disabled. If the Trend Scan Delay is 0, it is assumed as 1 second when calculating the sample rate.

Note If an interval is selected that is too rapid for the PanelMate unit or PLC to keep up with the request, a blank bar will appear where any interval has been missed. Low sample values might also cause a blank bar to appear. To distinguish a low sample value from a missed interval, configure the minimum calibration lower than the lowest expected minimum value.

If the trigger type is DISCRETE, the trend will be sampled when the result of the Interval Expression changes from false to true.

If the trigger type is CHANGE, the Interval Expression field cannot be edited.

If you have a PanelMate Series 2000 or a PanelMate Series 3000, Interval is the value that will be displayed as a medium intensity horizontal bar to the right of the Value 1 bar. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000, Value 2 is the value that will be displayed as a blue horizontal bar to the right of the Value 1 bar. Note that if the Trigger Type field is not set to INTERVAL, this field is not displayed in the trend template.

The expression entered here may include multiple PLC word or bit references. Mathematical operations that may be used are multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

High Alarm Expression

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The results of the High Alarm Expression are compared to the results of the Value 1 Expression. If you have a PanelMate Series 2000 or PanelMate Series 3000 and Value 1 exceeds the high alarm, an alarm message will be placed in the alarm list and the trend sample whose value is in alarm will be displayed in high intensity. The trend sample will continue to be displayed in high intensity as other trend samples are being collected. A High Alarm bar is shown in high intensity to the left of the trend template. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000 and Value 1 exceeds the high alarm, an alarm message will be printed in the alarm window of the page that is currently in view and the trend sample whose value is in alarm will be displayed in red. The trend sample in alarm will continue to be displayed in red as other samples are being collected. A High Alarm bar is shown in red to the left of the trend template.

The expression entered here may include multiple PLC word or bit references. Mathematical operations that may be used are multiplication, division, addition, and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Low Alarm Expression

This is an optional entry. If no alarm is desired for this device, leave this field blank.

The results of the Low Alarm Expression are compared to the results of the Value 1 Expression. If you have a PanelMate Series 2000 or PanelMate Series 3000 and Value 1 exceeds the low alarm, an alarm message will be placed in the alarm list and the trend sample whose value is in alarm will be displayed in high intensity. The trend sample will continue to be displayed in high intensity as other trend samples are being collected. A Low Alarm bar is shown in high intensity to the left of the trend template. If you have a PanelMate Series 2000 Color or a PanelMate Series 4000 and Value 1 exceeds the low alarm, an alarm message will be printed in the alarm window of the page that is currently in view and the trend sample whose value is in alarm will be displayed in red. The trend sample in alarm will continue to be displayed in red as other samples are being collected. A Low Alarm bar is shown in red to the left of the trend template.

The expression entered here may include multiple PLC word or bit references. Mathematical operations that may be used are multiplication, division, addition and subtraction. You may also enter a single constant value (e.g., 900) as an expression. Parentheses may be used to change the order of operations.

This field accepts up to 70 characters.

Note Refer to Chapter 15 for a list of available conditions and operators.

Deadband Range

The deadband range is an area below the high alarm value and above the low alarm value, that must be crossed before Value 1 is considered to have returned to normal status (go out of alarm). The deadband range prevents multiple alarm messages from being generated when Value 1 is hovering around an alarm threshold.

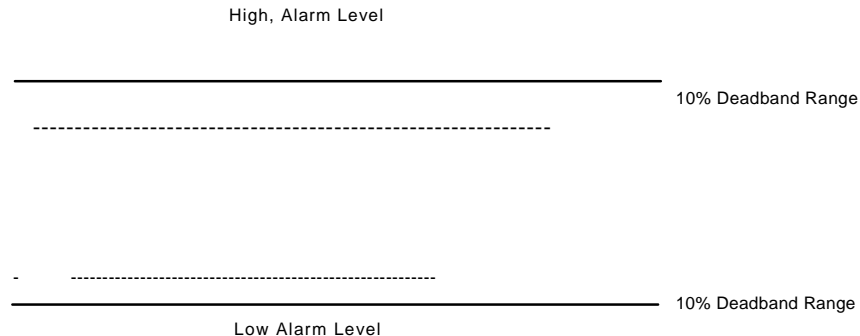


Figure 21-3 Deadband

This field accepts the numbers 0 through 99. These numbers represent the percentage of the high alarm value minus the low alarm value that defines the width of the deadband.

Alarm Acknowledgment

The selections available are Y (Yes) or N (No). This field will accept a Y or N. If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

Control Type

The selections available are NONE, NUMERIC, or BUTTONS.

A trend Template may be defined to show an analog graph without the operator being able to control it. For this type of template, select NONE.

Select NUMERIC if the operator will be directed to use the numeric keypad to enter a (setpoint) value. When this selection is made, three new fields will appear on the screen. These fields, Input Value Expression, Target Word Address, and Password Protection are described in the next section.

Select BUTTONS if the operator will be directed to use the control buttons to change a (setpoint) value. It is likely that you will use buttons labeled "increase" and "decrease", or a similar system, to change this value. When this selection is made, a Control Button Definition Table will appear on the screen. This table is described in the following section.

If either numeric or button control is defined, a small arrow will be displayed in the lower left corner of the template to indicate to the operator that a control function is available.

The numeric control definition consists of three entries, the Input Value Expression, Target Word Address, and Password Protection. The Input Value Expression is a mathematical expression that must be performed on the operator's numeric keypad input before the number is stored in the PLC. The Target Word Address is the PLC word reference that will store the result of the Input Value Expression. Password Protection will permit the selection of a layer of security for numeric entry if desired.

Figure 21-4 Numeric Control
Defintion Input Value
Expression

This field accepts up to 70 characters. If the operator input is to be entered in the PLC as-is, enter [?] in the field.

1: ([?]-
32)*5/9

The operator's input is changed from an entry of Fahrenheit to Celsius.

Example 2:

$[?]*([?]>=0)*([?]<=100)+([?]<0)*[123]+([?]>100)*[123]$

Target Word Address: [123]

The expression in Example 2 will limit entries between 0 and 100 to the PLC register. Entry of any value outside this range will have no effect on the value in the register.

Note Refer to Chapter 15 for a list of available conditions and operators.

Target Word Address

This field defines the location of the operator's input in the PLC as the result of the Input Value Expression.

This field accepts up to 18 characters.

As an example, to store a value in register 364 as a signed, 16-bit integer, use the following Target Word Address:

[364#S1 6]

The example above is shown using a generic format. Refer to the appropriate PLC chapter for more specific addressing formats.

Password Protection

It is possible to lockout access to numeric entry unless the operator provides the correct password or unlocks the security keyswitch wired to the PanelMate unit. The selections available are None, Key Only, Key and A, Key and B, Key and (A or B), A Only, B Only, or A or B. Password protection must be validated each time the template is selected for numeric entry.

This Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the *control button that is second from the top, etc. If is not necessary to use all control buttons*. Simply leave a line blank if you do not want a control button at that location.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC.. If a maintained input is desired, the bit may be latched in PLC logic.

Figure 21-5 Control Button Definition Table

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the control button. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces or a carriage return (<Ctrl> <m>) to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

Editing Existing Templates

To edit an existing template, use the cursor arrow keys in the Page Editor - Template Mode to select the template to be edited and press <F1>. The Table Template Editor will immediately appear on the screen with the fields filled-in as you last saved them for the selected template.

Exit the Table Template Editor

To exit the Table Template Editor and return to the Page Editor - Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When a form is completed, you will have gathered all the information you will need for this particular template.

TREND TEMPLATE EDITOR

Template Size: 1 HIGH/2WIDE or 1 HIGH/3WIDE or 2HIGH/2WIDE or 2HIGH/3WIDE or
3HIGH/2WIDE or 3HIGH/3WIDE

Device Name (48/65 char):

Units (6 char):

Trigger Type: INTERVAL or DISCRETE or CHANGE

Maximum Calibration (6 char):

Minimum Calibration (6 char):

Value 1 Expression (70 char):

Value 2 Expression (70 char):

Interval Expression (70 char):

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement:

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection NONE KEY A or B

If BUTTONS, Button

Control Label
(33 char)

PLC Bit
Reference (18 char)

FG	BG	B		
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Chapter 22

Graphic Editors

In this chapter, you will learn:

- How to use the Graphic Editor
- How to use the Character Editor
- How to create custom characters
- How to use the Symbol Editor
- How to create symbols which are a collection of characters
- How to use the Graphic Variable-Sized Template Editor
- How to add dynamic graphics

The Graphic Editors

When the Graphics Option is installed in the PanelMate unit, you have the ability to use custom characters, symbols, and to add dynamic graphics to your pages. If you have selected the Graphics Option when entering the Configuration Editor, you will have access to the Character Editor, Symbol Editor, and Graphic Variable-Sized Template Editors. This chapter explains each of these editors.

Note The Graphic Variable-Sized Template Editor is explained in this chapter although it is actually entered from the Page Editor - Variable-Sized Template Mode.

Character Editor

The Character Editor provides the ability to create custom characters by defining the 8 x 16 pixel bit-map for each character. This editor permits you to create a new character or edit an existing character while still viewing any page layout on a VGA system.

Within the PanelMate unit, there are four fonts or sets of characters. These are Normal, Double High, Quad, and Graphic. A font is actually a list of 128 characters whose shapes are defined by a pixel-map and are configured in a user-defined arrangement within the Character Editor. The character is arranged in an 8 x 16 matrix of pixels, where you define which pixels are ON or OFF. The Quad font and Double High font can be redefined. The Graphics font has 26 characters which can be redefined (this includes the 13 center-line drawing characters), and the ten International Characters in the Normal font can also be redefined.

With a VGA monitor, a work area is displayed at the right side of the configured page, to allow viewing of the original page during editing. The information provided in the Character Editor includes: the font type currently available for editing; the specific keyboard recall character currently selected for editing; the actual sized character; and an 8 x 16 matrix of dots representing the pixels in a character cell, in expanded format.

On a non-VGA system, the work area is located in the center of the screen flanked by two other recall characters to aide in the alignment process. A non-VGA system does not have the ability to show the online representation of the font characters.

The first step in editing an existing character or creating a new one for the currently selected font is to select the keyboard recall character to be referenced. You select a character by pressing the key on the keyboard (recall character). If an actual character has already been created and assigned to a recall character, the actual character will be displayed.

F1=EDIT	F2=FONT	F3=COPY	F4=	F5=DELETE
F5=	F7=SHOW FNT	FB=RESTORE	FQ=SAVE	F1D=EXI T

Figure 22-1 Character Editor - Select Mode Menu (VGA System)

The editing functions available from keys <F1> through <F10> in the Character Editor - Select Mode are as follows.

Edit

Press <F1> to enter the Character Editor - Edit Mode. This function provides access to other function selections which permit editing the pixels in the 8 x 16 cell matrix of the character already chosen. The VGA Mode and non-VGA Modes are explained in the following sections.

VGA Mode

F1=CHANGE	F2=CLEAR	F3=INVERT	F4=	F5=
F6=PEN UP/DOWN	F7=SHOW FLATS	FB=RESTORE	F9=	F10=EXIT

Figure 22-2 Character Editor - Edit Mode Menu (VGA Mode)

The Edit Mode functions include:

ARROW	The keyboard direction arrows are used to move a "cursor" pixel around the 8 x 16 matrix.
KEYS <F1> CHANGE	
<F2> CLEAR	This key is a toggle which either lights or unlights the pixel at the cursor pixel's current location. A lit pixel represents it as foreground, while an unlit pixel represents it as background.
<F3> INVERT	This key clears (erases) the entire matrix. This key causes all pixels in the 8 x 16 matrix to change to the state opposite the current one: all of those which are ON turn OFF; all OFF turn ON.
<F6> PEN UP/DOWN	This key toggles the pen between UP and DOWN. With the PEN DOW each cursor movements with the arrow keys will light a pixel.
<F7> SHOW FNT	This key provides a directory of fonts. (Not available on a non-VGA system.)
<F8> RESTORE	This key clears the 8 x 16 pixel matrix and restores any pixel pattern which had previously been assigned to the recall character.
<F10> EXIT	Returns to the Character Editor-Select Mode.

Non-VGA Mode

F1 ==CHANGE	F2= CLEAR	F3=I NVERT	F4=BORDER A	F5=
F6=PEN UP/DOWN	F7=	FS=RESTORE	F9=BORDER B	F10=EXIT

Figure 22-3 Character Editor - Edit Mode Menu (non-VGA Mode)

The Edit Mode functions include:

ARROW KEYS	The keyboard direction arrows are used to move a "cursor" pixel around the 8 x 16 matrix.
<F1> CHANGE	This key is a toggle which either lights or unlights the pixel at the cursor pixel's current location. A lit pixel represents it as foreground, while an unlit pixel represents it as background.
<F2> CLEAR	This key clears (erases) the entire matrix.
<F3> INVERT	This key causes all pixels in the 8 x 16 matrix to change to the state opposite the current one: all of those which are ON turn OFF; all OFF turn ON.
<F4> BORDER A	This key allows you to select the Border A character which is displayed to the left of the recall character to assist in editing.
<F6> PEN UP/DOWN	This key toggles the pen between UP and DOWN. With the PEN DOW each cursor movements with the arrow keys will light a pixel.
<F8> RESTORE	This key clears the 8 x 16 pixel matrix and restores any pixel pattern which had previously been assigned to the recall character.
<F9> BORDER B	This key allows you to select the Border B character which is displayed to the right of the recall character to assist in editing.
<F10> EXIT	Returns to the Character Editor-Select Mode.

Font

If you need to change the font of the recall character, press <F2> to choose font. Use the arrow keys to select Normal or Graphic. If the Double High and Quad fonts have been made available for creation of custom characters, they will also appear in the list. Press <Return> to make your selection.

1 py

Press <F3> to copy a character. This function permits you to copy the pixel map from one recall character to another. You will be prompted to select the source font, then the recall key for the character you would like to copy. Then you will be asked to select the destination recall key for the currently selected font. The prompt line will indicate your source and destination and then ask you to confirm.

Delete

Press <F5> to delete the entire font. Since deletion of a character font is permanent, you will receive a two level prompt to ensure that you want to delete it.

Show Font

Press <F7> to show fonts. This key presents a directory of the Normal and Graphic characters in the system, as well as Double High and Quad characters, if this font has been selected for redefinition. See Chapter 23, Defining System Parameters, to enable the re-definition of the Double High and Quad font. The characters available for you to edit are shown on the directory in solid blue color. By pressing the horizontal or vertical direction arrow keys while in the directory, you may select a character to edit by pressing <Return> to exit the directory.

Note that it is possible to use the memory space normally reserved for Double High and Quad characters for creation of additional customized characters. In such a case, however, you will completely remove access to the entire font as it was previously defined. Therefore, when the system parameter for the Double High or Quad is set to Y, the font ceases to have the special (Double High or Quad) characteristics. In effect, the entire font becomes normal-sized. Whenever a font is redefined in such a fashion, the new definition of any character will appear on any pages where the previous definition had already been placed. Be aware that this could cause unexpected appearances on such display pages. Note the Font Directory containing the predefined characters is shown in Figure 23-3. You are permitted to overwrite the area reserved for the ten characters of the International Font.

Restore

In the Select Mode Menu, press <F8> to restore the entire font. This function clears the currently selected font and restores any character which had previously been assigned.

Save

Press <F9> to save. This key saves any of the character changes made during the editing session.

Exit

Press <F10> to exit the Character Editor and return to the Page Editor.

Use cursor and return keys to select an edit font/character or F10 to exit.

```
+RECALL KEY III111~M;a1111~M MP          IIIIMIIINI
  NORMAL          L J          . ,      r
  GRAPHIC  -----■ ■ ■ ■ ■ ■ ■ / ■ ■          ~          ■ ■ ■ ■ ■ ■ ■ • ---
```

```
RECALLKEYsp ! "#S%&' ( )*+, - .10123456789 : ; <=>?
  NORMAL      ! "#S%9,' ( )*+, - .10123456789 : ; <_>?
  GRAPHIC  -----IIII1111■1111IIII
```

```
RECALL KEY CABDEFGH IJKLMNOPQRSTUVWXYZC\7" _ NORMAL
  @ABCDEFGHI JKLMNOPQRSTUVWXYZE\I " _
  GRAPHIC 1111111-1Lr1JL:11* 1 I-r 9 " 44tHIIJ
```

```
RECALL KEY `abcdef gh i j k lmnop9rstuvwxyz ! ) de NORMAL ` a b c d e f g
  h i j k l m n o p q r s t u v w x y z { ! } ~~~
  GRAPHIC          r T 1 E+          L 1 J 1 1          *.
```

The top row of RECALL KEYS are accessed through <Ctrl><Key> combinations except for <Ctrl><c> which is accessed by the <Alt><c> key combination.

Symbol Editor

A symbol is a collection of characters chosen from any of the fonts, and placed on the screen in relation to a character cell designated as the origin. When adding a symbol to a page with the add function of the Page Editor - Variable-Sized Template Mode, the origin will be used as a reference. Symbols are stored in a library and referenced by name. Symbols may be used on numerous pages, and numerous times on a single page.

After you save a symbol in the Symbol Library, it may be added to a page in the Variable-Sized Template Mode in the Page Editor. Note that the symbol may simply be used as a static variable-sized template. By configuring a symbol as a graphics variable-sized template, it is transformed from a static state to a dynamic state. The Symbol, configured in the Variable-Sized Template Editor, becomes a Graphics Variable-Sized Template when dynamics are added.

When you enter the Symbol Editor, you will be prompted to enter a name consisting of up to six characters, which will be used to recall a predefined symbol or to begin construction of a new one. (Names are not case sensitive.) Press <Return> to begin building a new symbol. Pressing <F2> within the Symbol Editor will display a library of existing symbol names.

Once you are in the Symbol Editor, characters may be placed on the page to form a symbol by pressing keyboard recall keys and using the direction arrows to position the character cursor. The editing functions available from the keys <F1> through <F10> are as follows:

- | | |
|--------------------------------|--|
| <F1>
EDIT | This function allows you to name the symbol to be edited or created. If the name is not currently in the library, a prompt will be issued to ascertain if this is a new symbol. If the answer is no, the symbol name prompt will be re-issued. If the answer is yes, the symbol may be drawn on the page using the current cursor position as the origin. |
| <F2> | The key displays the Symbol Library at the right edge of the LIBRARY screen. |
| <F3>
PARAMETR | This key permits changes to the character cell parameters. See the Parameter Editing Functions section in Chapter 14 for a complete explanation. |
| <F4>
REDRAW | This key refreshes the entire screen when pressed. |
| <F5>
DELETE | This function removes the identified symbol from the library. It makes no check to see if the symbol has been referenced by any page. If the symbol has been deleted from the library, an error message may be issued by the Page Editor when it tries to draw and update the screen. The Online System issues an error message and aborts at startup time if it cannot find the symbol. |
| <F6>
ORIGIN | This key permits alteration of the designated origin cell location of a symbol, without changing the shape or location of the symbol being edited. |

<F7> This function displays a page containing the current definition of the SHOW FNT Font Directory.

<F8> This function moves the symbol identified for editing. When <F8> MOVE is pressed, the symbol is highlighted. As arrow keys are pressed, a shadow of the symbol will move in the given direction. When the shadow is positioned where the symbol is to be moved, press <Return> to physically move the symbol to the new location. Press <F10> to cancel the action.

<F9> When pressed, this key saves the current symbol to the symbol SAVE library.

<F10> Press this key to exit the Symbol Editor. You will be prompted EXIT to save any symbols which you are actively editing.

If you press <F9> and a symbol by this name already exists, the following prompt is displayed:

A symbol by this name is already entered in the Symbol Library. Do you wish to replace it? Y or N.

Press "Y" to save the symbol, overwriting the previous version. Press "N" to save the symbol under a new name. You will be prompted for a new name. Press <Return> to save under the new name or <F10> to Cancel.

The page which follows contains gridwork provided to help you plan character composition and layout of symbols. The grid may be photocopied as needed. Each small rectangle may be shaded-in to represent a pixel. Groupings of 8 x 16 pixels are bordered to form a character cell, which is very close to the actual proportion on the PanelMate unit's page.

Parameters Editing Functions

Parameters Editing

All graphics variable-sized templates are placed on the page by moving a character cell cursor to the desired origin cell selected on the 20 x 65 character cell matrix available for each page. An individual character may be placed in any location on a page. Status lines are present at the top of the Page Editor to identify the current character foreground and background intensities or colors, blink state, font in use, cursor position and direction, and cell location of the cursor. The status line format is shown in the following figure.

Foreground	Background	NO INTENSITIES	Blink	Font	| Normal |
Line/Column	17/431	Template	m	Cursor Direction	| Right |

Figure 22-6 Status Line Format

Upon entering the Parameter Editing mode, the background color of the editable fields is changed from white to cyan. Note that the first field's background color is green. This indicates that the field can be selected for editing. Press <Return> to edit the field with the green background, or press a direction arrow key to move and select another field. Upon pressing <Return> at a green field, the background color becomes blue, and the field may then be edited. Press the up and down arrow keys to scroll through the list of options appropriate to that field. When the desired option is displayed, press the <Return> key to record the value. The field's background now reverts to green, and another field may now be selected. When all editing has been completed, press the <Return> key to exit the Parameters Editor and return to the function from which the Parameters Editor was accessed.

While in the Parameters Editor, an existing static character's color, font, and/or blink attribute can be modified. First, adjust the appropriate status line fields to reflect the desired attribute combination, then press the <F2> key labeled "PAINT". Next, by using the arrow keys, position the cursor over the character to be adjusted and press the space bar. The character now has the characteristics displayed on the status lines, and the cursor has moved one character cell in the direction currently indicated on the status line. Press <F10> to exit the Paint Mode and return to the Parameters Editor.

Direct Editing Functions (Hot Keys)

Within the Page Editor, several direct editing functions are provided to reduce the number of necessary keystrokes. For example, when editing the Cursor Direction parameter, one must first select Parameter Editing, then select Cursor Direction, and finally select the desired direction. To reduce the number of keystrokes, specific keystrokes are provided to accomplish specific results. This section contains information on each available direct editing function. The direct editing keystrokes, shown in bold type below, are not shown on the page menus.

Cursor Movement

Cursor movements within the Variable-Sized Template Page Editor and Symbol Editor are normally one character movement per arrow key depression.

To accelerate cursor movement, press <Ctrl> <arrow key> to move the cursor five characters. This

function is available at the Page Editor and Symbol Editor. **Font and Cursor Direction Selection**

The Font and Cursor Direction may be edited as described in Parameters Editing. To reduce the number of necessary keystrokes, the following keystrokes may be used at the Variable-Sized Template Page Editor and Symbol Editor to select the associated parameter.

<Alt> <n>	Select Normal Font
<Alt> <g>	Select Graphic Font
<Alt> <d>	Select Double High Font
<Alt> <q>	Select Quad Font
<Alt> <u>	Set Cursor Direction to Up
<Alt> <w>	Set Cursor Direction to Down
<Alt> <l>	Set Cursor Direction to Left
<Alt> <r>	Set Cursor Direction to Right

Foreground and Background Intensity or Color

Once the field is selected and has a green background, a single keystroke will select the following intensities or colors depending on your unit.

Not Keys	PanelMate Series 2000\PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\PanelMate Series 4000 Colors
<1>	NO Intensity	Black
<2>	LO Intensity	Red
<3>	MD Intensity	Green
<4>	HI Intensity	White
<5>	Not Used	Blue
<6>	Not Used	Yellow
<7>	Not Used	Cyan
<8>	Not Used	Magenta

Blink

Once the field is selected and has a green background, a single keystroke <Y> will select Yes and <N> will select No.

Graphic Variable-Sized Template Editor

Graphic Variable-Sized Templates are similar in function and purpose to the Indicator Templates. The Graphic Variable-Sized Template contains the same control functions as the Indicator Template and their Control Button Definition Tables are identical. The main difference is that the Indicator Template is a pre-defined graphic, while the Graphic Variable-Sized Template utilizes user-defined symbols for status indication.

Note The Graphic Variable-Sized Template Editor is explained in this chapter although it is actually entered from the Page Editor - Variable-Sized Template Mode. Select the <F2> key labeled "Add", then press <5> for Graphics.

The Graphic Variable-Sized Template can be used to indicate the status of a device and provide control for the device (e.g., by turning it ON or OFF). There are five lines to define the various states of the device. To tie a state to information in the PLC, a conditional expression may be entered which evaluates to true. The characteristics defined in the Symbol field, and FG, BG, and B fields, will be used to display the Graphic Element. The expression may be as simple as the condition of a single bit in the PLC (true = ON; false = OFF), a value comparison (register > constant), or a Boolean expression of up to 70 characters in length. The first step to adding a graphic is to enter a symbol name. The symbol will be placed in location 5 on the spreadsheet. The following figure shows a representation of the Graphic Variable-Sized Template Editor. Each of the fields which compose this spreadsheet is reviewed in the following sections.

GRAPHIC VARIABLE-SIZED TEMPLATE
CONFIGURATION EDITOR

Device Name

1
2
3
4
S

FG BG B

Symbol

Conditional Expression

Symbol Display Area

VS-Template Origin: Line D Column D
Control Indicator: Line O Column 0 Arrow

Display 0

1
2
3
4

FG BG B

Control Label

PLC Bit Reference

Figure 22-7 Graphic Variable-Sized Template Editor

Device Name

This field accepts 22 normal-size characters. This name is used as part of an alarm message. Therefore, it should be as descriptive as possible.

Symbol Definition Table

In the Symbol Definition Table, there are five lines that can be filled-in to define various states of the device. These five lines have their priorities established so that line 1 has the highest priority and line 5 has the lowest priority. Therefore, if two lines have conditional expressions that solve to true, the configuration of the line with the highest priority will be displayed on the page.

During configuration, the values in line 5 will be displayed on the page as default values. **FG**,

BG, B (Foreground, Background, Blink)

Since the Symbol Editor allows independent assignments of both foreground and background intensities and colors for each of the symbol's individual character cells, symbols may contain multiple intensities or colors in their original form. Individual cells within a symbol may also have independent blink states. Within the Graphic Variable-Sized Template Editor spreadsheet, there are fields for the assignment of the foreground intensity or color (FG), background intensity or color (BG), and Blink (B). When the Graphic Element Editor is first entered, the FG and BG fields contain the characters TR, and the B field contains a T. These characters designate the field assignment as transparent, and displays the original intensity or color and blink values of each character within the symbol.

If an intensity or color abbreviation is entered in the foreground or background field, the foreground or background of all characters comprising the symbol will be assigned that intensity or color when the expression is true. Likewise, if blink is assigned by entering Y (Yes), the background pixels of the entire symbol will blink when the expression is true.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background), Y (yes, blinking background) or T (transparent). Expert users may cursor to this field and press the hot keys, Y, N or T to make a choice directly.

Symbol

When a symbol is edited in the Graphics Variable-Sized Template Editor, the symbol's name will automatically be entered as the default value on line 5 of the Symbol field. This Symbol field accepts a symbol name up to six characters in length. This same symbol may be used on other lines to define additional states for the element, or other symbols may be used to show other states by entering their names on the additional lines of the symbol field.

Note Each graphic variable-sized template may be configured for up to five different visual states. During online operation, as changes in PLC data are evaluated, a currently-visible state will be erased in black so that a new state may be made visible. It is recommended that symbols not be permitted to overlap, in order to avoid unwanted and unpredictable overwrites of a graphic variable-sized template.

Conditional Expression

The conditional expression placed in this field may be a numerical, logical or relational expression which evaluates to true or false. When a numerical expression is evaluated, if the result is even (least significant bit = 0), the value is false, and if the result is odd (least significant bit = 1), the value is true. When in the Run Mode, if an expression evaluates to true, the characteristics defined for the line that is true will be used to display the Symbol on the page. If more than one expression is true at the same time, the line with the highest priority will be displayed, with line 1 having the highest priority and line 5 having the lowest priority.

This field accepts up to 70 characters. For information regarding the format for PLC word references, consult the PLC chapter for your specific PLC brand.

Refer to table 15-1 for a list of operators that may be used in a conditional expression. The operators are listed in order of precedence. Level 1 has the highest precedence and level 14 has the lowest precedence. All operators on the same level are evaluated left to right. Parentheses may be used to change the order of operation.

Alm (Alarm)

The selections available are Y (yes) or N (no).

This field allows you to designate any line of the template definition as an alarm state. A Y in this field means that, if the conditional expression in this line solves to true, an alarm message will be placed in the alarm list.

A Y also designates that this condition will be monitored at all times, regardless of the page that is in view. Therefore, judicious use of this alarm state is recommended to maximize the response time of the system.

Ack (Acknowledge Required)

This field will accept a Y (Yes) or N (No). If Y is entered, the corresponding alarm message must be acknowledged by the online operator before it is removed from the alarm list. If the alarm does not merit acknowledgment by the operator, then N may be entered into the field, and the alarm message will automatically be removed from the list when the alarm condition clears.

VS-Template Origin

The VS-Template Origin fields simply contain the line and column position of the variable-sized template origin character.

Control Indicator

The Control Indicator fields are used to position the control indicator arrow, associated with the dynamic element. The default position for the Control Indicator is actually on the origin cell, so most users will want it moved to a more easily visible location. The user may select the line/column location, along with the orientation or position of the arrow. The Display field is used to determine if the arrow is always visible, or visible only when the element is selected. You can edit this field.

Since the PanelMate unit allows multiple variable-sized templates to be placed within one template cell, the control indicator is the method of showing you which variable-sized template is selected.

Control Button Definition Table

The Control Button Definition Table is used to define the control buttons on the right side of your unit. If you have a PanelMate Series 2000, PanelMate Series 2000 Color, or a PanelMate Series 3000, you will have four control buttons. If you have a PanelMate Series 4000, you will have five control buttons. Line 1 of the table corresponds to the top control button, line 2 corresponds to the control button that is second from the top, etc. It is not necessary to use all control buttons. Simply leave a line blank if you do not want a control button at that location.

If a control button is defined, a small arrow will be displayed, as configured in the Control Indicator fields.

When the control button is pressed, the PanelMate unit sends a command to the PLC to set the referenced bit (e.g., [120 00]) to a 1. When the button is released, a separate command is sent to set the bit to a 0, thus providing a momentary input to the PLC. If a maintained input is desired, the bit may be latched in PLC logic.

FG, BG, B (Foreground, Background, Blink)

These fields allow you to select the foreground and background intensities or colors of the status area of the template. You may also determine if the background intensity or color should be blinking or non-blinking.

The FG (foreground) and BG (background) selections for the PanelMate Series are listed below.

Hot Keys	PanelMate Series 2000\ PanelMate Series 3000 Intensities	PanelMate Series 2000 Color\ PanelMate Series 4000 Colors
<1>	NO (no intensity)	BK (black)
<2>	LO (low intensity)	RD (red)
<3>	MD (medium intensity)	GR (green)
<4>	HI (high intensity)	WH (white)
<5>	Not Used	BL (blue)
<6>	Not Used	YE (yellow)
<7>	Not Used	CY (cyan)
<8>	Not Used	MG (magenta)

Press <Return> to open the Option Window and cursor to your selection, and press <Return> again to accept the entry and close the window. Expert users may wish to cursor to the FG or BG field and press the hot keys 1 through 4 to select the intensities for the PanelMate Series 2000 and PanelMate Series 3000 or press hot keys 1 through 8 to select colors for the PanelMate Series 2000 Color or PanelMate Series 4000.

In the B (blink) field, the selections available are N (no blinking background) or Y (yes, blinking background). Expert users may cursor to this field and press the hot keys, Y or N, to make a choice directly.

Control Label

This field accepts three lines of 11 normal-size alphanumeric characters. The characters will automatically wrap to the next line so you can eliminate a carriage return in some instances. If you wish to center your label, insert spaces to move the text to the desired location.

PLC Bit Reference

This field accepts 18 alphanumeric characters. This field defines which PLC bit will be turned on when an operator presses the corresponding control button. It is not possible to use any expression or conditional logic in this field (including a logical NOT).

Exit the Graphic

To exit the Graphic Variable-Sized Template Editor and return to the Page Editor -
Variable-Sized Template Mode, press <F10>.

Gathering Information for Configuration

Before beginning configuration, it will probably be useful to gather all the information you will need. The form provided on the following page may be reproduced and used to organize your data prior to entry into the PanelMate unit. When the form is completed, you will have gathered all the information you will need for this particular variable-sized template.

GRAPHIC VARIABLE-SIZED TEMPLATE EDITOR

Priority	FG	BG	B	Symbol	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

VS-Template Origin: Line # Column

Control Indicator: Line Column Arrow Display

Control Label	Button FG	BG	B	(33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Chapter 23

Defining System Parameters

In this chapter, you will learn:

- How to set the communications parameters for each port
- How to adjust the audio output volume
- How to use the fault relay for an alarm signal
- How to select the page that will be displayed at power-up
- How to set the screen blanking time interval
- How to set the automatic cancel time interval

Edit System Parameters

This section allows you to edit general system parameters used while the online system is in the Run Mode. After making this selection from the Configuration Editor menu, the first page of the System Parameters Table will be displayed. It will look similar to figure 23-1.

SYSTEM PARAMETERS TABLE EDITOR

F1=
F6=

F2=
F7=More

F3=
F8=

F4=
F9=

F5=
F10=EXIT

AUDIO OUTPUT

Operator Input

Alarms

Redefine Double High Font

Redefine Quad Font

Fault Relay Deenergize on Alarm

Host Display Window

Immediate Page Change

Remote Mode Change

Page Status Une Display

Control Bit Reset

Bit Zero After Com Fault

Retry Delay

Startup Page Number

Inactivity Period mins

Screen Blanking mins

Automatic Cancel

Page Password Timeout mins

Password A

Password B

Password A Overwrite

Password B Overwrite

Password Protection

Offline Mode

Set Date

Enable Password A Change

Enable Password B Change

Figure 23-1 System Parameters Table (Page 1)
You can access the second page of the System Parameters Table with the <F7> key (see figure 23-2). The second page is explained later in this section.

The Startup Page Number field allows you to choose which page will be displayed when the PanelMate online system first enters Run Mode. To change the page number, use the arrow keys to highlight the Startup Page Number field. Press <Return> and use the arrow keys to increase or decrease the number, then press <Return> again. The default for the startup page number is 0.

Audio Output

The Audio Output fields allow you to control the volume of the PanelMate unit's external speaker. The Operator Input field controls the volume of tones used as audio feedback for the membrane keyboard. The Alarms field controls the volume of alarm annunciation. To change a volume setting, use the arrow keys to highlight the correct Audio Output field. Press <Return> and the Audio menu will display all the possible choices (Low, Medium, High, and Off). Use the arrow keys to highlight your choice, then press <Return> again.

Inactivity Periods

The Screen Blanking field defines the time the PanelMate unit will wait with no operator inputs before blanking its screen. This function helps maximize the life span of the monitor. If any one page is displayed for a very long period, its image will get permanently burned into the monitor. To help prevent this from occurring, the PanelMate unit will wait for the indicated number of minutes. Then, if no membrane keys were pressed during this time, the PanelMate unit will display an all-black screen with the following message slowly scrolling up the screen.

Press any membrane key to recall display.

Pressing any key will recall the page which was blanked. The page will also be recalled automatically if any template or element on any page goes into alarm or if an automatic page change occurs. The selections that are available are OFF and 20 to 400 minutes in 20 minute increments.

The Automatic Cancel field defines the time the PanelMate unit will wait with no operator inputs before de-selecting a template. This function helps prevent accidental usage of the control buttons when an operator leaves a template or element selected after use. To prevent this from occurring, the PanelMate unit will wait for the indicated number of minutes. Then, if no membrane keys were pressed during this time, the PanelMate unit will cancel selection of any template or element. The selections that are available are OFF and 1 to 20 minutes in 1 minute increments.

Note The Cancel generated by the timeout of the Automatic Cancel feature will reset the Screen Blanking timer.

To change an Inactivity Period time setting, use the arrow keys to highlight the correct Inactivity Period field. Press <Return> and a selection menu will display all the possible choices. Use the arrow keys to highlight your choice, then press <Return> again.

Redefine Double High Font

If the graphics option is selected, you can choose to re-define the Double-High Font. An "N" entry keeps the default Double-High font. A "Y" entry will completely remove the font and permit the creation of additional customized characters.

Note If the Double-High font is redefined, make sure the character size selected for the templates and variable-sized templates in your configuration is not a redefined font. If the character size selected is a redefined font, redefined characters will appear in your template in Run Mode.

Redefine Quad Font

If the graphics option is selected, you can choose to re-define the Quad Font. An "N" entry keeps the default Quad font. A "Y" entry will completely remove the font and permit the creation of additional customized characters.

Note If the Quad font is redefined, make sure the charactersize selected for the templates and variable-sized templates in your configuration is not a redefined font. If the character size selected is a redefined font, redefined characters will appear in your template in Run Mode.

on Alarm

The Fault Relay Deenergize on Alarm field allows you to control what happens to the PanelMate unit's fault relay when an alarm occurs. An "N" entry will cause the fault relay to de-energize only when a communication error is detected, a system error occurs or when AC power is lost. A "Y" entry will cause the fault relay to de-energize also when an alarm condition is detected on a page. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Fault Relay menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Note that if this feature is enabled, the Bit Zero After Com Fault field must be disabled.

Host Display Window

The Host Display Window field allows you to enable an extra page which can receive and display data from a host computer. The Host Display Window uses the entire 3 X 5 template display area. Data is sent from the host computer via the Generic Protocol. A "Y" entry will enable the window. An "N" entry will disable it. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Host Display Window menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Refer to Chapter 35, Generic Protocol, for additional information on the Host Window.

Immediate Page Change

The Immediate Page Change field controls whether a PLC can change the displayed page (through the Page Change Register) while the PanelMate unit has a template or element selected. A "Y" entry will allow the page to change, even if the operator is in the process of entering information. An "N" entry will inhibit the page change until no template or element is selected (such as when the <CANCEL> key has been pressed). To change the setting, use the arrow keys to highlight the field. Press <Return> and the option window menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Remote Mode Change

The Remote Mode Change field allows the PanelMate unit to accept remote mode changes from Run Mode to Transfer Mode or Transfer Mode to Run Mode from a personal computer and determines the manner in which the remote mode change will occur. The selections available are: NEVER, IMMEDIATE, DEFAULT, and ACCEPT. The selections are explained below.

NEVER	A remote mode change is not allowed.
IMMEDIATE	The remote mode change will occur instantaneously.
DEFAULT	The remote mode change will occur when the PanelMate unit is in a default state (i.e., no templates or symbols are selected on the screen).
ACCEPT	An operator will have to accept the remote mode change from the online unit.

To change the setting, use the arrow keys to highlight the field. Press <Return> and the option window menu will display the choices. Use the arrow keys to highlight your choice, then press <Return> again.

Note For configurations created before version 2.1 that are converted to version 2.1 configurations, the Remote Mode Change field will default to the NEVER selection.

For more information on remote mode changes, refer to Chapter 27, Transfer Editor.

Page Status Line Display

The Page Status Line Display field controls how the Page Status Line is displayed during Run Mode. If STANDARD is selected, the Status Line will display all page numbers (0-9). The intensity or color of each number indicates the status of that page. If FIFO is selected, the Status Line will display only those pages in alarm in a first-in-first-out format. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Page Status Line selection menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Note If the PanelMate unit has more than 10 pages and page 10 or greater is configured, the FIFO format will automatically be used regardless of the setting in this field.

Control Bit Reset

The Control Bit Reset field controls the delay between the bit-set and bit-clear commands sent to a PLC from the control buttons. Control buttons can be pressed (causing a bit-set) and released (causing a bit-clear) very quickly. Some PLC programs need time to sense the bit-set command before receiving the bit-clear command. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Control Bit Reset selection menu will display all the possible choices. Use the arrow keys to highlight your choice, then press <Return> again. The selections available are: 0, 250, 500, or 1000 milliseconds.

Bit Zero After Com Fault

The Bit Zero After Com Fault field provides the capability to reset (i.e., write zeroes to) all PLC bits configured in the PLC Bit Reference fields for each control button. The PLC bits will reset when a PLC communication error has been cleared (i.e., communication with the PLC has been re-established) and the control button labeled "Enable Fault Relay" is pressed. A "Y" entry will enable the automatic reset of all PLC bits configured for control buttons. A "N" entry will disable the automatic reset of all PLC bits. To change the setting, use the arrow keys to highlight the field. Press <Return> and the option window menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Note If the Bit Zero After Com Fault field is enabled, the Fault Relay De-energized on Alarm field must be disabled.

Note If the fault relay is enabled via the Remote Enable Fault Relay Bit (from PLC), the Bit Zero After Com Fault field is not functional. The Bit Zero After Com Fault field is only applicable when the control button labeled "Enable Fault Relay" is pressed.

Retry Delay

In the event of lost communications, the Retry Delay field defines how the PanelMate unit will attempt to re-establish communications to the PLC. With this field set to "Y", the PanelMate unit will increase the time interval of attempts to re-establish communications as the length of time that the PanelMate unit and PLC are not communicating increases. This selection prevents several PLCs on a network from becoming busy unnecessarily if communications have not taken place over a long period of time. With this field set to "N", the PanelMate unit will immediately and continuously attempt to re-establish communications. This will prevent any delays which may occur after successfully sending data to the PLC.

Page Password Timeout

The Page Password Timeout field controls the length of time a page password will stay active after it has been logged-in. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Password Timeout selection menu will display all the possible choices. Use the arrow keys to highlight your choice, then press <Return> again. The selections available are OFF and 5-60 minutes in 5 minute intervals.

Passwords

The Password A and B fields allow you to enter password numbers which can be used to limit operator access to pages, offline mode, templates, and variable-sized templates during Run Mode. The Directory Editor, Bar Template, Readout Template, Table Template, Readout Variable-Sized Template, and Bar Variable-Sized Template Editors control the assignment of password protection and passwords that will be used. To change a password, use the arrow keys to highlight the correct field. Press <Return> and enter the password number you have chosen. Then press <Return> again to close the field. Each password can contain up to eight digits (0-9). Note that leading zeroes are not supported.

The default passwords which are sent with the demonstration screens are "1" for Password A and "2" for Password B.

Password Overwrite

The Password Overwrite fields decide whether passwords already present in a PanelMate online system will be overwritten when a new configuration is downloaded. You may want the operator to learn one pair of passwords which will not change with new configurations. An "N" entry will cause new passwords to be ignored when a configuration is downloaded to an online system; the passwords existing from the previous configuration will remain intact. A "Y" entry will cause the passwords saved in a configuration to become active when downloaded. To change the setting, use the arrow keys to highlight the field. Press <Return> and the Host Display Window menu will display both choices. Use the arrow keys to highlight your choice, then press <Return> again.

Password Protection

The Password Protection fields can require the operator to use a password and/or the external keyswitch before using a function during Run Mode. There are two passwords and one keyswitch. Any combination of these three elements may be used to restrict access. Two fields can protect entry into Offline Mode and the setting of Date/Time. To set protection, use the arrow keys to highlight the correct field. Press <Return> and the Protection menu will display all the possibilities. Use the arrow keys to highlight your choice, then press <Return> again.

The Enable Password A Change field and Enable Password B Change field will allow you to enable or disable the ability to change passwords when running online. The default is "Y" which permits operators with the password to change the password.

Exit

You can leave the System Parameters Table and return to the Configuration Editor menu by pressing the <F10> key.

Second Page b _{c-e}

You can access the second page of the System Parameters Table from the first page with the <F7> key. This page will look similar to figure 23-2.

SYSTEM PARAMETER TABLE EDITOR				
F1= F6=	F2= F7=More	F3= F8=	F4= F9=	F5- - F10=EXIT
Remote Alarm (to PLC)				
Acknowledge Bit (from PLC)				
Remote Silence (to PLC)				
Alarm Horn Bit (from PLC)				
Remote Enable (to PLC)				
Fault Relay (from PLC)				
Remote Sending of Passwords				
Hardware Selection				
Page Change (to PLC)				
Register (from PLC)				
Reset Clock to 00:00:00 Bit				

Figure 23-2 Systems Parameter Table (Page 2)

Remote Alarm Acknowledge

The PanelMate unit can set a bit in a PLC when the control button Acknowledge All Alarms is pressed during Run Mode. This bit is defined in the field labeled "Remote Alarm Acknowledge Bit (to PLC)". The PanelMate unit can also scan a bit in a PLC and acknowledge all current alarms when the bit is set. This bit is defined in the field labeled "Remote Alarm Acknowledge Bit (from PLC)". Only bit references are permitted in these fields. No expressions may be entered. Leaving the fields blank will disable the features. To enter a bit address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field.

Remote Silence Alarm Horn Bit

The PanelMate unit can set a bit in a PLC when the control button, "Silence Alarm Horn", is pressed during Run Mode. This bit is defined in the field labeled "Remote Silence Alarm Horn Bit (to PLC)". The PanelMate unit can also scan a bit in a PLC and silence the alarm horn when the bit is set. This bit is defined in the field labeled "Remote Silence Alarm Horn Bit (from PLC)". Only bit references are permitted in these fields. No expressions may be entered. Leaving the fields blank will disable the features. To enter a bit address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field.

Remote Enable Fault Relay Bit

The PanelMate unit can set a bit in a PLC when the control button, "Enable Fault Relay", is pressed during Run Mode. This bit is defined in the field labeled "Remote Enable Fault Relay Bit (to PLC)". The PanelMate unit can also scan a bit in a PLC and enable the fault relay when the bit is set. This bit is defined in the field labeled "Remote Enable Fault Relay Bit (from PLC)". Only bit references are permitted in these fields. No expressions may be entered. Leaving the fields blank will disable the features. To enter a bit address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field.

Note If the fault relay is enabled via the Remote Enable Fault Relay Bit (from PLC), the Bit Zero After Com Fault field is not functional. The Bit Zero After Com Fault field is only applicable when the control button labeled "Enable Fault Relay" is pressed.

Remote Sending of Passwords

The PanelMate unit can set a bit in a PLC when the operator enters valid passwords during Run Mode. These bits are defined in the fields labeled "Remote Sending of Passwords - Password A and B". The bit is set when the page password is logged-in on the Setup Page during Run Mode. The PanelMate unit can also set a bit in a PLC when the external keyswitch is used. This bit is defined in the field labeled "Remote Sending of Passwords - Hardware Selection". Only bit references are permitted in these fields. No expressions may be entered. Leaving the fields blank will disable the features. To enter a bit address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field. The bit is set when the password is valid to permit entry.

The PanelMate unit can write the number of its currently displayed page to a register in a PLC during Run Mode. Pages 00-29 use their page number. There are two special page numbers: the Alarm Page number is 100 and the Setup Page number is 102. This register is defined in the field labeled "Page Change Register (to PLC)". The PanelMate unit can also scan a register in a PLC and change to the page number matching the register value. This register is defined in the field labeled "Page Change Register (from PLC)". When a new valid number has been received from the page change register, the rightmost section of the Overview field will blink. If a control template has been selected by the operator, the page will not change immediately. As soon as the control template is deselected, the page will change. (This requirement can be changed through use of the Immediate Page Change field on the first page of the System Parameters Table) Only register references are permitted in these fields. No expressions may be entered. Leaving the fields blank will disable the features. To enter a register address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field.

The Page Change Register will override Page Password Protection. In order to maintain the protection, use "Remote Sending of Passwords" and PLC ladder logic to implement a protection scheme.

Reset Clock

The PanelMate unit can scan a bit in a PLC and reset its system clock when the bit is set. (The clock will reset each time you change to a page that has the reset clock bit set to 1.) This bit is defined in the field labeled Reset Clock to 00:00:00 Bit. Only bit references are permitted in this field. No expressions may be entered. Leaving the field blank will disable the feature. To enter a bit address, use the arrow keys to highlight the correct field. Press <Return> and enter the address you have chosen. Then press <Return> again to close the field.

The date will be changed to the day closest to the current time. The following examples show how the date is affected by the clock synchronization bit

<u>Time/Date Before Reset</u>	<u>Time/Date After Reset</u>
23:30:10 December 10, 1991	00:00:00 December 11, 1991
00:30:10 December 13, 1991	00:00:00 December 13, 1991
12:00:00 December 24, 1991	00:00:00 December 25, 1991
11:59:59 December 27, 1991	00:00:00 December 27, 1991

First Page

 _____

You can access the first page of the System Parameters Table from the second page by pressing the <F7> key.

Exit

You can leave the System Parameters Table and return to the Configuration Editor menu by pressing the <F10> key.

Chapter 24

PLC Name and Port Parameters Table

In this chapter, you will learn:

- How to set the communications parameters for each port
- How set a port for Unsolicited Device
- How to set a port for Generic Protocol
- How to define the Default PLC Name
- How to set the scan rates for alarm conditions and updating the current pages

Edit PLC Name and Port Table

This section allows you to set communication port parameters, PLC device names and ID numbers, Allen Bradley Remote VO parameters, and Custom Serial Interface setup. After making this selection from the Configuration Editor menu, the PLC Name and Port Editor will be displayed. It will look similar to figure 24-1.

PLC NAME AND PORT ERROR

F1-
F6-

F2-
F7-

F3-
F8-

F4=
F9-SAVE

F5
F10-EJECT

VCP UNIT PORT PARAMETER TABLE

Uryopclted
Démde

C-ienetic Protocol

Port Use	Network Data Stop	ID#	Bits	Bits Partly Rate	Elect. Name	Model	ID#	BCC/Blk#
1	A-B	0	8	None	9600	R5232	stot2	PI C-2 0
2	None	0	8	None	9600	RS232		
3	None	0	8	None	9600	RS232		
4	None	0	8	None	9600	RS232		

PLC NAME TABLE

lre	Name	ID#	Ports	Model
1	uNtl	2000000000	I/O	PLC-2 O
2			1	
3			1	
4			1	
5			1	
6			1	
7			1	
8			1	
9			1	
0			1	

Default PLC Name

unl

Screen Scan Delay

10.00

sec

Alarm Scan Delay

Om

sac

Menage Scan Delay

Om

sec

CSI Scan Delay Trend

0.00

sec

Soar Delay

0.00

sec

Figure 24-1 Port Parameter Table

Use

Under the PLC Name and Port Editor, the Use field describes how a port will be used. To change

the setting, use the arrow keys to highlight the field beside the port number you wish to use. Press <Return> and the Port Use menu will display all the possibilities (Printer, PLC type, and None). Use the arrow keys or press the <home> and <end> keys to scroll through the menu and highlight your choice, then press <Return> again.

Note that CSI, DH-485, MOD-ASC, or MOD-RTU are also possible selections if you have the Custom Serial Interface, Data Highway 485, or Modicon Modbus option installed on your PanelMate unit. For more information on these options, see the appropriate PLC chapter in the Communications section of this manual.

To configure a CSI driver, the CSI option must be selected in the Port Parameter Table. Press the <F3> key labeled "CSI Edit" to call the CSI Configuration Editor. See the CSI section in this chapter for more information.

To configure a DH-485 driver, the DH-485 option must be selected in the Port Parameter Table. Press the <F2> key labeled "Max Node" to call the Allen-Bradley Data Highway 485 Maximum Node Address Editor. See the Data Highway 485 section in this chapter for more information.

To configure the VO port for Accelerati/On, move the cursor to port 3 and press <Return>.

The Use field contains Data Highway, Data Highway Plus, and Remote VO selections. When any of the above are selected, the port will change to VO. See the Remote I/O Configuration section in this chapter for information regarding defining the Block Transfer Addressing, Active Rack Table, and Active Block Transfer Table.

Network ID# (PanelMate Port Parameter)

The Network ID# fields set the number assigned to the PanelMate unit on a PLC network. To change the number, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and enter the number. Then press <Return> again to close the field. See the appropriate PLC chapter for PLC Dependent network ID# information.

Note Do not use the same number for the network ID# and the PLC ID#.

Data Bits

The Data Bits fields set the number of data bits used in serial communication. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Data Bits menu will display all the possibilities (5, 6, 7, and 8). Use the arrow keys to highlight your choice, then press <Return> again.

Stop Bits

The Stop Bits fields set the number of stop bits used in serial communication. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Stop Bits menu will display all the possibilities (1, 1.5, and 2). Use the arrow keys to highlight your choice, then press <Return> again.

Parity

The Parity fields set the parity type used in serial communication. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Parity menu will display all the possibilities (None, Odd, and Even). Use the arrow keys to highlight your choice, then press <Return> again.

Baud Rate

The Baud Rate fields set the data transfer speed used in serial communication. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Baud Rate menu will display all the possibilities (110 to 38400). Use the arrow keys to highlight your choice, then press <Return> again. For "A-B Rem" selection of Accelerat/On, the choices are 57.6, 115.2, and 230.4 K baud.

Note The 38400 baud selection is not supported at this time.

Electrical (Elect.)

The Electt fields set the type of electrical communication standard to be used for *communication*. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Electrical menu will display all three possibilities (RS232, RS422, and 485-2). Use the arrow keys to highlight your choice, then press <Return> again. Note that the 485-2 selection should only be used for DH-485.

Unsolicited Device

The fields under the heading Unsolicited Device are applicable to serial and I/O ports accepting unsolicited messages for communication. Unsolicited messages are messages received by the PanelMate unit that are unexpected or not requested. Refer to the Unsolicited Messages section in Chapter 31, The Accelerati/On Interface, for more information.

Name

The Name fields define user-chosen names for each PLC to be addressed. You will use this name when specifying word and bit addresses that will display unsolicited data only. References specified with an Unsolicited Device Name will not be polled by the PanelMate unit and will only be updated by an unsolicited write from the PLC. To change the name, use the arrow keys to highlight the field you wish to use. Press <Return> and enter the name. Then press <Return> again to close the field.

Note Unsolicited references are initialized as zeroes.

Model

The Model fields define the model type of each PLC that supports unsolicited writes. Before changing this setting, make sure the Port field is set correctly. Then use the arrow keys to highlight the field for the PLC name you wish to use. Press <Return> and the PLC model menu will display all the possibilities for that PLC type. Use the arrow keys to highlight your choice, then press <Return> again.

Note Any configurations created before version 2.1 that are converted to version 2.1 configurations will have the default PLC model type displayed in the Unsolicited Model field.

Note The PLC model type in the MSG instruction, configured in the PLC ladder logic, must match the PLC type in the Unsolicited Model field.

Generic Protocol

The fields under the heading Generic Protocol are only applicable to serial ports using the Generic Protocol for communication. Refer to Chapter 35, Generic Protocol, for more information.

Note If you are using Generic Protocol, the Generic type (octal or decimal) is configured through the Unsolicited Model field.

Note Any configurations created before version 2.1 that are converted to version 2.1 configurations will have the selection in the Generic Name field displayed in the Unsolicited Name field.

Note Any configurations created before version 2.1 that are converted to version 2.1 configurations will have the selection in the Generic Type field displayed in the Unsolicited Model field.

ID# (Generic Protocol)

The ID# fields indicate whether an ID number of a specific PLC or host will be used in the Generic Protocol. If the PanelMate unit will be communicating with a single PLC or host, the setting should be "N". To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Generic ID Number menu will display both possibilities (Y and N). Use the arrow keys to highlight your choice, then press <Return> again.

BCCBIT#

The BCC/Bit# fields indicate whether each Generic Protocol frame will include the BCC of the frame. To change the setting, use the arrow keys to highlight the field for the port you wish to use. Press <Return> and the Generic BCCBit# menu will display both possibilities (Y and N). Use the arrow keys to highlight your choice, then press <Return> again.

Name

Under the PLC Name Table, the Name fields define user-chosen names for each PLC to be addressed. You will use this name when specifying word and bit addresses during page development. To change the name, use the arrow keys to highlight the field you wish to use. Press <Return> and enter the name. Then press <Return> again to close the field.

The ID# fields set the number assigned to each PLC on a PLC network. To change the number, use the arrow keys to highlight the field beside the correct PLC name. Press <Return> and enter the number. Then press <Return> again to close the field.

Note Do not use the same number for network ID# and the PLC ID#.

Port

The Port fields define which serial ports will be used to communicate to each PLC. To change the setting, use the arrow keys to highlight the field for the PLC you wish to use. Press <Return> and the Port menu will display all the possibilities (1, 2, 3, and 4). Use the arrow keys to highlight your choice, then press <Return> again.

An VO port selection is available when port 3 is set to DH, DH+, or Remote I/O. This selection requires the Accelerati/On option.

Model

The Model fields define the model type of each PLC. Before changing this setting, make sure the Port field is set correctly. Then use the arrow keys to highlight the field for the PLC name you wish to use. Press <Return> and the PLC model menu will display all the possibilities for that PLC type. Use the arrow keys to highlight your choice, then press <Return> again.

Default PLC Name Field

The Default PLC Name field will contain one of the PLC names or an Unsolicited Device Name entered by you in the list at the left of the screen. Any word or bit address used in the configuration which does not specifically state the name of a PLC will be assumed to be referring to this default PLC. It is to your advantage to use the name of the PLC most often referenced. To change the name, use the arrow keys to highlight the field and press <Return>. The Default PLC Name menu will display all the currently-entered PLC names. Use the arrow keys to highlight your choice, then press <Return> again.

Note You must have a default PLC Name in order to create a configuration.

Screen Scan Delay

The Screen Scan Delay field sets the time delay between updates of a page when in Run Mode. An entry of 0 will cause the PanelMate unit to update a page as fast as possible. The maximum entry is 99.9 seconds. To change the number, use the arrow keys to highlight the field. Press <Return> and enter the delay time you want. Then press <Return> again to close the field.

The Alarm Scan Delay field sets the time delay between updates of all alarm conditions not shown in the current page when in Run Mode. An entry of 0 will cause the PanelMate unit to update these background alarms as fast as possible. The maximum entry is 99.9 seconds. For best performance, set this time to the longest interval your application will permit. A minimum of 1.0 seconds is recommended. To change the number, use the arrow keys to highlight the field. Press <Return> and enter the delay time you want. Then press <Return> again to close the field.

Message Scan Delay

The Message Scan Delay field sets the time delay between updates of all register references defined in messages when in Run Mode. An entry of 0 will cause the PanelMate unit to update the register values as fast as possible. The maximum entry is 99.9 seconds. For best performance, set this time to the longest interval your application will permit. A minimum of 1.0 seconds is recommended. To change the number, use the arrow keys to highlight the field. Press <Return> and enter the delay time you want. Then press <Return> again to close the field.

The CSI Scan Delay is only displayed if the Custom Serial Interface Option has been selected.

The CSI Scan Delay field sets the time delay between reads of the serial device by the CSI Driver when in Run Mode. An entry of 0 will cause the PanelMate unit to update these background alarms as fast as possible. The maximum entry is 99.9 seconds. For best performance, set this time to the longest interval your application will permit. A minimum of 1.0 seconds is recommended. To change the number, use the arrow keys to highlight the field. Press <Return> and enter the delay time you want. Then press <Return> again to close the field.

Trend Scan Delay

The Trend Scan Delay field sets the time delay between updates from the PLC of all register references defined in the trend templates while in Run Mode. An entry of 0 will cause the PanelMate unit to update these background alarms as fast as possible. The maximum entry is 99.9 seconds. For best performance, set this time to the longest interval your application will permit. A minimum of 1.0 second is recommended. To change the number, use the arrow keys to highlight the field. Press <Return> and enter the delay time you want. Then press <Return> again to close the field.

Note The Trend Template Interval should be as long, if not longer, than the Trend Scan Delay.

Note When calculating the trend value sample rate, refer to the Interval Expression section in Chapter 21, Trend Templates, for additional information about configuring the Trend Scan Delay.

Remote I/O Configuration

AcceleratvOn allows the PanelMate unit to simulate one or more remote racks. The PLC communicates to the AcceleratVOn interface, as though the interface were a rack. For more information, see Chapter 31, The AcceleratVOn Interface.

To configure the VO port for remote VO, move the cursor to port 3 and press <Return>. Choose Remote VO from the Use field selections. An additional function key will be displayed while the cursor is on the VO port Use field. Press <F2> to access the Remote VO Configuration Editor. The PLC model will appear at the top of the screen. The number of racks available is dependent on the PLC model configured. This Remote I/O Configuration Editor is divided into three sections, the Block Transfer Addressing Type field, the Active Rack Table, and the Active Block Transfer Table. Refer to the figure below.

Note When configuring the I/O port for Remote I/O, select the PLC-3 model for PLCs with more than seven racks. PLC models (i.e., PLC 5/40 and PLC 5/60) that have more than seven racks must use the PLC-3 model selection to address racks above seven.

The following sections describe the function of each field.

ALLEN-BRADLEY REMOTE I/O CONFIGURATION						
F1-	F2=	F3-	F4=	F5		
F6-	F7_	F8-	F9=	F10=EXIT		
		PLC Model: PLC5/15				
BLOCK TRANSFER ADDRESSING	ACTIVE RACK TABLE QTR		ACTIVE BLOCK TRANSFER TABLE			
			Transfer Direct	Rock Group Slot		Size
	I_	A	COMMON	1	2	0 64
3	1.	B	READ	1	3	1 64
			WRITE	1	4	0 64
		D	COMMON	1	5	1 64
			READ	1	6	0 64
		G	WRITE	1	7	1 64
		H	PASS	2	0	0 64
		I	WRITE	2	1	1 10
		J				
		K				
		L				
		M				
		N				
		P				

Figure 24-2 Remote VO Configuration Editor

Block Transfer Addressing

The Block Transfer Addressing Type field allows you to define the word offset in all monitored and active Block Transfers as OCTAL or DECIMAL. The default is octal.

Active Rack Table

The Active Rack Table allows you to define which racks are to be simulated by the PanelMate unit on the network. Each full rack can be split into a quarter rack or any multiple of a quarter racks (i.e., 1/4, 1/2, 3/4, or full rack). A blank field is the default value and shows that the quarter rack is inactive. A status of 1, 2, 3, or 4 implies the quarter rack is active and indicates the starting quarter for a fractional rack. An asterisk, *, is contained in the other quarter racks which make up a fractional rack. For example, if you configured a half rack to start on the second quarter of rack 1, a 2 would appear in the second quarter space for rack 1 and an asterisk would appear in the third quarter space as a place holder. Figure 24-2 shows an example of the PanelMate unit simulating 3/4 of rack 1, 1/2 of rack 2, and 1/4 of rack 3. A status of 1 denotes 1/4 rack, 2 denotes 1/2 rack, 3 denotes 3/4 rack and 4 denotes a full rack.

Note When using a PLC 2130 and the PanelMate unit is configured as active groups within a rack other than the highest group, then the PLC will not scan for any groups higher than those the PanelMate unit is simulating (physical groups or groups simulated on another AcceleratI/On board). To avoid this situation, make the PanelMate unit the highest active group within a rack and only configure one PanelMate unit active on any one rack.

Active Block Transfer Table

The Active Block Transfer Table will allow you to configure active block transfers between the PanelMate unit and a PLC. You may define up to 16 active block transfers, A through P, each with up to 64 words.

Direct

This column defines the direction of the block transfer. The available selections are NONE, READ, WRITE, COMMON, and PASS. All of the selections describe communication from the PLC's point of view. The READ selection allows the PLC to read a block of data from the PanelMate unit. The WRITE selection allows the PLC to write a block of data to the PanelMate unit. The COMMON selection allows the PLC to both read data from and write data to the PanelMate unit. The PASS selection indicates that the block transfer is reserved for the pass-through feature. For more information on the pass-through feature, refer to the Allen-Bradley Remote VO Network Transfer section in Chapter 27, Transfer Editor.

Note The PASS selection can only be configured for one block transfer. **Rack**
This column defines the rack being used by the block transfer. The available selections are determined by the Active Rack Table. This field will scroll through only the active racks in the table.

Group

This column defines the group number within the quarter rack being used by the block transfer. The selections available are 0, 1, 2, 3, 4, 5, 6, and 7.

Slot

This column defines the slot number within the group being used by the block transfer. The available selections are 0 and 1.

Size

The column defines the size in 16-bit words of the block transfer. The available selections are decimal numbers from 1 to 64. If the Direction is selected as PASS, the size is fixed at 64. **Exit**

<F10>

Press <F10> to exit and return to the PLC Name and Port Editor.

Custom Serial Interface

The Custom Serial interface (CSI) permits the PanelMate units to communicate to ASCII devices, such as scales, sensors, and bar code readers. A CSI driver can read data from a serial RS-232 or RS-422 device. The data can be displayed on the PanelMate units and passed through to a PLC. The CSI can read up to 100 32-bit words from a serial device. The CSI can pass only one 32-bit word to the PLC. The maximum PLC update rate is one 32-bit value per second. The nature of these devices allow drivers to be written by the Eaton IDT Systems Engineering group. The following describes how to configure a CSI driver.

In order to configure a CSI driver, the CSI option must have been selected in the Use field of *the Port Parameter Table*. Press the <F3> key labeled "CSI Edit" to call the CSI Configuration Editor. The total number of words, number of words that can be passed through and the driver name are all defined by the designer of the CSI driver and are different for each driver. Before configuring any of the parameters described below, see the chapter that explains how these parameters should be set for your specific driver.

Note When previous version (before 2.XX) configurations are read into the Configuration Editor, the CSI Editor information does not get transferred and must be re-entered.

CSI Edit

Pressing the <F3> key, labeled "CSI Edit", while on the Use field for the port assigned as CSI calls the CSI Configuration Editor. The CSI Configuration Editor allows you to configure the parameters for your specific CSI driver.

The following screen will appear after making this selection.

The following sections describe each of the function keys and fields available in this editor.

CSI CONFIGURATION EDITOR													
F1=	F2=	F3=PREVIOUS	F4=NEXT	F5=									
F6=	F7=	F8=	F9=	F10=EXIT									
<table border="1"> <tr> <td>Driver Name I</td> <td></td> </tr> <tr> <td>Number of Words I</td> <td>I</td> </tr> <tr> <td>Default</td> <td></td> </tr> <tr> <td>Error Register</td> <td></td> </tr> </table>						Driver Name I		Number of Words I	I	Default		Error Register	
Driver Name I													
Number of Words I	I												
Default													
Error Register													
	Pass Through Ref.	Scale Expression		Pass Through Ref.	Scale Expression								
0			13										
1			14										
2			15										
3			16										
4			17										
5			18										
6			19										
7			20										
8			21										
9			22										
10			23										
11			24										
12													

Figure 24-3 CSI Configuration Editor

Previous <F3>

This function key will display the previous screen within this editor. Each of the four screens are identical except that the previous 24 words are shown for editing.

Next <F4>

This function key will display the next screen within this editor. Each of the four screens are identical except that the next 24 words are shown for editing.

Driver Name

This field will allow you to enter the name of the specific CSI driver that you wish to use. Pressing <Return> will open this field. Once open, type in the name of the driver you wish to use and then press <Return> to close the field. The name of the driver is case sensitive, so enter the name in upper case letters. If you enter the name in lower case letters, the configuration editor will change the letters to upper case when the field is closed.

See Chapter 32, Custom Serial Interface for the Toledo Digital Indicator, for the specific driver name. **Number**

of Words

The field is used to enter the number of words that the CSI driver will use. One hundred words are available. The number of words is CSI driver specific. See the documentation for your specific driver to find the correct value for this field.

Default Scale Expression

This field is used to enter an expression that will be applied to a CSI word before it is stored when the Scale Expression field does not contain an expression. Any CSI word that contains an expression in its corresponding Scale Expression, will have the Scale Expression applied instead of the Default Scale Expression.

Multiple PLC references, CSI references and mathematical operators can be used in this field. The register value is entered into the expression by [?].

For example, if you wished to multiply the incoming words by 10, the expression would look as follows.

[?]*10

Error Register

This field specifies the PLC register to which the CSI error number will be sent. One register reference may be entered in this field.

Pass Through References

This field will allow entry of one PLC register reference. The PLC reference is the destination address of the corresponding CSI word.

Scale Expression

This field is used to enter an expression that will be applied to a CSI word before it is stored.

As a word is written to by the device using the CSI, the Scale Expression will be applied to that word and the value passed through to the PLC. If no Scale Expression exists, the Default Scale Expression will be applied to that word and the resulting value passed through to the PLC. If no Default Scale Expression exists, the value stored in that word will be passed through to the PLC unchanged. Only one of the two scaled expressions will be applied to the word, never both. The Scale Expression has precedence over the Default Scale Expression.

Multiple PLC references, CSI references and mathematical operators can be used in this field. The register value is entered into the expression in the manner described in the chapter for your specific PLC brand. For example, if you wish to bit wise AND the incoming word with 8 and divide that result by a value in a PLC, using a Modicon PLC, the expression would look as follows.

([?]&8)440010]

Exit <F10>

Press <F10> to exit and save your CSI configuration and return to the PLC Name and Port Parameter Editor.

CSI Copy

You may copy a CSI configuration from one port to another. The first step is to define the CSI driver in the Use field for the destination of the copy. Press <F4>, CSI Copy, then answer the prompt which asks you to enter the destination port number (1-4).

Data Highway 485

Most Data Highway 485 (DH-485) devices have a parameter which sets the maximum node address. The maximum node address should be set as low as possible. This minimizes the amount of time used in soliciting data when initializing the link and when finding new data when token passes do not receive a response.

Note The Maximum Node Address (set in the second page of the PLC Name and Port Table) must match the actual maximum node address on the Data Highway 485.

In order to configure a DH-485 driver, the DH-485 option must have been selected in the Use field of the Port Parameter Table. Press the <F2> key labeled "Max Node" to call the Allen-Bradley Data Highway 485 Maximum Node Address Editor. Open the field by pressing <Return>, then use your arrow keys to select the maximum node address.

ALLEN-BRADLEY DATA HIGHWAY 485 MAXIMUM NODE ADDRESS EDITOR

F1=

F2=

F3=

F4=

F5=

F6=

F7=

F8=

F9=

F 1 =EXIT

Ma dmum Node Address 31

Figure 24-4 Maximum Node Address Editor

For more information about Data Highway 485, refer to Chapter 30, Allen-Bradley PLCs.

Chapter 25

System Online Labels Editor

In this chapter, you will learn:

How to define Online Labels

L.

C

System Online Labels (Online Label Alternatives)

This utility will allow you to change the labeling used on most of the PanelMate unit screens to any one of the normal font characters. If you have selected the Graphics Option, the Graphic Font is also available.

This utility contains nine screens for changing the labels. A menu at the top of each screen describes the use of the function keys. The following is a list of each function key and its use.

F3	Display previous screen.
F4	Display next screen.
F9	Save the system labels file to a temporary directory without exiting the System Online Labels Editor.
F10	Exit the System Online Labels Editor with optionally saving the system labels file.

If the Graphics Option is selected, the hot keys, <Alt> <n>, can be used to select the Normal font and <Alt> <g> can be used to select the Graphics font. Each character in the label can be called from either font. The lower left of each screen displays the Current Character Position font and the Current Character font for the insert key.

Note If you select Redefine Font in the System Parameters Editor, you can have access to the Double-High or Quad Font redefined characters. If the Graphics Option is selected, the hot keys, <Alt> <d> and <Alt> <q>, can be used to select the Double-High font and the Quad font.

The first screen will allow you to select the startup label set (standard or user) and to allow the label set to be changed during online operation.

Startup Online Labels

This field allows you to select the label set to be used at startup. The selections available in this field are STANDARD or USER. If STANDARD is selected, the PanelMate unit will use the label set shipped with the unit when going online. If USER is selected, the PanelMate unit will use the label set you have created when going online.

Use <Return> to open the field, cursor keys to select, and <Return> to close.

Change Labels Online

This field allows you to select whether or not the operator will be permitted to change the label set during online operation. If you select "Y" for this field, a control button labeled "Change Online Labels" will appear when the <Get Page> control button is pressed. This button will toggle between using the standard and user selected fonts. The selections available in this field are Y or N.

Use <Return> to open the field, cursor keys to select, and <Return> to close.

IHscellaneous Soft Keys 1

This screen will allow you to redefine the following labels.

Change Online Labels

View or Acknowledge Alarms

Get Page

Directory

Scroll Up

Scroll Down

Acknowledge Selected Alarm

Acknowledge All Alarms Get

Alarm Page Host Display

Window Silence Alarm Horn

Enable Fault Relay

RasceNemeous Soft Ke s 2

This screen will allow you to redefine the following labels.

Change Value Clear

Home

Select Table Entry

Return and Select

More Buttons Setup

Page Execute

Set Date

Set Time

Yes

No

User Entry Soft Keys

This screen will allow you to redefine the following labels.

Enter Password A:
Enter Password B: Enter
Passw. A/B: Enter Old
Password A: Enter Old
Password B: Enter New
Password A: Enter New
Password B: Reenter New
Password: Enter Date (MM-
DD-YY): Enter Time (HH-
MM-SS): Enter New Value:

Setup Page

This screen will allow you to redefine the following labels.

Change Password A Change Password B Log-in
Password A Log-in Password B Log-out
Password A Log-out Password B Set Date and
Time Enter Offline Mode Display System/Config.
Information

This screen will allow you to redefine the following labels.

Hardware Selection Disabled. Change Selection.
Invalid Entry. Press Any Key to Continue.
Invalid Entry. Reenter the Password.
Invalid Entry. Improper Confirmation. Reenter the Password.

Miscellaneous Text

This screen will allow you to redefine the following labels.

Directory of Page Titles

Press Directory for Additional Pages

ALARM PAGE

HOST DISPLAY WINDOW

SETUP PAGE PAGE

<NO CONTROL>

Current Date:

Press Page Number Below

Remote Mode Change Requested OK to Proceed?

Display System/Configuration Information

This screen will allow you to redefine the following labels.

USER CONFIGURATION

EXECUTIVE FIRMWARE

INSTALLED DRIVERS

Name:

Version:

Date/Time:

Free Bytes:

Used Bytes:

Options:

Company/ID:

Model:

Product:

Network:

Alarm Text

This screen will allow you to redefine the following labels.

Clrd

Ackd

LOW ALARM

HIGH ALARM

Chapter 26

Print Documentation

In this chapter, you will learn:

How to print system configuration documentation

Print Documentation

Print Documentation will print all pertinent information for a User Configuration, including:

- Directory Editor Page
- Individual Page Layouts
- Templates
- PLC Name and Port Table
- System Parameters
- Message Library
- Symbol Library
- System Online Labels
- Custom Character Representation

All documentation or individual area can be selected and automatically printed by the Configuration Software Package.

Note Print Documentation will not support printing of custom defined characters nor the International Font characters except in the Font printouts. Custom characters will be printed as periods (.) and International Font Characters will be printed as asterisks (*) for all other printouts including page layouts, templates, and the Message Library.

If you selected File as the Documentation Device in the Utility Parameters Editor, the following screen will appear so you may specify the print documentation filename. You may type the filename you prefer or press <F1> to select an existing filename. The Documentation Menu

will then appear.

PRINT DOCUMENTATION

F1=SELECT

F2=

F3=

F4=

F5=

F6=

F7=

F8=

F9=

F10=

Print Documentation Filename

Do not include the file extension.

Directory: C:\VCP\ONLJNE\print\

PRINT1.TXT

PRINT2.TXT

PRINT3.TXT

PRINT4.TXT

Figure 26-1 Print Documentation Screen

Note If you select additional component files after the initial print to file, subsequent prints will be appended to the print file as long as you do not exit the Documentation Menu.

To change the directory where your file will be placed, you must change the Documentaton Directory field on the second page of the Utility Parameters Editor. For more information, refer to the Edit Utility Parameters section in Chapter 9.

If you selected a parallel or serial port as the Documentation Device in the Utility Parameters Editor, the Documentation Menu will appear.

DOCUMENTATION MENU					
F1=SELECT F6=		F2= F7=		F3= F8-F9=	
				F4= F5=PRINT F10=EXIT	
S•	Directory	S	Page 15	S	PLC Name and Port Table
S•	Page 00	S*	Page 16	S	em Parameters Table
S•	Page 01	S•	Page 17	S	essaga Library
S•	Page 02	S	Page 18	S	Symbol Library
S	Page 03	S	Page 19	S	System Online Labels
S•	Page 04	S•	Page 20	S	Normal Font
S•	Page 05	S•	Page 21	S	
S	Page 06	S	Page 22	S	
S•	Page 07	S■	Page 23	S	
S•	Page 08	S	Page 24	S	
S•	Page 09	S•	Page 25	S•	

Indicates component file exists, S indicates option is selected for printing.

Figure 26-2 Print Documentation Menu

Use the arrow keys to cursor select a desired component file, then press <F1> to select the file. Once all desired component files are selected, press <F5> to begin printing. The printer setup is performed in the Edit Utility Parameters Editor described in Chapter 11.

Note Print Documentation is available only to printers connected directly to your personal computer. Print Documentation will not operate with a networked printer.

Chapter 27

Transfer Editor

In this chapter, you will learn:

- The features of the Transfer Editor
- How to connect to an online unit for transfer
- How to upload or download a configuration
- How to download Executive Firmware
- How to download a driver
- How to download an option
- How to read system configuration information

Overview

The Transfer Editor in the DOS-based Configuration Software Package is used to upload and download the memory of the PanelMate unit using serial port 1 or a remote network card. The PanelMate unit uses non-volatile FLASH memory. This memory is segmented into three main areas: Executive Firmware or Network Executive Firmware, Drivers, and User Configuration. The PanelMate unit also reserves memory to store options such as the Graphic Option and Custom Serial Interface (CSI) Option.

Note If you are using a remote network card, you must download the network driver to do a remote network transfer.

Note The terms upload and download are defined based on the view from the DOS-based personal computer. Therefore software is downloaded from the personal computer to the PanelMate unit and uploaded from the PanelMate unit to the personal computer.

The Executive Firmware or Network Executive Firmware is the base firmware of the PanelMate unit. The Executive Firmware or Network Executive Firmware must be downloaded before you can download configurations, PLC drivers, or options to ensure that the Executive Firmware or Network Executive Firmware, PLC drivers, and configurations are compatible before running your application. It contains the operating system and all the software which comprise the online functionality. You can upgrade a PanelMate unit by downloading new Executive Firmware or Network Executive Firmware without having to ship the unit back to Modicon. You can only download Executive Firmware or Network Executive Firmware, you cannot upload it. The Driver Memory is where the PLC, Host (Generic Protocol), or Custom Serial Interface (CSI) drivers are stored. The PanelMate unit can communicate with two PLC, Host, or CSI drivers at a time. Before going online, you must download the PLC or Host Driver and any CSI driver to match your User Configuration. PLC drivers must be downloaded after the Executive Firmware or Network Executive Firmware and before configurations or options. You can only download drivers, you cannot upload them.

The User Configuration memory is where you store your configuration. The PanelMate unit will have 10 or 30 pages of memory. Configurations must be downloaded after the Executive Firmware or Network Executive Firmware, PLC drivers, and options. You can upload and download User Configurations.

The Transfer Utility is also used to install options in the PanelMate unit. You must purchase the options separately. Options must be downloaded after the Executive Firmware and PLC drivers and before configurations. Options include Graphics, Customer Serial Interface (CSI), Allen-Bradley Data Highway 485 driver, Modicon Modbus driver, and the Remote Transfer option. Once an option is installed, it cannot be removed.

This chapter is divided into two sections: serial transfers and Allen-Bradley network transfers. If you will be transferring using a serial port, refer to the Serial Transfer section on the page 27-13. If you will be transferring using a remote network, refer to the Allen-Bradley Network Transfer section on page 27-23.

Transfer Information Menu

The Transfer Information Software Main Menu contains a selection named Transfer Information. If you choose this selection and the upload/download device is configured for serial communication, the following Transfer Information Menu will appear.

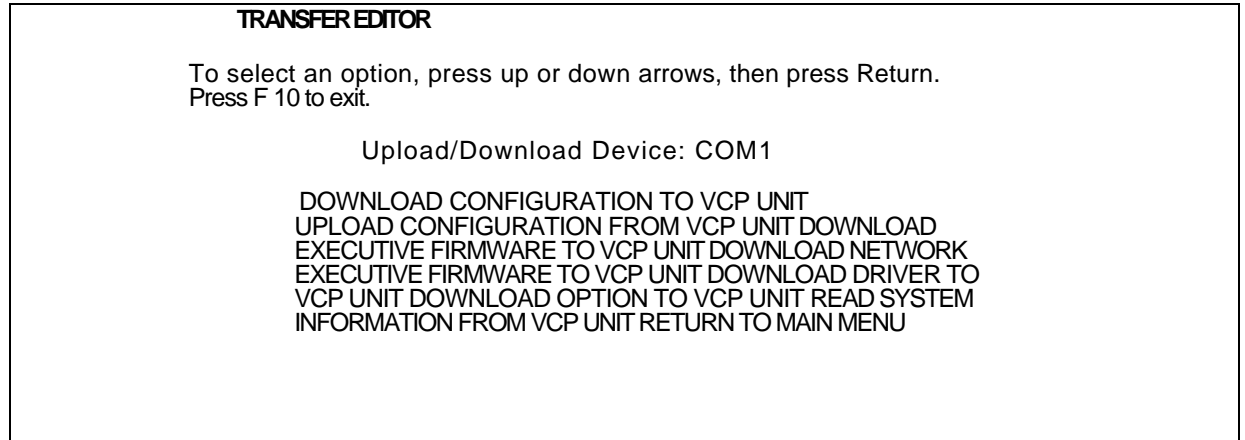


Figure 27-1 Transfer Information Menu

If you choose the Transfer Information selection and the upload/download device is configured for remote communication, the following Transfer Information Menu will appear.

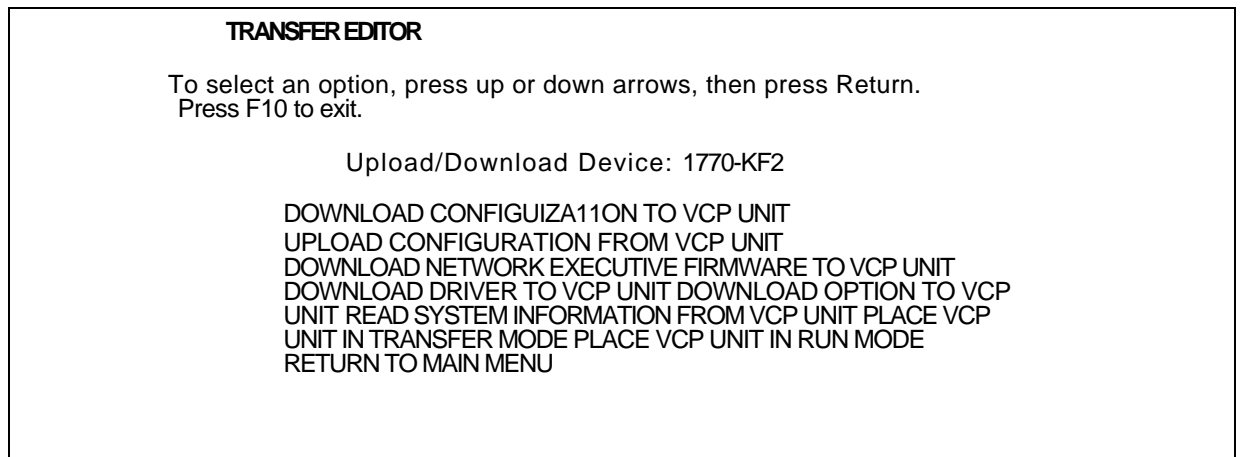


Figure 27-2 Transfer Information Menu

The following sections will give a brief description of each selection.

Download Configuration to VCP Unit

This selection allows you to transfer a configuration from the development computer to the PanelMate unit. The configuration will include system parameters, PLC connection information and display pages containing templates, elements, and static text.

Note The PanelMate unit must be loaded with Executive Firmware and necessary drivers and options before it can receive a configuration.

Download Configuration Error Prompts and Messages

In the event of an error, one of the following messages will be displayed:

CONFIGURATION COULD NOT BE DOWNLOADED. PRESS ANY KEY TO CONTINUE.

TRANSFER ABORTED. PRESS ANY KEY TO CONTINUE. CONFIGURATION COULD NOT BE DOWNLOADED DUE TO DATA TRANSFER ERRORS.

- Errors occurred during serial communication between the development computer and the online system.

CONFIGURATION COULD NOT BE WRITTEN TO VCP UNIT MEMORY.

- Write errors occurred in the online system's non-volatile memory.

USER ABORTED THE TRANSFER. PRESS ANY KEY TO CONTINUE.

- You pressed the <F10> key to stop the transfer.

VCP UNIT EXECUTIVE FIRMWARE INCOMPLETE. RELOAD EXECUTIVE FIRMWARE.

CONFIGURATION IS NOT COMPATIBLE WITH THE EXECUTIVE FIRMWARE VERSION.

- The configuration file being transferred was created with a different software version of the PanelMate unit than the Executive Firmware that has been loaded.

VCP UNIT REAL TIME CLOCK IS INOPERABLE. CANNOT DOWNLOAD CONFIGURATION.

- If you get this error, call Eaton IDT Customer Support at (614) 882-3282.

30 PAGE OPTION NOT INSTALLED ON VCP UNIT.

- You have attempted to transfer a 30 page configuration into a system with only 10 pages of memory.

GRAPHICS OPTION NOT INSTALLED ON VCP UNIT.

- The configuration file being transferred was created using the graphics option (creation of symbols). The online system does not contain this option.

CSI OPTION NOT INSTALLED ON VCP UNIT.

- The configuration file being transferred was created using the Custom Serial Interface option. The online system does not contain this option.

MODICON MODBUS OPTION IS NOT INSTALLED ON VCP UNIT.

- The configuration file being transferred was created using the Modicon Modbus option. The online system does not contain this option.

DH-485 OPTION IS NOT INSTALLED ON VCP UNIT.

- The configuration file being transferred was created using the DH-485 option. The online system does not contain this option.

DOWNLOADABLE DRIVER <drivername> IS NOT INSTALLED.

- The configuration file being transferred contains address references for a PLC driver. This driver is not loaded on the online system.

The <F10> key will return to the Transfer Information Menu.

Upload Configuration from VCP Unit

This selection allows you to transfer a configuration from the PanelMate unit to the development computer and store it.

After choosing this selection, the Transfer Editor will display a list of the configuration files presently in the Configuration directory specified in the Utility Parameters Editor. You may select a file name for storage of the configuration by typing it (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it. If you choose an existing name, you will overwrite the configuration currently stored under that name. When uploading a configuration from a PanelMate unit, refer to the table below for the correct filename extension.

Product	Number of Pages	File Extension
PanelMate 2000	10	PC1
PanelMate 2000	30	PC2
PanelMate 2000 Color	10	PC5
PanelMate 2000 Color	30	PC6
PanelMate 3000	10	PC1
PanelMate 3000	30	PC2
PanelMate 4000	10	PC3
PanelMate 4000	30	PC4

Table 27-1 File Extensions for Uploading Configurations

Upload Configuration Error Prompts and Messages

In the event of an error, one of the following messages will be displayed:

CONFIGURATION COULD NOT BE SAVED TO DISK.

CONFIGURATION COULD NOT BE UPLOADED. PRESS ANY KEY TO CONTINUE. TRANSFER

ABORTED.

PRESS ANY KEY TO CONTINUE. CONFIGURATION COULD NOT

BE UPLOADED DUE TO DATA TRANSFER ERRORS.

- Errors occurred during serial communication between the development computer and the online system.

USER ABORTED THE TRANSFER. PRESS ANY KEY TO CONTINUE.

- You pressed the <F10> key to stop the transfer.

VCP UNIT EXECUTIVE FIRMWARE INCOMPLETE. RELOAD EXECUTIVE FIRMWARE.

CONFIGURATION IS NOT LOADED ON VCP UNIT.

INVALID FILE EXTENSION. YOU MUST CHANGE THE FILE EXTENSION TO
<extension>.

- The correct filename extension must be used when uploading a configuration. Refer to table 27-1 for the list of filename extensions to be used with your PanelMate unit.

The < F10> key will return to the Transfer Information Menu.

Download Executive Firmware to VCP Unit

Note If the Upload/Download Device is configured for remote communication, this selection will not be displayed.

This selection allows you to transfer online operation software from the development computer to the PanelMate unit using serial communication. An online system must contain this software before executing a configuration. Note that downloading executive firmware will remove all drivers previously loaded on the VCP unit. You must re-download the appropriate drivers after the executive firmware has been downloaded.

Download Executive Firmware Error Prompts and Messages

In the event of an error, one of the following messages will be displayed:

USER CONFIGURATION filename IN VCP UNIT WILL BE INVALID. DO YOU WISH TO CONTINUE? PRESS Y OR N.

DOWNLOADABLE DRIVERS WILL BE ERASED FROM VCP UNIT. DO YOU WISH TO CONTINUE? PRESS Y OR N.

EXECUTIVE FIRMWARE VERSION IN VCP UNIT IS THE SAME VERSION AS TO BE DOWNLOADED. DO YOU WISH TO CONTINUE? PRESS Y OR N.

INVALID EXECUTIVE FIRMWARE FILE NAME. ROOT FILE NAME MUST END WITH A "1".

- This is the standard naming convention for Executive Firmware files.

MISSING <file> EXECUTIVE FIRMWARE FILE.

- The Executive Firmware is stored in two files. If one of the two is not found, this message is displayed.

INVALID EXECUTIVE FIRMWARE FILE <file>.

- The Executive Firmware is stored in two files. If one of the two is corrupt, this message is displayed.

EXECUTIVE FIRMWARE PARTIALLY LOADRn. DOWNLOADING REQUIRED SEC4NTS ONLY.

EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED DUE TO DATA TRANSFER ERRORS

- Errors occurred during serial communication between the development computer and the online system.

EXECUTIVE FIRMWARE COULD NOT BE WRITTEN TO VCP UNIT MEMORY.

- Write errors occurred in the online system's non-volatile memory.

EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED. PRESS ANY KEY TO CONTINUE. TRANSFER

ABORTED. PRESS ANY KEY TO CONTINUE.

USER ABORTED THE TRANSFER. PRESS ANY KEY TO CONTINUE.

- You pressed the <F10> key to stop the transfer.

EXECUTIVE FIRMWARE SEGMENT <segment> SUCCESSFULLY DOWNLOADED.

- The Executive Firmware is transferred in two segments.

VCP UNIT REAL TIME CLOCK IS INOPERABLE. CANNOT DOWNLOAD EXECUTIVE FIRMWARE.

The <F10> key will return to the Transfer Information Menu.

Download Network Executive Firmware to VCP Unit

If you purchase the Remote Transfer option, this selection will allow you to transfer online operation software from the development computer to the PanelMate unit using a remote network. This selection will download the Executive Firmware and a network driver. After you select the Executive Firmware filename, a second screen will appear allowing you to select the network driver to include with the Executive Firmware. The network driver is necessary to allow remote transfers. An online system must contain this software before executing a configuration. Note that downloading network executive firmware will remove all drivers previously loaded on the VCP unit. You must re-download the appropriate drivers after the network executive firmware has been downloaded.

Note To communicate over a remote network, you must first download the Network Executive Firmware and the network driver through the Serial Transfer Mode.

Download Network Executive Firmware Error Prompts and Messages In

the event of an error, one of the following messages will be displayed:

USER CONFIGURATION filename IN VCP UNIT WILL BE INVALID. DO YOU WISH TO CONTINUE? PRESS Y OR N.

DOWNLOADABLE DRIVERS WILL BE ERASED FROM VCP UNIT. DO YOU WISH TO CONTINUE? PRESS Y OR N.

EXECUTIVE FIRMWARE VERSION IN VCP UNIT IS THE SAME VERSION AS TO BE DOWNLOADED. DO YOU WISH TO CONTINUE? PRESS Y OR N.

INVALID EXECUTIVE FIRMWARE FILE NAME. ROOT FILE NAME MUST END WITH A "1".

- This is the standard naming convention for Executive Firmware files.

MISSING <file> EXECUTIVE FIRMWARE FILE.

- The Executive Firmware is stored in two files. If one of the two is not found, this message is displayed.

INVALID EXECUTIVE FIRMWARE FILE <file>.

- The Executive Firmware is stored in two files. If one of the two is corrupt, this message is displayed.

EXECUTIVE FIRMWARE PARTIALLY LOADED. DOWNLOADING REQUIRED SEGMENTS ONLY.

EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED DUE TO DATA TRANSFER ERRORS.

- Errors occurred during serial communication between the development computer and the online system.

EXECUTIVE FIRMWARE COULD NOT BE WRITTEN TO VCP UNIT MEMORY.

- Write errors occurred in the online system's non-volatile memory.

EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED. PRESS ANY KEY TO CONTINUE.

TRANSFER ABORTED. PRESS ANY KEY TO CONTINUE. USER ABORTED THE
TRANSFER. PRESS ANY KEY TO CONTINUE.

- You pressed the <F10> key to stop the transfer.

EXECUTIVE FIRMWARE SEGMENT <segment> SUCCESSFULLY DOWNLOADED.

- The Executive Firmware is transferred in two segments.

VCP UNIT REAL TIME CLOCK IS INOPERABLE. CANNOT DOWNLOAD EXECUTIVE FIRMWARE.

The <F10> key will return to the Transfer Information Menu.

Download Driver to VCP Unit

This selection allows you to transfer a communication driver from the development computer to the PanelMate unit. An online system must contain this driver to communicate to an outside device, such as a PLC.

Download Driver Error Prompts and Messages

In the event of an error, one of the following messages will be displayed:

DOWNLOADABLE DRIVER VERSION IN VCP UNIT IS THE SAME VERSION AS TO BE
DOWNLOADED. DO YOU WISH TO CONTINUE? PRESS Y OR N.

USER CONFIGURATION <filename> IN VCP UNIT WILL BE INVALID. DO YOU WISH
TO CONTINUE? PRESS Y OR N.

THE LAST EXECUTIVE FIRMWARE SEGMENT WILL BE ERASED AND WRITTEN
BACK TO MEMORY. DO YOU WISH TO CONTINUE? PRESS Y OR N.

CANNOT FIND EXECUTIVE FIRMWARE FOR POSSIBLE DOWNLOAD TO VCP UNIT. DO
YOU WISH TO CONTINUE? PRESS Y OR N.

DOWNLOADABLE DRIVER COULD NOT BE DOWNLOADED DUE TO DATA TRANSFER ERRORS.

- Errors occurred during serial communication between the development computer and the online system.

DOWNLOADABLE DRIVER COULD NOT BE WRITTEN TO VCP UNIT MEMORY.

- Write errors occurred in the online system's non-volatile memory.

DOWNLOADABLE DRIVER COULD NOT BE DOWNLOADED. PRESS ANY KEY TO CONTINUE.
TRANSFER ABORTED. PRESS ANY KEY TO CONTINUE. USER ABORTED THE TRANSFER.
PRESS ANY KEY TO CONTINUE.

- You pressed the <F10> key to stop the transfer.

The online unit can store two drivers in memory. If driver memory is filled to capacity, you will be unable to load additional drivers and will receive the following error message and prompt message.

INSUFFICIENT MEMORY IN VCP UNIT TO ACCOMMODATE DOWNLOADABLE DRIVERS.
EXECUTIVE FIRMWARE MUST BE RE-INSTALLED TO FREE VCP UNIT MEMORY.

You will need to re-load the Executive Firmware and the Downloadable Drivers. You do not need to re-load the User Configuration as long as you re-load the current revision level of the Executive Firmware which was in the online unit.

The <F10> key will return to the Transfer Information Menu.

Download Option to VCP Unit

This selection allows you to transfer an option from your development computer's floppy disk to the PanelMate unit. Optional functions include: Graphics option, Custom Serial Interface option, Allen-Bradley Data Highway 485 driver, Eaton IDT Modbus driver, and the Remote Transfer option. Insert the option diskette in the drive and begin the transfer. The option name will appear in the Option field.

The software can have up to 26 drivers if optional drivers are included. The abbreviations, which appear in the Use field of the PLC Name and Port Editor, the driver name, and the DOS-filenames, are listed below.

<u>Ike</u>	<u>Name</u>	<u>DOS filename</u>
A-B	Allen-Bradley Serial	AB.DRV
DH-485*	Allen-Bradley Data Highway 485	ABDH485.DRV
DHWAY	Allen-Bradley Data Highway	ABDH.DRV
DHWAY+	Allen-Bradley Data Highway Plus	ABDH.DRV
A-B REM	Allen-Bradley Remote I/O	ABREM.DRV
CSI*	Custom Serial Interface	CSITOL.DRV
EATON	Eaton	EATON.DRV
GE P/P	General Electric Peer-to-Peer	GE.DRV
GE WS	General Electric Master/Slave	GE.DRV
GE S90P	General Electric Series 90 Point-to-Point	GES90P.DRV
GE S90N	General Electric Series 90 Network	GES90.DRV
GENERIC	Generic Protocol	GENERIC.DRV
MITS	Mitsubishi	MITS.DRV
MITS-FX	Mitsubishi FX Series	MITSFX.DRV
MOD-ASC	Modicon ASCII	MODICON.DRV
MOD-RTU	Modicon RTU	MODRTU.DRV
MOD-RTU	Modicon RTU	MRTUE.DRV
OMRON	Omron Host Link	OMRON.DRV
REL	Reliance	RELIANCE.DRV
SIEMENS	Siemens	SIEMENS.DRV
SquareD	Square D	SQUARED.DRV
TI	Texas Instruments	TI.DRV
TI-HUP	Texas Instruments Hostlink Peer-to-Peer	TIHL.DRV
TI-HUM	Texas Instruments Hostlink Master/Slave	TIHL.DRV
TOSH-T2	Toshiba T2	TOSHT2.DRV
WEST	Westinghouse	WEST.DRV

***Note** The CSI and Allen-Bradley Data Highway 485 drivers require option diskettes which are purchased separately and must be installed in the PanelMate unit before the driver can be downloaded.

Note The Modicon RTU Enhanced driver (MRTUE.DRV) uses a 750 millisecond timeout versus the Modicon RTU driver (MODRTU.DRV) which uses a 3 second timeout. (Timeout refers to the length of time the PanelMate unit will wait to issue another request when a response was not received from the PLC.)

Download Option Errors

In the event of an error, one of the following messages will be displayed: <Option

name> OPTION COULD NOT BE INSTALLED.

COULD NOT FIND OPTION ON DISKETTE. PLEASE INSERT OPTION DISKETTE. PRESS ANY KEY TO CONTINUE OR F10 TO EXIT.

- The option file could not be found or a diskette is not in the drive.

INVALID OPTION FILE. PLEASE INSERT OPTION DISKETTE. PRESS ANY KEY TO CONTINUE OR F10 TO EXIT.

- The option file is corrupt.

INSTALL OPTION NOT AVAILABLE. PLEASE INSERT ANOTHER OPTION DISK. PRESS ANY KEY TO CONTINUE OR F10 TO EXIT.

- The option has a single license and it has already been used.

VCP UNIT REAL TIME CLOCK IS INOPERABLE. CANNOT DOWNLOAD OPTION. OPTION

<optionname> ALREADY INSTALLED ON VCP UNIT. OPTION DISKETTE CANNOT BE UPDATED. OPTION INSTALLATION ABORTED.

The <F10> key will return to the Transfer Information Menu.

Read fs"~e)ni

This selection will read the current configuration information from the PanelMate unit and display the current version of the executive firmware, options, and drivers currently loaded in the system. If you use this selection across a remote network, the system information can be read while the PanelMate unit is in the Run Mode. It is not necessary to place the PanelMate unit in the Transfer Mode before reading the system information. If a backup file (.BK1, .BK2, .BK3, .BK4, .BK5, or .BK6) is downloaded, the Read System Information screen will display the file extension as .PC1, .PC2, .PC3, .PC4, .PC5, or .PC6.

Note If your PanelMate unit will be performing network transfers or if your configuration requires multiple installed drivers, check the model field of the Display System Information screen (accessed from the Offline Menu) or the Read System Information screen (accessed from the Transfer Editor Menu). If a model other than B or E is displayed, a hardware upgrade to your PanelMate unit will be required. If a hardware upgrade is needed, call the Eaton IDT Customer Support at (614) 882-3282.

Place VCP Unit in Transfer Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

If the Remote Transfer option is installed and the Remote Mode Change field is configured as IMMEDIATE, DEFAULT, or ACCEPT in the System Parameters Table, this selection will allow you to remotely place the PanelMate unit in Transfer Mode while it is in Run Mode.

Refer to the Remote Mode Change section in Chapter 23, System Parameters, for more information on configuring this field.

Place VCP Unit in Run Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

If the Remote Transfer option is installed, this selection will allow you to remotely place the PanelMate unit in Run Mode while it is in Transfer Mode.

Return to Main Menu

This selection will cause the Transfer Information Software Main Menu to appear.

Serial Transfers

This section is for serial transfers only.

Preparing to Transfer

To use the Transfer Utility, three steps must be performed.

- The PanelMate online unit must be placed in the Serial Transfer Mode.
- The DOS-based personal computer must be connected through an upload/download cable to the PanelMate system.
- The Transfer Editor in the software must be invoked.

The PanelMate unit must be placed in the Serial Transfer Mode. If the unit is online, an orderly shutdown must be executed. The unit should be selected for the Offline Mode, then selected for Serial Transfer Mode. If the unit is offline, then simply select the Serial Transfer Mode. It is also possible to transfer to a PanelMate Electronics Module without the Monitor Housing Assembly or Front Panel Assembly connected. Simply supply AC power and connect to the personal computer. The PanelMate Electronics Module will boot up in Serial Transfer Mode.

Note If you have a PanelMate Series 3000, only the Front Panel Assembly can be removed. The DOS-based personal computer must be connected through an upload/download cable to the PanelMate unit. The default value for the DOS-based software is to use the first available serial port (usually COM1) of the personal computer. A different port may be selected from the Utility Parameters Editor.

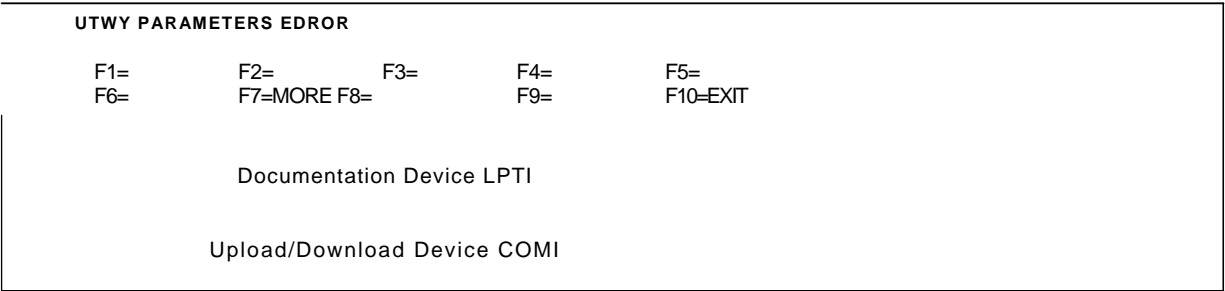


Figure 27-3 Utility Parameters Editor (Page 2)

The personal computer must be connected to serial port 1 on the PanelMate unit. You may use the upload/download cable which can be purchased separately from Eaton IDT to make this connection. This accessory is a 6 foot cable which connects between the 9-pin D-shell connectors of the two units. The accessory package also contains a 25-pin to 9-pin adapter in case your personal computer has a 25-pin port.

PanelMate Series DB-9P	Personal Computer DB-9S	PanelMate Series DB-9P	Personal Computer DB-25S
2 RD 3	RD 2	2 RD	2 TD
TD 5	TD 3	3 TD	3 RD
GND 7	GND 5	5 GND	7 GND
RTS 8	RTS 7	7 RTS	5 CTS
CTS	CTS 8	8 CTS	4 RTS
Shield	Hood	Shield	Hood

Figure 27-4 Serial Transfer Cable

The final step is to enter the Transfer Editor on the DOS-based personal computer. Once the PanelMate unit is placed in the Serial Transfer Mode all control is performed from the personal computer. Simply make the desired selection and follow the instructions.

Note You may change the default communication rate from 9600 baud to a higher baud rate. Note that not all personal computers support 38400 baud.

Following and CConfi u iUor _____ .L,

After choosing this option, the Transfer Editor will display a list of the configuration files presently in the Configuration directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to the desired name and press <Return> to select it. After selecting the configuration name, the Transfer Editor will display a status screen similar to figure 27-5.

TRANSFER EDITOR - DOWNLOAD CONFIGURATION				
F1-START	F2-9600	F3-19200	F4-38400	F5
F6-	F7=	F8=	F9-	F10-DQT
Press F1 to download the configuration, F2, F3, or F4 to change the baud rate, or F1 to exit				
TRANSFER STATUS				
Bytes Transmitted To VCP Unit: 0				218
gyl- To				
Complete:				
				[! 0% 1]
CONFIGURATION INFORMATION				
Configuration Name: FILE1.PC2 Product: PanelMate 3000 Version: XXX				
TRANSFER PARAMETERS				
Upload/Download Device: COM1				
Baud Rate: 9600				

Figure 27-5 Transfer Editor - Download Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a configuration, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING YOUR CONFIGURATION.

After the configuration has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:

CONFIGURATION SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Upload Configuration from VCP Unit

After you select the file name, the Transfer Editor will display the a status screen similar to figure 27-6.

TRANSFER EDITOR - UPLOAD CONFIGURATION

F1=START F2=9600 F3=19200 F4=38400 F5=
F6= F7= F8= F9= F10=EXIT
Press F1 to upload the configuration, F2, F3, or F4 to change the
baud rate or F10 to exit.

TRANSFER STATUS
Bytes Received From VCP Unit: 0
Bytes To Transfer: 218
Complete:

0%

CONFIGURATION INFORMATION

Configuration Name: FILE1.PC2 Product-
PanelMate 3000 Version:
X.XX

TRANSFER PARAMETERS
Upload/Download Device: COM1
Baud Rate: 9600

Figure 27-6 Transfer Editor - Upload Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. These fields will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the upload.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

After the development computer has been properly connected to a PanelMate unit, and the online system is ready to transfer a configuration, press <F1>. The Transfer Editor is now ready to receive. The Transfer Editor will count the number of bytes successfully received. It will notify you when the transfer is complete.

During normal operation, the screen will display the following status messages during the transfer:

CONFIGURATION SUCCESSFULLY UPLOADED. PRESS ANY KEY TO CONTINUE.

Download Executive Firmware to VCP Unit

After choosing this selection, the Transfer Editor will display a list of the Executive Firmware files presently in the Executive Firmware directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the Executive Firmware filename, the Transfer Editor will display a status screen similar to figure 27-7.

TRANSFER EDITOR - DOWNLOAD EXECUTIVE FIRMWARE				
F1=START	F2=9600	F3=19200	F4=38400	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to download the Executive Firmware or F10 to exit				
TRANSFER STATUS				
Bytes Transmitted to VCP Unit: 0				
Bytes To Transfer: XXX				
Estimated Time To Complete: Complete: 0%				
EXECUTIVE FIRMWARE INFORMATION				
Executive Firmware Name: VERX,000.EXF				
Version: X.XX				
TRANSFER PARAMETERS				
Upload/Download Device: COM 1				
Baud Rate: 9600				

Figure 27-7 Transfer Editor - Download Network Executive Firmware

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Executive Firmware Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Executive Firmware Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

After the development computer has been properly connected to the PanelMate unit and the online system has been set to receive an Executive Firmware file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE
CONFIRMATION. PLEASE WAIT ... CLEARING DOWNLOAD
EXECUTIVE FIRMWARE BIT.

After the Executive Firmware file has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:

EXECUTIVE FIRMWARE SUCCESSFULLY DOWNLOADED. PRESS ANY
KEY TO CONTINUE.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key

Note You must purchase the Remote Transfer option to use this selection. If you install the Remote Transfer option, you may still transfer through the Serial Transfer Mode if desired.

After choosing this selection, the Transfer Editor will display a list of the Executive Firmware files presently in the Executive Firmware directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the Executive Firmware filename, the Transfer Editor will display a list of the network driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the network driver filename, the Transfer Editor will display a status screen similar to figure 27-8.

```

TRANSFEREDITOR- DOWNLOAD NETWORK EXECUTIVE FIRMWARE

F1=SIART   F2=9600   F3=19200 F4=38400   F5
F6=        F7=        F8=        F9=        F10=E rr
Press F1 to download the Executive Firmware or F10 to exit.

TRANSFER

STATUS

Bytes Transmitted to VCP Unit: 0
Estimated Time To Complete: xxx
|1| 0%

EXECUTIVE FIRMWARE INFORMATION
Executive Firmware Name: VERX00C.EF
Version: X.XX

TRANSFERPARAMETERS
Upload/Download Device: COM1
Baud Rate: 9600

```

Figure 27-8 Transfer Editor - Download Executive Firmware

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

Note To communicate over a remote network, you must first download the Network Executive Firmware and the network driver through the Serial Transfer Mode.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an Executive Firmware file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

```

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.
PLEASE WAIT ... CLEARING DOWNLOAD EXECUTIVE FIRMWARE BIT.

```

After the Executive Firmware file has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:

```

EXECUTIVE FIRMWARE SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.

```

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Driver to VCP Unit

After choosing this selection, the Transfer Editor will display a list of the downloadable driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

If the downloadable driver file is found to be corrupt, the following message will be displayed: INVALID

DOWNLOADABLE DRIVER FILE <file>.

After selecting the downloadable driver filename, the Transfer Editor will display a status screen similar to figure 27-9.

TRANSFER EDITOR - DOWNLOAD DRIVER

F1=START F2=9600 F3=19200 F4=38400 F5=
F6= F7= F8= F9= F10=EXIT

Press F1 to download the Executive Firmware or F10 to exit

TRANSFER STATUS
 Bytes Transmitted to VCP Unit: 0
 Bytes To Transfer: XXX
 Estimated Time To Complete:
 Complete:

0%

DRIVER INFORMATION

 Driver Name: XXX.DIN Version: X.XX

TRANSFER PARAMETERS
 Upload/Download Device: COM 1
 Baud Rate: 9600

Figure 27-9 Transfer Editor- Download Driver

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Driver Information displays the driver name to be transferred and the driver version.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a downloadable driver file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error message during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING A DRIVER. After the downloadable driver has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:
DOWNLOADABLE DRIVER SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Option to VCP Unit

After choosing this selection, insert the option diskette in the drive and begin the transfer. The option name will appear in the Option field.

TRANSFER EDITOR - DOWNLOAD OPTION	
F1-START F6 -	F2=9600 F7=
F3=19200 F8=	F4=38400 F9=
Press F1 to download the Option or F10 to exit.	
F5- F10=EXr	
OPTION INFORMATION	
Option:	
Number of Option Installations	
Available on Diskette: A	
Option Installation Diskette Drive:	
TRANSFER PARAMETERS	
Upload/Download Device: COM1	
Baud Rate: 9600	

Figure 27-10 Transfer Editor - Download Option

The Option Information displays the option to be downloaded, the number of installations available on the diskette and the option installation diskette drive letter descriptor of a floppy drive set up in the Utility Parameters Editor. If this drive does not exist, the following message will be displayed:

OPTION INSTALLATION DISKETTE DRIVE DOES NOT EXIST.

The Transfer Parameters displays the upload/download device (i.e., COM1, COM2, COM3, or COM4) and the baud rate. If you wish to use a different baud rate from the one displayed, connect to the online unit which is in the Transfer Mode, then press <F2>, <F3>, or <F4> to choose 9600, 19200, or 38400, respectively.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an option, press <F1> to begin the transfer.

The Transfer Editor will notify you when the transfer is complete.

```
<option name> OPTION SUCCESSFULLY INSTALLED. PRESS ANY KEY TO  
CONTINUE.
```

The option will be removed from the Installation Diskette.

Read System Information from VC J nit

Press <F1> to read system configuration information or <F10> to exit.

TRANSFER EDITOR - READ SYSTEM INFORMATION				
F1=START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to read System/Configuration information or F10 to exdt.				
USER CONFIGURATION		TRANSFER PARAMETERS		
Name:	FILE1.PC2	Upload/Download Device:	COM1	Version: X.XX
Date/Time:	06/23/94 07:45			
Free Bytes:	40932	Used Bytes:	24064	
Network:				
Options:	30 Page, Graphics			
EXECUTIVE FIRMWARE				
Company/ID:	Eaton IDT, Inc.			
Product:	PanelMate 3000			
Version:	X.XX	Model B:	30 Page	
Network:				
Options:	Graphics			
INSTALLED DRIVERS				
Generic			(Version X.)X	

Figure 27-11 Read System Information Display

The Read System Information selection displays the current version of the executive firmware, options, and drivers currently loaded in the system. If you need to download the executive firmware, the message "EXECUTIVE FIRMWARE DOWNLOAD REQUIRED" will be displayed next to the executive firmware section.

Note Since the PanelMate unit is modular, the electronics module may be removed and transported to your personal computer to transfer files. The Serial Transfer Mode is the default state of the electronics module when power is applied.

Return to Main Menu

This selection will cause the Transfer Information Software Main Menu to appear.

Allen-Bradley Data Highway Network Transfers

This section is for Allen-Bradley Data Highway network transfers only.

Preparing to Transfer

To use the Transfer Utility, the following steps must be performed.

- The Remote Transfer option must be installed.
- The Network Executive Firmware, the Allen-Bradley network driver (**abdh.net**), and a valid Data Highway configuration must be downloaded through the Serial Transfer Mode the first time it is used.
- The DOS-based personal computer must be connected to a 1770-KF2 module or a 5136-SD card over a Data Highway to the PanelMate system that contains an installed Accelerati/On card communicating on Data Highway. Transfers through a 1785-KA module to a PanelMate unit on a Data Highway Plus network are not possible.
- The PanelMate unit must be placed in the Network Transfer Mode. The Network Transfer Mode selection can be made directly at the PanelMate unit or remotely by configuring the Remote Mode Change field in the System Parameters Table. Refer to the Remote Mode Change section in Chapter 23, System Parameters, for more information.

To transfer using the Data Highway network, the 1770-KF2/DH module or the 5136-SD/DH card must be selected as the Upload/Download Device in the Utility Parameters Editor.

UTILITY PARAMETERS EDITOR	
F1= F6--	F2= F7=MORE F8= F9= F10=EXlr
Documentation Device	LPT1
Upload/Download Device	1770-KF2/DH
PC Address	0
VCP Unit Address	0
Port	COM 1
Baud Rate	19200
Parity	NONE

Figure 27-12 Utility Parameters Editor (1770-KF2/DH)

The values shown in figure 27-12 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 1770-KF2 module on the network.
VCP Unit Address	This field selects the default address of the PanelMate unit to be accessed on the network.
Port	<i>This field selects the serial port that the configuration software will transmit and receive data to and from the 1770-KF2 module.</i>
Baud Rate	This field selects the baud rate transmission between the configuration software and the 1770-KF2 module.
Parity	This field selects the parity transmission between the configuration software and the 1770-KF2 module.

For more information about these parameters, refer to the 1770-KF2 module user manual.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2=	F3= F7=MORE F8=	F4= F9=	F5= F10=EXIT
Documentation Device		LPT1		
Upload/Download Device		5136-SD/DH		
PC Address		0		
VCP Unit Address		0		
SD Port Address		250		
SD Card Memory Address		D0000		
Card Revision		1		

Figure 27-13 Utility Parameters Editor (5136-SD/DH)

The values shown in figure 27-13 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	<i>This field selects the printer port or file on the personal computer.</i>
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 5136-SD/DH module on the network.
VCP Unit Address	This field selects the default address of the PanelMate unit to be accessed on the network.
SD Port Address	<i>This field selects the port location of the 5136-SD card used to load software and access the 5136-SD card.</i>
SD Card Memory Address	This field selects the memory address of the 5136-SD card.
Card Revision	This field selects the revision of the 5136-SD card.

For more information about these parameters, refer to the 5136-SD card user manual.

The final step is to enter the Transfer Editor on the DOS-based personal computer. Once the PanelMate unit is placed in the Network Transfer Mode, all control is performed from the personal computer. Simply make the desired selection and follow the instructions.

The figure below shows an example of a typical Data Highway transfer if you have a 1770-KF2 module connected to your personal computer.

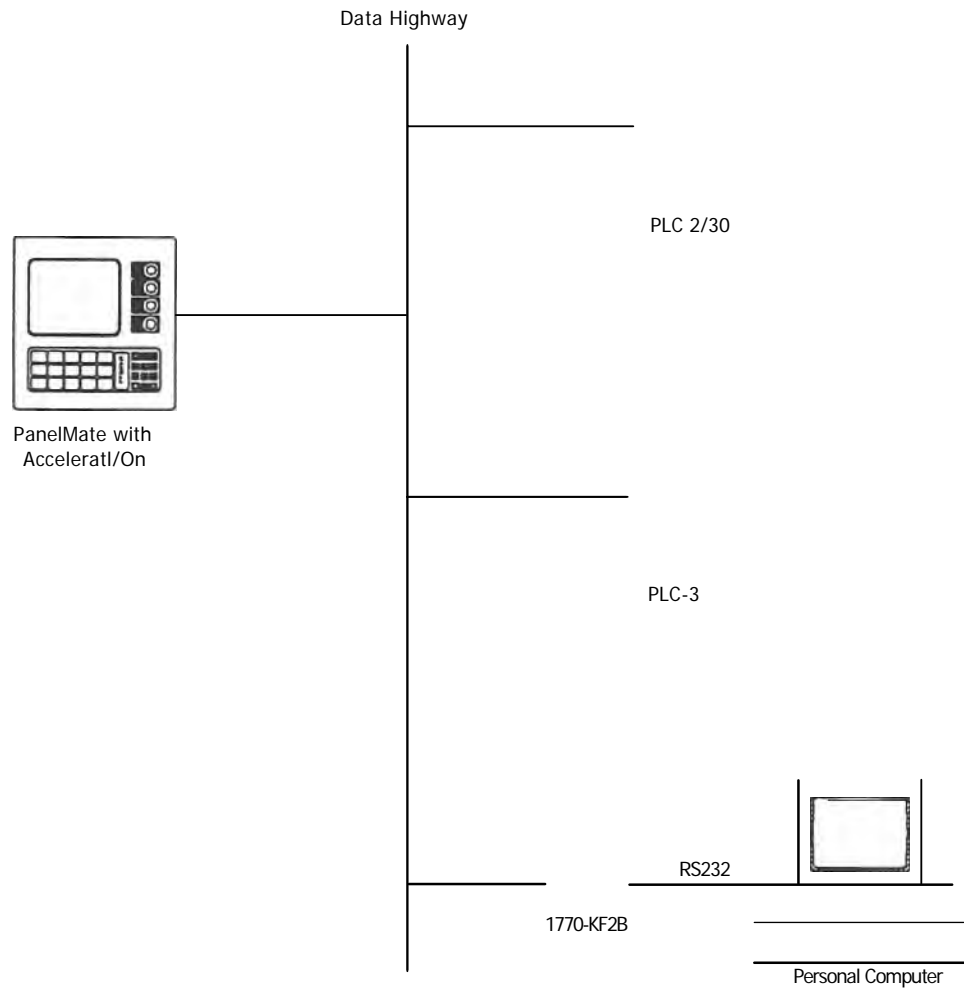


Figure 27-14 Data Highway Network Transfer with a 1770-KF Module

For more information about the 1770-KF2 module, refer to the 1770-KF2 module user manual.

The figure below shows an example of a typical Data Highway transfer if you have a 5136-SD card installed on your personal computer.

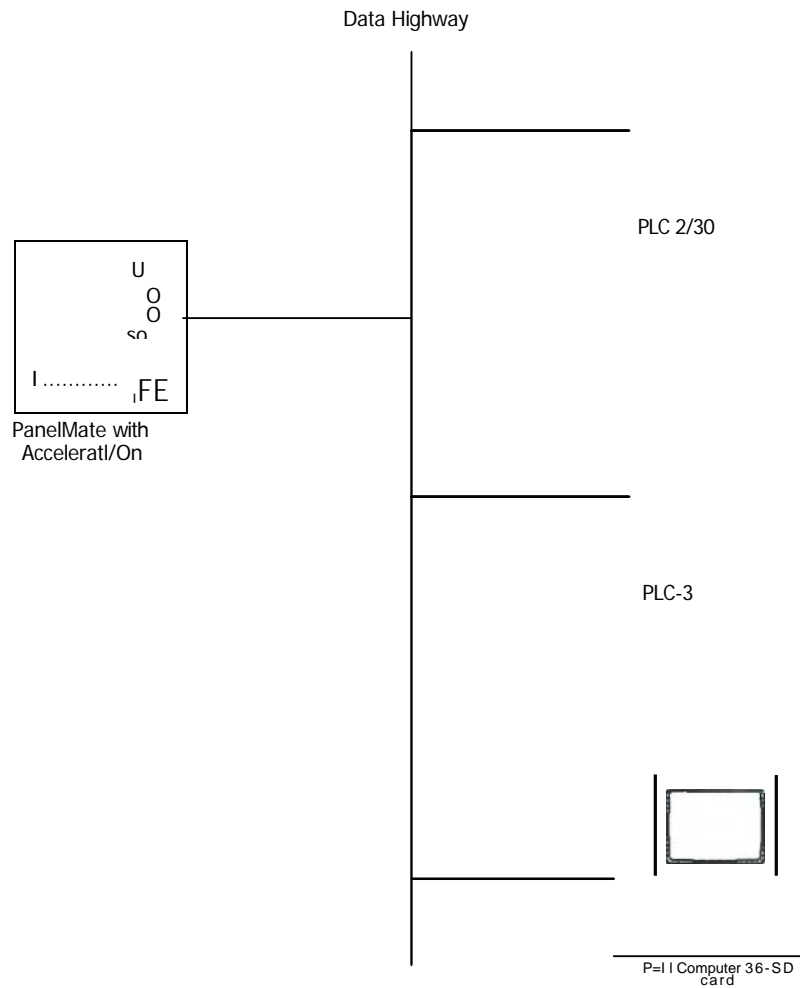


Figure 27-15 Data Highway Network Transfer

For more information about the 5136-SD card, refer to the 5136-SD card user manual.

Do-

The Download Configuration to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this option, the Transfer Editor will display a list of the configuration files presently in the Configuration directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the configuration name, the Transfer Editor will display a status screen similar to figure 27-16.

```
TRANSFER EDITOR - DOWNLOAD CONFIGURATION

F1=S?ART    F2=      F3=      F4=      F5-
F6-         F7=      F8=      F9-      F10=EXIT

Press F1 to download the configuration or F10 to exit

TRANSFER STATUS
  Bytes Transmitted To VCP Unit: 0
  Bytes To Transfer: XXX
  Estimated Time To Complete:
  Complete:  0%

CONFIGURATION INFORMATION
  Configuration Name: FILE1.PC2
  Product: PanelMate Plus 3000
  Version: X.XX

TRANSFER PARAMETERS
  Upload/Download Device: 1770-KF2/DH or 5136-SD/DH
  VCP Unit Address: 0
```

Figure 27-16 Transfer Editor - Download Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a configuration, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING YOUR CONFIGURATION. If the

PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE CONFIGURATION.

If a communication error occurs during the transfer, the screen will display the following message:

CONFIGURATION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR,

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

After the configuration has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed: CONFIGURATION SUCCESSFULLY DOWNLOADED.

PRESS ANY KEY TO CONTINUE.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Upload Configuration from VCP Unit

The Upload Configuration to VCP Unit selection is available in the Transfer Mode and the Run Mode.

After you select the file name, the Transfer Editor will display the a status screen similar to figure 27-17.

TRANSFER EDITOR - UPLOAD CONFIGURATION

F1=START

F2=

F3=

F4=

F5=

F6=

F7=

F8=

F9=

F10=EXIT

TRANSFER STATUS

Bytes Received From VCP Unit: 0

Bytes To Transfer: XXX

Estimated Time To Complete:

Complete:

0%

CONFIGURATION INFORMATION

Configuration Name: FILE 1.PC2 Product:

PanelMate 3000 Version:

XXX

TRANSFER PARAMETERS

Upload/Download Device: 1770-KF2/DH or 5136-SD/DH VCP

Unit Address: 0

Figure 27-17 Transfer Editor - Upload Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. These fields will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the upload.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to a PanelMate unit, press <F1> when ready to transfer a configuration. Note that configurations can be uploaded from the network transfer mode or from the run mode (online). The Transfer Editor is now ready to receive. The Transfer Editor will count the number of bytes successfully received. It will notify you when the transfer is complete.

During normal operation, the screen will display the following status messages during the transfer:

```
CONFIGURATION SUCCESSFULLY UPLOADED.      PRESS ANY KEY TO CONTINUE.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
CONFIGURATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

Download Network Executive Firmware to VCP Unit

The Download Network Executive Firmware to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the Executive Firmware files presently in the Executive Firmware directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the Executive Firmware filename, the Transfer Editor will display a list of the network driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the network driver filename, the Transfer Editor will display a status screen similar to figure 27-18.

TRANSFER EDITOR - DOWNLOAD NETWORK EXECUTIVE FIRMWARE				
F1-START F6=	F2- F7=	F3= F8=	F4 - F9=	F5= F10=EXIT
.				
TRANSFER STATUS				
Bytes Transmitted to VCP Unit: 0				
Bytes To Transfer: XXX				
Estimated Time To Complete:				
Complete:				
EXECUTIVE FIRMWARE INFORMATION				
Executive Firmware Name: VERXJOOC.EXF				
Version: X.XX				
TRANSFER PARAMETERS				
Upload/Download Device: 1770-KF2/DH or 5136-SD/DH				
VCP Unit Address: 0				

Figure 27.18 Transfer Editor - Download Network Executive Firmware

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Executive Firmware Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Note To transfer over a Data Highway network, you must first download the network executive firmware, the network driver (**abdh.net**), and a valid Data Highway configuration using the Serial Transfer Mode. Subsequent transfers can be downloaded through the Network Transfer Mode.

After the development computer has been properly connected to the PanelMate unit and the online system has been set to receive a Network Executive Firmware file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

```
PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.  
PLEASE WAIT ... CLEARING DOWNLOAD EXECUTIVE FIRMWARE BIT.
```

After the Executive Firmware file has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:

```
EXECUTIVE FIRMWARE SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO  
CONTINUE.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE CONFIGURATION.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED DUE TO COMM. ERROR #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Driver to VCP Unit

The Download Driver to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the downloadable driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

If the downloadable driver file is found to be corrupt, the following message will be displayed: INVALID

DOWNLOADABLE DRIVER FILE <file>.

After selecting the downloadable driver filename, the Transfer Editor will display a status screen similar to figure 27-19.

TRANSFER EDITOR - DOWNLOAD DRIVER

F1=START F2= F3= F4= F5=
F6= F7= F8= F9= F10=EXrr

Press F1 to download driver or F10 to exdt.

TRANSFER STATUS
Bytes Transmitted to VCP Unit: 0
Bytes To Transfer: 218
Estimated Time To Complete:

Complete: 0%

DRIVER INFORMATION
Driver Name: XXX.DRV Version: X.XX

TRANSFER PARAMETERS
Upload/Download Device: 1770-KF2/DH or 5136-SD/DH
VCP Unit Address: 0

Figure 27-19 Transfer Editor- Download Driver

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Driver Information displays the driver name to be transferred and the driver version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a downloadable driver file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error message during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING A DRIVER.

If the PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE DRIVER.

If a communication error occurs during the transfer, the screen will display the following message:

DRIVER COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

After the downloadable driver has been transferred, the Transfer Editor will wait for an acknowledgment from the online system. The following message will be displayed:

DOWNLOADABLE DRIVER SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Option to VCP Unit

The Download Option to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, insert the option diskette in the drive and begin the transfer. The option name will appear in the Option field.

TRANSFEREDITOR- DOWNLOAD OPTION	
F1=START	F2=
F6=	F7=
F3=	F8=
F4=	F9=
F5=	F10=EXIT
Press F1 to download the Option or Flo to exit.	
OPTION INFORMATION	
Option:	
Number of Option Installations	
Available on Diskette: A	
Option Installation Diskette Drive:	
TRANSFER PARAMETERS	
Upload/Download Device: 1770-KF2/DH or 5136-SD/DH	
VCP Unit Address: 0	

Figure 27-20 Transfer Editor - Download Option

The Option Information displays the option to be downloaded, the number of installations available on the diskette and the option installation diskette drive letter descriptor of a floppy drive set up in the Utility Parameters Editor. If this drive does not exist the following message will be displayed:

```
OPTION INSTALLATION DISKETTE DRIVE DOES NOT EXIST.
```

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2 or 5136-SD) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an option, press <F1> to begin the transfer.

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE OPTION.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
OPTION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
<option name> OPTION SUCCESSFULLY INSTALLED. PRESS ANY KEY TO  
CONTINUE.
```

The option will be removed from the Installation Diskette.

Information from

The Read System Information from VCP Unit selection is available in the Transfer Mode and the Run Mode.

Press <F1> to read system configuration information or <F10> to exit.

TRANSFER EDITOR - READ SYSTEM INFORMATION				
FI-START F6=	F2- F7=	F3= F8=	F4= F9=	F5= F10=EXIT
Press FI to read System/Configuration Information or F10 to exit.				
USER CONFIGURATION		TRANSFER PARAMETERS		
Name:	FILE1.PC2	Upload/Download Device:	1770-KF2/DH or 5136-SD/DH	
Version:	X.XX	VCP Unit Address:		
Date/Time:	06/23/94 07:45			
Free Bytes:	40932	Used Bytes:	24064	
Network:	Modicon Modbus Plus			
Options:	30 Page. Graphics			
EXECUTIVE FIRMWARE				
Company/ID: Modicon.Inc.				
Product:	PanelMate Plus 3000			
Version:	X.XX	Model B:	30 Page	
Network:	Alien-Brodey DH/DH+			
Optkxu:	Graphics			
INSTALLED DRIVERS				
Generic		(Version X.)X)		

Figure 27-21 Read System Information Display

The Read System Information selection displays the current version of the executive firmware, options, and drivers currently loaded in the system. If you need to download the executive firmware, the message "EXECUTIVE FIRMWARE DOWNLOAD REQUIRED" will be displayed next to the executive firmware section.

Note Since the PanelMate unit is modular, the electronics module may be removed and transported to your personal computer to transfer files. The Serial Transfer Mode is the default state of the electronics module when power is applied.

If a communication error occurs during the transfer, the screen will display the following message:

SYSTEM INFORMATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

Place VCP Unit in Transfer Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit in Transfer Mode selection is available in the Run Mode.

After making this selection, the Transfer Editor will display a screen similar to figure 27-22.

TRANSFER EDITOR - PLACE VCP UNIT IN TRANSFER MODE

F1=START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXf

Press F1 to start remote mode change or F10 to exit. TRANSFER

PARAMETERS

Figure 27-22 Place VCP Unit in Transfer Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Transfer Mode to Run Mode if the Remote Mode Change is configured as IMMEDIATE, DEFAULT, or ACCEPT in the System Parameters Table. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT . . . MODE CHANGE IN PROGRESS.

If the PanelMate unit is in the Transfer Mode, the screen will display the following message:

VCP UNIT ALREADY IN TRANSFER MODE.

If the PanelMate unit cannot be placed in the Transfer Mode, the screen will display the following message:

VCP UNIT CANNOT BE SWITCHED TO TRANSFER MODE.

If the PanelMate unit needs operator acceptance before switching to the Transfer Mode, the screen will display the following message:

WAITING FOR VCP UNIT OPERATOR ACCEPTANCE.

PRESS F10 TO ABORT.

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO TRANSFER MODE DUE TO COMM.  
ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO TRANSFER MODE. PRESS ANY KEY TO  
CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Transfer Mode. Although the mode change may take several seconds, it must be completed before another successful transfer can be made.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Place VCP Unit in Run Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit in Run Mode selection can be used only when the PanelMate unit is in the Transfer Mode.

After making this selection, the Transfer Editor will display a screen similar to figure 27-23.

TRANSFER EDITOR - PLACE VCP UNIT IN RUN MODE				
F1=START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to start remote mode change or F10 to exit. TRANSFER				
PARAMETERS				
Upload/Download Device: 1770-KF2/DH or 5136-SD/DH				

Figure 27-23 Place VCP Unit in Run Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH or 5136-SD/DH) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Run Mode to Transfer Mode. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

```
PLEASE WAIT ... MODE CHANGE IN PROGRESS.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message: VCP

```
UNIT ALREADY IN RUN MODE.
```

If the PanelMate unit cannot be placed in the Run Mode, the screen will display the following message:

```
VCP UNIT CANNOT BE SWITCHED TO RUN MODE.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO RUN MODE DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6 or the Remote STS and EXT STS Errors section in Chapter 30 for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO RUN MODE. PRESS ANY KEY TO CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Run Mode.

Although the mode change may take several seconds to several minutes (depending on the size of your configuration), it must be completed before another successful transfer can be made.

After a wait of one minute with no acknowledgment, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Return to Main Menu

This selection will cause the Transfer Information Software Main Menu to appear.

Allen-Bradley Data Highway Plus Network Transfers

This section is for Allen-Bradley Data Highway Plus network transfers only.

Preparing to Transfer

To use the Transfer Utility, the following steps must be performed.

- The Remote Transfer option must be installed.
- The Network Executive Firmware, the Allen-Bradley network driver (**abdh.net**), and a valid Data Highway Plus configuration must be downloaded through the Serial Transfer Mode the first time it is used.
- The DOS-based personal computer must be connected to a 1770-KF2 module, a 1784-KT card, or a 5136-SD card over Data Highway Plus to the PanelMate system that contains an installed AcceleratVOn card.
- The PanelMate unit must be placed in the Network Transfer Mode. The Network Transfer Mode selection can be made directly at the PanelMate unit or remotely by configuring the Remote Mode Change field in the System Parameters Table. Refer to the Remote Mode Change section in Chapter 23, System Parameters, for more information.

To transfer using the Data Highway Plus network, the 1770-KF2/DH+ module, the 1784-KT card, or the 5136-SD/DH+ card must be selected as the Upload/Download Device in the Utility Parameters Editor.

Note The 1784-KT option must be purchased and installed before you may transfer using the Data Highway Plus network with a 1784-KT card.

UTILITY PARAMETERS EDITOR					
F1= F6=	F2=	F3= F7=MORE	F4= F8=	F5= F9=	F10=EXIT
Documentation Device			LPT1		
Upload/Download Device			1770-KF2/DH+		
PC Address			0		
VCP Unit Address			0		
Port			COM1		
Baud Rate			19200		
Parity			NONE		

Figure 27-24 Utility Parameters Editor (1770-KF2)

The values shown in figure 27-24 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 1770-KF2 module on the network.
VCP Unit Address	This field selects the default address of the PanelMate unit to be accessed on the network.
Port	This field selects the serial port that the configuration software will transmit and receive data to and from the 1770-KF2 module.
Baud Rate	This field selects the baud rate transmission between the configuration software and the 1770-KF2 module.
Parity	This field selects the parity transmission between the configuration software and the 1770-KA module.

For more information about these parameters, refer to the 1770-KF2 module user manual.

UTILITY PARAMETERS EDITOR					
F1= F6=	F2=	F3= F7=MORE	F4= F8=	F5= F9=	F10=EXIT
Documentation Device			LPT1		
Upload/Download Device			1784-Kr		
PC Address			0		
VCP Unit Address			0		
KT Card Memory Address			D4000		
KT Card Channel Number			0		
Termination			Y		

Figure 27-25 Utility Parameters Editor (1784-KT)

Note The 1784-KT option must be purchased and installed before you may transfer using the Data Highway Plus network with a 1784-KT card.

The values shown in figure 27-25 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 1784-KT module on the network.
VCP Unit Address	This field selects the default address of the PanelMate unit to be accessed on the network.
KT Card Memory Address	This field selects the memory address of the 1784-KT card.
KT Card Channel Number	This field selects channel number for the 1784-KT card.
Termination	This field selects the termination for the 1784-KT card.

For more information about these parameters, refer to the 1784-KT card user manual.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2=	F3= F7=MORE F8=	F4= F9=	F5= F10=EXIT
Documentation Device		LPT1		
Upload/Download Device		5136-SD/DH+		
PC Address		0		
VCP Unit Address		0		
SD Port Address		250		
SD Card Memory Address		D0000		
Card Revision		1		
Terminal Name				

Figure 27-26 Utility Parameters Editor (5136-SD/DH+)

The values shown in figure 27-26 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 5136-SD/DH+ module on the network.
VCP Unit Address	This field selects the default address of the PanelMate unit to be accessed on the network.
SD Port Address	<i>This field selects the port location of the 5136-SD card used to load software and access the 5136-SD card.</i>
SD Card Memory Address	This field selects the memory address of the 5136-SD card.
Card Revision	This field selects the revision of the 5136-SD card.
Terminal Name	This field selects the name used for "who active" identity and diagnostics.

For more information about these parameters, refer to the 5136-SD card user manual. The final step is to enter the Transfer Editor on the DOS-based personal computer. Once the PanelMate unit is placed in the Network Transfer Mode, all control is performed from the personal computer. Simply make the desired selection and follow the instructions.

The figure below shows an example of a typical Data Highway Plus transfer if you have a 1770-KF2 module connected to your personal computer.

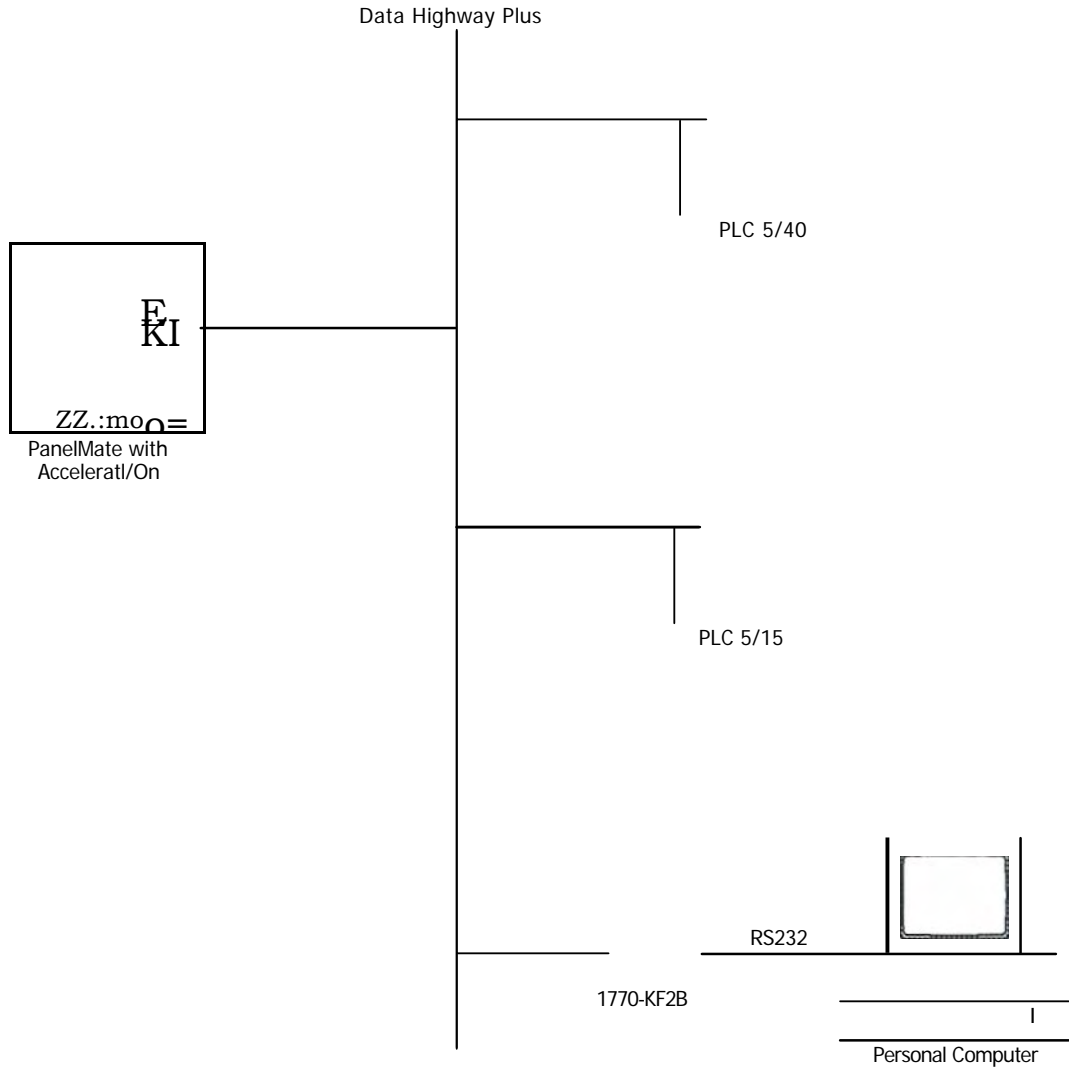


Figure 27-27 Data Highway Plus Network Transfer with a 1770-KF2 Module

For more information about the 1770-KF2 module, refer to the 1770-KF2 module user manual.

The figure below shows an example of a typical Data Highway Plus transfer if you have a 1784-KT or 5136-SD card installed in your personal computer.

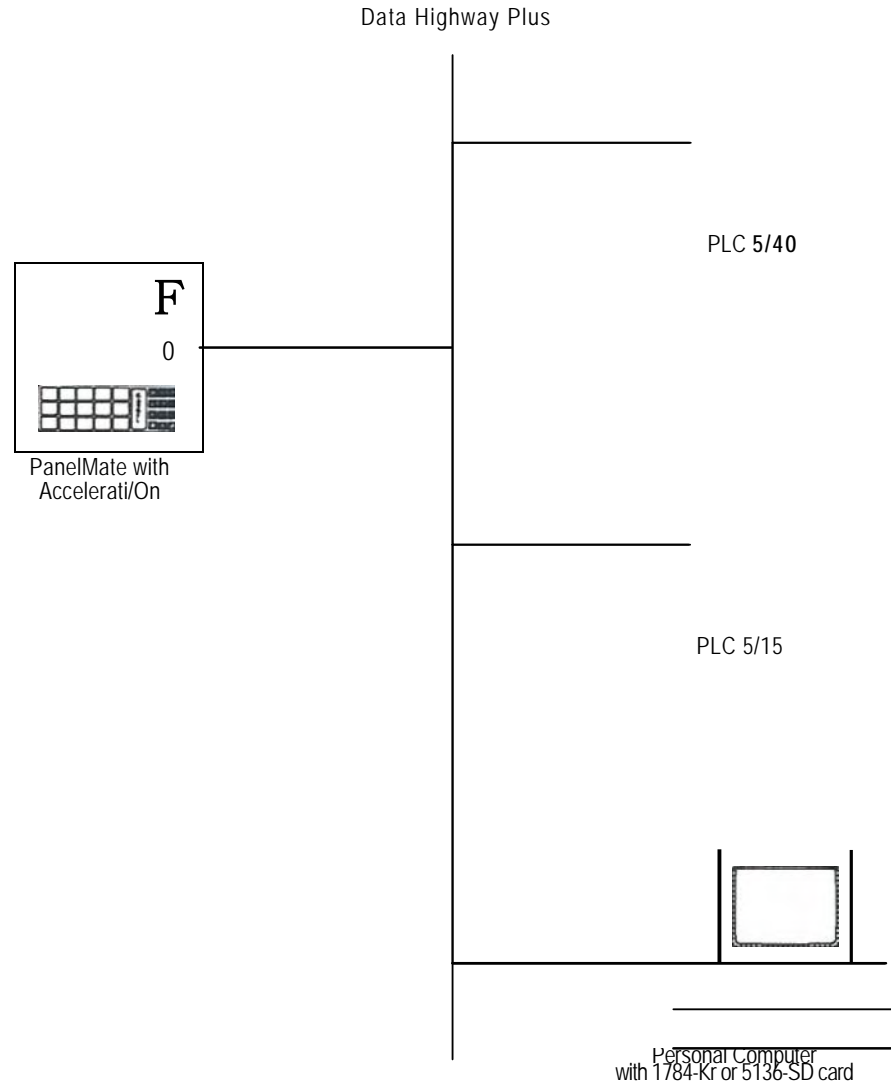


Figure 27-28 Data Highway Plus Network Transfer

For more information about the 1784-KT or 5136-SD card, refer to the 1784-KT card user manual or the 5136-SD card user manual.

Download Configuration to VCP Unit

The Download Configuration to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this option, the Transfer Editor will display a list of the configuration files presently in the Configuration directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the configuration name, the Transfer Editor will display a status screen similar to figure 27-29.

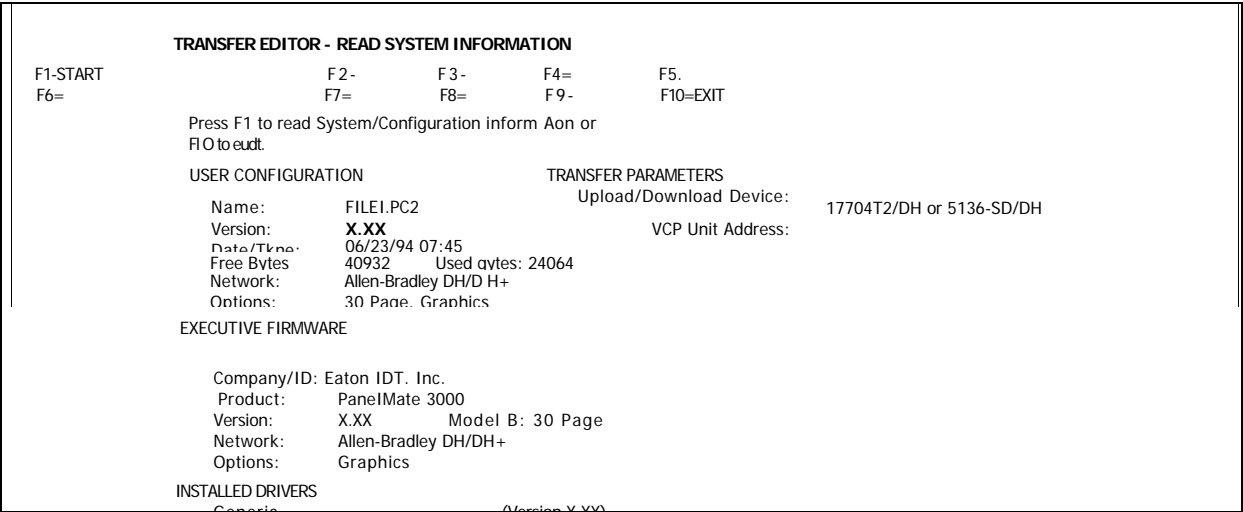


Figure 27-29 Transfer Editor - Download Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a configuration, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING YOUR CONFIGURATION. If the

PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE CONFIGURATION.

If a communication error occurs during the transfer, the screen will display the following message:

CONFIGURATION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After the configuration has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

CONFIGURATION SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE. After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Upload Configuration from VCP Unit

The Upload Configuration to VCP Unit selection is available in the Transfer Mode and the Run Mode.

After you select the file name, the Transfer Editor will display the a status screen similar to figure 27-30.

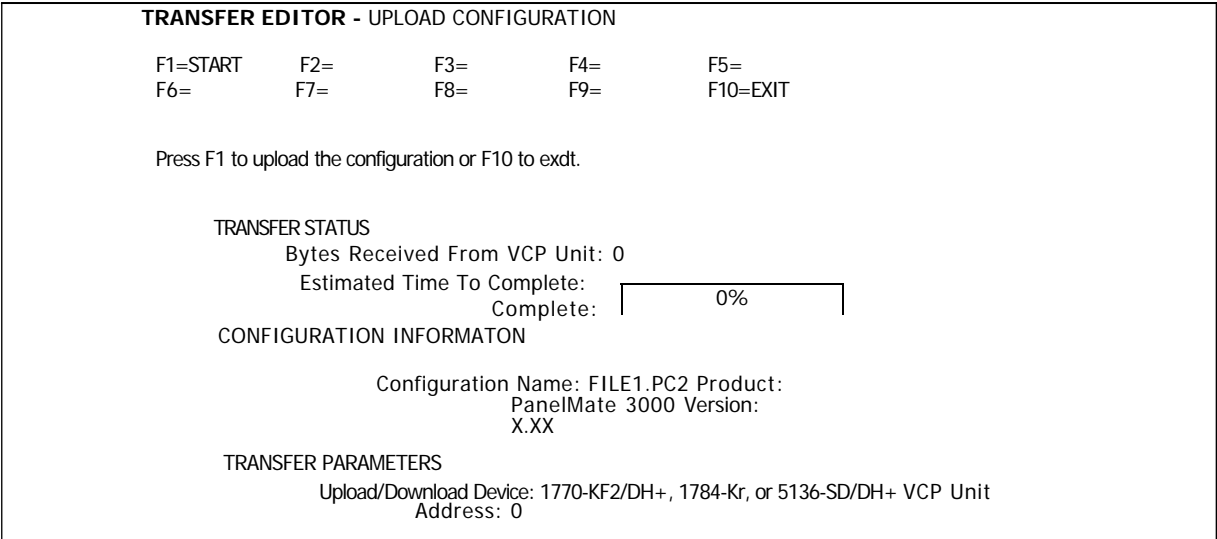


Figure 27-30 Transfer Editor - Upload Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. These fields will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Transfer Status displays the number of bytes to transfer. The bytes transmitted, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the upload.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to a PanelMate unit, press <F1> when ready to transfer a configuration. Note that configurations can be uploaded from the network transfer mode or from the run mode (online). The Transfer Editor is now ready to receive. The Transfer Editor will count the number of bytes successfully received. It will notify you when the transfer is complete.

During normal operation, the screen will display the following status messages during the transfer:

```
CONFIGURATION SUCCESSFULLY UPLOADED.          PRESS ANY KEY TO CONTINUE.  If a
```

communication error occurs during the transfer, the screen will display the following message:

```
CONFIGURATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

Download Network Executive Firmware to VCP Unit

The Download Network Executive Firmware to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the Executive Firmware files presently in the Executive Firmware directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the Executive Firmware filename, the Transfer Editor will display a list of the network driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the network driver filename, the Transfer Editor will display a status screen similar to figure 27-31.

```

TRANSFER EDITOR - DOWNLOAD NETWORK EXECUTIVE FIRMWARE

F1=START      F2-      F3-      F4=      F5
F6=           F7=      FB=      F4=      F10=EXIT

-----

TRANSFER STATUS
  Bytes Transmitted to VCP Unit: 0
  Bytes To Transfer: XXX
  Estimated Time To Complete:
  Complete:
  |-----| 0%

EXECUTIVE FIRMWARE INFORMATION
  Executive Firmware Name: VERXJ000.EXF
  Version: X.XX

TRANSFER PARAMETERS
  Upload/Download Device: 1770-KF2/DH+,1784-Kr, or 5136-SD/DH+
  VCP Unit Address: 0

```

Figure 27-31 Transfer Editor - Download Network Executive Firmware

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Executive Firmware Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Note To transfer over a Data Highway Plus network, you must first download the network executive firmware, the network driver (**abdh.net**), and a valid Data Highway Plus configuration using the Serial Transfer Mode. Subsequent transfers can be downloaded through the Network Transfer Mode.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an Executive Firmware file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

```

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.
PLEASE WAIT ... CLEARING DOWNLOAD EXECUTIVE FIRMWARE BIT.

```

If the PanelMate unit is in the Run Mode, the screen will display the following message: VCP

```

UNIT IS IN RUN MODE AND CANNOT RECEIVE EXECUTIVE FIRMWARE.

```

If a communication error occurs during the transfer, the screen will display the following message:

```
EXECUTIVE FIRWME COULD NOT BE DOG NLD2 DED DUE TO CCW. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After the Network Executive Firmware file has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

```
EXECUTIVE FIRMWARE SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.
```

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Driver to VCP Unit

The Download Driver to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the downloadable driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

If the downloadable driver file is found to be corrupt, the following message will be displayed: `INVALID`

```
DOWNLOADABLE DRIVER FILE <file>.
```

After selecting the downloadable driver filename, the Transfer Editor will display a status screen similar to figure 27-32.

TRANSFER EDITOR - DOWNLOAD DRIVER

F1=START

F2=

F3=

F4=

F5=

F6=

F7=

F8=

F9=

F10=EXIT

Press F1 to download driver or F10 to edt.

TRANSFER STATUS

Bytes Transmitted to VCP Unit:

0

Bytes To Transfer:

218

Estimated Time To Complete:

Complete:

0%

DRIVER INFORMATION

Driver Name:

XXX.DRV

Version:

X.XX

TRANSFER PARAMETERS

Upload/Download Device:

1770-KF2/DH+.1784-KT, or 5136-SD/DH+

VCP Unit Address:

0

Figure 27-32 Transfer Editor - Download Driver

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Driver Information displays the driver name to be transferred and the driver version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a downloadable driver file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error message during the transfer:

```
PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.
```

If the executive firmware has not been downloaded, the screen will display the following message:

```
PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE downloading A DRIVER.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE DRIVER.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
DRIVER COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After the downloadable driver has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

```
DOWNLOADABLE DRIVER SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO  
CONTINUE.
```

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Option to VCP Unit

The Download Option to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, insert the option diskette in the drive and begin the transfer. The option name will appear in the Option field.

TRANSFER EDITOR - DOWNLOAD OPTION				
F1=START	F2=	F3=	F4=	F5
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to download the Option or F10 to exit.				
OPTION INFORMATION				
Option:				
Number 0'0 ~tton Installations				
Available on Diskette: A				
Option Installation Diskette Drive:				
TRANSFER PARAMETERS				
Upload/Download Device: 1770#2/DH+,1784-KT, or 5136-SD/DH+				
VCP Unit Address: 0				

Figure 27-33 Transfer Editor - Download Option

The Option Information displays the option to be downloaded, the number of installations available on the diskette and the option installation diskette drive letter descriptor of a floppy drive set up in the Utility Parameters Editor. If this drive does not exist, the following message will be displayed:

OPTION INSTALLATION DISKETTE DRIVE DOES NOT EXIST.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an option, press <F1> to begin the transfer.

If the PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE OPTION.

If a communication error occurs during the transfer, the screen will display the following message:

OPTION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

<option name> OPTION SUCCESSFULLY INSTALLED. PRESS ANY KEY TO CONTINUE.

The option will be removed from the Installation Diskette.

Read System Information from VCP Unit

The Read System Information from VCP Unit selection is available in the Transfer Mode and the Run Mode.

Press <F1> to read system configuration information or <F10> to exit.

1TRANSFER ED TOR - READSYSTEMINFORMATION				
F1 START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to read System/Configuration Information or F10 to exit.				
USER CONRGURAIION		TRANSFERPARAMETERS		
Name:	RLEI.PC2	Upload/Download Device:	1770-KF2/DH+.1784KT. or 5136-SD/DH+	
Version:	XJOC	VCP Unit Address:		
Date/Time:	06/23/94 07:45			
Free Bytes:	40932	Used Bytes:	24064	
Network:	Allen-Bradey DH/DH+			
Options:	30 Page. Graphics			
EXECUTIVE FIRMWARE				
Company/ ID: Eaton IDT, Inc.				
Product:	PanelMate 3000			
Version:	XXX	Model B:	30 Page	
Network:	Allen-Bradey DH/DH+			
Options:	Graphics			

Figure 27-34 Read System Information Display

The Read System Information selection displays the current version of executive firmware, options, and drivers currently loaded in the system. If you need to download the executive firmware, the message "EXECUTIVE FIRMWARE DOWNLOAD REQUIRED" will be displayed next to the executive firmware section.

Note Since the PanelMate unit is modular, the electronics module may be removed and transported to your personal computer to transfer files. The Serial Transfer Mode is the default state of the electronics module when power is applied.

If a communication error occurs during the transfer, the screen will display the following message: SYSTEM

INFORMATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

Place VCP Unit in Transfer Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit Transfer Mode selection can be used only when the PanelMate unit is in the the Run Mode.

After making this selection, the Transfer Editor will display a screen similar to figure 27-35.

TRANSFER EDITOR - PLACE VCP UNIT IN TRANSFER MODE				
F1=START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXrr
Press F1 to start remote mode change or F10 to exit. TRANSFER				
PARAMETERS				
Upload/Download Device:		1770-KF2/DH+, 1784-KT, or 5136-SD/DH+		
VCP Unit Address:		0		

Figure 27-35 Place VCP Unit in Transfer Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Transfer Mode to Run Mode if the Remote Mode Change is configured as IMMEDIATE, DEFAULT, or ACCEPT in the System Parameters Table. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... MODE CHANGE IN PROGRESS.

If the PanelMate unit is in the Transfer Mode, the screen will display the following message:

VCP UNIT ALREADY IN TRANSFER MODE.

If the PanelMate unit cannot be placed in the Transfer Mode, the screen will display the following message:

VCP UNIT CANNOT BE SWITCHED TO TRANSFER MODE.

If the PanelMate unit needs operator acceptance before switching to the Transfer Mode, the screen will display the following message:

WAITING FOR VCP UNIT OPERATOR ACCEPTANCE.

PRESS F10 TO ABORT.

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO TRANSFER MODE DUE TO COMM.  
ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO TRANSFER MODE. PRESS ANY KEY TO  
CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Transfer Mode. Although the mode change may take several seconds, it must be completed before another successful transfer can be made.

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Place VCP Unit in Run Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit in Run Mode selection can be used only when the PanelMate unit is in the Transfer Mode.

After making this selection, the Transfer Editor will display a screen similar to figure 27-36.

TRANSFER EDITOR - PLACE VCP UNIT IN RUN MODE				
F1 START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to start remote mode change or F10 to exit. TRANSFER				
PARAMETERS				
Upload/Download Device: 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+				

Figure 27-36 Place VCP Unit in Run Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/DH+, 1784-KT, or 5136-SD/DH+) and the VCP unit address. The VCP unit address can be edited by pressing <Enter>. Note that once you change the VCP unit address, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Run Mode to Transfer Mode. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

```
PLEASE WAIT ... MODE CHANGE IN PROGRESS.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT ALREADY IN RUN MODE.
```

If the PanelMate unit cannot be placed in the Run Mode, the screen will display the following message:

```
VCP UNIT CANNOT BE SWITCHED TO RUN MODE.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO RUN MODE DUE TO  
COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO RUN MODE. PRESS ANY KEY TO CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Run Mode. Although the mode change may take several seconds to several minutes (depending on the size of your configuration), it must be completed before another successful transfer can be made. After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Return to Main Menu

This selection will cause the Transfer Information Software Main Menu to appear.

Allen-Bradley Remote I/O Network Transfers

This section is for Allen-Bradley Remote I/O network transfers only.

Preparation

To use the Transfer Utility, the following steps must be performed.

- The Remote Transfer option must be installed.
- The Network Executive Firmware, the Allen-Bradley network driver (**abrem.net**), and a valid Remote VO configuration must be downloaded through the Serial Transfer Mode the first time it is used.
- The DOS-based personal computer must be connected to a 1770-KF2 module, a 1784-KT card, or a 5136-SD card over Data Highway Plus to the PLC-5 that is scanner for the PanelMate system that contains an Accelerat/On card communicating over Remote VO.
- The PanelMate unit must be placed in the Network Transfer Mode. The Network Transfer Mode selection can be made directly at the PanelMate unit or remotely by configuring the Remote Mode Change field in the System Parameters Table. Refer to the Remote Mode Change section in Chapter 23, System Parameters, for more information.

To transfer using the Remote VO network, the 1770-KF2/Rem VO module, the 1784-KT/Rem VO card, or the 5136-SD/Rem VO card must be selected as the Upload/Download Device in the Utility Parameters Editor.

Note The 1784-KT option must be purchased and installed before you may transfer using the Data Highway Plus network with a 1784-KT card.

The Configuration Software allows the transfer of information to a PanelMate unit connected on the Remote VO network using the Allen-Bradley Data Highway Plus network. The pass-through feature takes information on the Data Highway Plus network and sends it using block transfers to the operator interface on a Remote VO network. Refer to the table below for a list Allen-Bradley PLCs that support the pass-through feature.

Processor	Series	Revision
PLC 5/11	All	All
PLC 5/15	B	N or later
PLC 5/20	All	All
PLC 5/25	A	J or later
PLC 5/30	A	B or later
PLC 5/40	A B	E or later B or later
PLC 5/60	A B	E or later B or later
PLC 5/250	All	All

Table 27-2 PLC Requirements for Pass-Through File Transfers

Note When using older PLC-5s (5/15 or 5/25), Executive Firmware and driver transfers could take several hours due to the PLC's limitations.

Note VO references corresponding to the rack-group-slot of the pass through block transfer should not be controlled or used in the PanelMate unit or the PLC ladder logic to avoid interfering with the transfer process.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2= F7=MORE	F3= F8=	F4= F9=	F5= F10=EXrr
Documentation Device		LPT1		
Upload/Download Device		1770-KF2/Rem I/O 0		
PC Address		0 PLCS/15		
PLC DH+ Address		COM1		
PLC Type		9600		
Baud Rate		NONE		
Parity				
VCP Unit Block Transfer Location				
Rack 1				
Group t 0				

Figure 27-37 Utility Parameters Editor (1770-KF2/Rem VO)

The values shown in figure 27-37 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	<i>This field selects the printer port or file on the personal computer.</i>
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 1770-KF2 module on the network.
PLC DH+ Address	This field selects the default address of the pass-through PLC-5 on the network.
PLC Type	This field selects the pass-through PLC-5 type on the network.
Port	<i>This field selects the serial port that the configuration software will transmit and receive data to and from the 1770-KF2 module.</i>
Baud Rate	This field selects the baud rate transmission between the configuration software and the 1770-KF2 module.
Parity	This field selects the parity transmission between the configuration software and the 1770-KF2 module.
Rack	This field selects the default PanelMate unit's rack that is reserved for the pass-through feature.
Group	This field selects the default PanelMate unit's group that is reserved for the pass-through feature.
Slot	This field selects the default PanelMate unit's slot that is reserved for the pass-through feature.

For more information about these parameters, refer to the 1770-KF2 module user manual.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

UTILITY PARAMETERS EDITOR				
F1= F6=	F2=	F3= F7=MORE F8=	F4= F9=	F5= F10=EXIT
Documentation Device		LPT1		
Upload/Download Device		1784-KT/Rem I/O		
PC Address		0		
PLC DH+ Address		0		
Kr Card Memory Address		D4000		
PLC Type		PPLC5/15		
KT Card Channel Number		Y		
Termination		Y		
VCP Unit Block Transfer Location				
Rack 1				
Group 0 0				

Figure 27-38 Utility Parameters Editor (1784-KT/Rem I/O)

Note The 1784-KT option must be purchased and installed before you may transfer using the Data Highway Plus network with a 1784-KT card.

The values shown in figure 27-38 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 1784-KT card on the network.
PLC DH+ Address	This field selects the default address of the pass-through PLC-5 on the network.
KT Card Memory Address	This field selects the memory address of the 1784-KT card.
PLC Type	This field selects the pass-through PLC-5 type on the network.
KT Card Channel Number	This field selects channel number for the 1784-KT card.
Termination	This field selects the network termination for the 1784-KT card.
Rack	This field selects the default PanelMate unit's rack that is reserved for the pass-through feature.
Group	This field selects the default PanelMate unit's group that is reserved for the pass-through feature.
Slot	This field selects the default PanelMate unit's slot that is reserved for the pass-through feature.

For more information about these parameters, refer to the 1784-KT card user manual.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

UTILITY PARAMETERS EDITOR

F1=
F6=

F2=
F7=MORE

F3=
F8=

F4=
F9=

F5=
F10=EXIT

Documentation Device

LPT1

Upload/Download Device

5136-SD/Rem I/O

PC Address

0

PLC DH+ Address

0

SD Port Address

250

SD Card Memory Address

00000

Card Revision

1

Terminal Name

PLC5/15

PLC Type

VCP Unit Block Transfer Location

Rack 1

Group 00

Figure 27-39 Utility Parameters Editor (5136-SD/Rem U0)

The values shown in figure 27-39 are default values. The parameters in the above figure are explained below:

Field	Description
Documentation Device	This field selects the printer port or file on the personal computer.
Upload/Download Device	This field selects the device to be used to upload or download files to the PanelMate unit.
PC Address	This field selects the address of the 5136-SD card on the network.
PLC DH+ Address	This field selects the default address of the pass-through PLC-5 on the network.
SD Port Address	This field selects the port location of the 5136-SD card used to load software and access the 5136-SD card.
SD Card Memory Address	This field selects the memory address of the 5136-SD card.
Card Revision	This field selects the revision of the 5136-SD card.
Terminal Name	This field selects the name used for "who active" identity and diagnostics.
PLC Type	This field selects the pass-through PLC-5 type on the network.
Rack	This field selects the default PanelMate unit's rack that is reserved for the pass-through feature.
Group	This field selects the default PanelMate unit's group that is reserved for the pass-through feature.
Slot	This field selects the default PanelMate unit's slot that is reserved for the pass-through feature.

For more information about these parameters, refer to the 5136-SD card user manual.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

The figure below shows an example of a typical Remote VO transfer if you have a 1770-KF2 module connected to your personal computer.

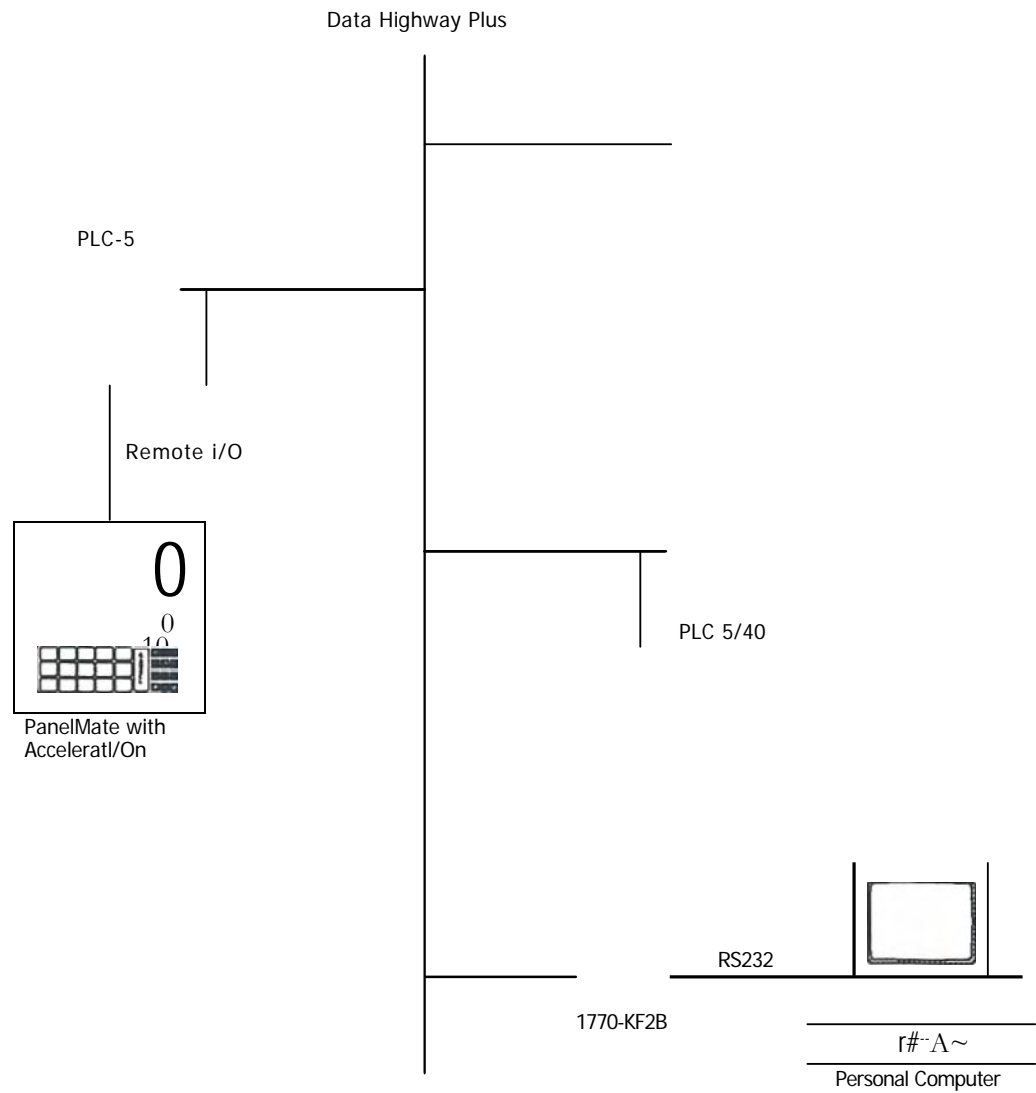


Figure 27-40 Remote I/O Network Transfer with a 1770-KF2 Module

For more information about the 1770-KF2 module, refer to the 1770-KF2 user manual.

The figure below shows an example of a typical Remote VO transfer if you have a 1784-KT or 5136-SD card installed in your personal computer.

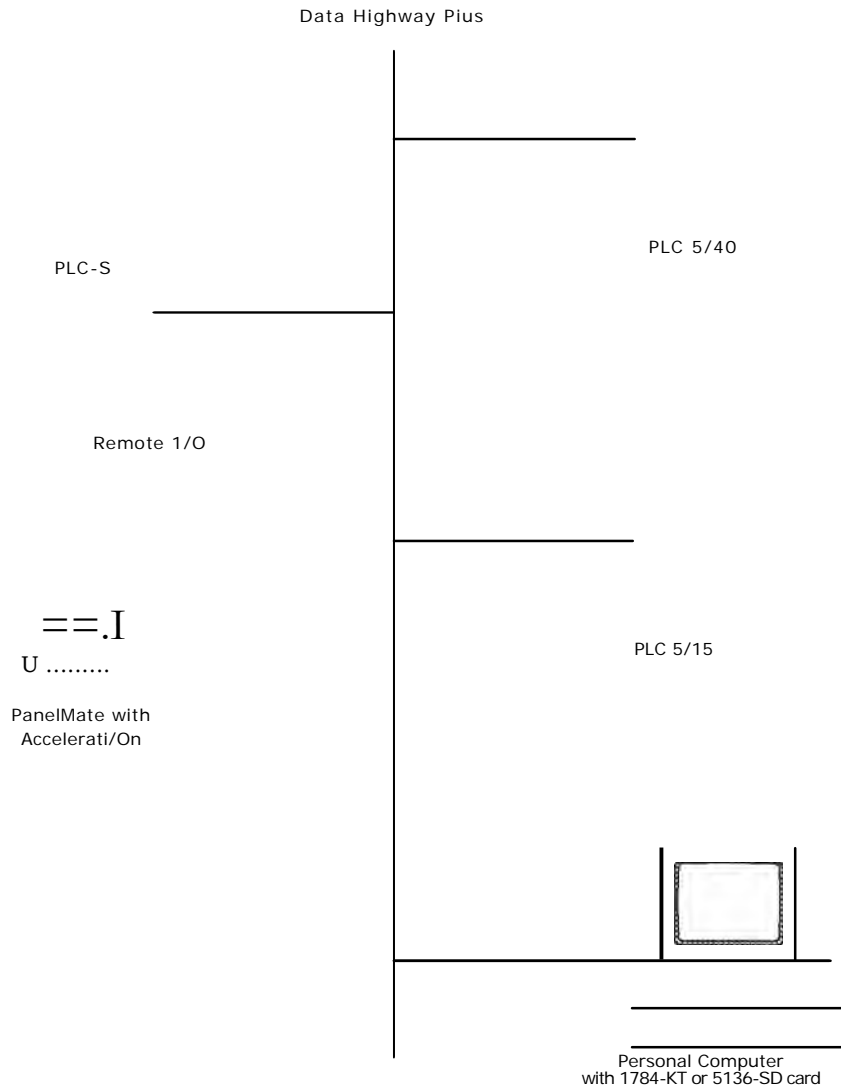


Figure 27-41 Remote I/O Network Transfer
 For more information about the 1784-KT or 5136-SD card, refer to the 1784-KT card user manual or the 5136-SD card user manual.

Download Configuration to VCP Unit

The Download Configuration to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this option, the Transfer Editor will display a list of the configuration files presently in the Configuration directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the configuration name, the Transfer Editor will display a status screen similar to figure 27-42.

```
TRANSFER EDITOR - DOWNLOAD CONFIGURATION
F1 START    F2=      F3=      F4 -      F5-
F6 -        F7 -      FB -      F9=      F10-EXIT

Press F1 to download the configuration or F10 to exit

TRANSFER STATUS
  Bytes Transmitted To VCP Unit: 0
  Bytes To Transfer: XXX
  Estimated Time To Complete: Complete: | 0% |

CONRGURATION INFCRMA31ON
  Configuration Name: FILE1.PC2 Product:
  PanelMate 3000 Version:
  XXX

TRANSFER PARAMETERS
  Upload/Download Device: 1770-KF2/Rem I/O, 1784-Kr/Rem I/O, or 5136SD/Rem I/O
  PLC DH+ Address: 0
  Rack: 1
  Group: 0
  Slot 0
```

Figure 27.42 Transfer Editor - Download Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem V0, 1784-KT/Rem V0, or 5136-SD/Rem V0), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a configuration, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.

If the executive firmware has not been downloaded, the screen will display the following message:

PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING YOUR CONFIGURATION. If the

PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE CONFIGURATION.

If a communication error occurs during the transfer, the screen will display the following message:

CONFIGURATION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After the configuration has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

CONFIGURATION SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO CONTINUE.

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Upload Configuration from VC

The Upload Configuration to VCP Unit selection is available in the Transfer Mode and the Run Mode.

After you select the file name, the Transfer Editor will display the a status screen similar to figure 27-43.

```
TRANSFER EDITOR - UPLOAD CONFIGURATION
F1-START      F2-      F3=      F4=      F5=
F6=      F7=      F8=      F9=      F10-EXIT

Press F1 to upload the configuration or F10 to exct.

TRANSFER STATUS
  Bytes Received From VCP Unth  0 XXX
    Bytes To Transfer
    Estimated Time To Complete:
    Complete:

CONFIGURATION INFORMATION
  Configuration Name: FILE1.PC2 Product:
    PanelMate 3000 Version:
    X.XX

TRANSFER PARAMETERS
  Upload/Download Device: 1770#2/Rem I/O,1784-KT/Rem I/O, or 5136-SD/Rem I/O
    PLC DH+ Address: 0
      Rack: 1
      Group: 0
      Slot: 0
```

Figure 27-43 Transfer Editor - Upload Configuration

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. These fields will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Configuration Information displays the configuration name to be transferred, the PanelMate Series product name (i.e., PanelMate 2000, PanelMate 2000 Color, PanelMate 3000, or PanelMate 4000), and the PanelMate software version of the stored configuration.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem I/O, 1784-KT/Rem I/O, or 5136-SD/Rem V0), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

After the development computer has been properly connected to a PanelMate unit, press <F1> when ready to transfer a configuration. Note that configurations can be uploaded from the network transfer mode or from the run mode (online). The Transfer Editor is now ready to receive. The Transfer Editor will count the number of bytes successfully received. It will notify you when the transfer is complete. During normal operation, the screen will display the following status messages during the transfer:

```
CONFIGURATION SUCCESSFULLY UPLOADED. PRESS ANY KEY TO CONTINUE.
```

If a communication error occurs during the transfer, the screen will display the following message:

CONFIGURATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

Download Network Executive Firmware to VCP Unit

The Download Network Executive Firmware to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the Executive Firmware files presently in the Executive Firmware directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After selecting the Executive Firmware filename, the Transfer Editor will display a list of the network driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it. After selecting the network driver filename, the Transfer Editor will display a status screen similar to figure 27-44.

TRANSFER EDITOR - DOWNLOAD NETWORK EXECUTIVE FIRMWARE

F1=START

F2=

F3=

F4=

F5=

F6=

F7=

F8=

F9=

F10=EXIT

Press F1 to download the Executive Firmware or F10 to exdt.

TRANSFER STATUS

Bytes Transmitted to VCP Unit: 0

Bytes To Transfer: XXX

Estimated Time To Complete:

Complete: 0%

EXECUTIVE FIRMWARE INFORMATION

Executive Firmware Name: VERX_OOC.EXF

Version: XXX

TRANSFER PARAMETERS

Upload/Download Device: 1770-KF2/Rem I/O, 1784-Kr/Rem I/O, or 5136-SD/Rem I/O

PLC DH+ Address: 0

Rack: 1

Group: 0

Slot: 0

Figure 27-44 Transfer Editor - Download Network Executive Firmware

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Executive Firmware Information displays the Executive Firmware name to be transferred and the Executive Firmware version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem V0, 1784-KT/Rem V0, or 5136-SD/Rem V0), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

Note To communicate over a Remote V0 network, you must first download the network executive firmware and the network driver (**abrem.net**) using the Serial Transfer Mode. Subsequent transfers can be downloaded through the Network Transfer Mode.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an Executive Firmware file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error messages during the transfer:

```
PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.  
PLEASE WAIT ... CLEARING DOWNLOAD EXECUTIVE FIRMWARE BIT.
```

After the Executive Firmware file has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

```
EXECUTIVE FIRMWARE SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO  
CONTINUE.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE EXECUTIVE FIRMWARE.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
EXECUTIVE FIRMWARE COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Driver to VCP Unit

The Download Driver to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, the Transfer Editor will display a list of the downloadable driver files presently in the Driver directory specified in the Utility Parameters Editor and available for transfer. You may select a file by typing its name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

If the downloadable driver file is found to be corrupt, the following message will be displayed: INVALID

DOWNLOADABLE DRIVER FILE <file>.

After selecting the downloadable driver filename, the Transfer Editor will display a status screen similar to figure 27-45.

TRANSFER EDITOR - DOWNLOAD DRIVER				
F1=START F6=	F2= F7=	F3= F8=	F4= F9=	F5= F10=EXIT
Press F1 to download driver or F10 to exit.				
TRANSFER STATUS				
Bytes Transmitted to VCP Unit:				
Bytes To Transfer 0				
Estimated Time To Complete:				
Complete: | 0% 1				
DRIVER INFORMATION				
Driver Name: XXX.DRV				
Version: X.XX				
TRANSFER PARAMETERS				
Upload/Download Device: 1770-KF2/Rem I/O, 1784-KT/Rem I/O, or 5136-SD/Rem I/O				
PLC DH+ Address: 0				
Rack: 1				
Group: 0				
Slot: 0				

Figure 27-45 Transfer Editor - Download Driver

The Transfer Status displays the number of bytes transmitted to the VCP unit, the number of bytes to transfer, the estimated time to complete the transfer, and the completion bar. The number of bytes transmitted to the VCP unit, the estimated time to complete the transfer, and the completion bar will be active once the transfer is initiated. Note that the completion bar will show the completion of tasks not the time required to complete the download.

The Driver Information displays the driver name to be transferred and the driver version.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem V0, 1784-KT/Rem V0, or 5136-SD/Rem V0), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive a downloadable driver file, press <F1> to begin the transfer. The Transfer Editor will count the number of bytes successfully transferred to the online system. The Transfer Editor will notify you when the transfer is complete.

During normal operation, the screen will display the following status or error message during the transfer:

```
PLEASE WAIT ... WAITING FOR VCP UNIT WRITE CONFIRMATION.
```

If the executive firmware has not been downloaded, the screen will display the following message:

```
PLEASE DOWNLOAD EXECUTIVE FIRMWARE BEFORE DOWNLOADING A DRIVER.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message:

```
VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE DRIVER.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
DRIVER COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

After the downloadable driver has been transferred, the Transfer Editor will wait for an acknowledgement from the online system. The following message will be displayed:

```
DOWNLOADABLE DRIVER SUCCESSFULLY DOWNLOADED. PRESS ANY KEY TO  
CONTINUE.
```

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Download Option to VCP Unit

The Download Option to VCP Unit selection can be used only when the PanelMate unit is in the Transfer Mode.

After choosing this selection, insert the option diskette in the drive and begin the transfer. The option name will appear in the Option field.

TRANSFER EDITOR - DOWNLOAD OPTION				
F1-START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10-Exit
Press F1 to download the Option or F10 to edit.				
OPTION INFORMATION				
Option:				
Number of Option Installations				
Available on Diskette: Option				
Installation Diskette Drive: A				
TRANSFER PARAMETERS				
Upload/Download Device: 1770-KF2/Rem I/O, 1784-KT/Rem I/O, or 5136-SD/Rem I/O				
PLC DH+ Address: 0				
Rack: 1				

Figure 27-46 Transfer Editor - Download Option

The Option Information displays the option to be downloaded, the number of installations available on the diskette and the option installation diskette drive letter descriptor of a floppy drive set up in the Utility Parameters Editor. If this drive does not exist, the following message will be displayed:

OPTION INSTALLATION DISKETTE DRIVE DOES NOT EXIST.

The Transfer Parameters displays the upload/download device (i.e., 1770-KF21Rem VO, 1784-KT/Rem VO, or 5136-SD/Rem I/O), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

After the development computer has been properly connected to the PanelMate unit, and the online system has been set to receive an option, press <F1> to begin the transfer.

If the PanelMate unit is in the Run Mode, the screen will display the following message:

VCP UNIT IS IN RUN MODE AND CANNOT RECEIVE OPTION.

If a communication error occurs during the transfer, the screen will display the following message:

OPTION COULD NOT BE DOWNLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

<option name> OPTION SUCCESSFULLY INSTALLED.
CONTINUE.

PRESS ANY KEY TO

The option will be removed from the Installation Diskette.

Read System Information from VCP Unit

The Read System Information from VCP Unit selection S is available in the Transfer Mode and the Run Mode.

Press <F1> to read system configuration information or <F10> to exit.

TRANSFER EDITOR - READ SYSTEM INFORMATION				
F1-START	F2=	F3-	F4=	F5
F6-	F7-	F8-	F9-	F10-EXIT
Press F1 to read System/Configuration Information or F10 to exit.				
USER CONFIGURATION		TRANSFER PARAMETERS		
Name:	RLE1.PC2	Upload/Download Device:	1770-KF2/Rem I/O.1784-I(T)/Rem I/O, or 5136-SD/Rem I/O	
Version:	X.XX	PLC DH+ Address:	0	
Date/Time:	06/23/94 07:45	Rock:	1	
=B14!*	40932 Used Bytes: 24064	Group:	0	
Options:	Allen-Bradley Rem I/O	Slot:	0	
	30 Page. Graphics			
EXECUTIVE FIRMWARE				
Company/ID: Eaton IDT, Inc.				
Product:	PanelMate 3000			
Version:	X.XX	Model B: 30 Page		
Network:	Allen-Bradley Rem I/O			
Options:	Graphics			
INSTALLED DRIVERS				
Allen-Bradley		(Version X.XX)		

Figure 27-47 Read System Information Display

The Read System Information selection displays the current version of executive firmware, options, and drivers currently loaded in the system. If you need to download the executive firmware, the message "EXECUTIVE FIRMWARE DOWNLOAD REQUIRED" will be displayed next to the executive firmware section.

Note Since the PanelMate unit is modular, the electronics module may be removed and transported to your personal computer to transfer files. The Serial Transfer Mode is the default state of the electronics module when power is applied.

If a communication error occurs during the transfer, the screen will display the following message: SYSTEM

INFORMATION COULD NOT BE UPLOADED DUE TO COMM. ERROR, #<XXXX>

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

Place VCP Unit in Transfer Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit Transfer Mode selection can be used only when the PanelMate unit is in the Run Mode. After making this selection, the Transfer Editor will display a screen similar to figure 27-48.

TRANSFER EDITOR - PLACE VCP UNIT IN TRANSFER
MODE
F1=START F2= F3= F4= F5=
F6= F7= F8= F9= F10=EXrr

Press F1 to start remote mode change or F10 to exit.

TRANSFER PARAMETERS
Upload/Download Device: 1770-KF2/Rem I/O, 1784-KT/Rem I/O, or 5136-SD/Rem I/O
PLC DH+ Address: 0
Rack: 1
Group: 0
Slot: 0

Figure 27-48 Place VCP Unit in Transfer Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem VO, 1784-KT/Rem VO, or 5136-SD/Rem I/O), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Transfer Mode to Run Mode if the Remote Mode Change is configured as IMMEDIATE, DEFAULT, or ACCEPT in the System Parameters Table. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

PLEASE WAIT ... MODE CHANGE IN PROGRESS.

If the PanelMate unit is in the Transfer Mode, the screen will display the following message:

VCP UNIT ALREADY IN TRANSFER MODE.

If the PanelMate unit cannot be placed in the Transfer Mode, the screen will display the following message:

VCP UNIT CANNOT BE SWITCHED TO TRANSFER MODE.

If the PanelMate unit needs operator acceptance before switching to the Transfer Mode, the screen will display the following message:

```
WAITING FOR VCP UNIT OPERATOR ACCEPTANCE. PRESS F10 TO ABORT.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO TRANSFER MODE DUE TO COMM.  
ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO TRANSFER MODE. PRESS ANY KEY TO  
CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Transfer Mode. Although the mode change may take several seconds, it must be completed before another successful transfer can be made.

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Place VCP Unit in Run Mode

Note This selection is not displayed if the Upload/Download Device is set for serial communication (i.e., COM1, COM2, COM3, or COM4).

The Place VCP Unit in Run Mode selection can be used only when the PanelMate unit is in the Transfer Mode.

After making this selection, the Transfer Editor will display a screen similar to figure 27-49.

TRANSFER EDITOR - PLACE VCP UNIT IN RUN MODE				
F1 START	F2=	F3=	F4=	F5=
F6=	F7=	F8=	F9=	F10=EXIT
Press F1 to start remote mode change or F10 to exit. TRANSFER				
PARAMETERS				
Upload/Download Device:		1770-KF2/Rem I/O, 1784-ICr/Rem I/O, or 5136-SD/Rem I/O		
PLC DH+ Address: 0				
Rack: 1				

Figure 27-49 Place VCP Unit in Run Mode Display

The Transfer Parameters displays the upload/download device (i.e., 1770-KF2/Rem V0, 1784-KT/Rem V0, or 5136-SD/Rem V0), PLC DH+ address, rack, group, and slot fields. The PLC DH+ address, rack, group, and slot fields can be edited by pressing <Enter>. Note that once you change the PLC DH+ address, rack, group, or slot fields, the changes you make will override the default settings in the Utility Parameters Editor until you exit the Transfer Editor.

Caution Make sure that the rack, group, slot you have selected for the pass-through is correct (i.e., addresses a PanelMate unit). An incorrect address could corrupt I/O data.

If the Remote Transfer option has been installed and the development computer has been properly connected to the PanelMate unit, you may remotely change the PanelMate unit from Run Mode to Transfer Mode. Press <F1> to start the remote mode change.

During normal operation, the screen will display the following status or error messages during the transfer:

```
PLEASE WAIT ... MODE CHANGE IN PROGRESS.
```

If the PanelMate unit is in the Run Mode, the screen will display the following message: VCP UNIT

```
ALREADY IN RUN MODE.
```

If the PanelMate unit cannot be placed in the Run Mode, the screen will display the following message:

```
VCP UNIT CANNOT BE SWITCHED TO RUN MODE.
```

If a communication error occurs during the transfer, the screen will display the following message:

```
VCP UNIT COULD NOT BE PLACED INTO RUN MODE DUE TO COMM. ERROR, #<XXXX>
```

Note If you receive this error, refer to the Communication Errors section in Chapter 6, or the Remote STS and EXT STS Errors section in Chapter 30, or your 1784-KT card user's manual for more information about the error number.

The Transfer Editor will notify you when the transfer is complete.

```
VCP UNIT SUCCESSFULLY PLACED INTO RUN MODE. PRESS ANY KEY TO CONTINUE.
```

Note When this message appears, the PanelMate unit has received instructions to switch to the Run Mode. Although the mode change may take several seconds to several minutes (depending on the size of your configuration), it must be completed before another successful transfer can be made.

After a wait of one minute with no acknowledgement, the Transfer Editor will allow you to abort the wait by pressing the <F10> key.

Return to Main Menu

This selection will cause the Transfer Information Software Main Menu to appear.

Chapter 28

File Management

In this chapter, you will learn:

How to Copy, Rename or Delete a Configuration

The File Management Menu

The Configuration Software Main Menu contains a selection named Perform File Management. Choosing this selection causes the File Management Menu to appear as shown below. This menu contains four selections. The following sections will give a brief description of each selection. These utilities only operate on configuration files.

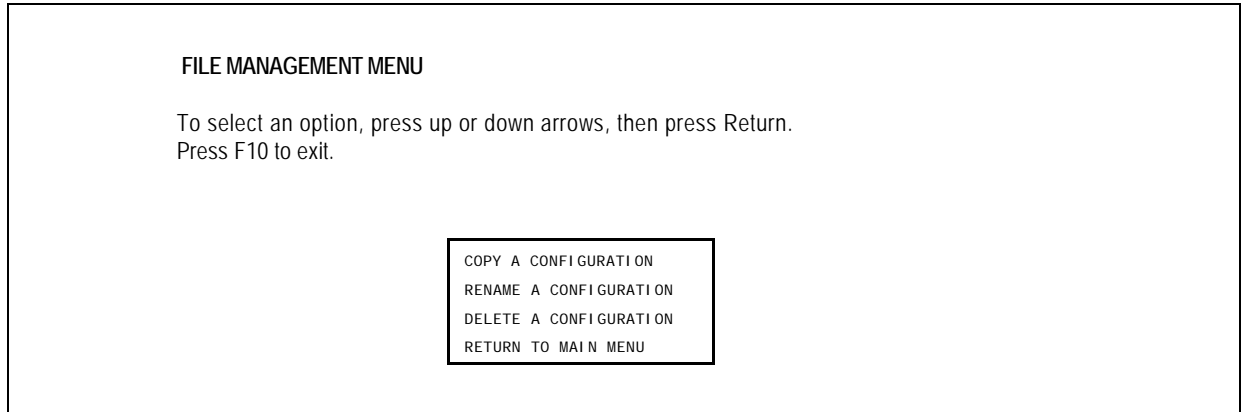


Figure 28.1 File Management Menu

Copy a Configuration

This selection allows you to duplicate a configuration presently on the disk specified in the Configuration Directory in the Utility Parameters Editor and give the copy a new name. After you have made this selection, the Utility will display a list of the configuration files presently on the disk and available for copying. It will also display two fields, one for the name of the configuration to be copied (source) and one for the name of the new copy (destination).

The source configuration name field will be open for input. You may select a file to copy by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After you have entered the name of the file to be copied, the destination configuration name field will be open for input. You may select a name for the new copy by typing a name (no extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list of existing files. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After the destination name has been chosen, the configuration file will be copied and stored on the hard disk. Then the following prompt will appear:

```
DO YOU WANT TO COPY ANY MORE CONFIGURATIONS? PRESS Y TO
COPY MORE CONFIGURATIONS, N TO EXIT.
```

If you answer the prompt with a "Y", the source configuration name field will be re-opened for input. You may enter it and a destination name as described above. If you answer this prompt with an "N", you will return to the File Management menu.

If you enter a destination configuration name that already exists on disk, the following message will be displayed:

FILE ALREADY EXISTS. DO YOU WISH TO OVERWRITE?

PRESS Y TO OVERWRITE FILE, N TO EXIT.

If you answer this prompt with a "Y", the new copy of the configuration will replace the existing configuration listed as the destination. If you answer this prompt with a "N", the destination configuration name field will be re-opened for input.

Rename a Configuration

This selection allows you to change the name of a configuration presently on the disk specified in the Configuration Directory in the Utility Parameters.

After you have made this selection, the Utility will display a list of the configuration files presently on the disk. It will also display two fields, one for the name of the configuration to be changed and one for the new configuration name.

The configuration name field will be open for input. You may select a file by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After you have entered the name of the file to be changed, the new configuration name field will be open for input. Select a name for the new copy by typing a name (no extension) and pressing <Return>. You may not select a name that already exists on disk.

After the new name has been chosen, the configuration file will be renamed. Then the following prompt will appear:

DO YOU WANT TO RENAME ANY MORE CONFIGURATIONS? PRESS Y TO

RENAME MORE CONFIGURATIONS, N TO EXIT.

If you answer the prompt with a "Y", the configuration name field will be re-opened for input. You may enter it and a new name as described above. If you answer this prompt with an "N", you will return to the File Management menu.

Use this Configuration Software Package to rename files. Do **not** use DOS. The software not only changes the DOS filename, but it also changes the internal structure of the file so that it contains the proper name for display on the online unit. DOS copy will only change the external reference.

Delete a Configuration

This selection allows you to erase an entire configuration from the disk specified in the Configuration Directory in the Utility Parameters Editor.

After you have made this selection, the Utility will display a list of the configuration files presently on the disk. You may select a file for deletion by typing its name (including extension) and pressing <Return>. You may also press the <F1> key which will highlight a name in the displayed list. With this method, use the arrow keys to move the highlight to a desired name and press <Return> to select it.

After you have entered the name of the file to be deleted, the following prompt will appear:

```
DO YOU REALLY WANT TO DELETE THE CONFIGURATION FILE?  
PRESS Y TO DELETE THE FILE, N TO ABORT DELETING THE FILE.
```

If you answer the prompt with a "Y", the configuration will be deleted. If you answer the prompt with an "N", no deletion will occur.

After a deletion is finished, the following prompt will appear:

```
DO YOU WANT TO DELETE ANY MORE CONFIGURATIONS? PRESS Y TO  
DELETE MORE CONFIGURATIONS, N TO EXIT.
```

If you answer the prompt with a "Y", the configuration name field will be re-opened. If you answer the prompt with an "N", you will return to the File Management menu.

Return to Main Menu

This selection will cause the Configuration Software Main Menu to appear.

Chapter 29

Troubleshooting the Configuration Software Package

In this chapter, you will learn:

The error messages generated by the Configuration Software

Miscellaneous Error Messages

The following is a list of some of the errors which may be generated for various reasons:

WRONG KEY. TRY AGAIN.

The user has pressed a key that is not a valid choice.

OUT OF MEMORY.

There is not sufficient RAM in the computer to perform the task requested.

PRINTER IS OUT OF PAPER.

The computer tried to print a file to a printer which is out of paper.

Configuration Software Startup Error Messages

The following is a list of errors which may be generated while starting the Configuration Utility.

These will be displayed in the Initialization Error Screen:

OVERLAY FILE(S) MISSING OR CORRUPT.

Verify that files with an EDT extension exist in the VCP directory and reload your software, or check the integrity of your hard drive.

INVALID BASE CONFIGURATION DIRECTORY.

A field in the Utility Parameters Editor is no longer valid.

INVALID TEMPORARY DIRECTORY.

A field in the Utility Parameters Editor is no longer valid.

INVALID BASE DOWNLOADABLE DRIVER DIRECTORY.

A field in the Utility Parameters Editor is no longer valid.

INVALID INSTALL OPTION DRIVE <descriptor>.

A field in the Utility Parameters Editor is no longer valid.

INVALID SERIAL PORT <descriptor>. APPLYING DEFAULT VALUE.

A field in the Utility Parameters Editor no longer matches the hardware. Cycle power.

INVALID PRINTER PORT <descriptor>. APPLYING DEFAULT VALUE.

A field in the Utility Parameters Editor no longer matches the hardware. Cycle power.

INVALID PARAMETER FOR PRINTER PORT <descriptor>. APPLYING DEFAULT VALUE.

Specify valid value for printer.

COULD NOT CREATE TEMPORARY DIRECTORY. APPLYING DEFAULT VALUE.

Check amount of free disk space.

INVALID BASE FIRMWARE DIRECTORY.

A field in the Utility Parameters Editor is no longer valid.

There are three more error messages which may be displayed although they will not be displayed in the Initialization Error Screen. They are displayed before the Error Screen.

COULD NOT DETECT A VIDEO ADAPTER. VCP UNIT SOFTWARE ABORTED.

CANNOT EXECUTE FROM A FLOPPY DISK. VCP UNIT CONFIGURATION SOFTWARE ABORTED.

COULD NOT ALLOCATE SUFFICIENT MEMORY. VCP UNIT SOFTWARE ABORTED.

Additional RAM memory is needed.

Program/File Load Error Messages

The following is a list of errors which may be generated while loading editors or other files from disk to RAM:

COULD NOT FIND THE <filename> FILE.

A file needed by the Utility is not on the hard disk (C:).

COULD NOT LOAD THE <filename> FILE - OPEN ERROR.

A file needed by the Utility was found but could not be opened.

COULD NOT LOAD THE <filename> FILE - READ ERROR.

A file needed by the Utility was found and opened but could not be read.

COULD NOT LOAD THE <filename> FILE - SECTION COMMIT.

COULD NOT LOAD THE <filename> FILE - ERROR <errornumber & errornumber>.

Help Page Error Messages

The following is a list of errors which may be generated while accessing a help page:

HELP PAGE IS NOT AVAILABLE.

COULD NOT FIND HELP DATA FILE. HELP PAGE IS NOT AVAILABLE.

COULD NOT LOCATE HELP PAGE IN HELP DATA FILE.
AVAILABLE.

HELP PAGE IS NOT

Reload PanelMate configuration software.

COULD NOT ALLOCATE MEMORY FOR HELP.

Additional RAM memory is needed.

Disk Access Error Messages

The following is a list of errors which may be generated while accessing the hard disk (C:), floppy disk (A: or B:), or other device:

CRITICAL ERROR.

Check your hardware.

INVALID FILE HANDLE.

Call Eaton IDT for assistance.

INADEQUATE SPACE ON DEVICE.

There is no room on device A:, B:, C:, etc.

DENIED ACCESS.

A write has been attempted to a file with read only attributes.

TOO MANY OPEN FILES.

Increase current file size in **config.sys** file. Call Eaton IDT for assistance.

FILE NOT FOUND.

Check correct file name.

UNDEFINED I/O ERROR.

There is a DOS error.

DRIVE <descriptor> IS WRITE PROTECTED.

DRIVE <descriptor> IS NOT READY.

CRC ERROR IN <location> DURING <operation> ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

SEEK ERROR DURING <operation> ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

UNKNOWN MEDIA TYPE ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

SECTOR NOT FOUND DURING <operation> ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

WRITE FAULT ERROR IN <location> ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

READ FAULT ERROR IN <location> ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

GENERAL <operation> FAILURE ON DRIVE <descriptor>.

Verify that the floppy type and drive are compatible.

urwlekked eiC- kmHc L " c j b/ c 'ce //

*rD C;~ . Ca.uS,e
SN e fl 14_c tlct mx °''' .VDtf- (% e Id / Pte p/c Vet"zCi . / e
0 ~ 9, < PI C 4runae e nGl Pc71-1 . r 1?r.*

File Name Error Messages

The following is a list of errors which may be generated when you specify a file name:

FILE NAME CONTAINS INVALID CHARACTERS. YOU MUST REENTER THE FILE NAME. INVALID
FILE NAME. YOU MUST REENTER THE FILE NAME. INVALID FILE PATH. YOU MUST
REENTER THE FILE NAME.

FILE NAME MUST INCLUDE AN EXTENSION. YOU MUST REENTER THE FILE NAME. FILE
COULD NOT BE FOUND. YOU MUST SELECT ANOTHER FILE NAME. FILE ALREADY
EXISTS. YOU MUST SELECT ANOTHER FILE NAME. FILE NAME MUST BE ENTERED. YOU
MUST REENTER FILE NAME.

Enter filename to continue.

FILE NAME IS A SUBDIRECTORY. YOU MUST SELECT ANOTHER FILE NAME. FILE NAME
IS NOT A SUBDIRECTORY. YOU MUST SELECT ANOTHER FILE NAME.

FILE IS NOT A VALID VCP UNIT CONFIGURATION. YOU MUST REENTER THE FILE
NAME.

INVALID CONFIGURATION CHECKSUM.

File is corrupt. Call Eaton IDT for assistance.

FILE NAME MUST NOT INCLUDE AN EXTENSION. YOU MUST REENTER THE FILE
NAME.

FILES DRIVE LENGTH IS INVALID. YOU MUST REENTER THE FILE NAME.
Verify that the drive name has one character.

FILE NAME LENGTH IS INVALID. YOU MUST REENTER THE FILE NAME.

FILE NAME EXTENSION LENGTH IS INVALID. YOU MUST REENTER THE FILE NAME.

File name extension must not exceed three characters in length.

FILES PATH IS INVALID. YOU MUST REENTER THE FILE NAME.

Chapter 30

Allen-Bradley PLCs

The PanelMate Series can be used with any of the programmable controllers in the Allen-Bradley PLC, PLC-2, PLC-3, PLC-5, and SLC 500 families. Communication to a PLC can be accomplished in a number of different ways. These include: direct connection to a single PLC; connection to Data Highway or Data Highway Plus via an intermediate serial communication module; direct connection to Data Highway, Data Highway Plus, or Remote I/O using the AcceleratI/On interface; direct connection to Data Highway 485 via an intermediate serial communication module. Instructions for use of AcceleratI/On begin in Chapter 31.

Memory

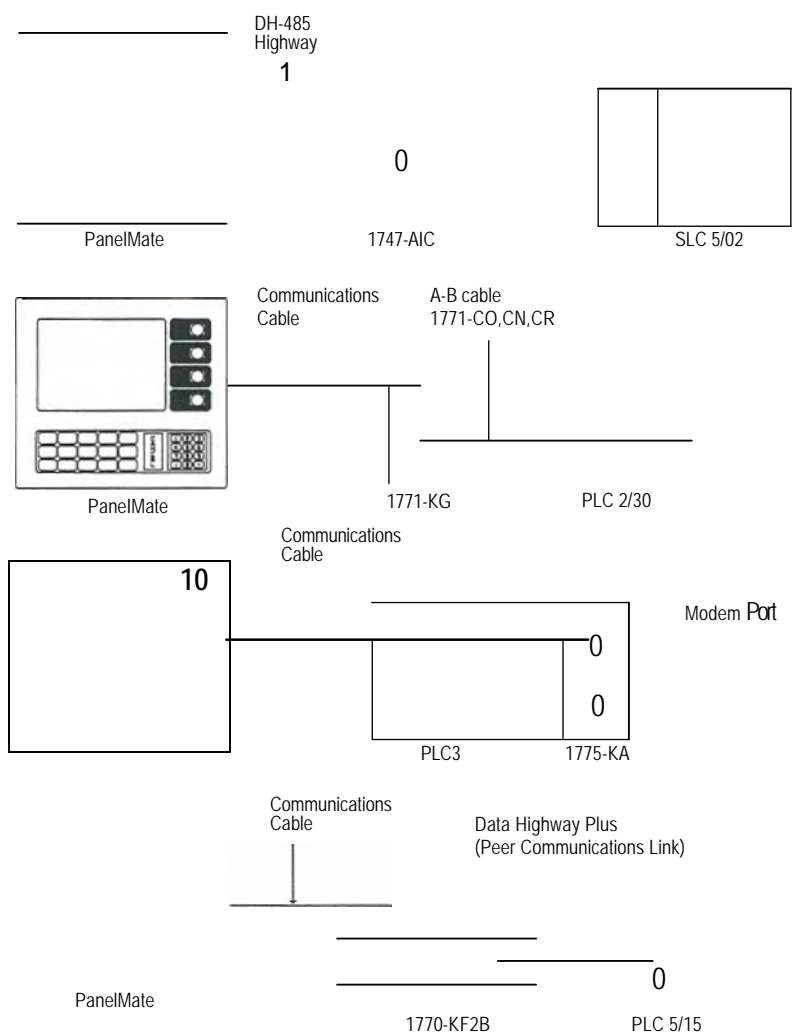
See your PLC manual for information on memory ranges.

Possible Configurations

Examples of possible connections are described and shown in the following pages.

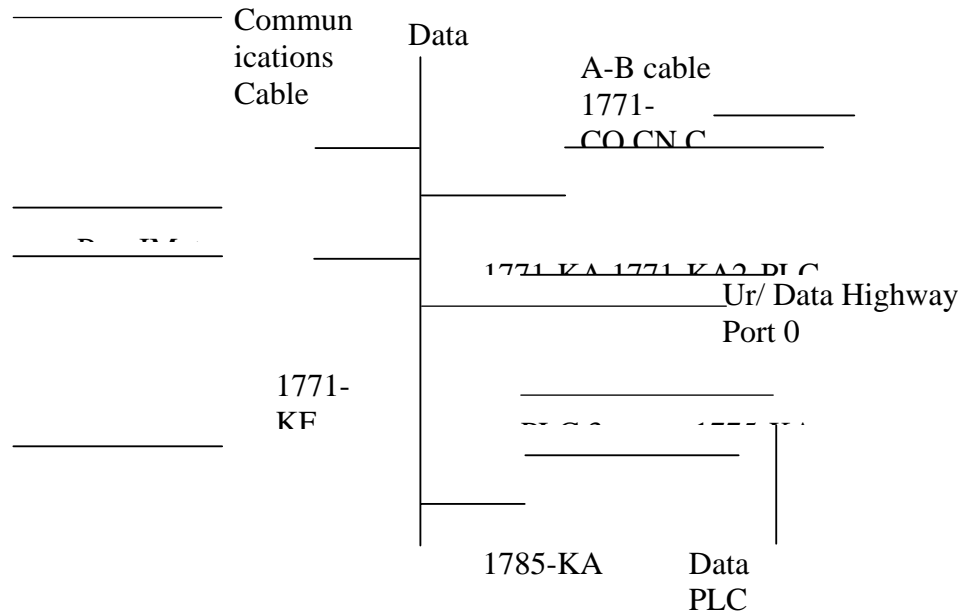
Serial Communication to one PLC

If the PanelMate unit is to communicate to a single PLC, a direct connection is most efficient. This allows the connection to be made with a single Allen-Bradley module (1747-AIC, 1771-KG, 1775-KA or 1770-KF2B).



Data Highway Connections Using Serial Communications

Multiple devices may be interconnected via Data Highway. Each device needs its own module to communicate on the highway. Switch settings, described later in this section, determine each device's station address.



Direct Connection to Data Highway 485

The PanelMate unit can communicate to the SLC 500, 5/01, and 5/02 PLCs. The PanelMate unit reads the I/O configurations when going online and must be in the online mode or turned on after all of the other nodes on the network. If you make additions or deletions to the I/O in your PLC, you must power the PanelMate unit down and back up to update the I/O configurations. Due to an Allen-Bradley PLC limitation, the PanelMate unit can only write to an output file if the SLC has a 5/02 processor and the output file was saved allowing this option. If you are using a SLC 500 or 5/01 PLC and attempt to write to an output file, an error message will be displayed. See the Communication Errors section in Chapter 6 for more information.

A 1747-AIC module must be used to communicate to all SLC PLCs. When communicating on a Data Highway 485, the PanelMate unit must be an end node, therefore, only two PanelMate units can be connected on the DH-485 as shown in the following figures.

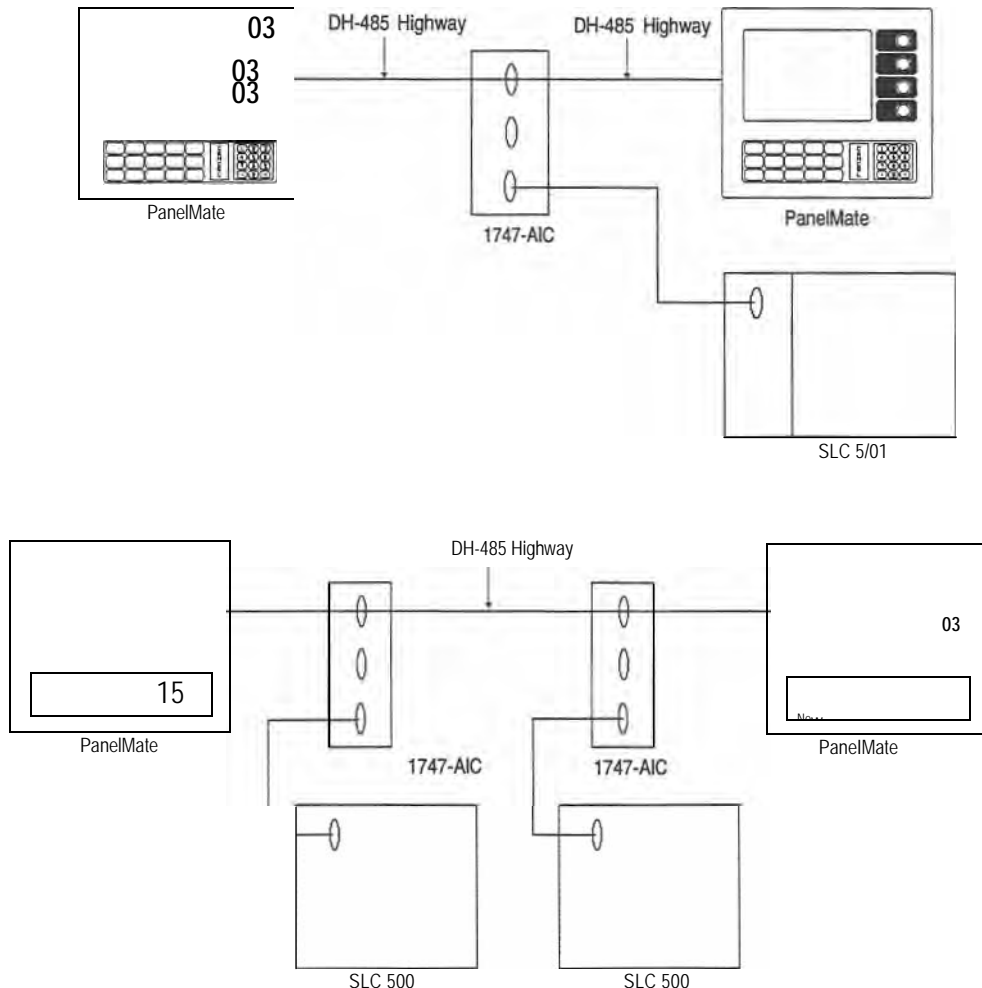


Figure 30-4 Multiple Data Highway 485 Connections

Note Allen-Bradley requires that no more than two initiators (i.e., two PanelMate units or one PanelMate unit and a programmer) access the SLC 500 or SLC 5/01 models. The Allen-Bradley SLC 5/02 does not have the two initiator limitation.

PLC-3 Data Access

The PanelMate unit can communicate with Allen-Bradley programmable controllers via the Data Highway or direct connection using PLC-2 protocols. The PLC-3 and 1775-KA Communications Adaptor Module can recognize these protocols and allow the PanelMate unit to access data table memory as if that memory were resident in a PLC-2 series processor.

In this manner, the PanelMate unit communicates through a file in the Input Image Section of the PLC-3 Data Table, where file number (10-100) corresponds to the station address of PanelMate unit. This is set as the Network ID# in the Port Parameter Table in the PLC Name and Port Editor. Statuses from real-world input modules are stored in Input Image File 0 and are not affected.

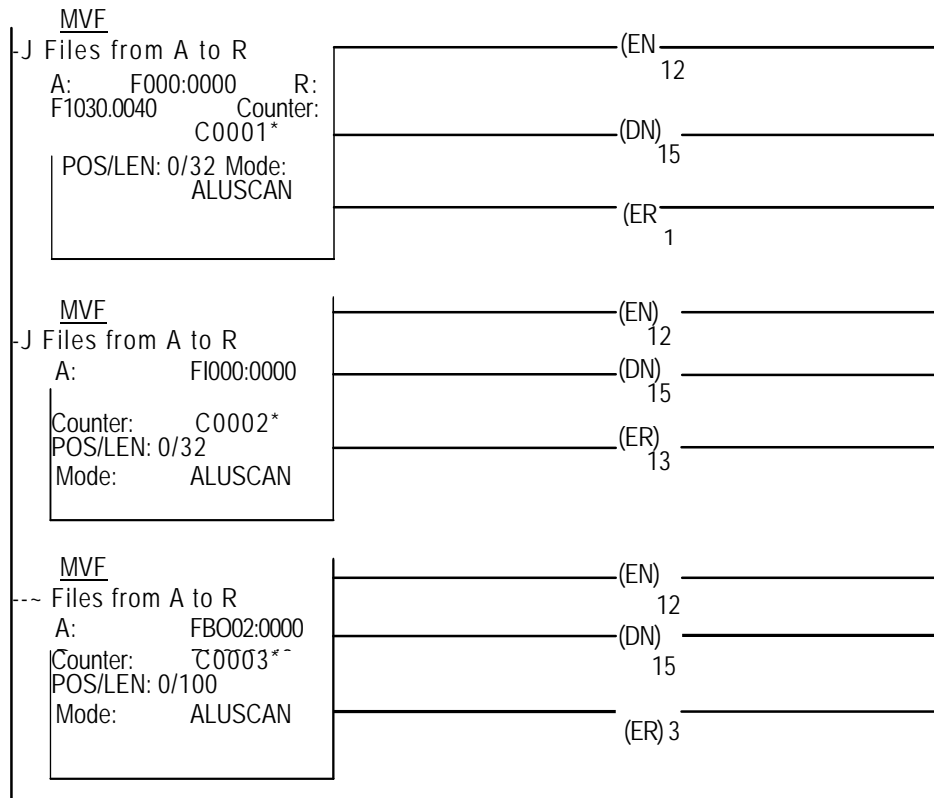
You should map any VO and numeric data which is to be used by the PanelMate unit from other areas of the data table, into the assigned Input Image File. This can be easily accomplished in a few rungs of ladder logic, using Move File (MVF) instructions. This creates a compact data sub-table that the PanelMate unit can access with a minimum number of reads, resulting in optimum communications response.

The following is an example of this technique. Assume that you want to use the following data in the PanelMate unit:

	Points Used	PLC-3 Data Table Addresses
512 Outputs	00000/00-00037/17	F00:0-1700:31
512 Inputs	10000/00-10037/17	F10:0-F10:31
100 Binary Values	first 100 words of Binary File 2	FB2:0-FB2:99

Assume that the Network ID# of the PanelMate unit is octal 30. Thus, the "window" we will be using will be Input Image File 30 (decimal). (Note that if PanelMate's ID is 0, Input Image File 8 is automatically selected.) You should ensure that this file has already been created (see PLC-3 Programming Manual Publication 1775-801).

The following three rungs would be included in the PLC-3 ladder diagram to map the three desired memory areas into file 1030.



* You can pick any three unused counters.

Controlling Data

If data and VO points are to be controlled by the operator via pushbutton or numeric entries, extra rungs can be added to move data from File 1030 into appropriate locations. The words used in 1030 for data sent by the operator must be outside the block areas written over by the above MVF rungs. In the above example, we have left words 0000 through 0037 available for writes.

Good engineering practice dictates that controlled statuses in the chosen Input Image File will not be written back into FIO.

Configuration Entries

With this technique, entries made for PLC-3 addresses in the Template Editors are then identical to those made for PLC-2 processors. Refer to Chapters 5, 6, 7, and 8 of this manual for specifics on each template type.

Continuing with the previous example, the following PLC-2 type addresses would then be used to reference the PLC-3 data.

<u>PLC-3 Addresses</u>	<u>PLC-2 Address Used in a PanelMate Unit</u>
F0000000 to 0003117	[40 00] to [77 17]
171000000 to 1003717	[100 00] to [137 17]
FBO02:0000 to FBO02:0099	[140] to [303]

* Assumes default PLC

PLC-5 Data Access

The diagram which follows illustrates that the 1785-KA module provides an interface between Data Highway Plus and Data Highway. Note again that the 1785-KA station address must be different from the other device addresses. Addresses and ID numbers shown in the diagram are samples only.

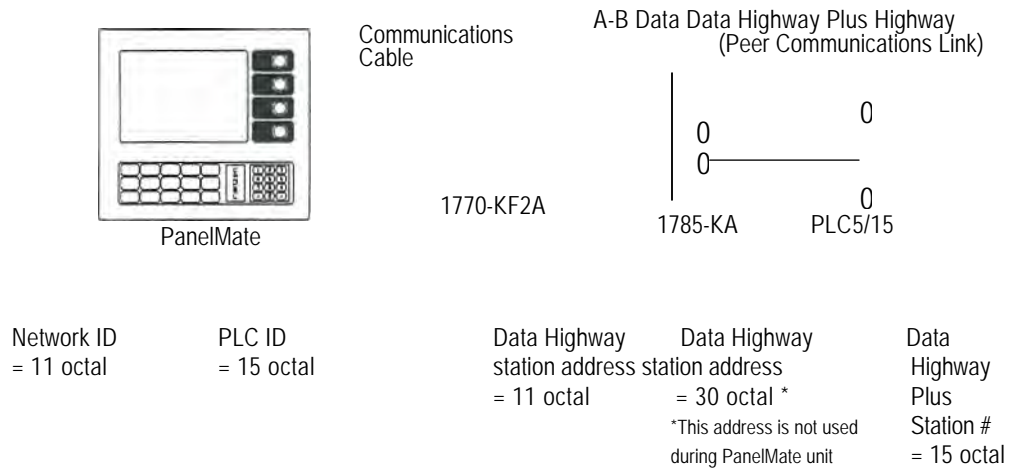


Figure 30-5 Connection to a PLC-5

The 1770-KF2B module can provide access for the PanelMate unit to use the Data Highway Plus with the PLC-5, as shown in the diagram which follows:

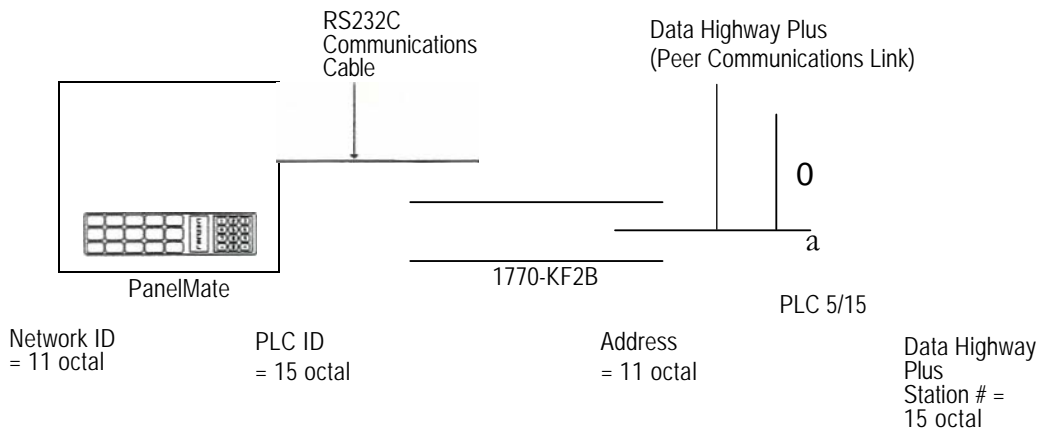


Figure 30-6 Connection to a PLC-5

The PanelMate unit can communicate with Allen-Bradley PLC-5's via the Data Highway Plus or direct connection using PLC-5 protocols. The PLC-5 can recognize these protocols via Data Highway Plus through interpretation by the 1770-KF2 unit B, the 1785-KE, or the 1785-KA modules and allow the PanelMate unit to access multiple files in the PLC-5.

Accessing Data

The PanelMate unit can access the following file types through the PLC-5 Command Set:

- Bit
- Integer
- Control
- Timer
- BCD
- Counter
- Input
- Output
- Status

See the Allen-Bradley PLC-5 Word and Bit References section for more information.

Controlling Data

The operator controls the data I/O points in the PanelMate unit via pushbuttons or numeric entries. The PanelMate unit will not allow inputs to be written. See PLC-5 Word and Bit References for more information.

Configuration Entries

When configuring the PanelMate unit for a PLC-5, select the PLC driver with the appropriate model from the onscreen choices presented in the PLC Name and Port Parameters Editor. For example, if a PLC-5/15 is used then the configuration should read "PLC 5/15".

SLC 500 Data Access

The SLC 500 Series supports a DH-485 link which uses a token-passing protocol with rotating mastership. The nodes are connected in a daisy chain fashion on the network with a maximum length of 4000 feet.

The DH-485 data link supports two types of devices: initiators (masters) and responders (slaves). All initiators on the link have a chance to initiate message transfers. The PanelMate unit will be an initiator on the network. If more than one PanelMate unit is on a network, a token passing algorithm is used to determine which initiator has the right to transmit.

The node address of a master can be any number from 0 to 31 and the address range for all slaves is 1 to 31. Therefore, the maximum number of nodes allowed on the link is 32. Typically, the PLC programmer defaults to node 0. The best network performance occurs when node addresses start at 1 and are assigned in sequential order. This minimizes the time to initialize the link.

Most DH-485 devices have a parameter which sets the maximum node address. The maximum node address should be set as low as possible. This minimizes the amount of time used in soliciting data when initializing the link and when finding new data when token passes do not receive a response. This field can be configured in the PLC Name and Port Table Editor. When your cursor is on a Use field selected for DH-485, pressing <F2> will recall the Allen-Bradley Data Highway 485 Maximum Node Address Editor. Open the field by pressing <Return>, then use your arrow keys to select the maximum node address.

The 1747-AIC communication module must be used with the SLC 500 PLCs.

Allen-Bradley Modules

A description of Allen-Bradley modules is given below. Consult the Allen-Bradley Data Highway Module Publications 1771-801, 807, 811, or 822 for more details.

Allen-Bradley modules for serial connections:

PLC Family	PLC-2	All	All	All	PLC-3	PLC-5	PLC-5
Module	1771-KG	1771-KE	1771-KF	1770-KF2A	1775-KA	1770-KF2B	1785-KE
Mounting	Rack	Rack	Panel	Desktop	Chassis	Desktop	Rack
Cable Connector	DB-15P	DA-15P	DA-15P	DB-25S	DB-25S	DB-25S	DA-15P
Connection	Direct	Data Hwy	Data Hwy	Data Hwy	Direct/ Data Hwy	PCL/ Data Hwy	PCL
Port Label	RS232C	RS232C	RS232C	Computer	Modem/ Data Hwy	Computer	Computer (RS232)

Table 30-1 Modules & Connectors for Allen-Bradley PLCs

Allen-Bradley modules for PLC to Data Highway connections:

PLC Family	PLC	PLC-2	PLC-3	PLC-5
Module #	1774-KA	1771-KA 1771 -KA2	1775-KA	1785-KA

Table 30-2 Modules for Data Highway Connection

Allen-Bradley modules for PLC to Data Highway Plus connections:

PLC Family	PLC	PLC-2	PLC-3	PLC-5
Module #	-	1785-KA3	1775-S5	Built-in

Table 30-3 Modules for Data Highway Plus Connection

Allen-Bradley modules for PLC to Data Highway 485 connections:

PLC Family	SLC 500	SLC 5/01	SLC 5/02
Module #	1747-AIC	1747-AIC	1747-AIC
Mounting	Panel	Panel	Panel
Cable Connector	6-position terminal block	6-position terminal block	6-position terminal block
Connection	DH-485	DH-485	DH-485
Port Label	DH485 INTFC	DH485 INTFC	DH485 INTFC

Table 30-4 Modules for Data Highway 485 Connection

Cabling

The communication between the PanelMate unit serial ports and most Allen-Bradley modules is RS232C, and so has a recommended maximum cable length of 50 feet. You should construct a communication cable of the desired length for each connection to be made. Note that the cable configuration is identical on the PanelMate unit-side for the various communication modules, with different connectors and pin outs on the Allen-Bradley end. Refer to the figure below for the connector required for each module. All PanelMate unit ports are female 9-pin (DB-9S), and so the connectors on the cables must be male 9-pin (DB-9P).

Cable shields should be grounded at one end only.

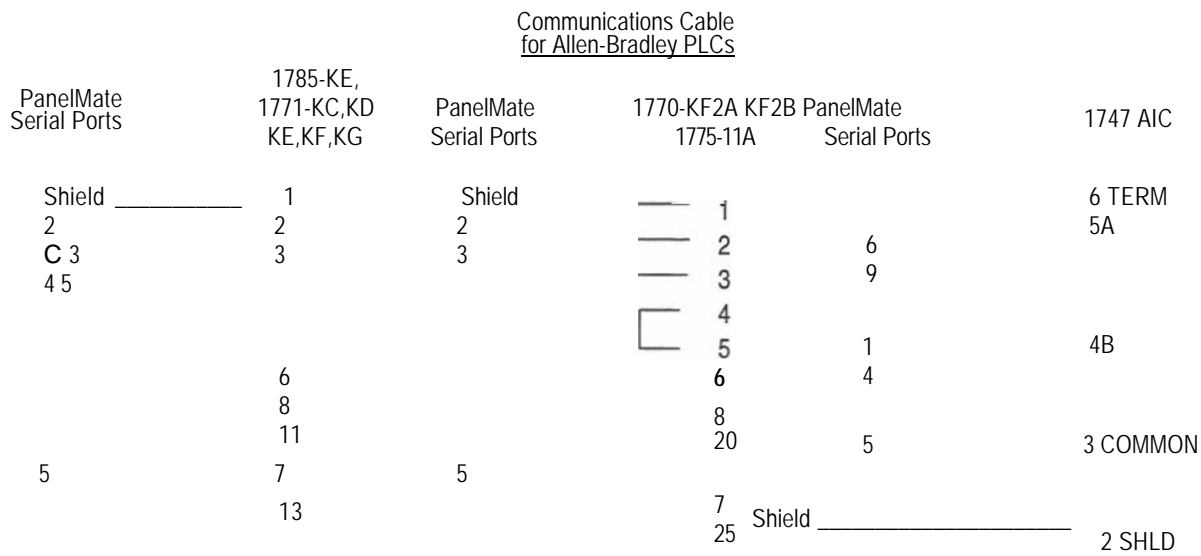


Figure 30-7 Cabling Diagrams

Communications Parameters

Each Allen-Bradley module has parameters which must be set in order to establish communications with the PanelMate unit. This is accomplished either through DIP switch settings on the individual module or programming selections using an Allen-Bradley programming terminal or programming software.

Standard communications parameters for communicating with a PLC-2, PLC-3, or PLC-5 are:

- 8 data bits
- 1 stop bit no
- parity
- 9600 baud rate

Standard communications parameters for communicating with a SLC 500 PLC are:

- 8 data bits
- 1 stop bit even
- parity 19200 baud
- rate

Note that the baud rate parameter is selectable, but Eaton IDT recommends using the setting 19200 for SLC 500 PLCs if it is available.

The following is a summary of the information available at the time of this manual's printing, describing the necessary settings for each of the modules. Be sure to check with Allen-Bradley for any possible updates or changes if you encounter any difficulty in communicating to the PanelMate unit.

Modules for PLC Data Highway Connection

1771-KA, 1771-KA2

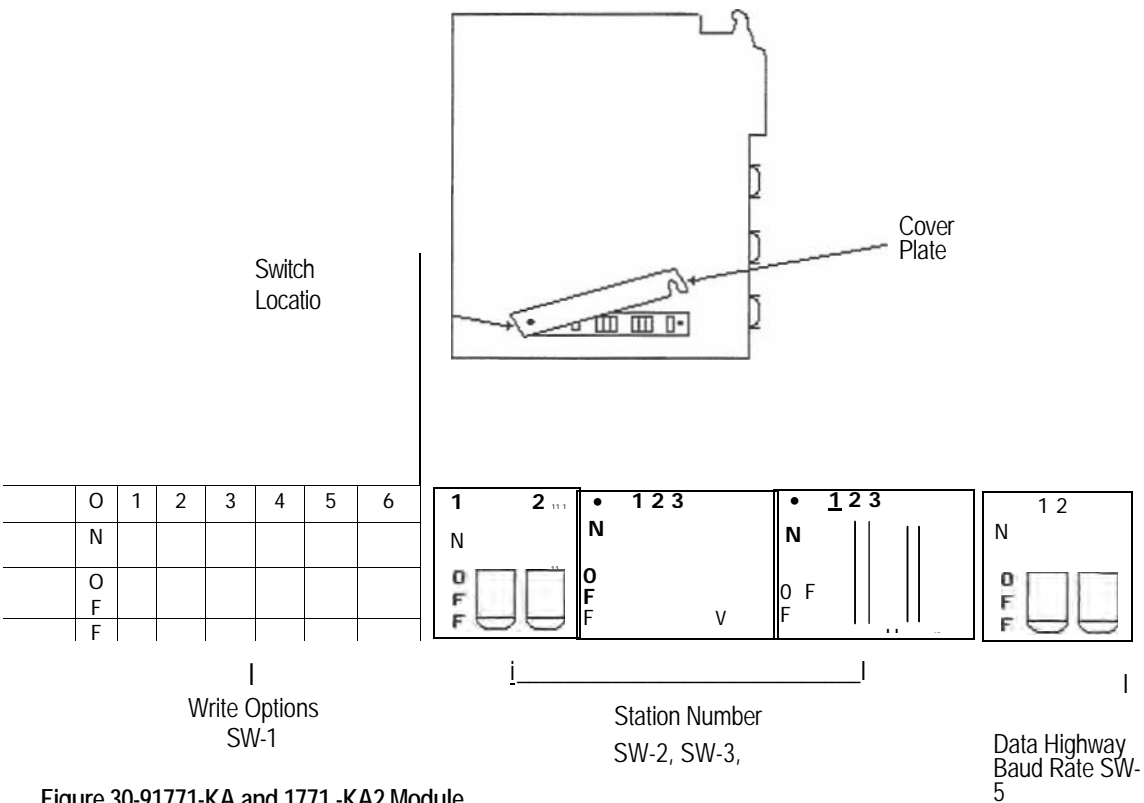


Figure 30-91771-KA and 1771 -KA2 Module

SW-1 Set switches 2 and 6 ON, and others OFF.
For 1771-KA2:
Set switches 2, 5 and 6 ON, and 1, 3 and 4 OFF.

Note Switch 6 on SW-1 is OFF when a 1771-KA module is connected to a PLC-2 (1772-LR). Switch 6 on SW-1 is OFF when a 1771-KA2 module is connected to a PLC-2 (1772-LR), a 1771-KG series B or another 1771-KA2 module.

SW-2, 3, 4 These switches should be set as the octal equivalent of the decimal PLC ID# you have established for this unit in the PLC Name and Port Editor.

SW-5 Set switches 1 and 2 ON (57.6K Baud).

1775-KA

The 1775-KA settings are programmed using the Allen-Bradley programming terminal (T50).

Station	A number between 10 and 377 (octal) that is the octal equivalent
Address	of the decimal PLC ID# you have established for the PLC in the PanelMate unit's PLC Name and Port Editor.
Module	Enabled
Status	

Be sure to match the baud rate, parity, data bits and stop bits with the entries made in the PLC Name and Port Editor.

1785-KA

The 1785-KA module acts as an interface between Data Highway Plus and Data Highway. The station number, set by DIP switches on the module, is its Data Highway address, which must be different from the PanelMate unit Data Highway address and the PLC-5's Data Highway Plus station number.

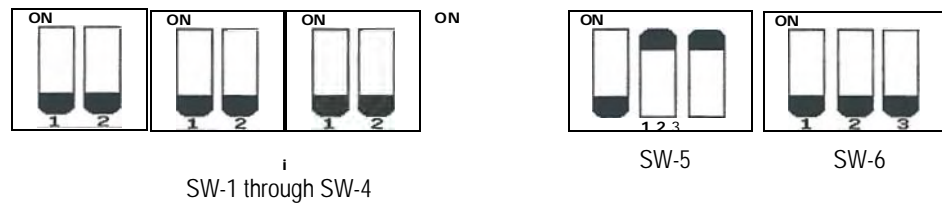
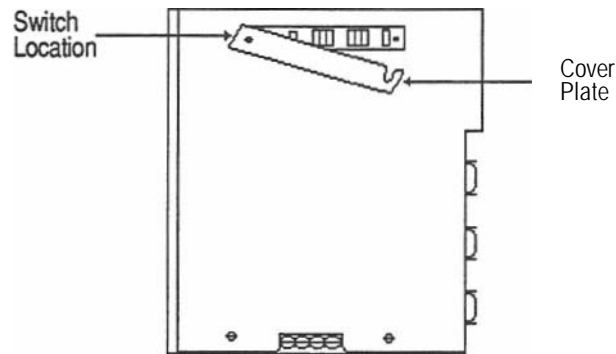


Figure 30-10 1785-KA Module DIP Switches

- SW-1 through SW-4 These are spare switches which should be set OFF as shown.
- SW-5,6 These switches represent the two-digit Data Highway address. The setting illustrated in Figure 30-9 is for an address of 30 octal. (This is not the PLC ID#.)

Modules for the PanelMate Data Highway Communication



1771-KE, 1771-KF SW-

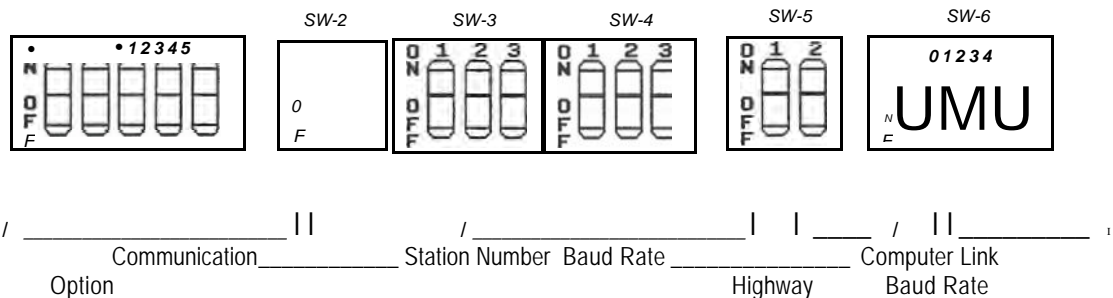


Figure 30-11 1771-KE and 1771-KF Module

Switch settings for Revision H of 1771-KE, 1771-KF

SW-1	Switches 1, 2, 4 and 5 OFF. Switch 3 ON.
SW-2,3,4	These switches should be set as the Network ID# you have established in the PanelMate PLC Name and Port Editor.
SW-5	Switches 1 and 2 ON (57.6K Baud)
SW-6	To use the default communications settings: switches 2, 3 and 4 ON, switch 1 OFF. This will produce the following settings: 9600 baud, module diagnostics are on. If switch 4 is OFF, the module will not execute diagnostics. To use other settings, be sure that the PanelMate unit and PLC settings match.

For Revision levels prior to H, same as above except:

SW-1	Switches 1, 2 and 4 OFF. Switches 3 and 5 ON.
SW-6	Switches 2 and 3 ON. Switches 1 and 4 OFF.

1771-KC, 1771-KD

SW-1	Communication options switches. Switch 2 and 5 must be OFF; others are not used.
SW-2,3,4	Station number switches. These should be set for the octal equivalent of the decimal Network ID#.
SW-5	Data Highway baud rate switches 1 and 2 must be ON (57.6K Baud).
SW-6	Computer link baud rate switches: 1 OFF 2 ON 3 ON 4 ON (9600 Baud)

1770-KF2 Series A, 1770-KF2 Series B

The 1770-KF2 Series A and Series B are desktop modules which can act as interfaces for the PanelMate unit to the Data Highway. The Series B performs the same function as the Series A, and can alternately act as a direct interface to the PLC-5 through Data Highway Plus. The layout of the DIP switches for setting communications parameters is identical for the two modules, except that SW-7 is not used on the Series A, but is functional on the Series B.

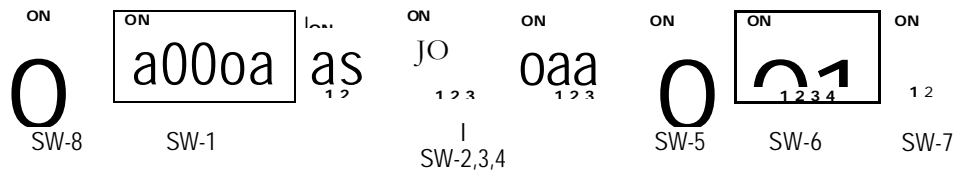


Figure 30-12 1770-KF2A, 1770-KF2B Module DIP Switches

Switch Settings

- SW-8 Note that this switch is to the left of the other switches in the previous diagram. For RS232C communication, set switch 1 OFF and switch 2 ON (as shown in the diagram). For RS422 communication, set switch 1 ON and switch 2 OFF.
- SW-1 Switches 1, 4 and 5 OFF. Switches 2 and 3 ON.
- SW-2,3,4 These switches represent the three-digit octal station number. They should be set as the Network ID# you have established in the PLC Name and Port Editor. The setting illustrated in the previous diagram is for an address of 11 octal (9 decimal).
- SW-5 Set both switches to ON, for a Data Highway rate of 57.6K baud.
- SW-6 For a communication rate of 9600 baud, set switch 1 OFF and switches 2 and 3 ON (as shown in Figure 14-13). Set switch 4 ON.
- SW-7 For Data Highway operation, set both switches 1 and 2 OFF.

Modules for Serial Connection

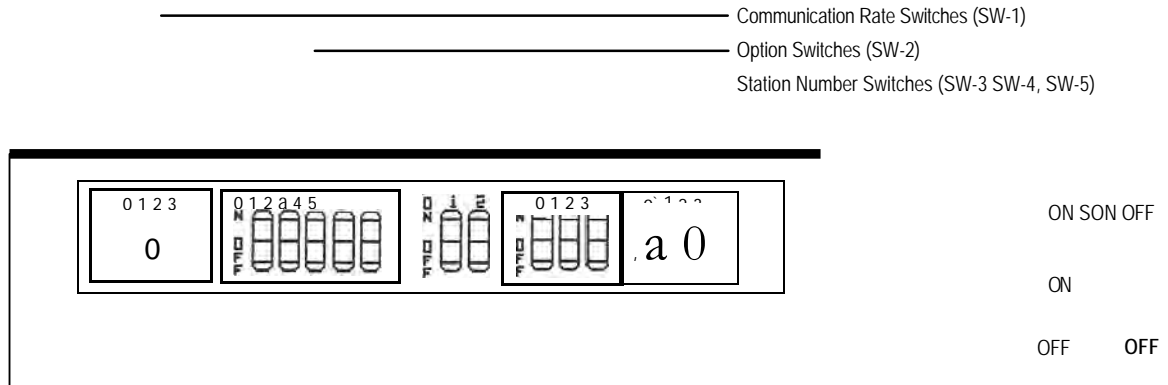


Figure 30.131771-KG Module

1771-KG

Switches are located behind a cover plate at the top of the module.

- SW-1 For the following communication parameters, 8 data bits, 1 stop bit, no parity, and 9600 baud, set switch 1 OFF and switches 2 and 3 ON.
- SW-2 Set switches 1, 2 and 5 OFF, and switch 3 ON. Switch 4 should be set ON if KG is the first module, OFF if KG is the second module regardless of the number of KG modules.
- SW-3,4,5 These switches determine the octal PLC ID number and are set as on the 1771-KA.

1775-KA

The 1775-KA settings are programmed using the Allen-Bradley Industrialized Programming Terminal (150) or programming software.

Data Highway Baud Rate	57.6K Baud
Station Address	A number between 10 and 377 (octal) that coincides with the octal equivalent of the decimal PLC ID# you have established for the PanelMate unit.
Port Status	Enabled
Baud and Parity	Set to match parameters configured in the PLC Name and Port Editor. Default: 9600 baud, 8 data bits, no parity.
Module Timeout Unpolled Mode	Typically 0.5 seconds (modem port)

Accepts Writes	Enabled - Writes from the PanelMate unit are accepted even if PLC keylock is in "Memory Protection ON" position. Disabled - Writes from the PanelMate unit are only accepted when PLC keylock is in "Memory Protect OFF" position.
Send Embedded Responses	Enabled

Modules for PanelMate to Data Highway Plus Connection

1770-KF2 Series B

The 1770-KF2 Series B module can act as a direct interface to the PLC-5 through Data Highway Plus.

The layout of the DIP switches for setting communications parameters is shown below.

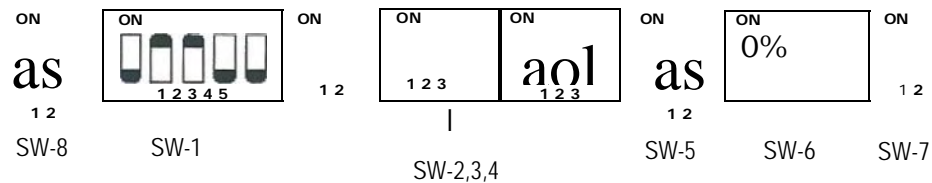


Figure 30-14 1770-KF2B Module DIP Switches

Switch Settings

- SW-8 Note that this switch is to the left of the other switches in the previous diagram. For RS232C communication, set switch 1 OFF and switch 2 ON (as shown in the diagram). For RS422 communication, set switch 1 ON and switch 2 OFF.
- SW-1 Switches 1, 4 and 5 OFF. Switches 2 and 3 ON. These switches control the special features of the KF2 module's asynchronous port.
- SW-2, 3, 4 These switches represent the three-digit octal station number. They should be set the same as the Network ID# you have established for the PanelMate unit. The setting illustrated in the previous diagram is for an address of 11 octal (9 decimal).
- SW-5 Set both switches to ON, for a Data Highway rate of 57.6K baud.
- SW-6 For a communication rate of 9600 baud, set switch 1 OFF and switches 2 and 3 ON (as shown in Figure 30-14). Set switch 4 OFF.
- SW-7 For Data Highway Plus operation (not functional with KF2A), set switch 1 ON and switch 2 OFF.

1785-KE Series A SW-1

SW-2

Switches 1, 2, 4 and 5 OFF. Switch 3 ON.

SW-3,4

Both switches OFF.

These switches represent the two-digit octal station number.
(PanelMate Network ID#)

SW-5

Set both switches ON for a Data Highway Plus rate of 57.6K baud.

SW-6

For a communication rate of 9600 baud, set switch 1 and 4 OFF and set switches 2 and 3 ON.

1785-KE Series B SW-

1 SW-

2

Switches 1, 2, 3, 5 and 6 OFF. Switch 4 ON.

These switches represent the three-digit octal station number. Switches 1 and 2 represent octal digit 0 and are not used. Both switch 1 and 2 should be set to ON. Switches 3, 4 and 5 represent the first octal digit, the most significant bit of the Data Highway Plus node address. Switches 6, 7 and 8 represent the second octal digit, the least significant bit of the Data Highway Plus node address. (PanelMate Network ID#)

For a communication rate of 9600 baud with a Data Highway Plus rate of 57.6K baud, set switches 1, 2, 4 and 5 ON and switch 3 OFF.

SW-3

Both switches OFF.

SW-4

Modules to Connect PanelMate to Data Highway 485

1747-AIC

The 1747-AIC module is used to connect SLC 500 PLCs to the Data Highway 485 network. The module provides a six position removable screw terminal block for connection to the communications cable.

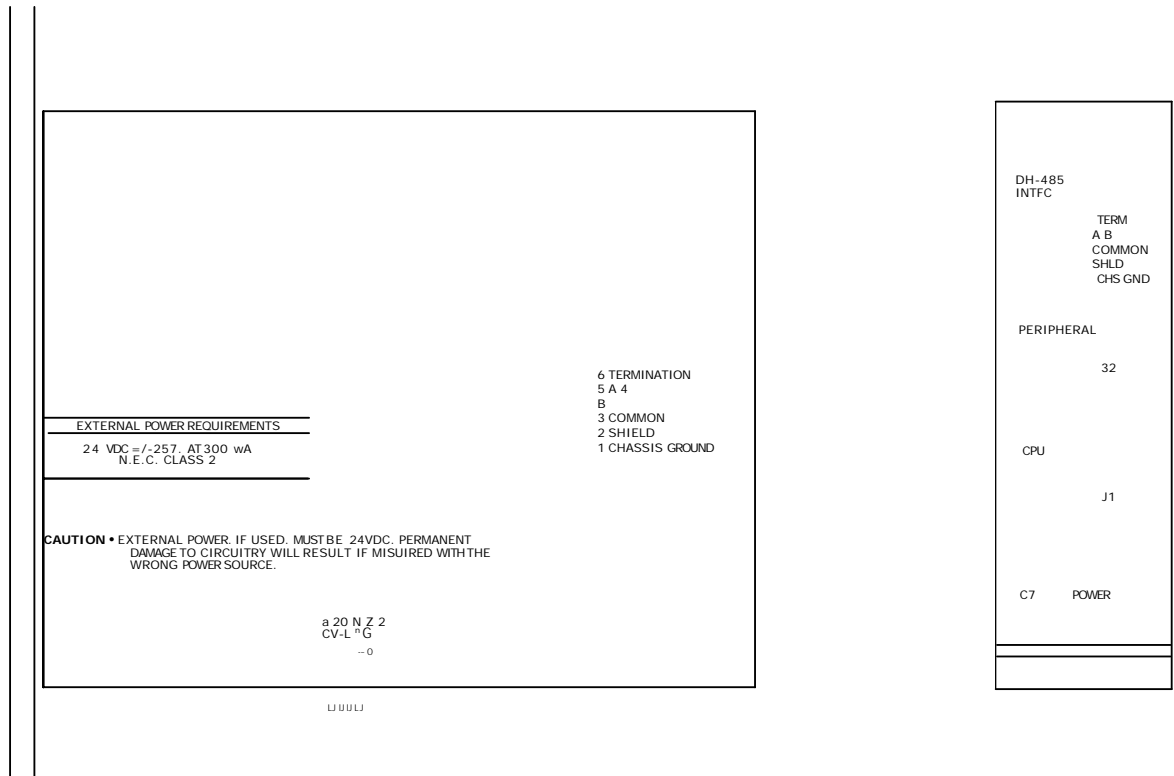


Figure 30.151747-AIC Module

Allen-Bradley Word and Bit References

The following section describes the use of Allen-Bradley word and bit references in your configuration. The general word referencing method is:

[plcname, word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

PLC-2 Word and Bit References

Allen-Bradley PLC-2 uses octal word addresses. You should select "PLC-2 o" at the model field in *the PLC Name and **Port** Editor to specify octal addressing. The PanelMate unit default format is BCD3.*

The following is the format for a word reference:

[ww]

ww = PLC reference number of the word.

The following is the format for a bit reference:

[ww bb]

ww = PLC reference number of the [word](#). [bb](#) =

PLC reference number of the bit. Note that there must

be a space between the word and bit.

The PanelMate unit can read all words between 10 and 77 (except word 27) and can read all words from 110 to the upper limit of your specific PLC-2.

The PanelMate unit can read all bits in the above words.

The PanelMate unit can reference more than one PLC word with a single read. The Allen-Bradley PLC-2 can read a maximum of sixty words per read. The maximum number of unused PLC words per read is fifteen. Once fifteen unused PLC words are encountered, the PanelMate unit will generate another read.

The PanelMate unit can write to all words, and bits in all words, between 10 and 77 (except word 27) and can write to all words, and bits in all words, from 120 to the upper limit of your specific PLC-2 UNLESS a word is configured as an input. The PanelMate unit can write to all bits in the above words.

PLC-3 Word and Bit References

Addressing for words and bits used in the PanelMate unit expressions is octal for the PLC-2 and PLC-3 families. You should select "PLC-2 o" at the model field in the PLC Name and Port Editor to specify octal addressing. The PanelMate unit default format is BCD3.

By adhering to the following procedure, you can use the PLC-2 driver for communications with a PLC-3:

1. Use an Input Image File, other than file 0, for all words and bits that will be accessed by the PanelMate unit.
2. The PanelMate unit will read and write to the Input Image File that corresponds to the Network ID# assigned to the serial port communicating with the PLC-3. For example, assume that Serial Port 2 will be used for communications to a PLC-3. By assigning Network ID# 30 to Serial Port 2 of the PanelMate unit, the online unit will access Input Image File 30 in the PLC-3.
3. Use PLC logic to move the necessary data to the assigned Input Image File.
4. Be sure that data formats are consistent. You can use format assignments in the PanelMate unit expression references or data moves in the PLC to ensure that the data formats are identical in both the PanelMate unit and the PLC.

The PanelMate unit can reference more than one PLC word with a single read. The Allen-Bradley PLC-3 can read a maximum of sixty words per read. The maximum number of unused PLC words per read is fifteen. Once fifteen unused PLC words are encountered, the PanelMate unit will generate another read.

PLC-5 Word and Bit References

The Allen-Bradley PLC-5 uses decimal word addresses. The PanelMate unit default format is S16. The following word and bit addressing descriptions apply to the PLC-5 Command Set.

General Format

[xf:e.s/b]

Note /b is an optional field

where

x = File Type

B - Bit	(signed 16)
N - Integer	signed 16
R - Control	signed 16
T - Timer	(signed 16)
D - BCD	BCD 4)
C - Counter	signed 16)
F - Floating point	(IEEE single precision floating point)

Note In Counter, Timer, and Control files word 0 is read only, and words 1 and 2 are read/write.

f = File Number

- 0 - 2 Reserved
- 3 - Bit
- 4 - Timer
- 5 - Counter
- 6 - Control
- 7 - Integer
- 8 - Floating Point
- 9-999 - Additional file storage

Note The above list of file types are default for Allen-Bradley. They can be changed by the user.

= Element delimiter e

= Element number

0 - 999 - (in decimal) . =

Subelement delimiter

s = Subelement mnemonic (used with Counter (C), Timer (T), and Control (R) files). Timer (T):

- PRE - Preset Value (word 1)
- ACC - Accumulated Value (word 2)

Counter (C):

- PRE - Preset Value (word 1)
- ACC - Accumulated Value (word 2)

Control (R):

- LEN - Length (word 1) POS
- Position (word 2)

/ = Bit delimiter

b = Bit number (not used in word and floating point references)

- 0-15999 - Decimal for Bit (B) type files when element number is not specified (optional)
- 0-15 - Decimal for all other file types, including Bit (B) type files which specify the element number

Certain file types allow mnemonics to be used instead of the actual bit number. The mnemonic should be placed after the "." and the 'T' is not used in this case. The following is a list of mnemonics that can be used.

Bit	<u>Timer (T)</u>
15	EN enable
14	TT timing
13	DN done
0-12	INVALID
Bit	<u>Counter (C)</u>
15	CU up enable
14	CD down enable
13	DN done
12	OV overflow
11	UN underflow
0-10	INVALID
Bit	<u>Control (R)</u>
15	EN enable
14	EU unload enable
13	DN done
12	EM empty
11	ER error
10	UL unload
9	IN inhibit
8	FD found
0-7	INVALID

I/O Format

When using the PanelMate unit to access I/O file types in the Allen-Bradley PLC-5 the following format must be used.

[O:rg/b] or [I:rg/b]

where

I = Input

O = Output

= Rack delimiter

r = Assigned rack number

0-3 for PLC-5/12 and PLC-5/15 0-7

for PLC-5/25

g = I/O group number

0-7 for all PLC-5 models

/ = Bit delimiter

b = Terminal (bit) number

0-17 for all PLC-5 models

Note To address an I/O word, do not include the lb field

Status Format

[S:e/b]

Note The /b is an optional field

where

S = Status

= Element delimiter

e = Element number (0-31) / =

Bit delimiter b = Bit number (0-

15)

Note To address a status word, do not include the /b field.

SLC 500 Word and Bit References

The Allen-Bradley SLC 500 uses decimal word addresses. The PanelMate unit default format is signed 16. The following word and bit addressing descriptions apply to the SLC 500 Command Set.

General Format

[xf:e.s/b]

Note /b is an optional field

where

x = File Type

B - Bit (signed 16) N -
Integer (signed 16) R -
Control (signed 16) T -
Timer (signed 16) C -
Counter (signed 16)

Note In Counter, Timer, and Control files word 0 is read only, and words 1 and 2 are read/write.

f = File Number

0 - 2 Reserved
3 - Bit
4 - Timer
5 - Counter 6
- Control 7 -
Integer
8 - Reserved
9-255 - Additional file storage

Note The above list of file types are default for Allen-Bradley. They can be changed by the user.

= Element delimiter

e = Element number

0 - 255 - (in decimal)

. = Subelement delimiter

s = Subelement mnemonic (used with Counter (C), Timer (T), and Control (R) files). Timer

(T):

PRE - Preset Value (word 1)

ACC - Accumulated Value (word 2)

Counter (C):

PRE - Preset Value (word 1)

ACC - Accumulated Value (word 2)

Control (R):

LEN - Length (word 1)

POS - Position (word 2)

/ = Bit delimiter

b = Bit number (not used in word references)

0-4095 - Decimal for Bit (B) type files when element number is not specified (optional) 0-15

- Decimal for Bit (B) and Integer (N) files types 13-15 - Decimal for Timer (T) file types

10-15 - Decimal for Counter (C) or bits 8 through 11 13

and 15 - Decimal for Control (R) file types

Certain file types allow mnemonics to be used instead of the actual bit number. The mnemonic should be placed after the "/" and the "." is not used in this case. The following is a list of mnemonics that can be used.

Bit	<u>Timer (T)</u>	
15	EN enable	
14	TT timing	
13	DN done	
0-12	INVALID	
Bit	<u>Counter (C)</u>	
15	CU up enable	
14	CD down enable	
13	DN done	
12	OV overflow	
11	UN underflow	
10	UA update accumulator (not available in the PLC 5) 0-9	INVALID
Bit	<u>Control (R)</u>	
15	EN enable	
14	EU unload enable	
13	DN done	
12	EM empty	
11	ER error	
10	UL unload	
9	IN inhibit	
8	FD found	
0-7	INVALID	

VO Format

When using the PanelMate unit to access I/O file types in the Allen-Bradley SLC 500 the following format must be used.

[O:e.s/b] or [I:e.s/b]
where

I = Input

O = Output

= Slot delimiter

e = Slot number

0-2 for SLC 500 model

1-30 for SLC 5/01 or SLC 5/02 models

= Word delimiter

s = Word number.

0-255 for all SLC 500 models

/ = Bit delimiter

b = Terminal (bit) number

0-15 outbits for SLC 500 model

0-23 input bits for slot 0 for SLC 500 model

0-15 input bits for slot 1 or 2 for SLC 500 model

0-15 input and output bits for SLC 5/01 and SLC 5/02

Note A word number is not required if the number of inputs or outputs does not the exceed 16 for slot. If a word number is not given, word zero is assumed. **Status Format**

[S :e/b]

Note The /b is an optional field
where

S = Status

= Element delimiter

e = Element number (0-15)

/ = Bit number

b = Bit number (0-15)

Note Words 0, 1, 2, 3, 4, 9, and 10 read only. Words 6, 7, 8, 11, 12, 13, 14, and 15 are read/write.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate unit expression fields.

PLC-2 and PLC-3

<u>Word</u>	
<u>References</u>	<u>Reference</u>
[19]	<u>Description</u>
[73]	Word 19
[130]	Word 73
	Word 130
<u>Bit References</u>	
<u>Reference</u>	<u>Description</u>
[43 07] [66	Word
2] [112 05]	43 Bit 7 Word 66
	Bit 2 Word 112
	Bit 5

PLC-5

Word References

<u>Reference</u>	<u>Description</u>
[B321:100]	Element 100 of Bit file 321
[N22:15] [d 10:891	Element 15 of Integer file 22
] [1:02] [0:27]	Element 891 of BCD file 10
[S:22] [C222:444]	Group 2 in rack 0 of reserved Input file 1
[C15:29.ACC]	Group 7 in rack 2 of reserved Output file 0
[c354:2.PRE]	Element 22 in reserved Status file 2
[T31:999]	Control value in element 444 of Counter file 222
[t9:52.aCC]	Accumulated value in element 29 of Counter file 15
[T354:2.pre]	Preset value in element 2 of Counter file 354 Control
[r119:272]	value in element 999 of Timer file 31 Accumulated
[R53:52.len]	value in element 52 of Counter file 9 Preset value in
[R111:721.PoS]	element 2 of Counter file 354 Status value in element
[b041:581]	272 of Control file 119 Length value in element 52 of
[n421:008]	Control file 53 Position value in element 721 of
[N009:077#s16]	Control file 111 Element 581 of Bit file 41
[D10:820#U32]	Element 8 of Integer file 421
	Element 77 of Integer file 9 (signed 16-bit)
	Element 820 of BCD file 10 (unsigned 32-bit)

Bit References

<u>Reference</u>	<u>Description</u>
[B34/17] [b4:091	Bit 17 of Bit file 34 (bit 1 of element 1)
/10] [N007:25/06]	Bit 10 of element 91 of Bit file 4 Bit 6 of
[D22:491/15]	element 25 of Integer file 7 Bit 15 of
[1:15/7] [0:32/11]	element 491 of BCD file 22 Bit 7 in
[s:06/8]	group 5 of rack 1 of Input file 1
[T9:71.eN]	Bit 11 in group 2 of rack 3 in Output file 0
[t4:1.DN]	Bit 8 in element 6 of Status file 2
[T77:32.acc/01]	Enable bit (15) in control word of element 71 of Timer file 9 Done
[0005:28.UN]	bit (13) in control word of element 1 of Timer file 4 Bit 1 of
[c163:08/14]	accumulated value of element 32 in Timer file 77 Underflow bit
	(11) in control word of element 28 of Counter file 5 Down Enable bit
	(14) in control word of element 8 of Counter
	file 163
	Bit 9 of preset value of element 2 in Counter file 88
	Found bit (8) in status word of element 954 in Control file 6 Inhibit
	bit (9) in status word of element 83 in Control file 46 Bit 14 of
	length value of element 7 in Control file 518
[C88:02.PRE/9]	
[R6:954.fd]	
[r46:83/09]	
[r518:7.LeN/14]	

Word ReferencesReference [13202:100]

[N22:15]

[d10:141] [1:1.3]

[0:2.1] [S:22]

[C222:144]

[C15:29.ACC]

[c254:2.PRE]

[T31:199]

[t9:52.aCC]

[T154:2.pre]

[r119:172]

[R53:52.len]

[R111:121.PoS]

[b041:81]

[n21:008]

[N009:077#s16]

[D10:120#U32]

Bit ReferencesReference

[B34117] [b4:091

/10] [N007:25/06]

[D22:191/15]

[1:1.1/5] [0:2.3/1]

[s:06/8] [T9:71

/eN] [t4:1 /DN]

[T77:32.acc/01]

[0005:28/UN]

[c163:08/14]

[C88:02.PRE/9]

[R6:1541fd]

[r46:83/09]

[r118:7.LeN/14]

Description

Element 100 of Bit file 202 Element 15

of Integer file 22 Element 141 of BCD

file 10 Word 3 of slot 1 of Input file 0

Word 1 of slot 2 of Output file 1

Element 22 in reserved Status file 2

Control value in element 144 of Counter file 222

Accumulated value in element 29 of Counter file 15

Preset value in element 2 of Counter file 254 Control

value in element 199 of Timer file 31 Accumulated

value in element 52 of Counter file 9 Preset value in

element 2 of Counter file 154 Status value in element

172 of Control file 119 Length value in element 52 of

Control file 53 Position value in element 121 of Control

file 111 Element 81 of Bit file 41

Element 8 of Integer file 21

Element 77 of Integer file 9 (signed 16-bit)

Element 120 of BCD file 10 (unsigned 32-bit)

Description

Bit 17 of Bit file 34 (bit 1 of element 1)

Bit 10 of element 91 of Bit file 4 Bit 6 of

element 25 of Integer file 7 Bit 15 of

element 191 of BCD file 22 Bit 5 of word

1, slot 1 of Input file 0 Bit 1 of word 3,

slot 2 of Output file 1 Bit 8 in element 6

of Status file 2

Enable bit (15) in control word of element 71 of Timer file 9 Done

bit (13) in control word of element 1 of Timer file 4 Bit 1 of

accumulated value of element 32 in Timer file 77 Underflow bit

(11) in control word of element 28 of Counter file 5 Down Enable bit

(14) in control word of element 8 of Counter

file 163

Bit 9 of preset value of element 2 in Counter file 88

Found bit (8) in status word of element 154 in Control file 6 Inhibit

bit (9) in status word of element 83 in Control file 46 Bit 14 of

length value of element 7 in Control file 118

Allen-Bradley Remote STS and EXT STS Errors

The most common remote errors reported by the Allen-Bradley PLC are listed in the following tables. If you are using Allen-Bradley PLCs for Data Highway or Data Highway Plus, a complete set of error codes can be found in the Allen-Bradley Publication 1770-6.5.16, November 1991. Take note of the hexadecimal error code and consult the Allen-Bradley publication. If the remote error code is FOXX (hex), then the XX represents the Allen-Bradley EXT STS (extended status) error code. The EXT STS codes are found in the EXT STS Codes for Command Code OF (hex) table. Other remote error codes are found in the Remote STS Error Codes table.

Error Number	Description
00	Success - no error
10	Illegal command or format
20	Host has a problem and will not communicate
30	Remote node host is missing, disconnected, or shut down
40	Host could not complete function due to hardware fault
50	Addressing problem or memory protect rungs
60	Function disallowed due to command protection selection
70	Processor is in program mode
80	Compatibility mode file missing or communication zone problem
90	Remote node cannot buffer command
AO	Not used
BO	Remote node problem due to download
CO	Cannot execute command due to active IPBs
DO	Not used
EO	Not used
FO	There is an error code in the EXT STS byte

Table 30-5 Remote STS Error Codes

You will have an EXT STS byte if your STS codes is FO (hex). The EXT STS has different definitions depending on the command code (type of command) in your message packet. If the command code is:

00 to 08 (hex)	There is not an EXT STS byte.
OE or OF (hex)	These are Data Highway/Data Highway Plus codes.
OB, 1A, or 1 B (hex)	These are DH-485 codes.

Error Number	Description
0	Not used
1	A field has an illegal value
2	Less levels specified in address than minimum for any address
3	More levels specified in address than system supports
4	Symbol not found
5	Symbol is of improper format
6	Address does not point to something usable
7	File is wrong size
8	Cannot complete request, situation has changed since the start of the command
9	Data or file is too large
A	Transaction size plus word address is too large
B	Access denied, improper privilege
C	Condition cannot be generated - resource is already available
D	Condition already exists -- resource is already available
E	Command cannot be executed
F	Histogram overflow
10	No access
11	Illegal data type
12	Invalid parameter or invalid data
13	Address reference exists to deleted area
14	Command execution failure for unknown reason; possible PLC-3 histogram overflow
15	Data conversion error
16	Scanner not able to communicate with 1771 rack adapter
17	Adapter cannot communicate with module
18	1771 module response was not valid
19	Duplicated label
1A	File is open; another node owns it
1 B	Another node is the program owner
1 C to FF	Not used

Table 30-6 Remote EXT STS Error Codes





Chapter 31

The Accelerati/On Interface

The Accelerati/On interface is a separate product which is compatible with the PanelMate Series units. An Accelerati/On interface may be installed in a PanelMate unit to provide communication to Allen-Bradley PLCs through Data Highway, Data Highway Plus, or the remote I/O network. The interface provides several distinct advantages:

- With Accelerati/On, the PanelMate unit can connect directly to Data Highway, Data Highway Plus, or the Remote I/O network without requiring any communication modules.
- The direct connection just noted eliminates the need for serial RS232 connections, permitting data to transfer at 57.6K baud for Data Highway and Data Highway Plus, and 57.6K baud, 115.2K baud, 230.4K baud for Remote I/O.
- When it is connected to the remote I/O network, a unique monitor mode permits the PanelMate unit with Accelerati/On to read discrete inputs, outputs, or block transfers directly off the I/O link without requiring the PLC to transmit the data to the PanelMate unit.
- While the PanelMate unit is communicating to one or more Allen-Bradley PLCs through Accelerati/On, it can still simultaneously communicate to other PLCs using its two serial ports.

When Accelerati/On is used as an interface to Data Highway or Data Highway Plus, the PanelMate unit functions as a master - polling one or more PLCs on the network to obtain or transmit data.

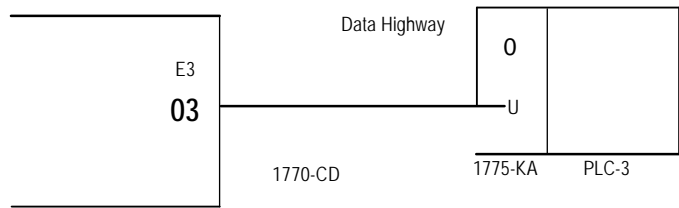
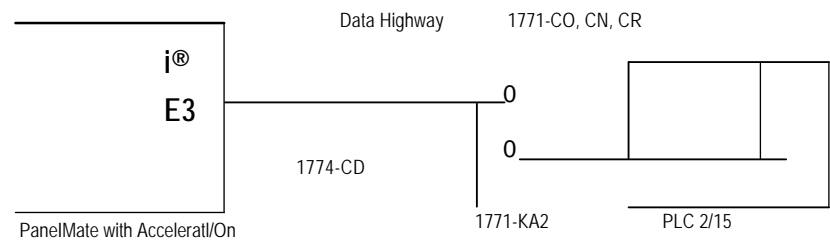
When Accelerati/On is used as an interface to the Remote I/O network, the PanelMate unit simulates one or more remote racks. Each rack can be split into a quarter rack or any multiples of a quarter rack (i.e., 1/4, 1/2, 3/4 or full rack). The PLC can use normal I/O scan or block transfer operations to read or write data to or from the PanelMate unit, as though the interface was a rack. As with any Remote network, the PLC will be the master while the PanelMate unit will be a slave.

Possible Configurations

The AcceleratI/On interface may be used to communicate to a Data Highway, Data Highway Plus, or Remote I/O network. The interface may be configured for only one of these communication types at any one time. The PanelMate unit's serial ports may be used for communication to multiple PLC's, CSI devices, or a printer at the same time.

Examples of possible configurations are described in the following sections.

Direct Data Highway Connections



PanelMate with AcceleratbOn

Multiple Data Highway Connections

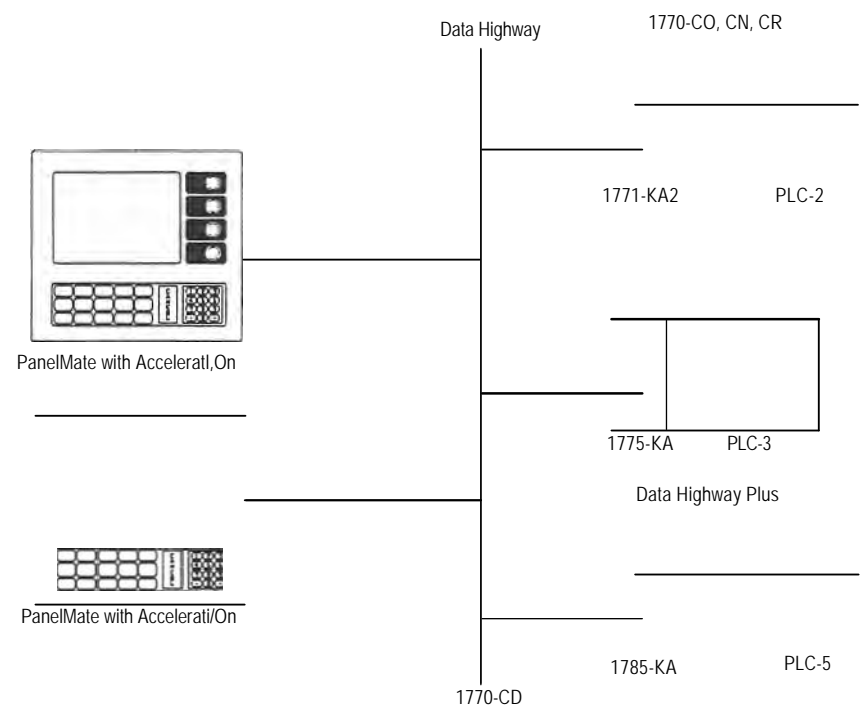


Figure 31-2 Multiple Data Highway Connections

Serial and Direct Data Highway Connections

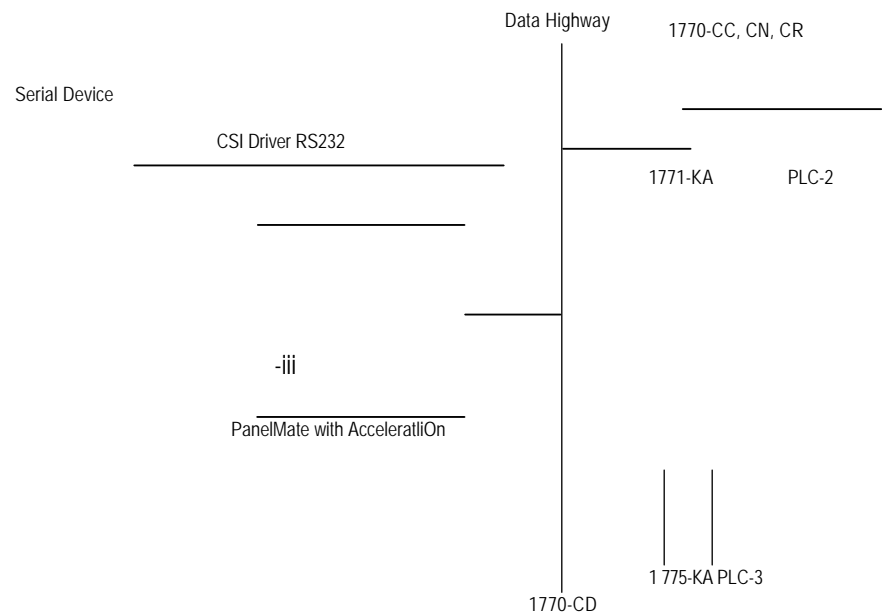


Figure 31-3 Serial and Direct Data Highway Connections

Direct Data Highway Plus Connections

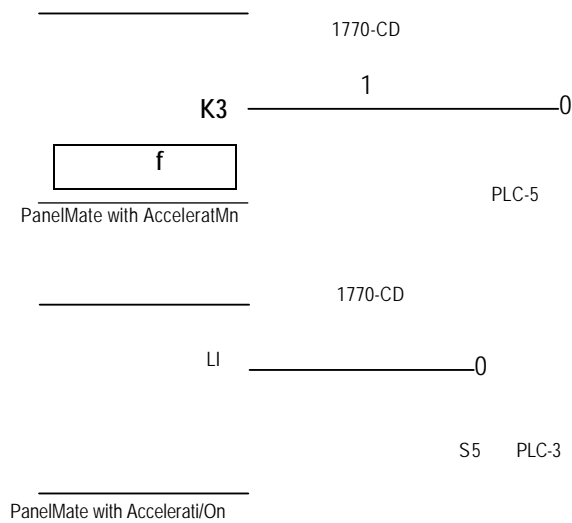


Figure 31-4 Direct Data Highway Plus Connections

Multiple Data Highway Plus Connections

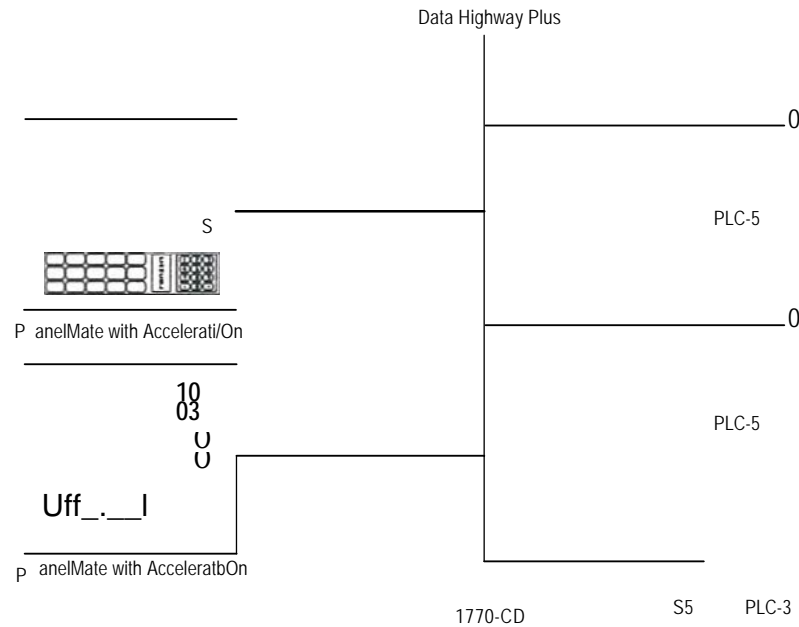


Figure 31-5 Multiple Data Highway Plus Connections

Serial and Direct Data Highway Plus Connections

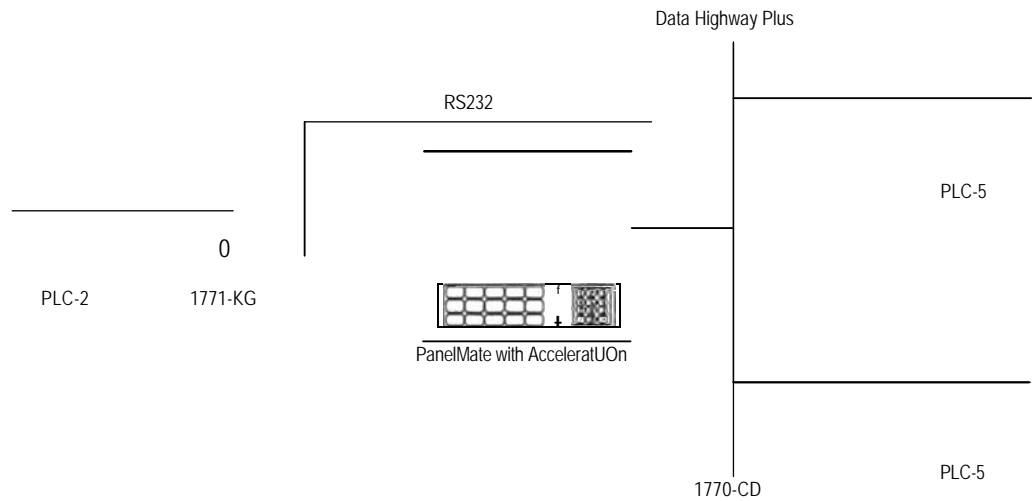


Figure 30-6 Serial and Direct Data Highway Plus Connections

Direct Data Highway and Data Highway Plus Connections

The PanelMate unit on a Data Highway can access all nodes on Data Highway and Data Highway Plus.

Note The PanelMate unit on the Data Highway Plus network cannot access nodes on the Data Highway, only nodes on the Data Highway Plus are accessible.

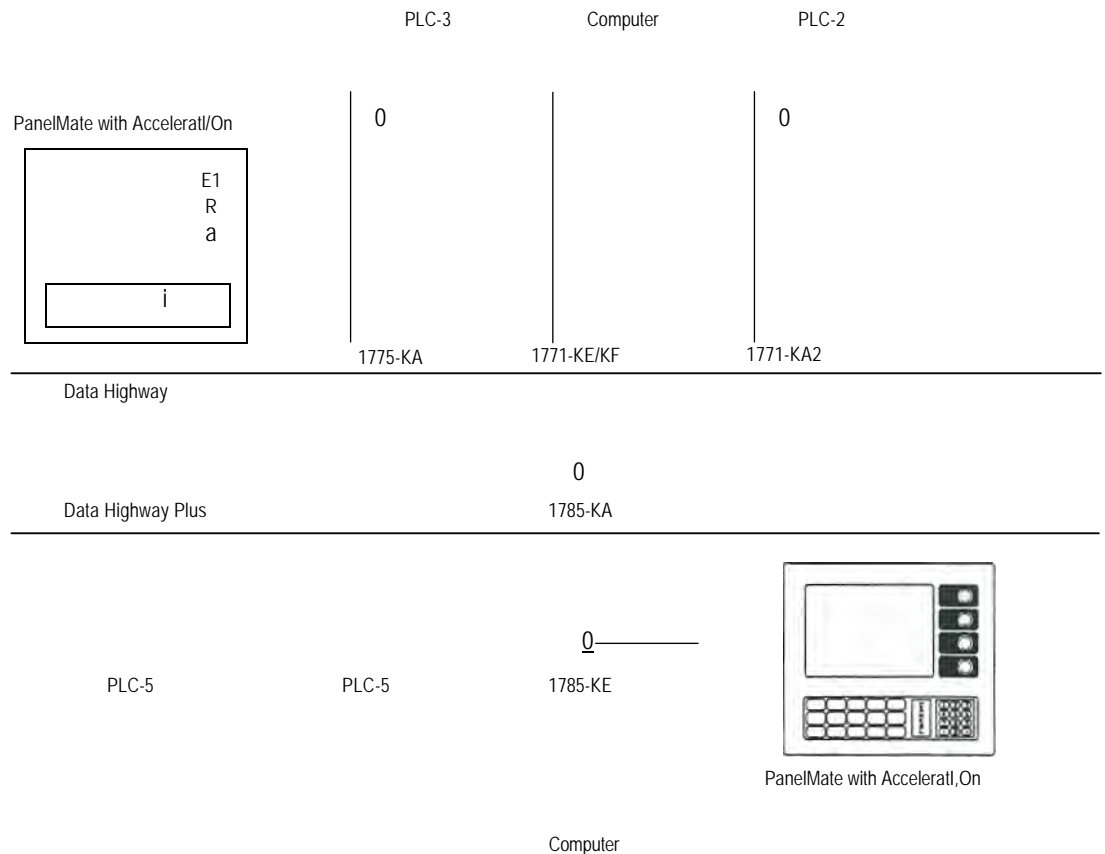


Figure 31-7 Direct Data Highway and Data Highway Plus Connections

Remote UO Connections

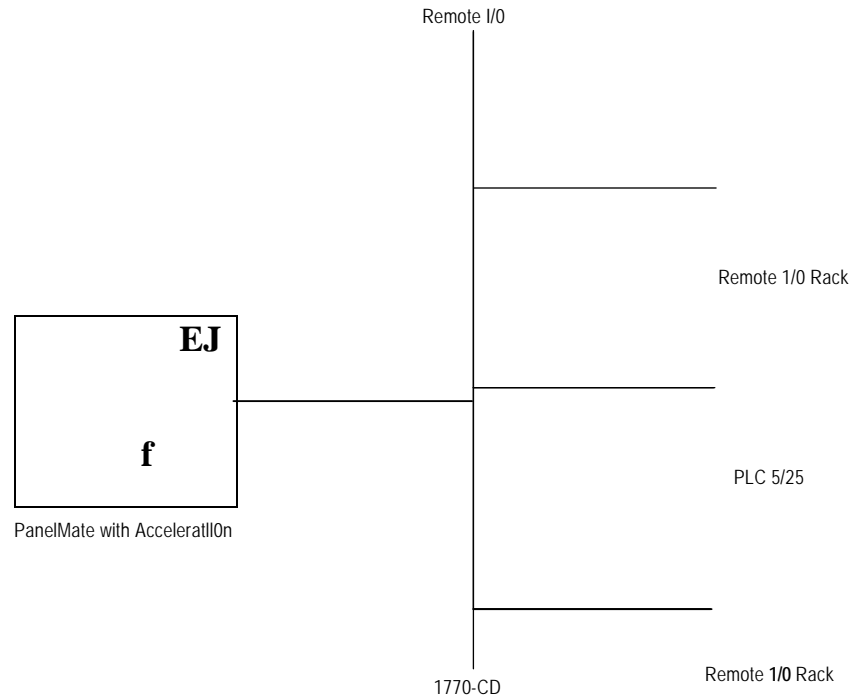


Figure 31-8 Remote I/O Connections

Serial and Direct Remote I/O Connections

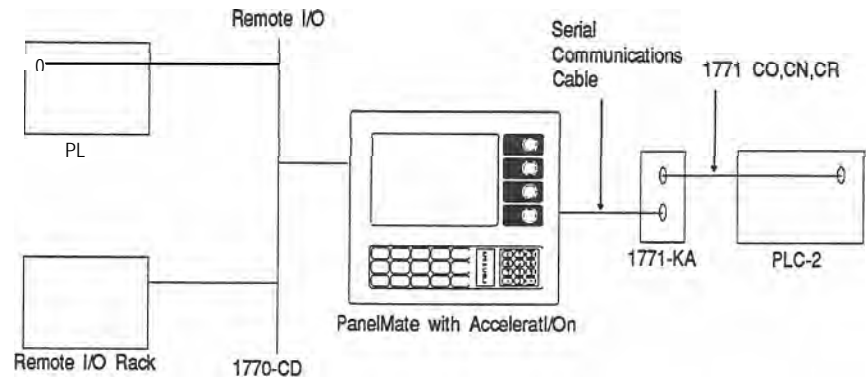


Figure 31-9 Serial and Direct Remote I/O Connections

Cabling

The _same connection guidelines recommended for any Data Highway, Data Highway Plus, or Remote VO device should be used for connecting a PanelMate unit to any of these networks. Standard 1770-CD twinaxial cable or equivalent should be used. A minimum cable length of 20 feet between nodes should be observed. Proper network termination procedures should be observed.

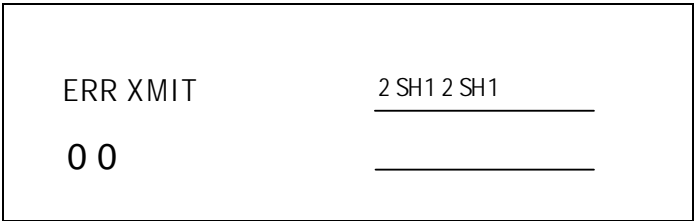
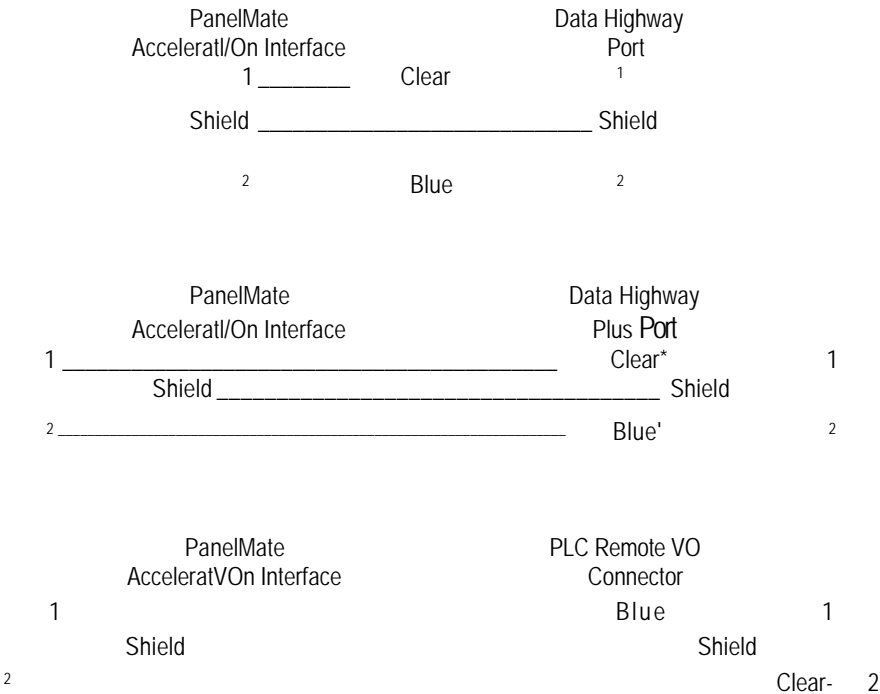


Figure 31-10 Network Connection on Accelerat/On Interface

Network connections for the Accelerat/On interface are on the main video unit's left side (looking at the rear of the unit).



Conductor colors for the Data Highway Plus and Remote VO networks are not absolute. The clear and blue colors may be on either pins 1 or 2, but must be consistent throughout the network.

Figure 31-11 Cabling Diagrams

Two sets of electrically-common network connections are provided: 1, Shield, 2. A six-position female connector is shipped with each interface. Cabling connections are made to this female connector and then attached to the AcceleratI/On interface.

A 150-ohm resistor should be attached to the female connector for proper termination when required. Consult Allen-Bradley documentation for information regarding correct termination of Data Highway, Data Highway Plus, or Remote I/O networks.

In general, the following rules apply: If the AcceleratI/On interface is the end node on a network, the supplied 150-ohm resistor is needed. If the interface is not the end node on the network, the resistor is not needed.

Communication Parameters

The PanelMate unit's AcceleratVOn interface can be used with a network communication rate of 57.6K baud for Data Highway and Data Highway Plus, and 57.6K baud, 115.2K baud, or 230.4K baud for Remote I/O. The desired rate is selected in the PLC and Port Parameters utility.

Note If your application requires communication at 230K baud, the EPROM on the AcceleratI/On interface must be at revision 04 or greater (PIN 85-00285-04 or 85-00307-04).

See the proper Allen-Bradley documentation for information on setting the communication rate for other network devices.

Modules for SLC 5/02 Remote I/O Communication

1747 SN

The 1747 SN module allows up to four additional remote I/O racks. These racks are numbered from 0-3. Each rack provides eight input and eight output words.

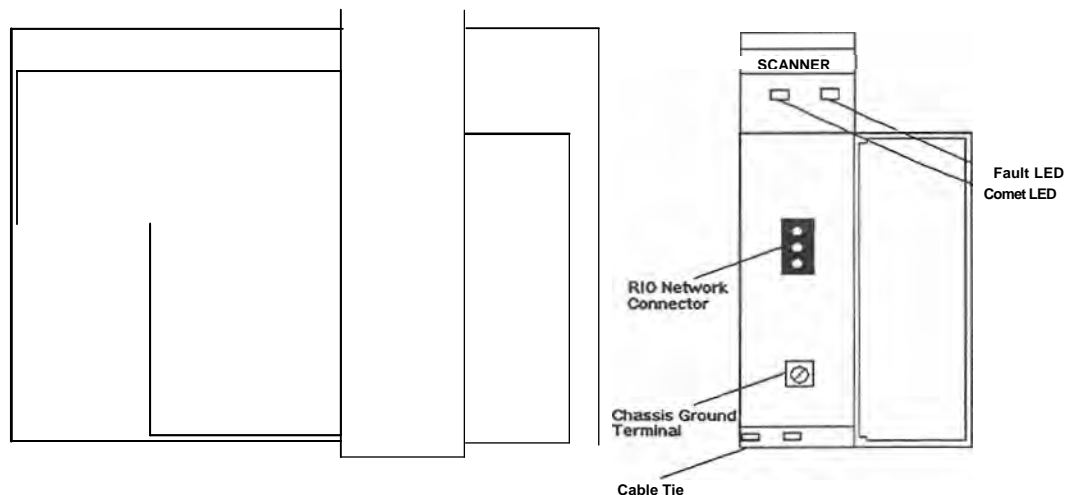


Figure 31-12 1747 SN Scanner Module

The switch positions for setting the baud rate are listed in the following table.

Baud Rate	Switch 1	Switch 2
57.6 KBaud	ON	ON
115.2 KBaud	ON	OFF
230.4 KBaud	OFF	ON
230.4 KBaud	OFF	OFF

Table 31.1 Baud Rate Table

When configuring the local rack, if the 1747 SN module is not currently a selection in the software package, enter the number 13608 as the Module Code ID. For details on configuring your module, consult the 1747 SN User's Manual or Eaton IDT's technical note, the PanelMate Plus Series Communications to an Allen-Bradley SLC 5/02 - Remote I/O.

Note The 1747 SN module will not allow block transfers to any device including the PanelMate units.

Diagnostic Indicators

The AcceleratI/On interface has two diagnostic indicator lights near the network connector. (Refer to figure 31-10.)

The green indicator is labeled "TRANSMIT." It will remain off when the PanelMate unit is in Configuration Mode. When the PanelMate unit goes online, the light will flash rapidly after network communication has been established.

The red indicator is labeled "ERROR." It will remain on when the PanelMate unit is in the Configuration Mode. When the PanelMate unit goes online, the light will go off to indicate proper initialization of the interface. A red light which stays on during Run Mode indicates a problem with the AcceleratVOn hardware. If you have installed the interface, check installation of the circuit board in the Electronics Module. If the installation appears correct or if the interface was installed by Eaton IDT, call Customer Service at (614) 882-3282.

Allen-Bradley Word and Bit References

The following section describes the use of Allen-Bradley word and bit references in your configuration. The general word referencing method is:

[plcnam,word#format]

The "plcnam" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcnam" and "#format" are optional.

The general bit referencing method is:

[plcnam,bit]

The "plcnam" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See Chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

Data Highway and Data Highway Plus

When a PanelMate unit with AcceleratiOn is communicating to Data Highway or Data Highway Plus, it is a master. The PanelMate unit can accept unsolicited write messages from a PLC through the Data Highway or Data Highway Plus networks. See Chapter 29 for information regarding Allen-Bradley word and bit addresses and their use in the PanelMate Plus template editors for Data Highway/Data Highway Plus applications.

Remote VO

The following subsections describe the reference formats for Input and Output memory, the reference formats for monitored and active block transfer memory, along with error messages which may be displayed.

Note All numbers used for PLC addressing in the remote VO references are in octal.

Monitored UO

The monitoring feature allows a PanelMate unit to reference all VO data in a remote rack utilizing the PLC's standard VO scan. This will not affect the VO scan time nor will it require additional ladder logic to be used.

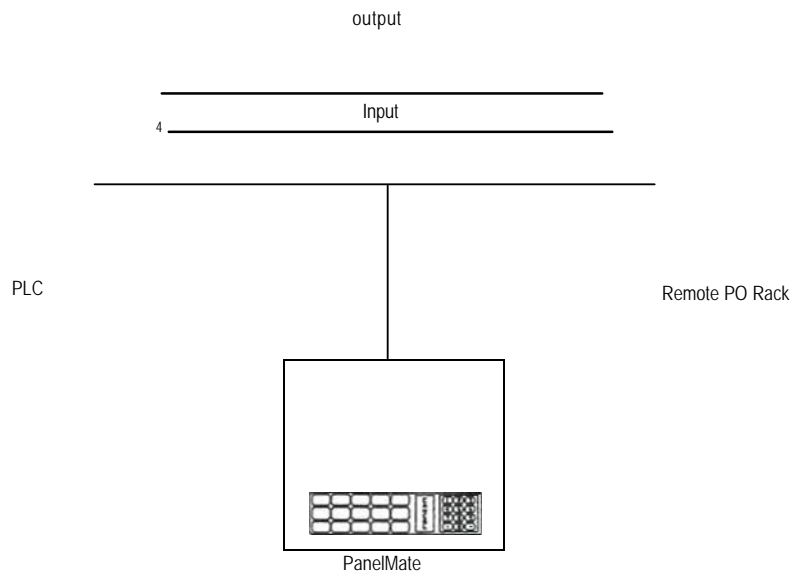


Figure 31-13 Monitored I/O

The following addressing format will be used:

[T:RG/BB]

where:

T	File type (I=input or O=output)
	Type separator
R	Rack number
	1-7 octal for PLC-2) 0-37 octal for PLC-3) 1-3 octal for PI-C-515) 1-7 octal for PLC-5125) (0-3 octal for SLC 5102)
G	Group number (0-7)
BB	Bit specifier (0-17 octal, 2-digit maximum)

Example: [1:10/0]

PanelMate units will reference input bit 0 in rack 1, group 0, slot 0.

For a PLC-2, PLC-5/15, PLC-5/25, and SLC 5102, the maximum rack number can be contained within one octal digit. The first character after the file type separator character ":" is the rack number. Since a PLC-3 may have more than eight racks, the rack number may be comprised of two octal digits. If two octal digits are entered consecutively after the file type separator, then the rack number is assumed to be the first octal digit and the group number is assumed to be the second octal digit. If three octal digits are entered consecutively after the file type separator, then the rack number is assumed to be the first two octal digits and the group number is assumed to be the third octal digit.

Active Block Transfer Referencing

Active block transfers and monitored block transfers are different in that active block transfers have the ability to move data to and from the PLC from the PanelMate unit as shown in figure 31-14. Active block transfers must be configured in the Allen-Bradley Remote I/O Configuration Table to avoid any errors. The PanelMate unit will allow addressing to any word or bit within the referenced active block transfer. Since the active block transfers have been configured beforehand, a slightly different method of referencing will be used, allowing the active block transfer ID to be used much like a macro substitution in place of the rack-group-slot.

Note It is not recommended to use the PanelMate unit's input or output addresses in a slot where active block transfers have been configured.

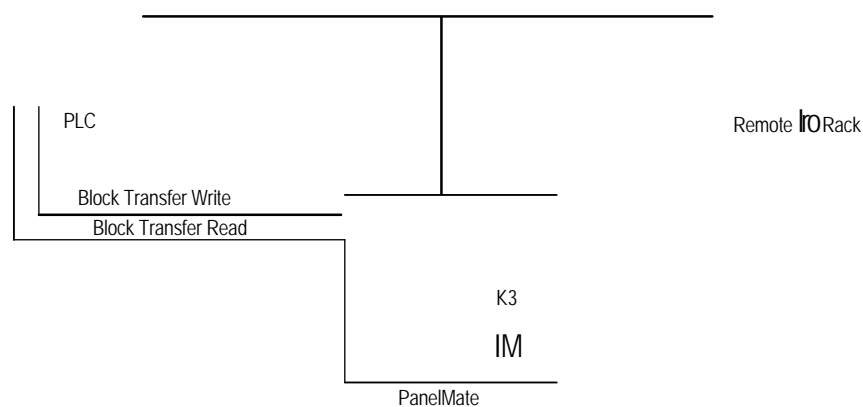


Figure 31-14 Active Block Transfers

The following addressing format will be used:

[B:D WW/BB]

where:

- | | |
|----|---|
| B | Active block transfer specifier |
| : | Type separator |
| D | Transfer ID ("A-P" character designator from Active Block Transfer Table) Block |
| , | separator (only one space is allowed) |
| | Word offset (0-77 octal when Block Transfer Addressing is octal; 0-63 decimal |
| | when Block Transfer Addressing is decimal, 2-digit maximum, the maximum |
| WW | value determined by block transfer size) Bit |
| | separator |
| | Bit offset (0-17 octal, 2-digit maximum) |

Example: [B:A 1/0]

The PanelMate unit will reference bit 0 of word 1 in active block transfer "A" configured in the remote I/O configuration.

Note The Transfer ID is configured from the Active Block Transfer Table in the Allen-Bradley

Monitored Block Transfer Referencing

A block transfer causes a block of data to move between an VO module and a PLC data file. In the AcceleratVOn interface, all block transfers are stored in data buffers and saved on a rack-group-slot basis. Any block transfer that occurs on remote VO will be buffered by the AcceleratVOn card, and any word within the monitored block transfer buffer can be read by the PanelMate unit. There are two sets of block transfer data buffers: one for block transfer reads and one for block transfer writes.

Note Block transfers can only be monitored from remote racks.

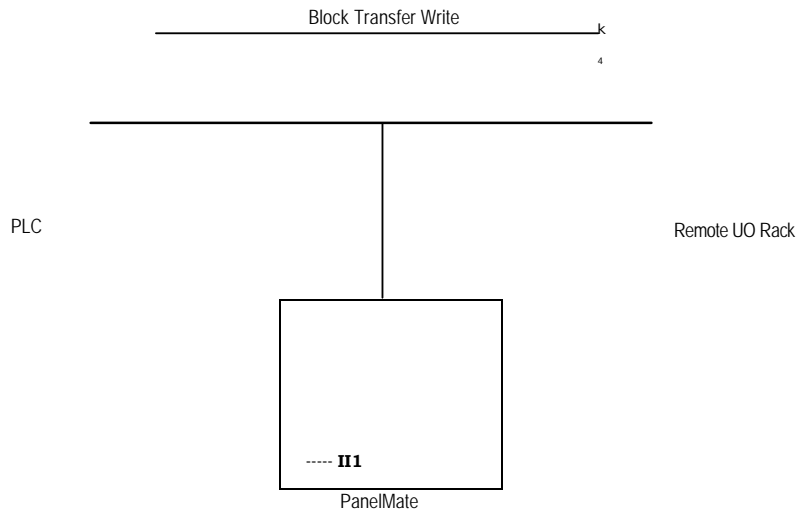


Figure 31-15 Monitored Block Transfers

The following addressing format will be used:

[T:RGS WW/BB] where:

T

Type (R = block read, W = block write)

Type separator

R

Rack number

1-7 octal for PLC-2) 0-37
octal for PLC-3) 1-3 octal
for PLC-5/15) 1-7 octal for
PLC-5/25) 0-3 octal for
SLC 5/02)

G

Group number (0-7)

S

Slot number (0 or 1)

Block separator (only one space is allowed)

WW

Word offset (0-77 octal when Block Transfer Addressing is octal; 0-63 decimal when Block Transfer Addressing is decimal; 2-digit maximum)

/

Bit separator

BB

Bit offset (0-17 octal, 2-digit maximum)

Example: [R:100 1]

The PanelMate unit will reference word 1 of the block transfer read going to the PLC from the module that is in rack 1, group 0, slot 0.

For a PLC-2, PLC-5/15, PLC-5/25, and SLC 5/02, the maximum rack number can be contained within one octal digit; thus, the first character after the file type separator character ":" is the rack number. Since a PLC-3 may have more than eight racks, the rack number may be comprised of two octal digits. If three octal digits are entered consecutively after the file type separator, then the rack number is assumed to be the first octal digit, the group number is assumed to be the second octal digit and the slot number is assumed to be the third octal digit. If four octal digits are entered consecutively after the file type separator, then the rack number is assumed to be the first two octal digits, the group number is assumed to be the third octal digit, the slot number is assumed to be the fourth octal digit.

Control Button Reset Delay

During Run Mode operation, operators can use the PanelMate unit's control button feature to emulate momentary pushbuttons. When an operator presses a control button, the PanelMate unit sets the assigned bit on the Accelerati/On interface so that the bit can be read by the remote VO scan cycle. When the operator releases the control button, the PanelMate unit clears the assigned bit on the Accelerati/On interface. In order to ensure that the bit on the Accelerati/On interface is in a set condition long enough to be read by the VO scan, the PanelMate unit provides a method to delay resetting the bit. The Control Button Reset Delay feature noted in Chapter 24, PLC Name and Port Parameters Table, provides a method of delaying bit reset by multiples of 250 milliseconds.

Active Racks

An active rack is a rack that does not physically exist but rather is being simulated by the PanelMate unit interface. Simulating a rack or multiples of a quarter rack is the only way for the PanelMate unit to write data to the PLC. You must define the PanelMate unit as an Active Rack in order to have control bits read by a PLC.

The PanelMate unit is capable of simulating racks on the bus as well as monitoring the other racks' data. This is very important since the only way for the PanelMate unit to write to the PLC is through a simulated rack. Refer to table 31-2 for possible rack addresses. The PanelMate unit interface card can simulate any or all available unused racks, but must not attempt to simulate rack addresses for racks that physically exist. If a physical rack is being simulated, both the PanelMate unit and the physical rack will respond to any messages, causing invalid data to be sent to the PLC.

Note When using a PLC 2/30 and the PanelMate unit is configured as active groups within a rack other than the highest group, then the PLC will not scan for any groups higher than those the PanelMate unit is simulating (physical groups or groups simulated on another Accelerati/On board). To avoid this situation, make the PanelMate unit the highest active group within a rack and only configure one PanelMate unit active on any one rack.

Note Although a PLC-3 can have 63 racks, the PanelMate unit has configuration tables sized for 32 racks; since the interface board can only monitor a single channel on the PLC-3, only 16 racks can be simulated or monitored.

The Allen-Bradley Remote I/O Configuration Editor contains a section called the Active Rack Table which will be used when configuring the active racks. Since the maximum number of racks that can be addressed is dependent upon the PLC type, it will be necessary to enter the *Remote VO PLC model first in the PLC Name and **Port** Table before proceeding to the* Allen-Bradley Remote VO Configuration Editor. Refer to the Remote I/O Configuration section in Chapter 24, for more information on configuring the PanelMate unit with Remote I/O.

The following table shows the addressable racks for each PLC model.

PLC Type	Number of Racks		
	Octal	Decimal	Range
PLC-2	7	7	1-7
PLC-3	37	32	0-37
PLC5/15	3	3	1-3
PLC5125	7	7	1-7
SLC 5/02	3	3	0-3

Table 31-2 Rack Addresses

The following write restrictions will apply:

- Cannot write to an output reference
- Can only write to input references if the reference's rack is active (set as active in Active Rack Table)
- Cannot write to monitored block transfers (both read and write)
- Can only write to active block transfer references with a direction of READ or COMMON

Block Transfers

Many of Allen-Bradley's PLC modules support block transfers. These modules generally have more than one word of information per slot, and block transfers are the only convenient way of moving data between these modules and the PLC. The data is moved from the module into a data file within the PLC. One block transfer can move up to 64 words of data, the block transfer specified by giving the rack, group and slot. Block transfers only occur when the PLC is programmed to use them. To implement a block transfer, a block transfer read (BTR) or block transfer write (BTW) instruction is placed on one of the ladder logic rungs. The instruction will specify the rack-group-slot for the transfer as well as the number of words, file and starting element number.

The PanelMate unit's interface card supports two types of block transfers (monitored and active).

For monitored block transfers, the PanelMate unit will monitor all block transfers being sent from the PLC to the various racks and keep one read and one write per slot. For active block transfers, the PanelMate unit is capable of sending and receiving block transfer reads and writes for racks that have been made active. To accomplish this, the size and location of all active block transfers to be executed by an active rack must be specified before communications start. Active block transfers must still be programmed into the PLC for any data exchanges to take place.

Monitored and active Block Transfers can be addressed as octal or decimal. To configure the address for the Block Transfers as octal or decimal, refer to the Block Transfer Addressing *section in Chapter 24, PLC Name and **Port** Parameters Table, for more information.*

Block Transfer Examples

Possible Block Transfer Write Example (PLC-5115)

The following rung will continually block transfer write to the PanelMate unit assigned as active rack #3.

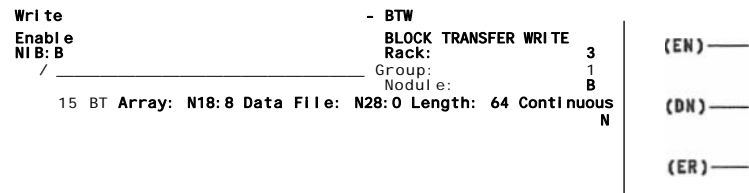


Figure 31-16 Block Transfer Write

Possible Block Transfer Read Programming (PLC-5/15)

The following rung will continually block transfer read from the PanelMate unit assigned as active rack #2.

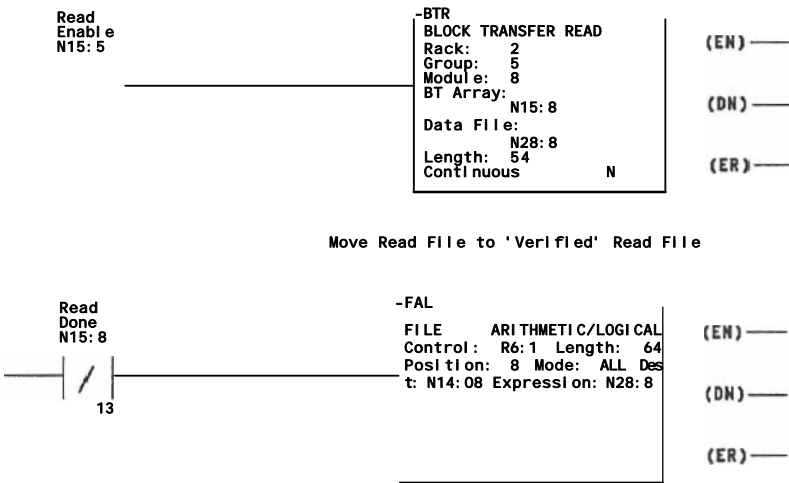


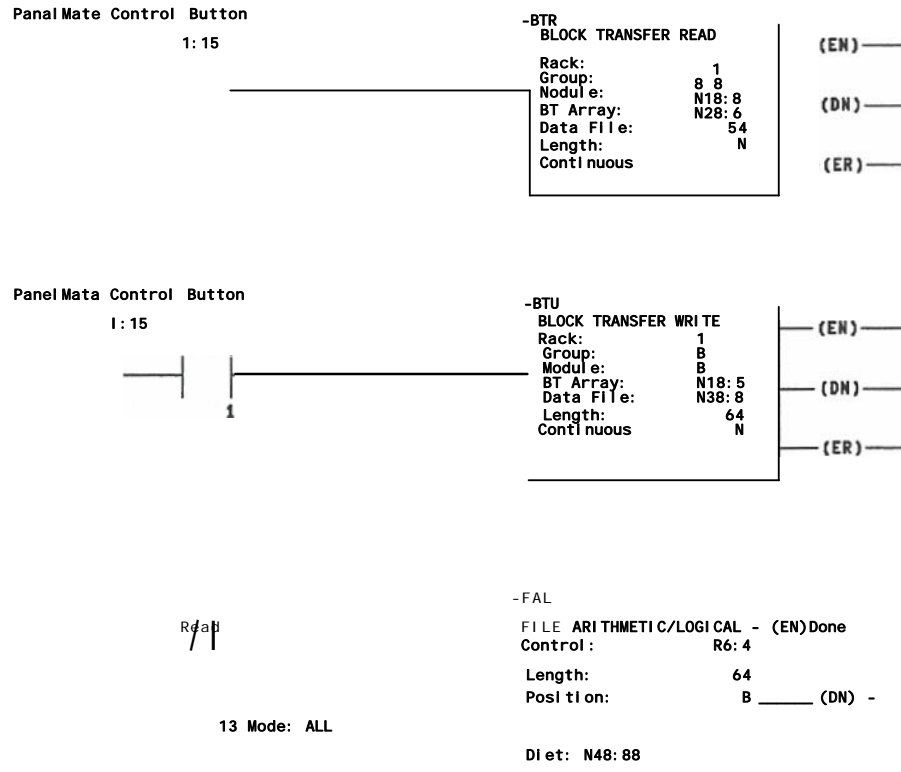
Figure 31-17 Block Transfer Read

The PLC program should use verified read data. When moving data from one type of data table section to another, the FAL instruction will convert the data format (such as integer to BCD). If this is not desired, use the File Copy instruction.

Possible Recipe Example Using Block Transfers (PLC-5/15)

(Assuming the PanelMate unit is configured as rack 1, group 0, slot 0, and direction is COMMON.)

In this example a standard recipe is stored in N30. It is block transfer written to a common block transfer area in the PanelMate unit. Once adjustments are made to the recipe, it is Block Transfer read into N20. The data block transfer is moved to N40 which now contains the modified recipe.



Figure

Possible Continuous Bi-directional Block Transfer Example (PLC-2)

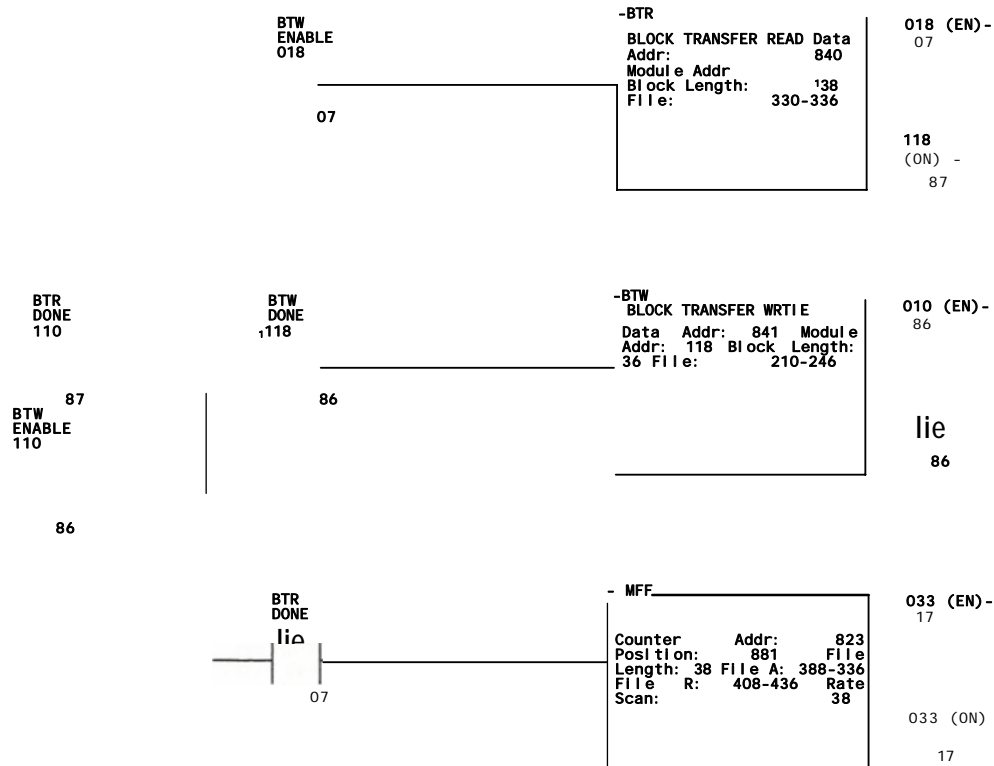


Figure 31-19 Continuous Bi-directional Block Transfer

Block Transfer Discussions

Active Block Transfer Sent to Inactive Rack

If the PLC sent a block transfer to a rack that was not active (and did not physically exist), an error would exist in the PLC since no rack would be responding to the block transfer; the Accelerat/On interface would ignore the block transfer.

Active Block Transfer Write Error

If the PanelMate unit is configured for a write (or common) block transfer, but has not received one from the PLC, a non-fatal communication error will occur. Once the PanelMate unit receives the block transfer, the error will cease and no other errors will follow.

For example, a one-shot block transfer write occurring before the PanelMate unit is initialized online.

Active Block Transfer Read Error

An error will be generated only when a block transfer read is invalid. However, no error will be displayed when the PanelMate unit is configured for a block transfer read and the PLC does not execute a block transfer read or if the block transfer read occurred before the PanelMate unit is initialized online.

Block Transfer Buffer Allocation

The PanelMate unit can buffer up to 128 block transfers (both active and monitored). The interface card allocates 128 bytes (64 words) for each monitored block transfer regardless of the size of the actual block transfer. Although it is highly unlikely, it is possible for more than 128 block transfers to be configured or monitored. In this case, any new block transfer (one that has not already been buffered) received after the first 128 block transfers will not be buffered. It is also possible that enough large block transfers could be active and monitored that the interface card may run out of enough memory to store them. In both of these circumstances, if the PanelMate unit makes a request for data within a block transfer which is not currently stored in the interface board block transfer buffer, then a non-fatal communication error will result. Since block transfer buffers will never be deallocated (the interface board would have to be reconfigured), there is no online recovery from these errors. To recover from the errors, you must re-boot the system.

Monitored Block Transfer

It may be possible, particularly during the bit initialization or during the initial page display after Run Mode initialization, that various references to monitored block transfers will be in error since the I/O board has not yet monitored the block transfers containing the requested information. Non-fatal communication errors will continue until the Accelerati/On board has monitored the required block transfers.

Unsolicited Messages

The PanelMate unit can accept unsolicited write messages (MSG instructions) from a PLC through the Data Highway or Data Highway Plus networks when using the AcceleratVOn interface. The PanelMate unit supports only protected and unprotected writes.

Unsoliciteds should only be used for priority information transfer. If the PanelMate unit receives an unsolicited message from a PLC, the normal polling will be interrupted and the unsolicited message will be immediately processed. Once completed, the PanelMate units normal polling will resume.

In the PLC's perspective, the PanelMate unit will be seen as another PLC on the network.

If you are using a PLC-2, unsolicited messages are referred to as command zone rungs. Command code "Remote Station No." must be the PanelMate unit's Network ID. Note that the command zone rung must be first.

The following is an example of unsolicited writes to the PanelMate unit using a PLC-2.

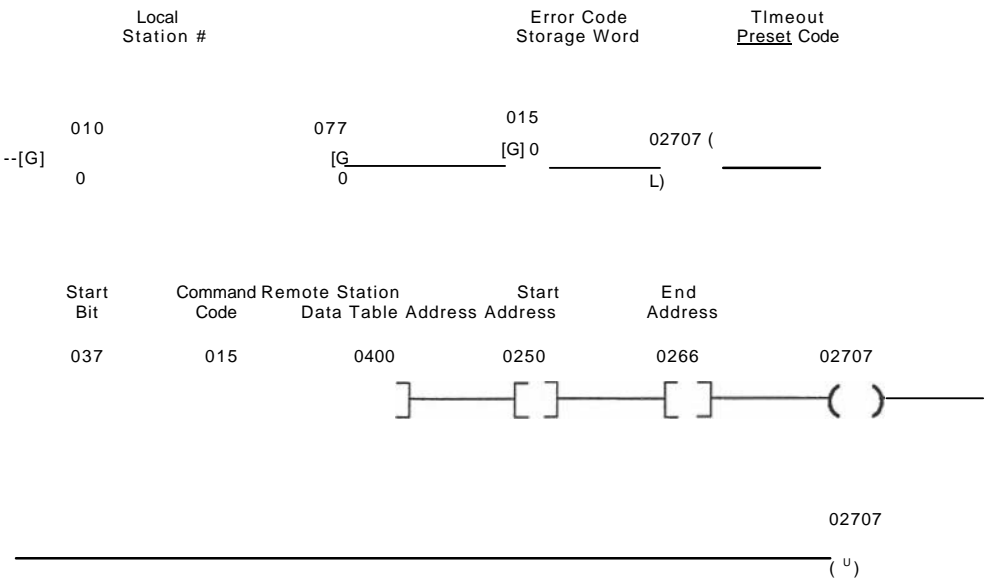


Figure 30-20 PLC-2 Command Zone Rung
For remote station data table address, the PanelMate unit's normal addressing restrictions apply.

If you are using a PLC-3 or PLC-5, unsolicited messages are referred to as PLC MSG instructions. The following is an example of unsolicited writes to the PanelMate unit using a PLC-3.

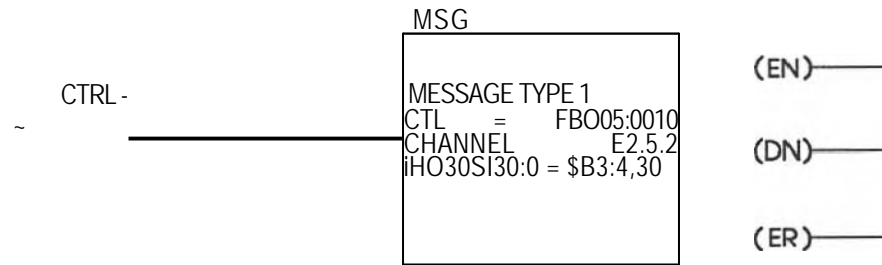


Figure 31-21 PLC-3 MSG Instruction (Write Only)

Note The destination address must be an input image file that matches the PanelMate unit's Network ID.

Example:

\$130:0 PM Network ID = 30

The following is an example of unsolicited writes to the PanelMate unit using a PLC-5. MSG

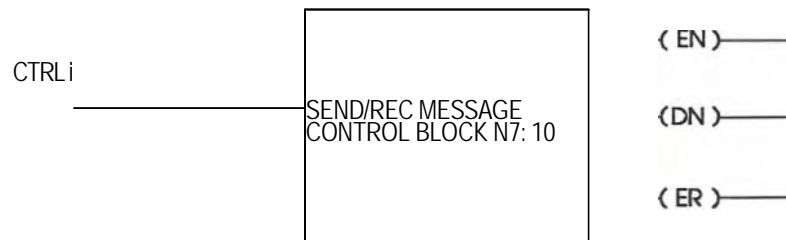


Figure 30-22 PLC-5 MSG Instruction (Write Only)

MSG instructions must be write only because the PanelMate unit can only receive unsolicited.

When a PLC-5 model sends unsolicited (MSG instructions) to the PanelMate unit, the PLC provides three pieces of information in the communication packet that is sent: File Number, Element Number, and Data Type. Inputs (I), Outputs (O), Status (S), Bit (B), and Integer (N) file types all have the Integer (signed 16) data type. Timer (T), Counter (C), Control (R), Float (F), and BCD (D) all have their own data types. File types are not sent in the data packet.

The PanelMate unit cannot determine the validity of the data type of the file number where the PLC is attempting to send data. Since it is valid for the user to enter B10:0, N10:0, F10:0, [etc. in](#) the same configuration, the PLC driver must make certain assumptions and will assign the file type based on the data type given in the communication packet. This, in conjunction with the information given in the communication packet, restricts the types of unsolicited writes the PanelMate unit can accept from a given source file type.

The rules for unsolicited writes from a PLC-5 are listed below.

1. If the destination file number is 0, the data will go to the PanelMate unit's Output File type (O). _ In the PanelMate unit, the file number 0 is reserved for Output only.
2. If the destination file number is 1, the data will go to the PanelMate unit's Input File type (I). In the PanelMate unit, the file number 1 is reserved for Input only.
3. If the destination file number is 2, the data will go to the PanelMate unit's Status File type (S). In the PanelMate unit, the file number 2 is reserved for Status only.
4. If the source data type is Integer (i.e., file type Output, Input, Status, Bit, or Integer), the unsolicited write will go to the PanelMate unit's Integer file type (N). Note that the data type is known, not the file type. The PanelMate unit will reference all signed 16-bit integers as file type N.
5. If the source data type is Timer, the data will go to the PanelMate unit's Timer File type (T).
6. If the source data type is Counter, the data will go to the PanelMate unit's Counter File type (C).
7. If the source data type is Control, the data will go to the PanelMate unit's Control File type (R).
8. If the source data type is Float, the data will go to the PanelMate unit's Float File type (F).
9. If the source data type is BCD, the data will go to the PanelMate unit's BCD File type (D). If data types are mismatched, data may appear in unexpected unsolicited registers.

The following are PLC-5 unsolicited write examples.

Example 1:

Message Instruction Parameters
Source Table Address: N7:0
Destination Table Address: T10:0
Number of Elements: 5

In the PanelMate unit, the following unsolicited references will be written to:

N10:0
N10:1
N10:2
N10:3
N10:4

The data is written to Integer file type because of the source table file type (Integer data type (N)).

Example 2:

Message Instruction Parameters

Source Table Address: B10:30
Destination Table Address: R6:0
Number of Elements: 5

In the PanelMate unit, the following unsolicited references will be written to:

N6:0
N6:1
N6:2
N6:3
N6:4

The data is written to Integer file type because of the source table file type (Integer data type (B)).

Example 3:

Message Instruction Parameters

Source Table Address: D10:30
Destination Table Address: N7623
Number of Elements: 5

In the PanelMate unit, the following unsolicited references will be written to:

D76:23
D76:24
D76:25
D76:26
D76:27

The data is written to BCD file type because of the source table file type (BCD data type (D)).

Example 4:

Message Instruction Parameters

Source Table Address: T4:0
Destination Table Address: 0:00
Number of Elements: 2 (Note that each Timer element is 3 words)

In the PanelMate unit, the following unsolicited references will be written to:

0:00 (T4:0)
0:01 (T4:0.PRE)
0:02 (T4:0.ACC)
0:03 (T4:1) 0:04
(T4:1.PRE) 0:05
(T4:1.ACC)

The data is written to Output file type because of the destination file number is 0.

Example 5:

Message Instruction Parameters

Source Table Address: C5:40

Destination Table Address: T10:23

Number of Elements: 2 (Note that each Counter element is 3 words)

In the PanelMate unit, the following unsolicited references will be written to:

C10:23

C10:23. PRE

C10:23.ACC

C10:24

C10:24. PRE

C10:24.ACC

The data is written to Counter file type because of the source table file type (Counter data type (C)).

Refer to the proper Allen-Bradley manual for further unsolicited message configuration.

Note that this product incorporates patented technology which is licensed by Allen-Bradley Company, Inc. Allen-Bradley has not technically approved, nor does it warrant or support this product. All warranty and support for this product is provided by Eaton IDT, Inc.

I

0

Chapter 32

Custom Serial Interface for the Toledo Digital Indicator

The following describes the Custom Serial Interface (CSI) for the Toledo Scale Indicator. This driver has been written for the 8142 model of Digital Indicators.

Possible Configurations

An example of a possible configuration is shown in the figure below.

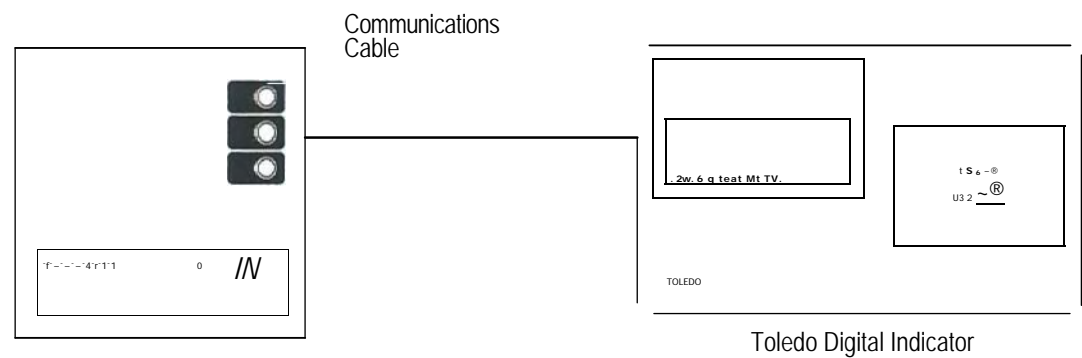


Figure 32-1 Direct Connection

Cabling

The PanelMate unit and the Digital Indicator communicate using the standard RS232 protocol. Use the port labeled "JN" on the Digital Indicator to communicate to the PanelMate unit. The following diagram shows the cable pinouts for the PanelMate unit and for the Digital Indicator.

Cable Pinouts	
PanelMate	Digital Indicator
(Male DB-9P)	(Male DB-25P)
RD 2	2TX
TD 3	3 RX
GND 5	7 GND 4
	RTS 5
	CTS 6
	DSR 20
	DTR

Figure 32-2 Cabling

The following diagrams shows the JN port position on the rear of the two Digital Indicator models.

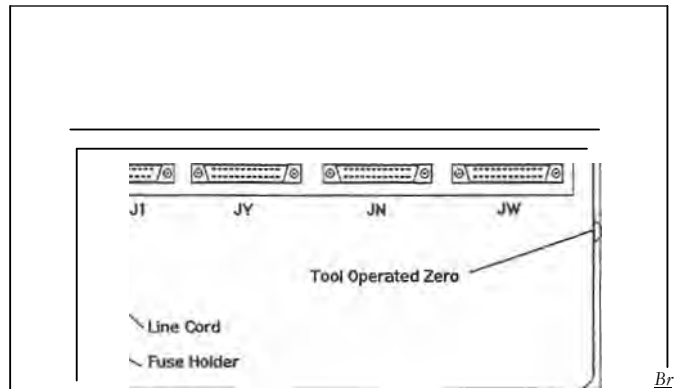


Figure 32-3 Desk Enclosure (Rear View)

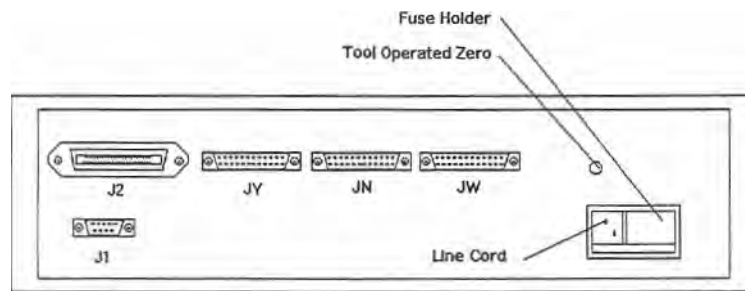


Figure 32-4 Rack Enclosure (Rear View)

Communications Parameters

The following is a list of the standard communications parameters for the Digital Indicator.

These parameters are entered in the PLC Name and Port Parameter Table. 7

Data Bits

1 Stop Bit

Even Parity

9600 Baud

As with all CSI drivers, the CSI Scan Delay in the PLC Name and Port Parameters screen should be set to one second. Faster CSI scan times may slow communications to other devices.

CSI Configuration

Several parameters must be specified in the CSI Configuration Editor. This editor is described in the Custom Serial Interface section in Chapter 24. The following sections describe each of the fields that must be set. All other fields can be any value required for your specific application. The following is an example of a Toledo Digital Indicator configured to work with a Modicon PLC.

CSI CONFIGURATION EDITOR					
F1=		F2=		F3=PREVIOUS F4=NEXT	
F6=		F7=		F8= F9= FS=	
				F10=EXIT	
Driver Name | TOL				1	
Num6er of Words | 16					
Default Scale Expression |					
Error Register |					
Pass Through Ref.		Scale Expression		Pass Through Ref.	
Scale Expression					
t				13	
0				14	
1				15	
3				16	
4	CMOD,40001*U32]			17	
S	[MOD ,40003MU32]			18	
6				19	
7				20	
8				21	
9				22	
10				23	
11				24	
12					

Figure 32-5 CSI Configuration Editor

Driver Name

The name of the driver for the Toledo Digital Indicator is "TOL". The driver name should be entered in all capitalized letters. If it is not, the letters will be changed to all capital when the field is closed.

Number of Words

This driver requires six words to be configured.

Default Scale Expression

This field is optional and is described in more detail in the Custom Serial Interface section in Chapter 24.

Error Register

This field is optional and is described in more detail in the Custom Serial Interface section in Chapter 24.

Pass Through Ref.

This field is optional. For the screen shown in figure 32-5, two 32-bit words will be passed through to a Modicon PLC named "MOD". CSI register four will be passed through to registers 40001 and 40002 in the Modicon PLC. The weight will be stored in 40001 and the tare weight will be stored in 40002. CSI register five, weight and status, will be passed through to registers 40003 and 40004, respectively. Note that the unsigned 32-bit format specifier (#U32) must be entered in the reference to pass through both CSI registers.

It is also possible to pass through individual CSI registers to PLC registers. Simply designate the PLC reference in the Pass Through Ref. column in the CSI Configuration Editor (e.g., [mod,40001] specified for Pass Through Ref. 0 will pass through CSI register 0 (weight) to register 40001 in the PLC).

Although this driver allows two 32-bit words to be passed through, it is usually not desirable to configure both words. The screen update time will be reduced by passing data through to a PLC. If your application does not require data to be passed through, do not place PLC references in these fields.

CSI Register Layout

The following diagrams show the CSI register layout with a description of the status bits. CSI

Register 0 (Read Only)

16	15	14	13	12	1	10	8	7	5	3	1	Weight
					1							

CSI Register 1 (Read Only)

[illegible]

CSI Register 2 (Read Only)

16	15	14	13	12	11	10	9	8	7		5	4	3	2	1	Weight
----	----	----	----	----	----	----	---	---	---	--	---	---	---	---	---	--------

CSI Register 3 (Read Only)

Diagram illustrating the SWC Bit 4 of SWC field structure. The field is 16 bits wide, with bit positions 16 down to 1 labeled at the top. Bit 1 is labeled '1'. The field is divided into two 8-bit sections. The right 8-bit section (bits 8-1) is labeled 'Status'. The left 8-bit section (bits 16-9) is labeled 'Decimal Location Bit'. The left 8-bit section is further divided into two 4-bit sections. The right 4-bit section (bits 12-9) is labeled '5-6 of SWA Bits 0-6'. The left 4-bit section (bits 16-13) is labeled 'of SWB Bit 3 of'. The left 4-bit section is further divided into two 2-bit sections. The right 2-bit section (bits 14-13) is labeled 'SWC Bit 4 of SWC'. The left 2-bit section (bits 16-15) is labeled 'Bit 6 of SWC'.

CSI Register 4 pass-through Word 1 (Write Only)

16	15	14	1 3	12	11	10		8	7	6	5	4	3	1	Weight
----	----	----	--------	----	----	----	--	---	---	---	---	---	---	---	---------------

CSI Register 4 pass-through Word 2 (Write Only)

[illegible]

CSI Register 5 pass-through Word 1 (Write Only)

16	15	14	13	12	11	10		8	7			3	2	1	Weight
----	----	----	----	----	----	----	--	---	---	--	--	---	---	---	--------

CSI Register 5 pass-through Word 2 (Write Only)

16	15	14	13	12	11	10	8	7	4	3	2	1	Status
													Decimal Location Bit
													5-6 of SWA Bits 0-6
													of SWB Bit 3 of
													SWC Bit 4 of SWC
													Bit 6 of SWC

Status Word A (SWA)		
Indicator Bit	CSI Bit	Description
1 - 4	3.1 - 3.4	Location of decimal point*
5	3.5	Always 0
6	3.6	Always 0

Status Word B (SWB)		
Indicator Bit	CSI Bit	Description
0	3.7	Gross = 0, Net = 1
1	3.8	Under Zero, Positive = 0, Negative = 1
2	3.9	Overcapacity = 1**
3	3.10	In Motion = 1
4	3.11	Pounds = 0, Kilograms = 1
5	3.12	Always 1
6	3.13	Powerup not Zeroed = 1

Status Word C (SWC)		
Indicator Bit	CSI Bit	Description
3	3.14	Print Request = 1
4	3.15	Expanded Weight = 1
6	3.16	Manual Tare in kg = 1

* These four bits do not correlate to the four bits used to describe the decimal point position in the Toledo Scale manual. The value of these four bits will be equal to the number of decimal places.

Bit 9 of CSI register 3 indicates a weight or tare weight larger than can be displayed in the CSI registers, not on the Indicator.

CSI registers 0, 1, 2, and 3 are 16-bit words and may be read, but not written to by the PanelMate unit. CSI registers 4 and 5 are 32-bit words and may not be referenced (read) by the PanelMate unit. These registers are used for pass-through to a PLC only.

Note If the result of a scale expression for 32-bit CSI registers (4 or 5 for Toledo Scale) is greater than 2147483647 or less than -2147483648, the error "Invalid scale expression on [plcname, CSI register]" will be displayed on the PanelMate unit. If this error occurs on a CSI register with pass through defined to a PLC, the error message will include "(NO PASS THRU)" to indicate the registers did not get passed through to the PLC.

Digital Indicator Configuration

The Digital Indicator requires selections to be made for scale display, units, and many others. This section will describe only the selections required for operation with the PanelMate unit. See the 8142 Technical Manual for more information on the mentioned selections. **Output Mode [F5.1 2]**

The output mode selection allows configuration of the communications port on the indicator. This selection should be set to Toledo Continuous (2).

RS422 Input Selection [F5.2 0]

This selection should be set to RS232 Input (0).

Baud Rate [F5.3 9600]

This selection should be set to 9600 baud.

Checksum [F5.4 1]

The checksum should be enabled (1).

ASCII Command Input [F5.17 2]

This selection should be set to Demand/Continuous Mode (2).

Print Interlock/Autoprint [F5.18 1]

This selection should be set to No Print Interlock or Autoprint (1).

CSI Word and Bit References

The format default for the CSI is signed, 16 bit. The references for words are the same for CSI as for other PLC types. The following is an example of a CSI word reference.

[0]

This reference will allow the weight to be displayed when used in a template.

To display the tare weight or the weight with the decimal point correctly placed, the following equation may be used.

$$[0] * (.1 ** ([3] & 15))$$

CSI word three will be ANDed with the number 15 to clear all bits except those used for determining the decimal place. By using this equation, the decimal point placement can be changed in the Indicator without affecting the PanelMate unit configuration. The following is an example of the reference and calculation of a weight with three decimal places.

Word [0] = 22689

Word [3] =

16
0

3		2	
0	0	1	1

Using the above equation:

$$[0] * (.1 - * ([3] & 15)) = 22689 * (.1 * (3))$$

$$= 22.689$$

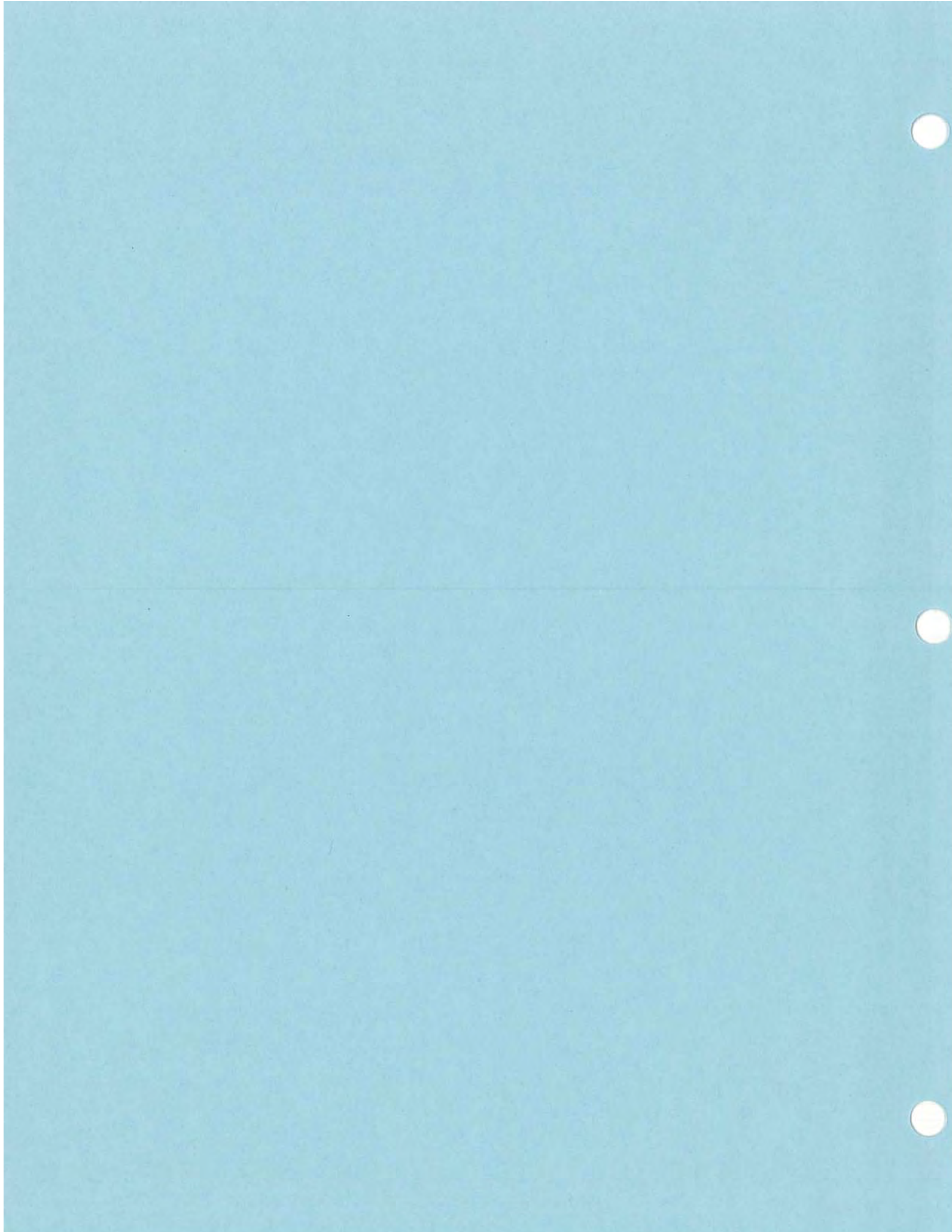
22.689 would be displayed in the template.

Single bits within a CSI word may be referenced. All bits within words are numbered from 1 to 16. The

following is an example of a reference to the motion bit in status word B of the Indicator. [3.10]

This reference can be used to indicate when the scale attached to the Indicator is in motion.

0



Chapter 33

Eaton PLCs

The PanelMate Series supports the use of the Eaton Cutler-Hammer D500 (models CPU20, CPU25, and CPU50) and D200 PR4C Programmable Logic Controllers (PLCs).

Up to eight PLCs can be connected to one PanelMate unit by using the current protocol.

Memory

The Eaton Cutler-Hammer D500 family (models CPU20, CPU25, and CPU50) and the D200 PR4C processor use decimal word addresses.

The following list contains descriptions of the memory types:

<u>Memory Type</u>	<u>Symbol</u>	<u>Description</u>
X (Read only)	XW	Input device (bit)
(Read only)	Y	Input register Output
YW		device (bit) Output
R		register
RW		Control relay device (bit)
Z		Control relay register
ZW		Remote link storage device (bit)
C		Remote link storage register Counter
T		register
D		Timer register (max. value 32767)
		Data register

The following list contains descriptions of the memory ranges:

		Devices or Registers		
		CPU20	CPU25	CPU50/D200 PR4C
X or Y	Device	X or Y 000-15F (256 devices)	X or Y 000-15F (256 devices)	X or Y 000-31 F (512 devices)
	Register	XW or YW 00-31 (32 registers)	XW or YW 00-31 (32 registers)	XW or YW 00-63 (64 registers)
Z	Device	Z000-Z31F (512 devices)	Z000-Z31 F (512 devices)	Z000-Z31 F (512 devices)
	Register	ZW00-ZW31 (32 registers)	ZW00-ZW31 (32 registers)	ZW00-ZW31 (32 registers)
R [*]	Device	R000-R63F (1024 devices)	R000-R63F (1024 devices)	R000-R63F (1024 devices)
	Register	RW00-RW63 (64 registers)	RW00-RW63 (64 registers)	RW00-RW63 (64 registers)

		Registers Only		
		CPU20	CPU25	CPU50/D200 PR4C
XW or Y	Register	XW or YW 16-31 (16 registers)	XW or YW 16-31 (16 registers)	XW or YW 32-63 (32 registers)
T	Register	T000-T127 (128 timers)	T000-T127 (128 timers)	T00-T127 (128 timers)
C	Register	C00-C95 (96 counters)	C00-C95 (96 counters)	C00-C95 (96 counters)
D	Register	D0-D1535 (1536 registers)	D0-D1535 (1536 registers)	D0-D1535 (1536 registers)
[*] Devices R600-R63F (registers RW60-RW63) are reserved for special functions. Data should not be altered in these locations.				

Table 33-1 Memory Ranges

Examples of possible connections are described and shown in the following sections.

Direct

Direct connection to a CPU20 using the computer interface terminals, or to a CPU25 or CPU50 using the computer interface board (D5000IB99).

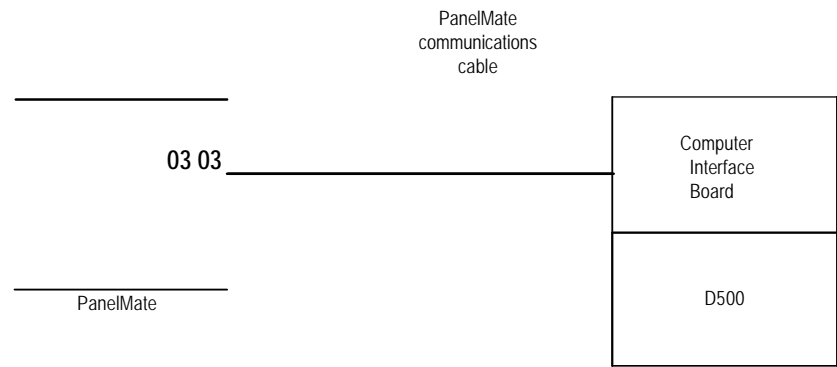


Figure 33-1 Single PLC Connection

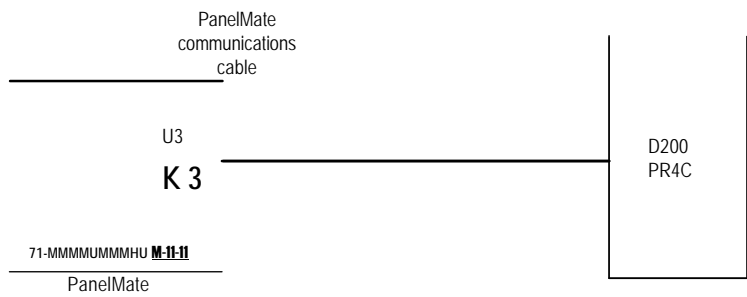


Figure 33-2 Connection to D200 PR4C Processor

Multiple

Multiple connections to CPU20s using the computer interface terminals, or to CPU25s or CPU50s using the computer interface board (D5000IB99).

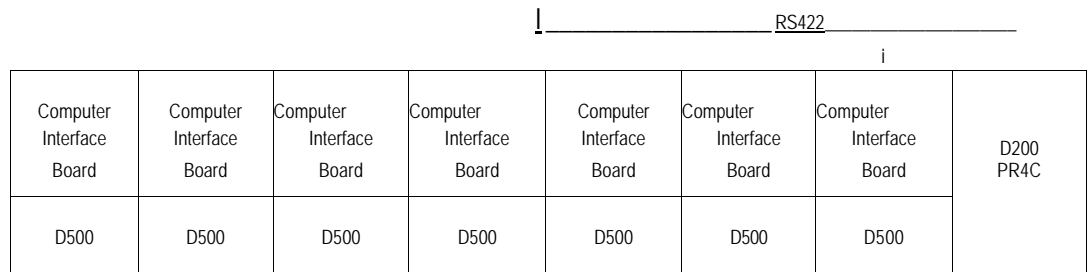


Figure 33-3 Multiple Connections

Cabling

The communications between the PanelMate unit's serial ports and Eaton Cutler-Hammer PLCs is RS422 and, therefore, has a recommended maximum length of 4000 cable feet. You should construct a communications cable of the desired length for each connection needed. The cable is a shielded twisted pair. All PanelMate ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

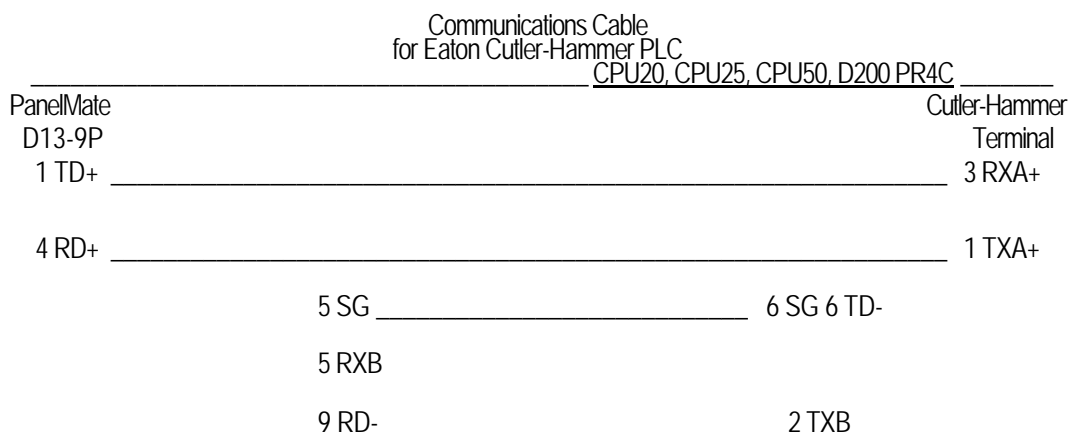


Figure 33-4 RS422 Cabling

Communications Parameters

Standard parameters for communications with Eaton Cutler-Hammer PLCs are:

- 8 data bits (fixed on Eaton Cutler-Hammer)
- 1 stop bit (fixed on Eaton Cutler-Hammer)
- NONE Parity
- 9600 Baud Rate

CPU20

The following DIP switches are set to describe communications:

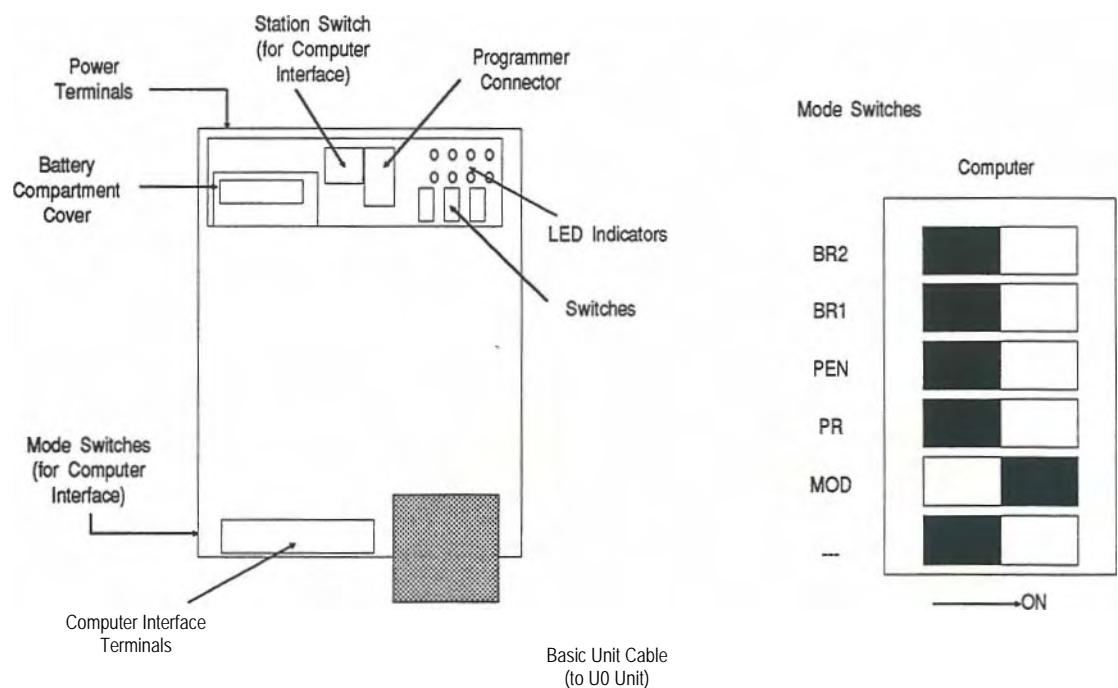


Figure 33-5 CPU20

Baud Rate

Rate	BR2	BR1
9600	OFF	OFF
4800	OFF	ON
2400	ON	OFF
1200	ON	ON

Transmission

Mode	MOD
Special	OFF
Standard	ON

Parity Type

Type	PR
Odd	OFF
Even	ON

Parity

Mode	PEN
Disable	OFF
Enable	ON

Table 33-2 CPU20 Port Configurations

At the upper right of the processor, there are three two-position switches used to set its mode of operation.

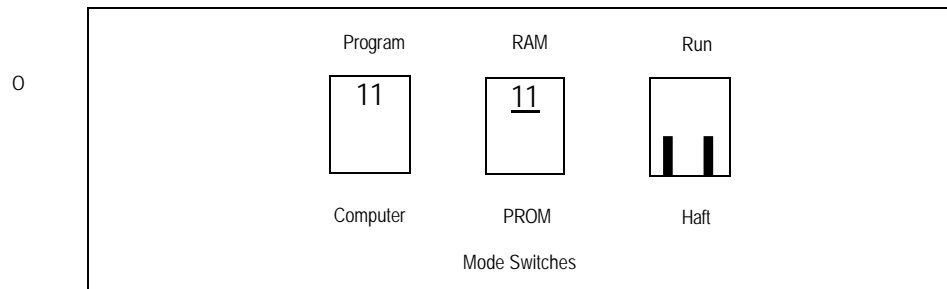


Figure 33-6 Mode Operation Switches

The Computer/Program slide switch must be in the Computer position and the Run/Halt slide switch must be in the Run position to enable communications with the PanelMate unit.
CPU25 and CPU50

The following diagram shows the layout of the interface board for CPU25 and CPU50.

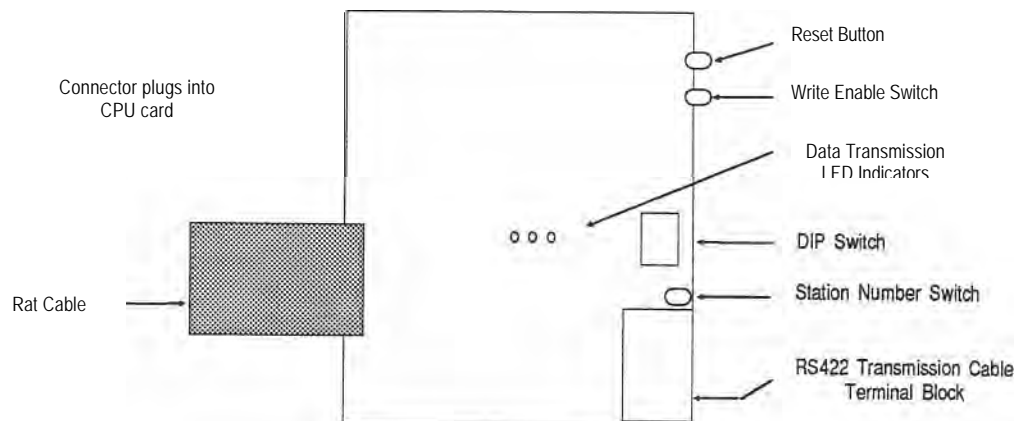


Figure 33-7 RS422 Interface Board

Refer to tables 33-3 and 33-4 to set communication parameters.

DIP switches:		
OFF	ON	
	8	8 - SPO- Control command enabled (off)
	7	7 - SP1 - Program block write enabled (off)
	6	6 - SP2 - Binary mode disabled (on)
0	5	5 - BRO- (on)
EM	4	4 - BR1 - BAUD rate = 9600 (off)
	3	3 - BR2 - (off)
WD	2	2 - PEN - Parity Disabled (on)
EM	1	1 - EVN - Parity odd/even don't care (off or on)

Baud Rate: The DIP Switch settings shown above are for 9600 Baud. If other settings are required, select the setting from the following table.

Table 33-3 RS422 Interface Board DIP Switch Settings

The Write Enable switch must be in the ON position.

Baud Rate	Disabled	9600	4800	2400	1200	600	300	1200
Switch								
(5) BRO	OFF	ON	OFF	ON	OFF	ON	OFF	ON
(4) BR1	OFF	OFF	ON	ON	OFF	OFF	ON	ON
(3) BR2	OFF	OFF	OFF	OFF	ON	ON	ON	ON

Table 33-4 CPU25 and CPU50 Baud Rate Selection

D200 PR4C

The following DIP switches are set to define communication parameters.

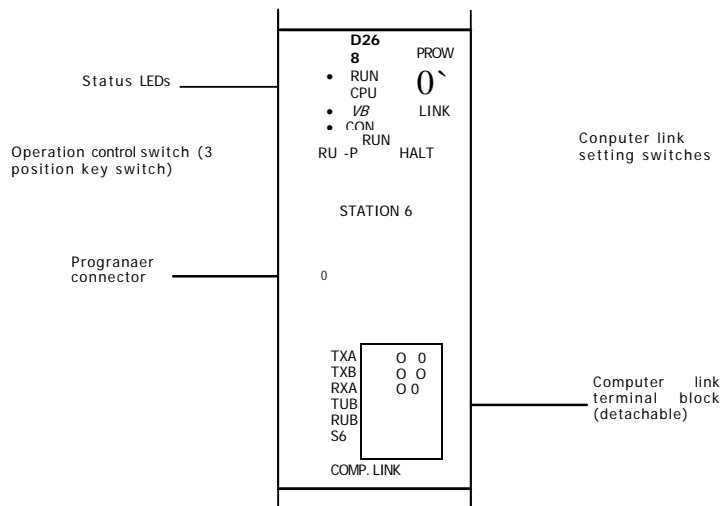


Figure 33-8 Switch Locations

To communicate with the PanelMate unit, the computer link setting switch should be set to link as shown in figure 33-9.

PROM

Figure 33-9 Computer Link Setting Switch

Use the station number rotary switch to set the station number for the computer interface mode. (0 to F)

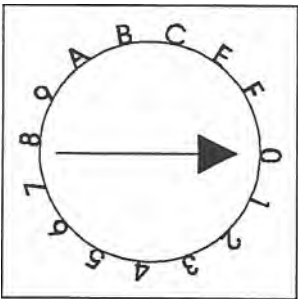


Figure 33-10 Station Number Rotary Switch

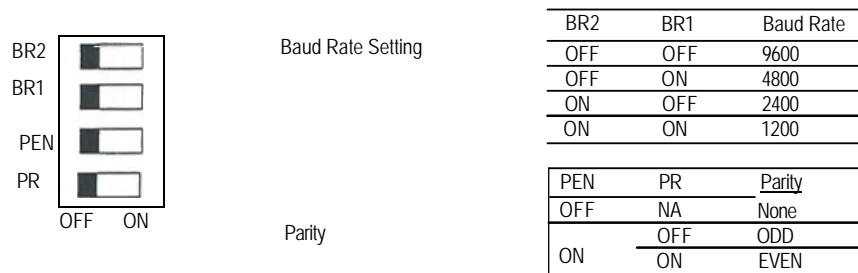


Figure 33-11 Baud Rate and Parity Switch Settings

Eaton Word and Bit References

The following section describes the use of Eaton word and bit references in your configuration. The general word referencing method is:

`[plcname,word#format]`

The "plcnam" is the name of the designated PLC as listed in the PLC Name and Port Parameter Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

`[plcname,bit]`

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

Register and Device References

Register References

The format used for expressions is the memory type symbol (upper or lower case) and a reference number.

The following is the format for a register reference:

`[mmrrr]`

m = memory type symbol (XW, YW, RW, ZW, C, T, D)

r = register value (leading Os are not required)

Note In order to reference D registers greater than three digits, the D symbol must be omitted. The D symbol on register values less than four digits is optional.

Device References

The following is the format for a device reference:

[mrrb]

m = memory type symbol (X,Y,R,Z)

r = two digit register value (leading 0s are not required) b = bit number in hex (0-F)

The supported Eaton PI-Cs will allow a maximum of 32 contiguous words per read. The maximum number of unused words before another read is generated is 10.

Examples

Word References

<u>Reference</u>	<u>Description</u>
[YW3]	Output register 3
[XW04]	Input register 4
[D1]	Data register 1
[1500]	Data register 1500
[2]	Data register 2
[RW10]	Control relay register 10
[C29]	Counter register 29
[T17]	Timer register 17

Bit References

[Y03 F]	Output device, bit 15 of output register 3
[X110]	Input device, bit 0 of input register 11
[R147]	Control relay device, bit 7 of register 14
[Z224]	Remote link storage device, bit 4 of register 22

The PLC ID number in the PLC Name Table must correspond to the selected station number on the CPU20. There are eight distinct ID numbers (0 through 7). Stations 8 and 9 on the rotary switch correspond to station numbers 0 and 1, respectively. To avoid confusion, do not use numbers over 7.

J₂₁₅₁ Pi:

The PLC ID number in the PLC Name Table must correspond to the selected station number on the CPU25 or CPU50. There are eight distinct ID numbers (0 through 7). Stations 8 through F on the rotary switch correspond to station numbers 0 through 7, respectively. To avoid confusion, do

D200 PR4C PLC ID Number Settings

The PLC ID number in the PLC Name Table must correspond to the selected station number on D200 PR4C. There are eight distinct ID numbers (0 through 7). Stations 8 through F on the rotary switch correspond to station numbers 0 through 7, respectively. To avoid confusion, do not use numbers over 7.

s

0

Chapter 34

General Electric PLCs

The GE Driver supports the Series Five, Series Six, Series Six Plus, and the Series 90 models. All models support the master/slave protocol which allows only one node to be the master (PanelMate unit). The master is the only device which can initiate communications. The Series Six and Series Six Plus models also support the peer/peer protocol which allows either device to initiate communications. The port use selections available in the PLC Name and Port Table are GE WS (for models S5, S6, S6+, S6+WBit), GE P/P (for models S6, S6+, S6+WBit), and GE S-90 (for models 311, 331, 731, 732, 771, 772, 781, and 782). Note that there are two GE S-90 drivers. The GE-90P driver is used for point-to-point communication and the GE-90N is used for network communication. The Series Six Plus with bit write model selection (S6+WBit) in the PLC Name and Port Table supports both the Series Six and the Series Six Plus PLCs that have a CCM2 or CCM3 card with bit write capability. In all other cases, use the driver for your specific PLC. For example, always use the S5 model selection with Series Five PLCs and the 771 model selection with the Series 90-70 model 771 PLC.

Memory

The following memory types are supported by the GE Series 5, 6 and 6+driver:

<u>Memory Type</u>	<u>Memory Address</u>
16-Bit Word	
R	Register
Bit	
AI	Auxiliary input
AO	Auxiliary output
I	Input
O	Output
Ix+yyyy	Expanded input channels
Ix-yyyy	Expanded input channels
Ox+yyyy	Expanded output channels
Ox-yyyy	Expanded output channels

Where:

x = channel numbers 1-7 and 9-F (0 and 8 are not available for Ix+yyyy and Ox+yyyy) yyyy = bit number 1-1024

The following memory types are supported by the GE Series 90 driver:

<u>Memory Type</u>	<u>Memory Address</u>
16-Bit Word	
%AI	Analog inputs
%AQ	Analog outputs
%R	Data registers
Byte or Bit	
%I	Discrete machine inputs
%Q	Discrete machine outputs
%M	Discrete internal coils
%T	Discrete temporary internal coils
%G	Genius global data
%S	System memory Read Only
%SA	System memory
%SB	System memory
%SC	System memory

The following tables show the relationship between the I/O references and registers.

REAL I/O POINTS			INTERNAL DISCRETE REFERENCES	
REGISTER	I/O REFERENCE		REGISTER	I/O REFERENCE
R0001	A00001- A01024	AUX	R2049	00-0001- 00-1024
R0065	A10001- A11024	AUX	R2113	10-0001- 10-1024
R0129	01+00001- 01+1024	M	R2177	01-0001- 01-1024
R0193	11+0001- 11+1024	A	R2241	11-0001- 11-1024
R0257	02+0001- 02+1024	I	R2305	02-0001- 02-1024
R0321	12 + 0001- 12 +1024	N	R2369	12-0001- 12-1024
R0385	03 + 0001- 03+1024		R2433	03-0001- 03-1024
R0449	13 + 0001- 13 +1024	I	R2497	13-0001- 13-1024
R0513	04 + 0001- 04 + 1024	O	R2561	04-0001- 04-1024
R0577	14 + 0001- 14 +1024		R2625	14-0001- 14-1024
R0641	05+0001- 05+1024	C	R2689	05-0001- 05-1024
R0705	15 + 0001- 15 +1024	H	R2753	15-0001- 15-1024
R0769	06+0001- 06+1024	A	R2817	06-0001- 06-1024
R0833	16 + 0001- 16 +1024	I	R2881	16-0001- 16-1024
R0897	07+ 0001- 07+1024	N	R2945	07-0001- 07-1024
R0961	17 + 0001- 17 +1024		R3009	17-0001- 17-1024
R1025	User Register		R3073	08-0001- 08-1024
R1089	User Register		R3137	18-0001- 18-1024
R1153	09+0001- 09+1024	A	R3201	09-0001- 09-1024
R1217	19 +0001- 19 +1024	U	R3265	19-0001- 19-1024
R1281	0A+0001- 0A+1024	X	R3329	0A-0001- 0A-1024
R1345	1A +0001- 1A +1024		R3393	1A-0001- 1A-1024
R1409	08+0001- 0B+1024	I	R3457	0B-0001- 0B-1024
R1473	1B + 0001- 1B +1024	O	R3521	1B-0001- 1B-1024
R1537	0C+ 0001- 0C+1024		R3585	0C-0001- 0C-1024
R1601	1C +0001- 1C +1024	C	R3649	1C-0001- 1C-1024
R1665	0D+0001- 0D+024	H	R3713	0D-0001- 0D-1024
R1729	1D +0001- 1D +1024	A	R3777	1D-0001- 1D-1024
R1793	0E+0001- 0E+024	I	R3841	0E-0001- 0E-1024
R1857	1E +0001- 1E +1024	N	R3905	1E-0001- 1E-1024
R1921	0 F+0001- 0F+024		R3969	0F-0001- 0F-1024
R1985	1F +0001- 1F +1024		R4033	1F-0001- 1F-1024

Possible Configurations

The following sections describe some of the possible configurations of the PanelMate unit with General Electric PLCs.

Direct

Direct connection between one PanelMate unit and one GE PLC. Either master/slave or peer-to-peer protocol may be used.

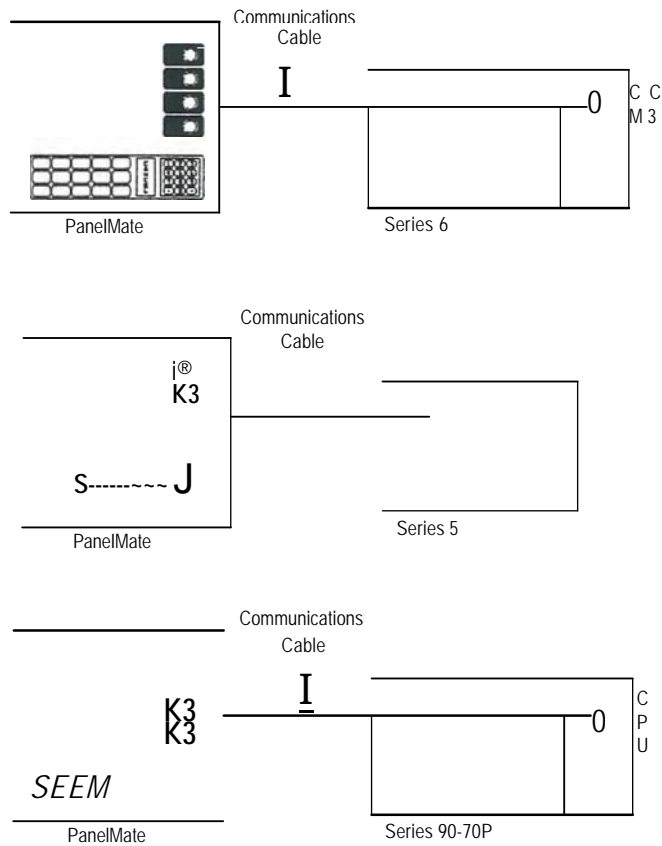


Figure 34.1 Direct Connections

Note that there are two GE S-90 drivers. For point-to-point communication, use the GE-90P driver. When communicating on a network, use the GE-90N driver.

Multidrop

Multidrop connection between the PanelMate unit and GE PLCs. The master/slave protocol must be used for multidrop communications. The PanelMate unit is always the master and the GE PLCs are the slaves.

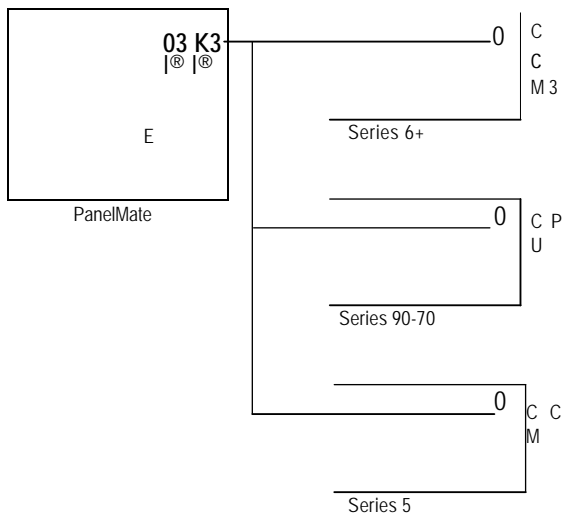


Figure 34-2 Multidrop Connection

Cabling

Communications between the PanelMate unit and General Electric PLCs can be with either **RS232C** or **RS422** (except for the Series 90 which is RS422 only). The maximum cable length when using RS232C is 50 feet, while the maximum cable length for RS422 is 4000 feet. All the PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

Pin	Signal
1	RS-422 Transmit Data (+) (Output)
2	RS-232 Receive Data (Input)
3	RS-232 Transmit Data (Output)
4	RS-422 Receive Data (+) (Input)
5	Signal Ground
6	RS-422 Transmit Data (-) (Output)
7	RS-232 Request to Send (Output)
8	RS-232 Clear to Send (Input)
9	RS-422 Receive Data (-) (Input)

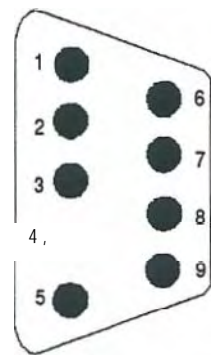


Table 34-2 PanelMate Port Pinouts

CCM2

The CCM2 card has two ports. One port (J1) uses a 25-pin connector, while the second port (J2) uses a 9-pin connector. The following figures show the pinouts and signals for each port.

Port J1



Pin	Signal		
1	Do not connect	17	RS422 TO (-)
2	RS232 TO	18	RS422 TO (+)
3	RS232 RxD	19	OIU GND
4	RS232 RTS	20	OIU +5 V (5A)
5	RS232 CTS	21	RS422 CLK in (+)
6	Do not connect	22	-12 V
7	Signal GND	23	RS422 CLK in (-)
8	Do not connect	24	RS422 CLK out (+)
9	Do not connect	25	RS422 CLK out (-)
10	Do not connect		
11	Keyout VO		
12	+12 V		
13	RS422 RxD (+)		
14	RS422 RxD (-)		
15	Do not connect		
16	Do not connect		

Table 34-3 Port J1 Pinouts



a	Signal
1	RS422 TO (+)
2	RS232 TO
3	RS232 RxD
4	RS232 RTS
5	RS232 CTS
6	RS422 TO (-)
7	Signal GND
8	RS422 RxD (+)
9	RS422 RxD (-)

Table 34-4 Port J2 Pinouts

Series Five

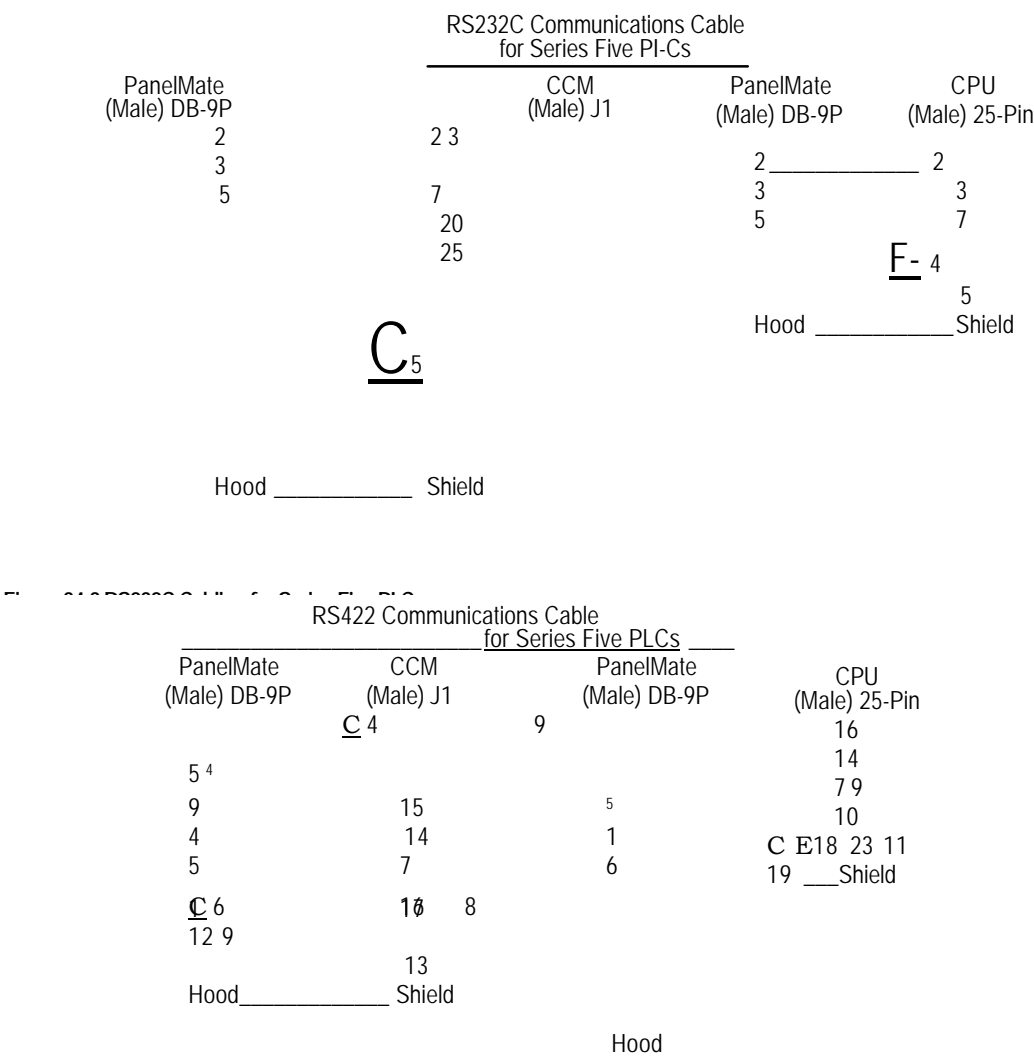


Figure 34-4 RS422 Cabling for Series Five PI-Cs

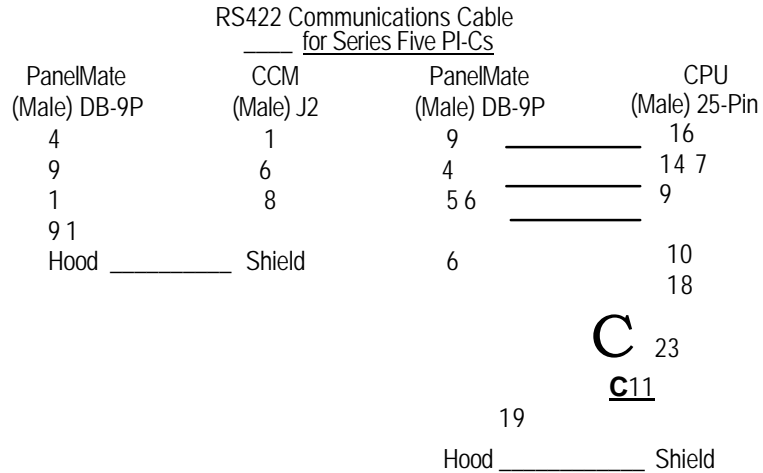


Figure 34-5 RS422 Cabling for Series Five PLCs

Series Six and Six Plus

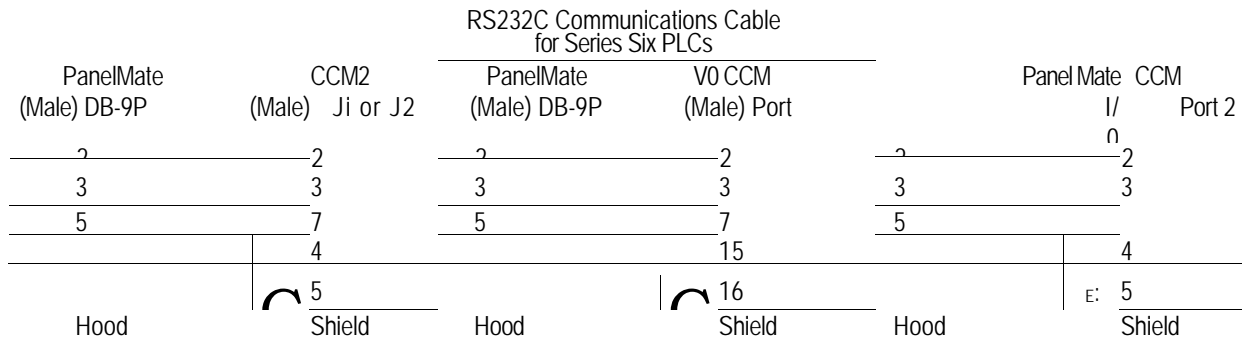


Figure 32-6 RS232C Cabling for Series Six and Six Plus PLCs

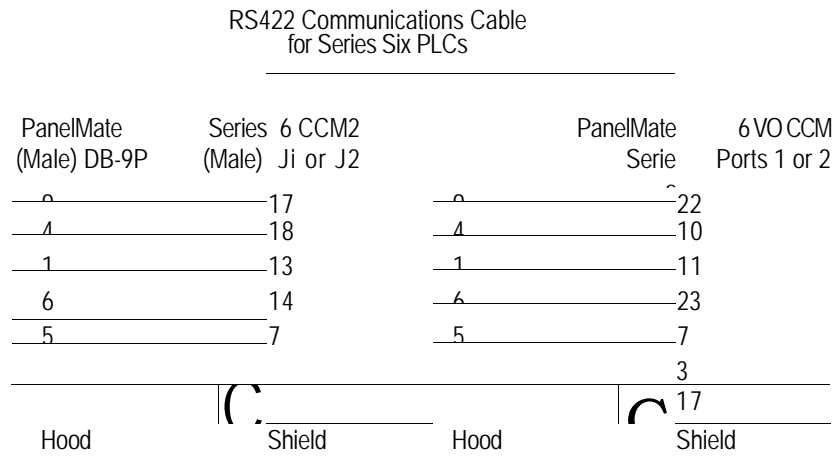


Figure 32-7 RS422 Cabling for Series Six and Six Plus PLCs

Series 90

Connection to the Series 90 PLC is through the serial port located on the front of the power supply of the 90-30 PLC and on the CPU of the 90-70 PLC.

RS422 Communications Cable
for Series 90 PLCs

PanelMate (Male) D13-9P	GE (Male) 15-Pin
1 11	
4 13	
5 7	
	9
6 10 9	12
	8
	14
	6
	LI
15	
Hood Shield	

* Termination resistance for the receive data (RD) signal needs to be connected only on units at the end of the lines. This termination is made on the Series 90 PLC products by connecting a jumper between pin 9 and pin 10 inside the 15 pin D-shell with the following exception. For Series 90-70 PLCs, catalog numbers IC697CPU731 and IC697CPU771, the termination for RD at the PLC is implemented by a jumper between pin 9 and pin 11.

Figure 34-8 RS422 Cabling for Series 90 PLCs

Communications Parameters

Standard communication parameters for communicating with the Series Five, Series Six, Series Six Plus, and Series 90 are as follows. These parameters are given only as a starting point and may be changed to meet the demands of your application. The communication parameters are set via DIP switches on the Series Five, Series Six, and Series Six Plus PLCs and via programming software for the Series 90 PLCs. In the PLC Name and Port Table, set the PanelMate unit's communication parameters to match the settings of your PLC.

Series Five	Series Six and Six Plus	Series 90
8 Data bits	8 Data bits	8 Data bits
1 Stop bit	1 Stop bit	1 Stop bit
No Parity	Odd Parity	Odd Parity
19.2K Baud	9600 Baud	19.2K Baud

Note The minimum baud rate setting for network communication to the GE Series 90 PLC is 4800. The minimum baud rate setting for point-to-point communication to the GE Series 90 PLC is 1200.

PLC ID

The valid PLC ID ranges for each GE PLC model are listed below. The PLC ID should match the [PLC ID](#) assigned in the PLC Name and Port Table.

PLC		PLC ID Range
Series Five		0 - 90 -
Series Six	Master/Slave	
Series Six Plus	Plus (Master/Slave)	
Series Six Plus	(Peer/Peer)	0 - 255
Series Six Plus	Plus (Peer/Peer)	
		Up to 6 characters: 0-9, A-F (upper case) (e.g., 123456, ABCDEF, 1A)
Series Six		Up to 7 characters: ASCII character with decimal values 32-127 (e.g., 1234567, TUvwxyz, 123#)
Series		

Note The PLC ID in the port parameter table must match the ID in the PLC. A case discrepancy will prevent successful communications.

Switch Settings

The PanelMate unit can use the CCM2, CCM3, or I/O CCM card for communications with a Series Six and Series Six Plus PI-Cs. The CCM module is needed for communications with Series Five PLCs. Each of these cards are discussed in the following sections.

CCM

The following figure shows the port and DIP switch positions on the CCM card. This card is used with Series Five PI-Cs only.

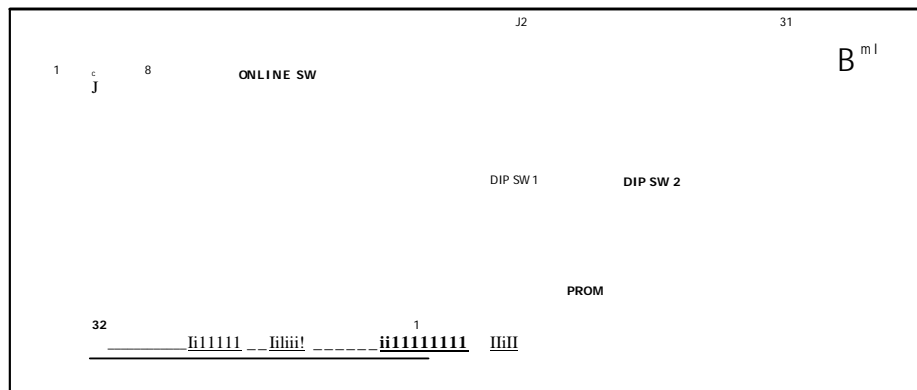


Figure 34-9 CCM Port and Switch Positions

The CCM card has two DIP switch banks, labeled DIP SW1 and DIP SW2. DIP SW1, switch 1 through switch 7, are used to set the slave station address. Switch 1 is the least significant bit. Switch 9 is used to select either master or slave.

Switch 8	Master/Slave	Switch 9
Off*	Master Slave*	On Off
Default		

Table 34-5 DIP Switch Bank 1

The second DIP switch bank is used to configure the response delay time, turnaround delay, diagnostic mode, parity, and baud rate. The following tables show the possible settings for each DIP switch bank.

Baud Rate	Switch 1	Switch 2	Switch 3	Parity	Switch 4
300	On	Off	Off	Odd None*	On Off
600	Off	On	Off		
1200	On	On	Off		
2400	Off	Off	On		
4800	On	Off	On		
9600*	Off	On	On		
19.2k	On	On	On		
				Self Diagnostics	Switch 5
				Diags On Diags Off	On Off

Turnaround Delay	Switch 6	Delay Time	Switch 7	Switch 8	Switch 9
10 msec. No Delay*	On Off	0* 20 100 500	Off On Off On	Off Off On On	Off*
Default					

Table 34-6 DIP Switch Bank 2

CCM2

The following figure shows the port and DIP switch positions on the CCM2 card.

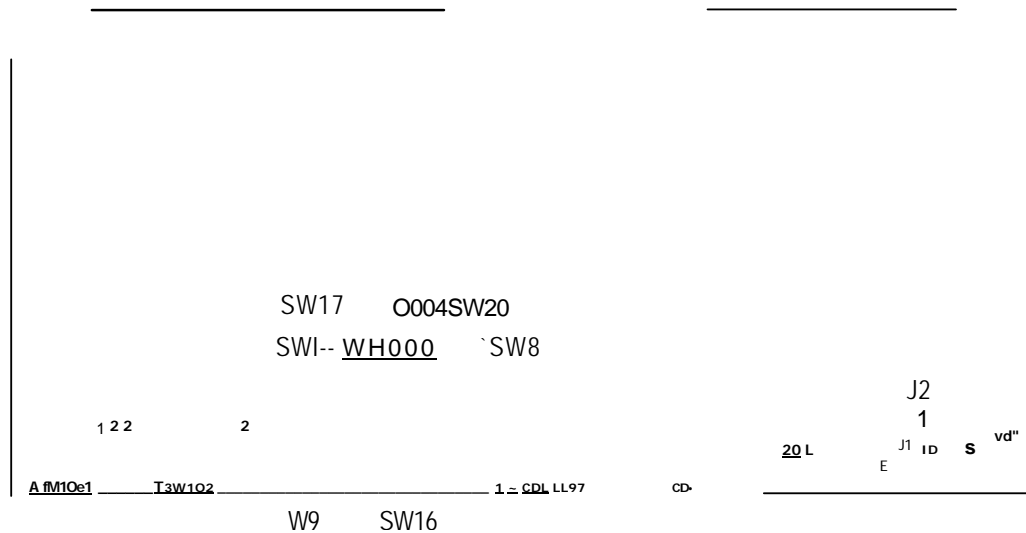


Figure 34-10 CCM2 Switch Positions

The CCM2 card has 17 DIP switches which are used for configuration of baud rate, turnaround time, protocol, and parity of the two ports, labeled "J1" and "J2". The 17 switches are divided between three switch banks and are positioned on the card as shown in figure 34-10. The switch numbers are silkscreened on the circuit board. The switch numbers given in the following tables reference the silkscreened numbers and not the switch numbers marked on each individual package.

Baud Rate	Switch 9	Switch 10	Switch 11	Turn Around Delay	Switch 15	Switch 16
300	Open	Open	Open	0 ms	Open	Open
600	Close	Open	Open	10 ms	Close	Open
1200	Open	Close	Open	500 ms	Open	Close
2400	Close	Close	Open	500 ms	Close	Close
4800	Open	Open	Close			
9600	Close	Open	Close			
19.2K	Open	Close	Close			

Protocol	Switch 12	Switch 13	Switch 14	Parity	Switch 17
Master RS232	Open	Open	Open	Enabled (odd)	Close
Master RS422	Close	Open	Open	Disabled	Open
Slave RS232	Open	Close	Open		
Slave RS422	Close	Close	Open		
Peer RS232	Open	Open	Close		
Peer RS422 w/o clk	Close	Open	Close		
Peer RS422 with clk	Open	Close	Close		
Test 3	Close	Close	Close		

Table 34-7 Port J1 Configuration

Baud Rate	Switch 1	Switch 2	Switch 3	Turn Around Delay	Switch 7	Switch 8
300	Open	Open	Open	0 ms	Open	Open
600	Close	Open	Open	10 ms	Close	Open
1200	Open	Close	Open	500 ms	Open	Close
2400	Close	Close	Open	500 ms	Close	Close
4800	Open	Open	Close			
9600	Close	Open	Close			
19.2k	Open	Close	Close			
Protocol	Switch 4	Switch 5	Switch 6	Miscellaneous Switch Settings		
Master RS232	Open	Open	Open	Switch 18	Don't Care	
Master RS422	Close	Open	Open	Switch 19	Don't Care	
Slave RS232	Open	Close	Open	Switch 20	Always Open	
Slave RS422	Close	Close	Open	Parity	Switch 17	
Peer RS232	Open	Open	Close			
Peer RS422	Close	Open	Close			
Test 1	Open	Close	Close	Enabled (odd)	Close	
Test 2	Close	Close	Close	Disabled	Open	

Table 348 Port J2 Configuration
CCM3

The CCM3 card DIP switches should be configured the same as the CCM2 card described in the previous section. The placement and numbering of the DIP switches are exactly the same as the CCM2 card.

I/O CCM

The following figure shows the port and DIP switch positions on the I/O CCM card.

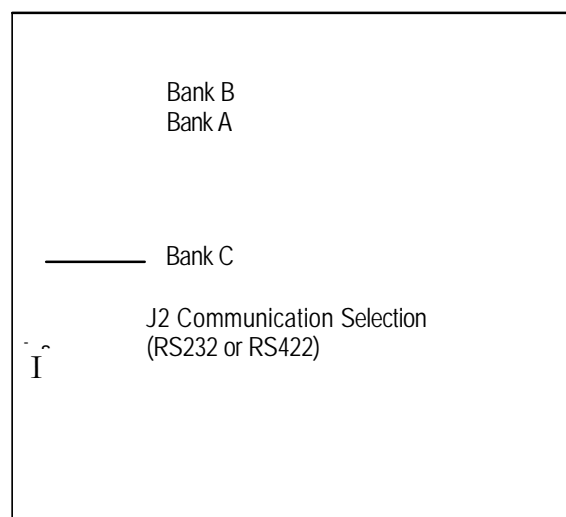


Figure 34-11110 CCM Switch Positions

The I/O CCM card has three banks of DIP switches. Bank A is used to configure port one. Bank B is used to configure port two. Bank C is used to configure pins 15 and 16 for RS232D operation. The first switch position in bank C should be left in the closed state.

The following tables show the possible DIP switch settings for the I/O CCM card. The switch numbers correspond to the number on the DIP bank.

Baud Rate	Switch 1	Switch 2	Switch 3	Parity	Switch 7	Switch 8
110	Open	Open	Open	No Parity	Open	Open
300	Close	Open	Open	No Parity	Close	Open
600	Open	Close	Open	Odd Parity	Open	Close
1200	Close	Close	Open	Even Parity	Close	Close
2400	Open	Open	Close			
4800	Close	Open	Close			
9600	Open	Close	Close			
19.2K	Close	Close	Close			

Protocol	Switch 4	Switch 5	Switch 6
CCM Master RS232/RS422	Open	Open	Open
CCM Master Current Loop	Close	Open	Open
CCM Slave RS232/RS422	Open	Close	Open
CCM Slave Current Loop	Close	Close	Open
CCM Peer RS232/RS422	Open	Open	Close
CCM Peer Current Loop	Close	Open	Close
RTU Slave RS232/RS422	Open	Close	Close
RTU Slave Current Loop	Close	Close	Close

Table 34-9 DIP Switch Settings for Bank A

Baud Rate	Switch 1	Switch 2	Turn Around Delay	Switch 6	Parity	Switch 7
300 1200 9600 19.2K	Open Close Open Close	Open Open Close Close	0 ms 500 ms	Open Close	No Parity Odd Panty	Open Close
Protocol	Switch 3	Switch 4	Switch 5			
CCM Master RS232 CCM Master RS422 CCM Slave RS232 CCM Slave RS422 CCM Peer RS232 CCM Peer RS422 RTU Slave RS232 RTU Slave RS422	Open Close Open Close Open Close Open Close	Open Open Close Close Open Open Close Close	Open Open Open Close Close Close Close Close		Module Operation	Switch 8
					Operational Test	Open Close
					Reset Switch	Switch 9
					Enabled Reset	Open Close

Table 3410 DIP Switch Settings for Bank B

Function	Switch
RS-232D Operation Disconnects Pins 15, 16 for Port 1 RS232D Connects Pins 15, 16 for Port 1 RS232D operation (use external jumper if desired across pins 15-16) 'Factory-set default position	1 Open Close*

Table 34.11 DIP Switch Settings for Bank C

Series Five CPU

The Series Five CPU has one four-position DIP switch bank. This DIP switch bank is used to configure the 25-pin port on the CPU and to configure the CCM address and protocol.

The following table shows the possible settings for this DIP switch:

CCM Port Communications	Switch 1	CCM Port Address	Switch 2
RS232' RS422	On Off	1 (No Parity) Scratch Pad	On Off
Baud Rate	Switch 3	Switch 4	
300 1200 9600* 19.2K	Off Off On On	Off On Off On	

Default

Table 34.12 CPU DIP Switch Settings

General Electric Word and Bit References

The following section describes the use of General Electric word and bit references in your configuration.

The general word referencing method is:

[plcname,word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

GE Series Five PLC Word and Bit References

Series Five PLCs use decimal word addresses. The PanelMate unit format default is U16.

Inputs and outputs use bit references.

The following list contains the memory types and ranges supported by the Series Five driver:

10001	to 11024
00001	to 01024
11+0001	to 11+1024
01+0001	to 01+1024
01-0001	to 01-1024
02-0001	to 02-1024
11-0001	to 11-512
12+0001	to 12+1024
02+0001	to 02+1024
R00001	to R16384

Figure 34-12 Memory Types and Ranges

All of the references in Table 34-12 are bit references, except for registers R00001 through R16384, which are word references.

The following is the format for a register reference.

[rr]

rr PLC reference number of the register.

The following is the format for a bit reference:

[xi]

x PLC memory type (0 or I).

i PLC reference number of the input or output.

The following is the format for a register bit reference (Read Only):

[rr bb]

rr PLC reference number of the register.

bb PLC reference number of the bit position. The bit positions are numbered from 1 to 16, least significant to most significant, respectively.

Note The register number must be followed by a space.

The PanelMate unit can reference more than one PLC word with a single read. The Series Five PLC can read a maximum of forty words per read. The maximum number of unused PLC words per read is ten. Once ten unused PLC words are encountered, the PanelMate unit will generate another read.

Note Bit writes to the following are not permitted. They are generally used by the CPU:

Internal status bits I1-XXX

Output status bits 02-1000 through 02-1024

Series Six Word and Bit References

GE Series Six PLCs use decimal word addresses. The PanelMate unit format default is U16. The following list contains the memory types supported by the Series Six driver: AI

Auxiliary Input (Bit Reference)

AO Auxiliary Output (Bit Reference)

I Input (Bit Reference)

O Output (Bit Reference)

R Register (Word Reference)

The following is the format for a register reference.

[rr]

rr PLC reference number of the register.

The following is the format for a bit reference: [xi]

x PLC memory type (0 or I).

i PLC reference number of the input or output.

The following is the format for a register bit reference (Read Only):

[rr bb]

rr PLC reference number of the register.

bb PLC reference number of the bit position. The bit positions are numbered from 1 to 16, least significant to most significant, respectively.

Note The register number must be followed by a space.

Note that General Electric Series Six Family PLCs store double precision numbers with the first (low) register holding the least significant word and the next consecutive (high) register holding the most significant word. The PanelMate unit, however, interprets the first register as the most significant word and the next consecutive register as the least significant word. For example, if the value 1 is stored in register 624 and the value 0 is stored in register 625, General Electric would interpret the stored value as 1, while the PanelMate unit would display the value as 65536. To read a double precision number correctly, multiply the low byte by 65536 and add this value to the high byte.

Bit Writes Without Ladder Logic

The GE Fanuc communication protocol for Series Six, for the latest CCM2 and CCM3 cards, will allow the PanelMate unit to directly alter the state of a single bit without the use of ladder logic. The part numbers for the cards which allow single bit writes are listed below.

CCM2 IC6000B536K
CCM3 IC6000B537K

Note Cards with part numbers that have revisions later than K will also support single bit writes. The part number should be labeled in the lower lefthand corner of the board. If either of these cards are installed, then select "S6+WBit", even for Series Six PLCs, for the model name in the PLC Name and Port Editor; otherwise, select "S6". If the board number is IC6000B516 or IC600CB517, an upgrade kit is available from General Electric to allow single bit writes without using ladder logic.

Bit Writes With Ladder Logic

CCM cards, other than those mentioned in the previous section, will not permit an external intelligent device to directly alter the state of a single bit (input, output, etc.) without overwriting the entire word in which that bit exists. As a result, the PanelMate unit will write a value to a designated word in the GE PLCs specifying which bit should be set or cleared. A section of each PLC program is necessary to interpret this value in order to change the appropriate bit.

Within the PLC Name Table, the PLC ID# is defined using the following format:

ID#-Rreg# (8 characters maximum)

ID#	PLC ID#
R	optional "R"
reg#	Register value used to receive bit set/clear information

Note If no register value is entered, the default is 255.

The value that the PanelMate unit writes to the PLC in order to specify what bits to write, always contains the number (address) of the bit to be changed. This value is represented as a positive or negative number, depending on whether the bit is to be set or cleared, respectively. The value sent to the PLC is sent using the normal Series Six word/block write instruction. The value is described below:

15000 < value	=	AIx where x = value - 15000
10000 < value <= 15000	=	Ix where x = value - 10000
5000 < value <= 10000	=	AOx where x = value - 5000
0 < value <= 5000	=	Ox where x = value

The following ladder logic rungs may be added to a GE PLC program for the purpose of setting and clearing individual bits as dictated by the instructions the PanelMate unit writes to the unit's instruction word (word 255) in GE PLCs.

GE Series 6: Program to Interpret Bit Controls
If Bit Address in Reg 255

```

CONST          R0256      R0255      R0256                                01023
+[ A      MOVE      B ]+[      A :      B      ]+-----+-----+-----+-----+--+(-)--+
1+00000

```

|

(Then set or clear bit
101023 CONST

```

          R0256      CONST      R0256
+--]/[--+ A MOVE      B ]+DO [SUB      N      REPS]+      ( )
1          +00001      001

```

|

(Reset Reg 255
101023 CONST

```

          R0255
      A MOVE      B ]+1
      +00000

```

|

+ELSE continue with other processing

|

+ [ENDSW]+

|

```

IR0255      R0254
+[ A      MOVE      B ]+

```

|

Get absolute value of address
 If address < 0. then:

```

I          CONST R0254          CONST          01024
+{SHIFT LEFT N    MATRIX    LEN] ----- +-(-)-+
-+1          00001          001

I
+Set flag 1

101024      R0255          R0254      R0254      R0254      CONST
+--] [--+ [ A MOVE      B ]+[ A INV      B      LEN]+          ( )
1                                          001
  
```

!Address! = absolute value

```

I
101024      R0254 CONST

          A ADDX B = I          R0255
          +00001          C ]+
  
```

!Auxiliary inputs +If

!address!>15000 then:

```

I
ICONST      R0255      R0254          01022
+[ A SUBX B      = C ]----- +-(-)-+
1+15000

1
01022      R0255 CONST      R0254
      A SUBX B = C ]+          ( )
1          +15000
  
```

```

I
+If address > 0 then set bit
1
101022      01024      R0254          A10001      CONST
-! I----] / [--+ [      BIT      SET      MATRIX      LEN]+          ( )
  
```

```

I          064
  
```

Address	Op Code	Op Name	Op Fields	Op Comment	Op Hex
101022	01024	R0254		A10001	CONST
+ -] [---+] [---+ [BIT CLEAR MATRIX LEN]+ ()					
| 64					
Inputs					
+Else if laddressl > 10000 then					
1					
101022	CONST R0255	R0254			01021
A SU BX B = C ] +-( )-+ | +10000					
1					
101021	R0255	CONST	R0254		
+--] [---+ [A SUBX B= C]+ +10000					
1					
+If address > 0 then set bit					
1					
101021	01024	R0254		10001	CONST
+ -] [---+--] | [---+ [ BIT SET MATRIX LEN]+ ()					
| 064					
+Else clear bit					
1					
101021	01024	R0254		10001	CONST
+--] [---+--] [---+ [BIT CLEAR MATRIX LEN]+ ()					
| 064					
1					
(Auxiliary Outputs					
+Else if laddressl> 5000 then					
1					
101022	01021	CONST	R0255	R0254	01020
+--] A SUBX B =C]-----+-----+-----+-----+-----+-----+-----+-----+-()-+					
+05000					

```

1
161020      R0255 CONST      R0254
          A      SUBX B      = C
1
          +05000
If address>0 then set bit
101020      01024      R0254      SET      A00001      CONST
          BIT                      MATRIX      LEN]+
1
          064
(E[se dear bit

1
101020      01024      R0254      CLEAR      A00001      CONST
+ -] [--+] [--+] BIT                      MATRIX      LEN]+
1
          064
(Outputs
101022      01021 01020 R0255                      R00253
+ -] / [-----] / [-----] / [---] A      Move      B]
1
|Else if address>0 then set bit
1
101022      01021 01020 01024 R0253      SET      00001      CONST
          BIT                      MATRIX      LEN]+
1
          064
(Else dear bit

1
101022      01021 11020 11024 R0253                      00001      CONST

+--] / [--+--] / [--+--] / [--+--] [--+] BIT      CLEAR      MATRIX      LEN]+
1
          064

1
+[] RETURN
1
1
|[ENDSW]+ Note:      Bit reference is sent to register 255. If bit reference
1
          is negative then bit is to be cleared, otherwise bit is
1
          to be set

```

|

Registers - 253, 254, 255, and 256 are used by the program.

+{ENDSW}+

Output points 1020, 1021, 1022, 1023, and 1024 are used by the program.

|

GE Series Six Plus Word and Bit References

GE Series Six Plus PLCs use decimal word addresses. The PanelMate unit format default is U16. For Series Six Plus PLCs, the PanelMate unit permits access to all memory addresses, up through the largest 5-digit address available (the PanelMate unit can actually read addresses up through a maximum of 99999). All registers in the Series Six Plus may be accessed by the PanelMate unit directly. Series Six Plus units feature extended I/O channels with addresses grouped in blocks of 1024, using prefixes such as 12+. The following list contains the memory types supported by the Series Six Plus driver.

AI	Auxiliary Input (Bit Reference)
AO	Auxiliary Output (Bit Reference)
I	Input (Bit Reference) Output (Bit
O	Reference) Register (Word
	Reference)
Ix + yyyy	Expanded Input Channels
Ox + yyyy	Expanded Output Channels

where x = channel numbers 1 - 7 and 9 - F (0 and 8 not available) yyyy
= bit number 1 - 1024

Bit Writes Without Ladder Logic

The GE Fanuc communication protocol for Series Six Plus for the latest CCM2 and CCM3 cards will allow the PanelMate unit to directly alter the state of a single bit without the use of ladder logic. The part numbers for the cards which allow single bit writes are listed below:

CCM2 IC6000B536K
CCM3 IC6000B537K

Note Cards with part numbers that have revisions later than K will also support single bit writes. The part number should be labeled in the lower lefthand corner of the board. If either of these cards are installed, then select "S6+WBit" for the model name in the PLC Name and Port Editor; otherwise, select "S6+". If the board number is IC6000B516 or IC600CB517, an upgrade kit is available from General Electric to allow single bit writes without using ladder logic.

Bit Writes With Ladder Logic

CCM cards, other than those mentioned in the previous section, will not permit an external intelligent device to directly alter the state of a single bit (input, output, etc.) without overwriting the entire word in which that bit exists. As a result, the PanelMate unit will write a value to a designated word in the GE PI-Cs, specifying which bit should be set or cleared. A section of each PLC program is necessary to interpret this value in order to change the appropriate bit.

Within the PLC Name Table, the PLC ID# is defined using the following format:

ID#-Rreg# (8 characters maximum)

ID#	PLC ID#
R	optional "R"
reg#	Register value used to receive bit set/clear information

Note If no register value is entered, the default is 255.

The value that the PanelMate unit writes to the PLC in order to specify which bits to write, contains the register and number of the bit to be changed. This value is represented as a positive or negative number, depending on whether the bit is to be set or cleared, respectively. The PLC word containing the value is controlled by the PanelMate unit, using normal Series Six Plus word/block write instructions.

The two byte value sent by the PanelMate unit is represented as shown in the following figure:

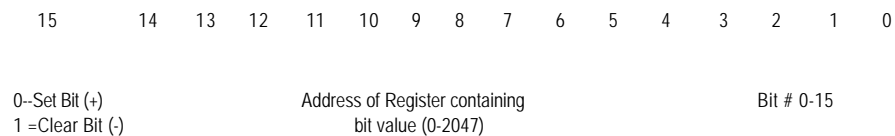


Figure 34-13 Bit Reference Format

Note It is not possible to write to references *lx-yyyy* or *Ox-yyyy*.

Note that GE register values range from 1 - 2048, and bits are numbered 1-16 per register. The PanelMate unit sends a register value from 0 - 2047, and a bit value from 0 - 15. When the PanelMate unit sends a bit value of 0, it is interpreted as the sixteenth bit of the designated register value, and when it is 1 - 15, it is the specified bit of the designated register value + 1.

Examples

PanelMate Reference = OF + 0001

Value sent to GE = 0111100000000001 (reg. = 1920, bit = 1)

Interpretation = Set bit 1 of register 1921

PanelMate Reference OE + 1024

Value sent to GE = 0111100000000000 (reg. = 1920, bit = 0)

Interpretation = Set bit 16 of register 1920

PanelMate Reference = 01

Value sent to GE = 0100000000000001 (reg. = 1024, bit = 1)

Interpretation = Set Output value bit 1

PanelMate Reference A01

Value sent to GE = 0000000000000011 (reg. = 0, bit = 3)

Interpretation = Set Auxiliary Output value 3 (bit 3 of register 1)

PanelMate Reference = A01

Value sent to GE = 1111111111111101 (reg. = 0, bit 3)

Interpretation = Clear Auxiliary Output value 3 (bit 3 of register 1)

In the last example, the value is negative so the two's complement is calculated before interpreting a register and bit value. I/O bit values (Ixxxx, Oxxxx) are designated as being in registers 1024 - 1151, but the values in the registers are not affected since the I/O bit values are stored in a separate location. I/O values 11024 and 01024 are not available for setting and clearing unless logic is added to the PLC program to check the bit value, in addition to the register range. In the PLC program supplied, Output register values are 1024 - 1087, and Input register values are 1088 - 1151. Output 1024 would be designated as register 1088, bit 0, and Input 1024 would be designated as register 1152, bit 0.

The following ladder logic rungs may be added to a Series Six Plus PLC program for the purpose of setting and clearing individual bits as dictated by the instructions the PanelMate unit writes to the bit write register (default word 255) in GE PI-Cs.

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525

<<RUNG 390>>

Program section to implement bit set and clear operations for the PanelMate units pushbuttons when the PanelMate unit is used with the Series Six Plus advanced VO. The registers used are R0620 through R0632, and the outputs used are A00977 through A00985. Any other data space could be used by modifying this section of program. The PanelMate unit instructs the GE PI-Cs to set and clear bits by writing coded values to a register called the "Bit Write Register" (BWR). The BWR is user-selectable during development using the PLC Name and Port Editor of the PanelMate unit. A register number may be entered following a PLC ID# and a "-" character in the Logical Device Unit, PLC ID# field. If no register number is explicitly designated by the user, the BWR used defaults to R0255 (default setting).

In the following program, the BWR is R0621. Whenever R0621 is nonzero, The PanelMate unit has written a "Bit Write Code" (BWC) to the BWR, indicating a bit to set or clear. A00977 becomes energized otherwise.

If there is a BWC in BWR, call the subroutine to set/clear bits.

```
| |
| Do not
| Set or
| (Clear
|
|
| IA00977 Const R0620 Const R0620
| +-]/[---[ A MOVE B ]-[ DO SUB N REPS ]- ( )
| 390 +00001 001
|
| <<RUNG 392>>
```

```
|
| (Clear the BWR, ff there is a BWC (Note - for purposes of debugging, it is most convenient to temporarily remove this
|
|
```

(Debug Rung Remover	Do not Set or Clear	Bit Write Register	rung.)
---------------------	---------------------	--------------------	--------

```
|
| IA00985 A00977 Const R0621
| + -] [----- 1/1 -- [ A MOVE B ]
| 390 +00000
|
```

```
| <<RUNG 393>>
|
```

```
(Else continue with other processing
|
| +[ENDSW]
| <<RUNG 394>>
|
```

(Subroutine to seVclear bits. Copy BWC (R0621) to R0622

(Bit	Bit
(Write	write
(Register	Memory

```
IR0621      R0622
+[ A      MOVE      B ]
```

<<RUNG 395>>

(Test BWC to see if it is a negative number and energize A00978 if it is 1 (high bit set). Note that whenever the BWC is positive, a bit is to be set, however, if the BWC is negative, a bit is cleared.

	Const		Const		Addr
+ [SHIFT LEFT	N	MATRIX	LEN]	-----	()
	000001		001		

I <<RUNG 396>>

1

I COPY

I BWC (R0621) to R0622 again

I

I	Write	Write
I	Register	Memory
I		

I	R0621		R0622
+ [	A	MOVE	B]

I

I <<RUNG 397>>

I

(Derive the absolute value of the BWC in R0622. If the BWC is negative,
(take the twos complement of the value. (Invert all bits and add one.)

I

I	Bit	Bit
I	Write	Write
I	Memory	Memory
I		

IA00978	R0622	R0622	Const
+ - J [ ---- [	A INV B		LEN]

I	395	001
---	-----	-----

I

I <<RUNG 398>>

I	Bit	Bit
I	Write	Write
I	Memory	Memory
I		

+AO0978	R0622	Const	R0622
I ---- ] [ --- [	A ADDX	B =	C]
I	395	+00001	

I

I <<RUNG 399>>

```

|
(Clear R0623
|
|          # of Bit
|          to be
|          set
|
|Const      R0623
+ [ A      MOVE      B ]-      ( )
1+00000

|
| <<RUNG 400>>

| |
|The upper 12 bits of the BWC contain the address of the register
|containing the bit to be set or cleared. Shift these bits from IR0622 to
|R0623, and then save them in R0624.

|
|          Bit
|          Write
|          Memory
|
|          Const      R00622      Const
+ [ SHIFT LEFT      N      MATRIX      LEN ]-      ( )
|          00012      002
|
| <<RUNG 401 >>

| |
(Move the Register Address to R0624
|

```

# of Bit	Register		
to be		Address	
set		of Bit	
R0623		R0624	
+ [A	MOVE	B] -	()
| <<RUNG 402>>			
		...	

| Clear R0623			
|		# of Bit	
|		to be Set	
|		R0623	
| Const			
+ [A	MOVE	B] -	() 1
+00000			
| <<RUNG 403>>			

(The lower 4 bits of the BWC (still in R0622) contain the number of the (bit to be			
set or cleared. Shift these bits from R0622 to R0623, and follow them to			
remain in R0623.			
|		Bit	
|		Write	
|		Memory	
|	Const	R0622	Const
+ [SHIFT LEFT	N	MATRIX	LEN] -
|	00004		002
			()
| <<RUNG 404>>			

```

|
| Const      R0631    +[  A
|           MOVE      B  ],
|
+00000

```

```

|
| <<RUNG 405>>

```

```

| Const      R0632
|
|[ A      MOVE      B ]( )
|
| +00000

```

```

|
| <<RUNG 406>>

```

```

|
|
|
| of Bit

```

```

|to be
|set

```

```

|
|1R0623      R0632
|[ A      MOVE      B ]

```

```

|
| <<RUNG 407>>

```

```

|

```

```

|
|The following checks register R0623 for zero. If the 4 bits of the BWC
| (in R0623) is zero, this indicates that the 16th bit needs to be cleared, therefore
| 16 must be added to R0623. The following rungs will accomplish this function.

```

```

|
|IR0632      R0631
|
|+ [ A :      B ] ----- (

```

```

|
|
|
| <<RUNG 408>>

```

```

|

```

```

|                                     # of Bit
|                                     to be
|                                     set
|
IA00982   Const           R0623                                     A00981
+----] [---- [ A           MOVE      B ]----- ( )
      407 +00016

<<RUNG 409>>

```

If the register address in R0624 is ≤ 1087 and $R0624 > 1024$, then the (bit ID be set or cleared is a real output. A00979 becomes energized and IR0625 and R0626 are ignored. Note that the register address is actually Iregister address -1.

```

|

(Register Register NotReal Bit is (Address      Address      Address
lof Bit      of Bit      Memory      Real
Output

|
IR0624      Const      R0625      Const      R0624      R0626      A00979
+[ A SUBX B =      C ]-[ A SUBX B =      C ]      ( ) |      +01087 +01024

|

I <<RUNG 410>>

```

```

|

|
If BWC is for a real output, subtract 1024 from the register address, (multiply
by 16, and add the bit number to get the address of the output Ito set or
clear (00001 through 01024)

|

```

```

|

```


]Bit is Register (Real
Address (Output of
Bit

IA00979 R0624
----I [----[A MOVE R0627 B]-[R0627 A SUBX Const B = R0628 C]- ()

409 +01024

<<RUNG 411>>

(Bit is
[Real
(Output

IA00979 R0628 Const B = R0629 C]
t---] [----[A MPY

409 +00016

<<RUNG 412>>

]Bit is	# of Bit	Not Real
]Real	to be	I/O Reg
]Output	Set	Address
IA00979	R0629	R0623 R0630
1 ]|---	A	ADDX B = C] -

409
<<RUNG 413>>

(Set the output when the BWC is positive

]Bit is Not Real (Real I/O Reg

]Output Address

IA00979 A00978 R0630

00001

Const

+----] [-----] / BIT SET MATRIX 315 LEN] 064

409 395

<<RUNG 414>>

(Clear the output when the BWC is negative.

]Bit is Not Real (Real I/O Reg

(Output Address

IA00979 A00978 R0630

00001

Const

+ ---] [-----] [-----] BIT CLEAR MATRIX 315 LEN]- 064 ()

<<RUNG 415>>

If the register address in R0624 is <= 1151 and R0624 >= 1088, then the bit to be set or cleared is a real input.

IA00980 becomes energized and R0625 and R0626 are ignored.

]Register Register Not Real Bit is (Address Address Address Real

lof Bit of Bit Memory Input

IR0624 Const R0625 Const R0624 R0626 A00980
+[A SUBX B C]-[A SUBX B C]----- ()

+01151

+01088

<<RUNG 416>>

I

If the BWC is for a real input, subtract 1088 from the register address, multiply by 16, and add the bit number to get the address of the input to set or clear:
(10001 through 11024)

1
Bit s Register (Real
Address Input of
Bit

I
IA00980 R0624
+---] [[A MOVE R0627 B]-[R0627 Const = R0628
A SUBX B C]-
+01088
1 415

I
I <<RUNG 417>>
I I
Bit s
(Real
Input
I

IA00980 R0628
Const R0629
+---] [[A MPY B = C +00016
I 415
I
I <<RUNG 418>>
i

I Bit is # of Bit Not Real
(Real to be I/O Reg
Input set Address I
IA00980 R0629 R0623 R0630
+---] [[A ADDX B C]-
415
<<RUNG 419>>

```

|
(Set the input when the BWC is positive
|
]Bit is Not Real (Real I/O Reg (Input
      Address

|
IA00980      A00978 R0630      10001      Const

+----] [-----]/[-----[ BIT      SET      MATRIX      LEN]-      ( )

| 415      395      064

|
| <<RUNG 420>>

|
..... p

|
|
(Clear the input when the BWC is negative
|
]Bit is      Not Real
IReal      I/O Reg
j Input      Address

|
IA00980      A00978      R0630      10001      Const
---I [-----] [-----[ BIT      CLEAR      MATRIX      LEN]-      ( )
| 415      395      064

1
1 <<RUNG 421 >>

|
]Bit is      Bit is      Register      Not Real
(Real      Real      Address      I/O Reg
]Output      Input      of Bit      Address

|
1AO0979      A00      A00981      R0624      Const      R0630
980
+---]/[-----]/[-----]/[-----[ A      ADDX      B      C ]-      ( )
| 409      415      408      +00001

|
| <<RUNG 422>>

|

```

I

I

]If the BWC is not a real input, output or if the "Adding 16 to Register" I(See Rung 407 - 408) function was not implemented, add one to the]register address to get a register range of R00001 through R02048 and Istore in register R00630.

Iif the "Adding 16 to Register" function was implemented, then do not add 11 (one) to the register, instead, store the register address in R0630. I

]Bit is	Bit is	Not Real	Registr	Not Real
]Real	Real	I/O Reg	Address	I/O Reg
(Output	Input	Address	of Bit	Address

I

IA00979	A00980	A00981	Const	R0630	R0624	R0630	
+ -] / [ -----] / [ -----] [----[			A MOVE	B ]-[	A	MOVE B]-	()

I 409 415 408 +00000 I

] <<RUNG 423>>

I

I

I

IStore the value in the register designated by the address in R0630 in
]R0626

I

]Bit is	Bit is	Not Real
(Real	Real	Address
]Output	Input	Memory

I

IA00979	A00980	IR0630	R0626	Const	
++-] / [-----] / [-----] [A			MOVE TBL EXT B	LEN]-	()
I 409	415			001	

I

I RUNG 424>>

I

I

I

(When the BWC is positive, set the bit in the value copied in R0626.

I

I

Bit is	Bit is	# of Bit	Not Real
(Real	Real	to be	Address
IOutput	Input	set	Memory

IA00979	A00980	A00978	R0623	R0626	Const		
+---	/ [-----]	[-----]	/ [--- [BIT	SET	MATRIX	LEN]-	()
1	409	415	395			001	

I

I <<RUNG 425>>

I

I

I

(When the BWC is negative, clear the bit in the value copied in R0626.

I

I

Bit is	Bit is	# of Bit	Not Real
IReal	Real	to be	Address
IOutput	Input	set	Memory

IA00979	A00980	A00978	R0623	R0626	Cc nst		
+---	/ [-----]	[-----]	[----- [BIT	CLEAR	MATRIX	LEN]-	()
1	409	415	395	001			

I

I <<RUNG 426>>

1

1

A

1

1

1

1

1

1

1

GE Series 90 PLC Word and Bit References

Series 90 PLCs use decimal word addresses. The PanelMate unit format default is S16, where the values can range from -32768 to 32767. 32-bit formats are not allowed for the byte memory type (i.e., S32, U32, BCD6, BCD8, BIN6, or BIN8). See the Word and Bit References section in Chapter 10 for valid word formats.

The following are the memory ranges for the Series 90-30 and 90-70 models.

	3-Li	33-1	731 732	771 772	781 782
%AI (Read/Write)	1-64	1-128	1-8192	1-8192	1-8192
%AQ (Read/Write)	1-32	1-64	1-8192	1-8192	1-8192
%R (Read/Write)	1-512	1-2048	1-16384	1-16384	1-16384
%I (Read/Write)	1-512	1-512	1-512	1-2048	1-12288
%Q (Read/Write)	1-512	1-512	1-512	1-2048	1-12288
%M (Read/Write)	1-1024	1-1024	1-2048	1-4096	1-12288
%T (Read/Write)	1-256	1-256	1-256	1-256	1-256
%G (Read/Write)	1-1280	1-1280	1-1280	1-7680	1-7680
%S (Read Only)	1-32	1-32	1-128	1-128	1-128
%SA (Read/Write)	1-32	1-32	1-128	1-128	1-128
%SB (Read/Write)	1-32	1-32	1-128	1-128	1-128
%SC (Read/Write)	1-32	1-32	1-128	1-128	1-128

The first three memory types in the above table are 16-bit word references (%AI, %AQ, %R) and the remaining memory types are bit references.

The following is the format for a word reference:

[%XXrrrrr]

XX	Beginning symbol PLC word memory type (AI, AQ, R). This may be upper or lower case.
rrrrr	PLC word reference number. Leading zeroes are allowed but not required.

The following is the format for a word bit reference (Read Only):

[%XXrrrrr/bb]

XX	Beginning symbol PLC word memory type (AI, AQ, R). This may be upper or lower case.
rrrrr	PLC word reference number. Leading zeroes are allowed but not required.
/	Character used as a delimiter between word address and bit number
bb	PLC reference number of the bit position. The bit positions are numbered from 0 to 15 with 0 being the least significant bit.

The following is the format for a byte (8-bit) reference: [B

:%XXbbbb]

B	Character designating byte reference Byte designator/memory type separator
XX	Beginning symbol PLC memory type (I, Q, T, M, G, S, SA, SB, SC). This may be upper or lower case.
bbbb	PLC byte reference number. This address must be a multiple of 8 + 1. Leading zeroes are allowed but not required.

The following is the format for a bit reference:

[%XXbbbb]

XX	Beginning symbol PLC memory type (I, Q, T, M, G, S, SA, SB, SC). This may be upper or lower case.
bbbb	PLC reference number of the bit position. Leading zeroes are allowed but not required.

Note that General Electric Series 90 Family PLCs store double precision numbers with the first (low) register holding the least significant word and the next consecutive (high) register holding the most significant word. The PanelMate unit, however, interprets the first register as the most significant word and the next consecutive register as the least significant word. For example, if the value 1 is stored in register 624 and the value 0 is stored in register 625, General Electric would interpret the stored value as 1, while the PanelMate unit would display the value as 65536. To read a double precision number correctly, multiply the low byte by 65536 and add this value to the high byte.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate unit expression fields.

Series 5, 6, and 6+

Word References

<u>Reference</u>	<u>Description</u>
[R1024]	Register 1024
[R701]	Register 701

Bit References

<u>Reference</u>	<u>Description</u>
[AI233]	Auxiliary input 233
[AO466]	Auxiliary output 466
[I18]	Input 18
[O42]	Output 42
[IF+999]	Input 999 of expanded channel IF+
[I7-766]	Input 766 of expanded channel 17
[OA+643]	Output 643 of expanded channel OA+
[O6-1019]	Output 1019 of expanded channel 06

Series 90/30 and 90/70

Word References

<u>Reference</u>	<u>Description</u>
[%AI32]	Analog input 32 Data
[%R1234]	register 1234

Byte References

<u>Reference</u>	<u>Description</u>
[B:%M65]	Discrete internal coil 65
[B:%Q9]	Discrete machine output 9

Bit References

[%SA32]	Bit 32 of system memory
[%T1 98]	Discrete temporary coil 198
[%AQ705/0]	Bit 0 of analog output 705
[%R1 50/15]	Bit 15 of data register 150

I

0



Chapter 35

Generic Protocol

The Generic Protocol allows you to use the PanelMate Series with any intelligent controller (PLC or host) capable of sending and receiving characters over an RS232 or RS422 serial connection. If your controller cannot be linked through any of the PanelMate unit's built-in communications interfaces, you can use the Generic Protocol to gain access to all of PanelMate unit's features. The Generic Protocol simply defines the way in which the PanelMate unit expects data to be transmitted to it, and the way in which it will send operator inputs to the PLC or host.

Hardware Interface to PI-Cs

For the most straightforward interface using Generic Protocol, you will want to use a BASIC module in conjunction with your PLC. This type of module generally provides one or more serial ports and has direct access to PLC registers and I/O memory. In addition, it can run the short BASIC routines that will be needed to transmit data between the PLC and the PanelMate unit. The following is a list of some of the major PLC brands and their corresponding BASIC modules: To connect the PanelMate unit to the PLC, a direct RS232C cable connection would normally be made between the PanelMate unit and one of the serial ports on the BASIC module.

<u>PLC Brand</u>	<u>BASIC Module</u>
GE Series Six	ASCII/BASIC module 500-
TI 500 Series	5035 BASIC module 627
Honeywell ISSC	COP module DLog Data
Square D	Controller 1771-DB
A-B PLC-2 Series	1775-GA
A-B PLC-3 Series	

Table 35-1 BASIC Modules

For distances over 50 feet, an RS422 electrical connection can be used.

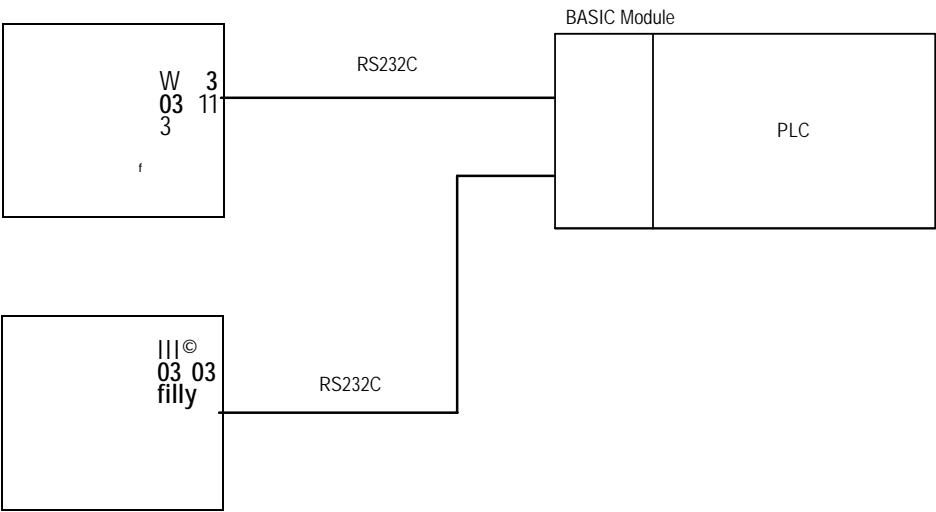


Figure 35-1 PanelMate to BASIC Module

Method of Operation

When Generic Protocol is used, the PanelMate unit operates as a slave and the host (BASIC module) is always the master. This means that the PanelMate unit does not initiate transmissions. Instead, the PanelMate unit waits until the host directs a command to it and then responds appropriately. The options available to the host include:

- Transmitting a group of register values
- Asking for any new operator inputs
- Asking for the last response to be repeated
- Testing the communication link

In response to commands received from the host, the PanelMate unit can:

- Acknowledge proper receipt of the commands
- Send operator inputs

Each transmission between the host and the PanelMate unit begins and ends in a similar fashion. Transmissions will vary in length, and will consist of numbers (primarily register values) sent as sequences of printable ASCII characters, separated by punctuation. The use of ASCII makes this protocol very straightforward to implement, even by using a PLC BASIC module with a limited instruction set.

In spite of the fact that it is a slave, the PanelMate unit still remains very much in control of updating screen information (once it receives new data from the host), detecting and announcing alarms, and accepting and managing operator inputs. The primary difference between using Generic Protocol and specific communications interfaces is in how the transfer of register and I/O data occurs. In the latter case, the PanelMate unit constantly asks for data, which the PLC then sends. When the Generic Protocol is used, the host or BASIC module controls when (and how frequently) the data is sent out.

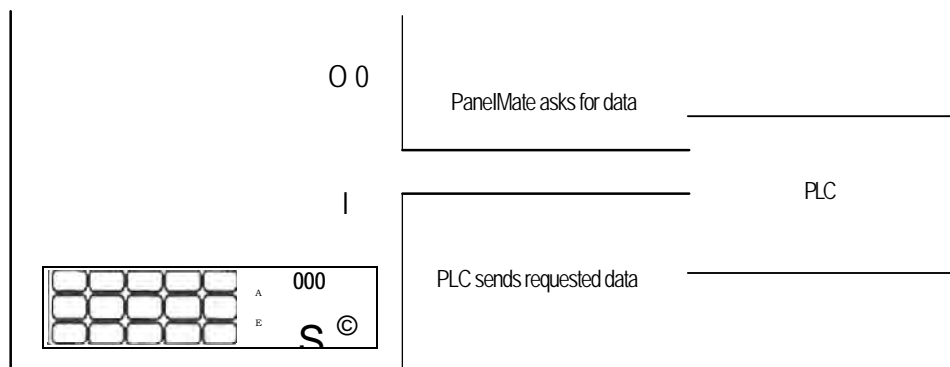


Figure 35-2 PLC Specific Interface

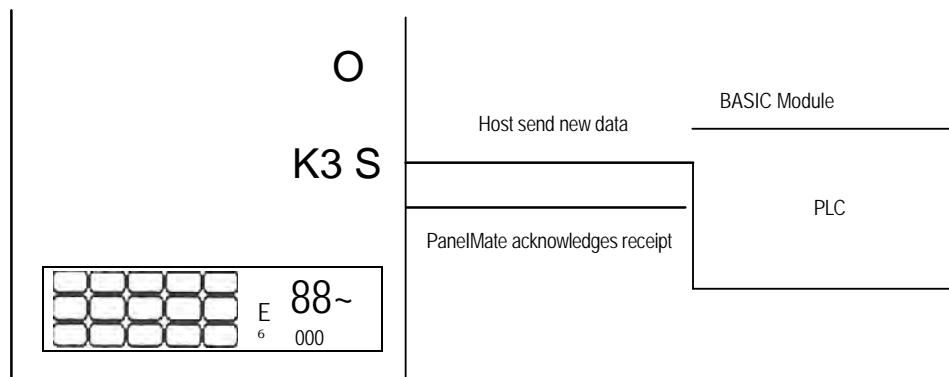


Figure 35-3 Generic Protocol Interface

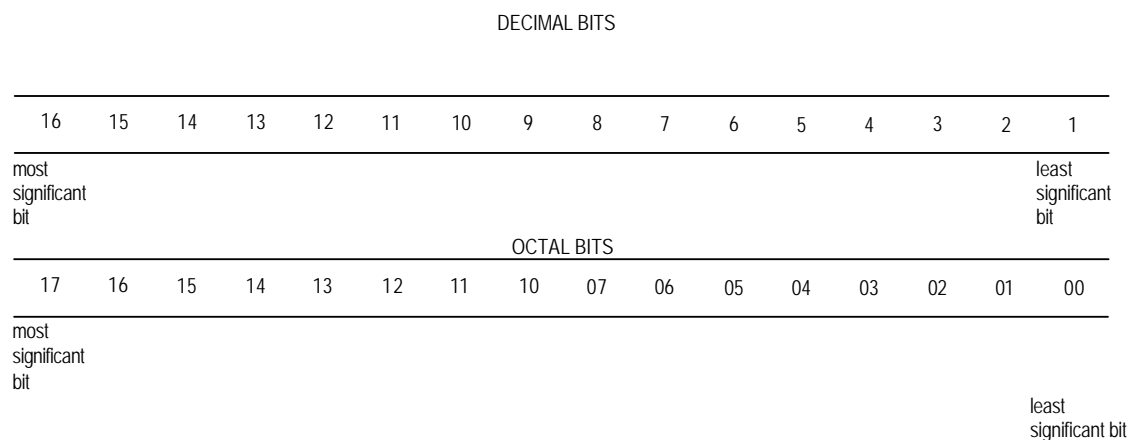
PanelMate Configuration - Octal vs. Decimal

When configuring templates or elements that will be updated using the Generic Protocol, the first decision to make is whether you prefer an octal or decimal addressing system. The PanelMate unit will recognize either one, depending upon a selection you make in the PLC Name and Port Parameters Editor (refer to Chapter 24). Note that the default selection is octal.

By selecting an addressing system, you define the addresses which are valid entries for word and bit references.

A Generic word address is simply a number, like [123]. Note that for decimal systems, the addresses [1] through [65535] are all valid. For octal systems, word addresses may start at [0] and can range up to [177777], but only valid octal numbers may be used. This means that the next address after [7] is [10]. [8] and [9] are not valid.

A Generic bit address is a two-part number consisting of a word number followed by the number of the bit within the word. Bit numbering depends on the selection of decimal or octal, as shown in the following diagram.



Thus, decimal bit addresses range from [1.1] to [1.16], [2.1] to [2.16], and so on up to [65535.16]. Octal bit addresses range from [0.00] to [0.07], [0.10] to [0.17], [1.00] to [1.07], and so on up to [177777.17].

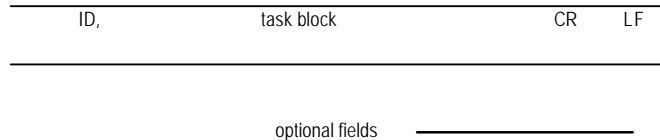
The following diagram summarizes the range of available addresses which can be used for configuration in both decimal and octal versions. Note that address 65535 octal is actually the 27486th consecutive word.

DECIMAL		98		Bit 17		OCTAL	
Bit 16						10 07	
WORD 1				WORD 0			
2				1			
3				2			
4				3			
5				4			
6				5			
7				6			
8				7			
9				10			
10				11			
27485				65534			
27486				65535			
27487				65536			
65534				177776			
65535				177777			

Frames

As was indicated earlier, all transmissions between the host and the PanelMate unit have a common structure, although length and specific content will differ. This common format is called the frame, and it defines how all transmitted messages should begin and end. The Generic Protocol makes it easy for programs written in BASIC to create and send messages, and to detect the beginning and end of incoming messages.

The standard frame for messages in Generic Protocol is shown below:



- The ASCII character ":" (58 dec, 3A hex). This indicates the beginning of a new message.
- ID, The ID# of the PanelMate unit involved in the transmission. This is the Network ID number assigned in the PLC Name and Port Editor. This number can be 1-254. The ID# is sent as one or more ASCII characters and must be followed by a comma (ASCII code 44 dec, 2C hex). Leading zeroes and blanks are allowed. (None will be sent by the PanelMate unit.)
- task block This is the main body of the frame. It contains ASCII numbers, separated by commas, which define the type of operation and any associated data. The task block varies in length.
See the following section, Task Blocks, for specific details.
- CR LF The ASCII character ";" (59 dec, 3B hex). This indicates the end of the transmission.
- The ASCII characters for carriage return (13 dec, OD hex), and line feed (10 dec, OA hex). Neither one or both of these characters (in either order) may be included in frames sent to the PanelMate unit. This means that frames can be sent easily using BASIC's printer commands like PRINT or LPRINT. These trailing characters are ignored by the PanelMate unit.
All frames transmitted by the PanelMate unit include both characters in the order shown.

Task Blocks

The task block defines the specific purpose of the transmission, and must be sent within the frame previously described. The host must create the task block, place it in a frame, and send it to the PanelMate unit. The response from the PanelMate unit will also include a task block within a frame. The formats of the possible task blocks are given below and each starts with a unique "task code".

The following table lists the set of task codes that are available.

Task Code	Description								
4	Host		sends		to				
		4	addr	value1	value2	...	,value60		
					1 to 60	values			
5	Host		requests						
			current page from PanelMate						
		5							
133	Host		requests						
			operator input from PanelMate						
		133							
132	Host		sends		to		and	operator	input
		132	addr	value1	value2	requests	,value60		
				~	1 to 60	...			
						values			
134	Host		requests						
			PanelMate to re-transmit last frame						
		134							
64		Pan	sends	standard acknowledgement to host					
		64	page						

Task Code	Description											
65		PanelMate	send		single-	numeric keypad input to host						
		65	page		addr						value	
66		PanelMate	send		double-	numerical	keypad input to host					
		66	page		addr	value					value	
67		PanelMate	send	control	button	to	host					
		67	page		addr	bit					value	
68	Host transmits ASCII information directly through PanelMate to an attached printer											
		68	Text up to 80 characters									
69	Host	Display Window	Message									
		69	row		,col	fg	bg		,font		bnk	text
70	Host	Display Window	Erase									
		70	row		,col	,fg	bg		,font	bnk	num row	num col

Task Codes

Notes Regarding Register Addresses and Data Values

1. Generic word addresses can range from 0 to 65535 in the PanelMate unit. However, many versions of BASIC interpret values over 32767 as negative. To be compatible, the PanelMate unit will accept address values in the range -32768 to -1, and interpret them as 32768 to 65535. You can also send the numbers 32768 to 65535 directly, if you prefer. When transmitting a word address to the host, the PanelMate unit will always use the numbers -32768 to -1 to represent addresses 32768 to 65535.
2. Register values can be sent as numbers in the range -32768 to 32767 (the minus sign is sent as an ASCII character) to be compatible with most versions of BASIC. You can also send numbers in the range 0 to 65535. The PanelMate unit will accept either. How the value is ultimately interpreted will depend on the data format selected for each configured reference.
3. Values transmitted by the PanelMate unit will always be in the range -32768 to 32767 (the minus sign is sent as an ASCII character). The BASIC module should interpret values in the range -32768 to -1 as 32768 to 65535, if appropriate.

4 - Host Sends Data to PanelMate

Using task code 4, the PLC (host) can transmit from 1 to 60 specific register values to the PanelMate unit.

In response, the PanelMate unit is expected to return a task block containing task code 64.

<div><div>4</div><div>addr</div><div>,values</div><div>,value2</div><div>value60</div></div>		1 to 60 values
4 ,addr	The ASCII character 4 (52 dec, 34 hex). The reference address associated with the first value in the group of values which follow. Addresses of subsequent values in the group are assumed to be sequential. The address may be 0 to 65535, sent in ASCII, and must be preceded by a comma.	
,value	A register value, which can range from -32768 to 32767. From 1 to 60 values may be transmitted in a block. Values are sent in ASCII and are preceded by commas. Leading zeroes and spaces are permitted but not required.	

5 Host Requests Current Page from PanelMate

Using task code 5, the host can ask the PanelMate unit what page is currently being displayed. This task code can also be used by the host to determine if the PanelMate unit is actually online.

In response, the PanelMate unit is expected to return a task block containing task code 64.

<div>5</div>		
5	The ASCII character 5 (53 dec, 35 hex).	

133 - Host Requests Operator Input from PanelMate

Using task code 133, the host can ask the PanelMate unit for any new operator inputs. In response, the PanelMate unit will use one of the following task codes:

- 64 Indicates no new operator inputs are available
- 65 Transmits a single register value
- 66 Transmits a double-precision value
- 67 Transmits an instruction to set or clear a bit

<div>133</div>		
133	The ASCII characters 133.	

132 - Host Sends Data and Requests Operator Input

Using task code 132, the PLC (host) can transmit from 1 to 60 specific register values to the PanelMate unit and expect the unit to return any new operator inputs. In response, the PanelMate unit will use one of the following task codes:

- 64 Indicates no new operator inputs are available
- 65 Transmits a single register value
- 66 Transmits a double-precision value
- 67 Transmits an instruction to set or clear a bit

132	,addr	,value1	,value2	,value60
<hr/>				
1 to 60 values				
The ASCII characters 132.				
132	The reference address associated with the first value in the group of values which follow. Addresses of subsequent values in the group are assumed to be sequential. The address may be 0 to 65535, sent in ASCII, and must be preceded by a comma.			
,addr				
,value	A register value, which can range from -32768 to 32767. From 1 to 60 values may be transmitted in a block. Values are sent in ASCII and are preceded by commas. Leading zeroes and spaces are permitted, but not required.			

134 - Host Requests PanelMate to Re-Transmit Last Frame

Using task code 134, the hosts requests the PanelMate unit to repeat the last frame it has transmitted.

In response, the PanelMate unit will re-transmit its last frame, which will include one of the task codes 64, 65, 66, or 67.

134	
134	The ASCII characters 134.

64 - PanelMate Sends Standard Acknowledgment to Host

Using task code 64, the PanelMate unit indicates to the host that it has successfully received a transmission from the host. As a response to a request for operator input, task code 64 indicates that no new operator inputs are available for transmission.

If the PanelMate unit has not successfully received a transmission from the host, the PanelMate unit will not respond at all.

This task code may be sent by the PanelMate unit as a response to host task codes 4, 5, 132, 133, or 134.

64 page

64	The ASCII characters 64.
,page	The number of the page currently being displayed, sent in ASCII, preceded by a comma. The Alarm Summary Page is page 100 and the Setup Page is page 102.

65 - PanelMate Sends Single-Precision Numeric Keypad Input to Host

Using task code 65, the PanelMate unit sends a single-precision value to the host. This value is the result of the Input Value Expression as defined for a numeric keypad input associated with a template.

This task code may be sent by the PanelMate unit as a response to host task codes 132, 133 or 134.

65	page	,addr	,value
----	------	-------	--------

65	The ASCII characters 65.
,page	The number of the page currently being displayed, sent in ASCII, preceded by a comma. The Alarm Summary Page is page 100 and the Setup Page is page 102.
,addr	The Target Word Address configured for this numerical input point. Only the word address is sent, in ASCII, preceded by a comma.
,value	The result of the associated Input Value Expression. This number is an integer in the range -32768 to 32767 and is sent in ASCII, preceded by a comma.

66 - PanelMate Sends Double-Precision Numeric Keypad Input to Host

Using task code 66, the PanelMate unit sends a double-precision value to the host. This value is the result of the Input Value Expression as defined for a numeric keypad input associated with a template.

This task code may be sent by the PanelMate unit as a response to host task codes 132, 133, or 134.

66	,page	,addr	,value	,value
----	-------	-------	--------	--------

- 66 The ASCII characters 66.
- ,page The number of the page currently being displayed, sent in ASCII, preceded by a comma. The Alarm Summary Page is page 100 and the Setup Page is page 102.
- ,addr The Target Word Address configured for this numerical input point. Only the word address sent, in ASCII, preceded by a comma.
- ,value value The double-precision result of the Input Value Expression is split into two 16-bit register values and transmitted (in ASCII) with the most significant part first. A comma precedes each of the two values, each of which will be in the range -32768 to 32767.

67 - PanelMate Sends Control Button Input to Host

Using task code 67, the PanelMate unit sends an instruction to the host to set or clear a bit that is associated with a control button input by the operator.

Note If you are on the Host Display Window, this task code will return to the number of the page you were on before going to the Host Display Window.

67	page	,addr	,ba	value
----	------	-------	-----	-------

- 67 The ASCII characters 67.
- ,page The number of the page currently being displayed, sent in ASCII, preceded by a comma. The Alarm Summary Page is page 100 and the Setup Page is page 102.
- ,addr The word number portion of the bit address configured for the control button, sent in ASCII, preceded by a comma.
- ,bit The bit number portion of the bit address configured for the control button. Range is 1-16 for decimal systems, 0-17 for octal systems, sent in ASCII, preceded by a comma.
- ,value This will be a one if the bit is to be turned on, or a zero if it is to be turned off. It is sent in ASCII, preceded by a comma.

68 - Host Transmits Data through PanelMate to Printer

Using task code 68, the PanelMate unit users can assign their host devices to transmit ASCII information directly through the PanelMate unit to an attached printer. This operation has no effect on the simultaneous processing of data by the PanelMate unit through its other ports.

68	Text up to 80 characters
68	The ASCII characters 68.
Data	Text up to 80 ASCII characters.

Pass through requests are considered to be equivalent to one line of text on an IBM-compatible printer and are, therefore, limited to 80 characters of text. Since each request is considered one line, no CR LF pair need be embedded in the text. These will be automatically inserted by the PanelMate unit. Note that the optional CR LF pair at the end of the packet is still supported.

Semicolons are not allowed in the ASCII text field since a semicolon is used to delimit the end of the packet. Pass through requests will be handled as an individual line of output, and no coordination of the printer port with alarm routines is performed. If data which could cause an alarm is received by the PanelMate unit through one port while a pass through request is being processed through another port, the alarm data will be processed immediately after the current pass through line is processed. The host is responsible for avoiding this conflict of data transfers.

69 - Host Transmits Message to Host Display Window

Using task code 69, the host can send a text message to the PanelMate unit's host display window. The host display window is an 22 x 66 rectangular area, which is the same size as the 3 x 5 cell matrix area used for templates. The upper left-hand corner of this area is row 0, column 0. The bottom right-hand corner of this area is row 21, column 65. The message will be truncated if larger than the size permitted by the above dimensions. Note that if a message is sent to an out of range row or column location, the message will be displayed on the screen in the wrong location.

69	,row	,fg	,bg	,font	,bnk	,text
69						The ASCII characters 69.
,row						Row number in text area starting at the upper left-hand corner (0-21).
,col						Column number in the text area starting at the upper left-hand corner (0-65).
,fg						Foreground intensity (0-3) or color (0-7) of text message.

Intensifies		Colors	
	No	0	Black
1	Low	1	Red
2	Medium	2	Green
3	High	3	White
		4	Blue
		5	Yellow
		6	Cyan
		7	Magenta

,bg Background intensity (0-3) or color (0-7) of text message.

Intensities		Colors	
	No	0	Black
1	Low		Red
2	Medium	2	Green
3	High	3	White
		4	Blue
		5	Yellow
		6	Cyan
		7	Magenta

,font Font type (0-3).

Font Types	
0	Normal
1	Graphics
2	Double High
	Quad

,bnk Blinking area attribute (0 = no blink, 1 = blink).

,text Message to display

70 - Erase Rectangular Section of Host Display Window

Using task code 70, any rectangular block may be erased. The erase can be in any color, and can be requested to blink.

70	,row	fg	bg	,font	,bnk	,num row	,num col
----	------	----	----	-------	------	----------	----------

70 The ASCII characters 70.

,row Row number in text area starting in the upper left-hand corner (0-21).

,col Column number in text area starting in the upper left-hand corner (0-65).

,fg Must be 0.

,bg Color of block after erase (0-3).

Intensities		Colors	
	No	0	Black
1	Low	1	Red
2	Medium	2	Green
3	High	3	White
		4	Blue
		5	Yellow
		6	Cyan
			Magenta

,font	Must be 0.
,bnk	Blinking area attribute (0 = no blink, 1 = blink).
,num row	Number of rows to erase.
,num col	Number of columns to erase.

The row and column fields, along with the number of rows and columns field, define a rectangular area starting at the row and column values.

Block Check Calculation

The Block Check Calculation (BCC) is not supported in this software version. Contact the Eaton IDT Customer Support at (614) 882-3282 if further information is desired.

PLC Name and Port Parameters Editor

You must be sure to configure the PLC Name and Port Parameter appropriately for the mode of the Generic Protocol you wish to use. Refer to Chapter 9 for details on entering your selections in this editor.

In the Port Parameter Table, the port "Use" field should be set to Generic. Be sure to set the three format selections in the Format for Generic Protocol section to reflect your choice of Type (octal or decimal numbering) and whether you expect the PanelMate unit ID# to be included with each frame (Y or N).

Note BCC is not supported in this software version.

When using the Generic Protocol and only one host, the PLC Name Table should be filled in as follows:

1. For Item #1, enter any name in the PLC Name field. 2.

Set the ID# to 0.

3. Select the Port# you have defined as GENERIC. 4.

Open and close the Default PLC Name field once.

Note If an ID of 0 is selected, the PanelMate unit will not return the ID number in its task code command packets.

The Screen, Message and Alarm Scan delay fields are not applicable to Generic Protocol implementations.

Checking the Communication Link

The integrity of the communication link to PanelMate unit can be monitored by the host or PLC in three ways:

1. Continual polling of the PanelMate unit for operator input (either task code 132 or 133). Receipt of any response from the PanelMate unit verifies that both units and the link are functioning.
2. Monitoring of the PanelMate unit's fault relay contact. An energized contact indicates that the PanelMate unit is operating correctly.
For Generic Protocol, there is a three second timeout period which starts whenever an operator input is ready to be transmitted. If the host has not polled the PanelMate unit (task code 132 or 133) within three seconds of the input, the PanelMate unit will de-energize its fault relay and report a communications error.
3. Monitoring the number of times that a message must be sent before it is properly received by the PanelMate unit. If the host needs to re-send messages frequently, this would indicate a poor communication link, probably due to noise interference.

Generic Protocol Driver Development

Overview

This section provides information about the typical development steps which are necessary to communicate with the PanelMate unit, using the Generic Protocol. Also included are numerous example programs written in BASIC, which illustrate the techniques discussed within this chapter. At the end of this section, these example programs are combined into a complete program for use when communicating with the PanelMate unit using the Generic Protocol.

The typical development path is outlined in the following steps. The remainder of this section follows this same outline.

1. Establish a communications link
 - a. Select Generic Protocol on the PanelMate unit.
 - b. Construct and connect serial cable(s).
 - c. Simulate Generic Protocol on the host device.
2. Implement Generic Protocol frames
 - a. Write subroutine to send frame.
 - b. Write subroutine to receive frame.
3. Communications using task blocks
 - a. Build task blocks to send data.
 - b. Interpret task blocks received.
4. Main program functions
 - a. Update the PanelMate unit with data.
 - b. Receive operator entries from the PanelMate unit

Establish Communication Link

Before attempting to write a Generic Protocol driver, verify that the connecting cables and communication parameters are correct. This can be accomplished by sending a communications request from the host to the PanelMate unit. A sample routine to accomplish this is included at the end of this section.

Select Generic Protocol on PanelMate

Note All system configurations should be backed-up to an IBM PC before clearing memory. Clearing memory causes the PanelMate unit to reset all of its memory.

To configure a PanelMate unit's port for Generic Protocol, use the PLC Name and Port Editor to complete the configuration.

Communication parameters set at the host are generally selected using hardware switches, software calls, or a combination of the two. Since each device may handle these parameters differently, it is recommended to consult the host users manual.

Connect Serial Cable

A PanelMate unit's communications cable must be constructed. The following figures show the pinouts for the PanelMate unit's serial ports.

RS232C Pin Assignments PanelMate Serial Ports		RS422 Pin Assignments PanelMate Serial Ports	
2	RxD	9	RD (-)
3	TO	4	RD (+)
	GND		GND
5	Shield	5	TD (+)
Hood		1	TD (-)
		6	TD (-)
			Shield
		Hood	

Figure 35-5 RS232/422 Pinouts

Simulate Generic Protocol on Host

In order to communicate with the PanelMate unit, it is necessary to program the host to send messages to the PanelMate unit which, in turn, will send messages back to the host. In the following example, the host sends a message to the PanelMate unit asking for the current PanelMate unit page number. The PanelMate unit responds by sending a standard acknowledgment to the host, which includes the page number.

The following routine written in BASIC, illustrates how the page number of a PanelMate unit might be read. The comments include an outline (lines 30, 35 and 40) of software initialization calls (which are not detailed here) that might be required by a device. When the program is run, it should return "0,64,1,-65," provided the PanelMate unit is displaying page one. Note that in line 55, the PanelMate unit has been assigned an optional ID# of 35. Successful implementation of this program establishes that the communication link from the host to the PanelMate unit is working.

```
10      REM      Program to test communication link
15      REM      to PanelMate unit by reading the current
20      REM      PanelMate unit screen displayed
25      REM
30      REM      Reset the port - clear the input/output
35      REM      Buffers
40      REM      Set baud rate, stop bits, and parity
45      REM
50      REM      Send request for page #
55      PRINT    ":35,5,-40,"
60      REM
65      REM      Receive response
70      LINE     INPUT BUF$
75      LPRINT   BUF$
80      END
```

Implement Generic Protocol Frames

In the previous example program, a fixed format message was sent to the PanelMate unit to test the cabling and communication parameters. In practice, fixed format messages are rarely used since variable data is normally transmitted. Therefore, it is useful to write subroutines to send and receive data packets using the format required by the Generic Protocol. The format, commonly called a frame, is shown and described earlier in this chapter. All data sent and received using the Generic Protocol must use this format.

Send a Frame

The following routine, written in BASIC, sends a Generic Protocol frame with a unit ID, BCC, and _trailing carriage return/line feed. Assume that the following variables are initialized with the appropriate values.

IDNUM%	The ID number of the PanelMate unit being sent.
TASK%[]	An array of values to be sent as the task block (1 to 62 numbers long).
TASKLEN%	The number of values to send as the task block (1 to 62).

```
300      REM      Subroutine to send a frame
320      LOOPCNT% = 0
330      PRINT
340      PRINT      IDNUM%,
350      IF LOOPCNT% >= TASKLEN% GOTO 410
370      PRINT
380      PRINT      TASK%[LOOPCNT%]
390      LOOPCNT% = LOOPCNT% + 1
400      GOTO      350
410      PRINT
440      PRINT      "
450      RETURN
```

Receive a Frame

The following routine, written in BASIC, receives a Generic Protocol frame with a unit ID. The following variables are returned from the subroutine.

TASK%[]	An array of values containing the task block received (1 to 62 numbers long).
TASKLEN%:	The number of values received (1 to 62).

```

500      REM          Get a character or timeout
510      TIMEOUT% = 0
520      CH% = INKEY%( )
530      IF CH%<> 0 THEN RETURN
540      IF TIMEOUT%>= 800 THEN RETURN

550      TIMEOUT% = TIMEOUT% + 1
560      GOTO      520

600      REM          Get a number from the PanelMate unit 610
          NUM% = 0

620      NEG% = 1 :REM number is positive (-1 for negative) 625
          FIRST%=1

630      GOSUB      500

640      IF CH% = 45 THEN NEG% = -NEG% : GOTO 630
650      IF CH%>57 OR CH%<48 THEN GOTO 680

660      NUM% = (NUM%*10) + CH% - 48

670      GOTO      630

680      NUM% = NUM% * NEG%

690      RETURN

700      REM          Get a packet
710      TASKLEN% = 0:FIRST% = 1

720      GOSUB      500

730      IF CH% = 0 THEN RETURN
740      IF CH%<>58 THEN GOTO 720

760      GOSUB 600

770      IF CH% = 0 THEN RETURN
780      IF CH%<>44 AND CH%<>59 THEN GOTO 760

800      IF FIRST% = 1 THEN FIRST% = 0: GOTO 760

810      TASK%[TASKLEN%] = NUM%
820      TASKLEN% = TASKLEN% + 1

830      IF CH%<>59 THEN GOTO 760
840      TASKLEN% = TASKLEN% - 1

860      LPRINT "CHECK SUM ERROR"
870      TASKLEN% = 0

880      RETURN

```

The following example routine should print 64 and 1, repeatedly, when run.

```
1000      REM      Program tests send/receive
1010      IDNUM% = 35
1020      TASK%[0] = 5
1030      TASKLEN% = 1
1040      GOSUB 300
1050      GOSUB 700
1060      IF CH% = 0 THEN LPRINT "ERROR" 1070
          X% = 0
1080      IF X% > + TASKLEN% THEN GOTO 1120
1090      LPRINT TASK%[X%];
1100      X% = X% + 1
1110      GOTO 1080
1120      LPRINT
1130      GOTO 1000
1140      END
```

Communications Using Task Blocks

Using the routines provided in the previous sections, the Generic Protocol driver can be completed by building task blocks to contain the data to be transferred, and for periodically polling the PanelMate unit for operator entries.

Subroutines, written in BASIC, which may be used to view the operation of each task code, are contained in the following sections.

Task Code 4

The following subroutine builds and transmits a task 4 block. The following variables must be set prior to calling the subroutine.

ADDR%	The reference address associated with the first value being sent to the PanelMate unit.
DADDR%	The address in the PLC of the first value to send to the PanelMate unit.
DLEN%	The number of values to send to the PanelMate unit (1-62).

```
2000    REM      Host sends data to PanelMate unit
2010    TASK-/. [O] = 4
2020    TASK%[1] = ADDR%
2030    REM      Set up data
2040    REM      Load TASK%[2] thru TASK%[DLEN% +2]
2050    REM      with data from PLC at DADDR% (*See comment)
2060    TASKLEN% = DLEN% + 2
2070    REM      Send packet from example #2
2080    GOSUB    300
2090    RETURN
```

*The manner in which host data is read is typically machine-specific.

Task Code 5

The following subroutine builds and transmits a task 5 block. There are no variables which need to be set prior to calling the subroutine.

```
3000    REM      Host requests current page from PanelMate unit 3010
3010    TASK-/. [O] = 5
3020    TASKLEN% = 1
3030    GOSUB    300
3040    RETURN
```

Task Code 133

The following subroutine builds and transmits a task 133 block. There are no variables which need to be set prior to calling the subroutine.

```
4000    REM      Host requests operator input from PanelMate Compact
4010    TASK%[0] = 133 4020
4030    TASKLEN% = 1 4030 GOSUB
4040    RETURN
```

Task Code 132

The following subroutine builds and transmits a task 132 block. The following variables must be set prior to calling the subroutine.

ADDR%	The reference address associated with the print value being sent to the PanelMate unit.
DADDR%	The address in the host of the first value to send to the PanelMate unit.
DLEN%	The number of values to send to the PanelMate unit (1-62).

```
5000    REM      Host sends data to the PanelMate unit
5005    REM      and requests operator inputs
5010    TASK%/[O] = 132
5020    TASK%[1] = ADDR%
5030    REM      Set up data
5040    REM      Load TASK%[2] thru TASK%[DLEN% + 2]
5050    REM      With data from the PLC* at DADDR%
5060    TASKLEN% = DLEN% + 2
5070    REM Send packet from example #2
5080    GOSUB     300
5090    RETURN
```

*The manner in which PLC data is read is typically very machine-specific.

Task Code 134

The following subroutine builds and transmits a task 134 block. There are no variables which need to be set prior to calling the subroutines.

```
6000    REM      Host requests the PanelMate unit to re-transmit host frame
6010    TASK%[0] = 134 6020
TASKLEN% = 1 6030 GOSUB
300 6040 RETURN
```

Interpret Task Blocks Received - 64, 65, 66 and 67

The following task blocks may be received by the host in response to an initial transmission to the PanelMate unit. Task codes 65, 66 and 67 are only received after the host issues a request for operator entries. The most direct way to receive the PanelMate unit response task blocks is to handle all the possible packets in one routine. Therefore, the following subroutine interprets task blocks 64, 65, 66 and 67.

```
7000      REM          Interpret received packets
7010      GOSUB          700
7020      IF CH% = 0 THEN RETURN
7100      IF TASK%/. [0] = 64 THEN RETURN
7200      IF TASK%[0] <> 65 THEN GOTO 7300
7210      REM          Write TASK%[3] to register at TASK%[2] 7220
          RETURN
7300      IF TASK%[0] <> 66 THEN GOTO 7400
7310      REM          Write TASK%[3] to register at TASK%[2] and
7320      REM          write TASK%[4] to register at TASK%[2] + 1
7330      RETURN
7400      IF TASK%[0] <> 67 THEN GOTO 7500
7410      IF TASK%[4] = 0 THEN GOTO 7450
7420      REM          SET bit at word number TASK%[2]
7430      REM          bit number TASK%[3] (0-15) to ON
7440      RETURN
7450      REM          SET bit at word number TASK%[2]
7460      REM          bit number TASK%[3] (0-15) to OFF 7470
          RETURN
7500      LPRINT "BAD TASK CODE!" RETURN
```

Main Program Functions

Using the previously described subroutines to send and receive the Generic Protocol packets, a simple loop can be written to communicate data between the host and the PanelMate unit. The following program example continually updates the PanelMate unit with words 100 through 109, and then processes any operator entries. Similarly, other words could be sent to the PanelMate unit by adding more calls. Care should be taken to read each PanelMate unit response after each host transmission.

```

9000      REM      Main program (addresses used are examples)
9010      ADDR% = 100: REM Send to the PanelMate unit register 100

9020      DADDR% = 100: REM Send 10 registers (100-109)

9040      GOSUB      5000: REM Send packet, allow response
9050      GOSUB      7000: REM Process input packet

9060      IF CH% = 0 THEN LPRINT "NO RESPONSE!"
9070      GOTO      9000: REM Send/receive forever 10000

      END
```

Examples

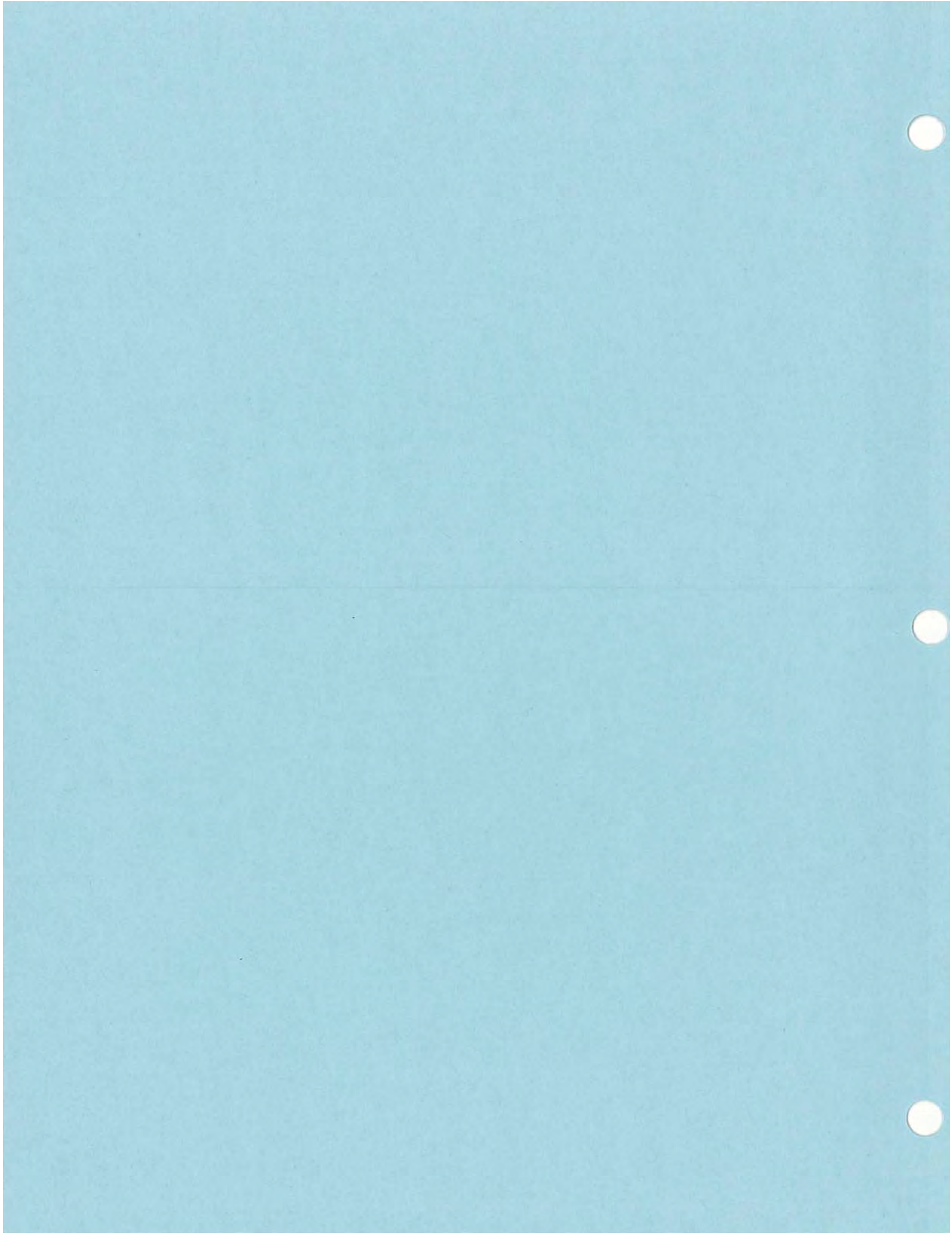
The following are examples of valid PLC references which may be assigned in the PanelMate unit expression fields.

<u>Word References</u>	
<u>Reference</u>	<u>Description</u>
Word 1	
[1	
[123]	Word 123
[65535]	Word 65535
[0]	Word 0
[77]	Word 77
[177777]	Word 177777
 <u>Bit</u>	
<u>References</u>	<u>Description</u>
<u>Reference</u>	Word 1 bit 8 Word
[1.8]	123 bit 14 Word
[123.14]	65535 bit 27 Word 0
[65535.27]	bit 7 Word 77 bit 14
[0.7]	Word 1777777 bit 27
[77.14]	
[1777777.27]	

0

0

0



Chapter 36

Mitsubishi PLCs

The PanelMate Series can be used with programmable controllers in the Mitsubishi Standard A Series (AOJ2H, AI, A1 N, A1 S, A2, A2N, A3, AN, A3H, A3M, and A73), Extended A Series (A2A, A2A(S1) and A3A), FX Series (FX-16, FX-24, FX-32, FX-48, FX-64, and FX-80), and the FXo Series (FXo-14, FXo-20, and FXo-30). Communication to the A Series PLCs will be through the AJ71C24 Computer Link Module. Communication to the FX and FXo Series will be through an RS232/RS422 converter. Communication to the FXo Series will be through the FX-20P-CADP Universal Adaptor.

Memory

The following memory types are supported by the Mitsubishi A Series driver:

<u>Memory Type</u>	<u>Memory Areas</u>
16-Bit Word	
TN	Timer (present value) Register
CN	Counter (present value) Register Data
D W	Register
R D	Link Register File
Bit	Register Special
X Y	Register
M L	
S B	Input Relay device Output
F M	Relay device Internal Relay
TS	device Latch Relay device
TC	Step Relay device Link
CS	Relay device Annunciator
CC	device Special Relay device
	Timer (contact) device Timer
	(coil) device Counter
	(contact) device Counter
	(coil) device

The following memory types are supported by the Mitsubishi FX and FXo Series driver:

<u>Memory Type</u>	<u>Memory Areas</u>
16-Bit Word	
TN	Timer (present value) Register
CN	Counter (present value) Register (16-Bit)
CN	Counter (present value) Register (32-Bit)
D	Data Register
D	Special Register
Bit	
X Y	Input Relay device Output
M M	Relay device Auxiliary
S TS	Relay device Special
TC	Relay device State device
CS	Timer (contact) device Timer
CC	(coil) device Counter
	(contact) device Counter
	(coil) device

Mitsubishi A Series Memory Ranges

The following tables show the word device types supported by the Mitsubishi A Series driver. Link Register addresses are hexadecimal. All other addresses are decimal. These memory types can be referenced as a single bit or 16-bit word.

Model	Timer (Present Value) Register	Counter (Present Value) Register	Data Register
AOJ2H	TN0000-TN0255	CN0000-CN0255	D0000-D1023
AI	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A1N	TN0000-TN0255	CN0000-CN0255	D0000-D1023
AIS	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A2	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A2N	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A3	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A3N	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A3H	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A3M	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A73	TN0000-TN0255	CN0000-CN0255	D0000-D1023
A2A	TN000000-TN002047	CN000000-CN001023	D000000-DO06143
A2A (S1)	TN000000-TN002047	CN000000-CN001023	D000000-DO06143
A3A	TN000000-TN002047	CN000000-CN001023	D000000-DO06143

Note Timer and counter registers are read only.

Model	Link Register	File Register	Special Register
AOJ2H	W0000-W03FF	R0000-R8191	D9000-D9255
AI	W0000-W03FF	Not Supported	D9000-D9255
AI N	W0000-W03FF	Not Supported	D9000-D9255
A1S	W0000-W03FF	R0000-R4095	D9000-D9255
A2	W0000-W03FF	R0000-R4095	D9000-D9255
A2N	W0000-W03FF	R0000-R4095	D9000-D9255
A3	W0000-W03FF	R0000-R8191	D9000-D9255
A3N	W0000-W03FF	R0000-R8191	D9000-D9255
A3H	W0000-W03FF	R0000-R8191	D9000-D9255
A3M	W0000-W03FF	R0000-R8191	D9000-D9255
A73	W0000-W03FF	R0000-R8191	D9000-D9255
A2A	W000000-W000FFF	R000000-R008191	D009000-DO09255
A2A (S1)	W000000-W000FFF	R000000-R008191	D009000-DO09255
A3A	W000000-W000FFF	R000000-R008191	D009000-DO09255

Note Special registers are read only.

The following tables show the bit device types supported by the Mitsubishi A Series driver. Input, Output, and Link Relay addresses are hexadecimal. All other addresses are decimal. These memory types can be referenced as a single bit or 16-bit word.

Model	Input Device	Output Device	Internal Relay Device
AOJ2H	X0000-X01FF	Y0000-Y01FF	M0000-M2047
AI	X0000-X00FF	Y0000-Y00FF	M0000-M2047
AIN	X0000-X00FF	Y0000-Y00FF	M0000-M2047
AIS	X0000-X00FF	Y0000-Y00FF	M0000-M2047
A2	X0000-X01FF	Y0000-Y01FF	M0000-M2047
A2N	X0000-X01FF	Y0000-Y01FF	M0000-M2047
A3	X0000-X07FF	Y0000-Y07FF	M0000-M2047
A3N	X0000-X07FF	Y0000-Y07FF	M0000-M2047
A3H	X0000-X07FF	Y0000-Y07FF	M0000-M2047
A3M	X0000-X07FF	Y0000-Y07FF	M0000-M2047
A73	X0000-X07FF	Y0000-Y07FF	M0000-M2047
A2A	X000000-X0001FF	Y000000-Y0001FF	M000000-M008191
A2A (S1)	X000000-X0003FF	Y000000-Y0003FF	M000000-M008191
A3A	X000000-X0007FF	Y000000-Y0007FF	M000000-M008191

Note Input devices are read only.

Model	Latch Relay	Step Device	Link Relay Device
AOJ2H	L0000-L2047	S0000-S2047	B0000-B03FF
AI	L0000-L2047	S0000-S2047	B0000-B03FF
A1N	L0000-L2047	S0000-S2047	B0000-B03FF
AIS	L0000-L2047	S0000-S2047	B0000-B03FF
A2	L0000-L2047	S0000-S2047	B0000-B03FF
A2N	L0000-L2047	S0000-S2047	B0000-B03FF
A3	L0000-L2047	S0000-S2047	B0000-B03FF
A3N	L0000-L2047	S0000-S2047	B0000-B03FF
A3H	L0000-L2047	S0000-S2047	B0000-B03FF
A3M	L0000-L2047	S0000-S2047	B0000-B03FF
A73	L0000-L2047	S0000-S2047	130000-1303FF
A2A	L000000-L008191	S000000-S008191	B000000-B000FFF
A2A (S1)	L000000-L008191	S000000-S008191	B000000-B000FFF
A3A	L000000-L008191	S000000-S008191	B000000-B000FFF

Model	Annunciator Device	Special Relay Device	Timer (Contact) Device
AOJ2H	F0000-FO255	M9008-M9247	TS0000-TS0255
AI	F0000-FO255	M9008-M9247	TS0000-TS0255
AI N	F0000-FO255	M9008-M9247	TS0000-TS0255
AI S	F0000-FO255	M9008-M9247	TS0000-TS0255
A2	F0000-FO255	M9008-M9247	TS0000-TS0255
A2N	F0000-FO255	M9008-M9247	TS0000-TS0255
A3	F0000-FO255	M9008-M9247	TS0000-TS0255
A3N	F0000-FO255	M9008-M9247	TS0000-TS0255
AV	F0000-FO255	M9008-M9247	TS0000-TS0255
A3M	F0000-FO255	M9008-M9247	TS0000-TS0255
A73	F0000-FO255	M9008-M9247	TS0000-TS0255
A2A	F000000-F002047	M009000-M009255	TS000000-TS002047
A2A (S1)	F000000-F002047	M009000-M009255	TS000000-TS002047
A3A	F000000-F002047	M009000-M009255	TS000000-TS002047

Note Special relay devices are read only.

Special relay devices M9000-M9007 and M9248-M9255 cannot be read directly by the PanelMate unit for the models shown. However, ladder logic could be written to set and clear readable devices, such as link relay devices based on the status of these specific bits. The PanelMate unit could then reference the readable devices.

Model	Timer (Coil) Device	Counter (Contact) Device	Contact (Coil) Device
AOJ2H	T00000-TC0255	CS0000-CS0255	000000-CC0255
AI	T00000-TC0255	CS0000-CS0255	000000-CC0255
AI N	T00000-TC0255	CS0000-CS0255	000000-CC0255
AI S	T00000-TC0255	CS0000-CS0255	000000-CC0255
A2	T00000-TC0255	CS0000-CS0255	000000-CC0255
A2N	TC0000-TC0255	CS0000-CS0255	000000-CC0255
A3	T00000-TC0255	CS0000-CS0255	000000-CC0255
AN	T00000-TC0255	CS0000-CS0255	000000-CC0255
A3H	T00000-TC0255	CS0000-CS0255	000000-CC0255
A3M	T00000-TC0255	CS0000-CS0255	000000-CC0255
A73	T00000-TC0255	CS0000-CS0255	000000-000255
A2A	TC000000-T0002047	CS000000-CS001023	00000000-CC001023
A2A (S1)	T0000000-T0002047	CS000000-CS001023	00000000-CC001023
A3A	T0000000-T0002047	CS000000-CS001023	00000000-CC001023

HN'Is -Aohi FX Series Memory Ranges

The following tables show the word device types supported by the Mitsubishi FX Series driver. All addresses are decimal. These memory types can be referenced as a single bit or 16-bit words unless otherwise noted.

Model	Timer (Present Value) Register	Counter (Present Value) Register	Data Register	Special Register
FX-16	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255
FX-24	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255
FX-32	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255
FX-48	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255
FX-64	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255
FX-80	TN000-TN255	CN000-CN199 (16-bit) CN200-CN255 (32-bit)	D000-D511	D8000-D8255

Note The following Special Registers are read only.

D8001-D8012
D8028-D8029
D8040-D8067
D8069-D8070

Note Data Registers using bit references are read only.

The following tables show the bit device types supported by the Mitsubishi FX Series driver. Input Relay and Output Relay addresses are octal. All other addresses are decimal. These memory types can be referenced as a single bit or 16-bit word (must be a multiple of 16).

Model	Input Relay Device	Output Relay Device	Auxiliary Device
FX-16	X000-X177	Y000-Y177	M0000-M1023
FX-24	X000-X177	Y000-Y177	M0000-M1023
FX-32	X000-X177	Y000-Y177	M0000-M1023
FX-48	X000-X177	Y000-Y177	M0000-M1023
FX-64	X000-X177	Y000-Y177	M0000-M1023
FX-80	X000-X177	Y000-Y177	M0000-M1023

Note Input Relay Devices are read only.

Model	Special Relay Device	State Device	Timer (Contact) Device
FX-16	M8000-M8255	S000-S999	TS000-TS255
FX-24	M8000-M8255	S000-S999	TS000-TS255
FX-32	M8000-M8255	S000-S999	TS000-TS255
FX-48	M8000-M8255	S000-S999	TS000-TS255
FX-64	M8000-M8255	S000-S999	TS000-TS255
FX-80	M8000-M8255	S000-S999	TS000-TS255

Note The following Special Relay Devices are read only.

M8000-M8014
M8020-M8021
M8029 M8046
M8048 M8060-
M8067 M8072-
M8073

Note Word writes to State Device S992 are not allowed.

Model	Timer (Coil) Device	Counter (Contact) Device	Counter (Coil) Device
FX-16	T0000-TC255	CS000-CS255	00000-CC255
FX-24	T0000-TC255	CS000-CS255	00000-CC255
FX-32	T0000-TC255	CS000-CS255	00000-CC255
FX-48	T0000-TC255	CS000-CS255	00000-CC255
FX-64	T0000-TC255	CS000-CS255	CC000-CC255
FX-80	i C000-TC255	CS000-CS255	CC000-CC255

Mitsubishi FXo Series Memory Ranges

The following tables show the word device types supported by the Mitsubishi FXo Series driver. All addresses are decimal. These memory types can be referenced as a single bit or 16-bit words unless otherwise noted.

Model	Timer (Present Value) Register	Counter (Present Value) Register	Data Register	Special Register
FXo-14	TNOO-TN55	CNOO-CN15 (16-bit) CN235-CN249 (32-bit) CN251-CN254 (32-bit)	D00-D31	D8000-D8069
FXo-20	TNOO-TN55	CNOO-CN15 (16-bit) CN235-CN249 (32-bit) CN251 -CN254 (32-bit)	D00-D31	D8000-D8069
FXo-30	TNOO-TN55	CNOO-CN15 (16-bit) CN235-CN249 (32-bit) CN251-CN254 (32-bit)	D00-D31	D8000-D8069

Note The following Special Registers are read only.

D8001-D8013
D8028-D8029
D8040-D8067
D8069

The following tables show the bit device types supported by the Mitsubishi FXo Series driver. Input Relay and Output Relay addresses are octal. All other addresses are decimal. These memory types can be referenced as a single bit or 16-bit word (must be a multiple of 16).

Model	Input Relay Device	Output Relay Device	Auxiliary Device
FXo-14	X00-X17	Y00-Y15	M000-M511
FXo-20	X00-X17	Y00-Y15	M000-M511
FXo-24	X00-X17	Y00-Y15	M000-M511

Note Input Relay Devices are read only.

Note Word writes to Output Relay Device YO are not allowed.

Model	Special Relay Device	State Device	Timer (Contact) Device
FXo-14	M8000-M8254	S00-S63	TS00-TS55
FXo-20	M8000-M8254	S00-S63	TS00-TS55
FXo-30	M8000-M8254	S00-S63	TS00-TS55

Note The following Special Relay Devices are read only.

M8000-M8022
M8029 M8061
M8065-M8067
M8246-M8254

Note Word writes to Timer (Contact) Device TS48 are not allowed.

Model	Timer (Coil) Device	Counter (Contact) Device	Counter (Coil) Device
FXo-14	TCOO-TC55	CS00-CS15 CS235-CS249 CS251-CS254	CC00-CC15 CC235-CC249 CC251-CC254
FXo-20	TCOO-TC55	CS00-CS15 CS235-CS249 CS251-CS254	CC00-CC15 CC235-CC249 CC251-CC254
FXo-30	TCOO-TC55	CS00-CS15 CS235-CS249 CS251-CS254	CC00-CC15 CC235-CC249 CC251-CC254

Note Word writes to Timer (Coil) Device TC48 are not allowed.

Note Word writes to Counter (Contact) Devices CS240 are not allowed.

Note Word writes to Counter (Coil) Devices CC240 are not allowed.

Possible Configurations

The following sections describe some of the possible configurations of the PanelMate unit with Mitsubishi PLCs. Network to network communication is not supported by the Mitsubishi driver.

Direct

Direct connection between a PanelMate unit and a Mitsubishi A Series processor.

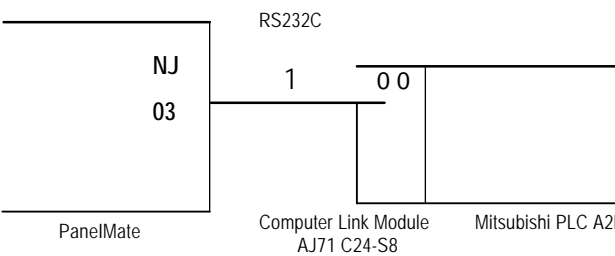


Figure 36-1 Direct Connection

Direct connection between a PanelMate unit and a Mitsubishi FX Series processor.

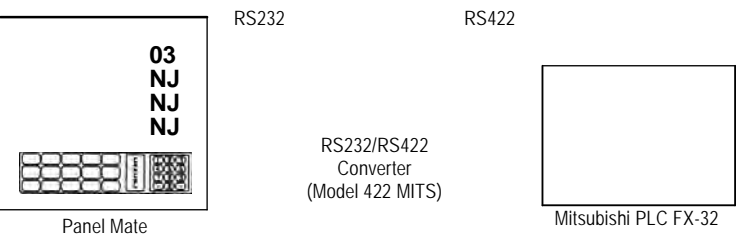


Figure 36-2 Direct Connection

Note An RS422 cable is required. For pinout information, refer to figure 36-7.

Direct connection between a PanelMate unit and a Mitsubishi FXo Series processor.

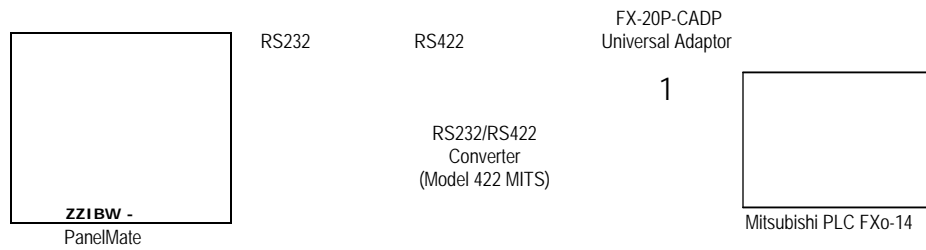


Figure 36.3 Direct Connection

Note An RS422 cable is required. For pinout information, refer to figure 36-7.

Network (Mitsubishi A Series only)

The following figure shows a network consisting of three devices and a PanelMate unit.

Note You could also use RS422 cabling to connect the PanelMate unit to the Mitsubishi A Series PLC.

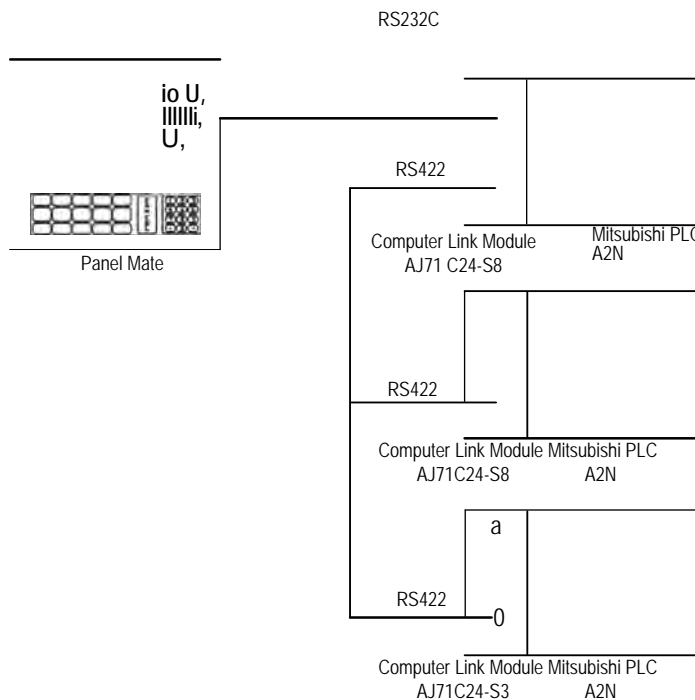


Figure 36-4 Network Connection

Cabling

The following figures show the cable configuration between a PanelMate unit and the AJ71 C24 module for the Mitsubishi A Series PLCs. The Mitsubishi A Series driver supports RS232C and RS422 communications. The maximum cable length when using RS232 is 50 feet, while the maximum cable length for RS422 is 4000 feet. RS422 cable must be a twisted double-wire shielded cable. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

<u>PanelMate</u> <u>(Male) 9-Pin</u>	<u>AJ71 C24</u> <u>(Male) 25-Pin</u>
2 RX 3	2 TX
TX 5	3 RX 4
SG 7	RTS 5
RTS 8	CTS 6
CTS	DSR 7
	SG 8 CD
	20 DTR

Figure 36-5 RS232 Cabling for AJ71 C24 Module (Mitsubishi A Series)

<u>PanelMate</u> <u>(Male) 9-Pin</u>	<u>AJ71 C24 (Male)</u> <u>25-Pin</u>
1 TX+ ® SDA	SDB
4 RX+ ® RDA	
5 SG ® RDB	
6 TX- ® SG	
9 RX- ® FG	

Figure 36-6 RS422 Cabling for AJ71 C24 Module (Mitsubishi A Series)

The Mitsubishi FX and FXo Series requires an RS232/RS422 converter to communicate with the PanelMate Series. The following figures show the cable configuration between a PanelMate unit and the RS232/RS422 converter for the Mitsubishi FX and FXo Series PLCs. Note that the Mitsubishi FXo Series has a built-in non-standard port which communicates RS422. To communicate to the PanelMate Series, you must also use an FX-20P-CADP Universal Adaptor which converts the port to a 25-pin port. The maximum cable length when using RS232 is 50 feet, while the maximum cable length for RS422 is 4000 feet. RS422 cable must be a twisted double-wire shielded cable. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

PanelMate (Male) 9-Pin	RS232 side of Converter (Male) 25-Pin			RS422 side of Converter (Female) 25-Pin	Mitsubishi FX Series (Male) 25-Pin
2	3	R	R	2	2
3	2	S	S	3	3
5	7	2	4	4	17
8	5	3	2	5	5
7	4	2	2	15	15
RS232/RS422 Converter Model 422 MITS				16	16
				17	4
				18	18
				20	20
				20	20

Figure 36-7 RS232/RS422 Converter Cabling for the Mitsubishi FX Series PLCs

PanelMate (Male) 9-Pin	RS232 side of Converter			RS422 side of Converter 25-Pin	Mitsubishi FXo Series (Male) 25-Pin
2	3	R	R	2	2
3	2	S	S	3	3
5	7	2	4	4	17
8	5	3	2	15	15
7	4	2	2	16	16
RS232/RS422 Converter Model 422 MITS				17	4
				20	20
				20	20

Figure 36-8 RS232/RS422 Converter Cabling for the Mitsubishi FXo Series PLCs

Communications Parameters

The standard communications parameters for communicating to Mitsubishi A Series PLCs are:

Baud rate	300 through 19200
Data bits	8
Parity	Even
Stop bits	1

Note The settings for parameters, such as baud rate, must match the parameters set for the PanelMate unit

The standard communications parameters for communicating to Mitsubishi FX and FXo Series PLCs are:

Baud rate	9600
Data bits	7
Parity	Even
Stop bits	1

AJ71C24 Computer Link Module

The AJ71 C24 module is the interface between the PanelMate unit and the Mitsubishi PI-Cs. It has one RS232C and one RS422 port. Refer to the following tables for configuration information.

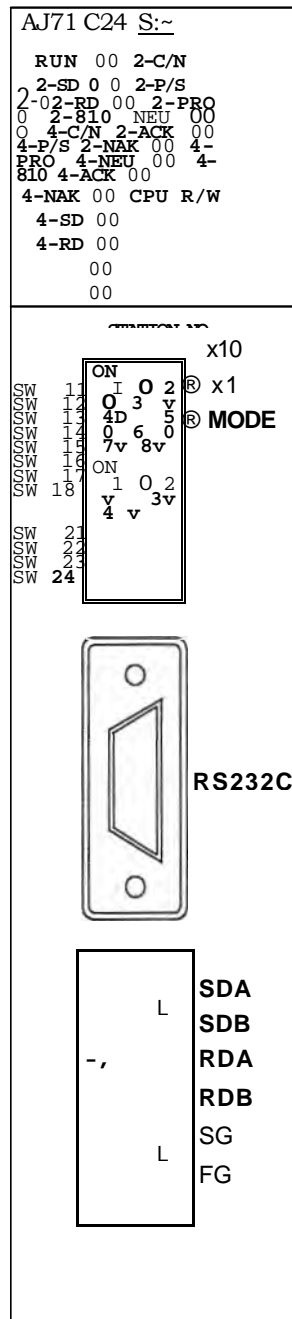


Figure 36-9 AJ71 C24-S3 Module

- L.
- L
- L

The following table describes the LED signals on the AJ71 C24 module and gives a brief description of their function. Refer to figure 36-9 to locate the LEDs.

<u>IQ</u>	<u>Description</u>
RUN	Normal run
2-SD	RS232C transmitting
2-RD	RS232C receiving
2-NEU	RS232C neutral
2-ACK	RS232 ACK
2-NAK	RS232 NAK
4-NEU	RS422 neutral
4-ACK	RS422 ACK
4-NAK	RS422 NAK
4-SD	RS422 transmission status
4-RD	RS422 received data status
2-C/N	Result of RS-232C and PC CPU communications
2-P/S	RS232 parity/sum check error
2-PRO	RS232C protocol error
2-SIO	RS232C SIO error
4-C/N	Result of RS422 and PC CPU communications
4-P/S	RS422 parity/sum check error
4-PRO	RS422 protocol error
4-SIO	RS422 SIO error
CPUR/W	Communications with PC CPU

Table 36-1 LED Signals and Descriptions

The station numbers are located below the LEDs and can be set in the range from 0 to 31. Set the X10 station number to the tens digit in the station number and set the X1 switch to the ones digit in the station number. The station number may be set to any value which does not duplicate another station number. Station numbers do not have to be sequential.

The mode setting switch is located below the station numbers and selects the transmission control protocol. The mode setting switch must be set to 1, 5, or A for communications to the PanelMate unit. Those selections enable Protocol 1. The method of setting the transmission control protocol and the meaning of the switch settings are described in the table below.

Mode Setting Switch Number	Mode Settings		Notes
	RS232C	RS422	
0	Unusable	Unusable	
1 2 3 4 5 6 7 8	Protocol 1 Protocol 2 Protocol 3 Protocol 4 No protocol No protocol No protocol No protocol	No protocol No protocol No protocol No protocol Protocol 1 Protocol 2 Protocol 3 Protocol 4	For connection of computers to RS232C and RS422 individually, or for connection of a printer to the no protocol interface. Both the interfaces work independently.
9	No protocol	No protocol	This mode is used to enable a no protocol computer link with all devices connected to the RS232C and RS422 interfaces. Data transmitted by a computer can be received by all AJ71 C24 modules.
A B C D	Protocol 1 Protocol 2 Protocol 3 Protocol 4	Protocol 1 Protocol 2 Protocol 3 Protocol 4	This mode is used to enable a dedicated protocol computer link with all devices connected to the RS232C and RS422 interfaces. Data transmitted by a computer can be received by the AJ71 C24 designated by the send message.
E	Unusable	Unusable	
F	Module test	Module Test	RS232C and RS422 operate independently.

Table 36-2 Protocol Settings

* When the mode switch is set from 9 to D, the RS232C and the RS422 interfaces operate as if interlocked with each other.

The following table lists and describes the dipswitch setting for the AJ71C24 module.

Switch	Description				ON		OFF		Notes	
SW11	Main channel settings				RS422		RS232C		Valid for modes A to D	
SW12	Data length				8 bits		7 bits		-	
SW13 SW14 SW15	Baud Rate Transmission Speed Setting	300 OFF OFF OFF	600 ON OFF OFF	1200 OFF ON OFF	2400 ON ON OFF	400 OFF OFF ON	9600 ON OFF ON	19200 OFF ON ON	Unable ON ON ON	
SW16	Parity check				Enabled		Disabled		-	
SW17	Parity setting				Even		Odd		Valid only when parity check enabled is selected	
SW18	Stop bit				2 bits		1 bit			
SW21	Sum check				*Enabled		Disabled			
SW22	Write during RUN				*Enabled		Disabled			
SW23	Send area terminal resistance				Present		Absent		Valid only when RS422 is used	
SW24	Receive area terminal resistance				Present		Absent			

Table 36-3 Dipswitch Settings for the AJ71 C24 Module

These settings are not optional and must be set as indicated.

Mitsubishi Word and Bit References

The following section describes the use of Mitsubishi word and bit references in your configuration. The general word referencing method is:

[plcname,word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference memory type and number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional if you are using the default PLC and do not wish to change the data format, respectively.

The general bit device referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference memory type and number (address) of the bit, coil, or input to be written or read. See chapter 10 for a more detailed explanation of word and bit references, including format descriptions. The Mitsubishi A Series driver is supported on the PanelMate unit for models AOJ2H, AI, A1 N, A1 S, **A2, A2N**, A3, A3N, A3H, A3M, A73, A2A, A2A(SI), and AA. These models use a combination of decimal and hexadecimal addresses. Bit references are from 0 to 15. The PanelMate units format default is S16.

The following list contains the memory types supported by the Mitsubishi A Series driver.

TN - timer (present value) register CN -

counter (present value) register D - data
register

W - link register R -

file register

D - special register

X - input relay device Y - output

relay device M - internal relay

device L - latch relay device S

- step relay device B - link

relay device F - annunciator

device M - special relay device

TS - timer (contact) device TC

- timer (coil) device

CS - counter (contact) device

CC - counter (coil) device

The Mitsubishi Series FX and FXo driver is supported on the PanelMate unit for models FX-16, FX-24, FX-32, FX-48, FX-64, FX-80, FXo-14, FXo-20, and FXo-30. These models use a combination of octal and decimal addresses. Bit references are from 0 to 15. The PanelMate unit's format default is S16.

The following list contains the memory types supported by the Mitsubishi Series FX and FXo driver.

- TN - timer (present value) register
- CN - counter (present value) register
- D - data register
- D - special register
- X - input relay device
- Y - output relay device
- M - auxiliary relay device
- M - special relay device
- S - state device
- TS - timer (contact) device
- TC - timer (coil) device
- CS - counter (contact) device
- CC - counter (coil) device

The following is the format for referencing 16-bit or 32-bit (CN only) words.

[plcname,MMXXXJC]		
plcname		Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
		Optional PLC name delimiter.
MM		The word device memory type (e.g., D, W, CN).
	XXXX	The word number; maximum of 4 characters; leading zeroes are allowed.

The following is the format for referencing a single bit in a word device.

[plcname,MMXXXX/BB]		
plcname		Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
		Optional PLC name delimiter.
MM		The word device memory type (e.g., D, W, CN).
	XXXX	The element number; maximum of 4 characters; leading zeroes are allowed.
	/	Bit delimiter character.
	BB	Bit number in the range 00-15; leading zeroes is allowed.

Note Single bits referenced in a word are read only.

The following is the format for referencing bits in a bit device as a 16-bit word.

[plcname,W:MMXXXX]	
plcname	Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
	Optional PLC name delimiter.
W	Letter designating a 16-bit word.
	16-bit delimiter character.
MM	The bit device memory type (e.g. X, Y, TC, etc.)
XXXX	The starting bit number; must be a multiple of 16 (e.g., 0, 16, 32, 48, etc. for decimal addressing and 0, 20, 40, 60, etc. for octal addressing).

The following is the format for referencing a single bit in a bit device.

[plcname,MMXXXX]	
plcname	Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
	Optional PLC name delimiter.
MM	The bit device memory type (e.g. X, Y, TC, etc.)
XXXX	The bit number; maximum of 4 characters; leading zeroes are allowed.

The supported Mitsubishi PLC models will allow a maximum of 32 contiguous words per read. The maximum number of unused words before another read is generated is 15 for Mitsubishi A Series PLCs and 31 for the Mitsubishi FX and FXo Series PLCs.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate unit's expression fields.

Mitsubishi A Series

Word References

<u>Reference</u>	<u>Description</u>
[TN 13] [CN1 25] [D3] [Wff] [R8002] [D9111] [W:X1 FO] [W:YO] [W:M1024] [W:L1 6] [W:S256] [W:B3F0] [W:F1 28] [W:TS240] [W:TC32] [W:CS48] [W:CC64]	Word 13 is referenced in timer memory Word 125 is referenced in counter memory Word 3 is referenced in data register memory Word 255 is referenced in link register memory Word 8002 is referenced in file register memory Word 9111 is referenced in special register memory Word starting at bit 1 FO (496) in input memory Word starting at bit 0 in output memory Word starting at bit 1024 in internal relay memory Word starting at bit 16 in latch relay memory Word starting at bit 256 in step relay memory Word starting at bit 3F0 (1008) in link relay memory Word starting at bit 128 in annunciator memory Word starting at bit 240 in timer (contact) memory Word starting at bit 32 in timer (coil) memory Word starting at bit 48 in counter (contact) memory Word starting at bit 64 in counter (coil) memory

Bit References

<u>Reference</u>	<u>Description</u>
[X0003]	Bit 3 is referenced in input memory Bit 7 is referenced in output memory
[M006555]	Bit 6555 is referenced in internal relay memory Bit
[M999]	999 is referenced in auxilliary relay memory Bit 5444
[L005444]	is referenced in latch relay memory Bit 8000 is
[S008000]	referenced in step relay memory Bit 63 is
[S63] [B7]	referenced in state relay memory Bit 7 is
[F002007]	referenced in link relay memory Bit 2007 is
[MOO9200]	referenced in annunciator memory Bit 9200 is
[TS001999]	referenced in special relay memory Bit 1999 is
[T0001888]	referenced in timer (contact) memory Bit 1888 is
[CS001000]	referenced in timer (coil) memory
[00000999]	Bit 1000 is referenced in counter (contact) memory Bit 999 is
[TN123/13]	referenced in counter (coil) memory Word 123, bit 13 is
[CN1 25/12]	referenced in timer memory Word 125, bit 12 is referenced in
[D3/04]	counter memory Word 3, bit 4 is referenced in data register
[W9b/09]	memory Word 155, bit 9 is referenced in link register memory
[R8002102]	Word 8002, bit 2 is referenced in file register memory Word 9111,
[D9111 /10]	bit 10 is referenced in special register memory

Mitsubishi FX Series

Word References

<u>Reference</u>	<u>Description</u>
[TN114]	Word 114 is referenced in timer memory
[CN125]	Word 125 is referenced in counter memory
[D3]	Word 3 is referenced in data register memory
[D8111]	Word 8111 is referenced in special register memory
[W:X60]	Word starting at bit 60 (48) is referenced in input relay memory Word
[W:M16]	starting at bit 16 is referenced in auxilliary memory Word starting at bit
[W:TC1 28]	128 is referenced in timer (coil) memory Word starting at bit 80 is
[W:CS80]	referenced in counter (contact) memory
	Word 224 (32-bit) is referenced in counter memory
[CN224]	

Bit References

<u>Reference</u>	<u>Description</u>
[X14]	Bit 14 is referenced in input relay memory
rn	Bit 7 is referenced in output relay memory
[M98]	Bit 98 is referenced in auxilliary memory
[M8025]	Bit 8025 is referenced in special relay memory
[S58]	Bit 58 is referenced in state memory
[TS1 25]	Bit 125 is referenced in timer (contact) memory
[TC87]	Bit 87 is referenced in timer (coil) memory
[CS1 33]	Bit 133 is referenced in counter (contact) memory Bit
[CC201]	201 is referenced in counter (coil) memory

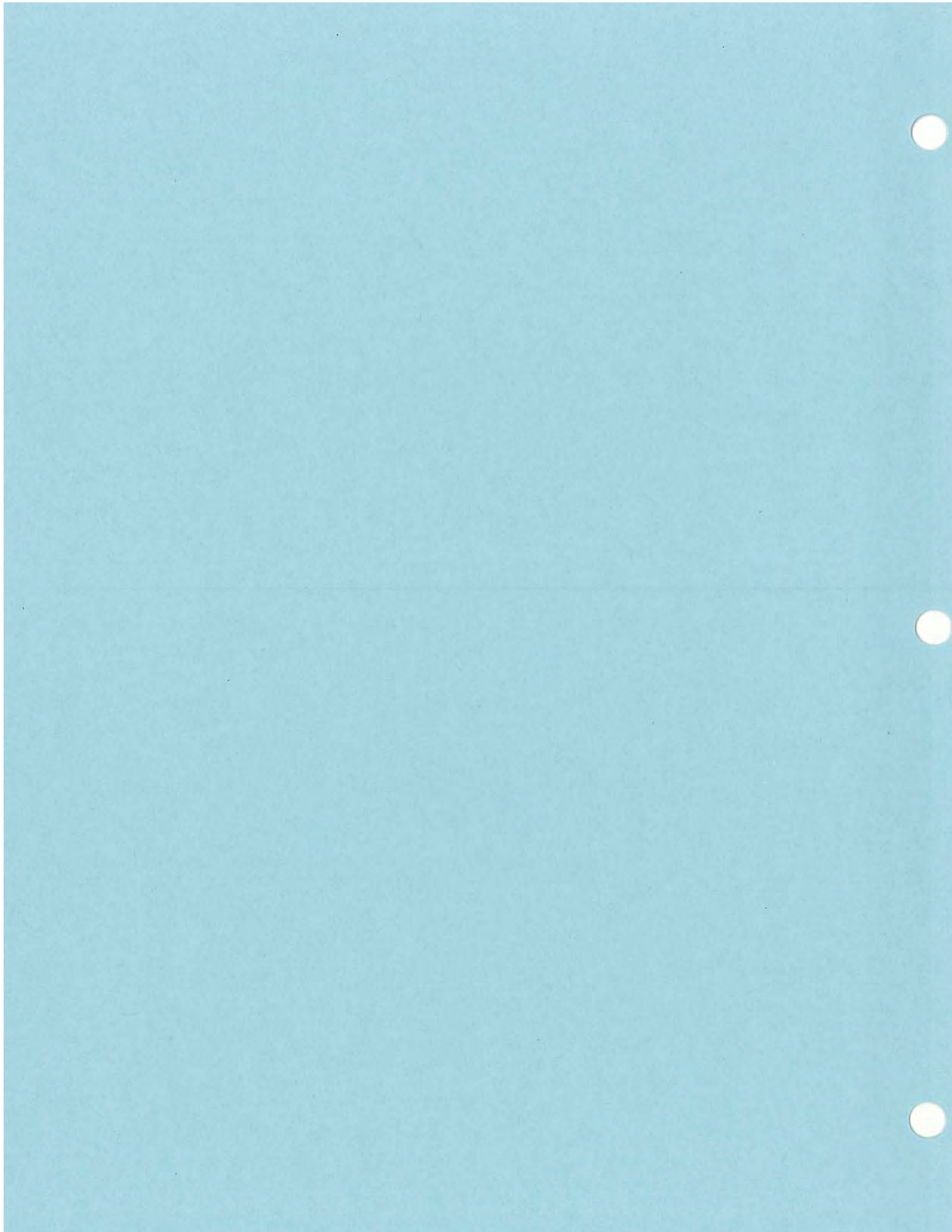
Mitsubishi FXo Series

Word References

<u>Reference</u>	<u>Description</u>
[TN 18]	Word 13 is referenced in timer memory Word 246 is
[CN246]	referenced in counter memory Word 17 is referenced
[D17]	in data register memory Word 8032 is referenced in
[D8032]	special register memory
[W:YO]	Word starting at bit 0 is referenced in output relay memory Word
[W:S20]	starting at bit 20 (16) is referenced in state device
	memory
[W:TS40]	Word starting at bit 40 (32) is referenced in timer (contact)
	register memory
[W:CCO]	Word starting at bit 0 is referenced in counter (coil) memory.

Bit References

<u>Reference</u>	<u>Description</u>
[X17]	Bit 17 is referenced in input relay memory Bit
[Y15]	15 is referenced in output relay memory
[M444]	Bit 444 is referenced in auxilliary memory
	Bit 8024 is referenced in special relay memory
[M8024]	Bit 24 is referenced in state memory
[S24]	Bit 28 is referenced in timer (contact) memory
[TS28]	Bit 12 is referenced in timer (coil) memory
[TC12]	Bit 253 is referenced in counter (contact) memory Bit
[CS253]	237 is referenced in counter (coil) memory
[CC237]	



Chapter 37

Modicon Controllers

The PanelMate Series can be used with any of the Modicon PLCs that have Modbus capability. You may use the Modbus ASCII mode driver or the Modbus RTU mode driver to communicate Modbus to Modicon PI-Cs. The driver takes responsibility for communications to this programmable controller, generating the protocol necessary to request information from and send information to the PLC. The PLCs simply respond to these requests and commands. No ladder logic is required in the PLC to support the interface to the PanelMate unit. The information in this chapter is for the Modbus ASCII and Modbus RTU mode drivers only. Depending on the driver selected in the PLC Name and Port Parameter table, you must select either ASCII or RTU mode to communicate to a PanelMate unit.

Memory

The following memory types are supported by the Modbus ASCII and Modbus RTU (Micro 84, 184, 384, 484, 584, 884 and 984) mode drivers.

0XXX 0XXXX 0XXXXX	Coils/discrete outputs
1XXX 1XXXX 1 XXXXX	Discrete inputs (read only)
3XXX 3XXXX 3XXXXX	Input registers (read only)
4XXX 4XXXX 4XXXXX	Holding/output registers

Note For Modicon PLCs, "F:" must precede all holding registers to designate a floating point number.

Possible Configurations

Examples of possible connections are described and shown in the following pages.

Direct

A direct connection to a Modicon PLC with built-in Modbus, without the need for any additional modules.

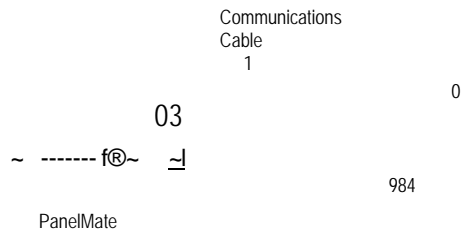


Figure 37-1 Direct Connection

Models without built-in Modbus require a Modbus adapter.

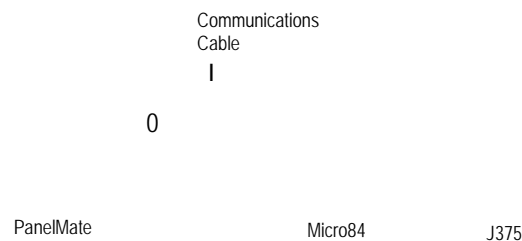
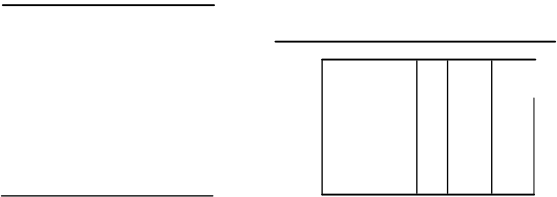
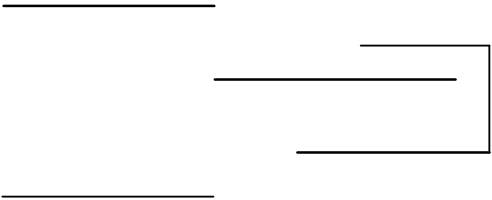


Figure 37-2 Connection using Modbus Adapter

Memory



"multiple PLCs on a Single Modbus

If the PanelMate unit is to communicate with multiple PLCs on a single Modbus network, it requires its own Modbus modem to provide the necessary interface.

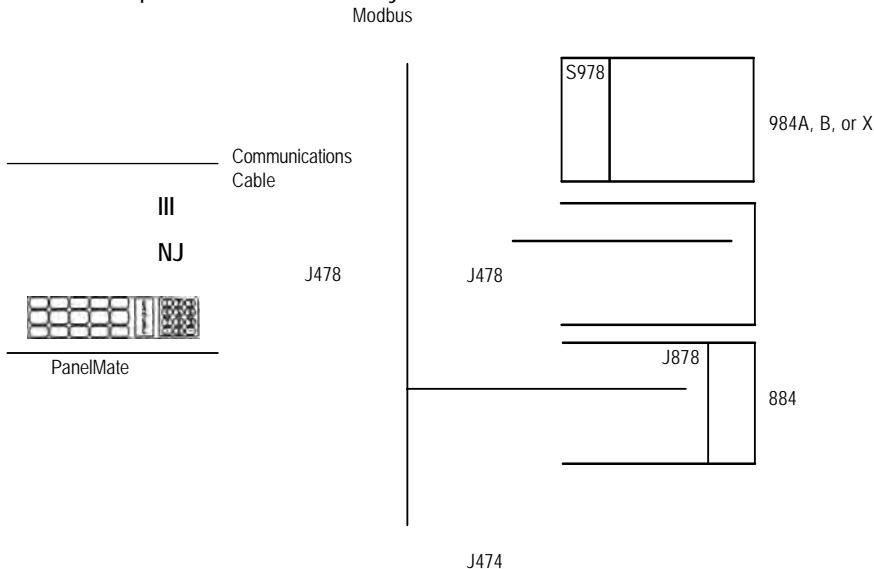


Figure 37-3 Multiple PLCs on Modbus

The following table shows the Modicon PLCs, adapters, and cable connectors. Consult the proper Modicon manual for any information not contained in this manual.

Model	9A8&4B	984-X	984-381 -480I-680 780	984-380	984-1XX*	884	584	484	µ84	Micro
# Modbus ports built-in	3	2	2**	1	1	2	2	None	None	1
Modbus Adapter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	J474	J375	N/A
Modbus Modem	S978	S978	J878	J878	J478	J478	J478	J474/475	J378	JXXX
Cable Connector	DB-25P	DB-25P	DE-9P	DB-9P	DB-9P	DB-25P	Military	30-pin	DB-25P	RJ45
Port(s)	1,2,3	1,2	1,2	1	1	1,2	1,2	1	1	1

t 984-120, 984-130, 984-145

** Models 984-385/485/685/785 have one Modbus port and one Modbus Plus port.

Table 37-1 Adapters & Cable Connectors for Modicon PLCs

Cabling

Communications between the PanelMate unit and Modbus is RS232C. The recommended maximum cable length is 50 cable feet. You should construct a communications cable of the desired length for each connection to be made. Note that the cable configuration is similar for the various Modicon PLCs and modems. All the PanelMate unit's ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

(You may also use a standard Modicon W190 cable instead of constructing your own.)

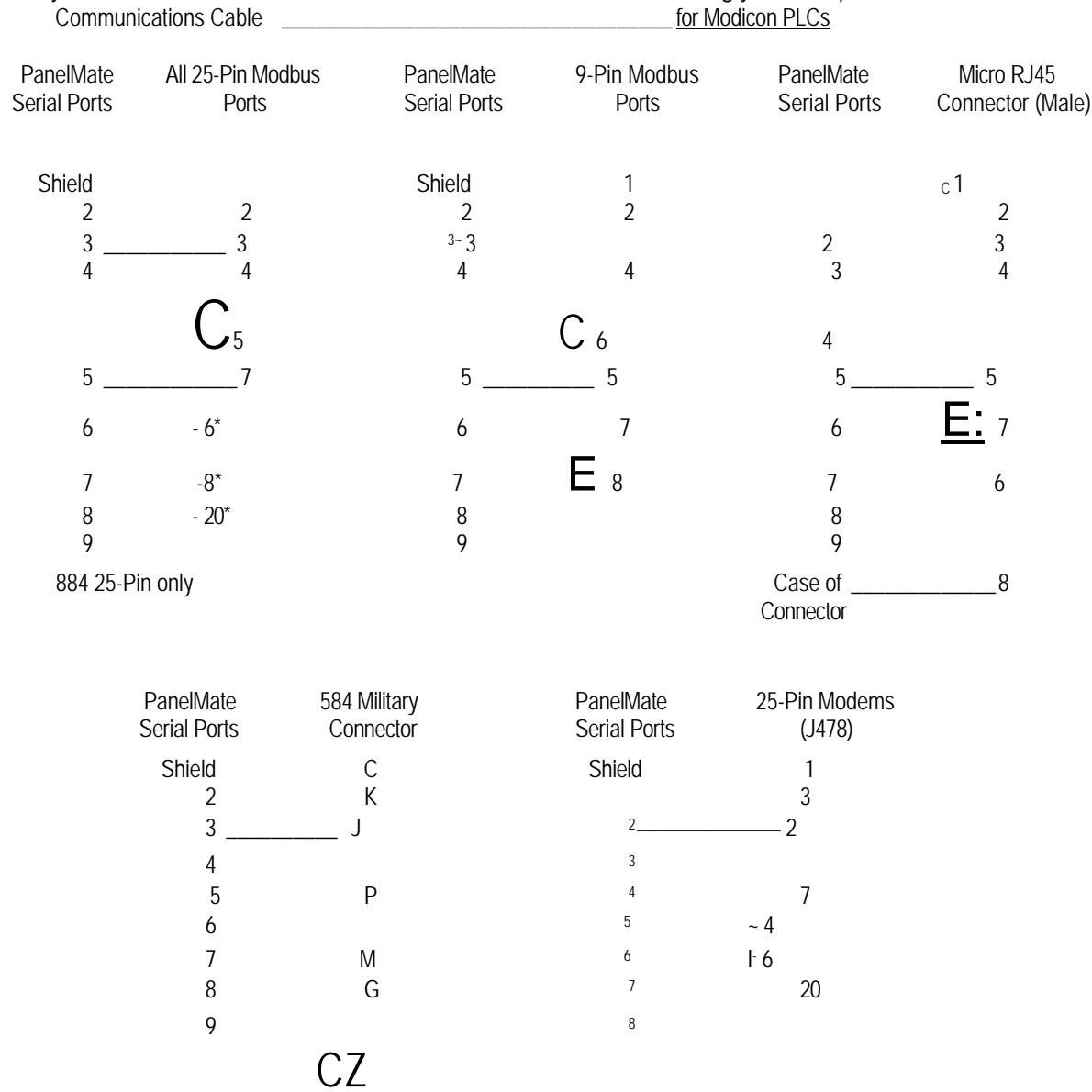


Figure 37-4 Cabling Diagrams

For applications requiring additional Modbus ports, it is recommended that Modbus expanders be used. Modbus Port Expanders from Modicon may be used to connect multiple PanelMate units to a single PLC. The PanelMate unit communications cable previously described may be used to connect the PanelMate unit and the PLCs to a Modbus Port Expander.

Communications Parameters

For each Modicon port used, certain parameters must be set in order to establish communications with the PanelMate unit. This is accomplished either through DIP switch settings on the individual module or programming selections using the Modicon P230 Programmer.

Standard communication parameters for communicating with Modicon PLCs using Modbus are:

- 7 data bits for ASCII mode and 8 data bits for RTU mode
- 1 stop bit* 9600
- baud rate
- ASCII or RTU mode** No
- parity

* 2 stop bits for 984-38X, 984-48X, 984-68X

**Depending on the driver selected in the PLC Name and Port Parameter table, you must select either ASCII or RTU mode to communicate to a PanelMate unit. All other parameters should be configured as listed above.

Note The following is a summary of the information available at the time of this manual's printing, describing the necessary settings for each PLC model. Be sure to check with Modicon for any possible updates or changes if you encounter any difficulty.

984 and 584 Modbus Ports

The Modicon P230 Programmer is used to set the communications parameters of the 984 and 584 Modbus ports.

For the PLC address, use the number that coincides with the PLC ID# you have established *for this unit in the PLC Name and **Port** Editor.*

*Depending on the driver selected in the PLC Name and **Port** Parameter table, select ASCII or RTU mode.*

Be sure to match the baud rate, parity, data bits, and stop bits with the entries made in the PLC Name and Port Editor.

984-38X, -48X, -68X and -78X

The 984-38X, -48X, -68X, and -78X models contain a switch to determine whether port parameters will be set up using the DIP switches or configured with the P230 programmer. See the Modicon manual for your specific PLC for information on the DIP switch settings. A switch is used to determine if the memory or the DIP switch is actually controlling the port parameters. Modicon recommends that the DIP switch setting remain in RTU mode so that a maintenance person can plug in a local Data Access Panel by selecting the DIP switches.

884 Mod bus Ports

Modbus port 1 parameters may only be configured using the Modicon P230 Programming Panel. Port 2 parameters may be set either by the Programming Panel or by DIP switches.

Port 1 is factory-set to the following parameters:

Data Bits - 7 (fixed) Mode - RTU

Parity - Even Stop

Bits - 1 Baud Rate -

9600

Be aware that 884 models with 4-digit serial numbers have no capability for ASCII mode communications, therefore RTU mode must be used for these models.

Port 2 parameters may be selected using the DIP switches located at the rear of the 884. The top set of switches is used to set the address of the PLC. This number corresponds to the PLC ID# entered in the PLC Name and Port Editor. The address is set as a binary number, where switch 8 is of lowest significance, and switch 1 is of the highest significance.

	Most Significant				Least Significant			
Dip Switch #	1	2	3	4	5	6	7	8
Example. PLC address = 11	0	0	0	0	1	0	1	1

Switch up for a binary 1 (ON); switch down for a binary 0 (OFF)

Table 37-2 Port 2 DIP Switch Settings

The bottom set of switches is used to set communication parameters. Be sure the parameters of both the 884 and the PanelMate unit match.

Micro 84/J375 Modbus Adapter

The J375 Modbus Adapter is a communications interface module for the Micro 84 PLC. The J375 provides one RS232C port connection for use with intelligent RS232 devices. Also, port connections are provided for the Micro 84 controller and a P370 Micro 84 Programmer.

The Modbus Adapter provides DIP switches at the rear of its case for address and system parameter selection.

The user may select the number of stop bits, parity, and baud rate. Data bits are fixed at 7.

Switch set one (S1) on the J375 determines the station address for the Micro 84. Station addresses are entered as binary numbers, where switch 1 is of lowest significance and switch 8 is of highest significance.

Dip Switch #	Most Significant				Least Significant			
	8	7	6	5	4	3	2	1
Example: PLC address = 11	0	0	0	0	1	0	1	1

Switch up for a binary 1 (ON); switch down for a binary 0 (OFF)

Table 37-3 Port 2 DIP Switch Settings

484 PLC/J474 Modbus Communication Interface

The J474 Communication Interface allows for a computer or other intelligent devices to communicate to a 484 PLC. The J474 may be connected to the Modbus or an RS232 device via a single 30-pin connector. All user options such as baud rate, parity, and stop bits are selected by the wiring of this connector.

The following tables include pin descriptions and selection options, for the J474 Modbus Communication Interface.

Pin	Function	Pin	Function
1	Protective Ground	16	Binary Address 16
2	Data Transmit	17	Stop Bit Option
3	Data Receive	18	Binary Address 32
4	Ready to Send	19	Parity Type Option
5	Clear to Send	20	Data Terminal Ready
6	Data Set Ready	21	Parity Enable
7	Signal Ground	22	Binary Address 64
8	Binary Address 1	23	Modbus Full Duplex In
9	Baud Rate 1	24	Binary Address 128
10	Binary Address 2	25	Modbus Full Duplex Out
11	Baud Rate 2	26	Signal Ground
12	Binary Address 4	27	Modbus Data In
13	Baud Rate 4	28	Mode Select 1
14	Binary Address 8	29	Modbus Data Out
15	Baud Rate 8	30	Mode Select 2

Note: Pins 1 through 7 and 20 conform to EIA RS232C specifications. **Table**

Baud rate is selected by connecting pins 9, 11, 13 and 15 to signal ground at pin 7. The following chart summarizes selection options, where YES = connect to pin 7 and NO = leave unconnected.

Baud Rate	Pin 9	Pin 11	Pin 13	Pin 15
50	YES	YES	YES	YES
75	NO	YES	YES	YES
110	YES	NO	YES	YES
134.5	NO	NO	YES	YES
150	YES	YES	NO	YES
300	NO	YES	NO	YES
600	YES	NO	NO	YES
1200	NO	NO	NO	YES
1800	YES	YES	YES	NO
2000	NO	YES	YES	NO
2400	YES	NO	YES	NO
3600	NO	NO	YES	NO
4800	YES	YES	NO	NO
7200	NO	YES	NO	NO
9600	YES	NO	NO	NO
19200	NO	NO	NO	NO

Table 37-5 Baud Rate Selection for the J474 Interface

The slave address (PLC ID#) is selected by connecting pins 24, 22, 18, 16, 14, 12, 10 and 8 to signal ground at pin 26. A binary pattern is used, where zero bit = connect to pin 26 and a one bit = leave unconnected. For example, the address 11 in binary is 00001011, which requires connection of pins 24, 22, 18, 16, and 12 to pin 26, as shown below.

	Most Significant						Least Significant	
Pin Number	24	22	18	16	14	12	10	8
Example: Address = 11	0	0	0	0	1	0	1	1

Switch up for a binary 1 (ON); switch down for a binary 0 (OFF)

Table 37-6 Example for a Slave Address of 11

Specific modes of operation are selected by connecting pins 28 and 30 to signal ground at pin 26. The following chart summarizes selection options where YES = connect to pin 26 and NO = leave unconnected.

Model	Pin 28	Pin 30
ASCII	YES	YES
RTU	YES	NO
Not Valid	NO	YES
Test	NO	NO

Table 37-7 Mode Selection

The number of stop bits and parity are selected by connecting pins 17, 19 and 21 to signal ground at pin 7. The following chart summarizes selection options where YES = connect to pin 7 and NO = leave unconnected.

Option	Pin 17	Pin 19	Pin 21	
Two stop bits, no parity	YES	YES	YES	
One stop bit, no parity	NO	YES	YES	
Two stop bits, no parity	YES	NO	YES	
One stop bit, no parity	NO	NO	YES	
Two stop bits, odd parity	YES	YES	NO	
One stop bit, odd parity	NO	YES	NO	
Two stop bits, even parity	YES	NO	NO	
.s sioj) sven				J

Table 37-8 Stop Bit and Parity Selection

Modicon Word and Bit References

The following section describes the use of Modicon word and bit references in your configuration. The general word referencing method is:

`[plcname,word#format]`

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

`[plcname,bit]`

The "plcname" is the designated PLC as listed in the PLC Name and Port table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

Modicon Micro 84, 184, 384 and 484

The Modicon PLCs listed above use decimal addresses. The PanelMate unit format default is

BIN3. The following list contains the supported memory types.

OXXX Coils/discrete outputs

1 XXX Discrete inputs (read only)

3XXX Input registers (read only)

4XXX Holding/output registers

The following is the format for a register reference.

[rr]

rr = PLC reference number of the register. The

following is the format for an input reference.

[ii]

ii = PLC reference number for an input. The

following is the format for a coil reference.

[cc]

cc = PLC reference number for a coil.

The PanelMate unit cannot write to inputs or input registers. Therefore, all control button PLC

bit references in the PanelMate unit editors refer to Modicon coils. Bit references in expressions refer to Modicon coils or inputs.

All references to words refer to Modicon registers.

Modicon PLC model Micro84 can read up to 16 words per read cycle. Models 184 and 484 will allow a maximum of 25 contiguous words per read. The maximum number of unused words for the three above mentioned PLCs is 10. The PanelMate unit generates another read when more than 10 unused PLC words are encountered.

Modicon 584, 884 and 984 Register, Input and Coil References

The Modicon PLCs listed above use decimal word addresses. The PanelMate unit format default is BIN4. The following list contains the supported memory types.

OXXXX	Coils/discrete outputs
OXXXXX	
1XXXX	Discrete inputs (read only) 1
XXXXX	
3XXXX	Input registers (read only)
3XXXXX	
4XXXX	Holding/output registers
4XXXXX	

Note The Modicon PLC model 984-785 allows six-digit addressing.

Note Bits within holding/output registers are read only.

The following is the format for a register reference.

[rr]

rr = PLC reference number of the register. The

following is the format for an input reference. [ii]

ii = PLC reference number for an input. The

following is the format for a coil reference. [cc]

cc = PLC reference number for a coil. The

following is the format for a register bit reference.

[rr bb]

rr = PLC reference number of the register.

bb = PLC reference number of the bit position. The bit positions are numbered from 1 to 16, least significant to most significant, respectively

Note that leading 0's are not required.

Note The register number must be followed by a space.

The PanelMate unit cannot write to inputs or input registers. Therefore, all control button PLC bit references in the PanelMate editors refer to Modicon coils. Bit references in expressions refer to Modicon coils or inputs.

All references to words refer to Modicon registers.

The Modicon PLC models 584, 884 and 984 allow up to 25 contiguous words per single read. The maximum number of unused words is 10. The PanelMate unit generates another read when more than 10 unused PLC words are encountered.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate expression fields.

Word References

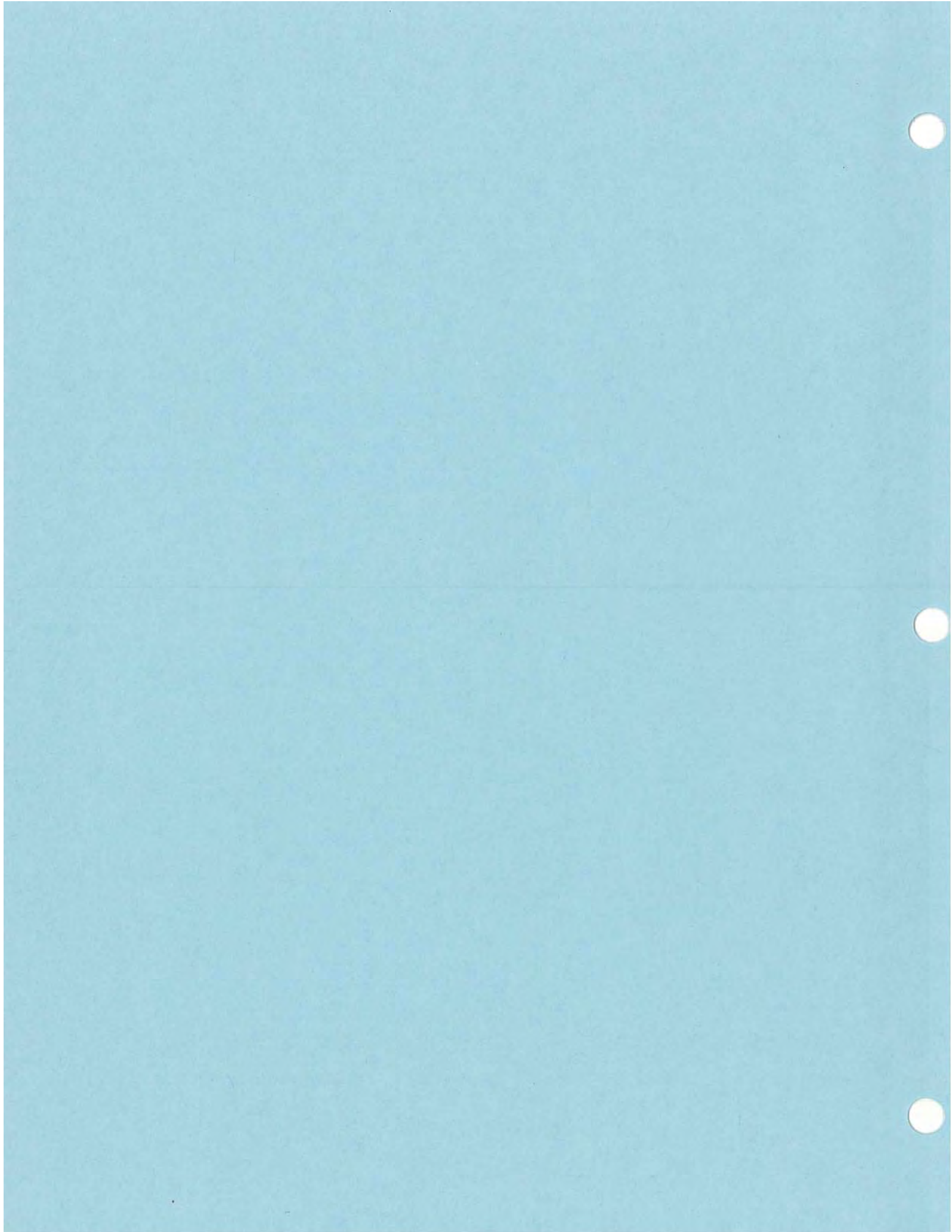
Reference	Description
[40010]	Output register 40010
[30001]	Input register 30001
[401000]	Output register 401000

Bit References

Reference	Description
[25]	Coil 25
[10009]	Discrete input 10009
[40098 16]	Bit 16 of output register 40098

I

0



Chapter 38

Omron PLCs

The PanelMate Series can be used with programmable controllers in the Omron C Series (C20K, C28K, C40K, C60K, C20, C20H, C28H, C40H, C200H, C120, C500, C1000H, and C2000H) and the CV Series (CV500 and CV1000).

Memory

The following list contains the memory types supported by the Omron C Series driver.

IR	VO and Internal Relay
HR	Holding Relay
TC	Timer/Counter
DM	Data Memory
LR	Link Relay
AR	Auxiliary Relay

The following list contains the memory types supported by the Omron CV Series driver.

CIO	VO and Internal Relay
AR	Auxiliary Relay
TC	Timer/Counter
DM	Data Memory

The Host Link protocol (C-mode and CV-mode) is common to all Omron PLCs. Host Link protocol does not directly support bit writes, although the protocol will allow devices to force bits on and off. The Omron driver has been implemented to force bits on and off. When at power up, the ladder logic in the PLC should write zeroes to all of the bit areas addressed by the PanelMate unit for control buttons. This will ensure that in the event that power is lost to the PLC during the time a control button is pressed, all of the bit areas are returned to a zero state. The IR and LR memory types are not retentive, except for the C200H. After power is lost, control over these areas returns to the PLC ladder logic program. The C200H processor is different from all of the other C and CV CPUs because it has the ability to set whether or not these bit areas are retentive. The C200H should be set up to be non-retentive for these bit areas. A bit in the special relay memory determines whether or not memory is retentive. The PanelMate unit cannot write to special relay memory. You must use your programmer to access special relay memory.

Note Omron markets the P series models (C20P, C28P, C40P, and C60P) and the F series models (C120F and C500F) overseas. The P series can be configured like the K series models (C20K, C28K, C40K, and C60K) and the F series can be configured like the C120 and C500 models.

The maximum address range (in decimal) for each of the supported PLC models is given in the following tables.

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K, C20	IROO-IR19 (IR18-1R19 are read only) IR000-
C20H, C28H, C40H, C200H C120,	IR255 (IR236-IR255 are read only) IROO-IR63
C500	(IR60-IR63 are read only) IR000-IR255 (1R247-
C1000H	1R255 are read only) IR000-IR255 (1R247-
C2000H	1R255 are read only) CI00000-CIO2555
CV500	CI00000-C102555
CV1000	

Table 38-1 I/O and Internal Relay (C-Mode) and CIO (CV-Mode) Memory Ranges

Note The I/O and internal relay (IR) read only memory references shown above are identical to special relay (SR) memory references.

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K, C20	HRO- HR9 HROO-
C20H, C28H, C40H, C200H C120,	HR99 HROO-
C500	HR31 HROO-
C1000H	HR99 HROO-
C2000H	HR99 Not
CV500	Supported Not
CV1000	Supported

Table 38-2 Holding Relay Memory Ranges

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K, C20	Not Supported
C20H, C28H, C40H, C200H C120,	AROO-AR27 Not
C500	Supported
C1000H	AROO-AR27
C2000H	AROO-AR27
CV500	AR000-AR511
CV1000	AR000-AR511

Table 38-3 Auxilliary Relay Memory Ranges

Note Auxilliary relay registers are read only.

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K, C20	Not Supported
C20H, C28H, C40H, C200H C120,	LROO-LR63
C500	LROO-LR31
C1000H	LROO-LR63
C2000H	LROO-LR63
CV500	Not Supported
CV1000	Not Supported

Table 38-6 Link Relay Memory Ranges

Note Link relay registers are read only.

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K, C20	T000-TC47
C20H, C28H, C40H, C200H C120,	T0000-TC511
C500	T0000-TC127
C1 000H	T0000-TC511
C2000H	T0000-TC511
CV500	T00000-TC0511; TC2048-TC2559
CV1000	T00000-TC1023; TC2048-TC3071

Table 38-4 Timer and Counter Memory Ranges

Note Timer registers are read only.

<u>Model</u>	<u>Range</u>
C20K, C28K, C40K, C60K	DMOO-DM63
C20	Not Supported
C20H, C28H, C40H, C200H	DM0000-DM1999
C120, C500	DM000-DM511
C1000H	DM0000-DM4095
C2000H	DM0000-DM6655
CV500	DM0000-DM8191
CV1000	DM0000-DM9999

Table 38-5 Data Memory Ranges

Possible Configurations

The following sections describe some of the possible configurations of the PanelMate unit with the Omron PLCs. Network to network communication is not supported by the Omron driver. The Omron processor models, which do not contain a Host Link port, must use an additional module.

Direct

Direct connection between the PanelMate unit and the processor.

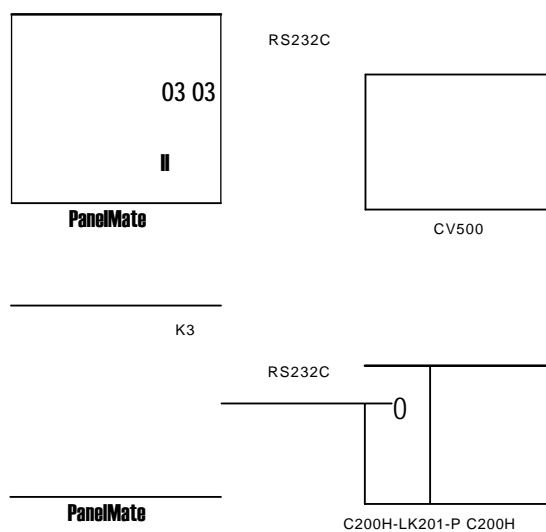


Figure 38-1 Direct Connection

Network

The following figure shows a network consisting of three PLCs and a PanelMate unit.

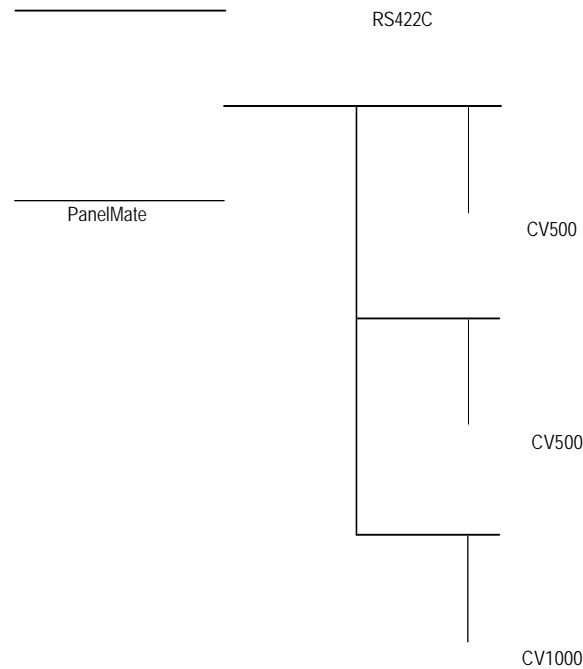


Figure 38-3 Network Connection

Cabling

The following tables show the pinouts for the Omron C Series and CV Series PLCs. The Omron driver supports RS232C and RS422 communications. The maximum cable length when using RS232 is 50 feet, while the maximum cable length for RS422 is 4000 feet. RS422 cable must be a twisted double-wire shielded cable. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

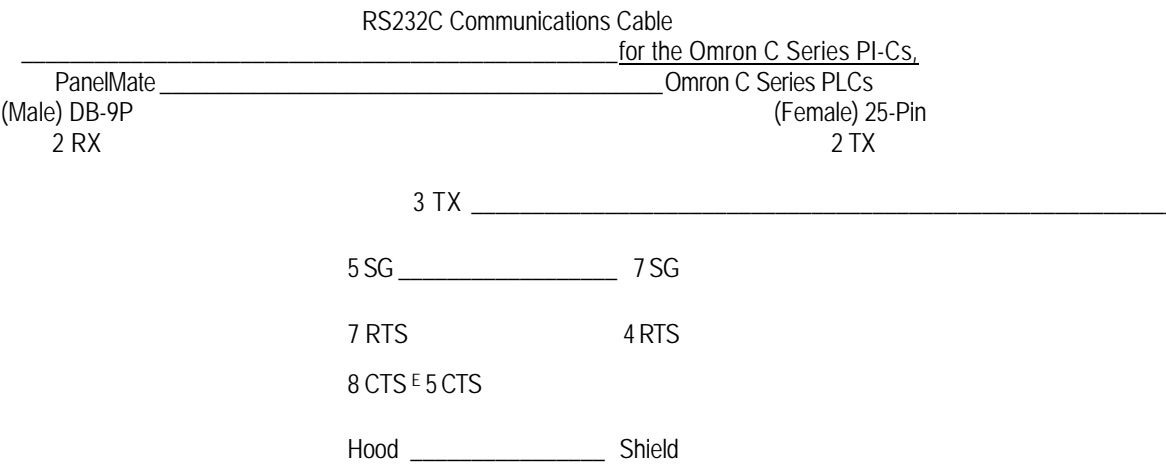


Figure 38-2 RS232C Cabling for the Omron C Series

RS232C Communications Cable
for the Omron CV Series PLCs

PanelMate (Male) DB-9P 2 RX 2 TX 3TX	Omron CV Series PI-Cs (Female) 25-Pin 3RX
--	---

5 SG _____ 9 SG

7 RTS 4 RTS 8 CTS L 5 CTS

Hood _____ Shield

Figure 38-4 RS232C Cabling for the Omron CV Series

RS422 Communications Cable
for the Omron C Series PLCs

PanelMate (Male) DB-9P 1 TX+ 1 RDB+	Omron C Series PLCs (Female) 25-Pin
---	--

4 RX+ 3 SG

5 SG 5 SDB+

6 TX- _____ 6 RDA

7 FG

9 RX- 9 SDA

Hood Shield

Figure 38-5 RS422 Cabling for the Omron C Series

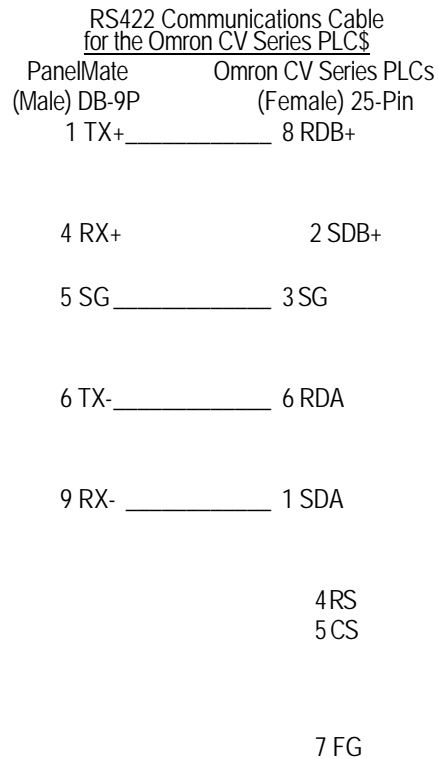


Figure 38-6 RS422 Cabling for the **Omron CV Series**

Communications Parameters

The Host Link Protocol supports both point-to-point and network interfaces. Both rack-mounted and CPU-mounted Host Link protocol interface links support RS232 and RS422 communication. The default communications parameters are shown below.

Baud rate	300 to 19200
Data bits	7
Parity	Even
Stop bits	2

The Omron PLC **ID** must be set in the range 0-31 for communications.

Note The settings for parameters, such as baud rate, must match the parameters set for the PanelMate unit.

Communication Module

The C200H-LK201-P communication module is an interface between the PanelMate unit and the Omron PLC. If you have another communication module, refer to your PLC user manual for more information.

Note A switch of the same name sometimes has different functions on different units.

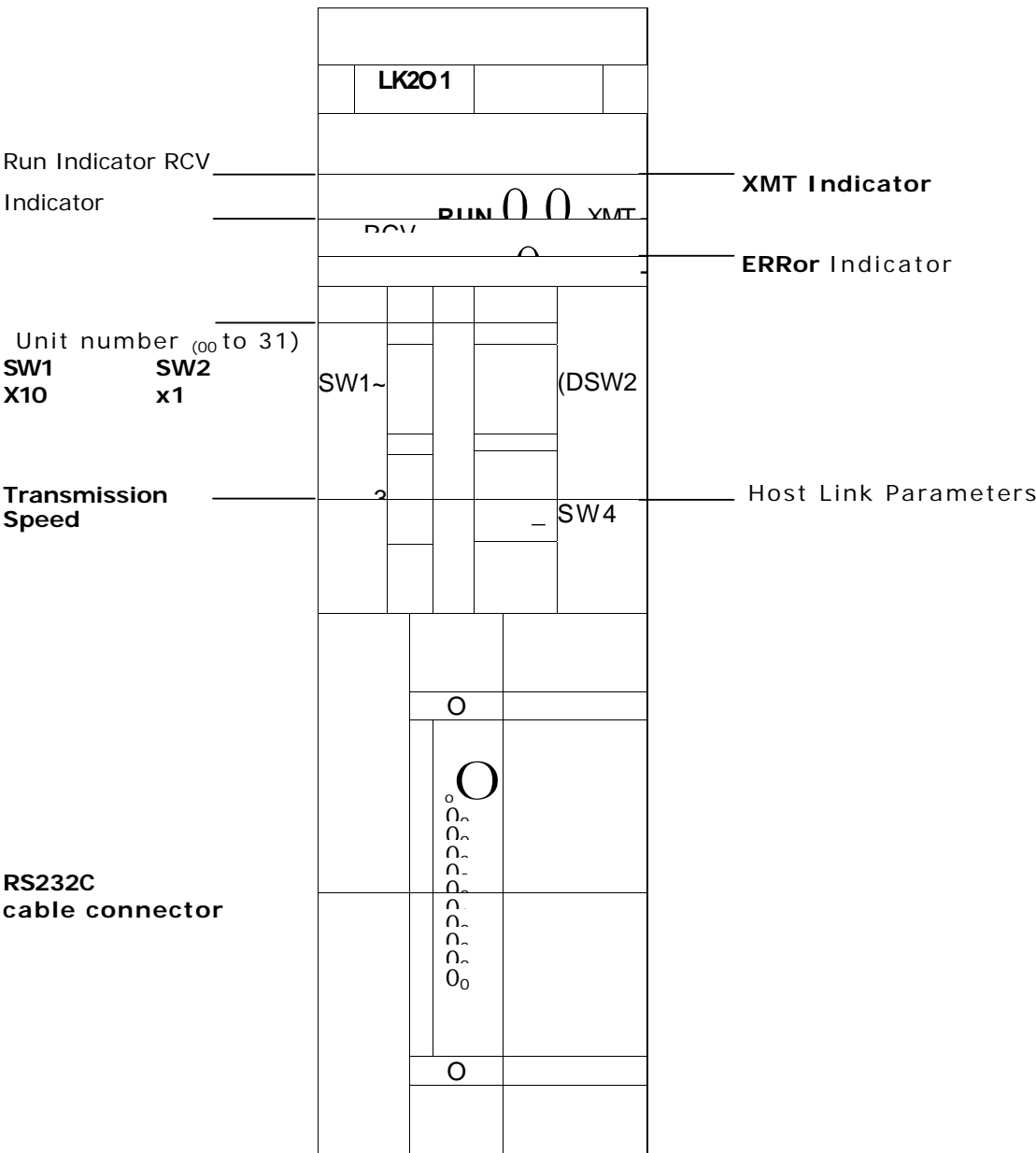


Figure 38-7 C200H-LK201-

SW1 and SW2 sets the unit number. Set SW1 to the number for the tens digit in the unit number and set SW2 to the ones digit in the node or unit number. For configuration information for SW3 and SW4, refer to tables 38-7 and 38-8.

0	300 bps
1	600 bps
2	1200 bps
3	2400 bps
4	4800 bps
5	9600 bps
6	19200 bps
7	Do not set
8	Do not set
9	Do not set

Table 38-7 Settings for SW3

The PanelMate unit supports all three command levels (1 through 3) of Host Link Unit commands.

SW4	Command Level	Parity	Transmission Code
0	1	Even	ASCII 7 bit 2 Stop bits
1	1, 2		
2	1, 2, 3		
3	Do not set		
4	1	Odd	
5	1, 2		
6	1,2,3		
7	Do not set		
8	1	Even	JIS 8 bits 1 Stop bit
9	1, 2		
A	1, 2, 3		
B	Do not set		
C	1	Odd	
D	1, 2		
E	1,2,3		
F	Do not set		

Table 38-8 Settings for SW4

The C200H-LK201 communication module has four dipswitches and a selector switch located on the back of the module.

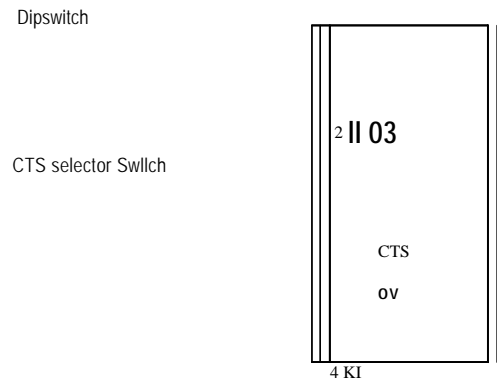


Figure 38-8 C200H-LK01 Communication Module (Rear View)

Dipswitches 1 and 2 are not used and should be set to OFF. Dipswitch 3 configures the module for a single-link or multiple-link and should be set to ON to communicate to the PanelMate unit. Dipswitch 4 configures the 5 V power supply and you should set as necessary for your application.

The CTS Selector Switch must be set to OV to communicate to the PanelMate unit.

Omron Word and Bit References

The following section describes the use of Omron word and bit references in your configuration. The general word referencing method is:

[plcname, word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname, word. bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the bit, coil, or input to be written or read. The "bit" number is the bit number in the address.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions. The Omron Host Link protocol is supported on the PanelMate unit for models C20K, C28K, C40K, C60K, C20, C20H, C28H, C40H, C200H, C120, C500, C1000H, C2000H, CV500, and CV1000. These models use decimal register addresses. Bit references are from 0 to 15. The PanelMate unit's format default is S16.

Note that the PLC reference consists of two- and three-character prefixes which identifies the memory type being referenced followed by the specific address. The following list contains the memory types supported by the Omron C Series [driver](#). [IR](#) I/O

and Internal Relay

HR	Holding Relay
TC	Timer/Counter
DM	Data Memory
LR	Link Relay
AR	Auxiliary Relay

The following list contains the memory types supported by the Omron CV Series driver.

CIO	VO and Internal Relay
AR	Auxiliary Relay
TC	Timer/Counter
DM	Data Memory

The following is the format of a register reference. [[plcname](#), [wwnnn](#)]
 plcname Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
 Optional PLC name delimiter. ww
 The word device memory type.
 nnnn The word number; maximum of 4 characters; leading zeroes are allowed.

The following is the format of a register bit reference. [[plcname](#), [wwnnn.bb](#)]
 plcname Optional PLC name found in the PLC Name Table. If left blank, the default name is used.
 Optional PLC name delimiter. ww
 The word device memory type.
 nnnn The word number; maximum of 4 characters; leading zeroes are allowed.
 Bit delimiter character.

bb Bit number in the range 00-15; leading zeroes are allowed. The PanelMate unit will allow the Omron models a maximum of 29 contiguous words for each block read. The maximum number of unused words before another read is generated is 15.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate unit's expression fields.

Note IR and CIO reference internal relay [memory](#). [IR](#) is used to reference internal relay memory for the C Series. CIO is used to reference internal relay memory for the CV Series.

Word References

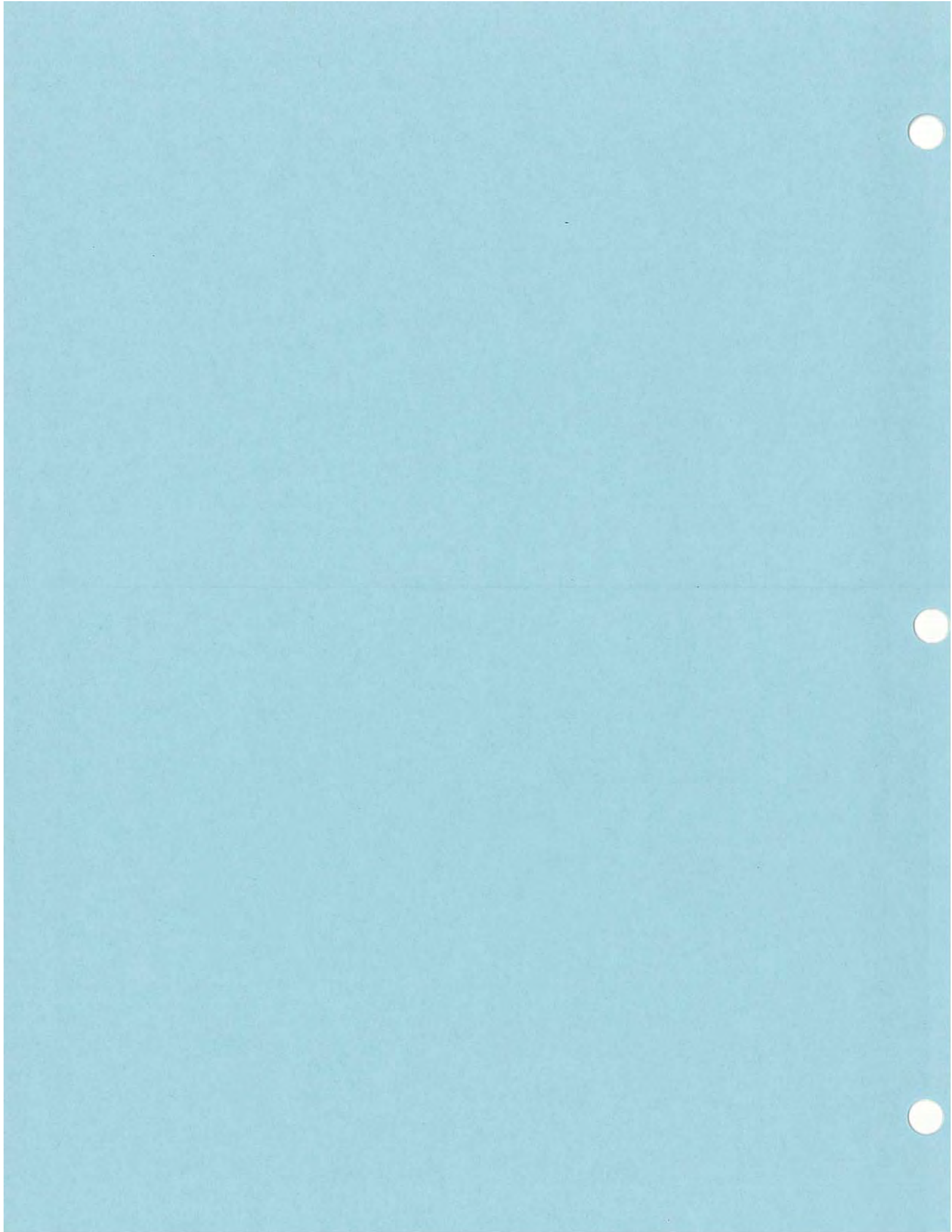
<u>Reference</u>	<u>Description</u>
[I R013] [H R022]	Word 13 is referenced in internal relay memory Word 22 is referenced in holding relay memory
[TC123]	Word 123 is referenced in timer and counter memory
[DM50]	Word 50 is referenced in data memory
[CIO003]	Word 3 is referenced in internal relay memory

Bit References

<u>Reference</u>	<u>Description</u>
[IR032.14]	Word 32 bit 14 is referenced in internal relay memory
[H R096.3]	Word 96 bit 3 is referenced in holding relay memory
[C 10005.2]	Word 5 bit 2 is referenced in internal relay memory

S

0



Chapter 39

Reliance AutoMate PLCs

The PanelMate Series can be used with any of the programmable controllers in the current Reliance AutoMate family using the Reliance driver. (The PanelMate Series does not support the earlier AutoMate 35 PLC.)

The driver takes responsibility for communications to the programmable controller, generating the protocol necessary to request information from, and send information to the PLC. No ladder logic is required in the PLC to support the interface to the PanelMate unit.

The PanelMate unit supports three types of connections to Reliance PLCs:

- To the R-Net using a Gateway
- To the serial communications card
- Direct to the PLC processor programming port

All three types of connections use the same cable type and the "node.slot" format for the PanelMate unit's PLC ID#.

Each PLC is addressed by a node number and a slot number. This address is entered in the PanelMate unit as the PLC ID# in the PLC Name and Port Table using the format "node.slot" (e.g., 22.3). The period is required. The node and slot number to use depends on the type of connection being used to access the PLC. This is explained in greater detail in the sections that follow. The slot number is simply the slot in which the processor card being addressed resides. Be aware that, in an AutoMate system using a 3-slot power supply, slot 1 is not available.

The PanelMate unit's network ID# should always be set to zero.

When using the CRT or Mini Programmer to configure the PLC, check for the following:

Selection:	1
Node #:	(This is the PLC ID#)
Max Node:	(Should always be one greater than Node #)
Configuration:	0

Memory

This table shows the maximum amount of memory available for the specific Reliance model. Your PLC may or may not have the maximum amount of memory.

Reliance Model	Valid Bit Ranges		Valid Register Ranges	
	Low	High	Low	High
15	0.00	15.17	0 1000	15 1067
15E	0.00	77.17	0 2000	77 2777
20	0.00	77.17	0 2000	77 2777
20E	0.00	77.17	0 2000 20000	77 3577 23777
30130E	0.00 2000.00 20000.00	77.17 3777.17 27777.17	0 2000 20000	77 3777 27777
40	0.00 1600.00 20000.00	177.17 17777.17 157775.17	0 1600 20000	177 17777 157775
40X	0.00 1600.00 20000.00	177.17 17777.17 157775.17	0 1600 20000	177 17777 157775
40E	0.00 20000.00	17777.17 157775.17	0 20000	17777 157775

Table 39-1 Memory Ranges

Note For Reliance Model 15E, registers 76-77 and 2700-2777 are read only.
For Reliance Model 20, registers 76-77 are read only.
For Reliance Model 20E, registers 76-77 and 2700-2777 are read only. For Reliance Model 30/30E, registers 76-77 and 3700-3777 are read only.
For Reliance Model 40/40E/40X, registers 1776-1777 and 17500-17777 are read only.

Note For Reliance Models 40 and 40X, if references 1760-1777 are used in your configuration, then references 2000-2015 should not be used. A PLC block read cannot span the boundary from 1777-2000.

Possible Configurations

Examples of possible configurations are described and shown in the following pages.

Direct

The RS232 port on the PLC may be used to make a direct connection to the processor. The processor port has a fixed baud rate of 9600. (A few AutoMate 20 PLCs have a 9600/1200 option.) The PLC node number is set through the programming port using a programming terminal, and is stored in non-volatile memory. Since communications is direct, the slot designation is always zero.

Example:

Processor ID# = 5

PanelMate PLC ID# = 5.0

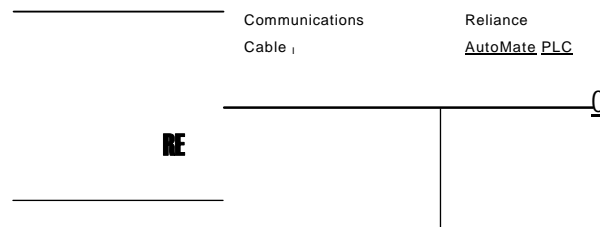


Figure 39-1 Direct Connection

A PanelMate unit connected directly to the programming port of an AutoMate 20 PLC should be deactivated before starting up the PLC. This model PLC stops if it receives a command from the programming **port** in the first few seconds after starting up. The PanelMate unit may be deactivated by either disconnecting the cable from the programming **port** or by putting the PanelMate unit in offline mode.

Serial Communications Card

A serial communication card may be placed in a rack with one or more Reliance PLC processors. The default PLC ID# for the serial communication card on the PanelMate unit will be in the form of "node.slot", where the node number is the slot where the serial communication card resides, and the slot number is the slot where the processor resides. The default baud rates on the top, middle and bottom port on the card are 9600, 4800 and 1200, respectively. Both the node number and the baud rates on the serial communications card can be changed by either PLC logic or by using a programming terminal.

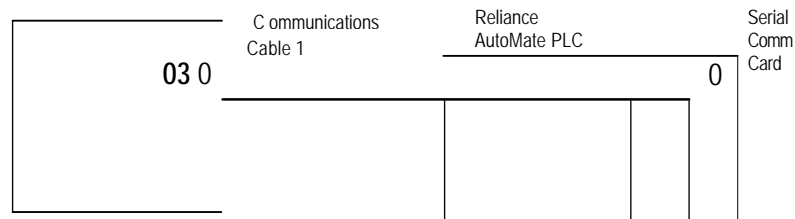


Figure 39-3 Serial Card Connection

Example:

Serial communications card in slot 2; processor in slot 1.

PanelMate PLC ID# = 2.1

R-Net is the network used by Reliance for its PLCs. To access the network, the PanelMate unit must have a port connected to a Gateway. The Gateway must, in turn, be connected to an R-Net processor. Refer to the Reliance documentation for details on these devices and their connections. The PanelMate unit will have access to every node in the network to which the R-Net processor is connected.

To access a particular PLC in the network, use the node number of the R-Net processor residing in the same rack as the PLC. The node number of the R-Net processor is determined by the switch settings on the front panel of the R-Net processor. The node number is given in hexadecimal on the front panel.

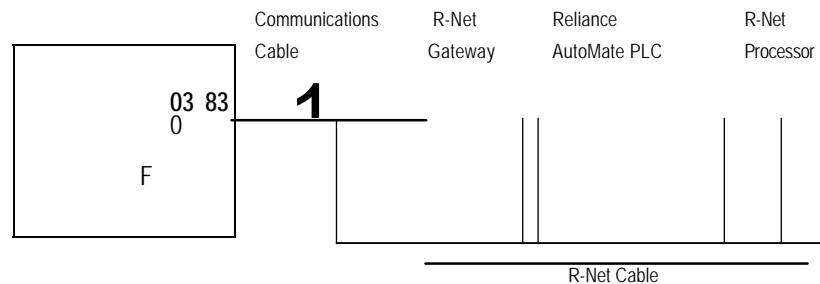


Figure 39-2 R-Net Connection

Cabling

The communication between the PanelMate unit and Reliance AutoMate PLCs is RS232C, and has a recommended maximum cable length of 50 cable feet. You should construct a PanelMate unit communication cable of the desired length for each connection. The PanelMate unit is a female 9-pin (DB-9S) port and the Reliance AutoMate port is a female 25-pin (DB-25S). All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

RS232C Communications Cable for Reliance AutoMate PLCs

PanelMate (Male) D13-9P	Reliance AutoMate (Male) DB-25P
2	2
3	3
	4
	5
	6
	8
	20
5	7
Hood	Shield

Figure 39-4 RS232C Cabling for Reliance PLCs

Communications Parameters

The standard communications parameters for communicating with Reliance AutoMate PLCs are:

- 8 Data bits 1
- Stop bit No
- Parity 9600
- Baud

Serial Communications Card

This card must be set to the correct baud rate unless you use the default value on one of the three ports (9600, 4800, 1200). The card uses its slot number as its node number by default. Both the default baud rate and the node number may be changed either by changing it in a program in the PLC or by means of a programming terminal.

R-Net Gateway

The port parameters may be set on the Gateway using the switches located inside the module. The following figure shows the DIP switch locations.

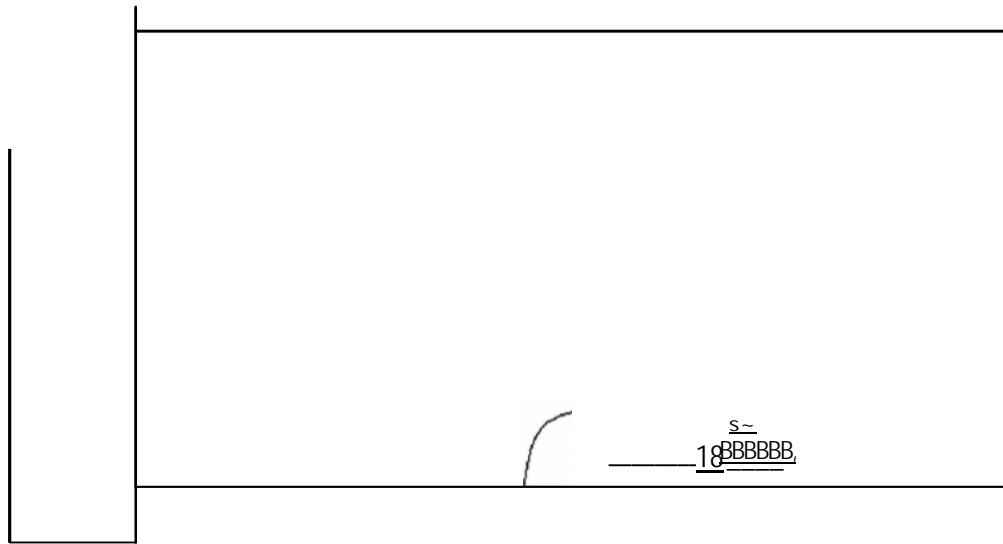


Figure 39-5 Gateway Switch Locations

The Gateway must be connected to an R-Net Processor. This processor must be set to a unique node number. To do this, set the node number using the rotary switches on the front panel of the processor. Remember that the node number is entered here in hexadecimal. The upper rotary switch is used for the high-order digit and the lower switch for the low-order digit.

Switch Position	On	Off
S1-1	Illegal	Asynchronous*
S1-2	Illegal	Binary'
S1-3	8 Data bits*	7 Data bits
S1-4	Parity on	Parity off*
S1-5	Parity even	Parity odd'

* Default value

Table 39-2 Port Configuration

Baud Rate	S1-6	S1-7	S1-8
110	Off	Off	Off
300	On	Off	Off
600	Off	On	Off
1200	On	On	Off
2400	Off	Off	On
4800	On	Off	On
9600*	Off	On	On
19200 (see S2-6)	On	On	On

* Default value

Table 39-3 Baud Rate Selection

Switch Position	Function	On	Off
S2-4	Receive dk	External	Internal'
S2-5	I/O Port	RS422	RS232*
S2-6	19200 baud	1937Hz**	18750Hz'''
S2-7	Not used	-	-
S2-8	Not used	-	-

- Default value
- +2.8 %
-2.3%

Table 39-4 Port Configuration

Reliance Word and Bit References

The following section describes the use of Reliance word and bit references in your configuration. The general word referencing method is:

[plcname,word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions. Reliance AutoMate PLCs use octal register addresses. The PanelMate unit format default is S16.

The following is the format for a register reference:

[rr]

rr PLC reference number of the register.

The following is the format for a register bit reference:

[rr]

bb]

PLC reference number of the register.

bb

PLC reference number of the bit.

Note A period (.) must be between the register and bit reference numbers.

The table at the beginning of this chapter shows the maximum amount of memory available for the specific Reliance model. Your PLC may or may not have the maximum amount of memory. The driver supports a maximum of 60 contiguous words per read. The PanelMate unit generates another read when more than 15 unused PLC words are encountered.

Examples

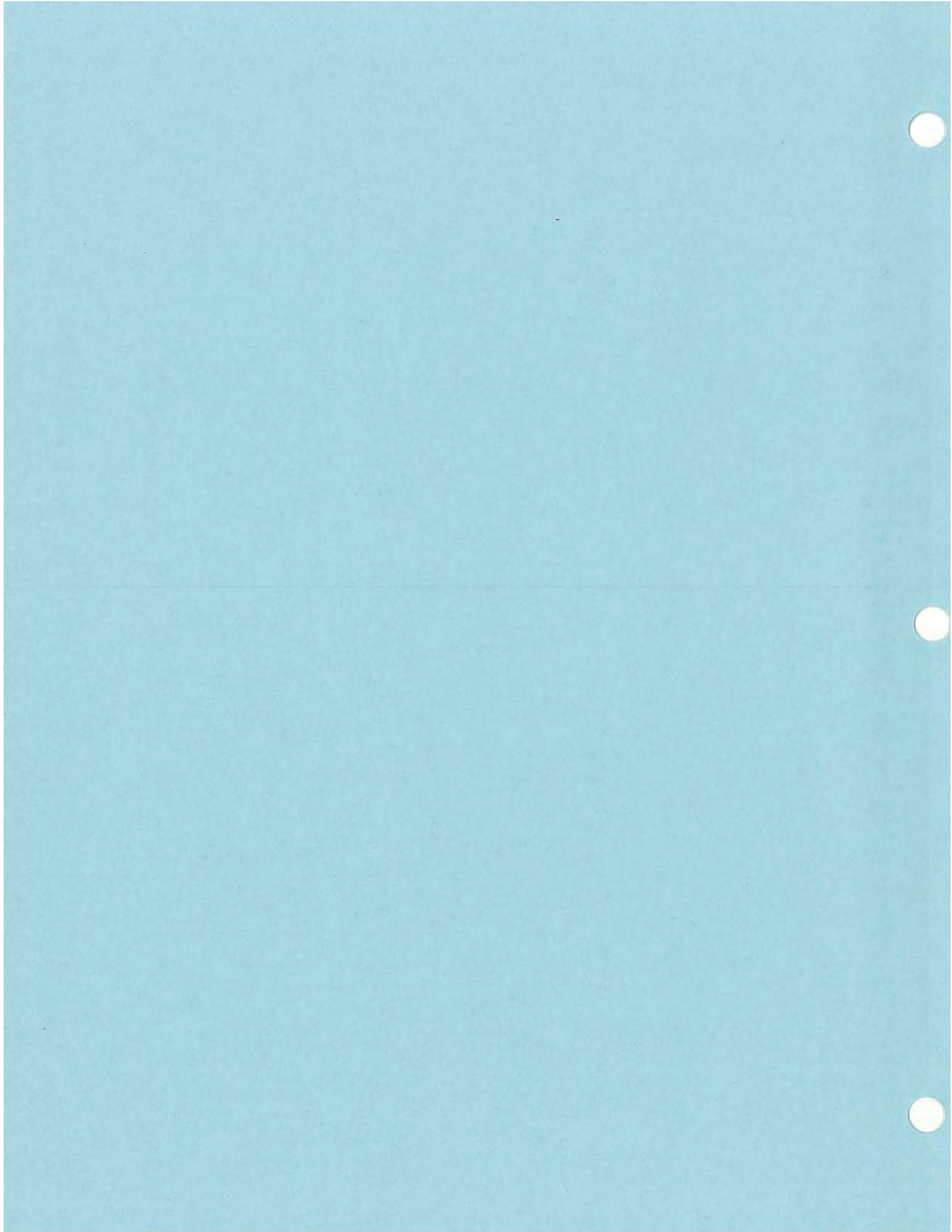
The following are examples of valid PLC references which may be assigned in the PanelMate expression fields.

Word References

<u>Reference</u>	<u>Description</u>
[2533]	Word 12 of Reliance Model 15 Word
[21333]	2533 of Reliance Model 20 Word 21333
[163]	of Reliance Model 30/30E Word 163 of
[2051]	Reliance Model 40 Word 2051 of
	Reliance Model 40E

Bit References

<u>Reference</u>	<u>Description</u>
[2.3] [42.5]	Word 2 bit 3 of Reliance Model 15 Word
[14.6]	42 bit 5 of Reliance Model 20 Word 14 bit
[4000.16]	6 of Reliance Model 30/30E Word 4000
[284.7]	bit 16 of Reliance Model 40 Word 284 bit
	7 of Reliance Model 40E



Chapter 40

Siemens PLCs

Using the CP524 or CP525 communications coprocessor, the PanelMate Series can communicate with any of the Siemens S5 U family of PLCs. The CP524 and CP525 communications coprocessor uses the 3964R protocol. The CP525 has two independent serial ports. The CP524 has only one serial port. (All references to the CP525 will include the CP524 unless otherwise noted.) The driver takes responsibility for communications to this programmable controller, generating the protocol necessary to request information from and send information to the PLC.

Unsoliciteds are not supported and should not be used. When writing to bit or byte addresses that do not exist, no errors will be generated. This section describes the basic configuration of Siemens PLCs and the PanelMate unit.

The Siemens driver supports models S5-115U, S5-135U and S5-155U.

Memory

The following list contains the memory types supported by the Siemens driver. D Data

Block	
I	Input (Read only)
F	Flag
C	Counter (Read only)
Q	Output
T	Timer (Read only)

Note Absolute, System and Extended memory areas are not supported.

There are several rack models within the Siemens S5 family of products. Each rack model can have different CPUs. Each CPU model may have different memory limits. The maximum address value for each of the supported PLC models is given in the following tables.

	CPU 944		CPU 943		CPU 942	CPU 941
Data Block (words)	256		256		256	256
Inputs (bytes)	128		128		128	64
Flags (bytes)	256		256		256	256
Counters (words)	128	128	128	128		
Outputs (bytes)	128		128		128	64
Timers (words)	128		128		128	128

Table 40-1 S5-115U CPU and Memory Configurations

	CPU 928	CPU 922 (R Processor)	CPU 921 (S Processor)	CPU 920 (M Processor)
Data Blocks (words)	256	256	256	256
Inputs (bytes) Flags	512	512	512	512
(bytes) Counters	256	256	256	
(words) Outputs	256	128	128	
(bytes) Timers (words)	512	512	512	512
	256	128	128	

Table 40-2 S5-135U CPU and Memory Configurations

	CPU 94617	CPU 922 (R Processor)	CPU 921 (S Processor)	CPU 920 (M Processor)
Data Block (words)	256	256	256	256
Inputs (bytes)	512	512	512	512
Flags (bytes)	256	256	256	
Counters (words)	256	128	128	
Outputs (bytes)	512	512	512	512
Timers (words)	256	128	128	

Table 40-3 S5-155U CPU and Memory Configurations

Note A - indicates that the memory area is not supported by the CPU model.

The S5-135U and S5-155U can operate in a multiprocessor configuration using either the M, S, R processors or CPU 928. These processors can also be used in stand-alone mode in the S5-155U. The following is a brief description of each processor.

- CPU928 This processor is designed for multiple tasks: it provides fast binary signal processing (open-loop control) as well as fast word processing (computing and closed-loop control).
- M Processor This processor is used for data processing, arithmetic and statistics.
- R Processor This processor is used mainly for fast word processing (computing and closed-loop control). It can also be used for binary signal processing.
- S Processor This processor is used mainly for fast binary signal processing (open-loop control). It can also be used for computing and closed-loop control.

Possible Configurations

The following sections describe some of the possible configurations of the PanelMate unit with Siemens PLCs.

Direct Connection

Direct connection between one PanelMate unit and one Siemens PLC.

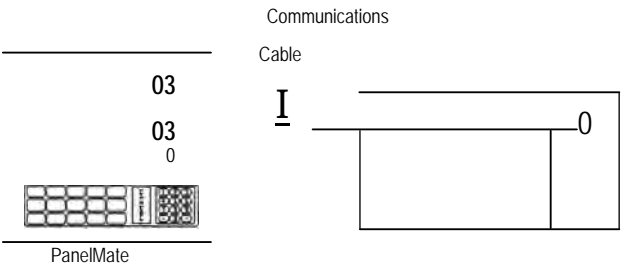


Figure 40-1 Direct Connection

Multiple Connection

The following figure shows a multiple connection consisting of two PanelMate units and a Siemens PLC.

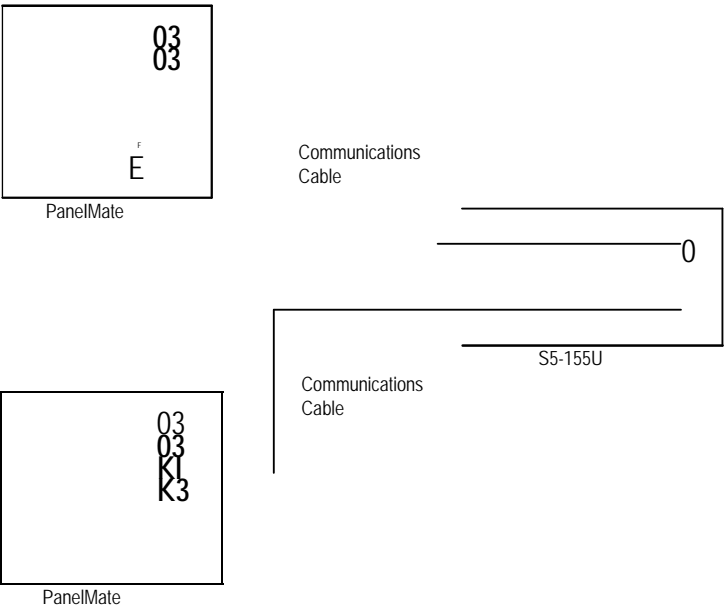


Figure 40-2 Multiple Connection

Cabling

The Siemens driver supports RS232C communications only. The following figure shows the cable configuration between the PanelMate unit and CP524 and CP525.

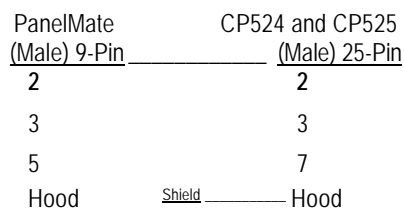


Figure 40-3 PanelMate to Processor Cabling

Communications Parameters

The default communications parameters are shown below. If you intend to use any baud rate other than the default, you must use the Siemens programmer to change it. The data bits, parity, and stop bits must be set as shown below and cannot be changed on the Siemens PLC.

Data bits	8
Parity	Even
Stop bits	1

Note The baud rate is configurable to these settings: 19200, 9600, 4800, 2400, 1200, 600, 300 and 110. When using a CP525, the sum of the baud rate on the two serial ports must not exceed 19200. In all cases, configure the PanelMate unit's serial port to match the selected baud rate.

Note that in order for the PanelMate unit and the Siemens PLC to communicate, the Siemens PLC must be set to the higher priority. The Siemens SEND-ALL and RECEIVE-ALL functions must be executing in the CPU.

Siemens Word, Byte, and Bit References

The following section describes the use of Siemens word, byte, and bit references in your configuration. The general word referencing method is:

[plcname, word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname, bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

The Siemens driver supports models S5-115U, S5-135U and S5-155U. These models use decimal register addresses and bit offsets.

Note that there is a one or two-character prefix which identifies the type of variable being referenced followed by the specific number of the variable. The following list contains the memory types supported by the Siemens driver. C

Counter (Read only)

T	Timer (Read only)
DW	Data Word
FW	Flag Word (Read only)
1W	Input Word (Read only)
QW	Output Word (Read only)
DL	Left Byte in Data Word
DR	Right Byte in Data Word
FY	Flag Byte (Read only)
IB	Input Byte (Read only)
QB	Output Byte (Read only)
D	Data Bit
F	Flag Bit
I	Input Bit (Read only)
Q	Output Bit

The prefixes are used to identify the usage of the variable to the Siemens PLC.

Word References

The following is the format for a data word memory reference.

[mddd:www]

ddd

Word memory type symbol (i.e., DW).

www

Data block number; 3-digit maximum, leading zeroes allowed.

Word offset within data block; 3-digit maximum, leading zeroes allowed.

The following is the format for a word memory reference or a register (16-bit word) reference in timer or counter memory (read only).

[mom]

m

Word memory type symbol (i.e., IW, FW, QW, T, C).

www

Word, timer, or counter number; 3 digit maximum, leading zeroes allowed. (Input words are read only).

Byte References

The following is the format for a data byte memory reference.

[mddd:www]

m

Byte memory type symbol (i.e., DL, DR).

ddd

Data block number; 3-digit maximum, leading zeroes allowed.

www

Word number; 3 digit maximum, leading zeroes allowed.

The following is the format for a byte memory reference.

[m:bbb]

m

Byte memory type symbol (i.e., IB, FY, QB).

bbb

Byte number; 3 digit maximum, leading zeroes allowed. (Input bytes are read only).

Bit References

The following is the format for a data bit reference within a data block.

[mddd:www.t]

m Byte memory type symbol (i.e., D).

ddd Data block number; 3-digit maximum, leading zeroes allowed.

www Byte number; 3 digit maximum, leading zeroes allowed.

t Bit number; 1 digit maximum.

The following is the format for a bit reference within a byte.

[m:bbb.t]

m Byte memory type symbol (i.e., I, F, Q).

bbb Byte number; 3 digit maximum, leading zeroes allowed. (Input
bits are read only).

t Bit number; 1 digit maximum.

Since the 3964R Protocol does not support bit and byte writes, the following is a Bit/Byte Write function block is required. It allows the PanelMate unit to write to data word bits, output bits, flag bits, and data word bytes. The PanelMate unit writes directly to Data Block 230. Data Block 230 must exist in the PLC and be ten words in length.

Note If the PLC Bit/Byte Write program uses interrupts which write to flag words 200-210, then these flag words should not be used. A solution would be to increase the size of data block 230 to 21 words and replace the flag word references with the new data block words.

ADDRESS	COMMAND		DESCRIPTION
000B			BIT/BYTE WRITE FUNCTION BLOCK.
000C			
000D			
000E	:C	DB 230	CALLS DATA BLOCK 230.
000F			
0010			OUTPUT BIT WRITE ROUTINE.
0011			.....
0012	:L	KM 00000000 00000000	LOAD MASK INTO ACCUM1.
0014	:L	DW 1	GET DW1 (PANELMATE Q BIT WRITES).
0015	:<=F		TEST TO SEE IF BIT WRITE REQUESTED.
0016	:JC	=M001	IF BIT WRITE PRESENT .. CONTINUE
0017			ELSE JUMP OVER SUBROUTINE.
0018			
0019	:T	FW 200	TRANSFER DATA TO FW200 (FASTER).
001A	:L	KM 00000111 01111111	STRIP ALL BUT BIT # AND ADDRESS
001C	:AW		AND MASK WITH DATA.
001D	:T	FW 202	TRANSFER RESULT INTO FW202.
000E		F 210.0	RESET THE FIRST OPERATION BIT.
001F	:A	F 200.4	CHECK FOR SET/RSET ==> INTO ROL.
0020	:DO	FW 202	LOAD BIT AND WORD ADDR OF OUTPUT.
0021		Q 0.0	COPY ROL VALUE INTO OUTPUT BIT.
0022			
0023	:L	KH 0000	ZERO OUT DW1 IN DB230 SO ANOTHER
0025	:T	DW 1	BIT WRITE CAN BE PREFORMED.
0026			
0027			
0028			
0029	:		FLAG BIT WRITE ROUTINE.
002A M001			.....

ADDRESS	COMMAND		DESCRIPTION
002B	:L	KM 00000000 00000000	LOAD MASK INTO ACCUM1.
002D	:L	DW 2	GET DW2 (PANELMATE F BIT WRITES).
002E	:<=F		TEST TO SEE IF BIT WRITE REQUESTED.
002F	:JC	=M002	IF BIT WRITE PRESENT .. CONTINUE
0030			ELSE JUMP OVER SUBROUTINE.
0031			
0032	:T	FW 200	TRANSFER DATA TO FW200 (FASTER).
0033	:L	KM 00000111 11111111	STRIP ALL BUT BIT # AND ADDRESS
0035	:AW		AND MASK WITH DATA.
0036	:T	FW 202	TRANSFER RESULT INTO FW202.
0037		F 210.0	RESET THE FIRST OPERATION BIT.
0038	:A	F 200.4	CHECK FOR SET/RSET ==> INTO ROL.
0039	:DO	FW 202	LOAD BIT AND WORD ADDR OF OUTPUT.
003A		F 0.0	COPY ROL VALUE INTO FLAG BIT.
003B			
003C	:L	KH 0000	ZERO OUT DW2 IN DB230 SO ANOTHER
003E	:T	DW 2	BIT WRITE CAN BE PREFORMED.
003F			
0040			
0041			
0042			DATA BIT WRITE ROUTINE.
0043	M002		.....
0044	:L	KM 00000000 00000000	LOAD MASK INTO ACCUM1.
0046	:L	DW 3	GET DW3 (PANELMATE DATA BIT WRITES).
0047	:<=F		TEST TO SEE IF BIT WRITE REQUESTED.
0048	:JC	=M003	IF BIT WRITE PRESENT .. CONTINUE
0049			ELSE JUMP OVER SUBROUTINE.
004A			
004B	:T	FW 200	TRANSFER DATA TO FW200 (FASTER).
004C	:L	KM 00001111 11111111	STRIP ALL BUT BIT # AND ADDRESS
004E	:AW		AND MASK WITH DATA.
004F	:T	FW 202	TRANSFER RESULT INTO FW202

ADDRESS	COMMAND	DESCRIPTION
0050	:T FW 206	AND FW206.
0051	:DO DW 4	GET THE DB # AND
0052	:C DB 0	CALL THE DB #.
0053	:L FY 202	LOAD BIT AND WORD ADDR.
0054	:L KM 00000000 00000111	LOAD THE MASK TO RETRIEVE THE BIT ADDR.
0056	:>F	IS THE BIT ADDR BETWEEN 0-7.
0057	:JC =M004	IF SO JUMP TO M004 (LO BYTE DATA BIT)
0058	:L KB 209	ELSE SET UP FY20TS LO DATA BIT.
0059	:T FY 207	
005A	:JU =M005	JUMP OVER HI DATA BIT SETUP.
005B M004	:L KB 208	SET UP FY207'S HI DATA BIT.
005C	:T FY 207	
005D M005	:L FW 202	LOAD BIT AND ADDRESS.
005E	:L KM 00000000 11111111	MASK OUT ADDRESS.
0060	:AW	
0061	:T FW 202	TRANSFER TO FW202 FOR SPEED.
0062	:DO FW 202	SET UP FOR LW TO GET THE DATA WORD.
0063	:L DW 0	LOAD THE DATA WORD INTO ACCUMI.
0064	:T FW 208	TRANSFER THE CURRENT VALUE TO FW208.
0065	F 210.0	RESET FIRST OPERATION BIT.
0066	:A F 200.4	CHECK TO SEE IF SET OR RESET IS
0067	:DO FW 206	PERFORMED AND SET OR RESET THE
0068	F 0.0	CORRESPONDING BIT.
0069	:L FW 208	LOAD FW W/ BIT CHANGED
006A	:DO FW 202	AND TRANSFER IT BACK TO ITS
006B	:T DW 0	ORIGINAL DW.
006C	:C DB 230	CALL ORIGINAL DATA BLOCK.
006D	:L KH 0000	ZERO OUT DW3 IN DB230 SO ANOTHER
006F	:T DW 3	BIT WRITE CAN BE PERFORMED.
0070		
0071		
0072		
0073		DATA BYTE HI WRITE ROUTINE.
0074 M003		.....

ADDRESS	COMMAND		DESCRIPTION
0075	:L	KM 00000000 00000000	LOAD MASK.
0077	:L	DW 6	CHECK TO SEE IF DATA BYTE HI WRITE
0078	:!=F		WRITE WAS REQUESTED CONTINUE IF YES
0079	:JC	=M006	ELSE JUMP OVER SUBROUTINE.
007A	:L	DW 5	LOAD THE DATA BYTE ADDR.
007B	:T	FW 200	TRANSFER IT TO FW200 FOR SPEED.
007C	:DO	DW 6	SET UP TO CALL THE DB.
007D	:C	DB 0	CALL THE DB.
007E	:L	FY 201	LOAD THE WORD ADDR.
007F	:T	FW 202	SET UP TO LOAD THE DATA WORD.
0080	:DO	FW 202	
0081	:L	DW 0	LOAD THE DATA WORD.
0082	:L	KM 00000000 11111111	MASK OUT THE HI BYTE.
0084	:AW		
0085	:L	FY200	LOAD THE DATA BYTE.
0086	:SLW	8	ROTATE IT INTO POSITION.
0087	:OW		MERGE OLD LO AND NEW HI BYTES.
0088	:DO	FW 202	TRANSFER THE WORD BACK TO ITS
0089	:T	DW 0	ORIGINAL LOCATION.
008A	:C	DB 230	CALL BACK DB23.
0008B	:L	KH 0000	ZERO OUT DW6 IN DB230 SO ANOTHER
008D	:T	DW 6	DATA BYTE HI WRITE CAN BE PERFORMED.
008E			
008F			
0090			
0091			DATA BYTE LO WRITE ROUTINE.
0092 M006			
0093	:L	KM 00000000 00000000	LOAD MASK.
0095	:L	DW 8	CHECK TO SEE IF DATA BYTE LO WRITE
0096	:!=F		WRITE WAS REQUESTED CONTINUE IF YES
0097	:JC	=M007	ELSE JUMP OVER SUBROUTINE.
0098	:L	DW 7	LOAD THE DATA BYTE ADDR.
0099	:T	FW 200	TRANSFER IT TO FW200 FOR SPEED.

ADDRESS	COMMAND		DESCRIPTION
009A	:DO	DW 8	SET UP TO CALL THE DB.
009B	:C	DB 0	CALL THE DB.
0090	:L	FY 201	LOAD THE WORD ADDR.
009D	:T	FW 202	SET UP TO LOAD THE DATA WORD.
009E	:DO	FW 202	
009F	:L	DW 0	LOAD THE DATA WORD.
OOAO	:L	KM 11111111 00000000	MASK OUT THE LO BYTE.
00A2	:AW		
00A3	:L	FY 200	LOAD THE DATA BYTE.
00A4	:OW		ROTATE IT INTO POSITION.
00A5	:DO	FW 202	MERGE OLD HI AND NEW LO BYTES.
00A6	:T	DW 0	TRANSFER THE WORD BACK TO ITS
00A7	:C	DB 230	ORIGINAL LOCATION.
00A8	:L	KH 0000	CALL BACK DB230.
OOAA	:T	DW 8	ZERO OUT DW6 IN DB230 SO ANOTHER
OOAB M007	:BE		DATA BYTE LO WRITE CAN BE PREFORMED.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate expression fields.

Word References

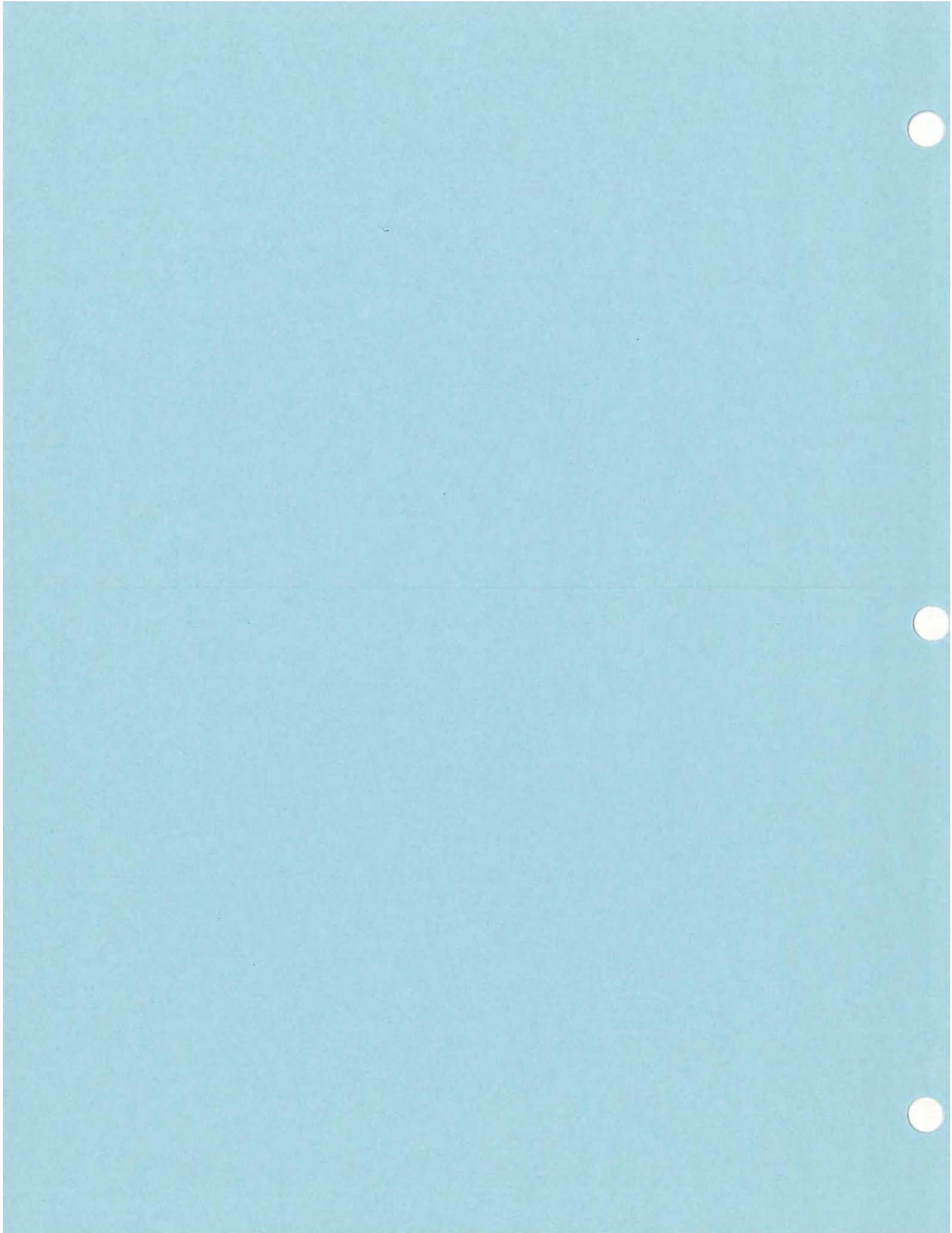
<u>Reference</u>	<u>Description</u>
[C:3]	Counter 3
[DW1 3:155]	Data block 13, word 155
[FW:4]	Flag block 4
[IW:46]	Input block 46
[QW:005]	Output block 5
[T:242]	Timer 242

Byte References

<u>Reference</u>	<u>Description</u>
[DL12:004]	Left byte in data word 4, data block 12
[DR22:192]	Right byte in data word 192, data block 22
[IB:013]	Input byte 13
[FY251]	Flag byte 15
[QB:245]	Output byte 245

Bit References

<u>Reference</u>	<u>Description</u>
[D17:32.15]	Data block 17, word 32, bit 15
[F:16.4]	Flag byte 16, bit 4
[I:96.4]	Input byte 96, bit 4
[Q:75.2]	Output byte 75, bit 2



Chapter 41

Square D PLCs

The PanelMate Series can be used with any of the Square D Sy/Max family of PLCs, using the Square D driver. The driver takes responsibility for communications to this programmable controller, generating the protocol necessary to request information from and send information to the PLC.

This section describes the basic configuration of Square D PLCs and the PanelMate unit. More information on the Square D modules can be found in the appropriate Square D Instruction Bulletin.

The Square D PLC driver supports models 100, 300, 400, 500, 600, and 700. The SY/MAX protocol must be used for each of the above mentioned models. No special ladder logic is required in the PLC to support the interface. Direct connection to the processor and network communications, using the Network Interface Module (NIM), are supported. Write broadcasting is also supported by this driver.

The following Square D route assignments can be used: 00-199 for normal network routing, 200 to read the NIM status, and 233-254 for network broadcasting capabilities.

Memory

The following list contains the memory types supported by the Square D driver.

S	Storage register
R	Internal relay logic
N	External VO
O	External output
I	External input

The maximum address range for each of the supported PLC models is given in the following table. Model

	<u>Address Range</u>
100	1-44 words
300	1-112 words
400	1-8000 words
500	1-2008 words
600	1-8000 words
700	1-8000 words

Table 41-1 Address Ranges

Possible Configurations

The following sections describe some of the possible configurations of the PanelMate unit with Square D PI-Cs.

Network to network communication is not supported by the Eaton IDT Square D driver.

Direct

Direct connection between PanelMate unit and the processor.

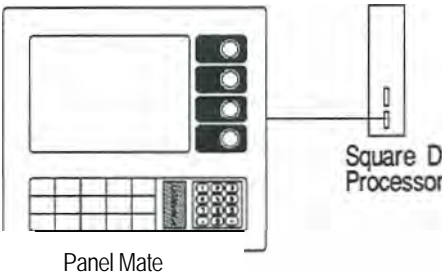


Figure 41-1 Direct Connection

Note When using a direct connection between the PanelMate unit and the Square D processor, the minimum baud rate for proper operation is 1200.

Network

The following figure shows a network consisting of two devices and a PanelMate unit.

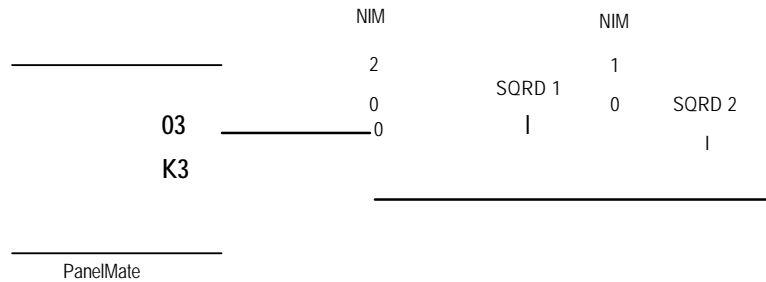
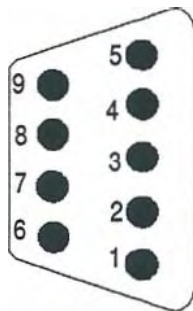


Figure 41-2 Network Connection

Note Network reads are not currently supported.

Cabling

The Square D driver supports RS422 communications only. The following tables show the pinouts for the processor module ports and NIM ports. These pinouts should be used for creating the communications cables.



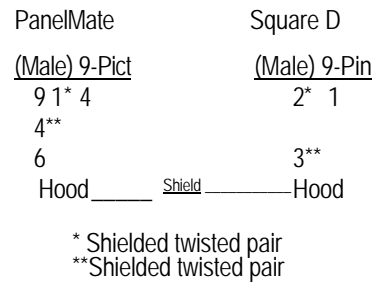
Pin	Signal
1	RS422 TO (-) 2
3	RS422 TO (+) 3 RS422
4	RS422 RxD (-) 4
5	RS422 RxD (+) 5
6	+5 V
7	+5 V
8	Signal GND
9	Signal GND
	Chassis GND (shield)

Figure 41-3 Square D Processor Port Pinouts 50

9 • 41 8 • 30
710
6 20
49

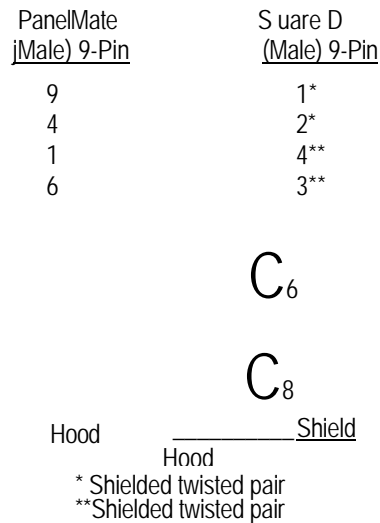
Pin	Signal
1	RS422 TO (-) 2
3	RS422 TO (+) 3 RS422
4	RS422 RxD (-) 4
5	RS422 RxD (+) 5
6	CTS (+) 6
7	RTS (+) 7
8	CTS (-) 8
9	RTS (-) 9
	Chassis GND (shield)

The following figures show the cable configuration between the PanelMate unit and Square D modules. The maximum cable length when using RS422 is 4000 feet. RS422 cable must be a twisted double-wire shielded cable. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).



Note If ground loop problems occur, remove hood connection of shield wire on PLC end.

Figure 41-5 PanelMate to Processor Cabling



Note If ground loop problems occur, remove hood connection of shield wire on PLC end. **Figure 41-6**

PanelMate to NIM Cabling

Communications Parameters

The default communications parameters are shown below. If you intend to use any baud rate other than the default with a direct connection, you must use the Square D programmer to change it. The data bits, parity, and stop bits must be set as shown below and cannot be changed on the Square D PLC:

Baud rate	9600
Data bits	8
Parity	Even
Stop bits	1

The NIM is the only part of the network described earlier that has switches which need to be set for proper communications. Two types of switches reside on the NIM; thumbwheel and DIP.

Note The settings for parameters, such as baud rate, must match the parameter setting of the PanelMate unit.

Thumbwheel Switches

The two thumbwheel switches, shown in the following figure, are used to select the module address on the network. The number set on the thumbwheel switches and the port number are used as the Network ID# and the PLC ID# in the PLC Name and Port Editor. The port number is used as a prefix on the front of the number on the thumbwheels.

For example, if the thumbwheels are set to 23 and the Square D processor is connected to COMM port 0 and the PanelMate unit is connected to COMM port 1, the PLC ID# should be 23 and the Network ID# should be 123.

DIP Switches

The NIM has three DIP switches which are mounted at the rear of the module near the card edge connector. The three DIP switches are labeled S3, S4, and S5. These switches are used to set the network baud rate, COM port baud rate, and mode of operation for COM ports 0 and 1.

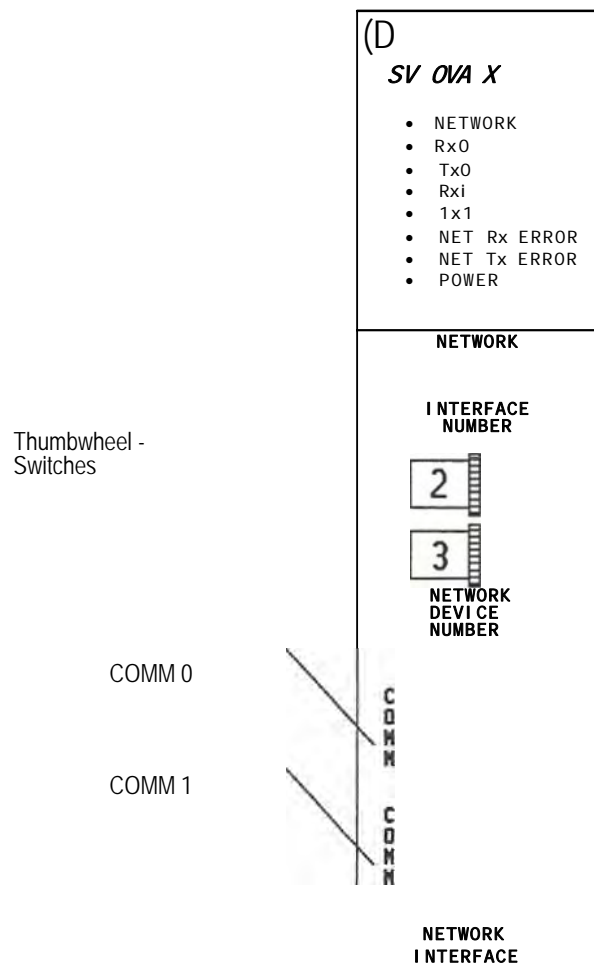


Figure 41-7 NIM

DIP Switch S3

A special network port, on the bottom of the NIM, is used for high speed network communications. DIP switch S3 selects the network baud rate for network port. The cable length to be used determines the maximum baud rate. The following table shows the

maximum cable length for each selectable baudrate.					
1	2	3	4	Baud Rate	Max Cable Length (feet)
Open	Closed	Closed	Closed	500,000	2,400
Closed	Open	Closed	Closed	250,000	4,250
Closed	Closed	Open	Closed	125,000	9,250
Closed	Closed	Closed	Open	62,500	15,000

Table 41-2 DIP Switch S3

DIP Switches S4 and S5

DIP switches S4 and S5 will allow you to select the mode of operation, baud rate, self test, and network size for COM ports 1 and 0, respectively. The following description covers both DIP switches. Switch position one selects whether broadcast messages on the network should be received by the COM port.

<u>Switch Position 1</u>	<u>Function</u>
Open	Disable receive broadcast
Closed	Enable receive broadcast

Table 41-3 DIP Switches S4 and S5

Note The function of this switch changes depending on the mode selected (described later). The function given above for this switch position is for the SY/MAX mode of operation. When using a SY/MAX family CRT in the peripheral mode, this switch should be closed.

Switch positions two and three select the mode of operation. The PanelMate unit supports the SY/MAX mode only. Therefore, both of these switch positions should be in the closed state. The following table shows the possible mode selections.

Switch Position <u>2</u> _____ <u>3</u>		<u>Mode</u>
Closed	Closed	SY/MAX
Open	Closed	Net to Net
Closed	Open	8881
Open	Open	Peripheral

Table 41-4 DIP Switches S4 and S5

Switch positions four, five, and six select the COM port baud rate. The following table shows the possible baud rates.

Switch Position <u>4</u> _____ <u>5</u> _____ <u>6</u>			<u>Baud Rate</u>
Closed	Closed	Closed	19,200
Open	Closed	Closed	9,600
Closed	Open	Closed	2,400
Open	Open	Closed	1,200
Open	Open	Open	300

Table 41-5 DIP Switches S4 and S5

Switch position seven on DIP switch S4 selects either normal operation or self test. The self test mode is used only for testing ports, RAM, and ROM on the NIM. The following table shows the possible switch selections.

Switch Position <u>7</u>	<u>Function</u>
Open	Normal operation
Closed	Self test

Table 41-6 DIP Switch S4

The procedure for running the self test is described in the Square D Instruction Bulletin for your NIM.

Switch position seven on DIP switch S5 sets the network size. The following table shows the possible network size selections.

<u>Switch Position 7 Function</u>	
Open	Network size = 100 (00-99)
Closed	Network size = 31 (00-30)

Table 41-7 DIP Switch S5

Note Reducing the network size to 31 modules will improve network access by a factor of three. Also, all modules on a network should have the same setting for this switch position. If this switch position on any of the modules is set to the closed state, the entire network size will be set to a maximum of 31.

Square D Word and Bit References

The following section describes the use of Square D word and bit references in your configuration. The general word referencing method is:

`[plcname,word#format]`

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

`[plcname,bit]`

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

The Square D Sy/Max protocol is supported on the PanelMate unit for models 100, 300, 400, 500, 600, and 700. These models use decimal register addresses and bit offsets. Addresses and offsets all range from 1 to 16 (not from 0 to 15). The PanelMate unit format default is S16.

Note that this consists of a one-character prefix which identifies the type of variable being referenced followed by the specific number of the variable. The following list contains the memory types supported by the Square D driver.

S - storage register

R - internal relay logic N -

external VO 0 - external

output I - external input

The prefixes are used to identify the usage of the variable to Square D. Each variable is uniquely identified by its number. Therefore, the prefix may be omitted from the reference (e.g., [11] may be used instead of [S11]).

The following is the format of a register reference.

[rr]

rr

PLC reference number of the register.

The following is the format of a register bit reference. [rr-bb]

rr

PLC reference number of the register.

bb

PLC reference number of the bit position. The bit positions are numbered from 1 to 16, least significant to most significant, respectively.

The PanelMate unit does not support writing to protected registers. If a template attempts to modify the contents of a protected register, a communications error will result. Therefore, if an unexplainable communications error occurs, the user is suggested to check the BEGIN FENCED REGISTERS and END FENCED REGISTERS parameters with a Square D Programmer. All data referenced by the PanelMate unit must lie between these parameters.

The supported Square D PLC models will allow a maximum of 60 contiguous words per read. The maximum number of unused words before another read is generated is 15.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate expression fields.

Word References

<u>Reference</u>	<u>Description -</u>
[S13] [R12]	Word 13 is placed in a storage register
[N3]	Word 12 is internal relay logic Word 3 is
[05]	external I/O Word 5 is external output
[19]	Word 9 is external input

Bit References

<u>Reference</u>	<u>Description</u>
[S32-14]	Word 32 bit 14 is placed in a storage register
[R96-3]	Word 96 bit 3 is internal relay logic Word 54 bit
[N54-15]	15 is external I/O Word 23 bit 2 is external
[023-2]	output Word 16 bit 4 is external input
[116-4]	





Chapter 42

Texas Instruments PLCs

The PanelMate Series can be used with the programmable controllers in the Texas Instruments (TI) 500 Series (520, 530, 560, and 565), 405 Series (425, 430, and 435), and 305 Series (315, 325, and 330) using the TI driver or the TIHL (Host Link) driver. The driver takes responsibility for communications to the programmable controller, generating the protocol necessary to request information from, and send information to, the PLC. The PLC simply responds to these requests and commands. Ladder logic is required in the PLC to support bit writes to the TI 405 and TI 305 PI-Cs.

Connection to PLCs using the PanelMate TI or TIHL driver can be accomplished by a direct connection to the RS232 port, the Data Communication Module (DCM), or the Data Communications Unit (DCU). The RS232 connection can only be used Point-to-Point. RS422 has multi-drop capabilities.

Memory

The following memory types are supported by the 500 Series driver:

<u>Memory Type</u>	<u>Memory Address</u>
16-Bit Word	
WX	WX Word Image Register
WY	WY Word Image Register
•	V Word Memory
DSP	Drum Step Preset
DSC	Drum Step Current Memory
DCP	Drum Count Preset Memory
DCC	Drum Count Current Memory (Read Only)
TCP	Timer/Counter Preset Memory
TCC	Timer/Counter Current Memory
LPV	Loop Process Variable
LMN	Output
LSP	Setpoint
LMX	Bias
Bit	
•	X Discrete Image Register Y Y Discrete Image Register
C	C Discrete Image Register

The following memory types are supported by the 405 Series driver:

<u>Memory Type</u>	<u>Memory Address</u>
16-Bit Word	
TMR	Timer
CNT	Counter
•	User Data
•	System Parameter
Byte or Bit	
GX	Remote VO
•	Input
Y	Output
C	Control Relays
S	Stages
T	Timer Relays (Read Only)
CT	Counter Relays (Read Only)
SP	Special Relays (Read Only)

The following memory types are supported for the 305 Series driver:

<u>Memory Type</u>	<u>Memory Areas</u>
16-Bit Word	
AC	Timer/Counter Accumulator (Read Only - Model 315)
R	Data Registers (Not Supported - Model 315)
Byte	
R	Data Registers (Not Supported - Model 315) (Read Only - Models 325 and 330)
Bit	
IO	Input/Output, Internal Relay, Shift Register (10373-10377
T C	is Read Only - Model 315) (10374-10377 is Read Only -
TC	Models 325 and 330) Timer Element (Read Only - all
SG	models) Counter Element (Read Only - all models)
	Timer/Counter Element (Read Only - all models) Stage
	Element

Memory addresses are in octal.

The following table shows the memory types and ranges supported by the 500 Series driver.

Memory Type	PLC Type			
	520	530	560	565
16-Bit Word				
WX	1-1023	1-1023	1-8192	1-8192
WY	1-1023	1-1023	1-8192	1-8192
V	1-1024	1-5120	1-228352	1-228352
DSP	1-30	1-30	1-1152	1-1152
DSC	1-30	1-30	1-1152	1-1152
DCC	1-30	1-30	1-1152	1-1152
TCP	1-128	1-400	1-10240	1-10240
TCC	1-128	1-400	1-10240	1-10240
DCP	1-30	1-30	1-1152	1-1152
LPV	-	-	-	1-64
LMN	-	-	-	1-64
LSP	-	-	-	1-64
LMX	-	-	-	1-64
Bit				
X	1-1023	1-1023	1-8192	1-8192
y	1-1023	1-1023	1-8192	1-8192
C	1-511	1-1023	1-8192	1-8192

Table 42-1 Memory Ranges for 500 Series Driver

Note For the Drum memory type (DSP, DSC, DCP and DCC), the range represents the drum number. For DCP memory, the range of step values is 1-16. DCP values are entered using the format [DCPxx yy] where xx = drum number, yy = the step value.

The following table shows the memory types and ranges supported by the 405 Series driver.

Memory Type	Memory Address	V Memory Addresses
16-Bit Word		
Timer	TMRO-TMR177	V00000-V00177
Counter	CNTO-CNT177	V01000-V01177
User Data	V01400-V07377	V01400-V07377
System Param	V07400-V07777	V07400-V07777
Byte or Bit		
Remote VO	GX0-GX777	V40000-V40037
Inputs	X0-X477	V40400-V40423
Outputs	Y0-Y477	V40500-V40523
Control Relays	C0-C737	V40600-V40635
Stages	S0-S577	V41000-V41027
Timer Relays	TO-T177 (Read Only)	V41100-V41107 (Read Only)
Counter Relays	CTO-CT177 (Read Only)	V41140-V41147 (Read Only)
Special Relays	SSPO) P137 (Read	00-V41205 (Read

Table 42-2 Memory Ranges for 405 Series Driver

The following table shows the memory types and ranges supported by the 305 Series driver.

Memory Type	PLC Type		
	315	325	330
16-Bit Word			
Timer/Counter Acc Data Registers	AC600-AC624 (Read Only) Not Supported	AC600-AC677 R400-R577	AC600-AC677 R400-R577
Byte or Bit			
Timer (Read Only)	T600-T624 (Not Available)	T600-T677	T600-T677
Timer/Counter (Read Only)	TC600-TC624 (Not Available)	TC600-TC677 C600-0677	TC600-TC677 0600-0677
Counter (Read Only)	C600-C624 (Not Available)	10000-10373	10000-10373
Input/Output	10000-10017 (Read Only) 1020-10357 10360-10377 (Not Available)	10374-10377 (Read Only) 10400-10577 10700-10777	10374-10377 (Read Only) 10400-10577 10700-10777
Stage	SG000-SG137	SG000-SG173 SG174-SG177 (Read Only) R400-R577	SG000-SG173 SG174-SG177 (Read Only) R400-R577

Table 42-3 Memory Ranges for 305 Series Driver

Note When using the 315 model, updates may take up to two minutes. The slow update times are due to limitations within the 315 model not PanelMate unit.

Note For models 325 and 330, byte 10370 and SG170 are read only.

Possible Configurations

Examples of possible configurations are described and shown in the following figures.

See the TI manual for your PLC to set the baud rate for the port on the CPU.

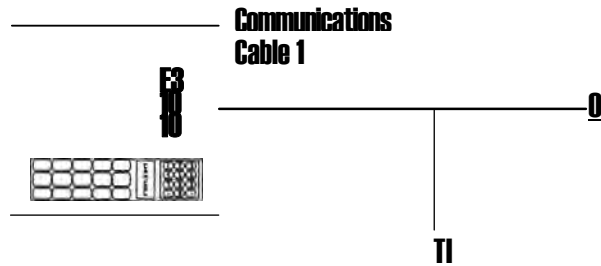


Figure 42-1 Direct Connection

Direct with DCPM

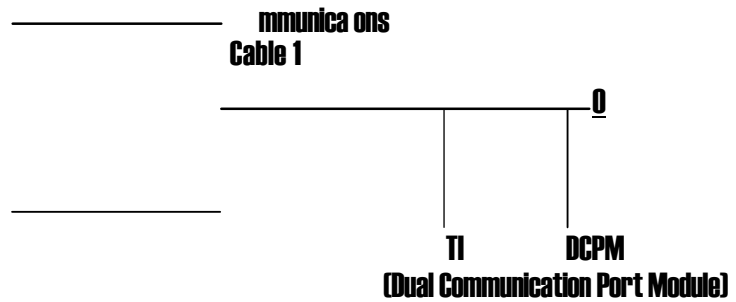


Figure 42-2 Connection to a DCPM

Direct with DCU

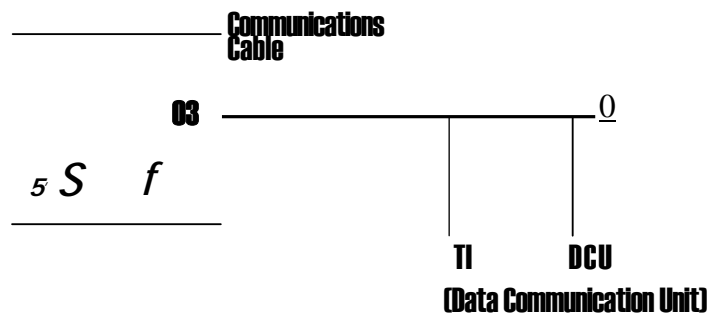


Figure 42-3 Connection to a DCU

Cabling

Communications between the PanelMate unit and TI 500 PLCs is RS232. Communications between 405 and 305 PLCs can be RS232 or RS422. The maximum cable length when using RS232 is 50 feet, while the maximum cable length for RS422 is 4000 feet. RS422 cable must be a twisted double-wire shielded cable. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

RS232C Communications Cable for PLCs		RS232C Communications Cable for PLCs		RS232C Communications Cable for PLCs	
PanelMate (Male) DB-9P	TI 500 and 305 (Male) DB-25P	PanelMate (Male) DB-9P	TI 405 (Male) DB-25P	PanelMate (Male) DB-9P	TI 545 Port 1 (Male) DB-9P
2	2	2	2	2	3
3	3	2	3	2	2
5	7	5	7	5	5
			4		7
	E 4		C 5		C 6
Additional not for RS232C					
communications to the TI 405.					

Hood Shield Hood

Figure 37-4 RS232C Cabling for TI PLCs

RS422 Communications Cable for PLCs		RS422 Communications Cable for PLCs		RS422 Communications Cable for PLCs	
PanelMate (Male) DB-9P	TI 435 Serial Interface Port (Male) DB-25P	PanelMate (Male) DB-9P	TI 305- (Male) DB-9P DCM	PanelMate (Male) DB-9P	TI 545 Port 2 (Male) DB-9P
1		1	17	1	5
4	9	4	14	4	1
	14				
5	7		7	5	6
6			16		
	10	6		6	8
9	16	9	15		7
				9	
	19		10		
	11		12		
	18		11		
	23		13		

Figure 42-5 RS422 Cabling for TI 405, 305, and 545 PLCs

Communications Parameters

Dual Communication Port Module TI 500 Series

The Dual Communication Port Module (DCPM) has two RS232/423 ports which work independently and permit simultaneous communication. The PanelMate unit does not support RS423. RS232 must be used for communications. The two ports are identical to the programming port on the PLC. All communication is serial with one stop bit at all baud rates, except at 110 baud, which has two stop bits. The ports may be configured for a baud rate ranging from 110 to 19.2K, and also for DTE or DCE mode. Standard communication parameters for communicating with TI PLCs are shown below. These parameters are given only as a starting point and may be changed to meet the demands of your application.

7 Data Bits 1

Stop Bit Odd

Parity 9600

Baud

Under the front access cover are two dipswitch banks. The upper dipswitch bank is for configuring port 1, while the lower dipswitch bank is for configuring port 2. The configuration switches are shown in the following figure.

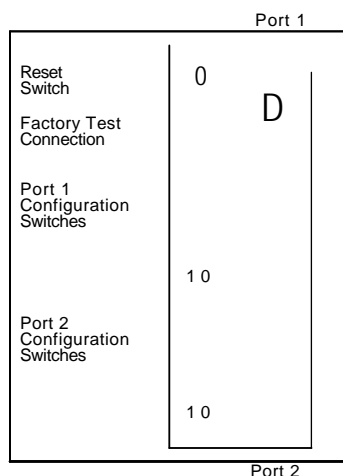


Figure 42-6 Dipswitch Bank Locations

Set switch 4 to the 1 position to select DTE mode or into the 0 position to select DCE mode. Switches 5 through 8 are not used.

Baud Rate	110	300	600	1200	2400	4800	9600	19.2K
Switch 1	0	1	0	1	0	1	0	1
Switch 2	0	0	1	1	0	0	1	1
Switch 3	0	0	0	0	1	1	1	1

Table 42-4 Baud Rate Selection

Serial Interface Port TI 435 PLC

The Serial Interface Port enables the TI 435 PLC to interface directly to the PanelMate unit.

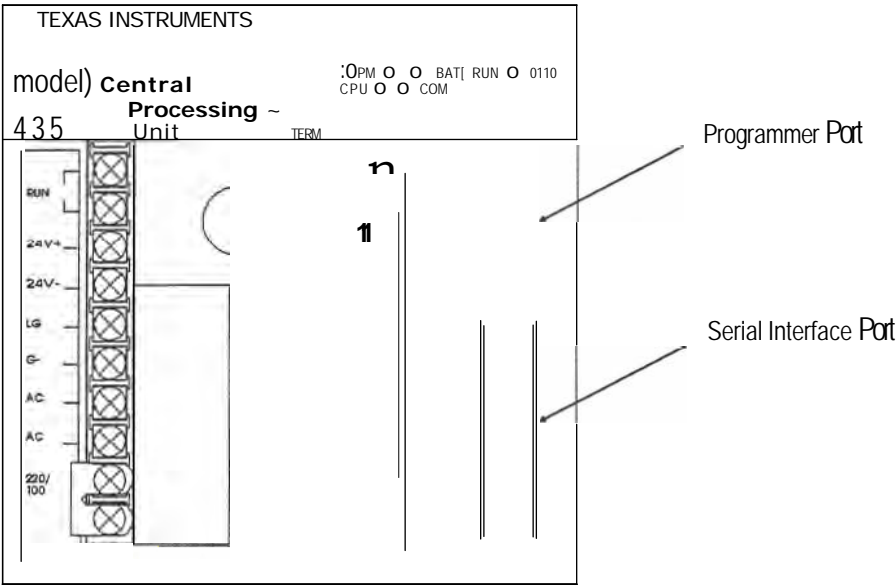


Figure 42-7 Texas Instruments 435 Serial Interface Port

Figure 42-8 shows the pinouts for the Serial Interface Port.

Pin	Name	Pin	Name
1	Not Used	14	TXD+
2	TXD	15	Not Used
3	RXD	16	TXD
4	RTS	17	Not Used
5	CTS	18	RTS
6	Not Used	19	RTS+
7	SG	20	Not Used
8	Not Used	21	Not Used
9	RXD+	22	Not Used
10	RXD-	23	CTS
11	CTS+	24	Not Used
12	Not Used	25	Not Used
13	Not Used		

Table 42-8 Serial Interface Port

Communication to the TI 435 is through the Host Link Protocol in Master/Slave mode. The PanelMate unit uses hexadecimal data protocol, not ASCII. Note that the data protocol and parity are set with the TI programming software in the Auxiliary Function 26, Set Secondary Address. Standard communication parameters for communicating directly with the TI 435 Serial Interface Port are shown below.

8 Data Bits
1 Stop Bit
Odd Parity
300 to 19200 Baud Rate*

* The baud rate is dipswitch selectable.

<u>Switch</u>	ON	OFF
SW1	CPU battery disabled	CPU battery enabled
SW2	Station address is 1	Station address is set via MIU (Machine Interface Unit) or programming software
SW3	Baud rate selection for Serial Interface Port	
SW4	Baud rate selection for Serial Interface Port	

Table 42-5 Dipswitch Settings

The dipswitch block is located at the rear of the CPU. Table 42-5 summarizes the dipswitch settings for the CPU dipswitch.

Baud	SW3,	SW4
300	Off	Off
1200	Off	On
9600	On	Off
19200	On	On

Table 42-6 Dipswitch Settings for Baud Rate

SW3 and SW4 on the dipswitch control the baud rate at which the Serial Interface Port will operate. Refer to table 42-6 for the baud rates corresponding to the settings of SW3 and SW4.

Data Communication Module TI 405 Series

The Data Communication Module (DCM) enables the TI Series 405 PLCs to interface with the PanelMate unit. The DCM supports the Hostlink protocol either Master/Slave or Peer-to-Peer. In the Master/Slave configuration PanelMate unit will be the Master device and the DCM will be the slave device in both the Point-to-Point and the Multidrop configurations. The DCM has a serial connection which will connect to the multi-drop network or directly point-to-point to the PanelMate unit.

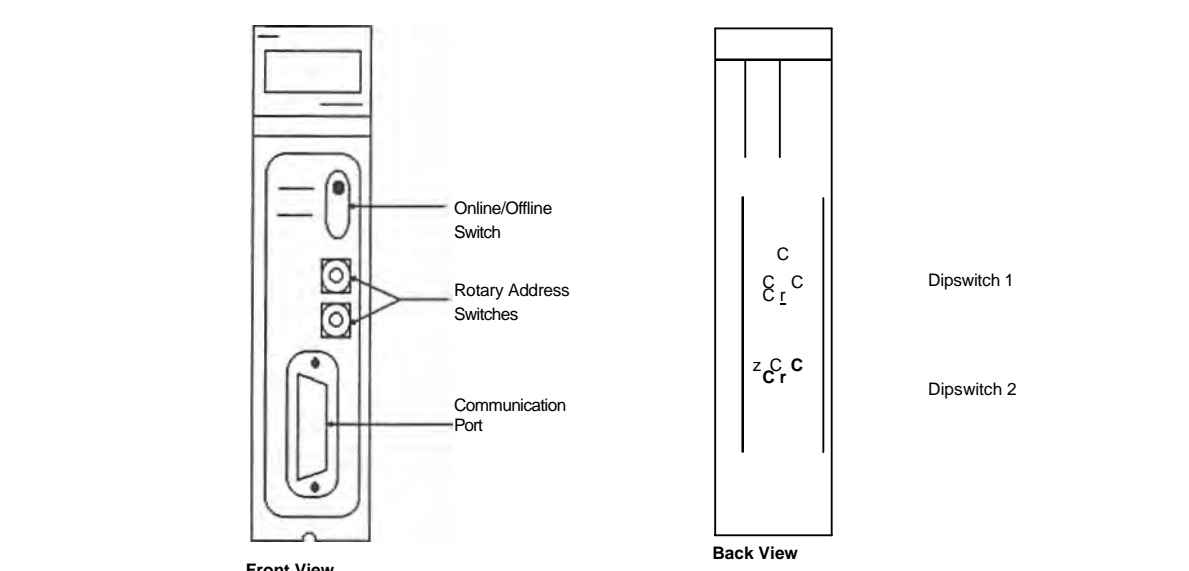


Figure 42-9 Switch Locations

There are two rotary switches on the DCM which select the network address of the PLC. This address must match the assigned PLC ID in the PLC Name and Port Table. There are two dipswitches located on the DCM. Dipswitch 1 sets the communication parameters. Switches 1, 2, and 3 of dipswitch 1 select the baud rate. Switch 4 sets the parity. Switch 5 must be set to Off. Switches 6 through 8 set the Response Time Delay. This should be set to Oms.

SWITCH POSITION				OFF ON		SWITCH POSITION			
TIME	6	7	8			BAUD	1	2	3
0	OFF	OFF	OFF	No Parity	|||	300	ON	OFF	OFF
2	ON	OFF	OFF	Self-Test	||| 2	600	OFF	ON	OFF
5	OFF	ON	OFF	Set to OFF	||| 3	1200	ON	ON	OFF
10	ON	ON	OFF		||| 4	2400	OFF	OFF	ON
20	OFF	OFF	ON		||| 5	4800	ON	OFF	ON
50	ON	OFF	ON		||| 6	9600	OFF	ON	ON
100	OFF	ON	ON		||| 7	19200	ON	ON	ON
500	ON	ON	OFF		m	38400	OFF	OFF	OFF
Response Time Delay (msec)									

Figure 42-10 Dipswitch 1

Dipswitch 2 sets the communication protocol and communication functions. Switch 1 and 2 select the protocol to be used. The following table shows the valid switch settings for the PanelMate unit Interface.

<u>PanelMate unit Port</u>	<u>Protocol</u>	<u>Switch 1</u>	<u>Switch 2</u>
TI-HUM	Hostlink Slave	OFF	OFF OFF
TI-HUP	Hostlink P/P	ON	

Switch 3 and 4 of dipswitch 2 should be set to OFF to enable communication timeout and to allow data to be transmitted in hexadecimal.

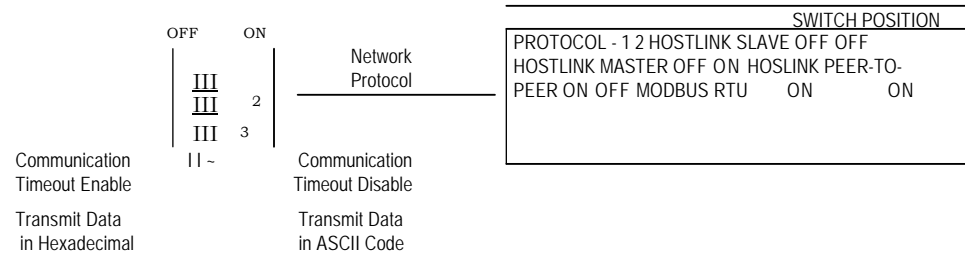


Figure 42-11 Dipswitch 2

The following parameters are the default port characteristics of the DCM.

RS422
8 Data Bits 1
Stop Bit Odd
Parity
Baud Rate 9600
Master-Slave

Data Communication Unit (DCU) TI 305 Series

The Data Communication Unit (DCU) enables the TI Series 305 PLCs to interface with external devices. The DCU only supports the master/slave protocol. The PanelMate unit will be the master device and the DCU will be the slave. When selecting a port use in the PLC Name and Port Parameters Table, use TI-HUM (Texas Instruments Hostlink master/slave). The two DCU models are 305-02DM and 305-03DM. The 305-02DM has one RS422 port and can be multi-dropped from a network with up to 90 (405 or 305) controllers. This model also supports a point-to-point connection. The 305-03DM has one RS-232 port and must use a point-to-point connection.

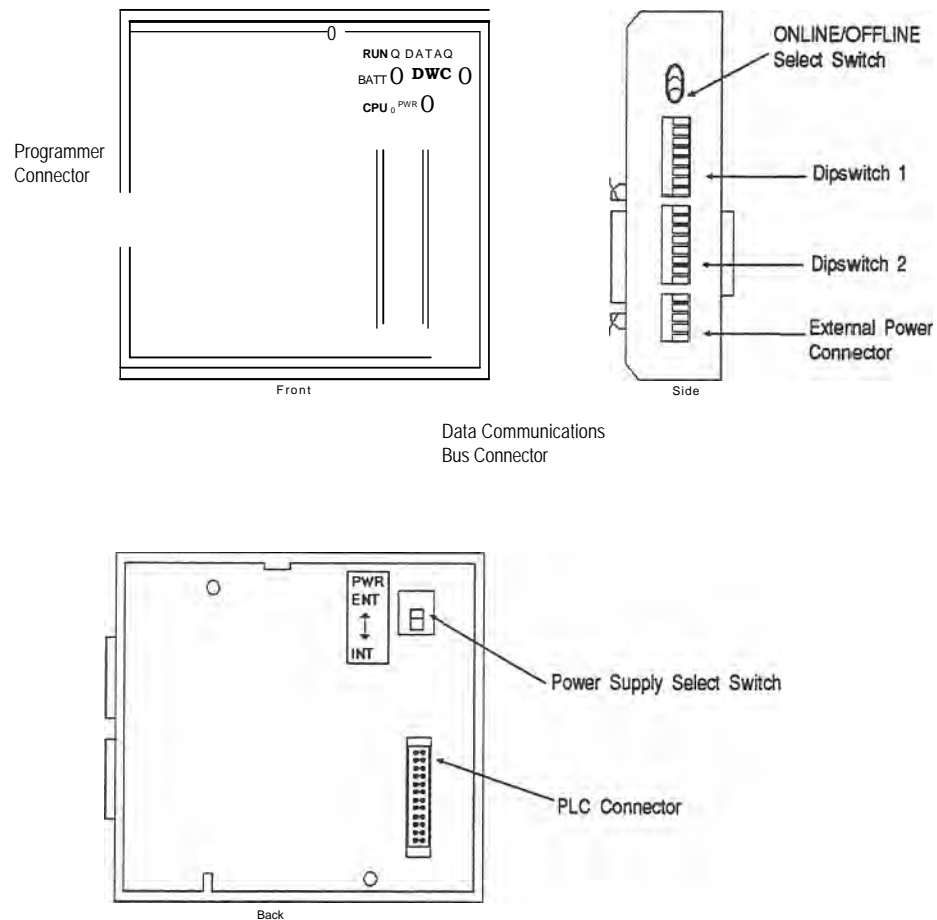


Figure 42-12 Data Communications Unit

There are two dipswitches located on the DCU. Dipswitch 1 selects the baud rate and internal functions. Switches 1 and 2 of dipswitch 1 select the baud rate. Switches 3 through 8 select the internal functions of dipswitch 1. See the following tables for the recommended settings.

Baud Rate	Switch 1	Switch 2
300	Off	Off
1200	On	Off
9600	Off	On
19200	On	On

Table 37-7 Baud Rate Settings for Dipswitch 1

Switch	Function	Setting
3	Parity	Odd or None
4	Self-Diagnostic	Operate
5	Turn-Around Delay	No Delay
6	Mode at Power Up	PGM or Run
7	Not Used	
8	Transmission Mode	HEX

Table 42-8 Internal Functions Settings for Dipswitch 1

Dipswitch 2 sets the slave address of the PLC. This must match the PLC ID in the PLC Name and Port Parameters Table. The station number can be any number from 1 to 90. The switches are set in binary with switch 1 representing the least significant bit. See the following figure for an example of dipswitch 2 with the station number set to 9.

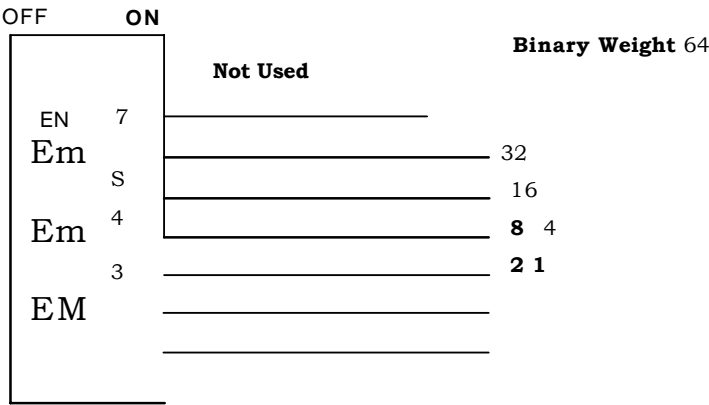


Figure 42-13 Dipswitch 2

Bit Writes With Ladder Logic - 405 Series

The Texas Instruments Hostlink Protocol does not permit an external intelligent device to directly alter the state of a single bit without overwriting the entire byte in which that bit exists. As a result, the PanelMate unit will write values to designated registers in the PLC, specifying which bit should be set or cleared. It is necessary to write a section of Ladder Logic/Stage Programming to interpret this value in order to change the appropriate bit. The PanelMate unit will write to four V memory registers to set or reset a bit. The four registers will be consecutive starting with the Bit Write register entered in the PLC ID field. If a Bit Write register is not entered, the register will default to V7374. When the default register is used, V7374, V7375, V7376 and V7377 will be used to accomplish the Bit Writes.

Register 1	This register contains a 16-bit mask in which the bit position to be set will be set to 1 and all other bits will be set to 0.
Register 2	Each memory type has a corresponding V memory address. Register 2 contains the V Memory address in which the bit to be set is located.
Register 3	This register contains a 16-bit mask in which the bit position to be reset will be set to 0 and all other bits will be set to 1.
Register 4	This register contains the V memory address in which the bit to be reset is located.

PLC ID Field

The format for the PLC ID for the TI 405 will include both the PLC ID and a memory register used for the four Bit Write Registers. The format will be the PLC ID followed by the memory address.

XX-VYYYYY or XX-YYYYY or XX

Where

XX	PLC ID in range 1 - 90
	PLC ID/memory address separator
V	Optional memory type specifier

YYYYY Optional starting V memory address in range 1400 - 7374

If a memory address is not entered, the Bit Write register will default to V7374. The following ladder logic rungs may be added to a TI 405 program for the purpose of setting and clearing individual bits.

I
(CONTAINS
(BIT MASK
(FOR SET
I V7374 KO
[]o(

(CONTAINS (BIT
MASK IFOR
RESET
I V7376 KO

11

|| V ADDRESS | || TO
CHANGE |
++ -P7377_____ |

[CONTAINS				LDD	
[BIT MASK					-|
[FOR SET				|	
|	V7374			|	
		KO		|	

-] o [-

KO~[CONTAINS		|
[BIT MASK		|
[FOR RESET		|
|	V7376	KO

|
-] o
|
/
CLEAR OUT DATA FROM SET BIT FUNCTION
|

[CONTAINS			OUTD	
[BIT MASK			| CONTAINS	|
IFOR SET			| BIT MASK	|
|	V7374	KO	| FOR SET	|

|
-] o
|
CLEAR OUT DATA FROM RESET FUNCTION

[CONTAINS			OUTD	_____
[BIT MASK	|	CONTAINS	|	
IFOR RESET	|	BIT MASK	|	
|	V7376 KO		| FOR RESET	|

-] o

-V7376---|

(END)

Bit Writes with Ladder Logic - Model 315

The Texas Instruments Hostlink Protocol does not permit an external intelligent device to directly alter the state of a single bit without overwriting the entire byte in which that bit exists. As a result, the PanelMate unit will write values to designated registers in the PLC, specifying which bit should be set or cleared. A section of Ladder Logic/Stage Programming is necessary to interpret this value in order to change the appropriate bit. The PanelMate unit will write to two consecutive bit/byte memory registers to set or reset a bit. The starting register that PanelMate unit will write to is determined by the register entered in the PLC ID field. If a Bit Write register is not entered, the register will default to 10340. When the default register is used, bytes 10340 and 10350 will be used to accomplish bit writes.

The following describes the values that will be written to the memory addresses:

Byte 1	This byte will be used to set bits 0-177. To set a particular bit, the actual bit number (octal) will be sent to this byte value. To reset the same bit, the bit number (octal) plus 200 (octal) will be sent to this byte value.
Byte 2	This byte will be used to set bits 200-373. To set a particular bit, the actual bit number (octal) minus 200 (octal) will be sent to this byte value. To reset the same bit, the bit number will be sent to this byte value.

Two rungs of ladder logic will be required for each bit write. Each rung will test the individual bits within the specified byte memory location for the bit pattern expected from the PanelMate unit. If the rung is true, the logic will set or reset a particular bit as required.

PLC ID

The format for the PLC ID for the model 315 will include both the PLC ID and a memory register used for the two Bit Write registers. The format will be the PLC ID followed by the memory address.

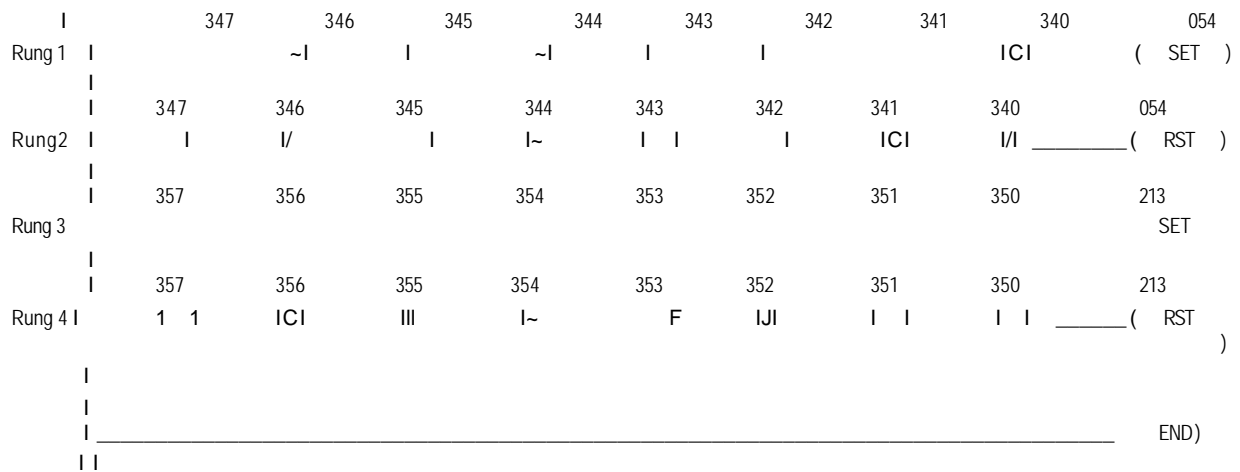
XX-IOYYY or XX-YYY or XX

Where

XX	PLC ID in range 1-90
	PLC ID/memory address separator
10	Optional memory type
YYY	Optional starting 10 byte memory address in range 0-340.

Note In the PLC ID field, 10 will default to a byte address.

The memory address must be on an 8-bit boundary. If an 10 memory address is not entered, the Bit Write register will default to 10340. The following ladder logic rungs are an example of setting and clearing bits that may be added to a model 315 program for the purpose of setting and clearing individual bits.



Example 1:

With a bit write to 10054, the PanelMate unit will write 54 octal (44 decimal). Rung 1 tests for bit pattern 0010 1100 in byte 10340 and sets 10054.

The PanelMate unit will also write 254 octal (172 decimal) to byte 10340. Rung 2 tests for bit pattern 1010 1100 in byte 10340 and resets 10054.

Example 2:

With a bit write to 10213, the PanelMate unit will write 13 octal (11 decimal). Rung 3 tests for bit pattern 0000 1011 in byte 10350 and sets 10213.

The PanelMate unit will also write 213 octal (139 decimal) to byte 10350. Rung 4 tests for bit pattern 1000 1011 in byte 10350 and resets 10213.

Bit Writes with Ladder Logic - Models 325 and 330

The Texas Instruments Hostlink Protocol does not permit an external intelligent device to directly alter the state of a single bit without overwriting the entire byte in which that bit exists. As a result, the PanelMate unit will write to a designated register in the PLC, specifying which bit should be set or cleared. A section of Ladder Logic Programming is necessary to be written to interpret this value in order to change the appropriate bit. The starting register that PanelMate unit will write to is determined by the register entered in the PLC ID field. If a Bit Write register is not entered, the register will default to AC677.

To set a bit, the bit number will be sent to the Bit Write Register. To reset a bit, the bit number (decimal) + 1000 (decimal) will be sent to the bit write register.

Two rungs of ladder logic will be required for each bit write. Each rung will test the specified register for the expected value from the PanelMate unit. If the rung is true, the logic will set or reest a particular bit as required.

PLC ID

The format for the PLC ID for models 325 and 330 will include both the PLC ID and a memory register used for the Bit Write register. The format will be the PLC ID followed by the memory address.

XX-ACYYY or XX-YYY or XX

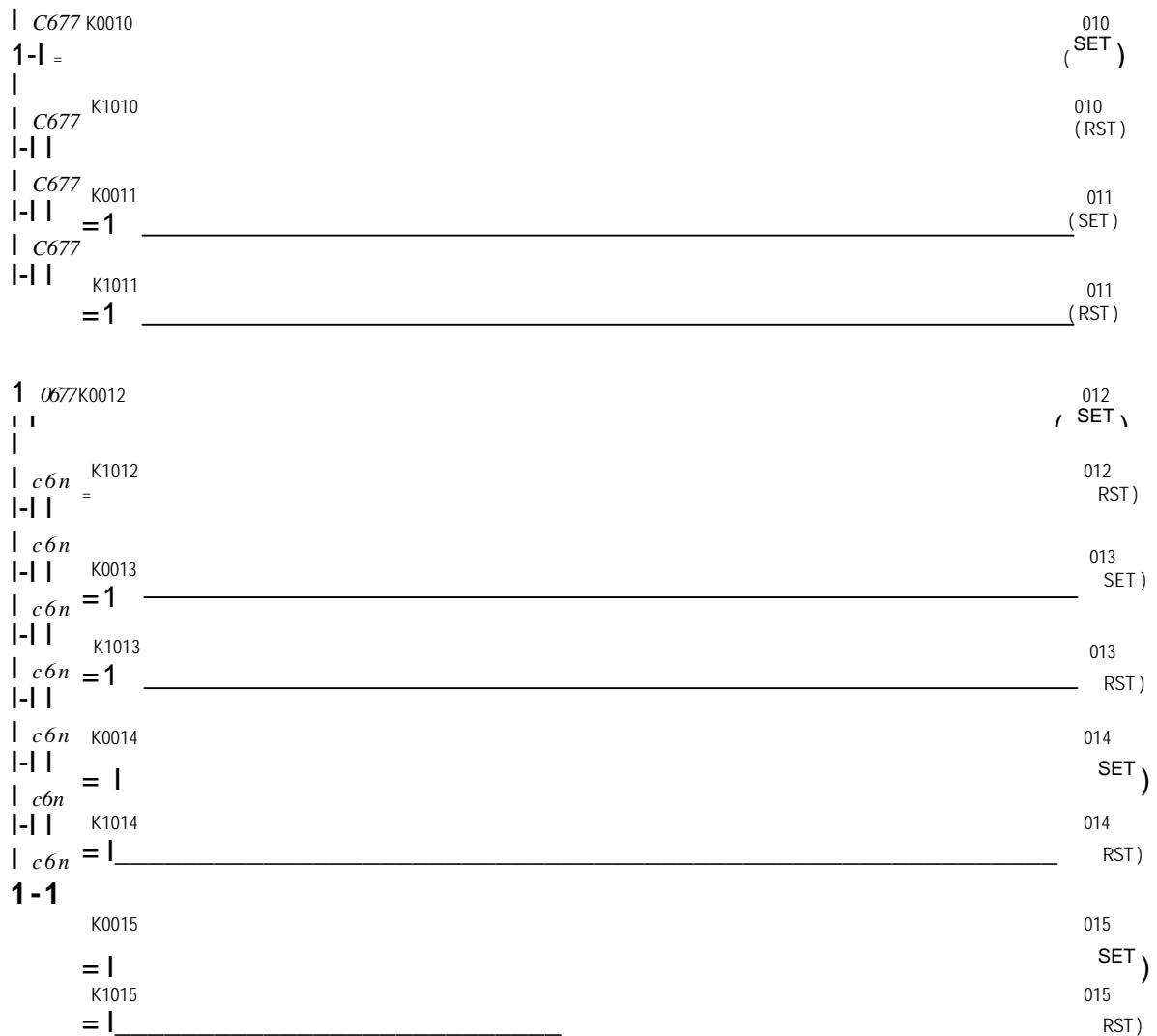
Where

XX PLC ID in range 1-90
PLC ID/memory specifier

AC Optional memory type

YYY Optional starting AC memory address in range 600-677

If an AC memory address is not entered, the Bit Write register will default to AC677. The following ladder logic rungs are an example of setting or clearing bits that may be added to models 325 and 330 program for the purpose of setting and clearing individual bits.



I	C677 K0016		016
I-I	=	_____	SET)
I			
I	C677 K1016		016
I-I	= I I	_____	RST)
I	C677 K0017		
I-I	= I I		
I	C677 K1017		017
I-I	= I I	_____	SET)
I			
I			
I		_____	017
I			RST)
I			
		_____	(END)

Texas Instruments Word and Bit References

The following section describes the use of Texas Instruments word and bit references in your configuration. The general word referencing method is:

[plcname, word#format]

The "plcnam" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname, bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions. **500**

Series Word and Bit References

Texas Instruments 520, 530, 560 and 565 PLCs use decimal word addresses. The PanelMate unit format default is U16.

The following is the format for an output reference.

[YY]

YY

PLC reference number of the output.

405 Series Word, Byte, and Bit References

Texas Instruments 405 PLCs use octal word addresses. The PanelMate unit format default is U16. The following is the format for a register reference.

M

- X Memory type (TMR, CNT, and V)
- Y Word address (leading zeroes not required)

To reference a byte value, the memory address must be on an 8-bit boundary. The following is the format for an 8-bit (byte) reference.

[B:XY]

- B Designating byte reference
 - Byte designator/byte address separator
- Memory type (GX, X, Y, C, S, T, CT, and SP) Y
 - Byte address

The following is the format for a bit referenced within a word.

[XY/B]

- Memory type (TMR, CNT, and V)
- Y Word address (leading zeroes not required)
- B Bit number in the range (0 - 17 in octal)

The following is the format for a single bit reference (device).

[XY]

- Memory type (GX, X, Y, C, S, T, CT, and SP)
- Y Bit address (leading zeroes not required)

305 Series Word and Bit References

Texas Instruments 305 PLCs use octal word addresses. The PanelMate unit format default is U16. The following is the format for a register reference.

(YJ

X Memory type (AC and R - for 325 and 330 models)

Y Word address (leading zeroes not required)

Note The Data Register (R) is 8-bits with this format.

The following is the format for a 16-bit data register reference.

[W:RY]

W Designating 16-bit word reference

16-bit designator/address separator R

Data register specifier

Y Word address

To reference a byte value, the memory address must be on an 8-bit boundary. The following is the format for a 8-bit (byte) reference

[B:XY]

B Designating byte reference

Byte designator/byte address separator X

Memory type (10, T, TC, C, and SG)

Y Byte address

Note Write restrictions that apply to each bit memory type also apply to the byte references. Byte 10370 is read only.

The following is the format for a bit referenced within a word.

[XYB]

X	Memory type (AC and R - for 325 and 330 models)
Y	Word address (leading zeroes not required)
/	Delimiter to separate bit number
B	Bit number in the range (0-17, 0-7 for Data Register)

or

[W:RYB]

W	Designating word reference
	Word designator/ address separator
R	Memory type (R - for 325 and 330 models)
Y	Word address
I	Delimiter to separate bit number
B	Bit number in the range (0-17)

The following is the format for a single bit reference (device).

[XY]

X	Memory type (10, T, TC, C, and SG)
Y	Bit address (leading zeroes not required)

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate unit expression fields.

500 Series

Word References

Reference

[WX12]

[WY18]

[V22]

[DSP12]

[DSC15]

[DCC9]

[TCP4]

[TCC19]

[LPV34]

[LMN43]

[LSP44]

[LMX61]

Description

Word image register 12

Word image register 18 V

Word memory 22 Drum

step preset 12

Word 15 of drum step current memory

Word 9 of drum count current memory Word

4 of timer/counter preset memory Word 19

of timer/counter current memory Word 34 of

loop process variable Output word 43

Setpoint word 44

Bias word 61

Bit References

Reference [X520]

[Y680]

[C7123]

[DCP3016]

Description

Bit 520 of a discrete image register Bit

680 of a discrete image register Bit

7123 of a discrete image register

Step 16 of drum 30 of drum count preset memory

405 Series

Word References

[TMR11]	Timer register 12
[CNT30]	Counter register 30
[V24]	User Data register 22

Byte References

[B:GX10]	Remote I/O register 10
[B:X20]	Input register 20 Output
[B:Y100]	register 100 Control relay
[B:C30]	register 30 Stage register 40
[B:S40]	Timer relay register 50
[B:T50]	Counter relay register 170
[B:CT1 70]	Special relay register 0
[B:SPO]	

Bit References

[GX12]	Bit 12 of remote I/O memory
[X315]	Bit 315 of input memory Bit 10
[CNT.50/10]	of counter word 150

305 Series

Word References

[AC614]	Timer/ Counter register 614
[W:R502]	Data register 502 (325 or 330 models only)

Byte References

[R12]	Data register 12 (325 or 330 models only)
[B:T611]	Timer register 611
[B:SG20]	Stage register 20

Bit References

[1012] [T617]	Input/Output register 12
[C622]	Timer element 617 Counter
[TC600]	element 622 Timer/Counter
[SG43]	element 600 Stage element
[W:R510/11]	43
[AC613/17]	Bit 11 of data register 510 (325 or 330 models only)
	Bit 17 of timer accumulator word 613.

S

0

Chapter 43

Toshiba PLCs

The PanelMate Series supports the use of the Toshiba T2 PLCs.

Up to eight PLCs can be connected to one PanelMate unit on an RS422 multidrop network.

Memory

The Toshiba T2 PLC uses decimal word addresses.

The following list contains descriptions and address ranges of the memory types:

<u>Word Memory Types</u>	<u>Description</u>	<u>Address Range</u>
XW (Read only) YW	Input registers Output register	XW00-XW63
RW	Control relay register Remote	YW00-YW63
ZW	link storage register Timer	RW00-RW63
T (Read only) C	register	ZW00-ZW31
(Read only) D	Counter register	T000-T1 27
	Data register	COO-C95 DO-D1535

<u>Bit Memory Types</u>	<u>Description</u>	<u>Address Range</u>
X (Read only)	Input device	X000-X31 F
Y	Output device	Y000-Y31 F
R	Control relay device	R000-R63F
Z	Remote link storage device	Z000-Z31 F

Note Register bit read and writes are not allowed. To access bits, you must use the bit memory types.

Note The maximum data value is 32767 for the timer register.

Possible Configurations

Examples of possible connections are described and shown in the following sections.

Direct

The figure below shows a direct connection to a Toshiba T2 PLC with a PU224 CPU.

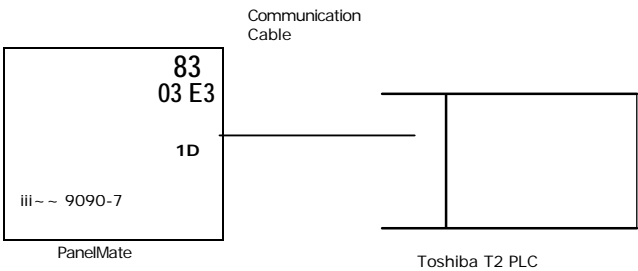


Figure 43-1 Single PLC Connection

Multiple

The figure below shows multiple connections to a Toshiba T2 PLC with a PU224 CPU. Note that eight PLCs is the maximum number of PLCs that can be on the multidrop.

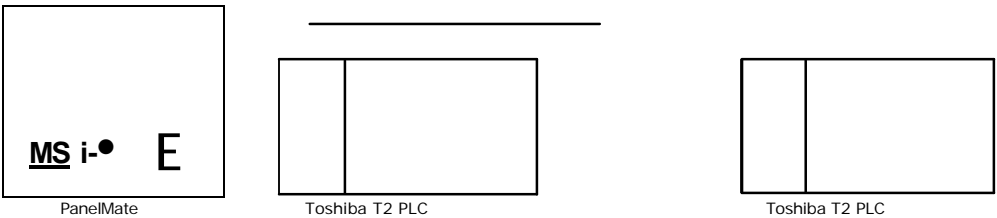


Figure 43-2 Single PLC Connection

Cabling

The communications between the PanelMate unit's serial ports and Toshiba PLCs is RS422 and, therefore, has a recommended maximum length of 4000 cable feet. You should construct a communications cable of the desired length for each connection needed. The cable is a shielded twisted pair. All PanelMate ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

Note that when using RS422 cabling, eight PLCs is the maximum number of PLCs that can be on the multidrop.

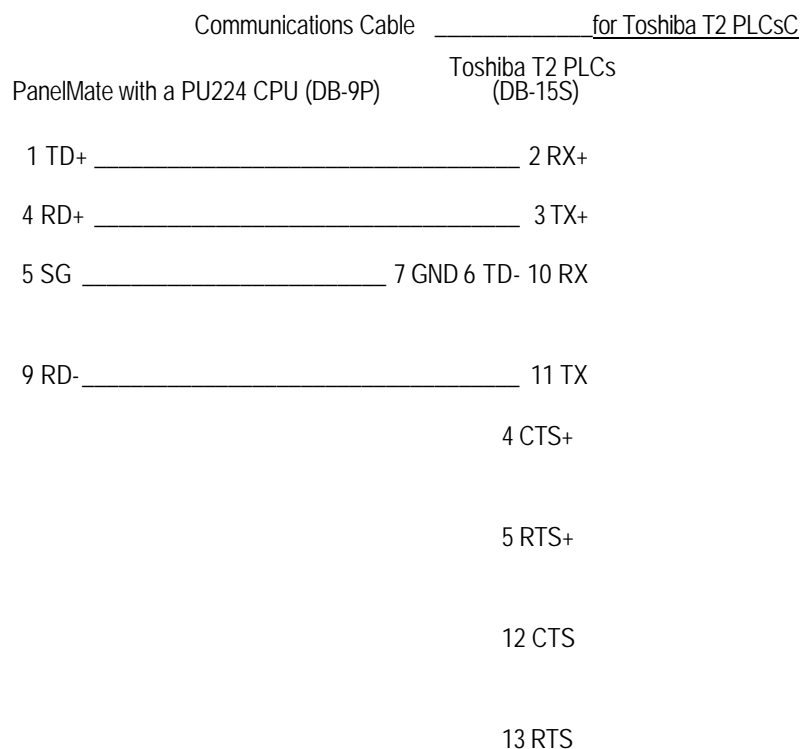


Figure 43-3 RS422 Cabling

Note that termination is required for a point-to-point connection. The PU224 requires a 1/2W 120

Communications Parameters

Standard parameters for communications with Toshiba PLCs are: 7

or 8 data bits

1 or 2 stop bits

ODD, EVEN, or NONE Parity

300, 1200, 2400, 9600, or 19200 Baud Rate

The following figure is an example of how to configure the PLC Name and Port Table in the PanelMate configuration software to communicate to the Toshiba T2 PLC.

PLC NAME AND PORT EDITOR

FI- F6-
F2- F7-
F3- F8-
F4- F9-SAVE
F5 F10-EXIT

Port Use		Network Data Stop				Bits Parity	FORMAT for Generic Protocol					
		ID#	Bits				Rate	Elect.	Type	ID#	BCC/Bit#	
1	NONE	0	8	1	None	9600	RS232					
2	TOSH-T2	0	8	1	None	9600	RS422					
I/O	UNEQUIP											

Item	Name	ID#	Ports	Model
1	T2	1	2	PU-224
2		0	2	PU-224
3		0	2	PU-224
4		0	2	PU-224
5		0	2	PU-224
6		0	2	PU-224
7		0	2	PU-224
8		0	2	PU-224
9		0	2	PU-224
10		0	2	PU-224

Figure 43-4 PLC Name and Port Table

The Toshiba T2 PLC has programming software called Toshiba Programming Development Software (TPDS). The following figures are an example of how to configure the system parameters in the Toshiba software to communicate to the PanelMate unit.

<System Parameters>		
1. Program ID		8. Error Status
2. System Comments		
3. Memory Capacity	10kS/4kW	
4. Steps Used	76	9. Diagnostic Message
5. PLC Type	T2	
6. PLC OS Version	Ver. 1.11	10. Date & Time (94-01-05) (W-mm-dd) (14:12:21) (hh:mm:ss)
7. T-PDS Version	Ver. 1.4	

Figure 43-5 Toshiba Programming Development Software (Page 1)

<System Parameters>		
11. Program Size Setting	(10)kSteps	14. Scan Time Setting ()x10mS
12. Sampling Buffer Size ()	kWords	15. Subprogra <i>Execution</i> Time
13. Retentive Memory Area		16. Timer Interrupt Interval
	RW000 - () T000	2 - 1000 mS () mS
	c000 - () 130000 -	
	()	17. Computer Link Settings
		Station No. (1) Baud
		Rate (9600)BPS
		Partly <u>None</u> Odd Even
		Data length (8)Bit
		Stop bit 1 2

Figure 43-6 Toshiba Programming Development Software (Page 2)

Link Port

The Link Port enables the Toshiba T2 PLC to interface directly to the PanelMate unit.

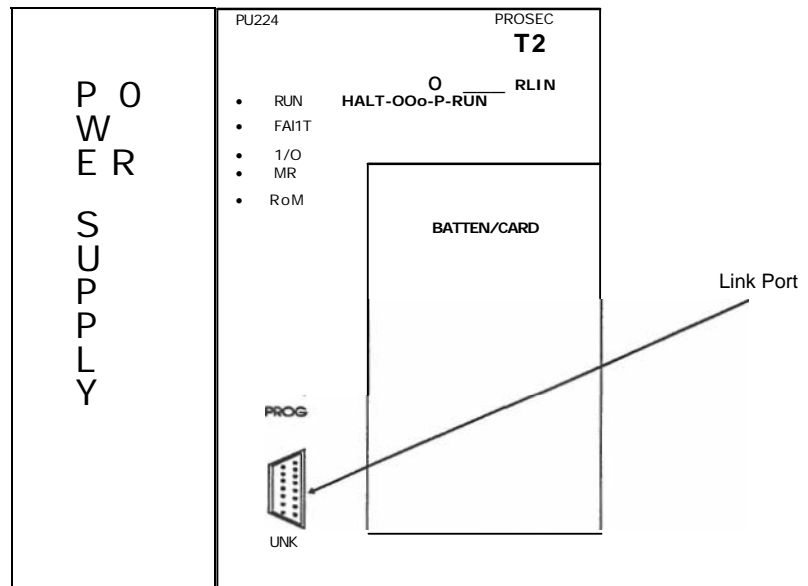


Figure 43-7 Toshiba T2 PLC Link Port

Toshiba Word and Bit References

The following section describes the use of Toshiba word and bit references in your configuration. The general word referencing method is:

[plcname,word#format]

The "plcname" is the name of the designated PLC as listed in the PLC Name and Port Parameter Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

[plcname,bit]

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions.

Register and Device References

Register References

The format used for expressions is the memory type symbol (upper or lower case) and a reference number. The PanelMate unit default format is unsigned 16-bit integer.

The following is the format for a register reference:

[mmrrr]
m = memory type symbol (XW, YW, RW, ZW, C, T, D) rrr =
register value (leading 0s are not required)

Note In order to reference D registers greater than three digits, the D symbol must be omitted. The D symbol on register values less than four digits is optional.

Device References

The following is the format for a device reference: [mrrb]

m = memory type symbol (X,Y,R,Z)
rr = register value (leading 0s are not required) b = bit
number in hex (0-F)

The supported Toshiba PI-Cs will allow a maximum of 32 contiguous words per read. The maximum number of unused words before another read is generated is 10.

Examples

Word References

<u>Reference</u>	<u>Description</u>
[XW008]	Input register 8
[YW034]	Output register 34
[RW45]	Control relay register 45
[ZW14]	Remote link storage register 14
[T030]	Timer register 30
[C19]	Counter register 19
[D155]	Data register 155

Bit References

[X01 A]	Input device, bit 10 of input register 1
[Y34C]	Output device, bit 12 of output register 34
[R441]	Control relay device, bit 1 of control relay register 44
[Z140]	Remote Link storage device, bit 0 of special register register

14

S

I

0



Chapter 44

Westinghouse Numa-Logic PLCs

The PanelMate Series may be used with any of the programmable controllers in the Westinghouse Numa-Logic family using the Westinghouse driver. The driver takes responsibility for communications to the controller, generating the protocol necessary to request information from, and send information to, the PLC. No ladder logic is required in the PLC to support the interface to the PanelMate unit.

Memory

The following are the different prefixes which may be assigned to Westinghouse PLC references used in the PanelMate unit:

Prefix	Type	Prefix	Type
AD	Discrete Output	IM	Discrete Output
BD	Discrete Output	LS	Discrete Output
BF	Discrete Output	MB	Discrete Output
BO	Discrete Output	MR	Discrete Output
BC	Discrete Output	MV	Discrete Output
BS	Discrete Output	NL	Discrete Output
CD	Discrete Output	NR	Discrete Output
CR	Discrete Output	OG	Output Group
DB	Discrete Output	OR	Output Register
DC	Discrete Output	SB	Discrete Output
EQ	Discrete Output	SK	Discrete Output
GE	Discrete Output	TR	Discrete Output
HR	Holding Register	TS	Discrete Output
IG	Input Group	TT	Discrete Output
IR	Input Register	UC	Discrete Output
IN	Discrete Input	UI	Discrete Output

Table 44.1 Memory Types

Memory types IR, IG, OR, OG, and HR all support the BP (Bit Pick) prefix to specify individual bits within the word.

The following are the ranges for the different Westinghouse PLC models supported by the PanelMate unit:

Memory Type	PC-700		PC-900		PC-1100	
	Mi	Max	Min	Max	Min	Mm
Discrete Inputs	1	256	1	128	1	64
Discrete Outputs	1	512	1	255	1	256
Register Inputs	1	32	1	16	1	8
Register Outputs	1	32	1	16	1	8

Table 44-2 Memory Ranges

Note To determine the maximum range for IG and OG memory, divide the discrete input maximum amount by 16. The minimum is 0.

Possible Configurations

Direct

The PanelMate unit can communicate with a Westinghouse PLC through a direct connection using Numa-Logic 6-byte protocol. This protocol allows direct access to any part of the memory in the Westinghouse programmable controller. The station address, Network ID number, and PLC unit number are not used.

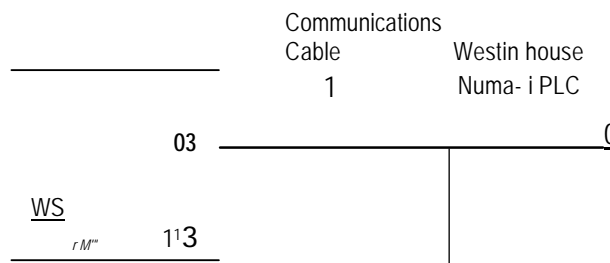


Figure 44-1 Direct Connection

Cabling

The communication between the PanelMate unit and the Westinghouse module is RS232C. The recommended maximum cable length is 50 cable feet. All PanelMate unit ports are female 9-pin (DB-9S), so the connectors on the cables must be male 9-pin (DB-9P).

RS232C Communications Cable

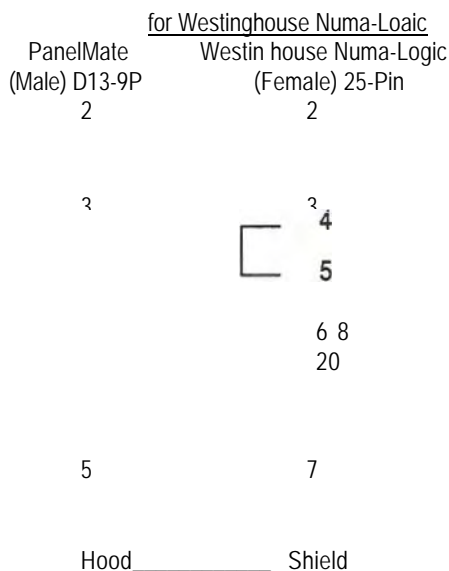


Figure 44-2 RS232C Cabling for Westinghouse PLCs

If you are using a PLC model which supports two communications channels through one 25-pin connector, a special variation of the previous cable can be made to allow access to both ports by different devices at the same time. In this manner, both the PanelMate unit and another device, such as an IBM PC used for PLC programming, could be connected to a PC-1100 simultaneously.

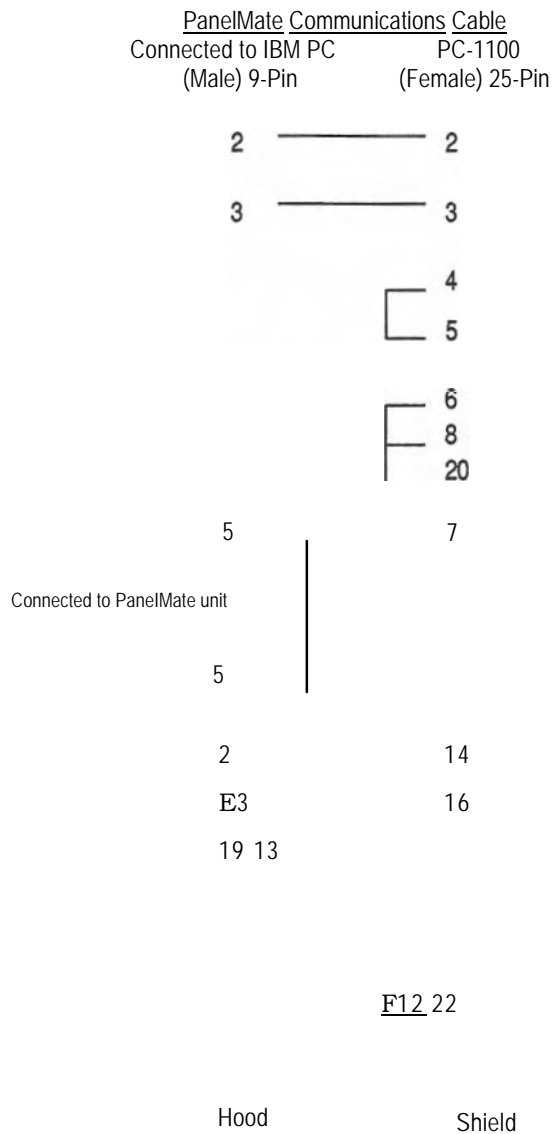


Figure 44-3 Multiple Connections to PC-1100

Communications Parameters

In both the PC-700 and PC-900, the configuration of RS-232 ports is identical. The PC-700 *exists in two versions, one having a single port, another having dual ports. The PC-900 and PC-1100 have a single port.*

The standard communications parameters for communicating with Westinghouse PLCs are:

8 Data bits 1
 Stop bit Odd
 Parity 9600
 Baud

The supported Westinghouse PLCs do not have switches for changing the communications parameters. See the appropriate Westinghouse PLC manual for more information.

Westinghouse Word and Bit References

The following section describes the use of Westinghouse word and bit references in your configuration. The general word referencing method is:

`[plcname,word#format]`

The "plcnam" is the name of the designated PLC as listed in the PLC Name and Port Table. The "word" is the reference number (address) of the word or register to be read or written. The "#format" is a code which specifies the format of the data being read or written. The "plcname" and "#format" are optional.

The general bit referencing method is:

`[plcname, bit]`

The "plcname" is the designated PLC as listed in the PLC Name and Port Table. The "bit" is the reference number (address) of the bit, coil, or input to be written or read.

See chapter 10 for a more detailed explanation of word and bit references, including format descriptions. The PanelMate unit restricts the access of variables to the maximum ranges of addresses allowed for the type of variable on the model of processor being used. If the address is outside this maximum range, an error is signaled to the user.

All five variable types occupy different locations in memory. It is, therefore, important that the correct prefix be used. The letters in the prefix may be any combination of capital and small letters.

There are a number of special functions supported in the PanelMate unit's Westinghouse driver. Each of these has a prefix associated with it which may be substituted for one of the prefixes above. A specific bit may be referenced within any word. There are two formats available to do this. The first format is consistent with that generally used by the PanelMate unit with other brands of PLCs. It consists of the word reference, a space, and the bit offset. An example of this is [IG2 14]. The other format is based upon the Bit Pick function built into Westinghouse PLCs. The Bit Pick prefix (BP) is entered, followed immediately by the bit offset. Next, a slash is entered, followed by the word reference. The above example may be redone in this format as [BP14/IG2].

There are two types of discrete points: input and output. Examples of these are IN0002 and CR0042, respectively. Each of these accesses one point in an input group or an output group. Therefore, in addition to referencing discrete input/output points in the manner described in the previous paragraph, input points or output points may be referenced using INnnnn or CRnnnn. Example: [BP14/IG2] may also be expressed as [IN0030]. Refer to Westinghouse documentation for additional instructions and information concerning the two formats.

Also, Westinghouse provides a number of different type prefixes for the user. These prefixes do not change the type of variable being referenced but define its usage within the program. These prefixes may also be used on the PanelMate unit. Example: TS0004 references the same VO point as CR0004, but defines the usage of the bit as Timer Seconds. The PanelMate unit supports all prefixes known to be used at this time. Consult your Westinghouse documentation for further information regarding the above.

Westinghouse Numa-Logic PLCs (PC-700, PC-900 and PC-1100) use decimal register addresses and bit offsets. Addresses and offsets all start from 1 (e.g., bit offsets range from 1 to 16, not from 0 to 15). The default data format is S16.

A typical Westinghouse holding register reference in a PanelMate unit expression may be [HR19]. Note that this consists of a two-character prefix which identifies the type of variable being referenced, followed by the specific number of the variable. There are several other types of word-length variables that are addressed in this manner. The prefix and a brief description of each data type are given below:

IR	Input Register
OR	Output Register
IG	Input Group
OG	Output Group
HR	Holding Register

The supported Westinghouse PLC models will allow a maximum of 60 contiguous words per read. The maximum number of unused words before another read is generated is 15.

Examples

The following are examples of valid PLC references which may be assigned in the PanelMate expression fields.

<u>Word Reference</u>	<u>& Reference</u>	<u>Description</u>
[HR1500]		Word 1500 is a holding register
[IG16]		Word 16 is a discrete input in PC-700
[IR32]		Word 32 is a register input in PC-700
[OG9]		Word 9 is a discrete output
[OR6]		Word 6 is a register output

Bit References

<u>Reference</u>	<u>Description</u>
[AD509]	Bit 509 is a discrete output in PC-700
[BD345]	Bit 345 is a discrete output in PC-700
[BF22]	Bit 22 is a discrete output in PC-700
[B03]	Bit 3 is a discrete output in PC-700
[BC254]	Bit 254 is a discrete output in PC-900
[BS1 12]	Bit 112 is a discrete output in PC-900
[CD1 8]	Bit 18 is a discrete output in PC-900
[CR9]	Bit 9 is a discrete output in PC-900
[DB255]	Bit 255 is a discrete output in PC-1100
[DC123]	Bit 123 is a discrete output in PC-1100
[EQ44]	Bit 44 is a discrete output in PC-1100
[GE6]	Bit 6 is a discrete output in PC-1100
[IN5]	Bit 5 is a discrete input in PC-900
[IM234]	Bit 234 is a discrete output
[LS 123]	Bit 123 is a discrete output
[MB56]	Bit 56 is a discrete output
[MR78]	Bit 78 is a discrete output
[MV98]	Bit 98 is a discrete output
[NL1 45]	Bit 145 is a discrete output
[NR175]	Bit 175 is a discrete output
[SB10]	Bit 10 is a discrete output
[SK15]	Bit 15 is a discrete output
[TR31]	Bit 31 is a discrete output
[TS66]	Bit 66 is a discrete output
[TT85]	Bit 85 is a discrete output
[UC24]	Bit 24 is a discrete output
[U126]	Bit 26 is a discrete output
[IG214]	Bit 14 of input group 2
[BP14/IG2]	Bit 14 of input group 2
[IN0030]	Bit 30 of the input group (same reference as [IG2 14] and [BP 14/I G2])
[CR0042]	Bit 42 of output group
[HR123416]	Bit 16 of holding register 1234

Appendix A

Default Font Directory

In this chapter, you will learn:

1. Default Font Directory
1. Line Drawing Characters

W
T
a
v

```
RECALLKEYsp ! #S%&' t )*+, - . /0123456789 : ; <=>?
NORMAL !"#S% &' C)*+0123456789: ; <=>?
GRAPHI C ----- IIIII111■IIIIIII
```

RECALL KEY @ABCDEFGH										" _									
NORMAL @ABCDEFGHI JKLMNOPQRSTUVWXYZ[\`]																			
GRAPHIC																			
I I I I I FHLf 1i[:14 11-1										I-r ,									
RECALL KEY `abcdef gh i i k										1 }-de									
NORMAL ' a b c d e f g h i j k l m n o p r s t u w w x g z t }																			
GRAPHIC																			
r T I [+1 L I I I										I -									

The top row of RECALL KEYS are accessed through <Ctrl><Keg> combinations except for <Ctrl><c> which is accessed by the <Alt><c> key combination.

Default Line Drawing Character Recall Keys
(Graphic Font)

elL f 9
a 1
Ar ... ● | i
u
k 1 m
n o p
11 11 1

Figure A-2 Line Drawing Characters

Appendix B

Detailed Specifications

In this chapter, you will learn:

Specific information about the PanelMate Series 2000, PanelMate Series 2000 Color, PanelMate Series 3000, and PanelMate Series 4000

PanelMate Series 2000 (Model 2400) Specifications

Main Processor

CPU	Motorola 68000 microprocessor
-----	-------------------------------

Monitor

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	4 levels

Environment

Temperature	Operating Ambient Temperature	0°-50°C
	Storage Temperature	-20°-65°C
Humidity	20-90% noncondensing	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement 57-500 Hz at 1 g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectional display 'itter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.5 Gauss.	
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	I EC 801-2	

Power Requirements

Voltage	Auto-sensing	110 VAC or 220 VAC 110 VAC 90 to 132 VAC) 220 VAC 180 to 264 VAC)
Frequency	50 to 60 Hz (47 to 63 Hz) _	
Consumption	52 watts 22 watts for the monitor) 30 watts for the Electronics Module)	

Serial Ports

Rate	Selectable; 110 to 38,400 baud All serial ports are DB9S (Sockets) All serial ports are selectable for RS232, RS422, or 485-2 signal levels
------	---

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	Connection point for 8 ohm, 2 watt industrial speaker
Connector	Removable two-terminal connector

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	23 pounds
Equipment Heat	178 BTU/hr. (52 watts) Output

PanelMate Series 2000 (Model 2600) Specifications

Main Processor

CPU	Motorola 68000 microprocessor
-----	-------------------------------

Monitor

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	4 levels

Environment

Temperature	Operating Ambient Temperature	0°-50°C
	Storage Temperature	-20°-65°C
Humidity	20-90% noncondensing	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement 57-500 Hz at 1 g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectional display Jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.5 Gauss.	
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2	

Power Requirements

Voltage	Auto-sensing	110 VAC or 220 VAC 110 VAC 90 to 132 VAC) 220 VAC 180 to 264 VAC)
Frequency	50 to 60 Hz (47 to 63 Hz)	
Consumption	52 watts (22 watts for the monitor) (30 watts for the Electronics Module)	

Serial Ports

Rate	Selectable; 110 to 38,400 baud
All serial ports are DB9S (Sockets)	
All serial ports are selectable for RS232, RS422, or 485-2 signal levels	

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

<u>Output-Type</u> Connector	Connection point for 8 ohm, 2 watt industrial speaker Removable two-terminal connector
---------------------------------	---

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight 23 pounds
Equipment Heat 178 BTU/hr. (52 watts) Output

PanelMate Series 2000 Color (Model 2700) Specifications

Main Processor

CPU	Motorola 68000 microprocessor
-----	-------------------------------

Monitor

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Dot Pitch	.28 mm

Environment

Temperature	Operating Ambient Temperature	0°-50°C
	Storage Temperature	-20°-65°C
Humidity	20-95% noncondensing	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement 57-500 Hz at 1 g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement 57-500 Hz at 2.5g acceleration
Shock	Operating:	10g
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectional display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.5 Gauss.	
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	IEC 801-2	

Power Requirements

Voltage	Auto-sensing	110 VAC or 220 VAC 110 VAC 90 to 132 VAC) 220 VAC 175 to 264 VAC)
Frequency	50 to 60 Hz (47 to 63 Hz)	
Consumption	75 watts (45 watts for the monitor) (30 watts for the Electronics Module)	

Serial Ports

Rate	Selectable; 110 to 38,400 baud All serial ports are DB9S (Sockets) All serial ports are selectable for RS232, RS422, or 485-2 signal levels
------	---

Elf

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	Connection point for 8 ohm, 2 watt industrial speaker
Connector	Removable two-terminal connector

Security Keysu.4ui

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight 30 pounds
Equipment Heat 75 watts (256 BTU/hr)
Output

Panel Mate Series 3000 Specifications

Main Processor

CPU	Motorola 68000 microprocessor
-----	-------------------------------

Monitor

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Grayscale	4 levels

Environment

Temperature	Operating Ambient Temperature	0°-50°C	
	Storage Temperature	-20°-70°C	
Humidity	20-80% noncondensing		
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure		
Vibration	Operating:	2g @ 10-500 Hz	
	Non-operating:	2g @ 10-500 Hz	
Shock	Operating:	15g	
	Non-operating:	30g	
Altitude	Operating:	10,000 feet above sea level	
	Non-operating:	40,000 feet above sea level	
AC Magnetic Field Influence	Unaffected by low level AC and DC magnetic fields. up to 150 Gauss.		Proper operation
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)		
Dielectric Withstand	UL-508, CSA C22.2		
ESD Immunity	IEC 801-2		

Power Requirements

Voltage	Auto-sensing	90 VAC to 132 VAC 175 VAC to 264 VAC
Frequency	47 to 63 Hz	
Consumption	50 watts	

Serial Ports

Rate	Selectable; 110 to 38,400 baud
	All serial ports are DB9S (Sockets)
	All serial ports are selectable for RS232, RS422, or 485-2 signal levels

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Audio Output

Type	Connection point for 8 ohm, 2 watt industrial speaker
Connector	Removable two-terminal connector

Security Keyswitch Input

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	15 pounds
Equipment Heat	170 BTU/hr. (50 watts) Output

PanelMate Series 4000 (Model 4500) Specifications

Main Processor

CPU	Motorola 68000 microprocessor
-----	-------------------------------

Monitor

Horizontal Scan Frequency	31.5 KHz
Refresh	60 Hz
Resolution	640 x 480 pixels (VGA)
Dot Pitch	0.28 mm
Electron Gun Configuration	In-line

Environment

Temperature	Operating Ambient Temperature	0°-50°C
	Storage Temperature	-20°-65°C
Humidity	20-95% noncondensing	
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure	
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement 57-500 Hz at 1 g acceleration
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement 57-500 Hz at 2.5g acceleration
Shock	Operating:	log
	Non-operating:	20g
Altitude	Operating:	10,000 feet above sea level
	Non-operating:	30,000 feet above sea level
AC Magnetic Field Influence	Objectional display 'titter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.5 Gauss.	
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)	
Dielectric Withstand	UL-508, CSA C22.2	
ESD Immunity	I EC 801-2	

Power Requirements

Voltage	Auto-sensing	110 VAC or 220 VAC 110 VAC 90 to 132 VAC) 220 VAC 180 to 264 VAC)
Frequency	50 to 60 Hz (47 to 63 Hz)	
Consumption	80 watts	
	50 watts for the monitor)	
	30 watts for the Electronics Module)	

Serial Ports

Rate	Selectable; 110 to 38,400 baud All serial ports are DB9S (Sockets) All serial ports are selectable for RS232, RS422, or 485-2 signal levels
------	---

Fault Relay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

A

Type	Connection point for 8 ohm, 2 watt industrial speaker
Connector	Removable two-terminal connector

Security Keyswitch ~^vType Contact closure

Connector	Removable two-terminal connector
-----------	----------------------------------

Other

Weight 55 pounds
Equipment Heat 80 watts (273 BTU/hr)
Output

PanelMate Series 4000 (Model 4200) Specifications

Main Processor			
CPU	Motorola 68000 microprocessor		
Monitor			
Horizontal Scan Frequency	31.5 KHz		
Refresh	60 Hz		
Resolution	640 x 480 pixels (VGA)		
Dot Pitch	0.28 mm		
Electron Gun Configuration	In-line		
Environment			
Temperature	Operating Ambient Temperature	0°-50°C	
	Storage Temperature	-20°-65°C	
Humidity	20-95% noncondensing		
NEMA Class	NEMA 4 or NEMA 12 when properly mounted in a correspondingly rated enclosure		
Vibration	Operating:	10-57 Hz at 0.006 inch peak to peak displacement 57-500 Hz at 1 g acceleration	
	Non-operating:	10-57 Hz at 0.015 inch peak to peak displacement 57-500 Hz at 2.5g acceleration	
Shock	Operating:	log	
	Non-operating:	20g	
Altitude	Operating:	10,000 feet above sea level	
	Non-operating:	30,000 feet above sea level	
AC Magnetic Field Influence	Objectional display jitter may result if operated near motors or transformers. Interfering AC fields around unit should not exceed 0.5 Gauss.		
Power Line	ANSI/IEEE C62.41-1991 (Location Category B)		
Dielectric Withstand	UL-508, CSA C22.2		
ESD Immunity	IEC 801-2		

Power Requirements

Voltage	Auto-sensing	110 VAC or 220 VAC 110 VAC 90 to 132 VAC) 220 VAC 180 to 264 VAC)
Frequency	50 to 60 Hz (47 to 63 Hz)	
Consumption	80 watts 50 watts for the monitor) 30 watts for the Electronics Module)	

Serial Ports

Rate	Selectable; 110 to 38,400 baud All serial ports are DB9S (Sockets) All serial ports are selectable for RS232, RS422, or 485-2 signal levels
------	---

Fa it "allay

Type	1 Form C contact
Rating	2A at 240 VAC, 2A at 120 VAC, 2A at 28 VDC (resistive load)
Connector	Removable three-terminal connector

Type	Connection point for 8 ohm, 2 watt industrial speaker
Connector	Removable two-terminal connector

Type	Contact closure
Connector	Removable two-terminal connector

Other

Weight	55 pounds
Equipment Heat	80 watts (273 BTU/hr) Output

Appendix C

Configuration Creation Checklist

In this chapter, you will learn:

Configuration Creation Checklist

Configuration Creation Checklist

Determine the features of your PanelMate unit.

Pages	10 or 30
Graphics Option	Y or N
CSI Option	Y or N
Modicon Modbus Option	Y or N
DH-485 Option	Y or N

Determine your PLC Brand and Model.

Review the Word and Bit References for the PanelMate unit's addressing.

Establish the data references inside the PLC. Group control bits, status bits and register information close together in PLC memory to reduce communication traffic.

Develop the strategy for Page usage. You may decide to group functionality on pages for the operator, for setup and for maintenance.

Develop a strategy for Page layout of the templates.

Create a scheme for use of the 4 levels of gray scale intensity or the 8 levels of color to indicate normal operating modes and fault conditions.

Use the worksheets compiled in Appendix G to gather the background information required to complete the spreadsheets for the templates.

Define requirements for custom characters and symbols if applicable.

Develop your password protection scheme. Consider the following areas which can

have password protection:

- Entry into the Offline Mode Online
- setting of date and time Page
- protection
- Numeric Entry protection

Define the use of the Fault Relay in conjunction with procedures for the operator in the event of a communication error.

Create your User Configuration on the DOS-based Configuration Software.

Download your configuration and PLC Driver to the PanelMate Series.

Appendix D

Installation Guidelines

In this chapter, you will learn:

1. Physical Installation Considerations
1. Environmental Considerations
1. Wiring Considerations

Overview

This document explains important considerations for installation of the PanelMate Series.

Physical Installation Considerations

Choosing where and how to mount your equipment is the first step in assuring its proper operation and long life.

The installation should protect your system from oil, dust, moisture, corrosive vapors, and other airborne contaminants. The front panels of the PanelMate Series provide a NEMA 4 or NEMA 12 rating when mounted in a correspondingly-rated enclosure.

When choosing an enclosure or mounting position, allow a good amount of free space around your unit. Leave at least six inches above and below the unit and six inches on either side. PanelMate units depend on this room to allow convection cooling of their interiors. Convection cooling draws a vertical column of air upward over internal circuitry through vents in the unit. This cooling air must not exceed 50°C (122°F). Placing a PanelMate unit on a flat surface blocks vents on the bottom of the unit, inhibiting convection cooling and causing damage to the unit.

Careful enclosure sizing is important for proper heat dissipation. Since other devices mounted in the same enclosure can also generate heat, consider the heat output of all equipment to be mounted in a given enclosure when choosing its size.

If the inside temperature of the enclosure is above the unit's recommended range (see tables D-1 through D-4 in the next section), you can use filtered fans, heat exchangers, air conditioners, or switch to a larger enclosure to lower the temperatures. Keep in mind that your system will be more reliable and have a longer life if it is exposed to environmental conditions within the recommended range.

Since heat rises to the top of an enclosure, the temperature inside can vary greatly from the bottom to the top. A fan can be used to circulate air within the enclosure and maintain a more uniform temperature top-to-bottom. Make sure the magnetic properties of any equipment used to cool the enclosure do not interfere with the operation of your equipment. CRT monitors are especially susceptible to magnetic fields.

Also remember to leave room for easy access to circuit boards, wiring or cabling connections, regular maintenance, and removal of the Electronics Module. Detailed panel cutout drawings are found in Chapter 5, Installation in an Industrial Enclosure, of this product manual for easy reference.

Your enclosure should be constructed of 14 gauge steel. This will help guard your unit against electromagnetic interference (your equipment is designed to meet IEEE Noise Immunity specification 472). It also provides good heat dissipation and proper structural support.

If an air-purged enclosure is used, it is recommended that the inside/outside pressure differential not exceed 0.5 PSI (13.8 inches water column). If needed, your unit can withstand a differential of up to 4.6 PSI (127 inches water column).

Never ship an enclosure with your equipment mounted inside. This may seriously damage the equipment. Units should be shipped in their original packing material, then mounted in an enclosure when it reaches its final destination.

Tables have been developed to help in your selection of a free-standing enclosure. It is based on the following assumptions: a 14 gauge cold rolled steel enclosure, the amount of watts dissipated by the PanelMate unit (the PanelMate Series 2000 dissipates 52 watts, the PanelMate Series 2000 Color dissipates 75 watts, the PanelMate Series 3000 dissipates 50 watts, and the PanelMate Series 4000 dissipates 90 watts), no additional methods of cooling, the enclosure having all sides uninsulated and at least 6-inches between the unit and the top and bottom of the enclosure. From this chart, you can predict how much the internal temperature will rise with different size enclosures.

The tables are offered to you as an aid in the selection of enclosures to be used with our product. Eaton IDT offers no guarantee or warranty to the specific applicability of this table as actual conditions may vary and methods of the use of our product are beyond our control. The ultimate responsibility for the product's conformance to published specifications lies with you, the customer. For specific information about enclosure selection and cooling methods, contact your enclosure vendor.

<u>Enclosure Size vs. Internal Temperature Rise</u>	
Standard Enclosure Size (inches)	Internal Temperature Rise*
20x16x12	12.7°C
20x20x12	11.7°C
24x20x12	9.4°C
24x24x12	8.3°C
*Accurate within 1/2°C	
Assumptions:	
14 gauge cold rolled steel	
All sides uninsulated (free-standing)	
6-inch clearance between PanelMate Series 2000 and the top and bottom of the enclosure	

Table D-1 Heat Output Specifications for the PanelMate Series 2000

<u>Enclosure Size vs. Internal Temperature Rise</u>	
Standard Enclosure Size (inches)	Internal Temperature Rise*
20x16x12	12.7°C
20x20x12	11.7°C
24x20x12	9.4°C
24x24x12	8.3°C
*Accurate within 1/2°C	
Assumptions:	
14 gauge cold rolled steel	
All sides uninsulated (free-standing)	
6-inch clearance between PanelMate Series 2000 Color and the top and bottom of the enclosure	

Table D-2 Heat Output Specifications for the PanelMate Series 2000 Color

<u>Enclosure Size vs. Internal Temperature Rise</u>	
Standard Enclosure Size (inches)	Internal Temperature Rise*
20x16x8	16.1 °C
20x20x8	12.5°C
24x20x8	10.2°C
24x24x8	9.0°C
*Accurate within 1/2°C	
Assumptions:	
14 gauge cold rolled steel	
All sides uninsulated (free-standing)	
6-inch clearance between PanelMate Series 3000 and the top and bottom of the enclosure	

Table D-3 Heat Output Specifications for the PanelMate Series 3000

<u>Enclosure Size vs. Internal Temperature Rise</u>	
Standard Enclosure Size (inches)	Internal Temperature Rise*
20x20x16	14.4°C
24x20x16	12.8°C
24x24x16	10.6°C
*Accurate within 1/2°C	
Assumptions:	
14 gauge cold rolled steel	
All sides uninsulated (free-standing)	
6-inch clearance between PanelMate Series 4000 and the top and bottom of the enclosure	

Table D-4 Heat Output Specifications for the PanelMate Series 4000

Environmental Considerations

Eaton IDT equipment is designed and tested to operate over a wide temperature range. Temperatures outside this range can severely shorten the life of your system. High humidity, vibration, shock, or altitude can also adversely affect your system's operation and lifespan.

See the following figures for a list of environmental operating parameters for the PanelMate Series.

Locate your system as far as possible from transformers, relays, motor starters, and power or high-voltage (Type A) wiring. Maintain at least ten feet between your system and this type of equipment. This equipment generates interference which can induce noise in electrical wiring. Magnetic fields greater than 0.5 Gauss can cause picture jitter and discoloration in video monitors. The flat-panel display of the PanelMate Series 3000 is virtually unaffected by magnetic fields up to 150 Gauss.

Line power provided to any electronic equipment should be relatively free of voltage drifts, spikes, and drop-outs. Spike suppressors, uninterruptable power supplies and other devices can be used to condition line voltage. Line power wiring should be Number 14 AWG stranded copper, with white insulation for neutral, black for hot, and green for ground (American color code). Line frequency should also be maintained within noted tolerances. All equipment should be properly grounded at a ground run separate from that used by high-power devices such as motor starters and arc welders.

Eaton IDT cannot advise nor accept liability regarding placement of our equipment in hazardous environments. If this is a requirement in your application, contact a vendor experienced in placing electronic equipment in hazardous environments.

Wiring Considerations

Another important concern should be the proper installation of wiring or cabling for your unit. Line power wiring should be Number 14 AWG stranded copper, with white insulation for neutral, black for hot, and green for ground (American color code).

When planning the location and placement of wiring, make sure that high-power lines are not in close proximity to low-level signal or communication cables. High-power conductors (Type A) include AC power lines and high power AC or DC I/O lines, such as those which connect to hard-contact switches, relays, solenoids, motors, generators and arc welders. These generate a large amount of electrical noise which can interfere with the operation of your equipment.

Low-signal-level conductors (Type B) include those carrying serial communication and local area networks such as Ethernet and PLC networks. These have a low tolerance for induced electrical noise. All low level wiring should be shielded and routed in a separate conduit or raceway from high-power wiring. All raceways and conduit must be properly grounded.

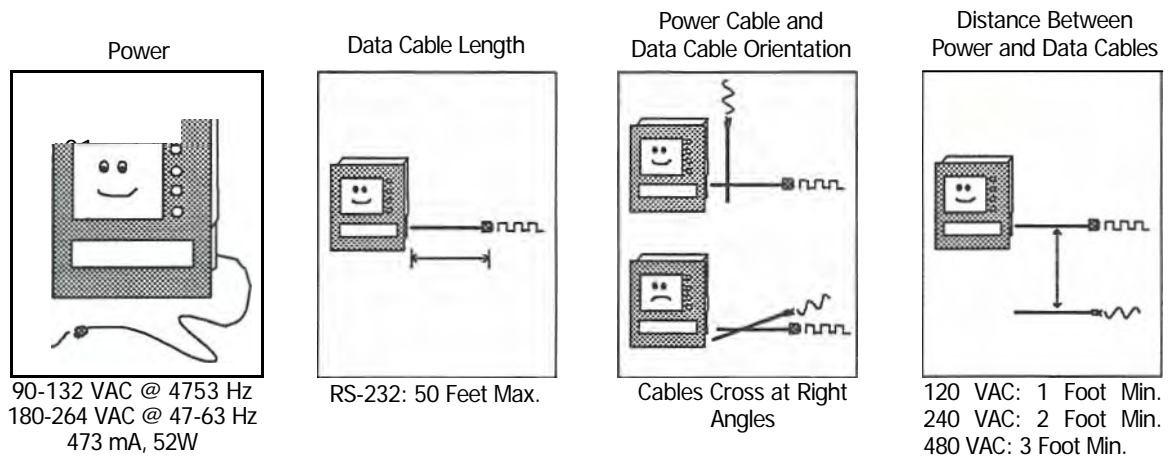


Figure D-7 Power and Wiring Specifications for the PanelMate Series 2000

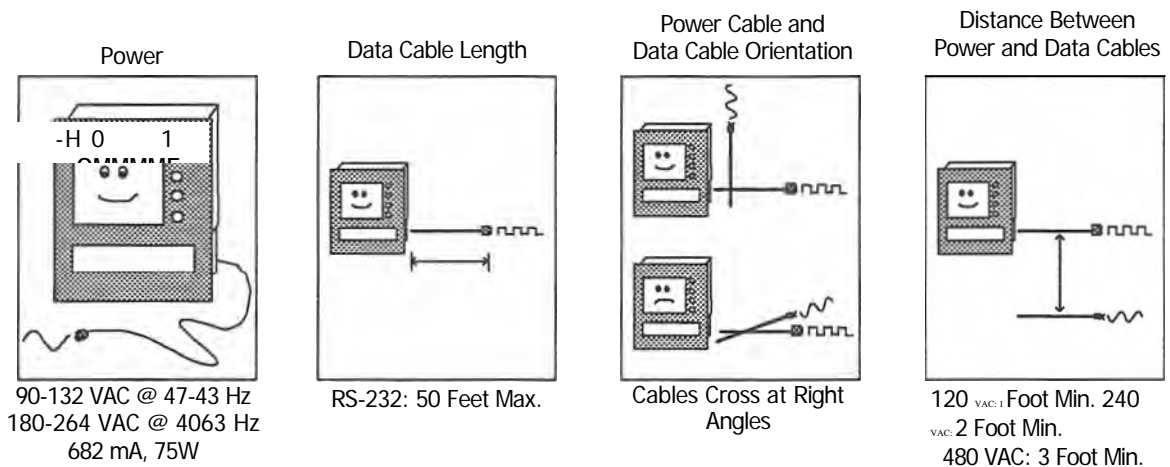


Figure D-8 Power and Wiring Specifications for the PanelMate Series 2000 Color

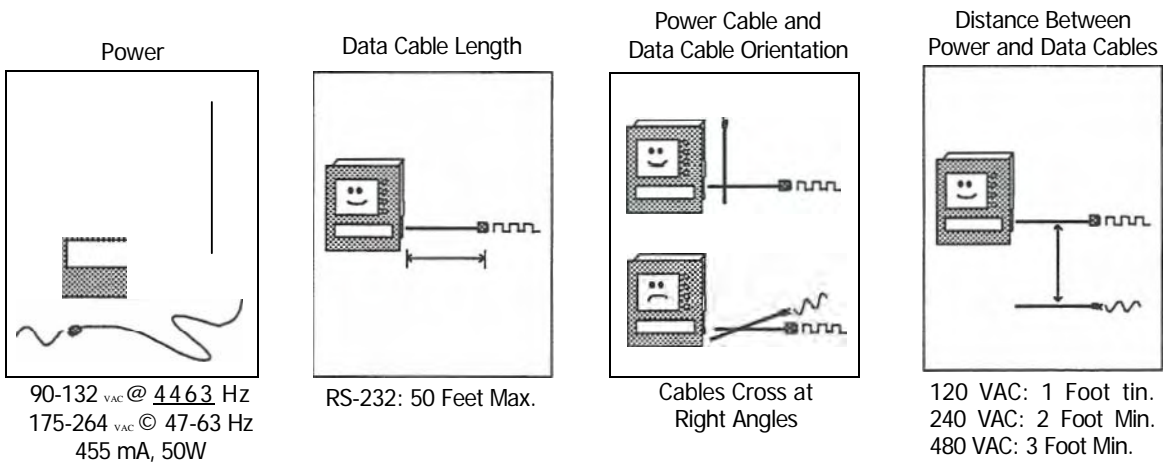


Figure D-9 Power and Wiring Specifications for the PanelMate Series 3000

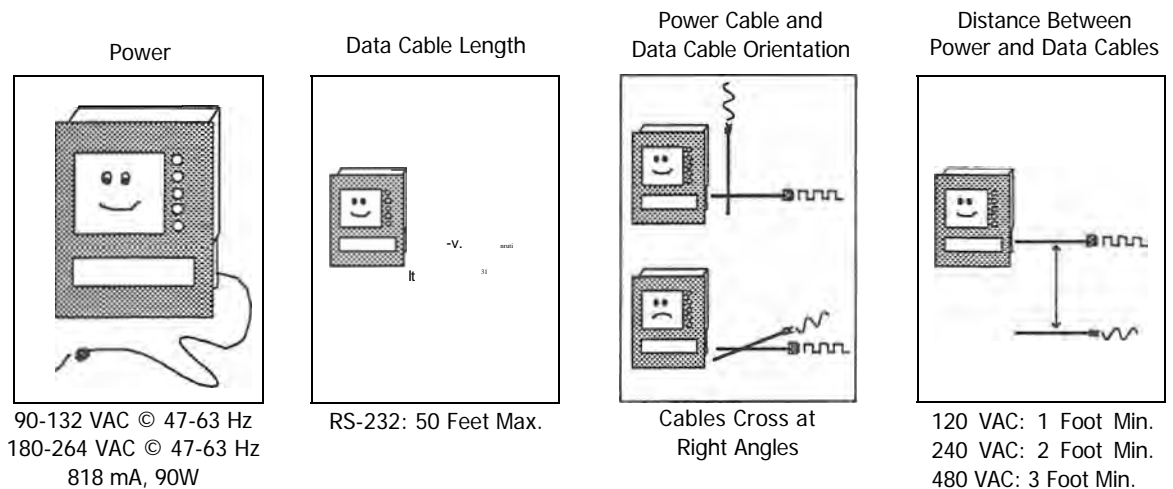


Figure D-10 Power and Wiring Specifications for the PanelMate Series 4000

Route low-level conductors at least one foot from 120V AC power lines, two feet from 240V AC power lines, and three feet from 480V AC power lines. If a low level conductor must cross high power lines, it should do so at a right angle.

Most RS232 serial communication cables should be no longer than 50 feet long. Some devices or high-noise environments may require shorter cabling. The effects of electrical noise can be reduced by using cables with twisted-pair conductors. This method uses one conductor of a twisted pair for a data transmit or receive line, and connects the second conductor of that pair to ground. Signal ground is run by paralleling two conductors of a twisted pair and using them as a single conductor. Higher noise immunity and distance can be achieved by using RS422 or 20 mA current loop communication. All communication cables should be shielded, with the shield grounded at one end only (to prevent shield current flow).

If there are significant voltage differences (6 volts) between the grounds of two devices which must be connected, the devices should be electrically isolated from each other. This can be accomplished with optical, fiber optical, or transformer isolators.

Follow manufacturer's instructions for installation of local area network and other communication cabling. High frequency communication often requires special conductors and precautions to guard against signal reflections. External high-frequency disturbances may require grounding of cable shields at both ends or at multiple points along the run.

Appendix E

Software Menu Hierarchy

In this chapter, you will learn:

The Software Menu Hierarchy

Editor Structure Hierarchy

Product Selection Menu

Use a PanelMate 2000 Application

Use a PanelMate 2000 Color Application

Use a PanelMate 3000 Application

Use a PanelMate 4000 Application

Main Menu

Develop a Configuration

Edit an Existing Configuration

Create a New Configuration

Return to Main Menu

Configuration Editor

Enter Directory Edit

Directory Editor

(Page Titles, Password Selection)

Page Editor

Template Mode

(Indicator Readout, Bar, Display, Table) Variable

Full-Sized Template Mode

(Indicator, Readout, Bar, Display, Graphic)

Message Library Editor

Character Editor Symbol Editor Window

Mode Page Page Editor Edit

System Parameters

Audio, Status to/Control from PLC, Define Passwords)

Edit PLC Name and Port Table

Edit System type, name, Labels serial port, scan

rates) Print Documentation

Optional Font

More Configuration

Save Configuration

Exit Configuration Editor

Transfer Information

Download Configuration to VCP Unit Upload

Configuration from VCP Unit Download Execute

Firmware to VCP Unit Download Network Executive

Firmware to CP Unit Download Driver to VCP Unit

Download Option to VCP Unit Read System Information

from the VCP Unit Return to Main Menu

Perform File Management

Copy a configuration

Rename Configuration

Delete a Configuration

Return to Main Menu

Verify a Configuration

Convert a Configuration

Convert a PanelMate 2000 Configuration Convert

a PanelMate 2000 Color Configuration

Convert a PanelMate 3000 Configuration

Convert a PanelMate 4000 Configuration

Edit Configuration Options Edit Conversion

Table Return to Main Menu

Return to Product Selection

Edit Utility Parameters

(Directory Names/Paths, Autosaves/Backups)

Editor Structure Hierarchy with Key Chapter Cross Reference

Product Selection Menu	Chapter 9
Configure a PanelMate 2000 Application	Chapter 9
Configure a PanelMate 2000 Color Application	Chapter 9
Configure a PanelMate 3000 Application	Chapter 9
Configure a PanelMate 4000 Application	Chapter 9
Main Menu	Chapter 11
Develop a Configuration	Chapter 12
Edit an Existing Configuration	
Create a New Configuration	
Return to Main Menu	
Configuration Editor	Chapter 13
Enter Directory Editor	Chapter 13
Directory Editor	
Bar	Chapter 17
Display	Chapter 18
Table	Chapter 21
Trend	
Indicator	Chapter 15
Bar Bout	Chapter 16
Display	Chapter 18
Graphic	Chapter 21
Message Library Editor ..	Chapter 19
Character Editor	Chapter 21
Symbol Editor	Chapter 21
Window Mode	Chapter 14
Save Page	Chapter 14
Exit Page Editor	Chapter 14
Edit System Parameters	Chapter 22
(Audio, Status to/Control from PLC, Define Passwords)	
Edit PLC Name and Port Table	Chapter 23
PLC Name, serial port, scan rates	
Edit System Online Labels	Chapter 24
Print Documentation	Chapter 25
Display Configuration	Chapter 12
Select International Font	Chapter 12
Merge Configuration	Chapter 12
Save Configuration	Chapter 12
Exit Configuration Editor	Chapter 12
Transfer Information	Chapter 26
Download Configuration to VCP Unit	
Upload Configuration from VCP Unit Download Executive	
Firmware to VCP Unit Download Network Executive	
Firmware to VCP Unit Download Driver to VCP Unit	
Download Option to VCP Unit Read Settings	
Information from VCP Unit	
Place VCP Unit in Transfer Mode	
Place VCP Unit in Run Mode Return	
Return to Main Menu	
Perform File Management	Chapter 27
Copy a Configuration	
Rename a Configuration	
Delete a Configuration	
Return to Main Menu	
Verify a Configuration	Chapter 11
Convert a Configuration	Chapter 11
Convert a PanelMate 2000 Configuration	
Convert a PanelMate 2000 Color Configuration	
Convert a PanelMate 3000 Configuration	
Convert a PanelMate Applications	

Appendix F

International Font Characters

In this chapter, you will learn:

- How to access the International Font
- How to use recall keys to enter the characters
- The character cell representations

Font Selection

Fonts are selected in the Configuration Editor Menu. Select the International Font by it's DOS filename. The fonts available at the time of this printing are:

Danish1.FNT
French1.FNT
French2.FNT
German1.FNT
Spanish1.FNT
Swedish1.FNT

The software will automatically install the 10 character cells in the normal font recall keys, **av** through **z**. To enter the recall key, **^v**, you must press the <Ctrl> <v> keys simultaneously.

Font Character Cell Representation

The cross-reference for each recall key and font are shown in the the following figures.

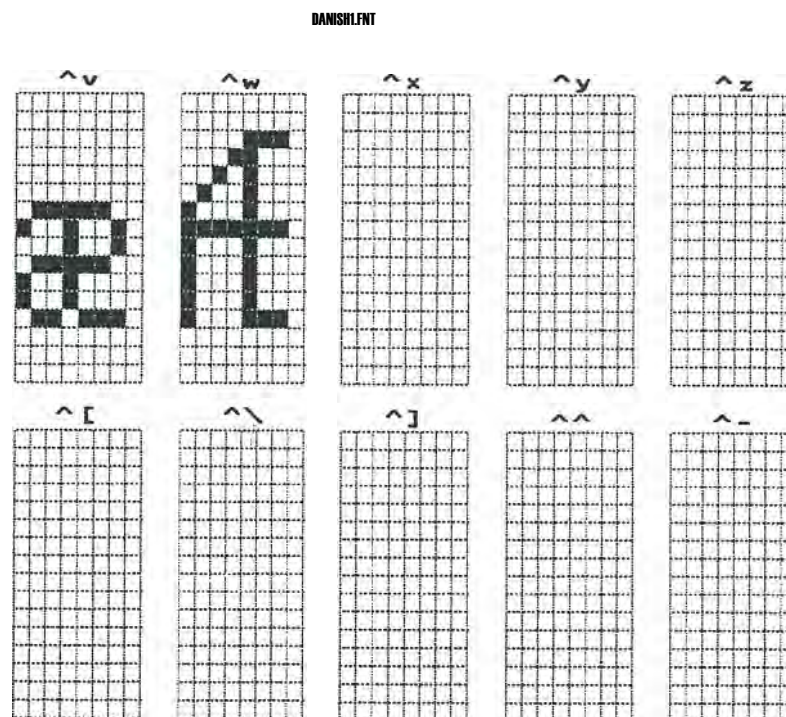


Figure F-1 Danish Font

FRENCHI . FNT

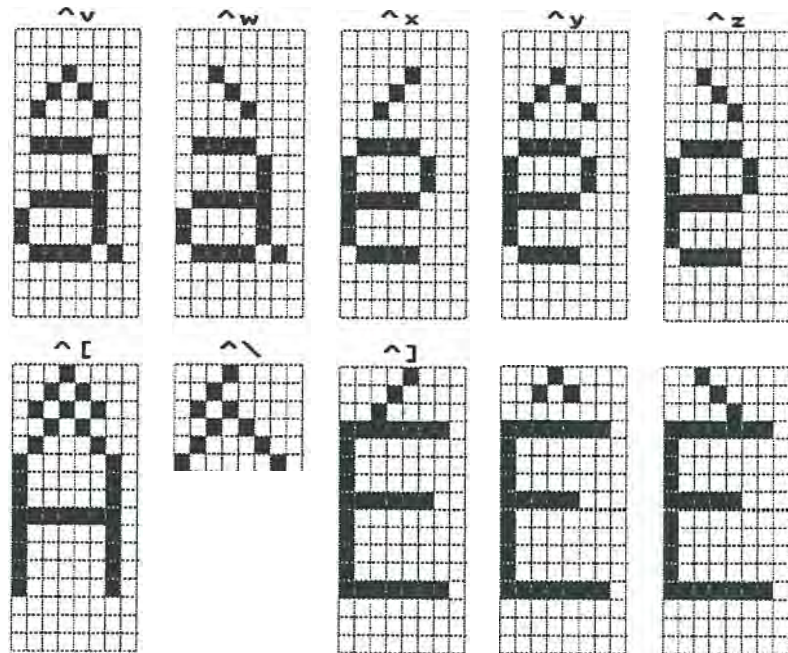


Figure F-2 French Font 1

FRENCH2 . FNT

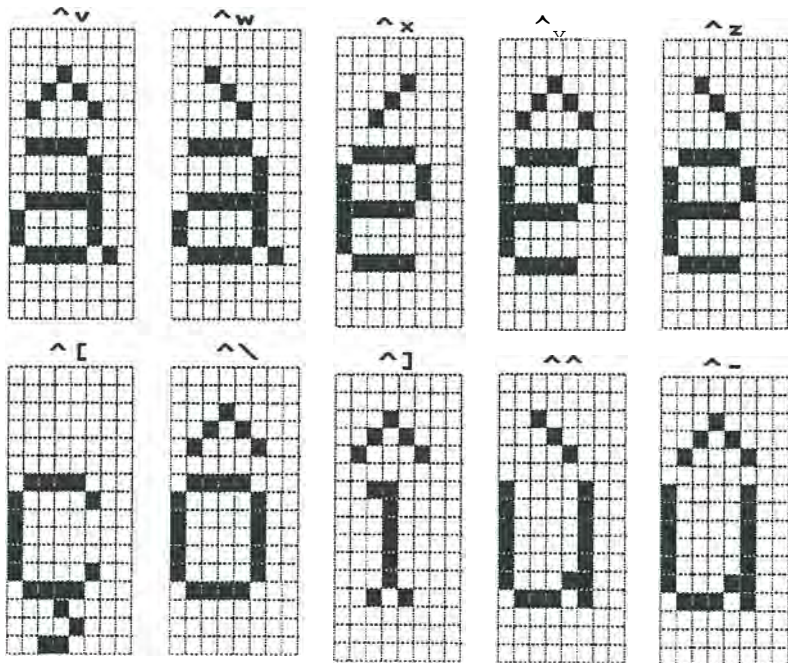


Figure F-3 French Font 2

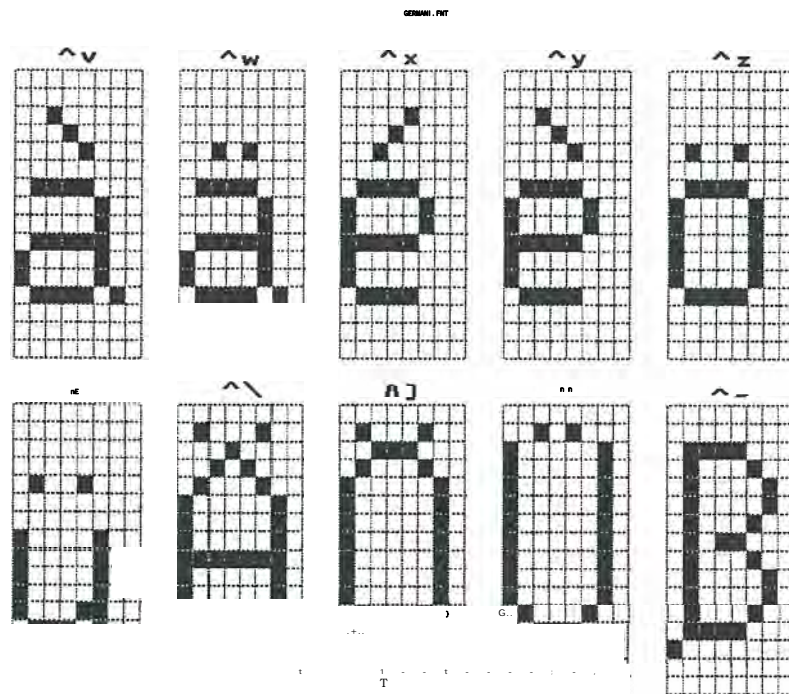


Figure F-4 German Font

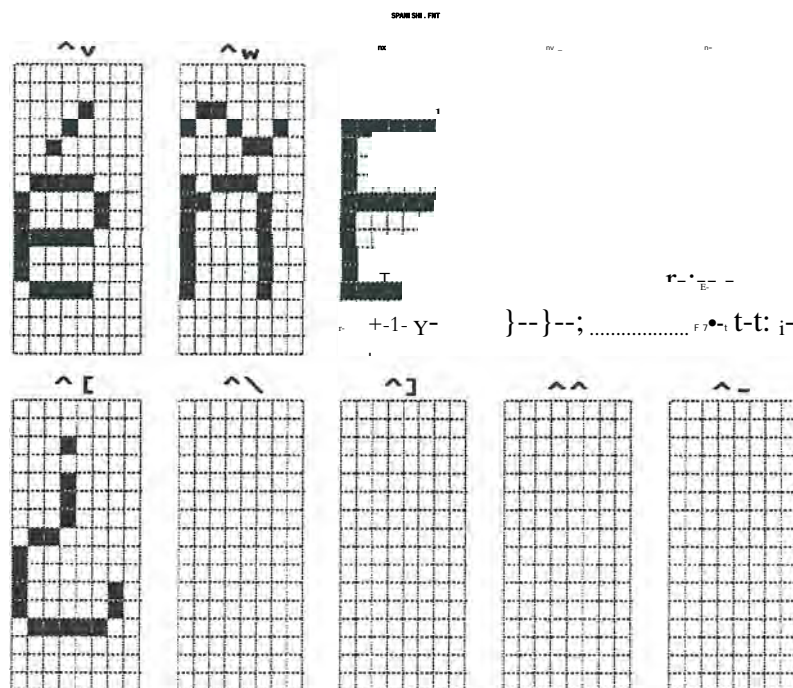


Figure F-5 Spanish Font

SWEDISHI.FNT

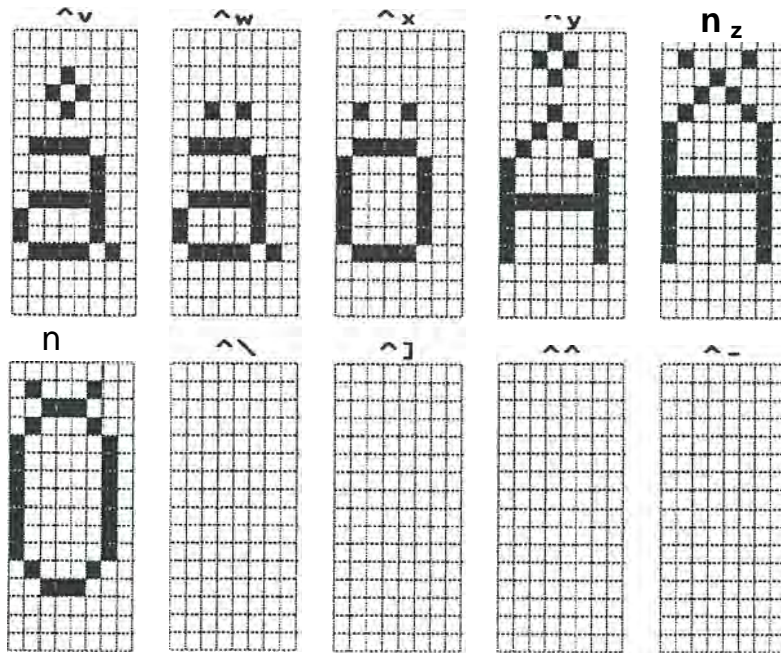


Figure F-6 Swedish Font

Appendix G

Worksheets

INDICATOR TEMPLATE EDITOR

Template Size: NORMAL or DOUBLE-WIDE

Character Size: NORMAL or QUAD or DOUBLE-HIGH

Device Name (22 char): _____

Priority FG BG

				Template Label (25 char)	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

INDICATOR VARIABLE-SIZED TEMPLATE EDITOR

Device Name (22 char):

Type (Outline, Solid)

Height (1,2)

V

Priority	FG	BG	B	Alarm Text (25 char)	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

READOUT TEMPLATE EDITOR

Template Size/Character Size: NORMAUQUAD or NORMAUDOUBLE-HIGH or
DOUBLE-WIDE/QUAD

Decimal Places (0-9):

Decimal Name (22 char):

Units (9 char):

Value 1 Expression (70 char):

Value 2 Expression (70 char):

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement:

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection _____ NONE KEY A _____ B _____ A or B

If BUTTONS,

Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

READOUT VARIABLE-SIZED TEMPLATE EDITOR

Readout Length:

Character Size: NORMAL or DOUBLE-HIGH or QUAD

Decimal Places: _____

Device Name (22 char): _____ Direc

Foreground Intensity/Color: _

Background Intensity/Color: _

Value Expression (70 char):

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement: Yes or No

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection NONE _____KEY A A or B

If BUTTONS,

	Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

BAR TEMPLATE EDITOR

Template Size: 2HIGH or 3HIGH

Device Name (22 char): _____

Units (6 char):

Maximum Calibration (6 char): ____

Minimum Calibration (6 char): ____

Value 1 Expression (70 char):

Value 2 Expression (70 char):__

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement:

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection NONE KEY A B A or B

If BUTTONS, Button

FG ' BG

	B				Control Label (33 char)	PLC Bit Reference (18 char)
1						
2						
3						
4						

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

BAR VARIABLE-SIZED TEMPLATE EDITOR

Bar Direction: Up, Down, Left or Right

Bar Height: _____

Bar Width: _____

Bar Intensity/Color: _____

Erase Intensity/Color: _____

Device Name (22 char): _____

Maximum Calibration (6 char): _____

Minimum Calibration (6 char): _____

Value Expression (70 char): _____

High Alarm Expression (70 char): _____

Low Alarm Expression (70 char): _____

Deadband Range (0-99%): _____

Alarm Acknowledgement: Yes or No

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char): _____

Target Word Address (18 char): _____

Password Protection _____ NONE _____ KEY A B _____ A or B

If BUTTONS,

Button	FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

DISPLAY TEMPLATE EDITOR

Template Size: 3WIDE or 4WIDE or WIDE			
Line	Display Expression (70 char)		
1			
2			
3			

Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1				
2				
3				
4				

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

DISPLAY VARIABLE-SIZED TEMPLATE EDITOR

Display Length (65 char): Direction:

Horizontal or Vertical

Message Expression (70 char)

Test Message

Global

Control Indicator Position: Above, Below, Left or Right

Control Indicator Display: Always or Selected

	Button FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

MESSAGE LIBRARY EDITOR

<u>Msg#</u>	<u>FG</u> <u>BG</u> _____ <u>B</u>	Message Text <u>65 char</u> _____	Char <u>Size</u> _____	<u>Destn</u>

TABLE TEMPLATE EDITOR

Template Size 1 or 2 or 3 HIGH, 2 or 3 WIDE Device
Name (22/56 char): _____
Parameters Tag (12/18 char)
Current Value Tag (6/7 char)
Edit Value Tag (0/6 char)
Units Tag (5/5 char)
Password Protection None _Key _A _B _A or B

TABLE ENTRY DEFINITION TABLE

#	Parameters	Value Expression	Dec. Pt.	Input Value Expression	Target Word Address	Units

TREND TEMPLATE EDITOR

Template Size: 1 HIGH/2WIDE or 1 HIGH/3WIDE or 2HIGH/2WIDE or 2HIGH/3WIDE or 3HIGH/2WIDE or 3HIGH/3WIDE

Device Name (48/65 char):

Units (6 char):

Trigger Type: INTERVAL or DISCRETE or CHANGE

Maximum Calibration (6 char):

Minimum Calibration (6 char):

Value 1 Expression (70 char):

Value 2 Expression (70 char):

Interval Expression (70 char):

High Alarm Expression (70 char):

Low Alarm Expression (70 char):

Deadband Range (0-99%):

Alarm Acknowledgement:

Control Type: NONE or NUMERIC or BUTTONS

If NUMERIC,

Input Value Expression (70 char):

Target Word Address (18 char):

Password Protection NONE KEY A A or B

If BUTTONS, Button

FG	BG	B	Control Label (33 char)	PLC Bit Reference (18 char)
----	----	---	----------------------------	--------------------------------

1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

GRAPHIC VARIABLE-SIZED TEMPLATE EDITOR

Priority	FG	BG	B	Symbol	Conditional Expression (70 char)	Alm	Ack
1							
2							
3							
4							
5							

VS-Template Origin:				Line #	Column
Control Indicator: Line		Column	Arrow	Display	

Control Label	Button FG	BG	B	33 char)	PLC Bit Reference (18 char)
1					
2					
3					
4					

Note Use <Ctrl> <m> to insert a carriage return in text fields.

Note If you have a PanelMate Series 4000, you will have five lines in the Control Button Definition Table.

Appendix H

ISA Symbols

In this chapter, you will learn:

- The ISA symbol names

- The ISA character cell representations

ISA Symbols

The file, _G ISA1.PC1, is a demonstration file included with the Configuration Software. This configuration contains over 50 pre-defined ISA symbols.

These symbols are examples only. They may be modified to meet your specific needs.

Representations of the ISA pages may be seen on the next few pages.

The ISA symbols use the Double-High and the Graphics character font. Over 40 characters remain available for use. See Figure H-8 to view the font directory for ISA symbols.

PAGE 0 ISA Symbol Set
PAGE EDITOR - MAIN MENU MODE

HELP

Press @ through F10 to select an operation mode.



The next five pages contain over 50 pre-defined ISA symbols.

The pre-defined symbols use the re-defined Double-High character Font and the Graphics Font. Over 40 characters remain available for you to modify. The symbols are examples only --- you may modify them or design your own to meet your specific needs.

Figure H-1 Font Directory for ISA Symbols

PAGE 1 CONTAINERS AND VESSELS
PAGE EDITOR - MAIN MENU MODE

HELP

Press II through 1710 to select an operation mode.

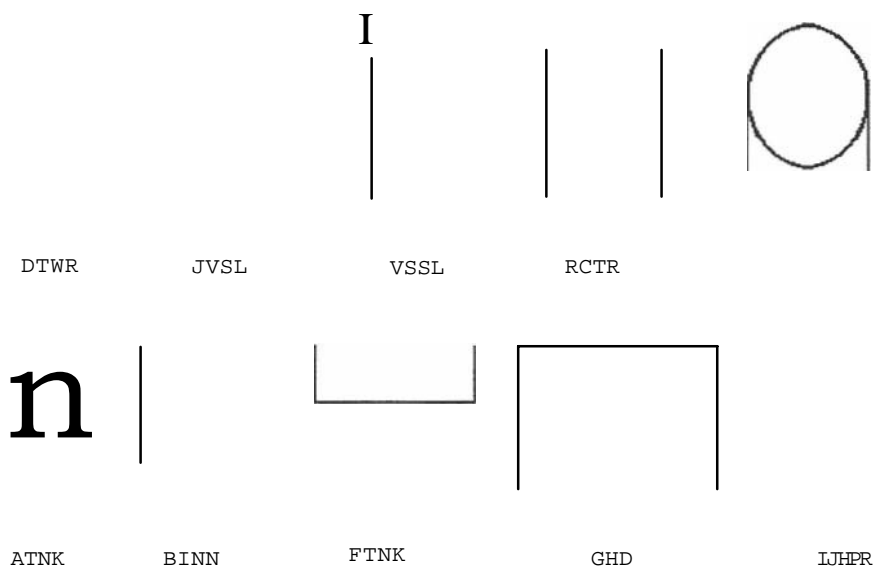


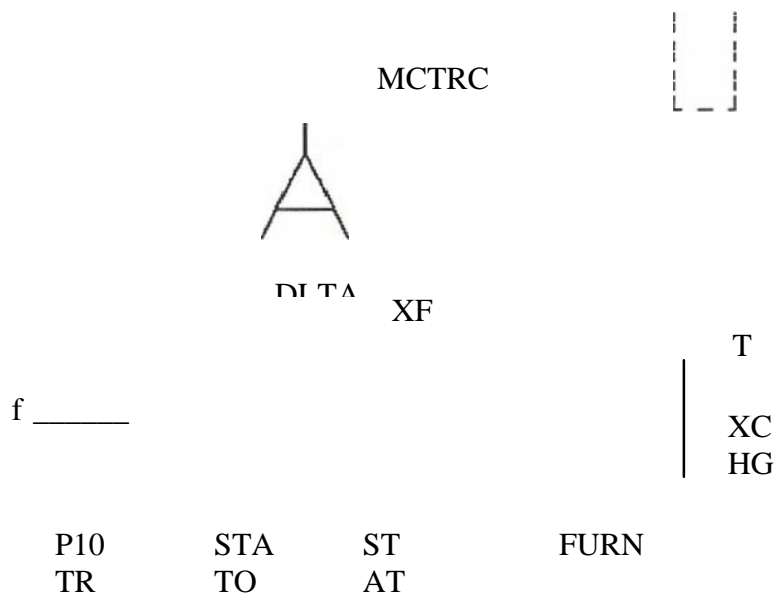
Figure H-2 Page 1 of the ISA Symbols

PAGE 2 ELECTRICAL,FILTERS, L HEAT TRANSFER

HEL

P PAGE EDITOR - MAIN MENU MODE

F10 to select an operation mode. It



Press = through F10 to select an operation mode.

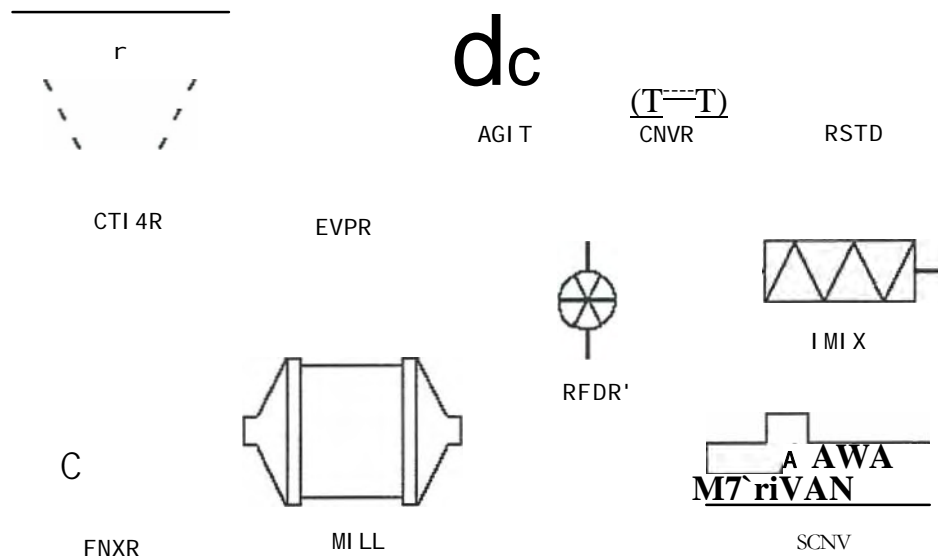


Figure H-4 Page 3 of the ISA Symbols

PAGE 4 RECIPROCATING AND ROTATING EQUIPMENT
PAGE EDITOR - MAIN MENU MODE

HELP

Press @ through F1@ to select an operation mode.

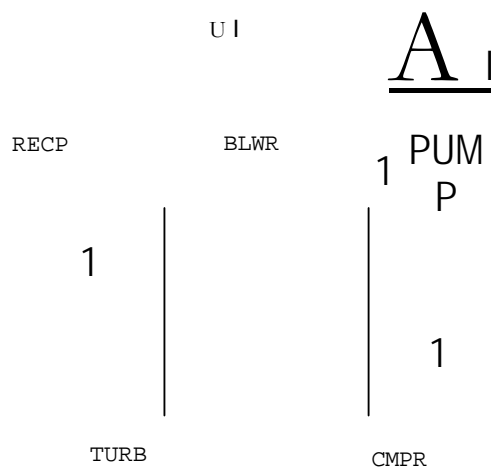


Figure H-5 Page 4 of the ISA Symbols

Press @ through F10 to select an operation mode.

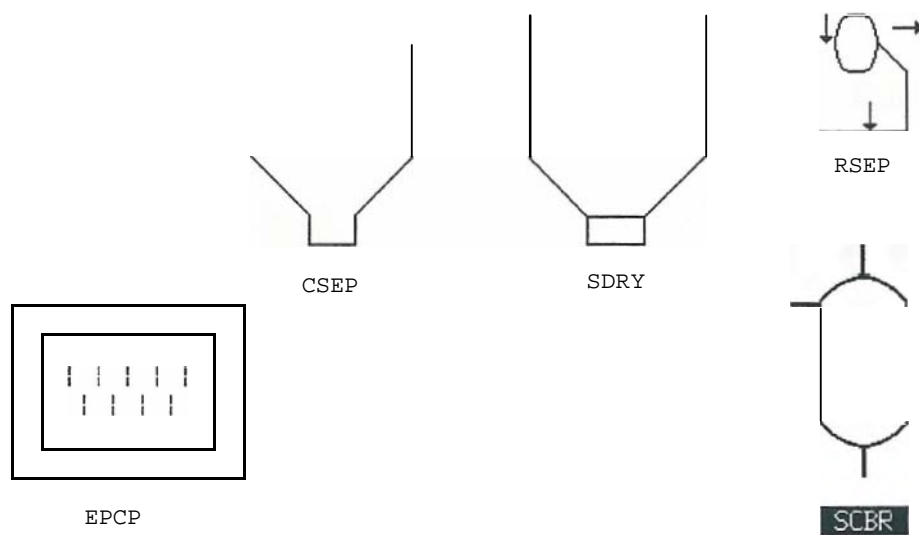


Figure H-6 Page 5 of the ISA Symbols

Press ® through IF1 to select an operation mode.
6



CVLV



BVLV

VLV3T



VLV32

VLV31



RVLVO



RVLVC

MATR

VLVEO

VLVEC



ACTRO

ACTRC

FONT DIRECTORY Press
F10 to exit.

	RECALL KEY	IP		IMIIMII aIII
IPIIM11M;11191~I		r1	~	~■■■■■■.---
GRAPHIC				
	DOUBLE HIGH			
	~5=~~			
RECALL KEY sp ! ' *S%'		() *+, -./0123456789 ;		<_>?
NORMAL ! 't96/&'		() *+, -./0123456789 ;;		<=>?
GRAPHIC -			- I I I I I///// I I 1 1 I	
DOUBLE HIGH f \ f				
tLSZ];ZS7				
RECALL KEY @ABCDEFGH			IJKLMNOPQRSTUVWXYZE\J	"
NORMAL @ABCDEFGH			IJKLMNOPQRSTUVWXYZC\J"	
GRAPHIC I I I I I		" \		
DOUBLE HIGH DC	r,		~t	
RECALL KEY `abcdef gh		i jk lmnopgrstu uwx9z{ 1 }-de		
NORMAL ` a b c d e f g h i j k l m n o p q r s t u u w x g z{ }				
GRAPHIC	rT	f ' ' 1T-~±	//	\\
DOUBLE HIGH X h,,/ v ^h j		1",l ~ ~ S z		

The top row of RECALL KEYS are accessed through <Ctrl><Key> combinations except for <Ctrl><c> which is accessed by the <Alt><c> key combination.

Figure H-8 Font Directory for ISA Symbols

Appendix I

Set Electronics Module Utility

In this chapter, you will learn:

How to use the Set Electronics Module Utility

Set Electronics Module Utility

This utility is designed to set the hardware functionality for spare electronic module assemblies. You may set the hardware to function as either a four button gray scale, four button color, or five button color PanelMate unit. The electronics module assembly must be returned to the factory to upgrade a 10-page unit to a 30-page unit.

How to Run the Set Electronics Module Utility

This utility will only run on Port 1. To use the utility, run the Configuration Software and read the system configuration information to verify proper communication between your PanelMate unit and your personal computer. This requires that the PanelMate unit be placed in the Transfer Mode. Use the default baud rate of 9600 baud. Once the information is read, leave the PanelMate unit in the Transfer Mode and exit the Configuration Software. This utility is loaded into the same directory as the Configuration Software. The default is the VCP directory. At the DOS prompt, select the directory which contains this utility and type: SETHW

Follow the instructions on the screen. After you have set the hardware functionality, exit the utility and return to DOS. You may then run the Configuration Software and download your user configuration. If you experience problems, please contact Eaton IDT Customer Service at (614) 882-3282.

Index

A

A-B module for direct connection

1771-KG, 30-18 1775-KA, 30-18

A-B module for PLC DH connection

1771-KA, 1771-KA2, 30-14
1775-KA, 30-15 1785-KA, 30-15

A-B module for PM unit DH connection 1770-KF2

unit A, 1770-KF2 unit B, 30-17 1771 -KC,
1771 -KD, 30-17 1771-KE, 1771-K F, 30-16

A-B module for PM unit to DH+ connection

1770-KF2 series B, 30-19 1785-KE
series A, 30-20 1785-KE series B, 30-20

A-B module for PM unit to DH-485, 30-21

1747-AIC, 30-21

Accelerati/On

Active Racks, 31-14

Allen-Bradley word and bit references, 31-10

Block transfers, 31-15 Cabling, 31-7

Communication parameters, 31-8

Data highway and data highway plus, 31-10

Diagnostic indicators, 31-9 Possible
configurations, 31-2 Remote I/O, 31-10

Ack (acknowledge required), 15-5

Active block transfer, 24-9

Direct, 24-9

Group, 24-10

Rack, 24-9

Size, 24-10

Slot, 24-10

Alarm scan delay, 24-6

Alarms, 6-11

Allen-Bradley PLCs

Memory, 30-2

Modules for AMI to data highway communication, 30-16

Modules for direct connection, 30-18 Modules for
PanelMate unit connections, 30-10 Modules for PLC data
highway connection, 30-14 Modules for PM unit to data
highway plus, 30-19 PLC-3 data access, 30-6
PLC-5 data access, 30-8

Possible configurations, 30-2

Serial cabling, 30-12

Serial communications parameters, 30-13

SLC 500 data access, 30-10 Unsolicited

write message, 31-20 Word and bit
references, 30-22

Audio feedback kit, 4-10

Audio output, 5-51, 23-2

Audio output check, 4-11

Audio output, problems, 8-3

B

B (Blink), 15-7,16-9, 16-19,17-10, 17-20,18-5,18-11, 21-12,
22-16

Bar templates, 17-2

Alarm acknowledgment, 17-6

Control button definition table, 17-9

Control type, 17-7

- Deadband range, 17-6
- Device name, 17-3
- Edit existing templates, 17-11 Exit the bar template editor, 17-11
- Gathering information for configuration, 17-11
- High alarm expression, 17-5, 21-7 Low alarm expression, 17-6, 21-7 Maximum calibration, 17-4 Minimum calibration, 17-4 Numeric control definition, 17-7 Template size, 17-3
- Units, 17-3
- Value 1 expression, 17-4, 21-5
- Value 2 expression, 17-5, 21-5
- Bar variable-sized templates, 17-13
 - Alarm acknowledgment, 17-16
 - Bar and erase colors, 17-14 Bar direction, 17-13 Bar height and width, 17-13
 - Control button definition table, 17-19
 - Control indicator display, 17-18 Control indicator position, 17-18 Control type, 17-16 Deadband range, 17-16 Device name, 17-14
 - Edit existing variable-sized templates, 17-21 Exit the bar variable-sized template editor, 17-21 Gathering information for configuration, 17-21 High alarm expression, 17-15 Low alarm expression, 17-15 Maximum calibration, 17-14 Minimum calibration, 17-14 Numeric control definition, 17-17 Value expression, 17-14
- Basic steps for creating a user configuration, 10-1

- Basic steps for creating an application, 3-2
- Battery test, 4-11
- Baud rate, 24-3
- BCC/BIT#, 24-5
- Benefits, 2-2
- BG (Background), 15-7, 16-9, 16-19, 17-10, 17-20, 18-5, 18-11, 21-12, 22-16
- Binary-based formats, 19-6
- Block check calculation, 35-15
- Block transfers
 - Discussions, 31-18
 - Examples, 31-16

C

- Cable, transfer (pinout), 5-50
- Character cell worksheet, 22-9
- Character editor, 22-2
 - Copy, 22-5
 - Default font directory, 22-5
 - Delete, 22-5
 - Edit, 22-3 Exit, 22-5
 - Font, 22-4
 - Restore, 22-5
 - Save, 22-5 Show fonts, 22-5
- Check system health, 4-6
 - Attach audio feedback kit, 4-10
 - Attach security keyswitch, 4-10
 - Connect AC power, 4-9
 - Execute the system diagnostics, 4-10
 - Power up the unit, 4-10
- Clock, reset, 23-10
- Communication errors, 6-19
- Conditional expression, 15-4
- Conditions and operators, 15-6

- Configuration creation checklist, C-1
 - Configuration editor menu, 12-4
 - Display configuration, 12-5
 - Edit PLC name and port table, 12-5
 - Edit system online labels, 12-5
 - Edit system parameters, 12-4
 - Enter directory mode, 12-4
 - Exit configuration editor, 12-5
 - Merge configuration, 12-5
 - Print configuration, 12-5
 - Save documentation, 12-5
 - Select configuration, 12-5
 - Select international font, 12-5
 - Configuration Mode, 2-5
 - Cursor moves, 2-6
 - Cursors, 2-6
 - Error messages, 2-6
 - Field colors, 2-6
 - Function keys, 2-7
 - Special features, 2-5
 - Configuration software
 - File naming conventions and file management, 9-9
 - Hardware requirements, 9-2
 - Non-VGA hardware, 9-9
 - Overview, 9-2
 - Starting, 9-3
 - Configuration Verifier, 11 -3
 - Connect keyswitch to PanelMate unit, 5-51
 - Connect PC to PanelMate unit, 5-50
 - Connect power, 5-49
 - Connect printer to PanelMate unit, 5-49
 - Control bit reset delay, 23-5
 - Control button definition table
 - B (blink), 15-7, 16-9, 16-19, 17-10, 17-20, 18-5, 18-11, 21-12, 22-16
 - BG (background), 15-7, 16-9, 16-19, 17-10, 17-20, 18-5, 18-11, 21-12, 22-16
 - Control label, 15-8, 16-9, 16-19, 17-10, 17-20, 18-5, 18-12, 21-12, 22-16
 - FG (foreground), 15-7, 16-9, 16-19, 17-10, 17-20, 18-5, 18-11, 21-12, 22-16
 - PLC bit reference, 15-8, 16-9, 16-19, 17-10, 17-20, 18-5, 18-12, 21-12, 22-16
 - Control buttons, problems, 8-2
 - Control label, 15-8, 16-9, 16-19, 17-10, 17-20, 18-5, 18-12, 21-12, 22-16
 - Convert a configuration, 11-4
 - Configuration options editor, 11-7
 - Conversion editor, 11-5
 - Conversion table editor, 11-7
 - CSI Scan Delay, 24-7
 - Custom Serial Interface (CSI), 24-10
 - Cabling, 32-2
 - Communication parameters, 32-3
 - CSI configuration, 32-4
 - CSI copy, 24-12
 - CSI edit, 24-11
 - Digital indicator configuration, 32-8
 - Possible configuration, 32-2
 - Word and bit references, 32-9
- ## D
- Data bits, 24-3
 - Data highway 485, 24-13
 - Data highway and data highway plus, 31-10
 - Deadband range, 16-6
 - Decimal place formats, 19-6
 - Decimal-based formats, 19-6
 - Default font directory, A-2
 - Default PLC Name, 24-6
 - Defining online labels, 25-2

- Defining system parameters, 23-2
- Destn (Destination), 19-3
- Detailed specifications, B-1
- Develop configuration menu
 - Create new configuration menu, 12-3
 - Edit an existing configuration, 12-2
- Device name, 15-3, 16-3, 17-3
- Diagnostics, execute, 4-11
- Direct editing functions
 - Cursor movement, 14-15, 22-11
 - Font and cursor direction selection, 14-15, 22-11
- Directory editor, 13-1
 - Accessing the page editor, 13-3
 - Before you start configuring pages, 13-2
 - Copy, 13-5
 - Delete, 13-5
 - Enter, 13-3
 - Exit, 13-6
 - Functions, 13-2
 - Memory free, 13-5
 - More, 13-6
 - Move, 13-5
 - Page title, 13-4
 - Protection, 13-3
 - Swap, 13-5
- Display configuration menu, 12-6
- Display templates, 18-2
 - Control button definition table, 18-4
 - Editing existing templates, 18-6
 - Exiting the display template editor, 18-6
 - Gathering information for configuration, 18-6
 - Message expression, 18-3
 - Template type, 18-3
 - Test message, 18-4
- Display tests, 4-11
- Display variable-sized templates, 18-8
 - Control button definition table, 18-11
 - Control indicator display, 18-10
 - Control indicator position, 18-10
 - Direction, 18-8
 - Display length, 18-8
 - Editing existing variable-sized templates, 18-12
 - Exit display variable-sized template editor, 18-12
 - Gathering information for configuration, 18-12
 - Global messages, 18-10
 - Message expression, 18-9
 - Test message, 18-10
- Documentation, print, 26-2
- Double High Fonts, redefine, 23-3

E

- Eaton PLCs
 - Cabling, 33-5, 43-4
 - Communications parameters, 33-6, 43-5
 - Memory, 33-2, 43-2
 - Possible configurations, 33-4, 43-3
 - Word and bit references, 33-10, 43-7
- Editing standards, 2-13
 - Data fields, 2-13
 - Fonts and font redefinition, 2-15
 - Help pages, 2-14
 - Option window, 2-14
- Editor structure hierarchy, E-2
 - Key chapter cross reference, E-3
- Electrical (Elect), 24-4
- Enclosure sizing, 5-2, 5-11, 5-19, 5-27, 5-32, 5-40
- Enhancing operator performance, 3-4
- Error code descriptions, 6-23, 6-28, 30-34 -35
- Errors
 - Communication, 6-19
 - Run mode, 6-19

System, 6-22 Execute
diagnostics, 4-11

F

Fault relay, 5-51, 6-17, 23-4

- Alarms, 6-19 Communication
errors, 6-18 Connecting, 5-51
Loss of power, 6-19 System
errors, 6-17

Fault relay check, 4-11

Fault relay, problems, 8-3

- FG (Foreground), 15-7, 16-9, 16-19, 17-10, 17-20, 18-5,
18-11, 21-12, 22-16

File management, 28-1

- Copy a configuration, 28-2
Delete a configuration, 28-4
Menu, 28-2
Rename a configuration, 28-3
Return to main menu, 28-4

Font and cursor direction selection, 14-15, 22-11

Font character cell representation, F-2 Font
selection, F-2

Fonts, International, 12-6, F-2

Fonts, show, 22-5

Format for Generic Protocol, 24-5

Formatting data in messages, 19-7

Formatting types, 10-4, 19-7

G

Gathering information for configuration, 3-5

General Electric PLCs

- Cabling, 34-5
CCM2, 34-12
CCM3, 34-13
COM2, 34-6

Communications parameters, 34-9

1/0 CCM, 34-13

Memory, 34-2

Possible configurations, 34-4

Switch settings, 34-10

Word and bit references, 34-15

Generic Protocol

- Block check calculation, 35-15 Checking
the communication link, 35-16

- Communications using task blocks, 35-21

- Connect serial cable, 35-17 Driver

- development, 35-16 Establish

- communication link, 35-17 Format, 35-5

- Frames, 35-6

- Hardware interface, 35-2

- Implement Generic Protocol frames, 35-18

- Method of operation, 35-3 PanelMate unit

- configuration, 35-4 PLC name and port

- editor, 35-15

- Select Generic Protocol on PanelMate unit, 35-17

- Simulate Generic Protocol on host, 35-18 Task

- Blocks, 35-7

- Task codes, 35-8

- Tasks blocks, 35-7

Generic Protocol, communication problems, 8-5

Graphic editor, 22-2

Graphic variable-sized templates, 22-12

- Control button definition table, 22-15

- Device name, 22-12

- Exit the graphic variable-sized template, 22-16

- Gathering information for configuration, 22-17

- Symbol definition table, 22-13

Graphics mode, 2-9

H

Hardware description, 2-13

High alarm expression, 1 7-5

Host display window, 6-9, 23-4

How to successfully develop your application, 3-1

- Basic steps, 3-2

- Defining the scope of the project, 3-2

- Enhancing operator performance, 3-4

- Gathering information for configuration, 3-5

- Page layout, 3-3

How to use this manual, 1-2

ID# (Generic Protocol), 24-5

ID# (PLC Name Table), 24-5

Immediate page change, 23-4

Indicator definition table

- Ack (acknowledge required), 15-13

- Alarm text, 15-12

- Alm (alarm), 15-13

- B (blink), 15-11

- BG (background), 15-11

- Conditional expression, 15-12

- FG (foreground), 15-11

Indicator templates, 15-2

- Character size, 15-3

- Device name, 15-3

- Editing existing templates, 15-8

- Exit the indicator template editor, 15-8

- Gathering information for configuration, 15-8

- Template definition table, 15-3 Template size, 15-3

Indicator variable-sized templates, 15-10

- Device name, 15-10

- Edit existing variable-sized templates, 15-13

- Exit indicator variable-sized template editor, 15-13

- Gathering information for configuration, 15-13 Indicator definition table, 15-11 Type, 15-10

- Width, 15-11

Input value expression, 16-7, 17-8, 21-9

Installation guidelines, D-1

- Environmental considerations, D-5

- Overview, D-2

- Physical installation considerations, D-2

- Wiring considerations, D-7

Installation in an industrial enclosure

- Enclosure sizing, 5-2, 5-11, 5-19, 5-27, 5-32, 5-40 PanelMate Series 2000 (Model 2400), 5-2, 5-6 PanelMate Series 2000 (Model 2600), 5-11, 5-15 PanelMate Series 2000 Color (Model 2700), 5-19, 5-23 PanelMate Series 3000, 5-27, 5-31 PanelMate Series 4000 (Model 4200), 5-40, 5-45 PanelMate Series 4000 (Model 4500), 5-32, 5-36

International Font Characters, F-1

International Fonts, 12-6

ISA Symbols, H-2

K

Keypad tests, 4-11

Keyswitch, 4-10

L

Labels, 25-2

- Labels, change labels, 25-2

- Labels, startup online, 25-2

- Line drawing characters, A-3, H-3

- Loading status screen, 6-4

- Lost password recovery, 6-15 Low alarm expression, 17-6

M

Main menu, 11-1 -2

- Convert a configuration, 11-4

- Develop a configuration, 11 -2

- Perform file management, 11-2

- Return to product selection, 11 -8

- Transfer information, 11-2 Verify a configuration, 11 -3

Maintenance, 7-2

Manual organization, 1-3

Merge configuration menu, 12-7

Message library editor, 19-2

- B (blink), 19-3

- BG (background), 19-3

- Char size (character size), 19-3

- Clock and calendar access, 19-8

- Destn (destination), 19-3

- Editing existing variable-sized templates, 19-8 Exit the message variable-sized template, 19-8 FG (foreground), 19-3

- Gathering information for configuration, 19-8

- Message text, 19-3

- Msg# (message number), 19-2

- Register references within messages, 19-4

Message scan delay, 24-7

Message text, 19-3

Mitsubishi PLCs

- Cabling, 36-12

- Communications parameters, 36-14

- Memory, 36-2

- Possible configurations, 36-10

- Word and bit references, 36-19

- Model, 24-6

Modicon Modbus PLCs

- 484 PLC/J474 Modbus Communication Interface, 37-9

- 884 Modbus Ports, 37-6

- 984 and 584 Modbus Ports, 37-5

- Cabling, 37-4

- Communications parameters, 37-5

- Memory, 37-2

- Micro 84/J375 Modbus Adapter, 37-7

- Possible configurations, 37-2 Word and bit references, 37-11

Modicon PLCs

- Adapters, 37-3

Monitor adjustments, 7-2

Monitor, problems, 8-2

Mounting collar, installing

- PanelMate Series 2000 (Model 2400), 5-7

- PanelMate Series 2000 (Model 2600), 5-16

- PanelMate Series 2000 Color (Model 2700), 5-24

- PanelMate Series 4000 (Model 4200), 5-46

- PanelMate Series 4000 (Model 4500), 5-37

N

Name, 24-5

Numeric control definition

- Input value expression, 16-7, 16-16, 17-8, 17-17, 21-9

- Password protection, 16-8, 16-17, 17-8, 17-18, 21-10

- Target word address, 16-8, 16-17, 17-8, 17-18, 21-10 Numeric passwords, 6-13

O

Offline Mode, 4-10

Omron PLCs

- Cabling, 38-6

- Communications parameters, 38-8

- Memory, 38-2

- Possible configurations, 38-5

- Word and bit references, 38-11

Online operation, 6-1

- Operator input, 6-10, 23-2
- Operator performance, enhancing, 3-4
- Operators, 15-5
- Origin cell, identify variable-sized template, 14-11
- Overview
 - Benefits, 2-2
 - Editing standards, 2-13
 - Hardware description, 2-13
 - Product description, 2-4

P

- Page change register, 23-4, 23-9
- Page editor
 - Character Editor, 22-2
 - Character mode, 14-11
 - Configuring, 14-2
 - Exit the page editor, 14-13
 - Main menu, 14-4
 - Message mode, 14-11
 - Page layout, 14-3
 - Parameters editing functions, 14-13
 - Save the page, 14-13
 - Symbol mode, 14-11
 - Template mode, 14-5
 - Variable-sized template mode, 14-9
 - Window mode, 14-12
- Page editor in template mode
 - Access the variable-sized template, 14-7
 - Add a template, 14-6
 - Copy a template, 14-7
 - Delete a template, 14-7
 - Edit a template definition, 14-5
 - Exit the template mode, 14-8
 - Memorize or recall a template, 14-8
 - Move a template, 14-6
 - Save, 14-8

- Page editor in variable-sized template mode, 14-9
- Add an variable-sized template to a page, 14-10
- Edit an existing variable-sized template, 14-10
- Edit parameters, 14-10
- Exit the variable-sized template mode, 14-11
- Identify an variable-sized template's origin, 14-11
- Overview, 14-9
- Redraw, 14-10
- Save, 14-11
- Show fonts, 14-10
- Template mode, 14-10

- Page layout, 3-3
- Page number, startup, 23-2
- Page password timeout, 23-6
- Page, alarm summary, 6-12
- Page, call a new, 6-9
- Page, PLC selection, 6-9
- Page, save, 14-8, 14-11
- PanelMate Series 2000 (Model 2400)
 - Collar outline, 5-9
 - Cutout and torque limits, 5-4
 - Mounting collar assembly, 5-7
 - Outline, 5-3
 - Panel mount collar, 5-9
 - Rear view, 5-5
- PanelMate Series 2000 (Model 2600)
 - Collar outline, 5-18
 - Cutout and torque limits, 5-13
 - Mounting collar assembly, 5-16
 - Outline, 5-12
 - Panel mount collar, 5-18
 - Rear view, 5-14
- PanelMate Series 2000 Color (Model 2700)
 - Collar outline, 5-25
 - Cutout and torque limits, 5-21

- Mounting collar assembly, 5-24
- Outline, 5-20
- Panel mount collar, 5-26
- Rear view, 5-22
- PanelMate Series 3000
 - Cutout and torque limits, 5-29
 - Outline, 5-28
 - Side view, 5-30
- PanelMate Series 4000 (Model 4200)
 - Collar outline, 5-47
 - Cutout and torque limits, 5-42
 - Cutout and torque limits for PanelMate 2900, 5-43
 - Mounting collar assembly, 5-46 Outline, 5-41
 - Panel Mount Collar, 5-48
 - Rear view, 5-44
- PanelMate Series 4000 (Model 4500)
 - Collar outline, 5-38 Cutout and torque limits, 5-34 Mounting collar assembly, 5-37 Outline, 5-33
 - Panel mount collar, 5-39
 - Rear view, 5-35
- Parameters editing functions, 22-10
 - Direct editing functions, 14-14, 22-10
 - Parameters editing, 14-13, 22-10
- Parity, 24-3
- Pass-through, 24-9, 27-57
- Password overwrite, 23-7
- Password protection, 6-13, 23-7
- Passwords, 23-7
- Personal computer
 - connecting, 5-50
- PLC bit reference, 15-8, 16-9, 16-19, 17-10, 17-20, 18-5, 18-12, 21-12, 22-16
- PLC name and port table, 24-2, 24-6
 - Alarm scan delay, 24-6 Baud rate, 24-3 BCCBIT#, 24-5 CSI scan delay, 24-7 Data bits, 24-3 Default PLC name field, 24-6 Electrical, 24-4
 - Format for generic protocol, 24-5 ID# (Generic Protocol), 24-5 ID# (PLC name table), 24-5 Message scan delay, 24-7 Name, 24-5 Network ID#, 24-3
 - Parity, 24-3 Port, 24-6
 - Screen scan delay, 24-6
 - Stop bits, 24-3 Use, 24-2
- PLC register formats, 10-4
- Port, 24-6
- Port, (pinout), 5-49
- Power-up sequence, 6-2
 - Check for executive firmware, 6-3
 - Compatibility with executive firmware, 6-3
 - Determine power-up mode, 6-4 Entering transfer mode, 6-3
 - Execute normal power-up diagnostics, 6-2
 - Off line mode initialization, 6-4 Presence of installed drivers, 6-4 Run mode initialization, 6-4
- Print documentation, 26-2
- Printer, problems, 8-4
- Problems
 - Audio output, 8-3

- Control buttons, 8-2
- Fault relay, 8-3
- Monitor, 8-2 Printer, 8-4
- Real-time clock, 8-4
- Specific error messages, 8-5
- TouchPanel, 8-2 Transferring memory, 8-4
- Product description, 2-4
 - Configuration mode, 2-5
 - Dos-based configuration software, 2-5
 - PanelMate online system, 2-4
- Pushbutton actuator kit
 - Install, 5-10
- Q
- Quad Fonts, redefine, 23-4
- R
- Readout templates, 16-2
 - Alarm acknowledgment, 16-6
 - Character size, 16-3
 - Control button definition table, 16-8
 - Control type, 16-6
 - Deadband range, 16-6
 - Decimal places, 16-3
 - Device name, 16-3
 - Editing existing templates, 16-9
 - Exit the readout template editor, 16-10
 - Gathering information for configuration, 16-10
 - High alarm expression, 16-5
 - Low alarm expression, 16-5
 - Numeric control definition, 16-7
 - Templates size, 16-3
 - Units, 16-3
 - Value 1 expression, 16-4
 - Value 2 expression, 16-4
- Readout variable-sized templates, 16-12
 - Alarm acknowledgment, 16-15
 - Character size, 16-12
 - Control button definition table, 16-18
 - Control indicator display, 16-17
 - Control indicator position, 16-17
 - Control type, 16-15
 - Deadband range, 16-15
 - Decimal places, 16-12
 - Device name, 16-13
 - Direction, 16-13
 - Editing existing elements, 16-19
 - Exit the readout template editor, 16-20
 - Foreground/background intensity, 16-13
 - Gathering information for configuration, 16-20
 - High alarm expression, 16-14
 - Low alarm expression, 16-14
 - Numeric control definition, 16-16
 - Readout length, 16-12
 - Value expression, 16-13
- Real-time clock, problems, 8-4
- Real-time clock, setting, 23-10
- Register references within messages, 19-4
 - Binary-based formats, 19-6
 - Decimal place formats, 19-6
 - Decimal-based formats, 19-6
- Regular maintenance, 7-2
- Reliance PLCs
 - Cabling, 39-5
 - Communications parameters, 39-5
 - Memory, 39-2
 - Possible configurations, 39-3
 - Word and bit references, 39-8
- Remote alarm acknowledge, 23-8

- Remote enable fault relay bit, 23-9
- Remote I/O, 31-10
 - Active block transfer, 31-12 Control button reset delay, 31-14 Monitor block transfer, 31-13 Monitored I/O, 31-11
- Remote I/O configuration, 24-8 Active block transfer table, 24-9 Active rack table, 24-9
- Remote sending of passwords, 23-9
- Remote silence alarm horn bit, 23-8
- Replacement pushbutton caps
 - Install, 5-10
- Reset clock, 23-10
- Run mode, 2-10, 6-6
 - Alarm summary page, 6-12
 - Alarms, 6-11
 - Call a directory, 6-10
 - Call a new page, 6-9
 - Default control button labels, 6-8
 - Errors, 6-19
 - Loading status screen, 6-4
 - Operator input, 6-10 PLC page selection, 6-9 System overview, 6-6 System overview field, 2-11
 - View or acknowledge alarms, 6-13

S

- Scan delay
 - Alarm, 24-6
 - CSI, 24-7
 - Message, 24-7
 - Screen, 24-6
- Screen blanking inactivity period, 23-3
- Screen scan delay, 24-6

- Security keyswitch, 4-10
 - Connection, 5-51
- Serial port termination, 5-50
- Serial printer
 - Connecting, 5-49
- Setting date and time, 4-11
- Setup page, 6-16
- Siemens PLCs
 - Cabling, 40-5
 - Communications parameters, 40-5
 - Memory, 40-2
 - Possible configurations, 40-4
 - Word and bit references, 40-6
- Software menu hierarchy, E-2
- Specific error messages, 8-5
- Specifications, B-1
 - PanelMate Series 2000 (Model 2400), B-3
 - PanelMate Series 2000 (Model 2600), B-5
 - PanelMate Series 2000 Color (Model 2700), B-7
 - PanelMate Series 3000, B-9 PanelMate Series 4000 (Model 4200), B-13 PanelMate Series 4000 (Model 4500), B-11
- Square D PI-Cs
 - Cabling, 41-3
 - Communications parameters, 41-4
 - DIP Switches, 41-5 Memory, 41-2
 - Possible configurations, 41-2
 - Thumbwheel Switches, 41-5
 - Word and bit references, 41-8
- Startup page number, 23-2
- Stop bits, 24-3
- Symbol definition table
 - Ack (acknowledge required), 22-14
 - Alm (alarm), 22-14

- B (blink), 22-13
- BG (background), 22-13
- Conditional expression, 22-14
- Control indicator, 22-15 FG (foreground), 22-13 Symbol, 22-14 VS-template origin, 22-15
- Symbol editor, 22-7
 - Character cell worksheet, 22-9
- System configuration information
 - Display, 4-14
- System diagnostics, execute, 4-10
- System errors, 6-22
- System health, check, 4-6
- System Information
 - Read, 27-12, 27-22, 27-36, 27-53, 27-71
- System online labels, 25-2
 - Alarm text, 25-5
 - Change online labels, 25-2
 - Display system or configuration information, 25-5
 - Error messages, 25-4
 - Miscellaneous soft key 1, 25-3
 - Miscellaneous soft keys 2, 25-3
 - Miscellaneous text, 25-5 Setup page, 25-4 Startup online labels, 25-2 User entry soft keys, 25-4
- System overview, 6-6
- System parameters, 23-2
 - Control bit reset, 23-5
 - Exit, 23-7, 23-10
 - Fault relay de-energize on alarm, 23-4
 - First page of table, 23-10 Host display window, 23-4
 - Immediate page change, 23-4

- Inactivity periods, 23-3
- Page change register, 23-9
- Page password timeout, 23-6
- Page status line display, 23-5
- Password overwrite, 23-7
- Password protection, 23-7
- Passwords, 23-7
- Remote alarm acknowledge, 23-8
- Remote enable fault relay bit, 23-9
- Remote sending of passwords, 23-9
- Remote silence alarm horn bit, 23-8
- Reset clock, 23-10 Second page of table, 23-8 Startup page number, 23-2
- System status, 4-12

T

- Table templates, 20-2
 - Current value tag, 20-3
 - Dec. pt., 20-5 Device name, 20-3 Edit value tag, 20-3
 - Editing existing templates, 20-6 Exit the table template editor, 20-6 Gathering information for configuration, 20-7 Input value expression column, 20-6 Parameter column, 20-4
 - Parameter tag, 20-3
 - Password protection, 20-4 Table entry definition table, 20-4 Target word address column, 20-6
 - Template size, 20-3 Units tag, 20-4
 - Value expression column, 20-5
- Target word address, 16-8, 17-8, 21-10
- Task Codes, 35-8

- 132 - Host sends data/req. op. input, 35-10
- 133 - Host req. op. input from PM unit, 35-9
- 134 - Host [req. PM](#) to re-transmit last frame, 35-10 4
- Host sends data to PanelMate unit, 35-9 5 - Host req. current page from PM unit, 35-9 64 - PM unit sends acknowledgment to host, 35-11 65 - PM unit sends keypad input to host, 35-11 66 - PM unit sends value to host, 35-12 67 - PM unit sends control button to host, 35-12 68 - Host transmits data to printer, 35-13
- 69 - Host transmits message to display window, 35-13
- 70 - Erase section of host display window, 35-14
- Template definition table
 - Alm (Alarm), 15-5
 - B (blink), 15-4
 - BG (background), 15-4
 - Conditional expression, 15-4
 - FG (foreground), 15-4
 - Template label, 15-4
- Template mode, 2-7
- Tests
 - Battery, 4-11
 - Display, 4-11
 - Keypad, 4-11
- Texas Instruments PLCs
 - Cabling, 42-6
 - Communications parameters, 42-7
 - Data communication module TI 405 series, 42-10
 - Data communication unit TI 305 series, 42-12
 - Dual communication port module TI 500 series, 42-7
 - Memory, 42-2
 - Possible configurations, 42-5
 - Word and bit references, 42-20
- Time and date, set, 4-11
- Toshiba PLCs
 - Cabling, 43-4
 - Communication parameters, 43-5
 - Memory, 43-2
 - Possible configurations, 43-3
 - Word and bit references, 43-7
- TouchPanel, problems, 8-2
- Transfer (Data Highway network)
 - Return to main menu, 27-39
 - Download configuration to VCP unit, 27-28
 - Download driver to VCP unit, 27-33
 - Download network executive firmware to VCP, 27-31
 - Download option to VCP unit, 27-34 Place VCP unit in run mode, 27-38 Place VCP unit in transfer mode, 27-37 Preparing to transfer, 27-23 Read system information from VCP unit, 27-36 Upload configuration from VCP unit, 27-30
- Transfer (Data Highway Plus network)
 - Download configuration to VCP unit, 27-46
 - Download driver to VCP unit, 27-50
 - Download network executive firmware to VCP, 27-48
 - Download option to VCP unit, 27-52 Place VCP in run mode, 27-55 Place VCP unit in transfer mode, 27-54 Preparing to transfer, 27-40 Read system information from VCP unit, 27-53 Return to main menu, 27-56 Upload configuration from VCP unit, 27-47
- Transfer (Remote I/O network)
 - Download configuration to VCP unit, 27-63
 - Download driver to VCP unit, 27-68
 - Download network executive firmware to VCP, 27-66
 - Download option to VCP unit, 27-70 Place VCP unit in run mode, 27-73 Place VCP unit in transfer mode, 27-72

- Preparing to transfer, 27-57
- Read system information from VCP unit, 27-71
- Return to main menu, 27-74 Upload configuration from VCP unit, 27-65
- Transfer (serial)
 - Download configuration to VCP unit, 27-15
 - Download driver to VCP unit, 27-20
 - Download executive firmware to VCP unit, 27-17
 - Download network executive firmware to VCP, 27-18
 - Download option to VCP unit, 27-21 Preparing to transfer, 27-14 Read system information from VCP unit, 27-22 Return to main menu, 27-22 Upload configuration from VCP unit, 27-16
- Transfer editor, 27-1
 - Data Highway network transfers, 27-23
 - Data Highway Plus network transfers, 27-40
 - Download configuration to VCP unit, 27-4
 - Download driver to VCP unit, 27-9
 - Download executive firmware to VCP unit, 27-6, 27-8
 - Download option to VCP unit, 27-10 Overview, 27-2
 - Place VCP unit in Transfer Mode, 27-13
 - Read system information from VCP unit, 27-12
 - Remote I/O network transfers, 27-57 Return to main menu, 27-13, 27-39 Serial transfers, 27-14
 - Transfer information menu, 27-3
 - Upload configuration from VCP unit, 27-5
- Transferring memory, problems, 8-4
- Trend templates, 21-2
 - Alarm acknowledgment, 21-8 Control button definition table, 21-11 Control type, 21-8
 - Dead band range, 21-8
 - Device name, 21-4
 - Editing existing templates, 21-13 Exit the table template editor, 21-13 Gathering information for configuration, 21-13 High alarm expression, 21-7 Interval expression, 21-6 Low alarm expression, 21-7 Maximum calibration, 21-4 Minimum calibration, 21-4 Numeric control definition, 21-9
 - Parameter tag, 21-4
 - Template size, 21-3
 - Trigger type, 21-4
 - Value 1 expression, 21-5
 - Value 2 expression, 21-5
- Troubleshooting guide, 8-1
 - Audio output problems, 8-3
 - Communication problems with Generic Protocol, 8-5
 - Control button problems, 8-2 Fault relay problems, 8-3
 - Monitor problems, 8-2 Printer problems, 8-4 Real-time clock problems, 8-4 Specific error messages, 8-5 TouchPanel problems, 8-2 Transferring memory problems, 8-4
- Troubleshooting the configuration software, 29-1 Disk access error messages, 29-4 File name error messages, 29-6 Help page error messages, 29-4 Miscellaneous error messages, 29-2 Program/file load error messages, 29-3 Startup error messages, 29-2
- Typographical conventions, 1-3

U

Unpacking, 4-2

User configuration

 Creating, 10-2

 Develop configuration menu, 12-2

 Overview, 10-2

 Transferring files, 10-4

V

Value 1 expression, 17-4

Value 2 expression, 17-5 Variable-
sized template mode, 2-8 Verify a
configuration, 11-3

W

Westinghouse PLCs

 Cabling, 44-3

 Communications parameters, 44-4

 Memory, 44-2

 Possible configurations, 44-3

 Word and bit references, 44-5

 Window mode, 14-12

Word and bit references, 10-4

Worksheets, G-1

Eaton IDT Reader Comment Card



Eaton IDT strives to provide quality product manuals and training manuals. Please take a moment and tell us what you think about this manual.

How do you use this document?

Introduction to the product ☒ Installation Instructions

Classroom resource ☐ Reference

Self-study/Tutorial ☐ Other

Please rate this document.

		Excellent	Very Good	Good	Fair	Poor
Technical Accuracy	Does the system work the way it is described in the manual?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Readability	Is the manual easy to read and understand?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clarity	Are the instructions easy to follow?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Examples	Are the examples helpful and realistic?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Are there enough examples?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization	Is the organization of the manual logical?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Is it easy to find what you are looking for?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Illustrations	Are the illustrations clear and useful?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Attractiveness	What did you think of the layout, printing, binding, etc.?	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Yes	No
Are there any terms or concepts that are not defined clearly? If so, what are they?	<input type="radio"/>	<input type="radio"/>

	Yes	No
After reading this document, are you able to use the equipment? If not, why?	<input type="radio"/>	<input type="radio"/>

What errors did you find in this manual? (Please include page numbers. Attach an extra sheet if necessary.)

Do you have any comments or suggestions? _____

Name _____

Manual Part Number: **01-000183-00**

Manual Title:

PanelMate Series Product Manual

Note that you may fax the Reader Comment Card to Eaton IDT at (614) 895-7111.

Thank You

BUSINESS® REPLY MAIL

..-PERMIT NO.228

, . WESTERVILLE, OHIO

POSTAGE WILL BE-PAID BY ADDRESSEE

Eaton IDT
Technical Publications Department
P.O. Box 6166 : , , Westerville, OH
43081-6166

```
I list] IIIIJ 111111611111111111111111111111111111 111
```