
PanelMate® Reliance Communication Driver Manual

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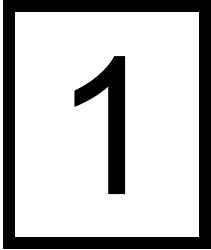
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This center, located in Zurich, Switzerland, provides high-level quality support and product repair services for your PanelMate products. You will receive real-time technical and application support.

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Introduction



In this chapter, you will learn:

- *About driver installation*
- *How to download drivers to a PanelMate unit*
- *The supported memory types*

Introduction

The Operator Station can be used with any of the programmable controllers in the current Reliance AutoMate family using the Reliance driver. The Operator Station does not support the earlier AutoMate 35 PLC.

Note: Check the Cutler-Hammer web site for current information on PanelMate PC connectivity to the Reliance driver.

The driver takes responsibility for communications to the PLC, 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 Operator Station.

The Operator Station supports three types of connection 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 Operator Station'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 upon 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 a PanelMate system using a three-slot power supply, slot 1 is not available.

The Operator Station's network ID should always be set to zero.

When using the CRT or Mini Programmer to configure the PLC, ensure the following:

Selection:	1
Node #:	Set to the PLC ID#.
Max Node:	Should always be greater than Node #1.
Configuration:	0

Installing Drivers

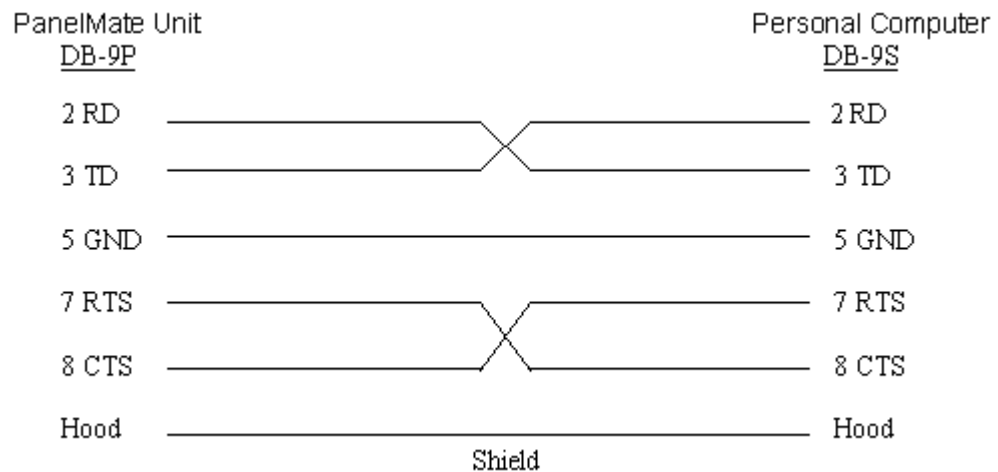
PanelMate Configuration Editor software is installed using a CD-ROM. To install the drivers from the CD-ROM, select the **Install Software** option and then **Install Drivers**. From the dialog box, select the driver you wish to install.

Downloading Drivers to a PanelMate Unit

- In the VCP Transfer Utility, choose the “Executive” tab and select the proper Executive Firmware to download to the PanelMate unit.
- Click the button labeled “Add to Operation List.”
Note: In order to download to a PanelMate for the first time or to clear the existence of another driver, the PanelMate must first be loaded with Executive Firmware.
- Choose the “Driver” tab.
- Select the appropriate driver to be downloaded to the PanelMate.
- Click the button labeled “Add to Operation List.”
- Place the PanelMate unit in Serial Transfer Mode.
- Connect a serial transfer cable from the correct port on the PC to port 1 on the PanelMate. (See cabling below.)
- Click “Start” at the bottom of the VCP Transfer Utility window.
- **Note:** For a more detailed description of downloading procedures and troubleshooting see *PanelMate Power Series, PowerPro, Pro LT Transfer Utility User’s Guide*.

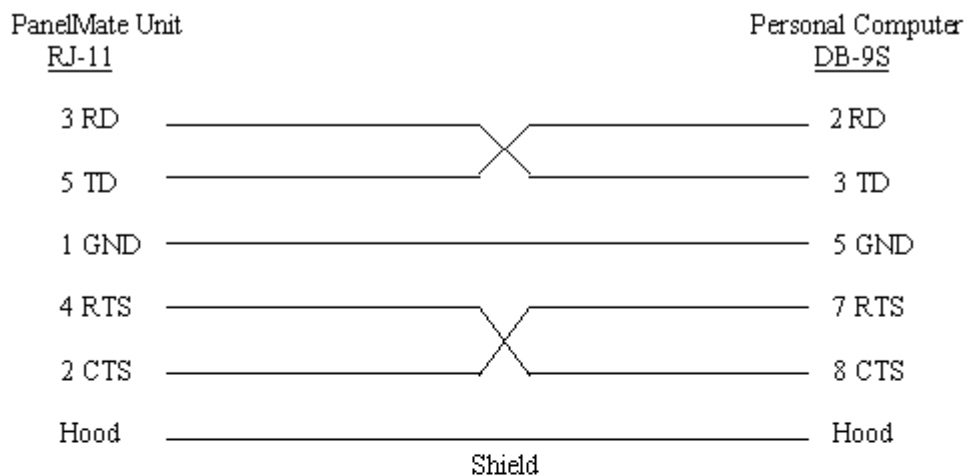
Serial Transfer Cables

Cable P/N 0518

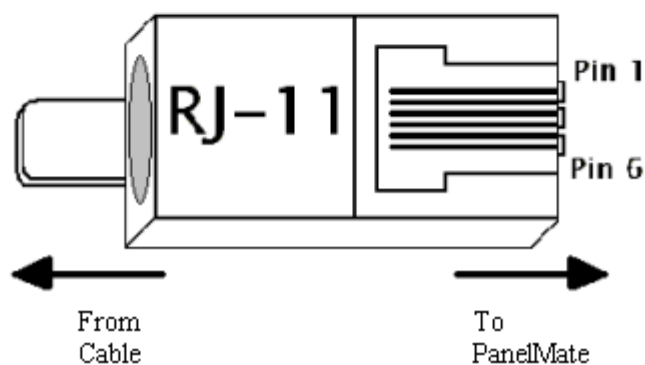


Cable P/N 0818

(PanelMate Power Series 1500 and PanelMate 500 only)



RJ-11 pin configuration



Memory Ranges

The following 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
30/30E	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

Read-only Registers and Memory Ranges

The following PLC registers are read-only.

Model	Read-only Registers	
15E	76-77	2700-2777
20	76-77	---
20E	76-77	2700-2777
30/30E	76-77	3700-3777
40/40E/40X	1776-1777	17500-17777

Note: For Reliance Models 40 and 40X, if references 1760-1777 are used in your configuration, you should not use references 2000-2015. A PLC block read cannot span the boundary from 1777-2000.

Possible Configurations



In this chapter, you will learn:

- *How to connect an operator station to Reliance PLCs*

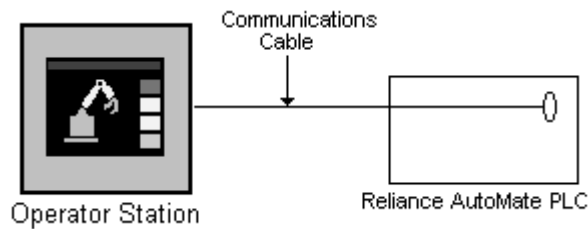
Direct Connection

The RS232 port on the PLC can 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 are direct, the slot designation is always zero.

Example:

Processor ID# = 5

PanelMate PLC ID# = 5.0



An Operator Station 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 Operator Station may be deactivated by either disconnecting the cable from the programming port or by putting the Operator Station in offline mode.

Serial Communication Card

Serial Card Connection

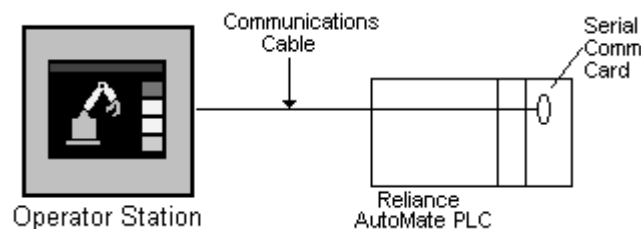
A serial communication card can be placed in a rack with one or more Reliance PLC processors. The default PLC ID# for the serial communication card on the Operator Station will be in the form of "node.slot", where the node number is the slot where the serial communication card resides, and the slot number 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.

Example:

Serial communications card in slot 2; processor in slot 1.

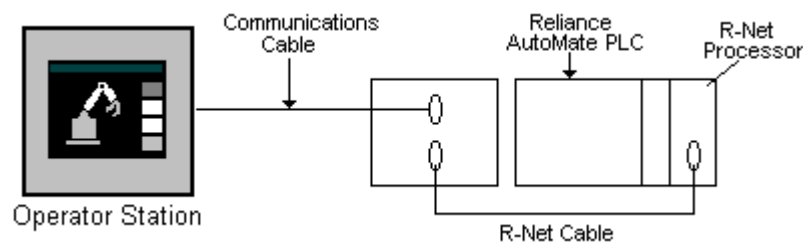
PanelMate PLC ID# = 2.1



R-Net is the network used by Reliance for its PLCs. To access the network, the Operator Station 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 Operator Station will have access to every node in the network to which the R-Net processor is connected.

R-Net Connection

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.



Cabling

3

In this chapter, you will learn:

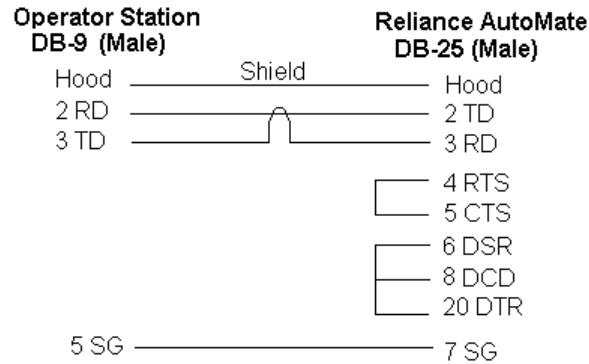
- *The cabling requirements for Reliance PLCs*


Cable Configurations

The communication between the Operator Station and Reliance AutoMate PLCs is RS232C, and has a recommended maximum cable length of 50 cable feet. You should construct an Operator Station communication cable of the desired length for each connection.

RS232C Cabling for Reliance PLCs

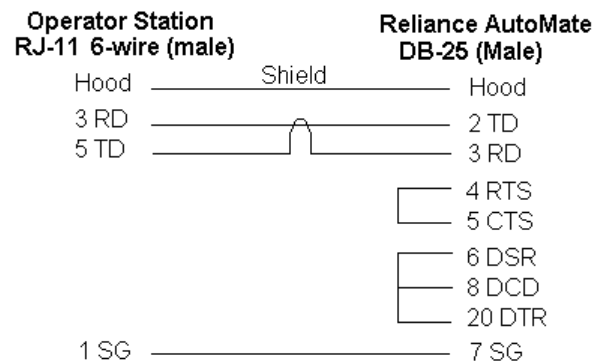
Operator Stations with female 9-pin (DB-9S) ports must have cables configured with male connectors (DB-9P).



 Denotes a twisted pair

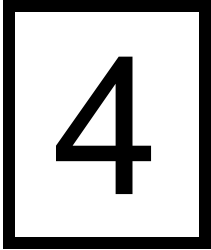
Note: For PanelMate PC applications, a female 9-pin connector is required for connecting to a male 9-pin port. To quickly convert a Cutler-Hammer cable for PC use, simply attach the 9-pin Gender Changer found in the PanelMate PC Runtime Kit.

The Operator Stations that have RJ-11 6-wire modular jacks must have cables configured with male modular connectors.



 Denotes a twisted pair

Communication Parameters



In this chapter, you will learn:

- *The different switch settings*

Standard Communications Parameters

The standard communications parameters for communicating with Reliance AutoMate PLCs are:

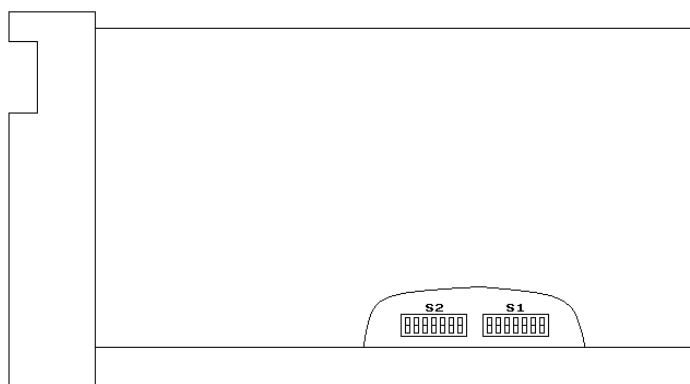
- 8 Data bits
- 1 Stop bit
- No Parity
- 9600 Baud

Serial Communication 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 Switch Locations

The port parameters may be set on the Gateway using the switches located inside the module. The following figure shows the DIP 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.

Gateway Switch Settings

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

Baud Rate Selection

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

Port Configuration

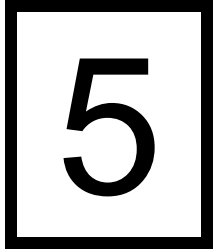
Switch Position	Function	On	Off
S2-4	Receive clk	External	Internal*
S2-5	I/O Port	RS422	RS232*
S2-6	19200	1937Hz**	18750Hz***
S2-7	Not used	-	-
S2-8	Not used	-	-

* Default value

** +2.8%

*** -2.3%

Word and Bit References



In this chapter, you will learn:

- *How to configure word and bit references*

Word Referencing Method

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 if you are using the default PLC and do not wish to change the data format, respectively.

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 the "Word and Bit References" topic in the Configuration Software Online Help for a more detailed explanation of word and bit references, including format descriptions.

The 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]

rr	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 Memory Ranges table on page 4 of Chapter 1, 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 Operator Station generates another read when more than 15 unused PLC words are encountered.

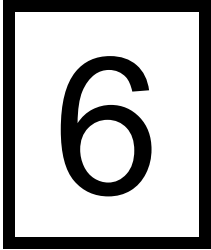
Examples

The following are examples of valid PLC references that may be assigned in the PanelMate expression fields.

Word References	
Reference	Description
[12]	Word 12 of Reliance Model 15
[2533]	Word 2533 of Reliance Model 20
[21333]	Word 21333 of Reliance Model 30/30E
[163]	Word 163 of Reliance Model 40
[2051]	Word 2051 of Reliance Model 40E

Bit References	
Reference	Description
[2.3]	Word 2 bit 3 of Reliance Model 15
[42.5]	Word 42 bit 5 of Reliance Model 20
[14.6]	Word 14 bit 6 of Reliance Model 30/30E
[4000.16]	Word 4000 bit 16 of Reliance Model 40
[284.7]	Word 284 bit 7 of Reliance Model 40E

Maintenance Access



In this chapter, you will learn:

- *How to use the Maintenance Template*

Maintenance Access

The Maintenance Template will access all memory locations supported by the driver as defined in the Memory Addressing topic. When running on-line, you can change the reference. The Maintenance Template is designed to assist you in specifying the reference by scrolling through a list of mnemonics that are used to enter the word reference

You must enter the correct mnemonics and numeric values and create a legal reference to change a reference.

Note: When a new reference is entered on an Operator Station, the Maintenance Template will remain in a paused state until the **Start Monitor** control button or the **Chng** soft function key is pressed. When the **Start Monitor** control button or the **Chng** soft function key is pressed, the Operator Station will parse the reference. (Parsing means checking the syntax and range of the reference to ensure that it is supported by the driver.)

Note: Maintenance Templates cannot be used to monitor unsolicited references.

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