UTICOR

P3000 PowerMarquee
Master Display
Hardware User Manual

(Manual Part Number MAN-P3000-003)

WARNING!

Programmable control devices such as UTICOR's P3000 PowerMarquee Master, must not be used as stand-alone protection in any application. Unless proper safeguards are used, unwanted start-ups could result in equipment damage or personal injury. The operator must be made aware of this hazard and appropriate precautions must be taken.

In addition, consideration must be given to the use of an emergency stop function that is independent of the programmable controller.

The diagrams and examples in this user manual are included for illustrative purposes only. The manufacturer cannot assume responsibility or liability for actual use based on the diagrams and examples.

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Manual P/N MAN-P3000-003

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UTICOR

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1

Introduction

In this chapter....

Manual Organization

The P3000 PowerMarquee Master Hardware User Manual is arranged in chapters. A description of key information contained in each chapter is provided below.

Chapter	Description
1	**Introduction** This chapter introduces you to the manual organization and overview. Information is provided on how to find help with installation of the hardware and programming. Also provided is an introduction to the P3000 PowerMarquee Master, its physical characteristics, and messages. Specifications for the various models of the PowerMarquee Master are provided on page 7 of this chapter.
2	**Unit Hardware** This chapter provides information on the P3000 PowerMarquee Master Hardware. Included are sections on DIP Switches, Changing Input Power from 115VAC to 230VAC, and Changing the Fuse. Control board features and settings are discussed, as well as accessing the board.
3	**PowerPanel Control Unit** In this chapter you will find information on the PowerPanel Control Unit that is inside the PowerMarquee Master. Provided is information on the PLC Port — the PLC connector pinout and a list of PLC cable part numbers. Also shown are COM1 Port connections to a programming computer or RS-232C/RS-422A connections.
4	**Outline Dimensions** The chapter includes outline dimension drawing for the two P3000 PowerMarquee model sizes.
A	**Appendix A** This chapter includes PLC to PowerPanel Control Unit Connector wiring diagrams for compatible PLCs and information about the option boards that are factory installed and allow connectivity to certain PLCs or networks.

Manual Overview
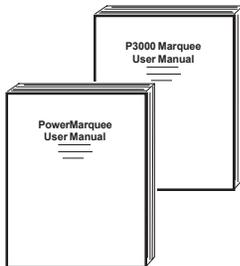
This manual, the P3000 PowerMarquee Master Hardware User Manual, P/N MAN-P3000-003, and the PowerMarquee Programming Software User Manual, P/N MAN-P3000-002 will take you through the steps necessary to get your PowerMarquee up and running in the shortest possible time. Although your familiarity with programmable message display devices will determine how quickly you move through the steps — we've provided you with easy, step-by-step instructions.

Need HELP?

PowerMarquee Programming Software Onscreen HELP

If you are using PowerMarquee Programming Software, context sensitive onscreen help is available. To access the Help windows, simply press the F1 function key while on the topic where you need help. For example, if you need help while working with screens, press the F1 function key while in that area and a popup window will be displayed. You may also click on the Help button located at the bottom of most dialog boxes to go to the help topic.

PowerMarquee Programming Software Fly-Over HELP

When the mouse cursor comes to rest over any tool bar item for a short while, a small window will appear containing a brief description of the function of that particular button. The window will disappear as soon as the cursor has been moved off the button.

Technical Support

Although most questions can be answered with this manual or the PowerMarquee Programming Software HELP topics,   you may find answers to your questions on our web site @ www.uticor.net.   If you still need assistance, please call our technical support at **1-800-832-3647 or FAX us at 1-563-359-9094.**

Introduction

1.0   The P3000 PowerMarquee Master

The PowerMarquee is a cost-efficient, alphanumeric display. It is the newest of UTICOR's line of Programmable Message Displays (PMD) The PowerMarquee is a large-character LED display that is available in two sizes.

The PowerMarquee is a large LED display available in 2 widths and 1 height for a total of 2 different sizes. The PowerMarquee is a red LED (also available in High-Bright Red LED display — see page 7) display that displays messages in 2", 4", 6", and 8" characters. The PowerMarquee uses suspended mounting: the unit is suspended using a hole in the top of each end plate.

1.1 Physical Characteristics

The PowerMarquee is housed in an anodized aluminum case. Two capped holes are provided for routing wires through the back access plate. The fuse, connectors, and switches can be accessed by removing the back access plate.

The front panel of the PowerMarquee contains a lens that covers the LED field and protects the inside of the unit. The LED field is offered in 2 sizes. The display area is 9.6" high. Field width sizes are 36" or 72" wide.

Chapter 2 provides hardware information for the marquee displays. Wiring requirements, switch settings, fuse locations, etc. are found in Chapter 2. Outline dimensions are located in Chapter 4.

1.2 Messages

How messages look depend on the way they were programmed. Messages programmed into the PowerMarquee master have message options that determine message outputs and visual appearance. One of the master message output options is sending messages to slaves. When the message contains this option, the message can be displayed on one, some, or all slaves.

The behavior of the message is determined by selected message options and/or embedded codes. Messages can be stationary, flashing, or scrolling. Scrolled messages scroll up or left. Other options determine if message text is centered on lines, if previous text remains on the display or is removed, etc. Embedded codes place time, date, and variable data locations in the message. These locations display the continuously-updated information it receives from the controller or computer.

The PowerMarquee displays also feature international character sets. This option is switch-selectable to allow message display in characters applicable to the languages of America (U.S.), Cyrillic, Germany, England, Denmark, Sweden, France, Kana (Japan)

The PowerMarquee has a large, LED field on which to display messages. The size of this field varies (see part numbers) and provides a variety of ways to display messages. 2", 4", 6", 8", and 8" compressed characters can be displayed simultaneously, even within the same message. Because of this, programmed embedded codes are used to change character size. Another code, a frame definition code, can be used to determine which lines of the display are used by a particular message.

Left-scroll messages feature "smooth scrolling", that is, letters move one LED at a time. Each portion of a letter will illuminate every dot in that row when it scrolls across the display. Upward-scrolling messages actually do not scroll at all. Rather, they "wipe on" to the display in an upward fashion. The first section of message lines appear, then the display pauses, clears, and displays the next section of text.

1.3 Conclusion

Application of the PowerMarquee display is as diverse as individual business needs. Think of it, if you will, as a mailbox into which messages addressed to that location are delivered (and subsequently displayed).

Now consider several mailboxes in various locations within your company. Delivery of these messages take a matter of milliseconds. And remember that these messages were written *by* employees of your company *for* employees of your company to keep everyone informed.

1.4 Specifications

POWER REQUIREMENTS:
115/230 VAC (102-132)(194-250) 47-63 Hz
(Jumper Selected — see 2.6)
1W4H: 130 VA
2W4H: 250 VA

OPERATING TEMPERATURE:
 0 to 60 ºC (0 to 140 ºF) Ambient

STORAGE TEMPERATURE:
–40 to +95 ºC (–40 to +203 ºF) Ambient

HUMIDITY:
0-95% RH Noncondensing

**ELECTRICAL
INTERFERENCE TOLERANCE:**
NEMA ICS 2-230 Showering Arc Test , ANSI C37.90a-1974
(SWC) Surge Withstand Capability Test

FUSE TYPE:

1W4H:	**115 VAC:** 1.5 Amp @ 250 V
	230 VAC: 1.0 Amp @ 250 V
2W4H:	**115 VAC:** 3.0 Amp @ 250 V
	230 VAC: 2.0 Amp @ 250 V

2AG Subminiature Slo-Blo, 5 mm x 15 mm (.177" x .580")

OVERALL DISPLAY:
2", 4", 6", 8", or 8" compressed Red LED Characters
5 x 7 Dot Matrix — 50.8 mm (2") High Characters
10 x 14 Dot Matrix — 101.6 (4") High Characters
15 x 21 Dot Matrix — 152.4 (6") High Characters
20 x 28 Dot Matrix — 203.2 (8") High Characters
10 x 28 Dot Matrix — 203.2 (8") High Characters

CHARACTER SET:
All Standard ASCII Upper/Lower Case and Symbols

**INTERNATIONAL
CHARACTER SETS:**
American (U.S.), Cyrillic, Germany, England, Denmark, Sweden,
France, Kana (Japan)

SPACE REQUIREMENTS:
Dependent upon unit size (see Appendix A)

HOUSING:
Extruded and Flat Plate Aluminum

WEIGHT:
1W4H: 37 lbs.
2W4H: 73 lbs.

CONNECTORS:
Power Input: 3 Wire-Clamp Screws for 12-18 AWG
Serial/Repeater Port: 11 Wire-Clamp Screws for 18-22 AWG
PowerPanel Connector: D-SUBS
Option Board Connector: (Depends upon type of Option Board)

Continued on next page —

PART NUMBER:

UPM- <u>X</u> W X <u>X</u> H - <u>X</u> X <u>0</u> X X
     1   **2**   **3** **4** **5** **6** **7**

1 (Width):   1 = 1 Wide
                        2 = 2 Wide

2 (Height):   4 = 4 High

3 (Future):   0 = None

4 (Color):   0 = Red
                        1 = High Bright Red

5 (Master):   0 = Master

6 (Memory):   2= 512K
                        3=1Meg

7 (Interfaces):   0= Serial Interfaces (Drivers)
                        1= Allen-Bradley
                        2 =Modbus Plus
                        5=Devcenet
                        6=Controlnet
                        7=Ethenet 10Mhz
                        8=Profibus
                        9=Ethernet IP 100Mhz

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2

Unit Hardware

In this chapter....

2. 0   INTRODUCTION TO P3000 POWERMARQUEE HARDWARE

All wiring terminations and adjustments are located inside the PowerMarquee. Figure 2-1 shows the PowerMarquee with the access plate removed. General components referenced in following chapter are labeled. Please note that PowerMarquee display comes in 2 sizes. Figure 2-1 shows the smaller unit. The access area is the same on all units.
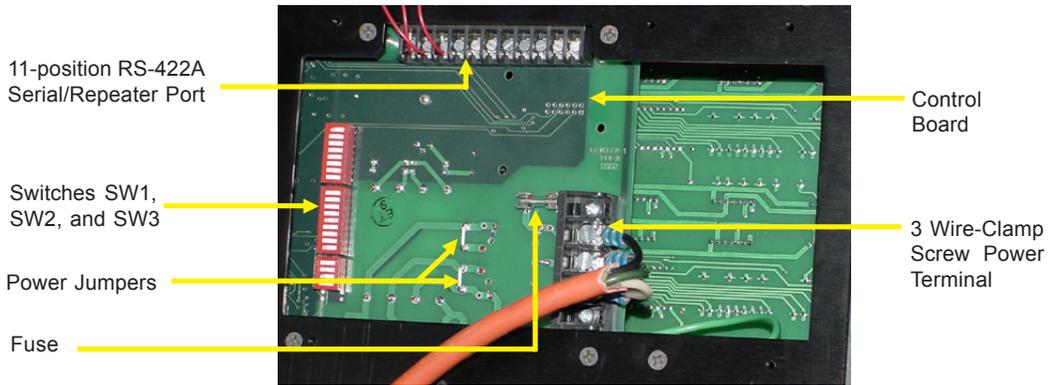

11-position RS-422A Serial/Repeater Port

Control Board

Switches SW1, SW2, and SW3

Power Jumpers

Fuse

3 Wire-Clamp Screw Power Terminal

Figure 2-1. Back View of the PowerMarquee Display with Access Plate Removed

2.1 INTERFACING

Terminal blocks are located inside the PowerMarquee. There are two 7/8"holes drilled in the access plate to accommodate routing the communication and power cables in and out of the cabinet (for 1/2" conduit fittings).

It is recommended that the power cables are not routed with the communication cables to reduce the chance of the power cables inducing noise into the communication signal lines. Additional holes can be drilled in the access plate if needed.

2.1.1 Power Input Terminals

Three terminals are provided for connecting operating power to the unit. These terminals are located on the Control Board (see figure 2-1, above). Power Input terminals are labeled L1, L2, and chassis ground (///). Always connect the ground terminal to the safety ground. Also located on the Control Board (and shown on figure 2-1) are the Power Jumpers and the Fuse.

The marquees are shipped from the factory set for 115 VAC operation. Refer to paragraph 2.4 to reconfigure the unit for 230 VAC operation.

2.1.2 RS-422A SERIAL/REPEATER PORT

The RS-422A Serial/Repeater Port is an 11-position terminal block through which all the outgoing communications to the other slave units take place. This port is located on the Control Board. The Control Board and its components are shown in figure 2-2.
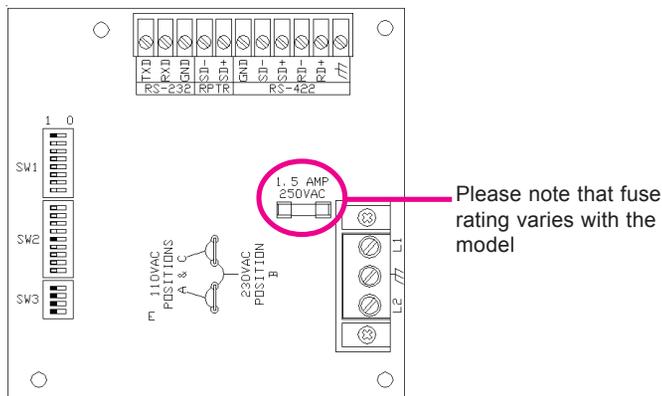

Please note that fuse rating varies with the model

Figure 2-2. Control Board Components

The PowerMarquee also has alternative RS-232C transmission capabilities (see paragraph 2.1.3). Typical wiring options for the Serial/Repeater Port are found in figure 2-3 on the next page.

The following text refers to figure 2.3 on the next page. The two configurations at the top can be used to interface to slave units when only unidirectional communication is to take place.

An RS-422 "link" consists of a two-wire transmitting line, a two-wire receiving line (optional), signal common and the shield that is usually terminated to safety ground. Each two-wire line should physically be implemented with the two wires of one of the twisted pairs in the cable. (The cable specified for RS-422 connections consists of three twisted pairs.) Each twisted pair is individually shielded, and each shield is brought out to a drain wire. <u>DO NOT USE WIRES FROM DIFFERENT TWISTED PAIRS TO MAKE UP A TWO-WIRE SIGNAL LINE</u>.
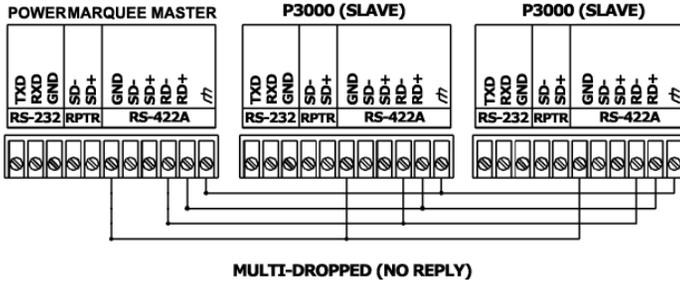
Note: Reference
designation levels of the
terminals when using
figure 2-3 for wiring
purposes.

All RS-422 connections
should be made with
cable of similar or
superior specifications
and characteristics to
those specified for *
Belden cable number
9730.

* Belden is a registered
trademark of Belden
Electrical Wire Prod-
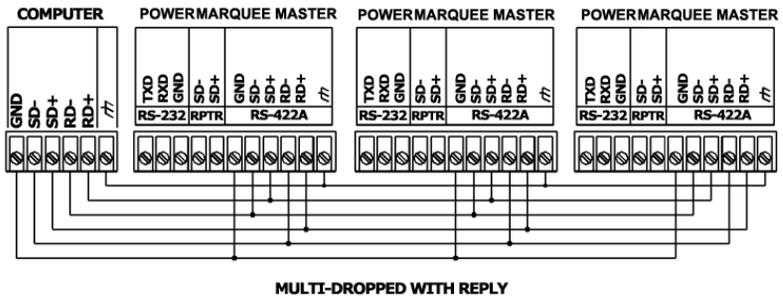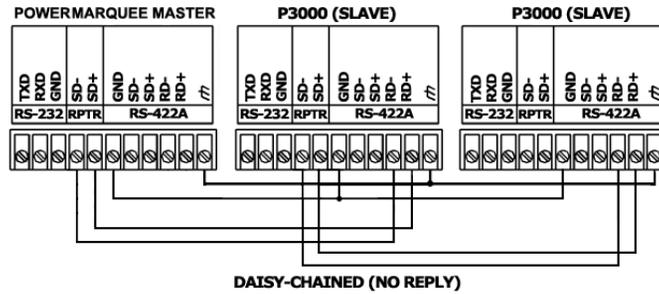ucts, a division of
Cooper Industries.

Figure 2.3 RS-422A Serial/Repeater Port Interfacing

Unit Hardware

2.2 DIP SWITCHES
The DIP Switches on the PowerMarquee Control board are set at the factory and MUST REMAIN IN THE POSITIONS SHOWN in the figure shown to the right with the exception of changing character sets described in paragraph 2.3, below.
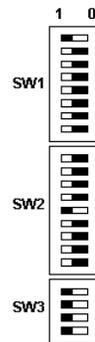
Figure 2.4 DIP Switch Settings

2.2.1 Switch Two — Changing Character Sets
 The switch selectable extended character sets are selected on positions 2 through 4 of Switch 2. Figure 2-5 shows the location of Switch 2 positions that control character set selection and defines the numerical value or setting for each position of these switches.
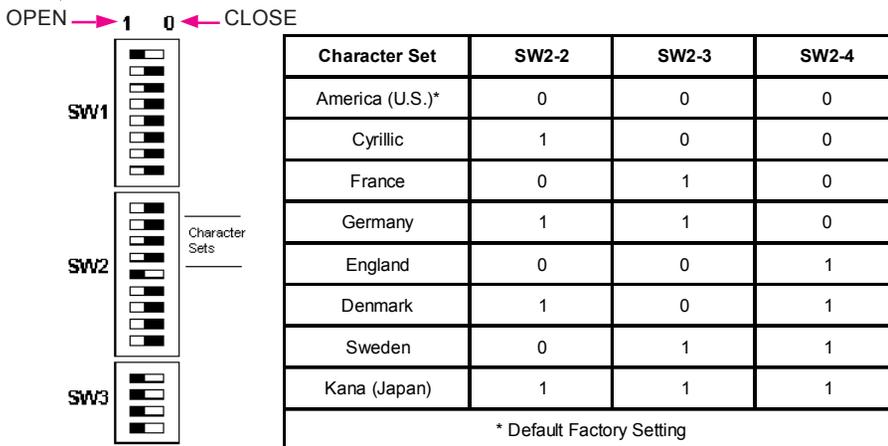
Character Set	SW2-2	SW2-3	SW2-4
America (U.S.)*	0	0	0
Cyrillic	1	0	0
France	0	1	0
Germany	1	1	0
England	0	0	1
Denmark	1	0	1
Sweden	0	1	1
Kana (Japan)	1	1	1
* Default Factory Setting			

Figure 2.5 Switch Two Settings to Define Character Sets

2.3 CHANGING FROM 115 VAC TO 230 VAC INPUT POWER • CHANGING THE FUSE

AC powered units can be changed from 115 VAC operation to 230 VAC operation. This change involves moving internal jumpers and changing the fuse. All AC units are shipped from the factory set for 115 VAC operation.

> *WARNING!!* **DISCONNECT AC POWER FROM THE UNIT BEFORE CHANGING THE FUSE or MOVING JUMPERS!!**

To operate the PowerMarquee at 115 VAC (as shipped from the factory):
> **1W4H** units — the jumpers must be in positions A and C with 1.5 Amp 250V Slo-Blo fuse*.
> **2W4H** units — the jumpers must be in positions A and C with 3.0 Amp 250V Slo-Blo fuse*.

To operate the PowerMarquee at 230 VAC:
> **1W4H** units — remove the jumpers from positions A and C and put one of these jumpers in position B. Replace the fuse with a 1.0 Amp 250V Slo-Blo fuse*.
> **2W4H** units — remove the jumpers from positions A and C and put one of these jumpers in position B. Replace the fuse with a 2.0 Amp 250V Slo-Blo fuse*.
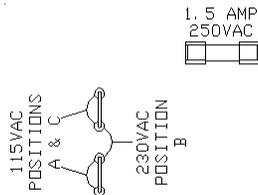
* 2AG Subminiature Slo-Blo, 5 mm x 15 mm (.177" x .580")

Figure 2-6 PowerMarquee Jumper Settings for 115/230 VAC Operation and Fuse Location

2.4 CONCLUSION

Chapter 2 covered the PowerMarquee hardware. Unit power is connected to three input power terminals. PowerMarquees also contain jumpers for changing the input power requirements. Fuse location is also shown in this section. Chapter 3 explains the PowerPanel Control Unit

3

# PowerPanel Control Unit

In this chapter....

3.0   POWERPANEL CONTROL UNIT

3.1 INTRODUCTION

The PowerPanel Control unit provides the P3000 PowerMarquee Master with some of the power and functionality of UTICOR's PowerPanel. The P3000 PowerMarquee is unique among other UTICOR marquees or displays in that it allows you to program the PowerPanel Control unit much like a PowerPanel and it is basically two units in one housing -- a message display and a PowerPanel Control unit. Once programmed using PowerMarquee Programming Software, you can send to and receive data from other marquees or various devices through a programmable logic controller (PLC). You will send messages to the PowerMarquee Master's display just as you would a slave unit. For more information, see PowerMarquee Programming Software Manual (P/N MAN-P3000-002) or the online help topics.

3.2 PLC PORT

The table, below , provides the pinout for the PLC connector. For wiring diagrams specific to your type PLC, see Appendix A
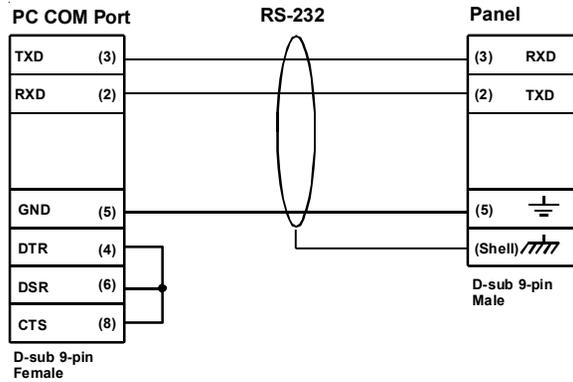.
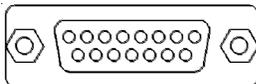
**PLC Connector
Pinout**

Pin Number	Connection
1	Chassis GND
2	PLC TXD (RS-232C)
3	PLC RXD (RS-232C)
4	+5V (100 Ohms)
5	Logic GND
6	LE
7	PLC CTS (RS-232C)
8	PLC RTS (RS-232C)
9	RD+ (RS-422A)
10	RD– (RS-422A)
11	SD+ (RS-422A)
12	SD– (RS-422A)
13	Termination Resistor (connect to pin 9)
14	NC
15	NC

PMD Master Control

3.3 COM1 PORT

The COM1 Port is used to connect a programming computer, printer, or slave device to the PowerPanel Control Unit. *The panel only needs to be connected to a PC when you are programming the unit.* The wiring diagram for the PowerPanel Programming Cable is shown below.

RS-232 PowerPanel Programming Cable (P/N CBL-UTICW-009)

PC COM Port	RS-232	Panel
TXD (3)		(3) RXD
RXD (2)		(2) TXD
GND (5)		(5)
DTR (4)		(Shell)
DSR (6)		D-sub 9-pin Male
CTS (8)		

D-sub 9-pin Female

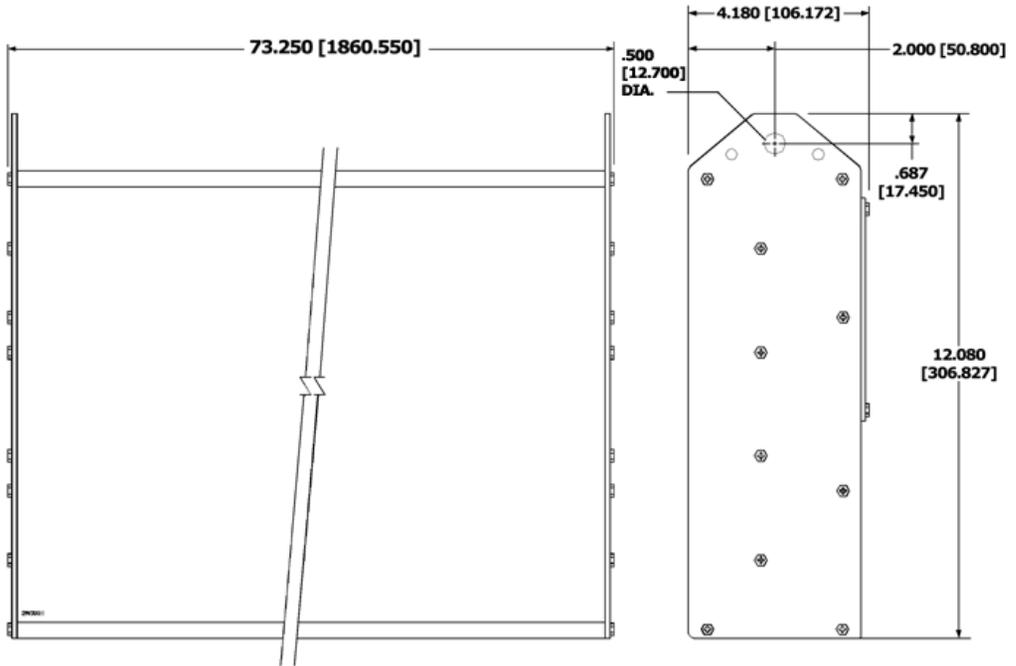| COM1 Connector		
Pin #	RS-232C Connection	RS-422A Connection
1	—	TXD– (RS-422/485)
2	TXD (RS-232C)	—
3	RXD (RS-232C)	—
4	—	RXD– (RS-422/485)
5	Logic GND	Logic GND
6	—	TXD+ (RS-422/485)
7	—	—
8	—	—
9	—	RXD+ (RS-422/485)

4

Outline Dimensions

In this chapter....

4.0 OUTLINE DIMENSIONS

The following figures provide information necessary for mounting the P3000 PowerMarquee Master Displays.

1W x 4H

UTICOR
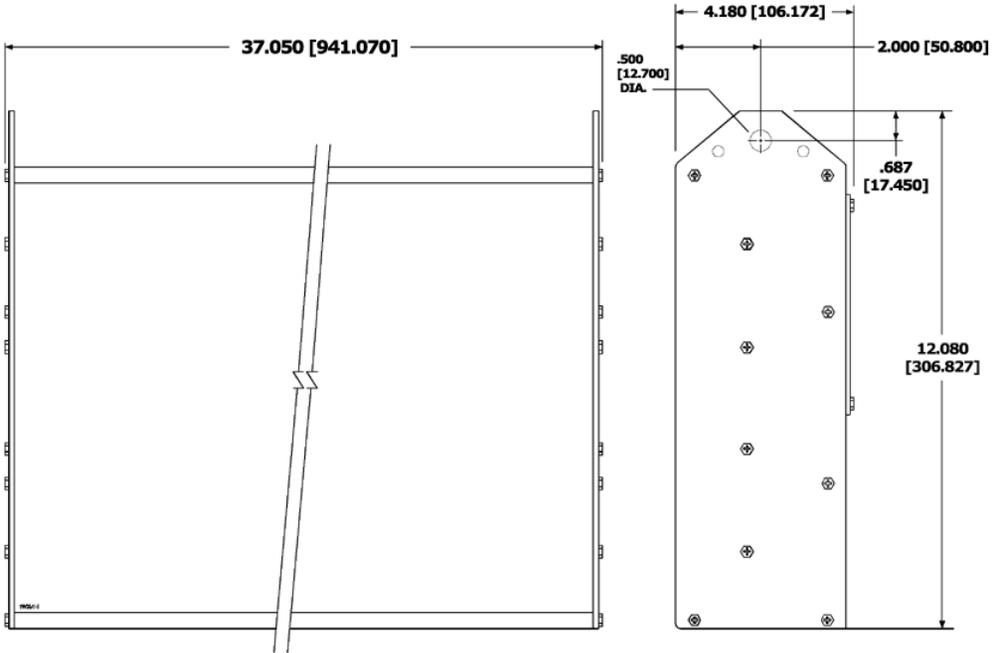
2W x 4H

The table below shows the P3000 PowerMarquee Master dimensions and configurations. All Power Marquee Master displays have a 4.18" unit depth. Unit weights are found in the general specifications section.

Note: The 8-inch narrow characters are denoted by "8N." These characters are half the width of the other 8-inch characters.

P3000 PowerMarquee Master unit Part Numbers, Dimensions, and Configurations.

Part Number	Unit Width	Unit Height	Display Area		Character Height (")	Characters Per Line	Number of Lines
			Width	Height			
1W4H	37.05"	12.08"	36"	9.6"	2/4/6/8/8N	20/10/6/5/10	4/2/1/1/1
2W4H	73.25"	12.08"	72"	9.6"	2/4/6/8/8N	40/20/13/10/20	4/2/1/1/1

Appendix A

A

In this chapter....
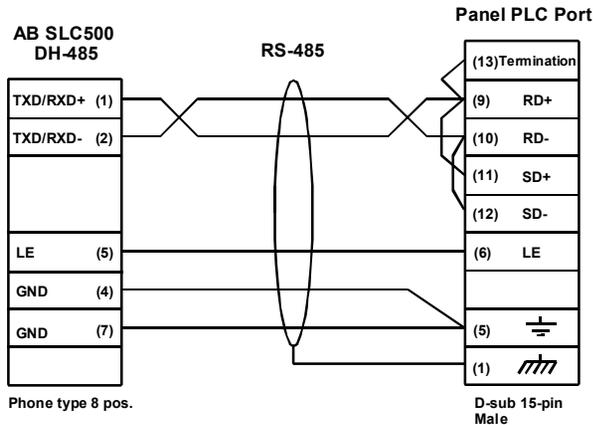
PLC Cable Wiring Diagrams

The following diagrams depict the wiring pinouts for the PowerPanel Control Unit (located inside the PowerMarquee) to PLC Cables. Use these diagrams to make a cable applicable to your type PLC and application. Cable holes are provided in the Rear Access Panel, or you may need to drill your own.

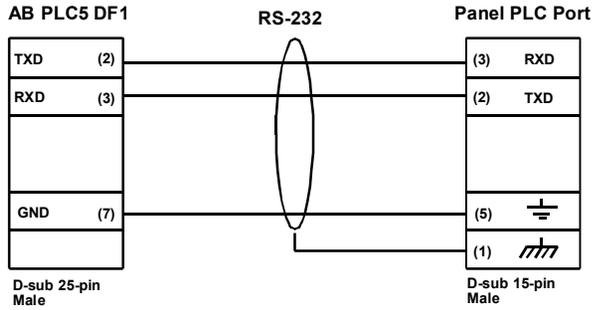PowerPanel Control Unit Female PLC Port (located on bottom of unit)
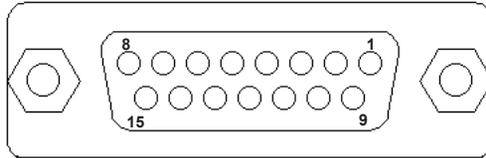
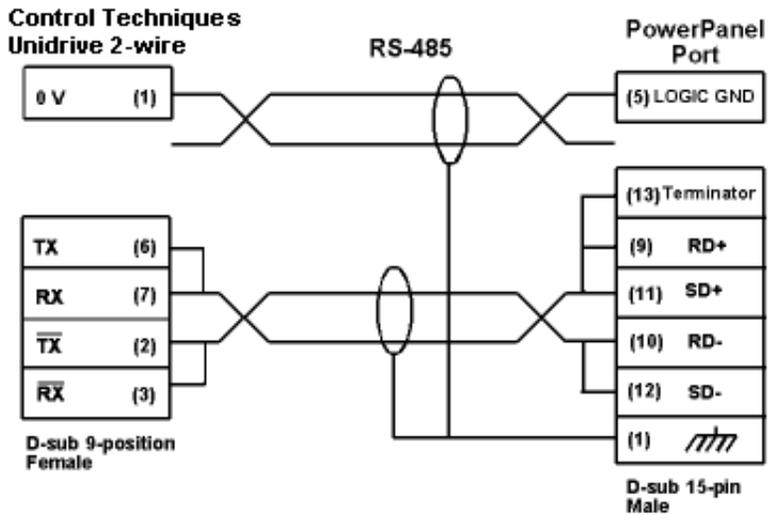## Allen-Bradley SLC500, 5/01, /02, /03 DH-485/AIC

### Allen-Bradley SLC500 DH-485/AIC (Point-to-Point or Multi-drop)

UTICOR

Allen-Bradley SLC DF1 RS-232

AB SLC DF1		RS-232		Panel PLC Port
TXD	(3)		(3)	RXD
RXD	(2)		(2)	TXD
GND	(5)		(5)	⏚
			(1)	⏚

D-sub 9-pin
Female

D-sub 15-pin
Male

Allen-Bradley Micrologix 1000/1200/1500 RS-232

A-B Micrologix PLC		RS-232		Panel PLC Port
TXD	(7)		(3)	RXD
RXD	(4)		(2)	TXD
GND	(2)		(5)	⏚
			(1)	⏚

D-sub 15-pin
Male

.290"

.35"
Dia.

Mini Din 8-pin Male
Nonstandard keying

Allen-Bradley PLC5 DF1 RS-232

Control Techniques Unidrive 2-wire

UTICOR

Control Techniques Unidrive 4-wire
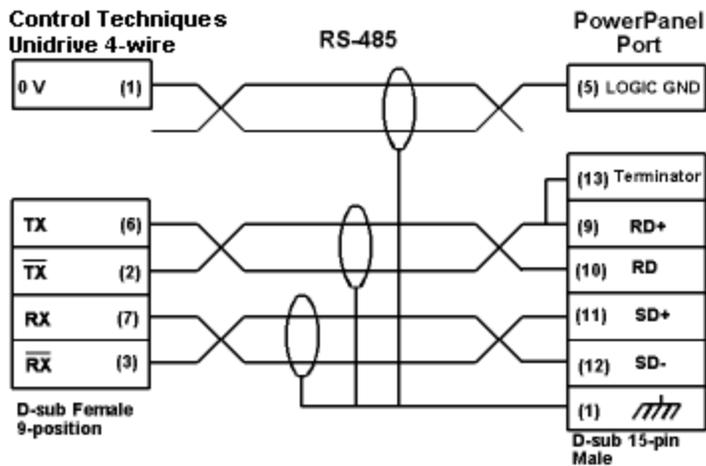
Control Technology Corporation (CTC)
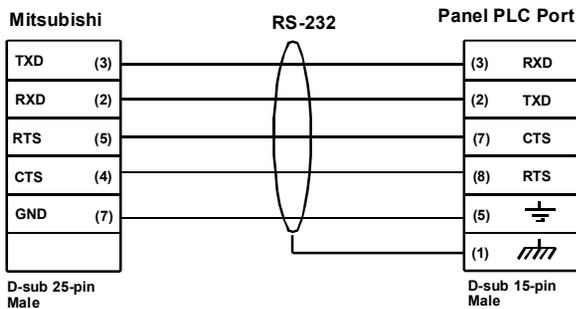
Appendix A
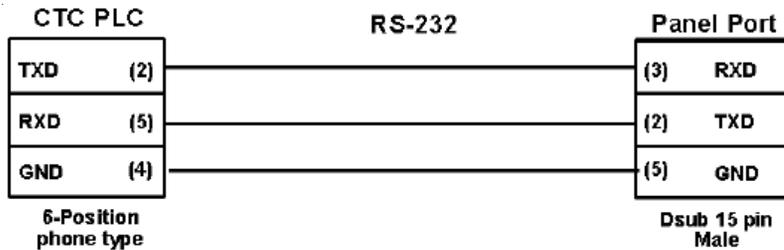
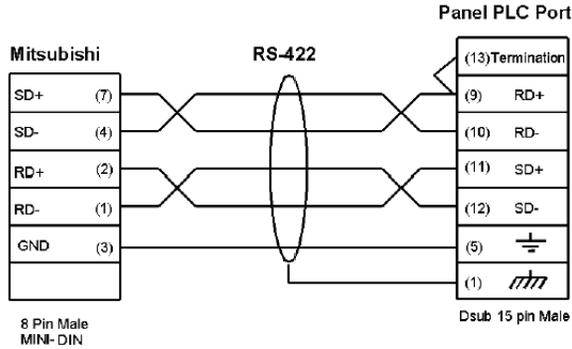## General Electric 90/30 and 90/70 15-pin D-SUB RS-422
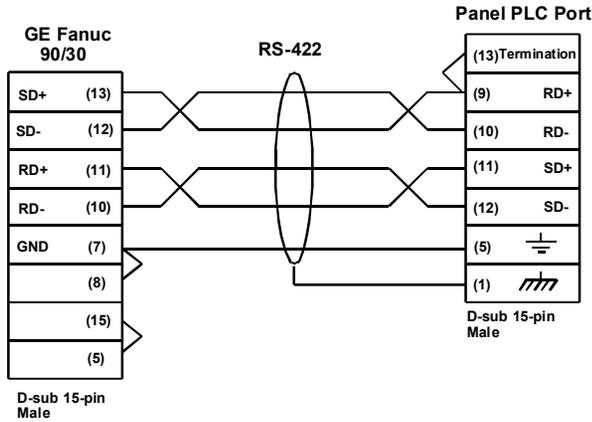
General Electric Versamax RS-232
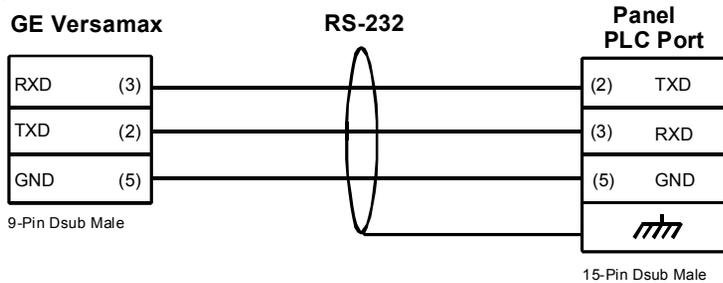
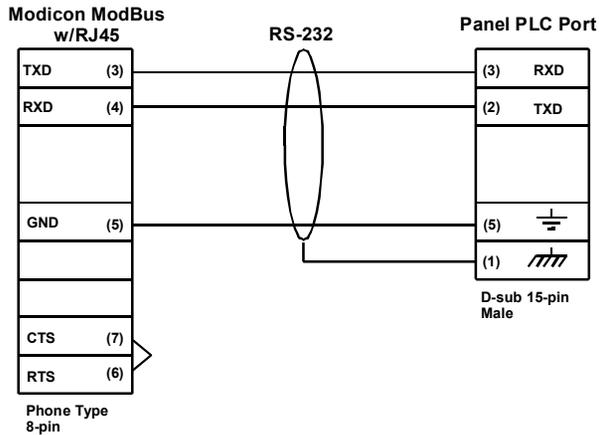## Mitsubishi FX Series 25-pin RS-422

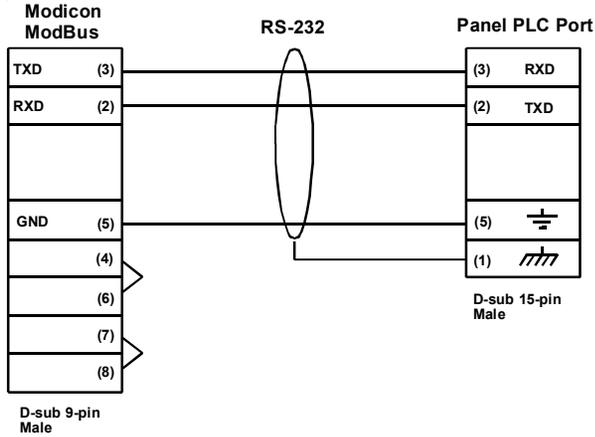## Mitsubishi FX Series 8-pin MINI-DIN RS-422

Panel PLC Port

Mitsubishi		RS-422			
				(13)	Termination
SD+	(7)			(9)	RD+
SD-	(4)			(10)	RD-
RD+	(2)			(11)	SD+
RD-	(1)			(12)	SD-
GND	(3)			(5)	
				(1)	

8 Pin Male
MINI-DIN

Dsub 15 pin Male

Modicon ModBus with RJ45

Modicon ModBus
w/RJ45   RS-232   Panel PLC Port

TXD	(3)		(3)	RXD
RXD	(4)		(2)	TXD
GND	(5)		(5)	
			(1)	
CTS	(7)			
RTS	(6)			

Phone Type
8-pin

D-sub 15-pin
Male

Modicon ModBus RS-232

Modicon ModBus		RS-232	Panel PLC Port	
TXD	(3)		(3)	RXD
RXD	(2)		(2)	TXD
GND	(5)		(5)	⏚
	(4)		(1)	⏚
	(6)			
	(7)			
	(8)			

D-sub 9-pin Male

D-sub 15-pin Male

Omron C200, C500 RS-232

Omron Host Link		RS-232	Panel PLC Port	
TXD	(2)		(3)	RXD
RXD	(3)		(2)	TXD
GND	(7)		(5)	⏚
			(1)	⏚
CTS	(4)			
RTS	(5)			

D-sub 25-pin Male

D-sub 15-pin Male

UTICOR

Omron Programming Port

Omron Programming Port

RS-232

Panel PLC Port

Omron Programming Port		Panel PLC Port	
TXD	(2)	(3)	RXD
RXD	(3)	(2)	TXD
GND	(9)	(5)	GND
RTS	(4)		
CTS	(5)		

9-Pin Dsub Male

15-Pin Dsub Male

Siemens S7 MPI Adaptor

Siemens S7 MPI Adaptor

RS-232

Panel PLC Port

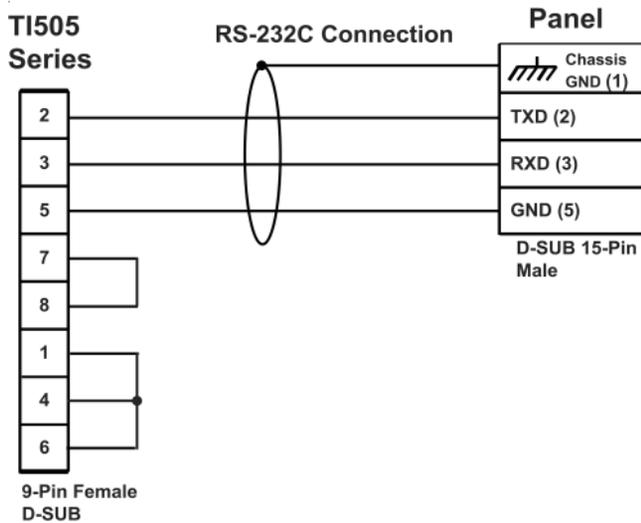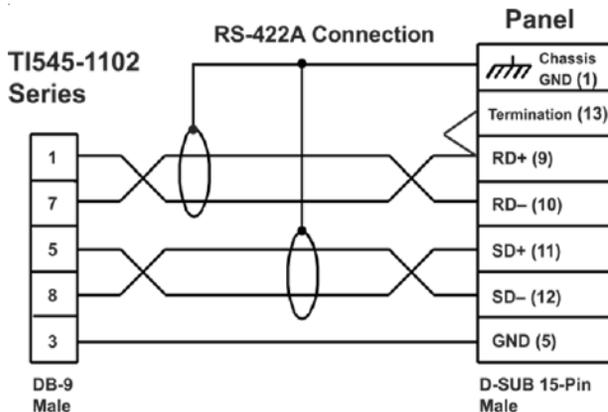| Siemens S7 MPI Adaptor		Panel PLC Port	
RXD	(2)	(2)	TXD
TXD	(3)	(3)	RXD
GND	(5)	(5)	GND
RTS	(7)	(7)	CTS
CTS	(8)	(8)	RTS

9-Pin Dsub Female

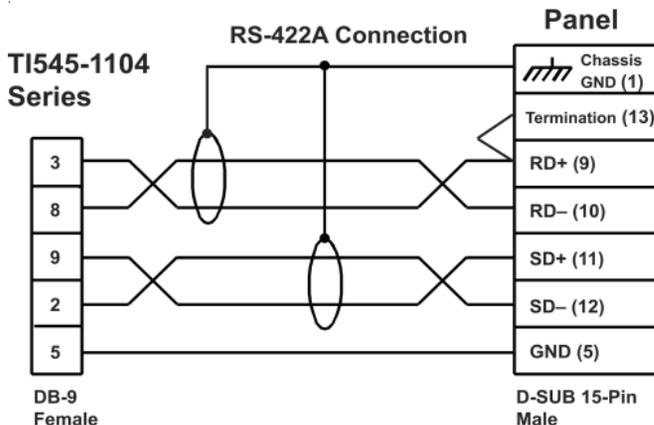15-Pin Dsub Male

Square D SYMAX 9-pin male RS-422A
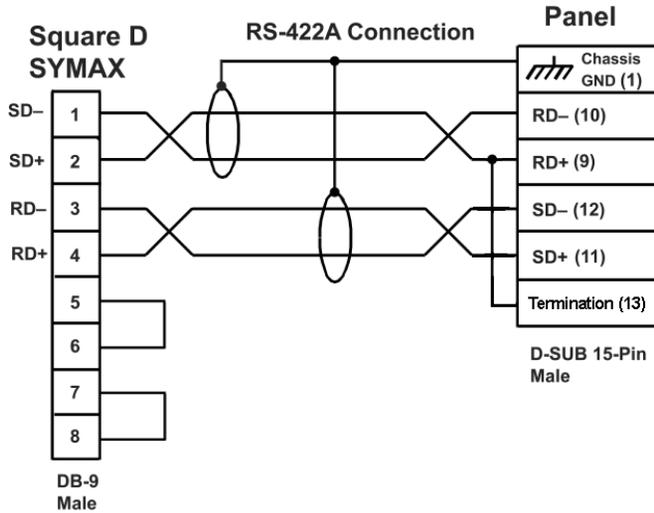
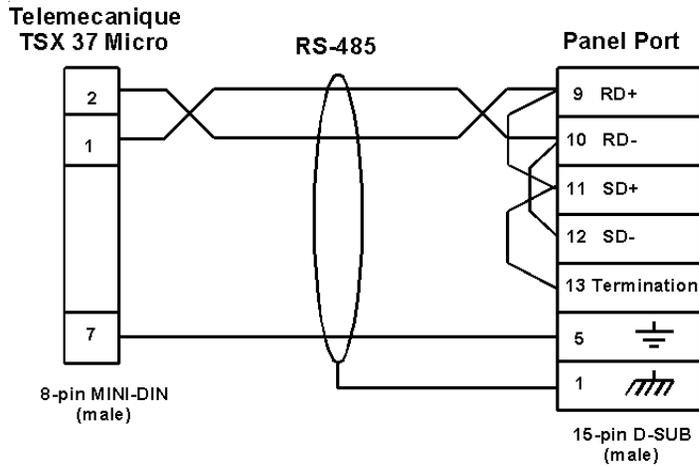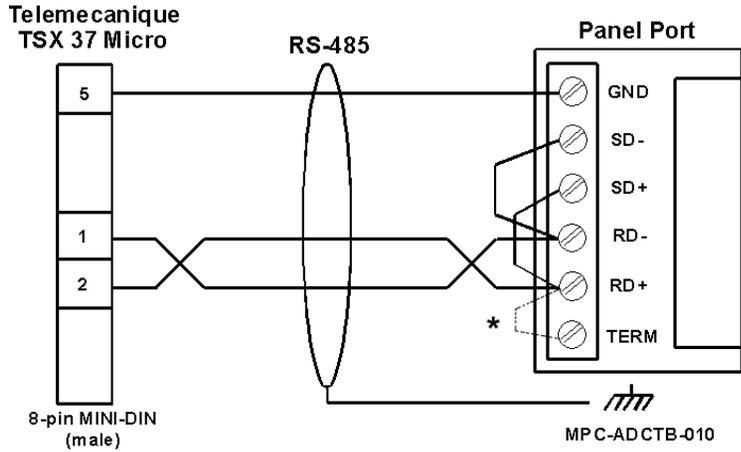## Texas Instruments TI505 Series 9-pin female RS-232C

Texas Instruments TI545-1102 Series 9-pin male RS-422A

## Texas Instruments TI545-1104 Series 9-pin female RS-422A

Uni-Telway

Option Card Installation Instructions

If your PowerMarquee was shipped with an option card installed, (Allen-Bradley Data Highway Plus, Generic DeviceNet I/O, Generic Ethernet I/O, Modicon Modbus Plus, Profibus-DP, or Serial option card), you will need this information A connector, unique to each option, is attached to these option boards and is accessible through the access plate in the back of the PowerMarquee

The option card has been installed into the backplane connector shown below of the PowerPanel Control unit in the marquee. (The connector on the bottom right side of the card installs into the backplane connector.) The card is secured with two screws.

Option Card is installed into the Backplane connector shown here

**62-PIN SOCKET MOUNT ON BACK SIDE OF OPTION CARD**

Appendix A
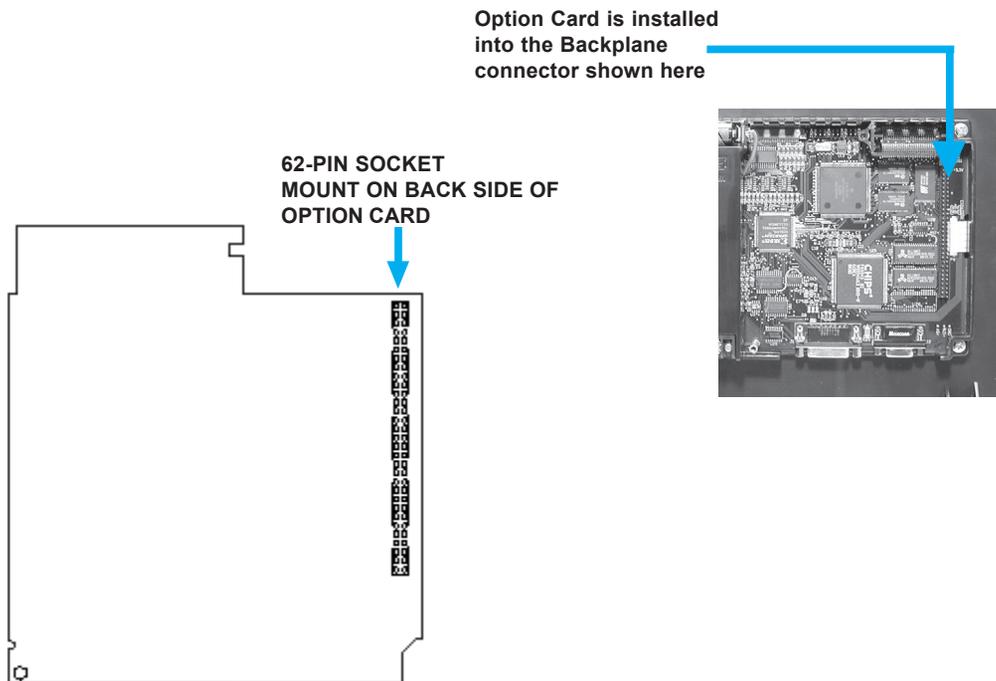
Generic DeviceNet I/O Option Card

The DeviceNet I/O Option Card has a special connector that is accessible through the access panel in the rear of the unit.

The DeviceNet connector extends over the edge of the board. Next to the connector are DIP Switches and then four LEDs that illuminate to indicate status. The Watchdog LED is only visible when you open the access panelr.

DeviceNet Connector

DIP Switches

Status LEDs

Watchdog LED
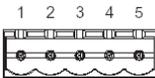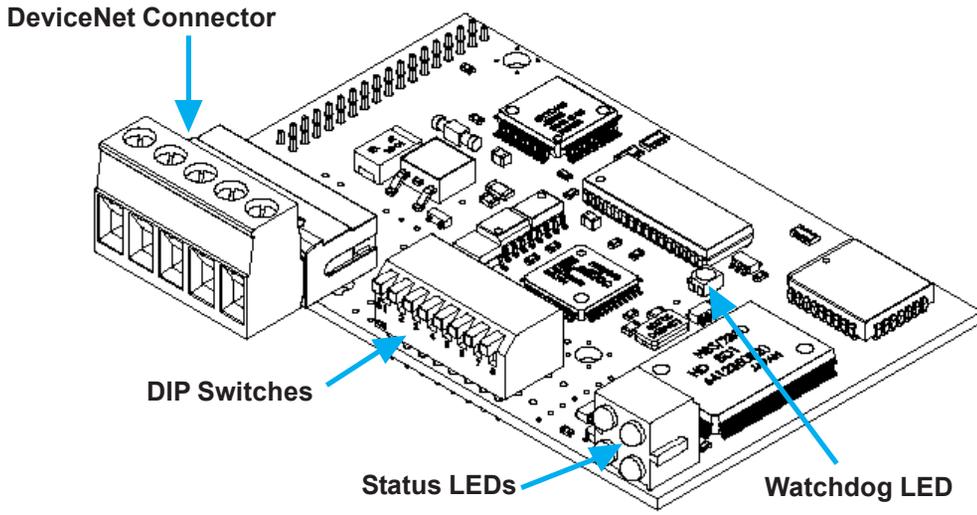
Connector Pin	Signal	Description
1	V-	Negative supply voltage
2	CAN_L	CAN_L bus line
3	SHIELD	Cable shield
4	CAN_H	CAN_H bus line
5	V+	Positive supply voltage
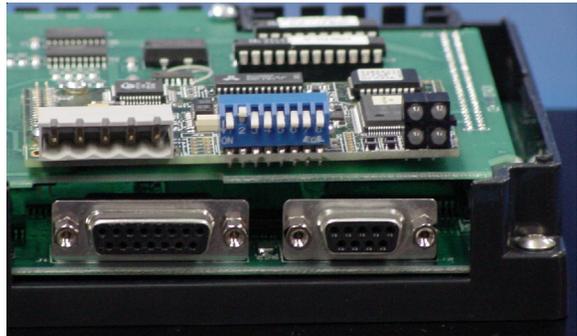
Generic Ethernet/ IP Option Card

The Ethernet/IP Option Card has a special connector that is accessible through the access panel in the rear of the unit.

The Ethernet /IP connector extends over the edge of the board. Next to the connector are DIP Switches used for configuration, and four LEDs that illuminate to indicate status. The Watch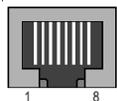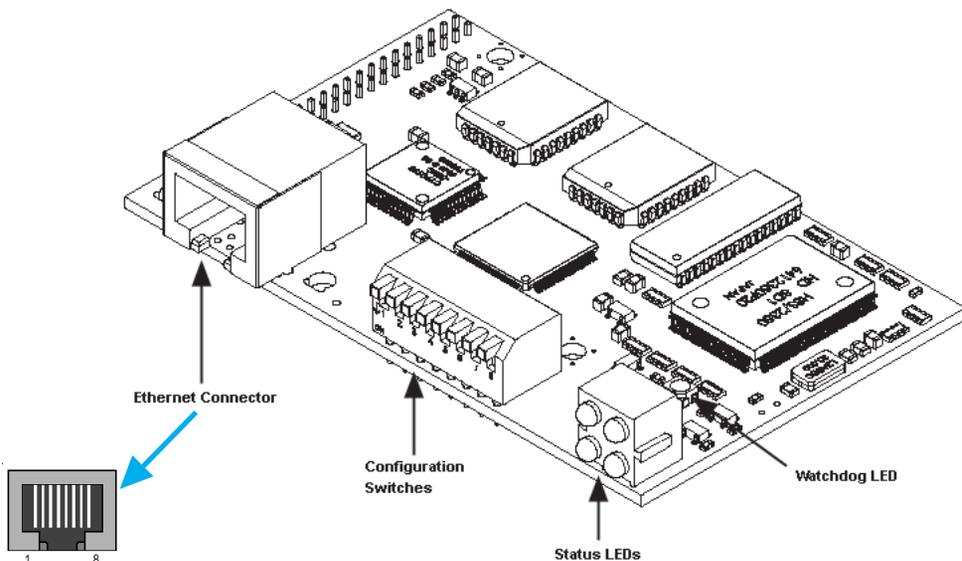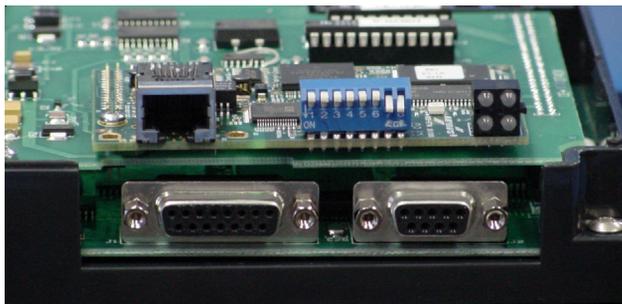dog LED is only visible when you open the rear access panel. The module uses twisted-pair cables, and no external termination is required.

Ethernet Connector

Configuration Switches

Watchdog LED

Status LEDs

| RJ45 (Standard)	
Pin	**Signal**
1	TD+
2	TD-
3	RD+
4	Termination
5	Termination
6	RD-
7	Termination
8	Termination

Modicon Modbus Plus Option Card

The Modbus Plus Option Card has a special connector that is accessible through the access panel in the rear of the unit.

The Modbus connector (9-pin Female D-SUB) extends over the edge of the board. Two types of connectors are available from Modicon for connecting devices to the network. Each inline drop requires a line connector, Modicon part number AS-MBKT-085. This part number contains one connector. The drops at the two ends of the cable, each require a terminating connector, Modicon part number AS-MBKT-185. This contains two connectors.

The Modbus Plus node address can be set using the first six positions of the DIP switches located at the top of the option board as shown in the diagram below. When the board is seated in the panel, setting the DIP Switch in the UP position is the ON position. There are three Status LEDs on the Modbus Plus option card: MBP, TXD, and RXD. The TXD and RXD LEDs indicate the board is transmitting or receiving data. The MPB LED (leftmost LED) indicates Modbus Plus status.
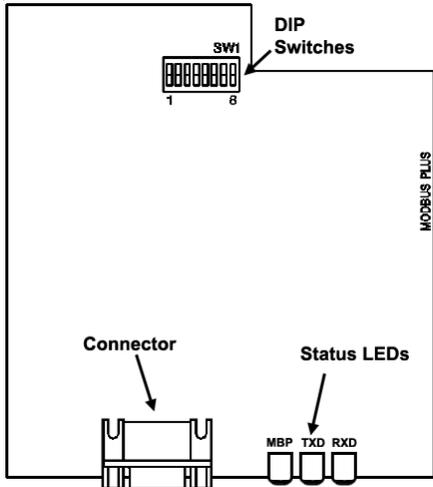
Generic Profibus-DP Option Card

The Profibus-DP Option Card has a special connector that is accessible through the access panel in the rear of the unit.

The Profibus-DP connector extends over the edge of the board. Next to the connector are a Termination Switch, Rotary Address Switches, and four LEDs that illuminate to indicate status.

Profibus-DP Interface

Termination Switch

Address Switches

LED Indicators
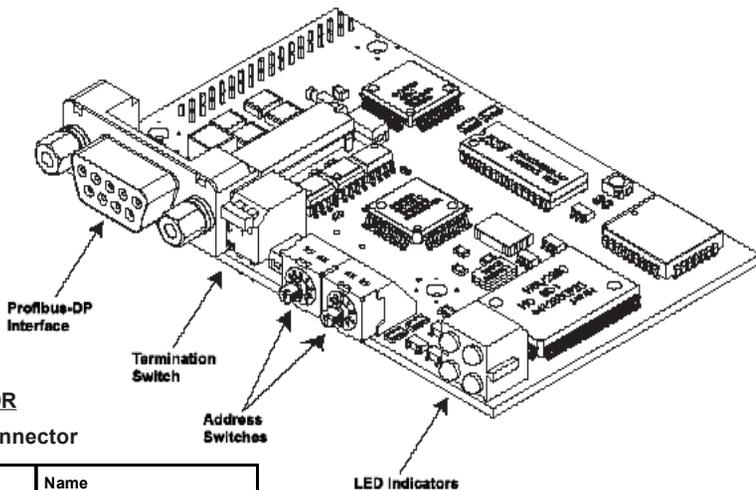
FIELDBUS CONNECTOR

9-pin female D-SUB connector

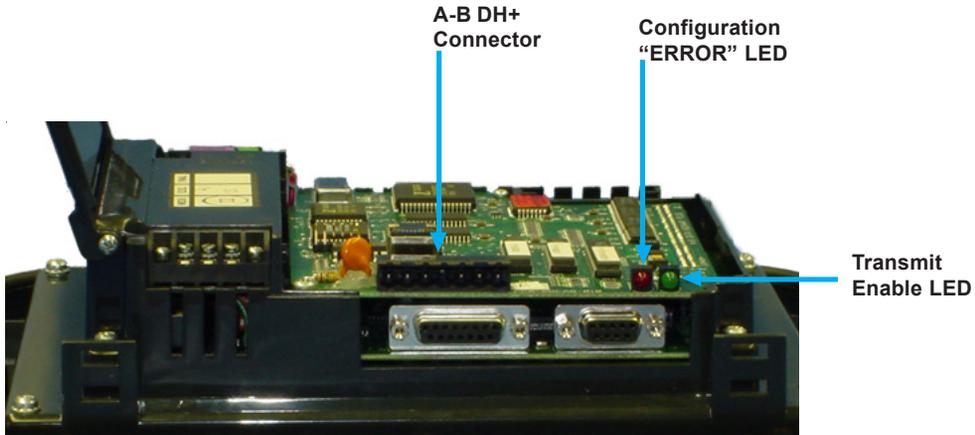| D-SUB	Screw Terminal	Name
Housing	Shield	Connected to PE
1	Not connected	-
2	Not connected	-
3	B-Line	Positive RxD/TxD according to RS-485 specification
4	RTS	Request to Send*
5	GND BUS	Isolated GND from RS-485 side*
6	+5 V BUS	Isolated +5 V from RS-485 side
7	Not connected	-
8	A-Line	Negative RxD/TxD according to RS-485 specification
9	Not connected	-

* +5V BUS and GND BUS are used for bus termination. Some devices, like optical transceivers (RS-485 to fiber optics) might require external power supply from these points. RTS is used in some equipment to determine the direction of transmission. In normal applications only A-Line, B-Line, and Shield are used.

Appendix A

Allen-Bradley Data Highway Plus Option Card

The Allen-Bradley Data Highway Plus/Remote I/O Option Card has a special connector attached that is accessible through the access panel in the rear of the unit.

The option card has been installed to the backplane connector on the PowerPanel Control unit. (The connector on the bottom right side of the card installs into the backplane connector.) The card is secured with two screws.

The Allen-Bradley Data Highway Plus PLC connector extends over the edge of the board. Next to the connector are two LEDs that illuminate to indicate status.

A-B DH+ Connector

Configuration "ERROR" LED

Transmit Enable LED

A-B DH+ Option Card Outline Drawing

**62-PIN SOCKET
MOUNT ON BACK SIDE**

RED GREEN

← **LEDs**

CLEAR SHIELD BLUE   CLEAR SHIELD BLUE

Configuration "ERROR"   Transmit Enable

PowerPanel Remote I/O Option Card	A-B PLC Data Highway Plus Connector
1 Blue _____	1
Shield _____	Shield
2 Clear _____	2

PowerMarquee Serial Option Board

If your PowerMarquee was shipped with a Serial Option Board installed, you will need this information A connector is attached to this option board and is accessible through the access panel in the rear of the unit.

The option card has been installed to the backplane connector on the the PowerPanel Conrol unit. (The connector on the bottom right side of the card installs into the backplane connector.) The card is secured with two screws.

The connector extends over the edge of the board.   See the following pages for more information.

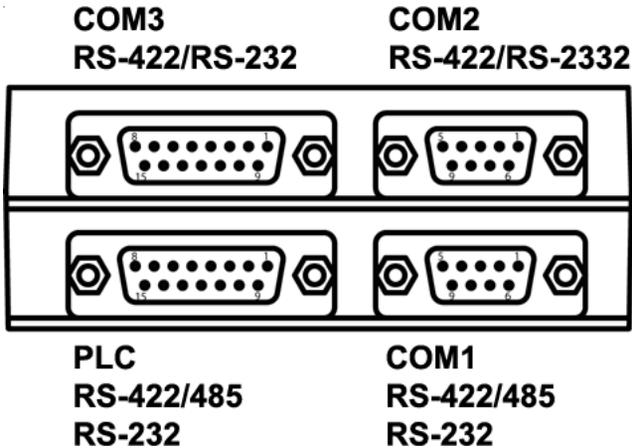## Serial Port COM3* (J1 15-Pin Female Connector)

*This port can use RS-485

Pin	Signal	Description
1	Chassis GND	Chassis Ground
2	TXD	RS-232 Serial Data Output
3	RXD	RS-232 Serial Data Input
4	+5V	+5V Through 120 Ohm Resistor
5	Signal GND	Signal Ground
6	LE	
7	CTS	RS-232 Clear To Send
8	RTS	RS-232 Request To Send
9	RXD+	RS-422/485 Serial Data Input +
10	RXD-	RS-422/485 Serial Data Input -
11	SD+	RS-422/485 Serial Data Output +
12	SD-	RS-422/485 Serial Data Output -
13	TERM	RS-422/485 120 Ohm Termination Resistor Connect to Pin 9
14	N.C.	
15	N.C.	

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Serial Port COM2* (J2 9-Pin Female Connector)

*This port CANNOT use RS-485

Pin	Signal	Description
1	SD-	RS-422 Serial Data Output -
2	TXD	RS-232 Serial Data Output
3	RXD	RS-232 Serial Data Input
4	RXD-	RS-422 Serial Data Input -
5	Signal GND	Signal Ground
6	SD+	RS-422 Serial Data Output +
7	CTS	RS-232 Clear To Send
8	RTS	RS-232 Request To Send
9	RD+	RS-422 Serial Data Input +

COM3
RS-422/RS-232

COM2
RS-422/RS-2332

PLC
RS-422/485
RS-232

COM1
RS-422/485
RS-232

Appendix A

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