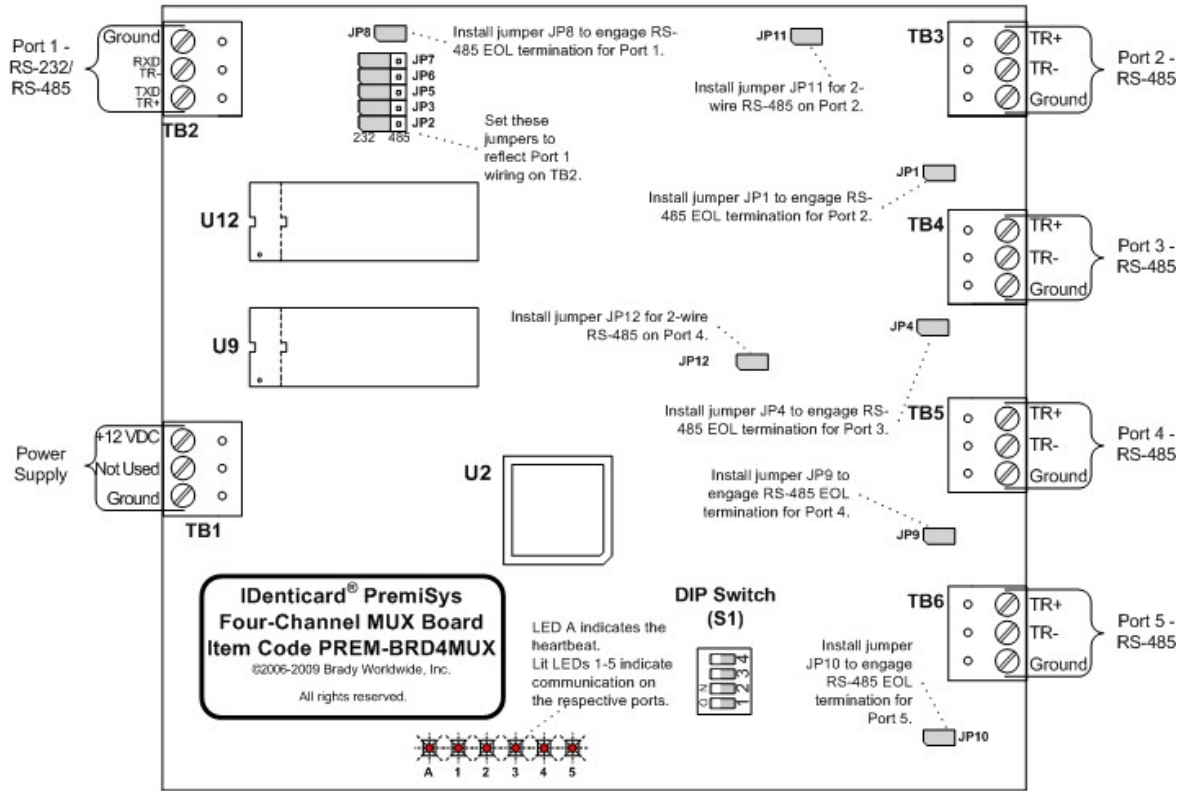


### Four-Channel MUX Board



### Four-Channel MUX Board Specifications

#### Certifications for the Four-Channel MUX Board

UL: recognized to UL 294: Access Control System Units - component  
 CE: EN55022, EN50082-1, IEC801-2, IEC801-3 and IEC801-4

#### Dimensions and Weight of the Four-Channel MUX Board

Board Width	6.0 inches (152 mm)
Board Height	5.0 inches (127 mm)
Board Depth	1.0 inch (25 mm)
Board Weight	4 ounces (113 g) (nominal)

#### Environmental Specifications for the Four-Channel MUX Board

Temperature	32°F to 158°F (0°C to 70°C) operating -67°F to 185°F (-55°C to 85°C) storage
Relative Humidity	0 to 95% RH noncondensing

### Power Specifications for the Four-Channel MUX Board



**CAUTION!** The processor in this component is intended for use only in a Class 2, low-voltage circuit!

Input Voltage	12 VDC $\pm$ 15%, 300 mA
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**IMPORTANT!** The Altronix® Power Supply Control panel contains 8 individual power outputs. Each output can supply up to 2.5 A @ 12 VDC. However, the total output amperage on all 8 ports cannot exceed 10 A. You must determine the load of each board in the loop to ensure that the current draw does not exceed 2.5 A per output port and that the total current draw on the power supply does not exceed 10 A.

### Wiring Requirements for the Four-Channel MUX Board

Power to Four-Channel MUX Board	Twisted pair, 18 AWG (0.823 mm <sup>2</sup> ).
RS-485 Connections	Twisted pairs, 22 AWG (0.325 mm <sup>2</sup> ), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops
RS-232 Connections	Twisted pairs, 22 AWG (0.325 mm <sup>2</sup> ), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

### Communications Specifications for the Four-Channel MUX Board

Port 1	RS-232 or Two-wire RS-485 via TB2, to controller or Host PC
Ports 2 and 4 (TB3 and TB5, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)
Ports 3 and 5 (TB4 and TB6, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)

### Indicators on the Four-Channel MUX Board

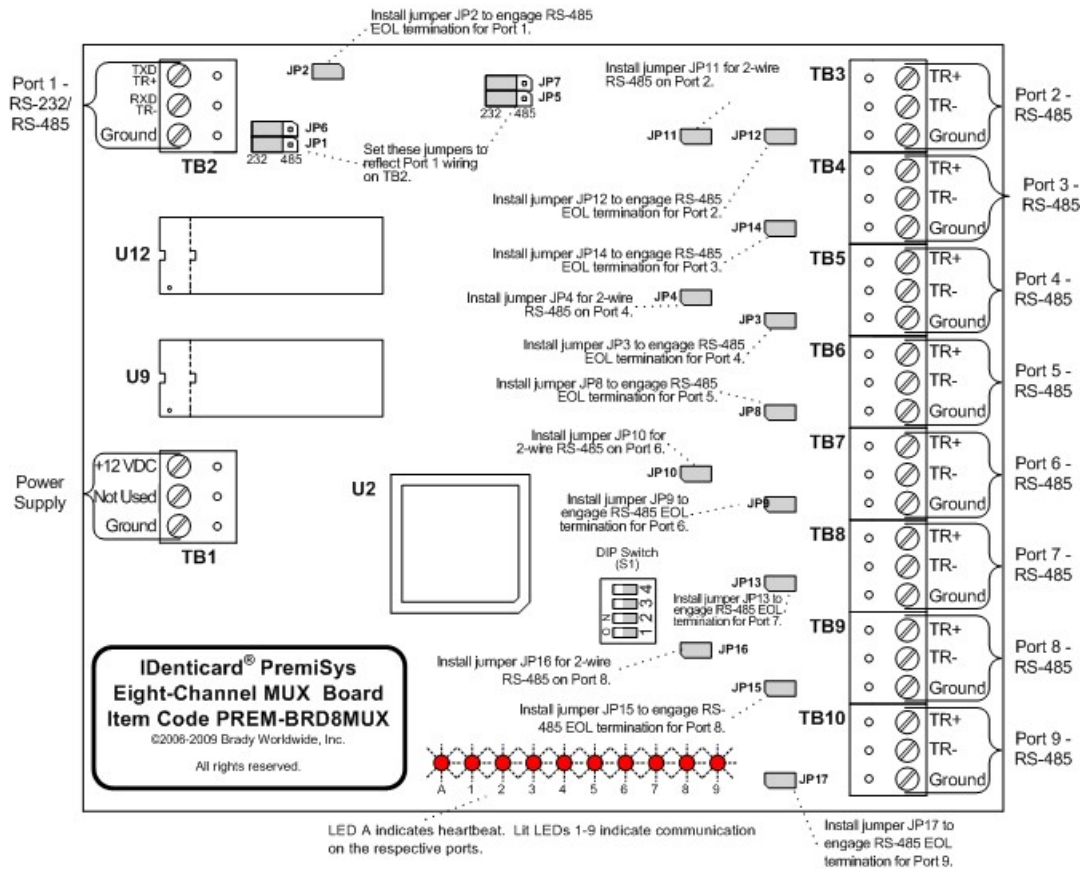
Visible	6 red, single-color LEDs
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### Four-Channel MUX Board Jumper Settings

Jumper	Setting	Selection
J1	Off	RS-485 EOL termination on Port 2 is disabled.
	On	RS-485 EOL termination on Port 2 is enabled.
J2,J3,J5, J6,J7	RS-232	Port 1 uses RS-232
	RS-485	Port 1 uses RS-485
J4	Off	RS-485 EOL termination on Port 3 is disabled.
	On	RS-485 EOL termination on Port 3 is enabled.
J8	Off	RS-485 EOL termination on Port 1 is disabled.

	On	RS-485 EOL termination on Port 1 is enabled.
J9	Off	RS-485 EOL termination on Port 4 is disabled.
	On	RS-485 EOL termination on Port 4 is enabled.
J10	Off	RS-485 EOL termination on Port 5 is disabled.
	On	RS-485 EOL termination on Port 5 is enabled.
J11	On	This jumper should always be installed for two-wire RS-485 communications on Port 2.
J12	On	This jumper should always be installed for two-wire RS-485 communications on Port 4.

## Eight-Channel MUX Board



## Eight-Channel MUX Board Specifications

### Certifications for the Eight-Channel MUX Board

UL: recognized to UL 294: Access Control System Units - component  
CE: EN55022, EN50082-1, IEC801-2, IEC801-3 and IEC801-4

### Dimensions and Weight of the Eight-Channel MUX Board

Board Width	6.0 inches (152 mm)
Board Height	5.0 inches (127 mm)
Board Depth	1.0 inch (25 mm)
Board Weight	5.57 ounces (158 g) (nominal)

### Environmental Specifications for the Eight-Channel MUX Board

Temperature	32°F to 158°F (0°C to 70°C) operating -67°F to 185°F (-55°C to 85°C) storage
Relative Humidity	0 to 95% RH noncondensing

### Power Specifications for the Eight-Channel MUX Board



**CAUTION!** The processor in this component is intended for use only in a Class 2, low-voltage circuit!

Input Voltage	12 VDC $\pm$ 15%, 300 mA
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**IMPORTANT!** The Altronix® Power Supply Control panel contains 8 individual power outputs. Each output can supply up to 2.5 A @ 12 VDC. However, the total output amperage on all 8 ports cannot exceed 10 A. You must determine the load of each board in the loop to ensure that the current draw does not exceed 2.5 A per output port and that the total current draw on the power supply does not exceed 10 A.

### Wiring Requirements for the Eight-Channel MUX Board

Power to Eight-Channel MUX Board	Twisted pair, 18 AWG (0.823 mm <sup>2</sup> ).
RS-485 Connections	Twisted pairs, 22 AWG (0.325 mm <sup>2</sup> ), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops
RS-232 Connections	Twisted pairs, 22 AWG (0.325 mm <sup>2</sup> ), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

### Communications Specifications for the Eight-Channel MUX Board

Port 1	RS-232 or Two-wire RS-485 via TB2, to controller or Host PC
Ports 2 and 4 (TB3 and TB5, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)
Ports 3 and 5 (TB4 and TB6, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)
Ports 6 and 8 (TB7 and TB9, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)
Ports 7 and 9 (TB8 and TB10, respectively)	Two-wire RS-485 (each port is used for transmitting and receiving data)

### Indicators on the Eight-Channel MUX Board

Visible	10 red, single-color LEDs
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### Eight-Channel MUX Board Jumper Settings

Jumper	Setting	Selection
J1, J5, J6, J7	232	Port 1 uses RS-232
	485	Port 1 uses RS-485
J2	Off	RS-485 EOL termination on Port 1 is disabled.
	On	RS-485 EOL termination on Port 1 is enabled.

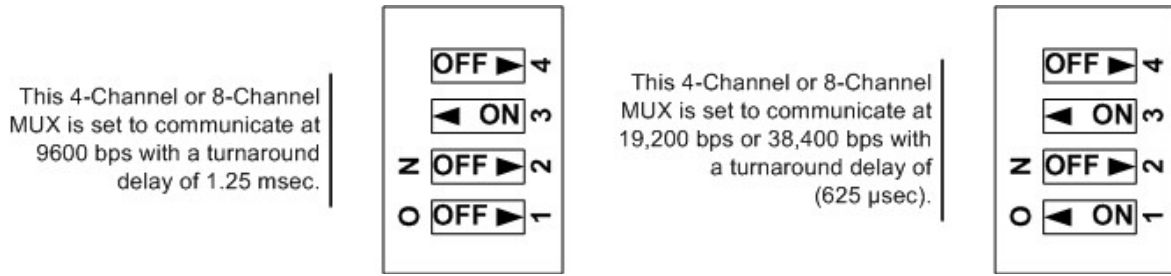
J3	Off	RS-485 EOL termination on Port 4 is disabled.
	On	RS-485 EOL termination on Port 4 is enabled.
J4	On	This jumper should always be installed for two-wire RS-485 communications on Port 4.
J8	Off	RS-485 EOL termination on Port 8 is disabled.
	On	RS-485 EOL termination on Port 8 is enabled.
J9	Off	RS-485 EOL termination on Port 6 is disabled.
	On	RS-485 EOL termination on Port 6 is enabled.
J10	On	This jumper should always be installed for two-wire RS-485 communications on Port 6.
J11	On	This jumper should always be installed for two-wire RS-485 communications on Port 2.
J12	Off	RS-485 EOL termination on Port 2 is disabled.
	On	RS-485 EOL termination on Port 2 is enabled.
J13	Off	RS-485 EOL termination on Port 7 is disabled.
	On	RS-485 EOL termination on Port 7 is enabled.
J14	Off	RS-485 EOL termination on Port 3 is disabled.
	On	RS-485 EOL termination on Port 3 is enabled.
J15	Off	RS-485 EOL termination on Port 8 is disabled.
	On	RS-485 EOL termination on Port 8 is enabled.
J16	On	This jumper should always be installed for two-wire RS-485 communications on Port 8.
J17	Off	RS-485 EOL termination on Port 9 is disabled.
	On	RS-485 EOL termination on Port 9 is enabled.

#### Four- and Eight-Channel MUX Board DIP Switches – Chart

Selection (Turn-Around Delay, Approximate)	Switches			
	S1	S2	S3	S4
300 bps (35 msec)	Off	Off	Off	Off
1200 bps (9.58 msec)	<u>On</u>	Off	Off	Off
2400 bps (4.79 msec)	Off	<u>On</u>	Off	Off
4800 bps (2.50 msec)	<u>On</u>	<u>On</u>	Off	Off
9600 bps (1.25 msec)	Off	Off	<u>On</u>	Off

19,200 bps / 38,400 bps normal (625 $\mu$ sec)	<u>On</u>	Off	<u>On</u>	Off
38,400 bps fast turn (365 $\mu$ sec)	Off	<u>On</u>	<u>On</u>	Off
38,400 bps fast turn (365 $\mu$ sec)	<u>On</u>	<u>On</u>	<u>On</u>	Off

### Sample DIP Switch Settings



### Setting End-of-Line (EOL) Resistance for the MUX Boards

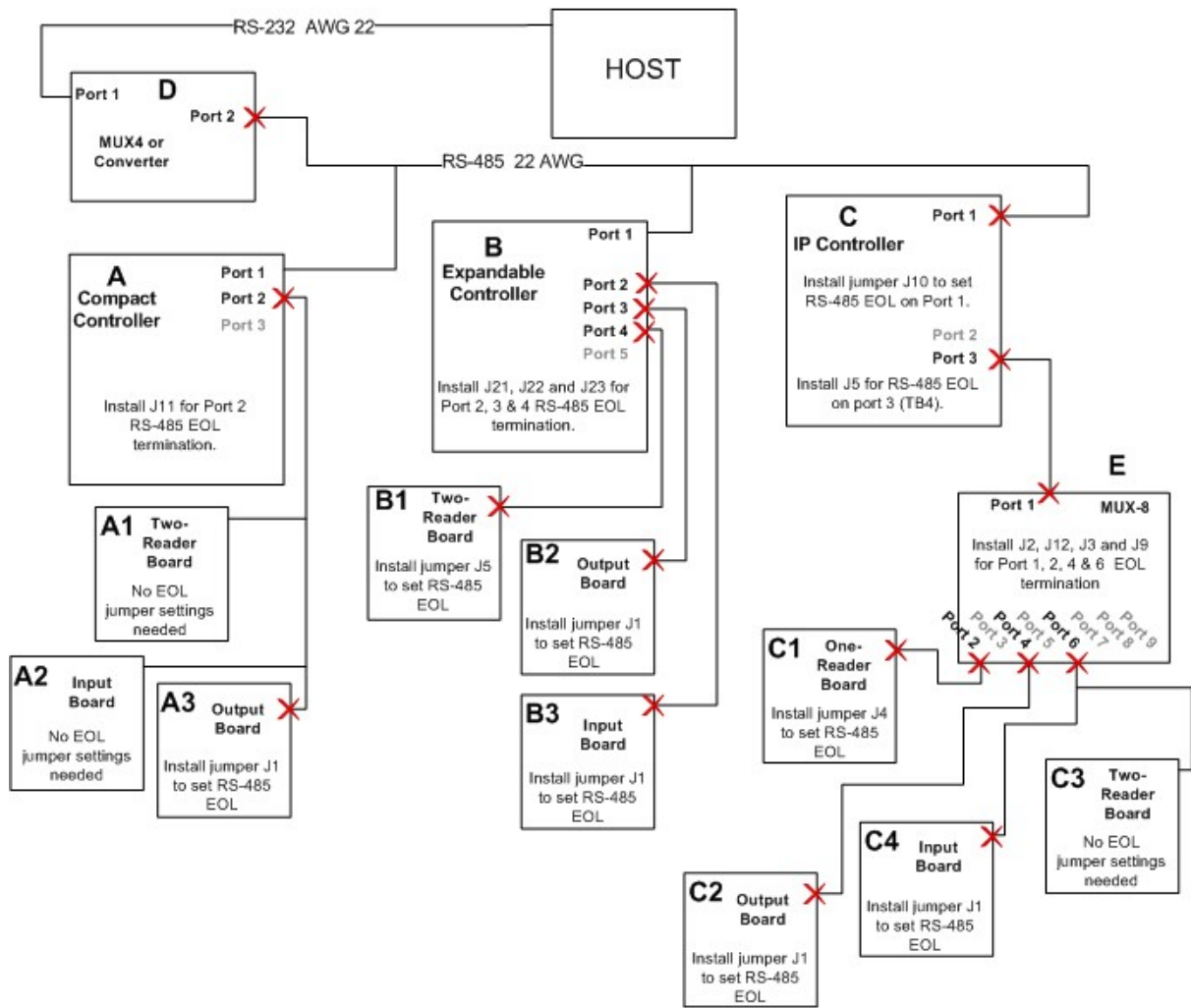
If the MUX Board is the last board in a run (the run does not include the MUX board's auxiliary boards,) install jumper J8 to set RS-485 EOL for Port 1.

The Eight-Channel Board "E," shown below, is the end of the line from controller "C." Since it is not advised to connect one MUX board to another MUX board, any MUX board installed downstream from a controller is the last MUX board in any run. Install jumper JP8 to set RS-485 EOL on Port 1 of board "E."

Board "D" below is a Four-Channel MUX Board and is connected between the host PC and a controller. Do not set the RS-485 EOL jumper because this MUX is not the end of the line.

On the Four-Channel MUX below (labeled "D") only Port 2 is used for downstream communication so only jumper JP1 must be set.

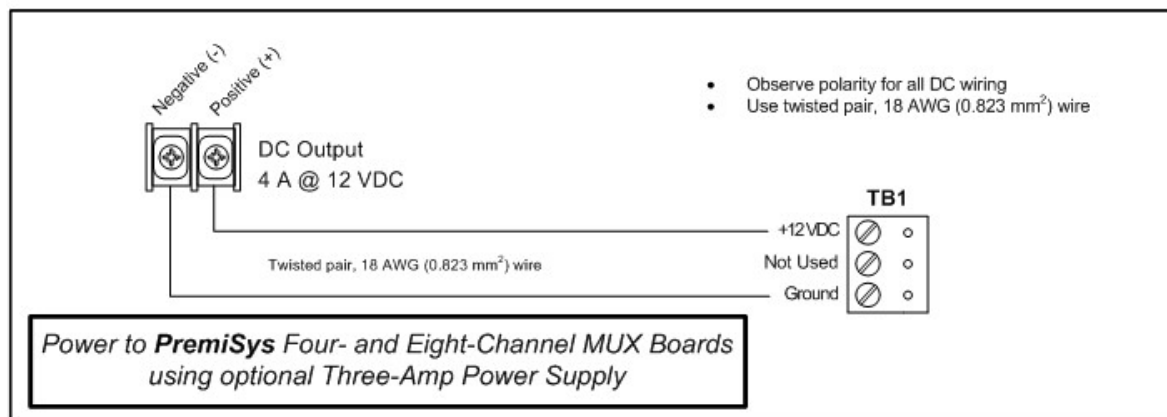
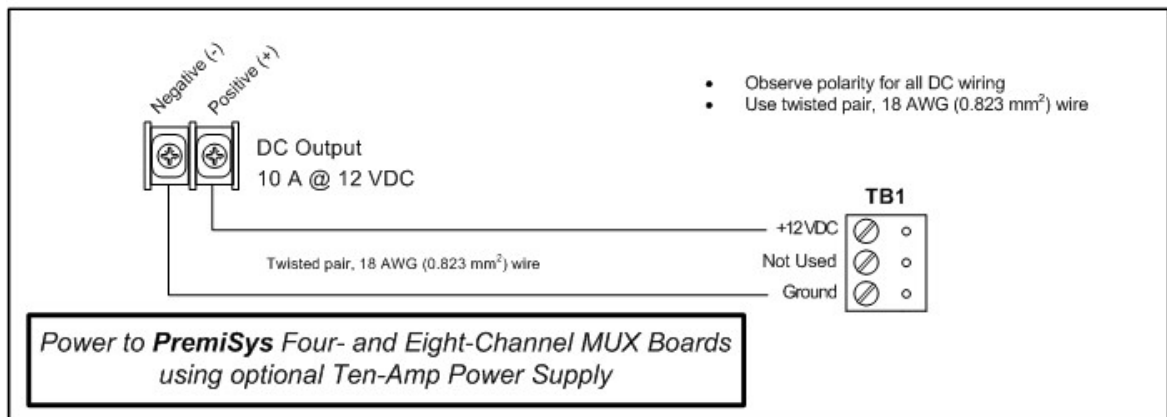
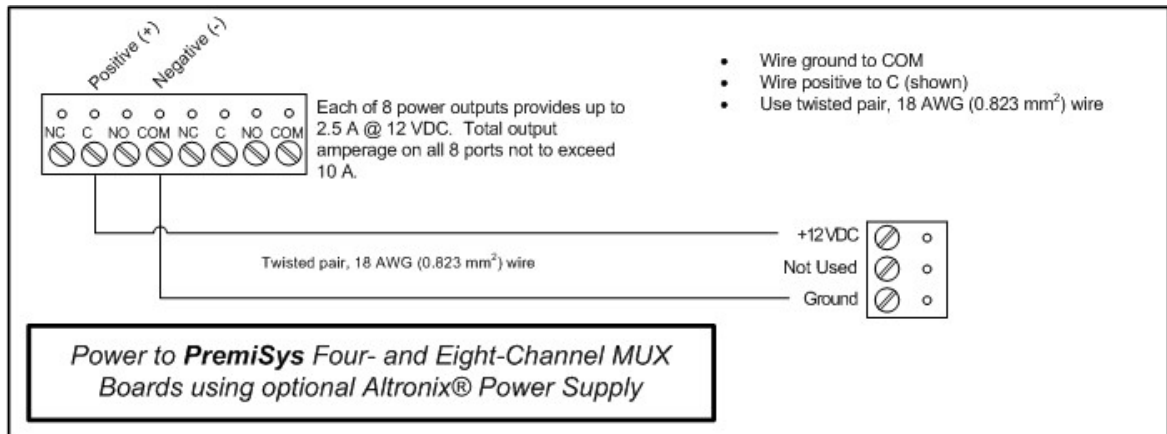




### Wiring a MUX Board to a Power Supply



**IMPORTANT!** The Altronix® Power Supply Control panel contains 8 individual power outputs. Each output can supply up to 2.5 A @ 12 VDC. However, the total output amperage on all 8 ports cannot exceed 10 A. You must determine the load of each board in the loop to ensure that the current draw does not exceed 2.5 A per output port and that the total current draw on the power supply does not exceed 10 A.



**CAUTION!** The processor in this component is intended for use only in a Class 2, low-voltage circuit!

### Four-Channel MUX Board LEDs

The Four-Channel MUX Board has six LEDs, A and 1-5, that indicate operation and communication of the board with the connected controller and auxiliary boards. See the

chart below.

<b>LED</b>		
A	Heartbeat and online status indicator:	
	<b>80/20 Off</b>	<b>80/20 On</b>
	Offline	Online
<b>Port LED</b>	<b>On</b>	<b>Off</b>
1	Data received	No data
2	Data received	No data
3	Data received	No data
4	Data received	No data
5	Data received	No data

### **Eight-Channel MUX Board LEDs**

The Eight-Channel MUX Board has ten LEDs, A and 1-9, that indicate operation and communication of the board with the connected controller and auxiliary boards. See the chart below.

<b>LED</b>		
A	Heartbeat and online status indicator:	
	<b>80/20 Off</b>	<b>80/20 On</b>
	Offline	Online
<b>Port LED</b>	<b>On</b>	<b>Off</b>
1	Data received	No data
2	Data received	No data
3	Data received	No data
4	Data received	No data

5	Data received	No data
6	Data received	No data
7	Data received	No data
8	Data received	No data
9	Data received	No data

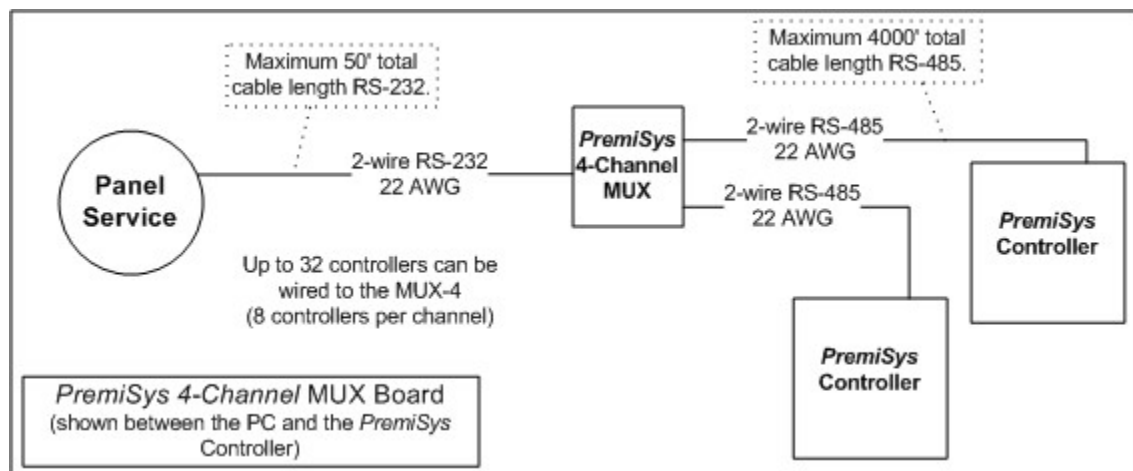
### Communications to Host

You can install a Four-Channel MUX Board between the Server PC and controllers to serve as a RS-232-to-RS-485 converter. The illustration below shows a general schematic of such an arrangement. Note the wiring distance restrictions given in the drawing.

You can connect up to 8 controllers per channel on the Four-Channel MUX Board, for a total of 32 controllers.

Although the Eight-Channel MUX Board can be used as a converter, the Four-Channel MUX Board features optical isolation, and so is better suited for use as a converter. The Eight-Channel MUX Board does not have optical isolation capability and is not recommended for use between the Server PC and the controllers.

The illustration below shows a general schematic of a Four-Channel MUX Board wired between the Server PC and controllers. Note the wiring distance restrictions given in the drawing.



#### Notes:

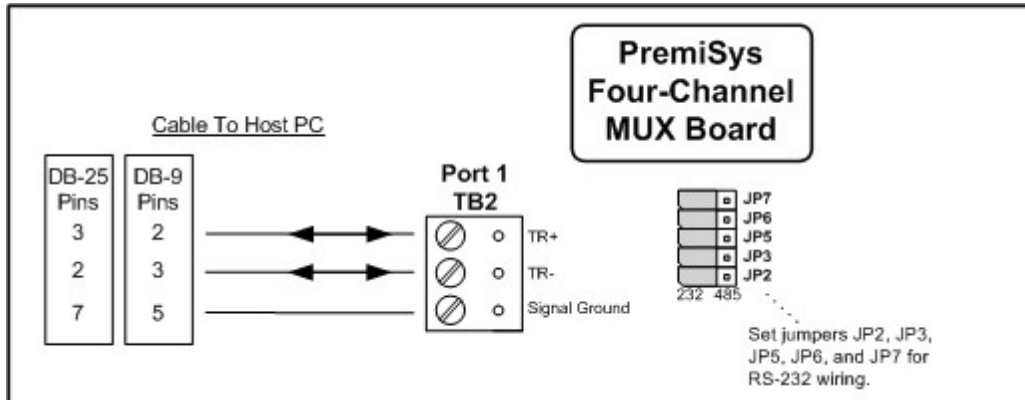


- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a MUX board between the Host and Two-Reader Controller or One-

Door Reader Controller since those controllers cannot receive communications via an RS-485 connection.

- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

#### Wiring PremiSys Four-Channel MUX Boards to the PremiSys Host

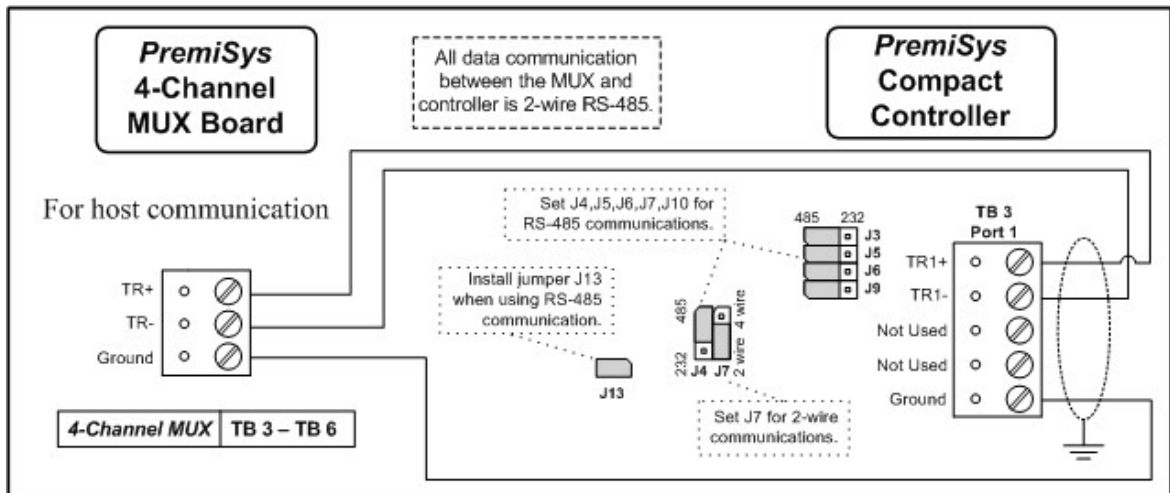
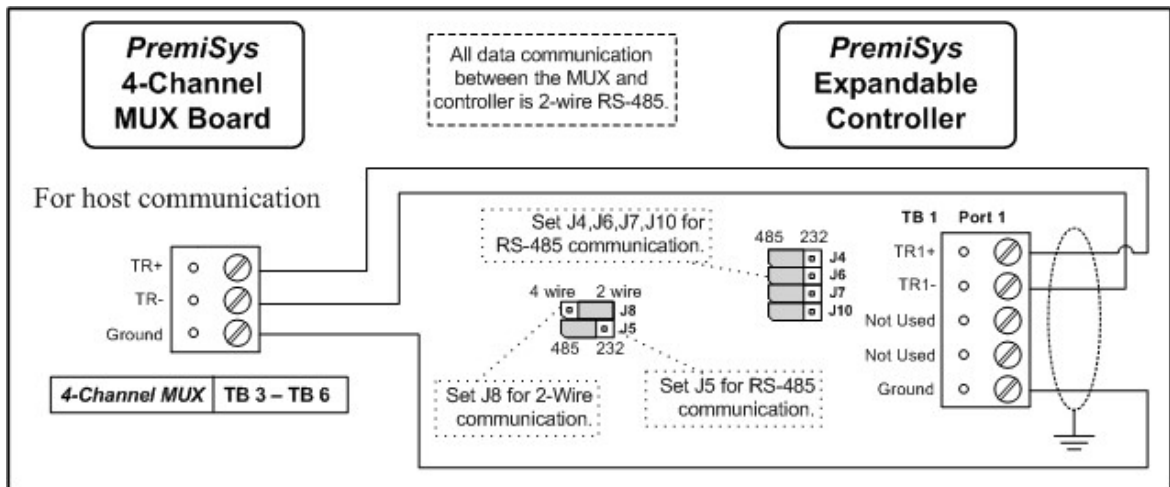
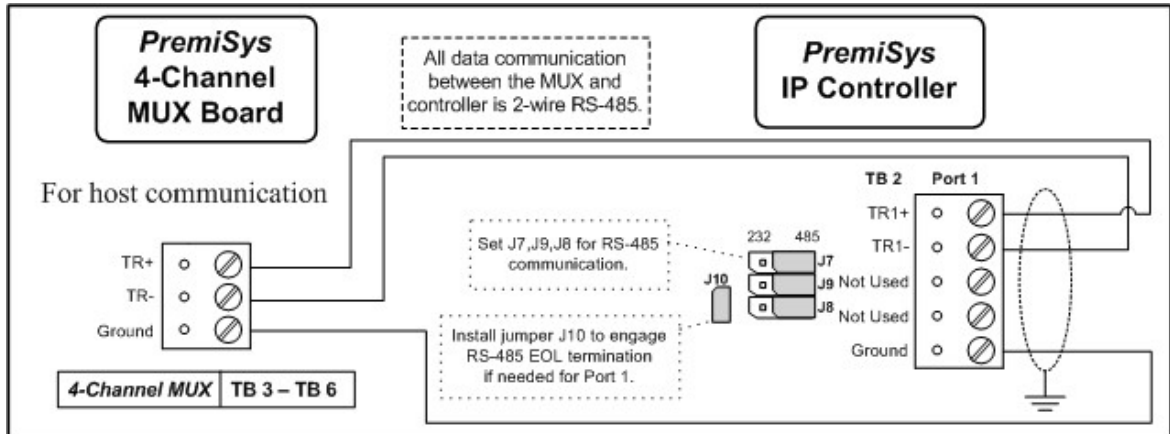


#### Notes:



- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a MUX board between the Host and Two-Reader Controller or One-Door Reader Controller since those controllers cannot receive communications via an RS-485 connection.
- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

Wiring PremiSys Four-Channel MUX Boards to PremiSys Controllers



Notes:

- The MUX boards cannot communicate to any board or controller

that cannot receive communications via RS-485. You cannot use a MUX board between the Host and Two-Reader Controller or One-Door Reader Controller since those controllers cannot receive communications via an RS-485 connection.

- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

### Communications to I/O Boards

The Four-Channel and Eight-Channel MUX Boards are both suitable for controller-to-reader boards and I/O boards. IDenticard Systems, Inc. does not recommend the Eight-Channel MUX for host-to-controller communications because it is not optically isolated.

The maximum 4000-foot (1219-meter) wiring distance always includes the wiring needed between the controller and the MUX board. For example, in the diagram below, if the cable between the controller and MUX board is 500 feet (152.4 meters), the run from the MUX board to the first I/O can be up to 3500 feet (91.4 meters).

The cabling distances are per run. To use the illustrated sample again, each of the cables to the three I/O boards can be up to 3500 feet (91.4 meters).

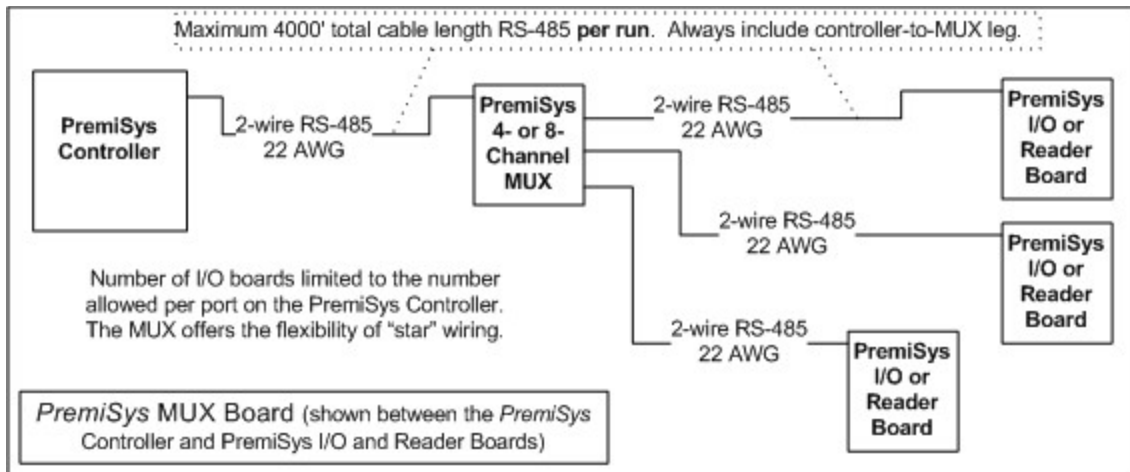
There are jumper and DIP-switch settings that must be made. See the following topics for additional information:

- [PremiSys Four-Channel MUX Board Jumper Settings](#)<sup>[259]</sup>
- [PremiSys Eight-Channel MUX Board Jumper Settings](#)<sup>[262]</sup>
- [PremiSys Four- and Eight-Channel MUX Board DIP Switches - Chart](#)<sup>[263]</sup>

MUX Boards are not addressed using a DIP switch or jumpers and they are not configured in the PremiSys software.



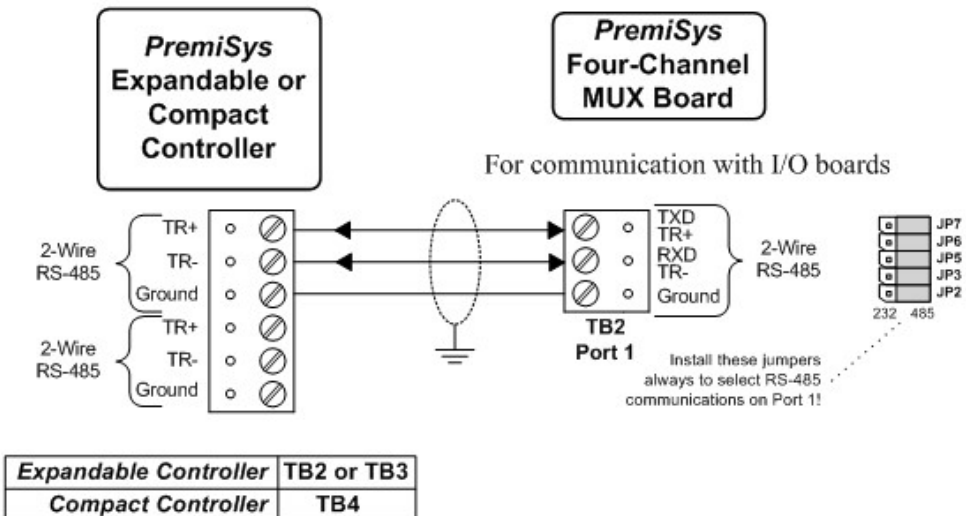
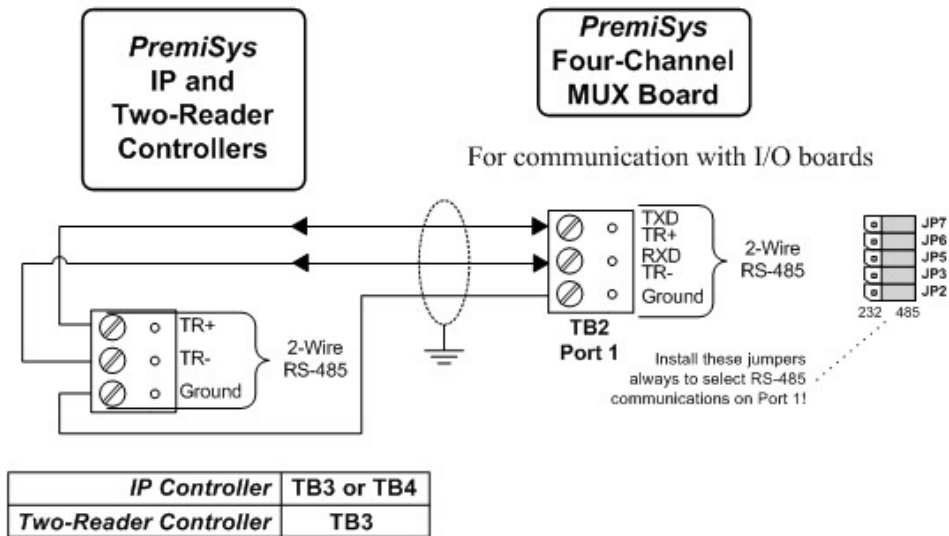
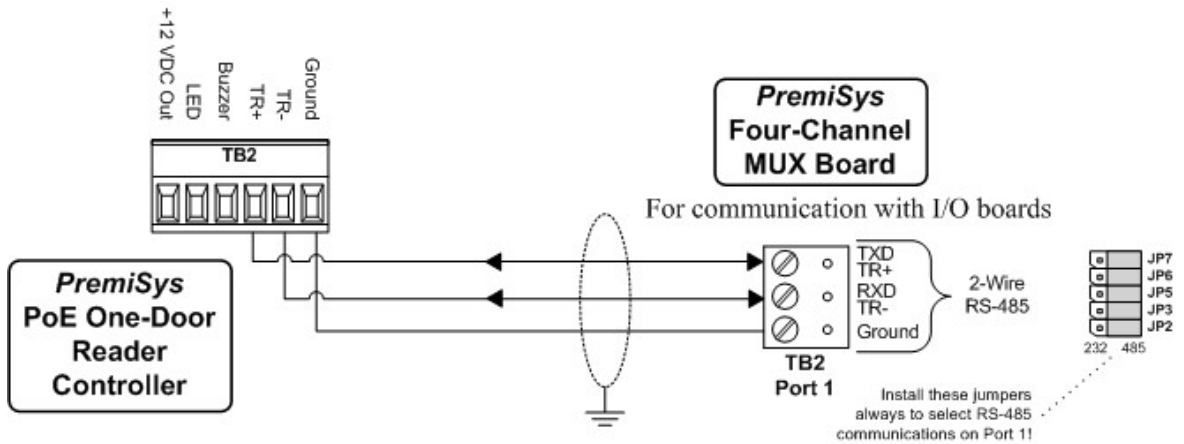
**Note:** The MUX Boards can accept only two-wire RS-485 communication.



### Wiring PremiSys Controllers to the Four- Channel MUX Board

You can use the PremiSys Four-Channel MUX board between the controller and its downstream input, output and reader boards. The schematics below show the wiring from the controllers to a Four-Channel MUX.



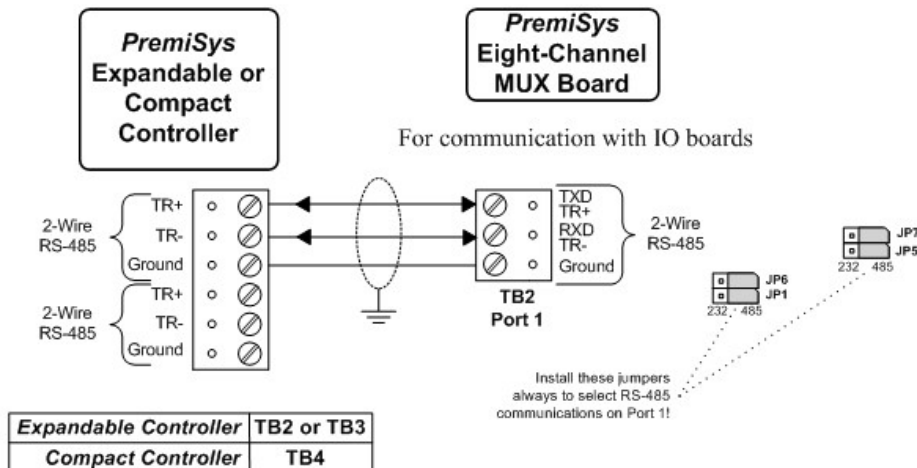
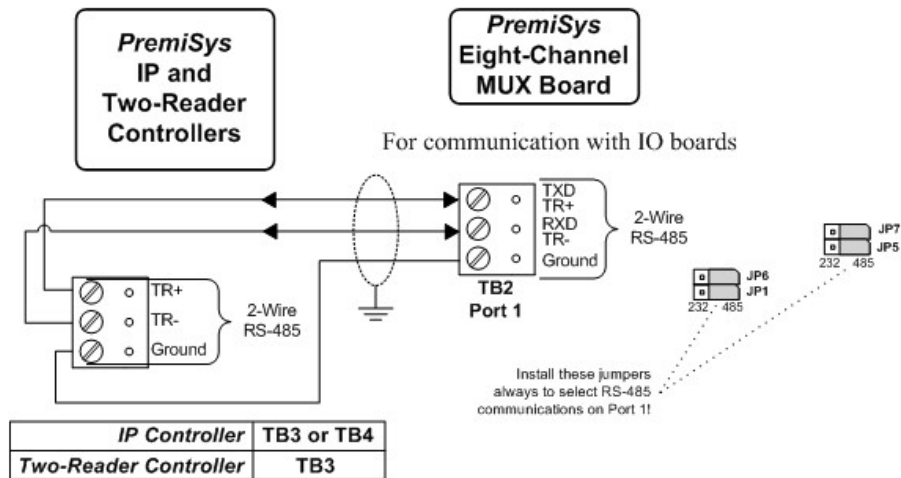
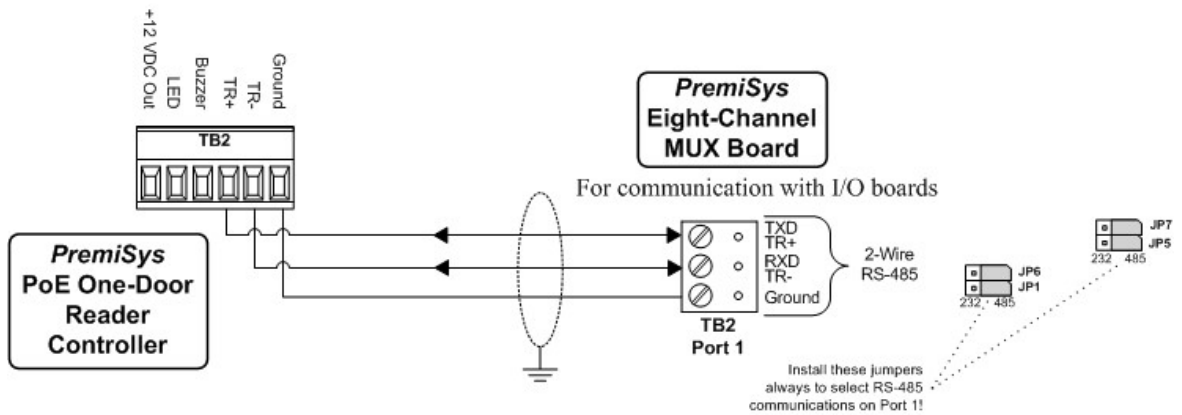


**Notes:**

- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a MUX board between the Host and Two-Reader Controller or One-Door Reader Controller since those controllers cannot receive communications via an RS-485 connection.
- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

**Wiring PremiSys Controllers to the Eight-Channel MUX Board**

You can use the PremiSys Eight-Channel MUX board between the controller and its downstream input, output and reader boards. The schematics below show the wiring from the controllers to an Eight-Channel MUX.



**Notes:**



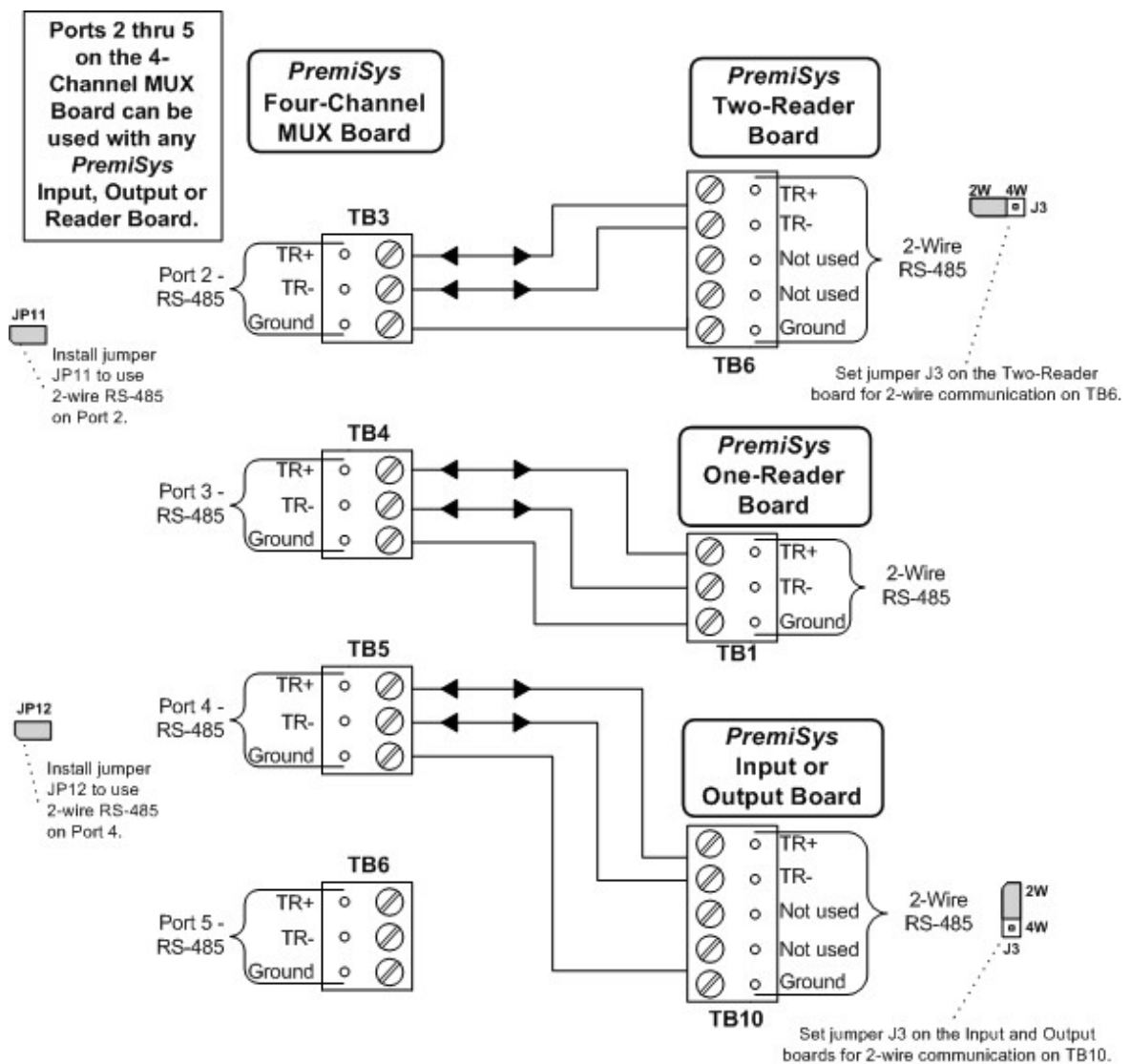
- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a MUX board between the Host and Two-Reader Controller or One-Door Reader Controller since those controllers cannot receive

communications via an RS-485 connection.

- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

#### Wiring PremiSys Four-Channel MUX Board to One-Reader, Two-Reader, Input or Output Boards

You can use the PremiSys Four-Channel MUX board between the controller and its downstream input, output and reader boards. The schematics below show the wiring from the Four-Channel MUX board to reader, input and output boards.



#### Notes:

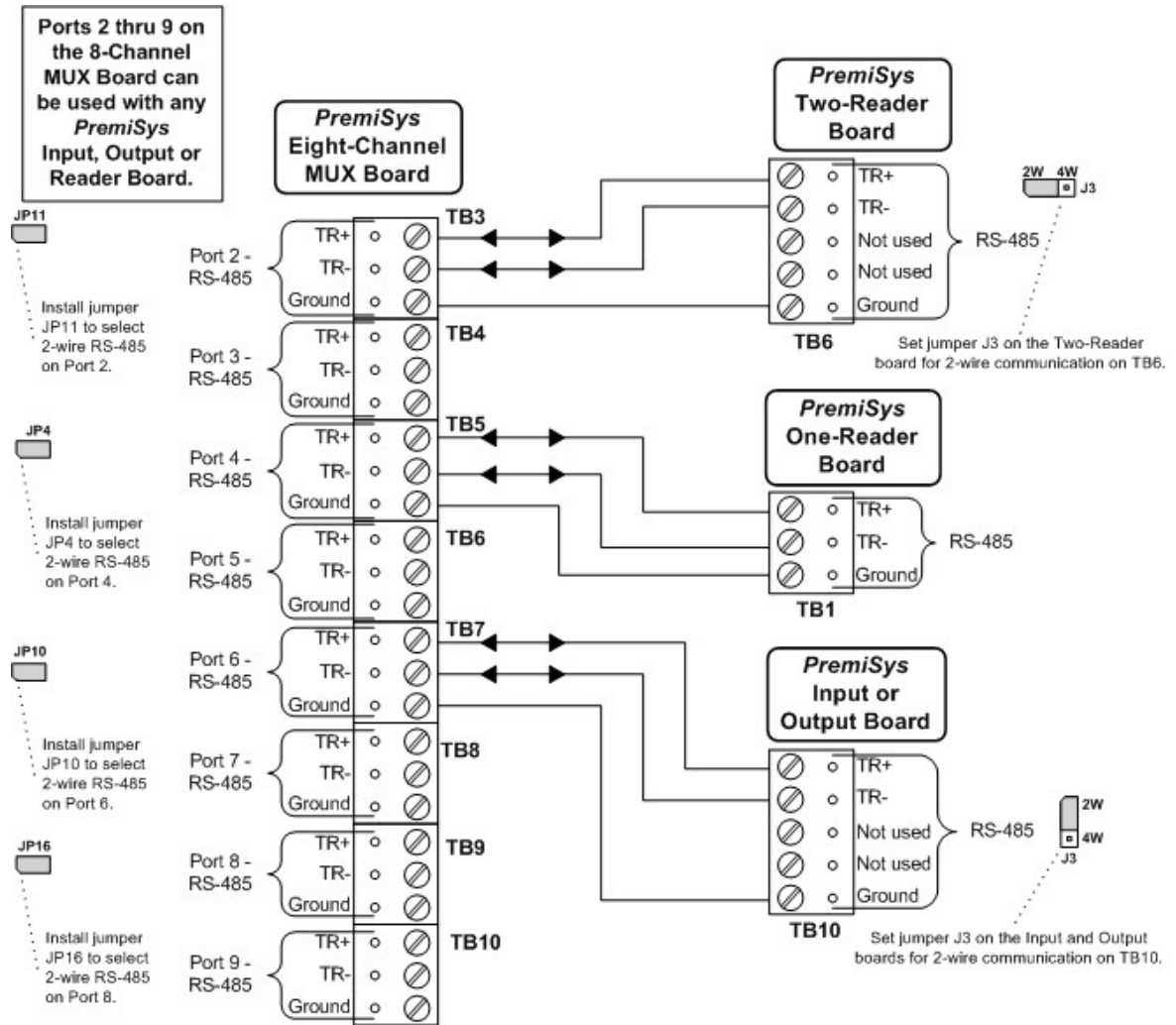
- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a

MUX board between the Host and Two-Reader Controller or One-Door Reader Controller since those controllers cannot receive communications via an RS-485 connection.

- You cannot use the MUX boards between a controller and a One-Door Reader Board because the One-Door Reader Board cannot receive communications via an RS-485 connection.
- Do not connect a MUX board to another MUX board.

**Wiring PremiSys Eight-Channel MUX Board to One-Reader, Two-Reader, Input or Output Boards**

You can use the PremiSys Eight-Channel MUX board between the controller and its downstream input, output and reader boards. The schematics below show the wiring from the Eight-Channel MUX board to reader, input and output boards.



**Notes:**



- The MUX boards cannot communicate to any board or controller that cannot receive communications via RS-485. You cannot use a