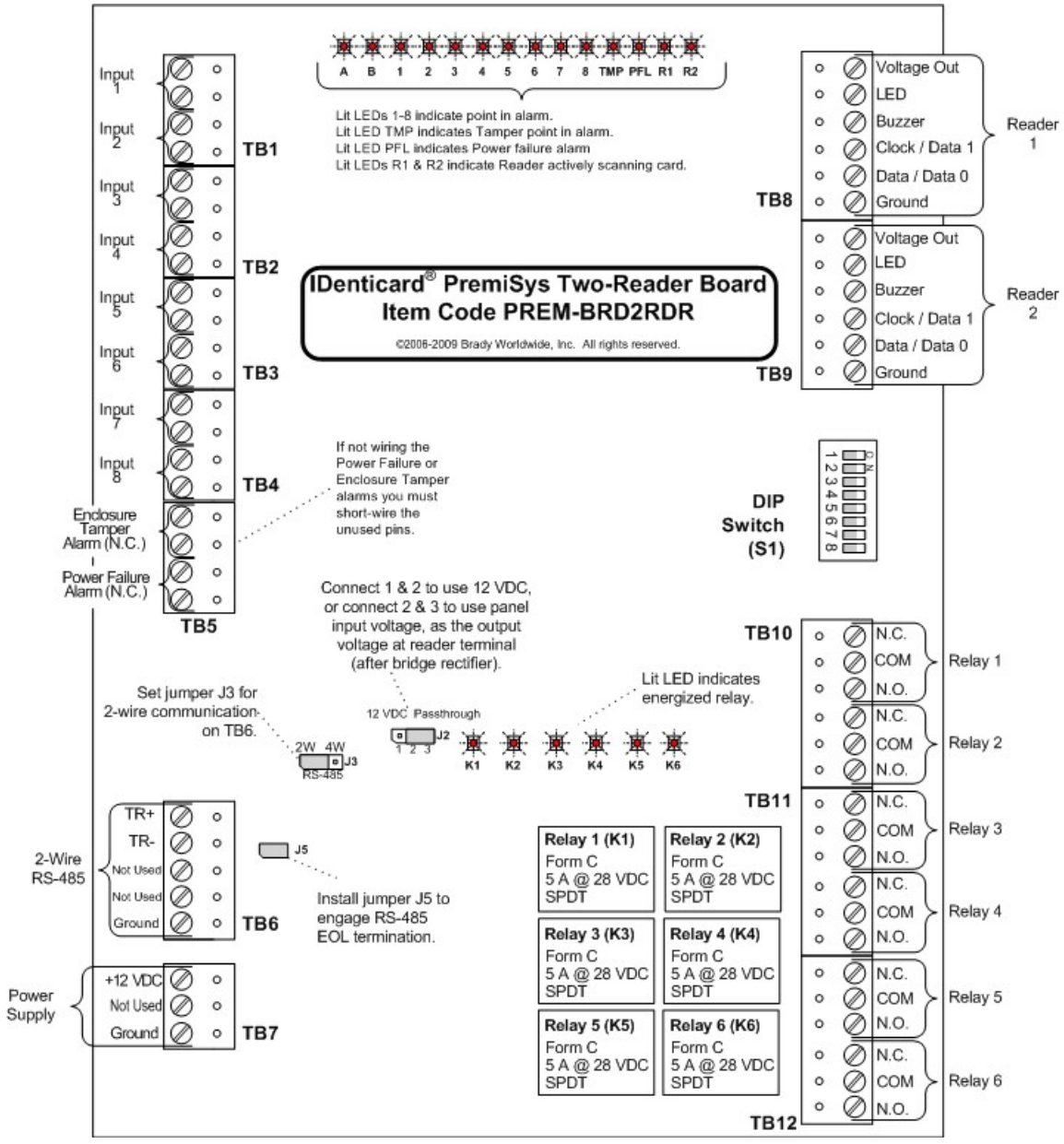
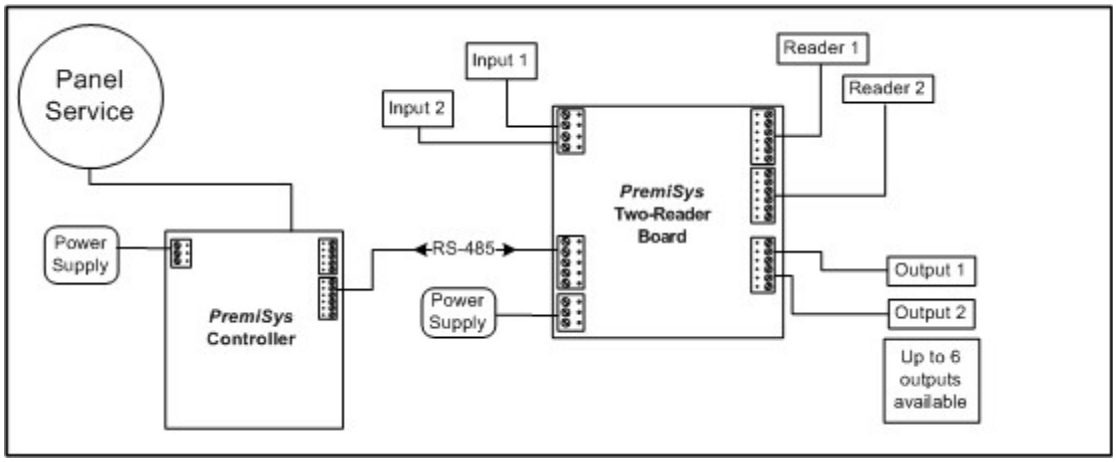
PremiSys Two-Reader Board



Sample General Configuration for a PremiSys Two-Reader Board Connected to a PremiSys Controller, a Reader and Auxiliary Equipment



Two-Reader Board Specifications

Certifications for the Two-Reader 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 Two-Reader Board

Board Width	8.0 inches (203 mm)
Board Height	6.0 inches (152 mm)
Board Depth	1.0 inch (25 mm)
Board Weight	11 ounces (312 g) (nominal)

Environmental Specifications for the Two-Reader 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 Two-Reader Board

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

Input Voltage	12 VDC ± 10%, 550 mA peak
Relay Ratings (each of six relays)	5 A at 28 VDC, noninductive load
Relay Contact Type	Form C
Relay Configuration	Single-pole double-throw (SPDT)
Inputs – Assignable	Eight supervised input points with end-of-line (EOL) resistors, 1K / 2K ohm 1% ¼ watt standard
Input – Dedicated	Two unsupervised, dedicated input point for enclosure tamper and power loss.
Card Reader Power (each of two readers)	12 VDC ± 10%, regulated 125 mA maximum each reader (see “Important” alert above) or 12 VDC ± 10% (input voltage passed through), 125 mA maximum each reader
Reader LED Output	TTL-compatible; high > 3 V, low < 0.5 V; 5 mA source/sink maximum
Reader Data Inputs	TTL-compatible inputs

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 Two-Reader Board

Power to Two-Reader Board	Twisted pair, 18 AWG (0.823 mm^2).
RS-485 Connection to PremiSys Controller	Twisted pairs, 22 AWG (0.325 mm2), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops
Connection to Relay-Controlled Devices	Use wire and gauge as required by load.
Connection to Input-Point Devices	One twisted pair per input, 30 ohms maximum
Connection to Reader	Six-conductor, 18 AWG. Maximum cable length: 500 feet (150 m), total copper, including drops

Communications Specifications for the Two-Reader Board

To PremiSys Controller or MUX Board	Two-wire RS-485, via TB1, 2,400-38,400 bps.

Access-Control Specifications for the Two-Reader Board

Relay Pulse Time	1 to 255 seconds
Door-Position Shunt Time	1 to 255 seconds

Indicators on the Two-Reader Board

Visible	20 red, single-color LEDs

Two-Reader Board DIP Switches – Chart

	Switches							
Selection	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Address 0	Off	Off	Off	Off	Off			
Address 1	**On**	Off	Off	Off	Off			
Address 2	Off	**On**	Off	Off	Off			

Address 3	**On**	**On**	Off	Off	Off			
Address 4	Off	Off	**On**	Off	Off			
Address 5	**On**	Off	**On**	Off	Off			
Address 6	Off	**On**	**On**	Off	Off			
Address 7	**On**	**On**	**On**	Off	Off			
Address 8	Off	Off	Off	**On**	Off			
Address 9	**On**	Off	Off	**On**	Off			
Address 10	Off	**On**	Off	**On**	Off			
Address 11	**On**	**On**	Off	**On**	Off			
Address 12	Off	Off	**On**	**On**	Off			
Address 13	**On**	Off	**On**	**On**	Off			
Address 14	Off	**On**	**On**	**On**	Off			
Address 15	**On**	**On**	**On**	**On**	Off			
Address 16	Off	Off	Off	Off	**On**			
Address 17	**On**	Off	Off	Off	**On**			
Address 18	Off	**On**	Off	Off	**On**			
Address 19	**On**	**On**	Off	Off	**On**			
Address 20	Off	Off	**On**	Off	**On**			
Address 21	**On**	Off	**On**	Off	**On**			
Address 22	Off	**On**	**On**	Off	**On**			
Address 23	**On**	**On**	**On**	Off	**On**			
Address 24	Off	Off	Off	**On**	**On**			
Address 25	**On**	Off	Off	**On**	**On**			
Address 26	Off	**On**	Off	**On**	**On**			
Address 27	**On**	**On**	Off	**On**	**On**			
Address 28	Off	Off	**On**	**On**	**On**			
Address 29	**On**	Off	**On**	**On**	**On**			
Address 30	Off	**On**	**On**	**On**	**On**			
Address 31	**On**	**On**	**On**	**On**	**On**			
2400 bps						Off	Off	
9600 bps						**On**	Off	
19,200 bps						Off	**On**	
38,400 bps						**On**	**On**	
Not used								Off

Two-Reader Board Jumper Settings

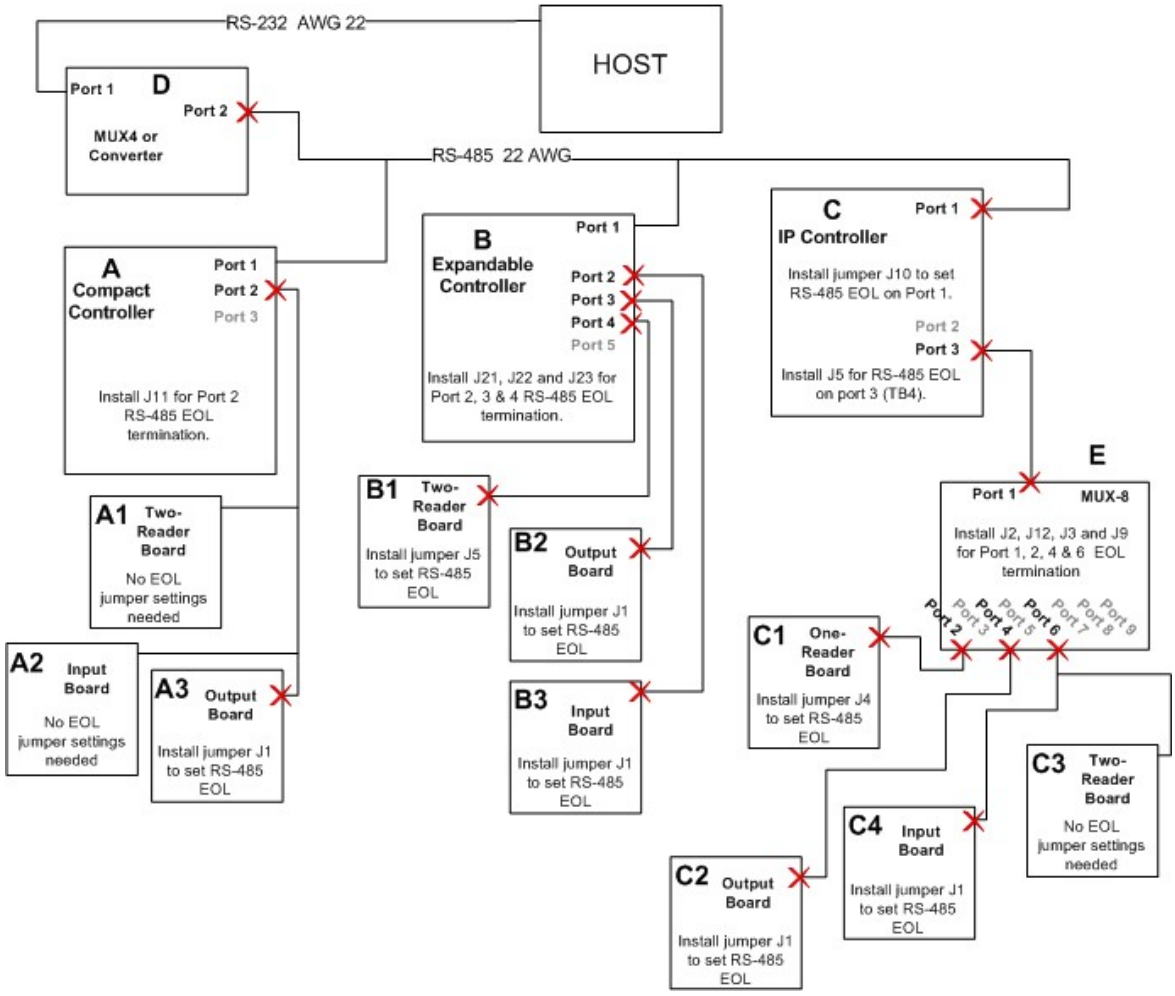
Jumper	Setting	Selection
J2	1-2 On [12V]	Regulated 12 VDC is supplied to reader ports.
	2-3 On [PT]	Input voltage at TB7 is “passed through” to reader ports.
J3	2W	Always choose this option to use two-wire RS-485 communications TB6.
	4W	Do not select this option. Four-wire RS-485 is not used.
J5,J6	Off	RS-485 EOL termination on TB6 is disabled.
	On	RS-485 EOL termination on TB6 is enabled.

IMPORTANT! You must provide at least 20 VDC of input voltage to the Two-Reader Board input to obtain 12 VDC at the reader port.

Setting End-of-Line (EOL) Resistance for the Two-Reader Board

If the PremiSys™ Two-Reader Board is the last board in a run, install jumpers J5 and J6 to set RS-485 EOL.

In the diagram below, boards A3, B1, B2, B3, C1, C2, and C3 should be set as end-of-line. The originating port on the associated controller should also be set for end-of-line.



Wiring a Two-Reader 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.

The Two-Reader Board can be powered with the 12 VDC supplied by any of the PremiSys™ power sources. To power the readers from the board, choose the "Pass-through" selection. Exercise caution to be sure that the voltage supplied to the Two-Reader Board is not too great for the reader to handle.

If you are connecting the Two-Reader Board to a reader that requires a voltage lower than 12V you must use a resistor to lower the voltage going out of the reader port.

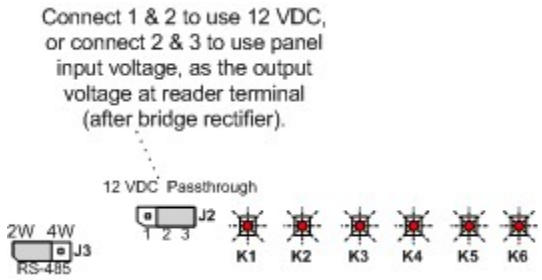
If you are connecting the Two-Reader Board to a reader that requires a voltage higher than 12V, set jumper J2 for "12VDC" but use a separate power source wired directly to

the reader to power it.

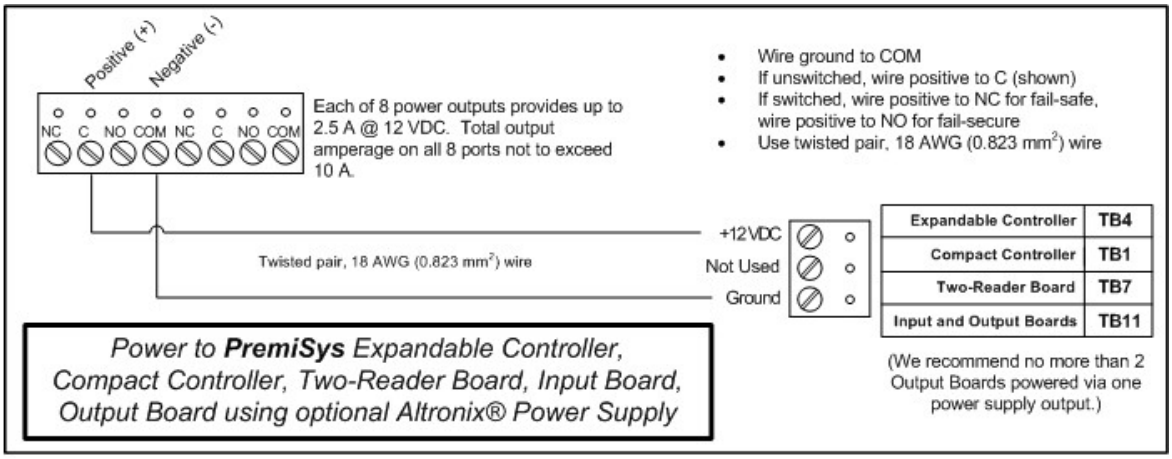
IMPORTANT! You may need to use a separate power supply to power your readers if:

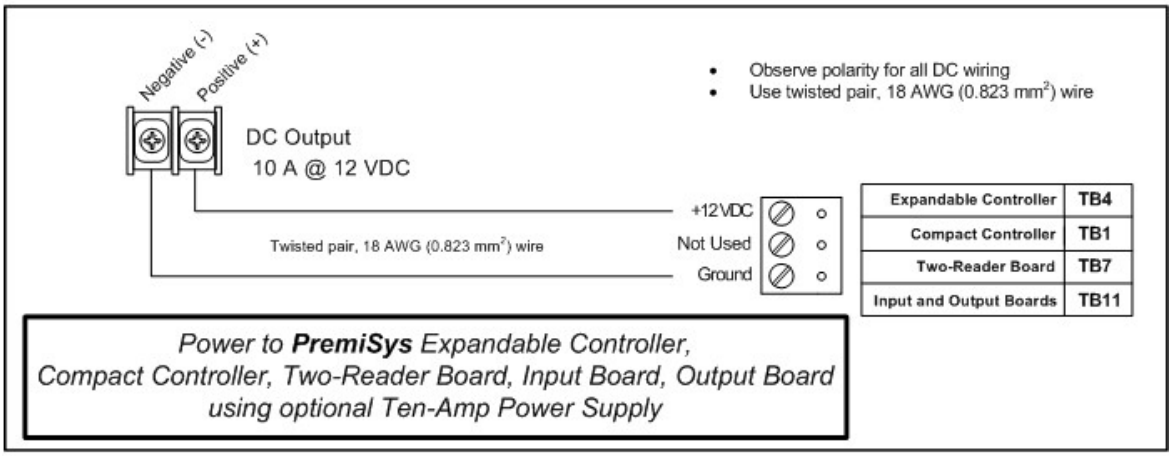
- **Your readers require 12 VDC or greater. You may be able to use the PremiSys Power Supply and get 12VDC at the readers when 12VDC is supplied to the board.**
- **Your readers require less than 12 VDC. In this case you must use a resistor to reduce the power output to match the power requirements of your readers.**

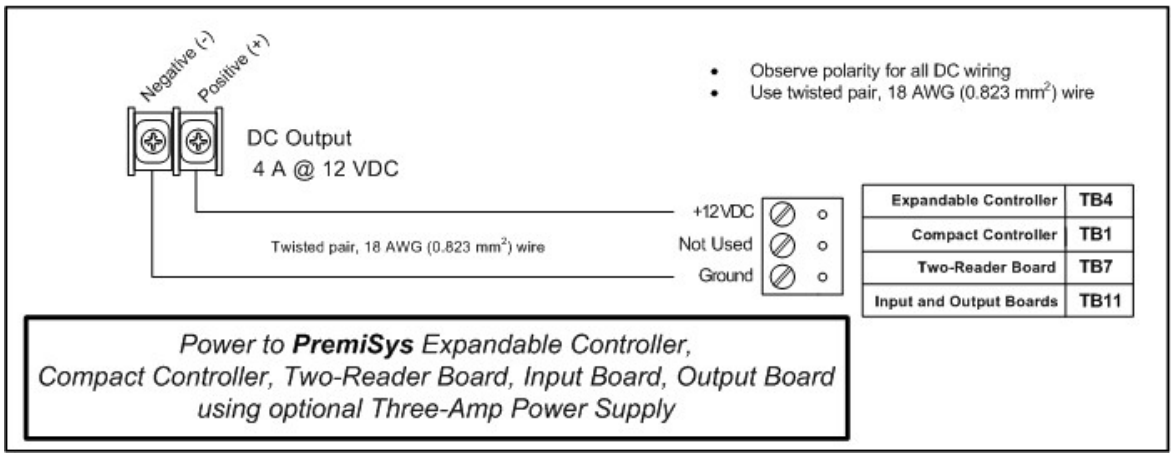
The voltage selection is made using jumper J2 on the Two-Reader Board:



Refer to the documentation enclosed with individual readers to determine if the readers must have their own separate power source and not be powered from the Two-Reader Board.


Positive (+)
Negative (-)
NC C NO COM NC C NO COM
Each of 8 power outputs provides up to 2.5 A @ 12 VDC. Total output amperage on all 8 ports not to exceed 10 A.
Wire ground to COM
If unswitched, wire positive to C (shown)
If switched, wire positive to NC for fail-safe, wire positive to NO for fail-secure
Use twisted pair, 18 AWG (0.823 mm²) wire
+12VDC
Not Used
Ground
Twisted pair, 18 AWG (0.823 mm²) wire
Expandable Controller TB4
Compact Controller TB1
Two-Reader Board TB7
Input and Output Boards TB11
(We recommend no more than 2 Output Boards powered via one power supply output.)
Power to PremiSys Expandable Controller, Compact Controller, Two-Reader Board, Input Board, Output Board using optional Altronix® Power Supply


Negative (-)
Positive (+)
DC Output
10 A @ 12 VDC
Observe polarity for all DC wiring
Use twisted pair, 18 AWG (0.823 mm²) wire
+12VDC
Not Used
Ground
Twisted pair, 18 AWG (0.823 mm²) wire
Expandable Controller TB4
Compact Controller TB1
Two-Reader Board TB7
Input and Output Boards TB11
Power to PremiSys Expandable Controller, Compact Controller, Two-Reader Board, Input Board, Output Board using optional Ten-Amp Power Supply


Negative (-)
Positive (+)
DC Output
4 A @ 12 VDC
Observe polarity for all DC wiring
Use twisted pair, 18 AWG (0.823 mm²) wire
+12VDC
Not Used
Ground
Twisted pair, 18 AWG (0.823 mm²) wire
Expandable Controller TB4
Compact Controller TB1
Two-Reader Board TB7
Input and Output Boards TB11
Power to PremiSys Expandable Controller, Compact Controller, Two-Reader Board, Input Board, Output Board using optional Three-Amp Power Supply

The Two-Reader Board has 20 LEDs:

- **LEDs** A and B indicate operation and communication of the board with the connected controller, as described below.
- **LEDs** R1 and R2 indicate the status of the board's readers, as described below.
- **LEDs** 1 through 8 indicate when the relevant input on the board goes into alarm, as described below.
- **LEDs** CT and PFL indicate the status of the dedicated inputs for cabinet tamper (CT) and power fault (PFL), as described below.

LED A indicates the heartbeat and online/offline status of the board as follows:

- If the board is **offline**, the LED cycles **off** for 800msec and **on** for 200msec.
- If the board is **online**, the LED cycles **on** for 800msec and **off** for 200msec.

LED B indicates communication activity on the RS-485 bus, not necessarily on the Two-Reader Board.

LEDs R1 and **R2** light to show activity at their respective readers.

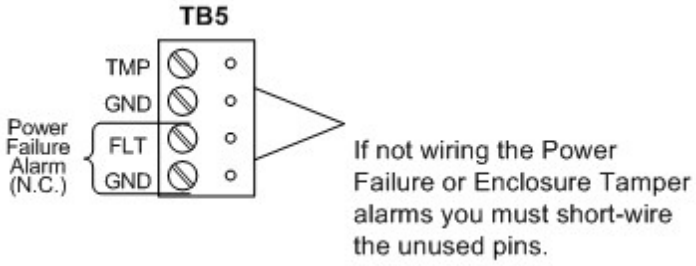
LEDs 1 through **8** flash every few seconds when the inputs are in a normal state. They glow steadily with an intermittent flash when their respective points go into alarm. They flash off and on several times every second when there is a fault (short) in the circuit. LEDs for points not in alarm continue to flash every few seconds when other points go into alarm.

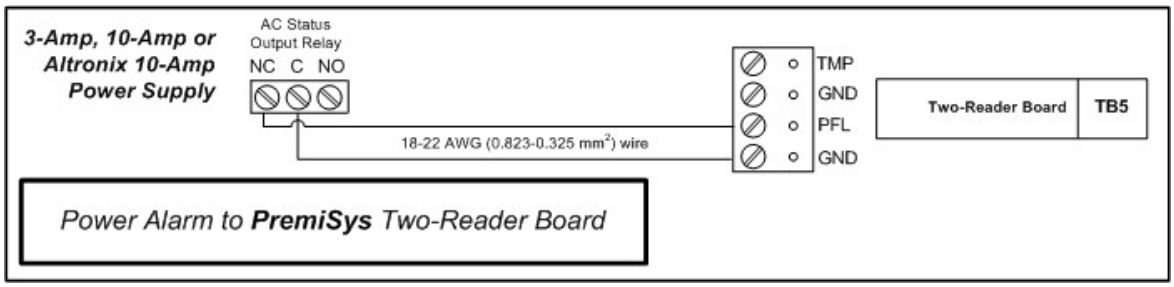
LEDs CT and **PFL** flash every few seconds when the inputs are in a normal state. They glow steadily with an intermittent flash when their respective points go into alarm.

LEDs K1 through **K6** remain unlit if their respective relays are inactive. If a relay is active, its LED glows steadily.

Wiring a Two-Reader Board to Monitor for UPS Power Loss

The PremiSys™ Two-Reader Board has dedicated inputs on terminal block 5 (see image below) for use as Enclosure Tamper and Power Failure Alarms. If these dedicated inputs are not wired for their intended use, install a shorting wire on each of them.

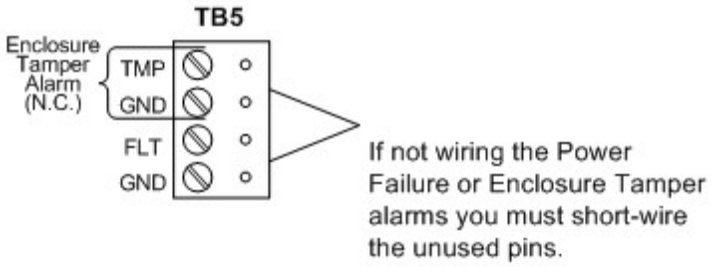




TB 5		
Power Failure	TB5-1	Ground
	TB5-2	Input 1

Wiring a Two-Reader Board Enclosure Tamper

The PremiSys™ Two-Reader Board has dedicated inputs on terminal block 5 (see image below) for use as Enclosure Tamper and Power Failure Alarms. If these dedicated inputs are not wired for their intended use, install a shorting wire on each of them.

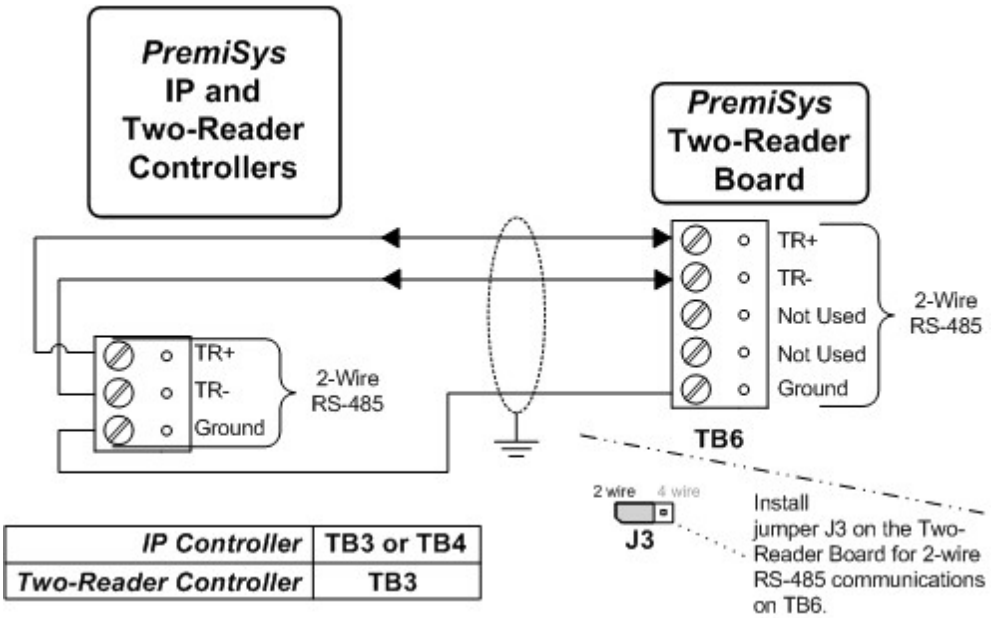


TB 5		
Enclosure Tamper	TB5-3	Ground
	TB5-4	Input 1

Wiring a Two-Reader Board to a Controller

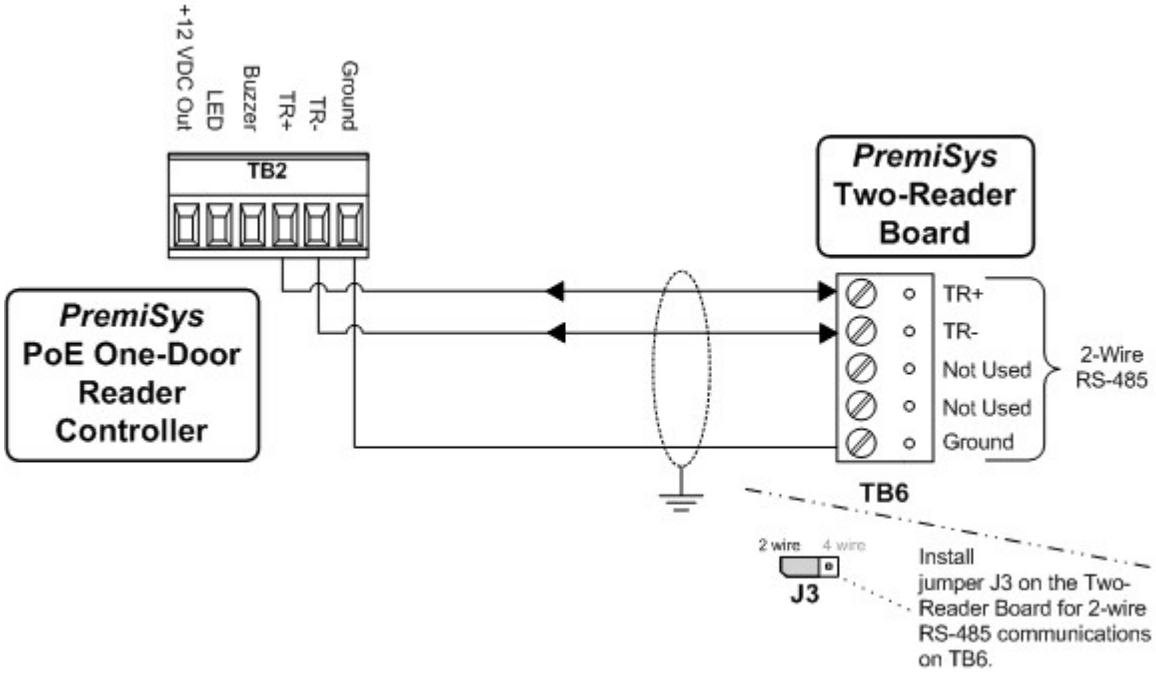
Note: Listed below are the maximum numbers of Two-Reader Boards you can connect to each of the named controllers. In parentheses are the maximum numbers of allowable doors (readers) on each controller:
IP Controller - 64 (64)

Two-Reader Controller - 32 (64)
PoE One-Door Reader Controller - 8 (17)

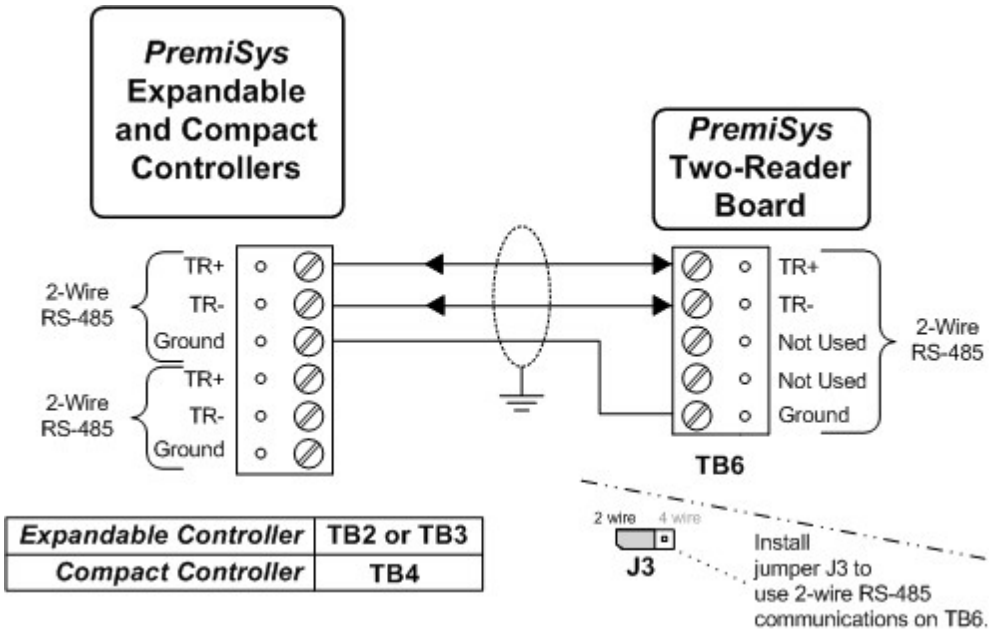


IP Controller	TB3 or TB4
Two-Reader Controller	TB3

IMPORTANT! Install Jumper J3 exactly as illustrated in the diagram above! Four-wire RS-485 cannot be used!



IMPORTANT! Install Jumper J3 exactly as illustrated in the diagram above! Four-wire RS-485 cannot be used!

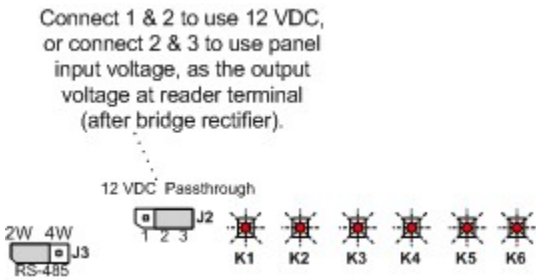


IMPORTANT! Install Jumper J3 exactly as illustrated in the diagram above! Four-wire RS-485 cannot be used!

Wiring a Two-Reader Board to Wiegand and ABA Readers

The Two-Reader Board can be powered with the 12 VDC supplied by any PremiSys™ power source. Then, to power the readers from the board, choose the selection in which the board-input voltage is passed through to the reader terminal block. Exercise caution to be sure that the voltage supplied to the Two-Reader Board is not too great for the reader to handle.

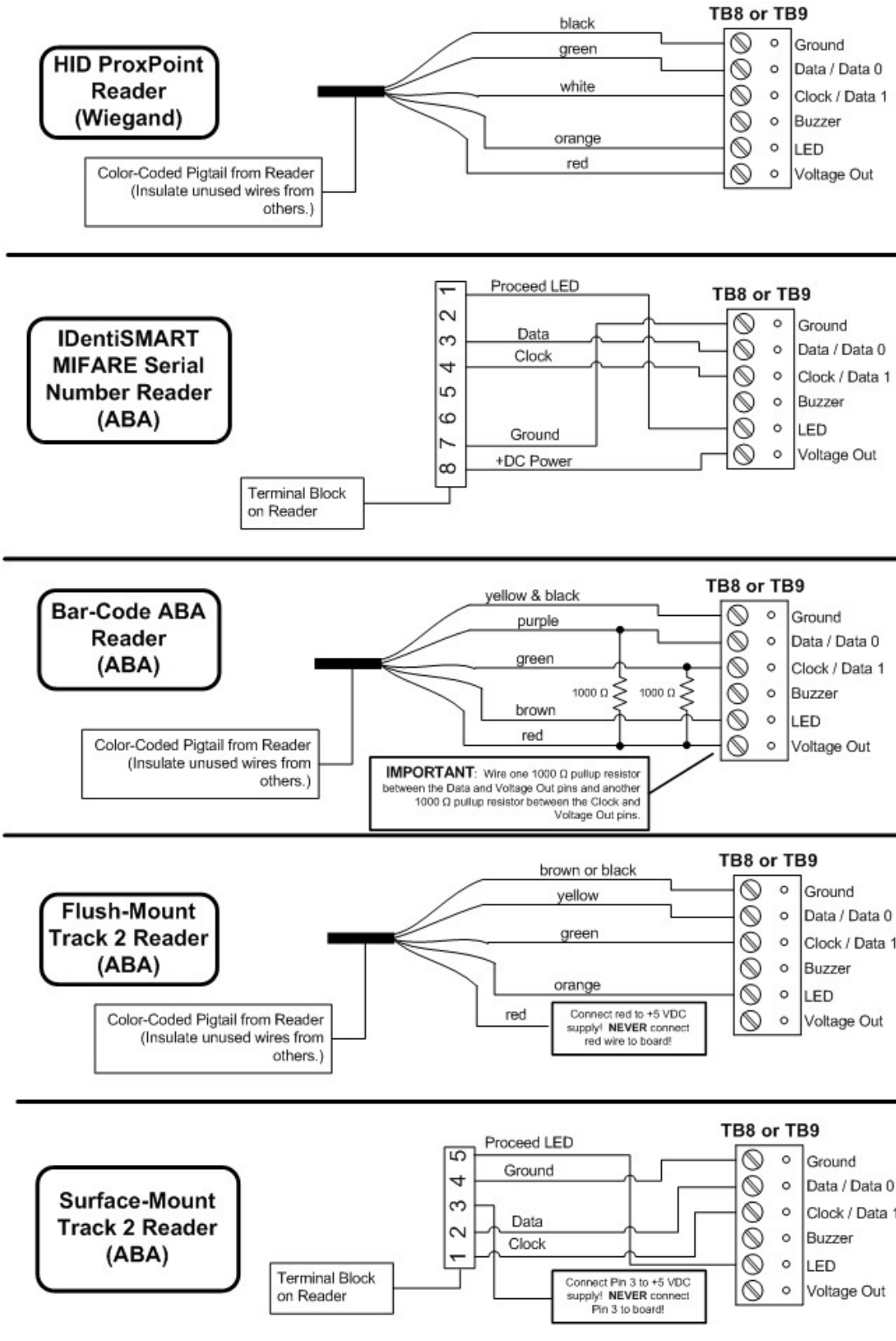
The voltage selection is made using jumper J2 on the Two-Reader Board.



Refer to the documentation enclosed with individual readers if the readers:

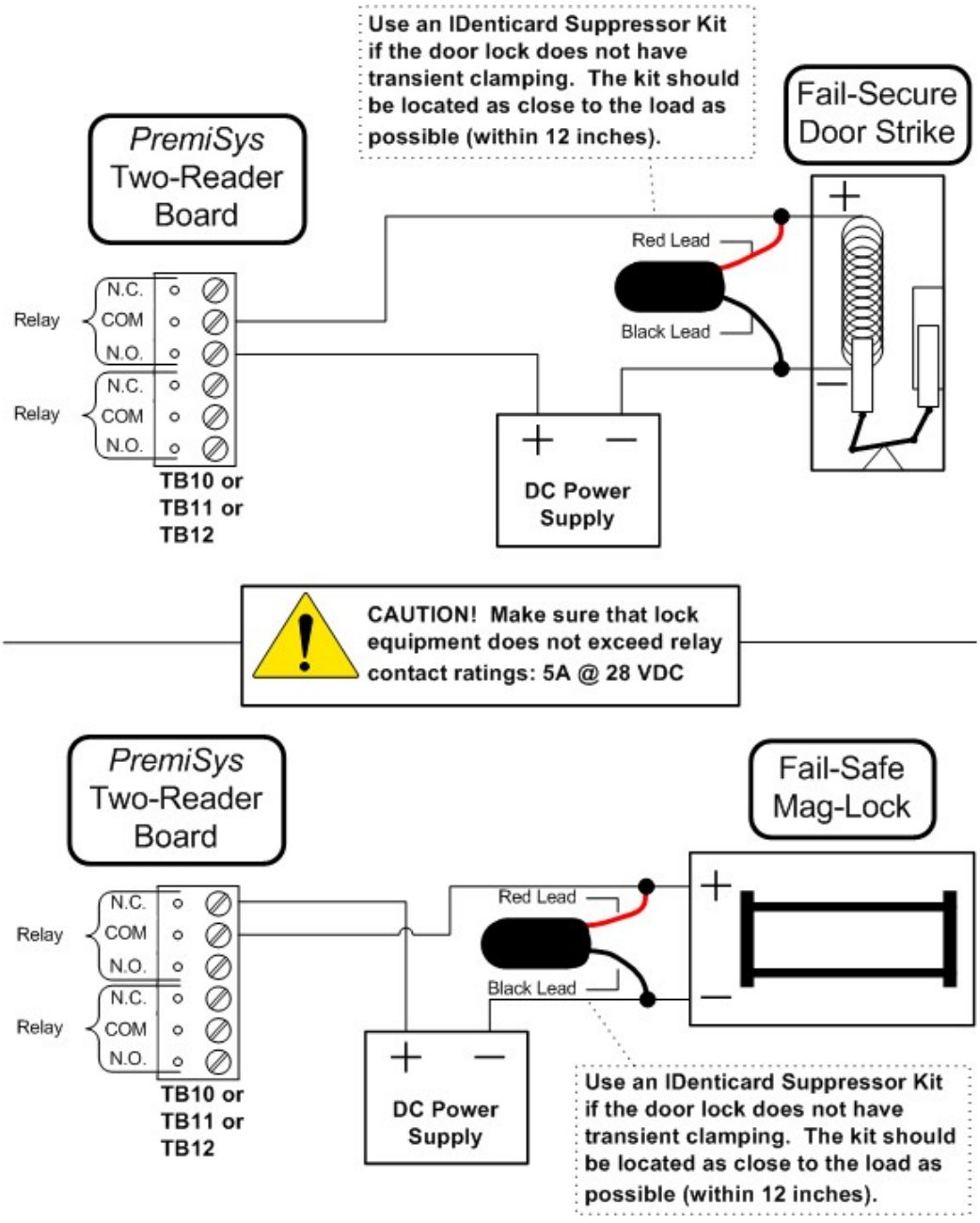
- Use a terminal block for connection to the board rather than a “pigtail” cable as shown below. Always double-check the color-coding scheme of any reader using a pigtail. The scheme depicted in this illustration is a very common standard, but may not necessarily be universal.
- Must have their own separate power source and not be powered from the Two-Reader Board.

IMPORTANT! When powering this board using either the Three-Amp or Ten-Amp Power Supplies, choose to pass the voltage through to the reader ports. You must provide at least 20 VDC of input voltage to the Two-Reader Board input to obtain regulated 12 VDC at the reader ports.


HID ProxPoint Reader (Wiegand)
Color-Coded Pigtail from Reader (Insulate unused wires from others.)
black
green
white
orange
red
TB8 or TB9
Ground
Data / Data 0
Clock / Data 1
Buzzer
LED
Voltage Out
IDentiSMART MIFARE Serial Number Reader (ABA)
Terminal Block on Reader
1 2 3 4 5 6 7 8
Proceed LED
Data
Clock
Ground
+DC Power
Bar-Code ABA Reader (ABA)
Color-Coded Pigtail from Reader (Insulate unused wires from others.)
yellow & black
purple
green
brown
red
1000 Ω
1000 Ω
IMPORTANT: Wire one 1000 Ω pullup resistor between the Data and Voltage Out pins and another 1000 Ω pullup resistor between the Clock and Voltage Out pins.
Flush-Mount Track 2 Reader (ABA)
Color-Coded Pigtail from Reader (Insulate unused wires from others.)
brown or black
yellow
green
orange
red
Connect red to +5 VDC supply! NEVER connect red wire to board!
Surface-Mount Track 2 Reader (ABA)
Terminal Block on Reader
1 2 3 4 5
Proceed LED
Ground
Data
Clock
Connect Pin 3 to +5 VDC supply! NEVER connect Pin 3 to board!

Reader 1		**Reader 2**	
TB8-1	Reader Ground	TB9-1	Reader Ground
TB8-2	Data / Data 0	TB9-2	Data / Data 0
TB8-3	Clock / Data 1	TB9-3	Clock / Data 1
TB8-4	Buzzer	TB9-4	Buzzer
TB8-5	Proceed LED	TB9-5	Proceed LED
TB8-6	Voltage to reader	TB9-6	Voltage to reader

Wiring a Two-Reader Board to Door Strike and Magnetic Lock



Wiring a PremiSys Two-Reader Board to Door Strike and Magnetic Lock (continued)

TB 10 (Output = Relay)		**TB 11** (Output = Relay)	
TB10-1	Relay 2: Normally open	TB11-1	Relay 4: Normally open
TB10-2	Relay 2: Common	TB11-2	Relay 4: Common
TB10-3	Relay 2: Normally closed	TB11-3	Relay 4: Normally closed
TB10-4	Relay 1: Normally open	TB11-4	Relay 3: Normally open
TB10-5	Relay 1: Common	TB11-5	Relay 3: Common
TB10-6	Relay 1: Normally closed	TB11-6	Relay 3: Normally closed

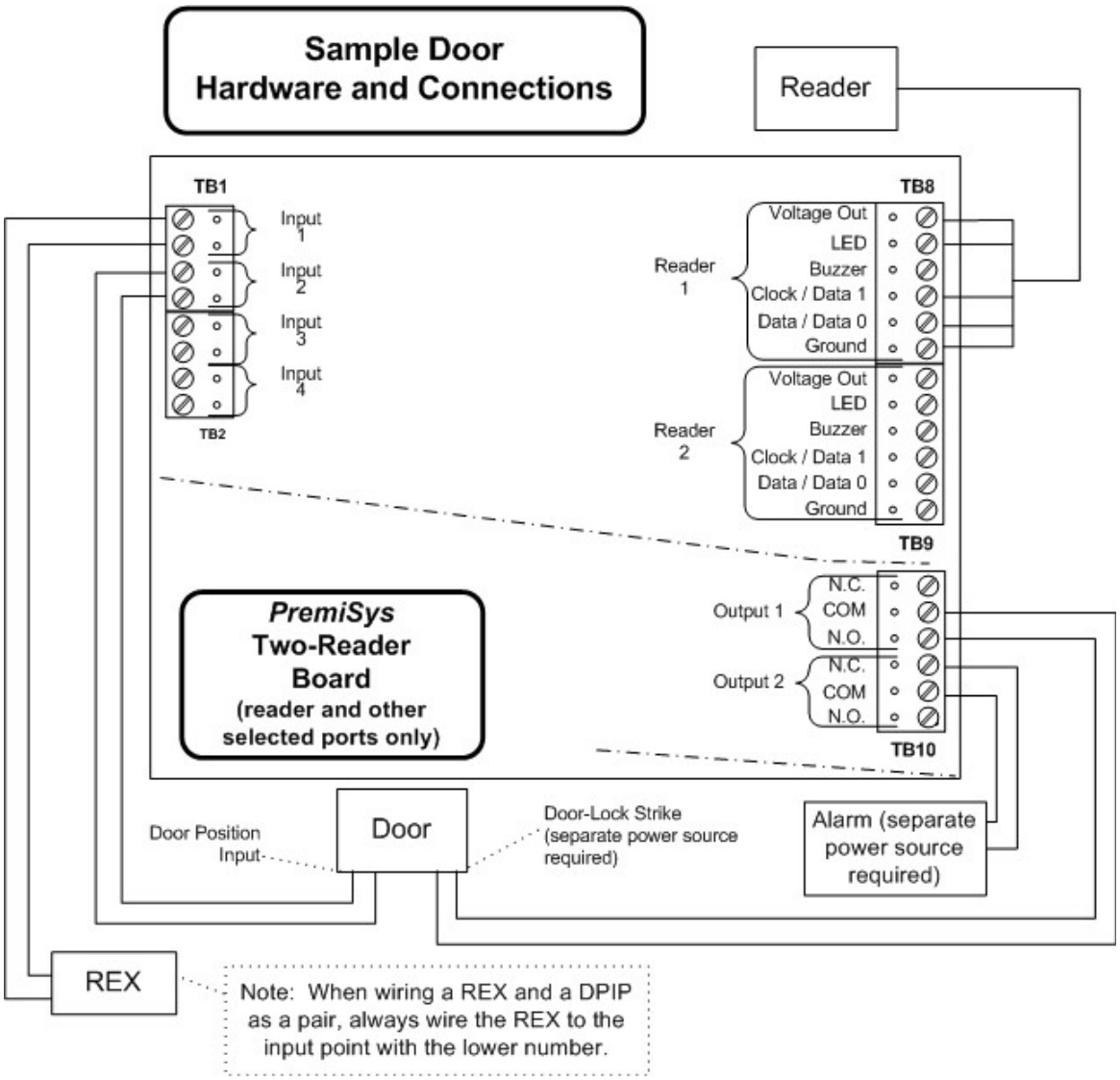
TB 12 (Output = Relay)	
TB12-1	Relay 6: Normally open
TB12-2	Relay 6: Common
TB12-3	Relay 6: Normally closed
TB12-4	Relay 5: Normally open
TB12-5	Relay 5: Common
TB12-6	Relay 5: Normally closed

Connecting Inputs and Relays on the Two-Reader Board

Relays may be wired normally open or normally closed, depending on the needs of the devices they are controlling.

Specify the output configuration (normally open, normally closed, normal action, inverted action) when setting up each relay in the software. See the PremiSys™ Online Help for details.

IMPORTANT! Any device switched by a relay should be powered from "outside" the PremiSys system.



IMPORTANT! Inputs on a single board are normally processed in ascending numeric sequence when they change state simultaneously or nearly simultaneously. Consequently, if wiring a REX input point and a door-position input point in a pair, make sure that the door-position input point has a higher input number than the REX point paired with it.

In the example illustrated above, the REX is wired to Input 1 and the door-position input point to Input 2. In this way, if the state changes on these points appear simultaneously, the system will process the REX before the door-open state, and therefore prevent a door-forced alarm, which would result if the points were processed in the reverse order.

If you cannot wire the points in the proper order, a means exists in the PremiSys

software to override this processing. See the PremiSys Online Help for details.

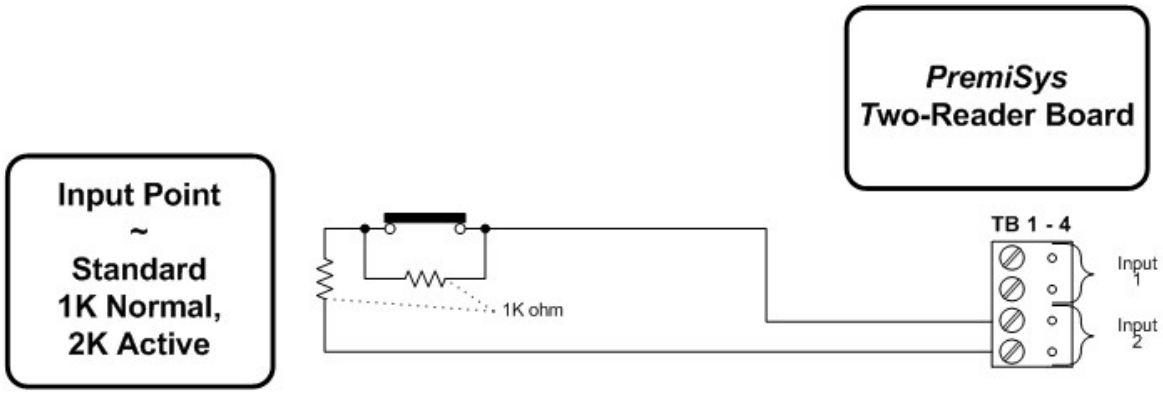
Wiring Supervised Input Points on the Two-Reader Board

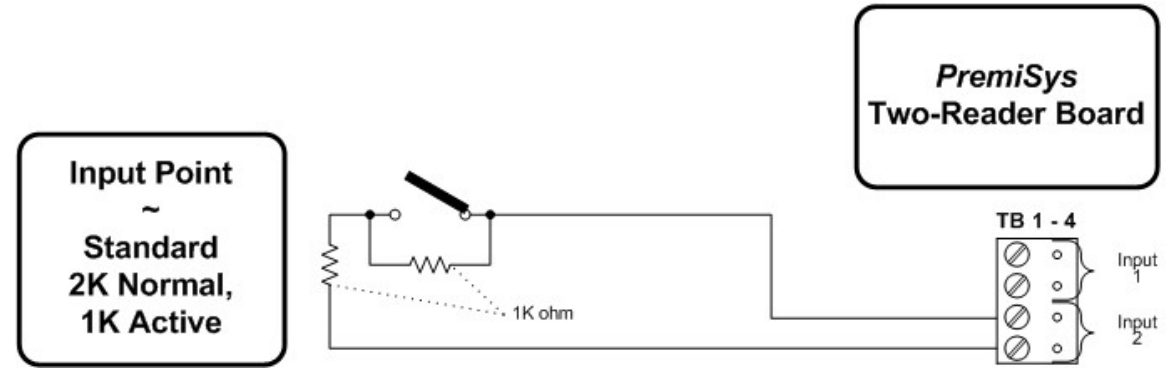
Supervised inputs such as these can be used for door-position input points or any other input that requires supervision. See the topic "Wiring Unsupervised Input Points on the PremiSys Two-Reader Board 220" to wire inputs that do not require supervision.

PremiSys™ supports only the standard “1 K normal, 2 K active” and “2 K normal, 1 K active” supervision modes depicted here.

Input circuits require one twisted pair per input and are rated at 30 ohms maximum.

IMPORTANT! Inputs on a single board are normally processed in ascending numeric sequence when they change state simultaneously or nearly simultaneously. Consequently, if wiring a REX input point and a door-position input point in a pair on a Two-Reader Board, make sure that the door-position input point has a higher input number than the REX point paired with it.





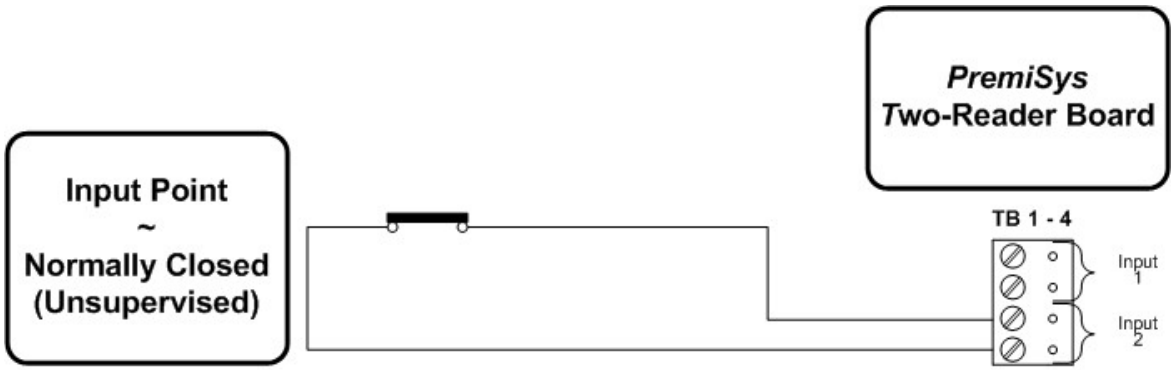
TB1		TB2	
TB1-1	Input 1	TB2-1	Input 3
TB1-2	Input 1	TB2-2	Input 3
TB1-3	Input 2	TB2-3	Input 4
TB1-4	Input 2	TB2-4	Input 4

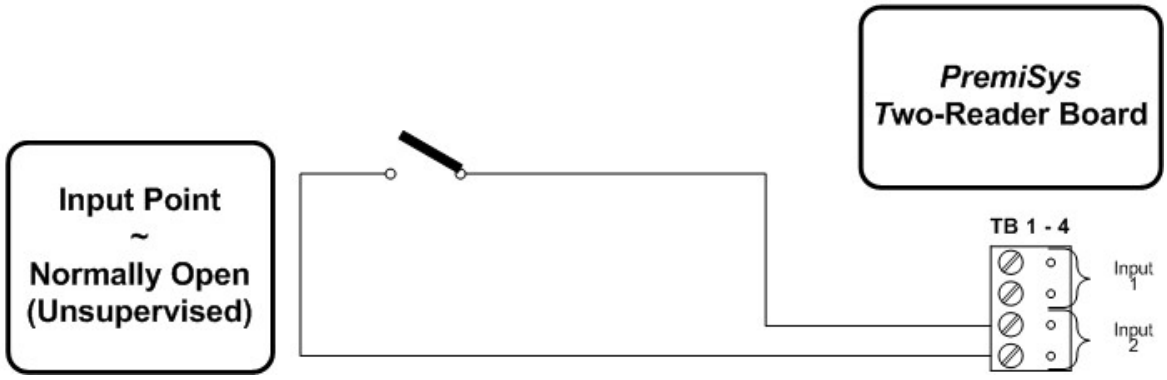
TB3		TB4	
TB3-1	Input 5	TB4-1	Input 7
TB3-2	Input 5	TB4-2	Input 7
TB3-3	Input 6	TB4-3	Input 8
TB3-4	Input 6	TB4-4	Input 8

Wiring Unsupervised Input Points on the Two-Reader Board

Unsupervised inputs such as these can be used for REXes, general-purpose input points or any other input that does not require supervision. See the topic "Wiring Supervised Input Points on the PremiSys Two-Reader Board 219" to wire inputs that require supervision.

Input circuits require one twisted pair per input and are rated at 30 ohms maximum.





TB1		TB2	
TB1-1	Input 1	TB2-1	Input 3
TB1-2	Input 1	TB2-2	Input 3
TB1-3	Input 2	TB2-3	Input 4
TB1-4	Input 2	TB2-4	Input 4

TB3		TB4	
TB3-1	Input 5	TB4-1	Input 7
TB3-2	Input 5	TB4-2	Input 7
TB3-3	Input 6	TB4-3	Input 8
TB3-4	Input 6	TB4-4	Input 8

Two-Reader Board LEDs

The Two-Reader Board has 20 LEDs:

LED			
A	Heartbeat and online status indicator		
B	"On" indicates I/O communication		
Input	Flash every few seconds	Steady glow with intermittent flash	Multiple flashes every second
1	Point 1 Alarm	Point 1 Normal	Point 1 Trouble
2	Point 2 Alarm	Point 2 Normal	Point 2 Trouble
3	Point 3 Alarm	Point 3 Normal	Point 3 Trouble
4	Point 4 Alarm	Point 4 Normal	Point 4 Trouble
5	Point 5 Alarm	Point 5 Normal	Point 5 Trouble
6	Point 6 Alarm	Point 6 Normal	Point 6 Trouble
7	Point 7 Alarm	Point 7 Normal	Point 7 Trouble
8	Point 8 Alarm	Point 8 Normal	Point 8 Trouble
	Flash	On	
Tamper	Enclosure secure	Enclosure tamper	

Power Fault	Power normal	Power lost
Reader		
Reader 1	"**On**" indicates Reader 1 port communication activity	
Reader 2	"**On**" indicates Reader 2 port communication activity	
Relay LED	**Off**	**On**
1	Relay 1 de-energized	Relay 1 energized
2	Relay 2 de-energized	Relay 2 energized
3	Relay 3 de-energized	Relay 3 energized
4	Relay 4 de-energized	Relay 4 energized
5	Relay 5 de-energized	Relay 5 energized
6	Relay 6 de-energized	Relay 6 energized

LEDs A and B indicate operation and communication of the board with the connected controller, as described below:

LED A indicates the heartbeat and online/offline status of the board as follows:

- If the board is **offline**, the LED cycles **off** for 800msec and **on** for 200msec.
- If the board is **online**, the LED cycles **on** for 800msec and **off** for 200msec.

LED B indicates communication activity on the RS-485 bus, not necessarily on the Two-Reader Board.

LEDs R1 and **R2** light to show activity at their respective readers.

LEDs 1 through **8** flash every few seconds when the inputs are in a normal state. They glow steadily with an intermittent flash when their respective points go into alarm. They flash off and on several times every second when there is a fault (short) in the circuit. LEDs for points not in alarm continue to flash every few seconds when other points go into alarm.

LEDs CT and **PFL** flash every few seconds when the inputs are in a normal state. They glow steadily with an intermittent flash when their respective points go into alarm.

LEDs K1 through **K6** remain unlit if their respective relays are inactive. If a relay is active, its LED glows steadily.