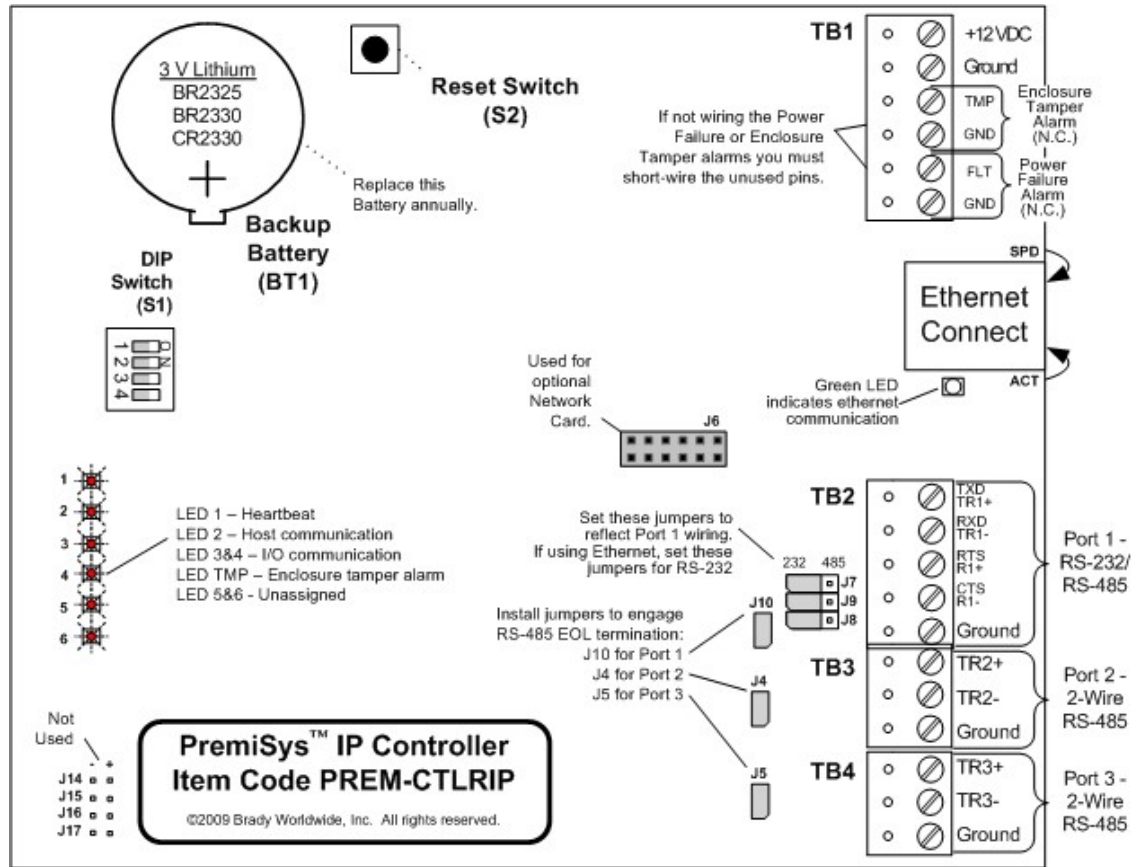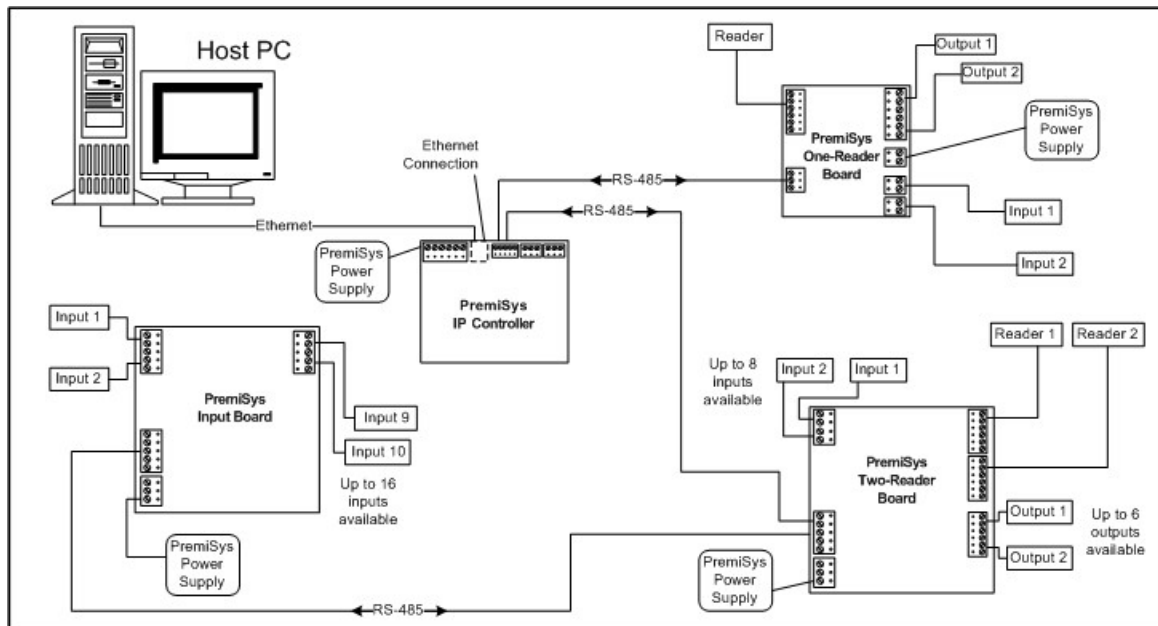## PremiSys IP Controller

Sample General Configuration for a PremiSys IP Controller Connected to other PremiSys Boards, a Reader and Auxiliary Equipment

IP Controller Specifications

Certifications for the IP Controller

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 IP Controller

Controller Width	5.0 inches (127 mm)
Controller Height	6.0 inches (152.4 mm)
Controller Depth	1.0 inch (25 mm)
Controller Weight	4.1 ounces (115 g) (nominal)

Environmental Specifications for the IP Controller

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 IP Controller

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

Input Voltage	12 – 24 VDC ± 10%, 300mA maximum 12 VDC @ 240mA (325mA with Network Card) nominal 24 VDC @ 135mA (175mA with Network Card) nominal
Memory Backup	Lithium coin cell, 3.0 V, type BR2325, BR2330, CR2330

⚠️ IMPORTANT! Replace the coin cells (memory backup) used in the controllers annually. Use three-volt, lithium coin cell batteries of the types BR2325, BR2330 or CR2330 as replacements.

⚠️ 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 IP Controller

Power to IP Controller	Twisted pair, 18 AWG (0.823 mm^2).
Primary Port – Ethernet to Host	Category 5 cable

Port 1 – RS-485, RS-232 or Ethernet to Host	Ethernet
	    Category 5 cable
	
	RS-232
	    Twisted pair, 22 AWG (0.325 mm^2), with overall shield
	    Maximum cable length: 50 feet (15.2 meters) of wire, total copper, including drops
	
	RS-485
	    Twisted pair, 22 AWG (0.325 mm^2), with overall shield, 120 ohm
	    Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

Port 2 – RS-485 to I/O boards	Twisted pairs, 22 AWG (0.325 mm^2), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops
Port 3 – RS-485 to I/O boards	Twisted pairs, 22 AWG (0.325 mm^2), with overall shield Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops
Alarm Inputs	Twisted pair, 30 ohms maximum

Communications Specifications for the IP Controller

Primary Port	Ethernet, 10/100Base-T interface

Port 1	Ethernet, 10/100Base-T interface;
	 RS-232, DTE or Two-wire RS-485
	    2,400-38,400 bps, asynchronous
	    9,600-115,000 bps, asynchronous

Port 2 and Port 3	Two-wire RS-485 2,400-38,400 bps, asynchronous

Access-Control Specifications for the IP Controller

Memory	17.7 MB assigned as follows:
	    15.7 MB for card information
	    1 MB for configuration data
	    1MB for transactions

Alarm Inputs	Two unsupervised, dedicated alarm inputs for enclosure tamper and power loss

Indicators on the IP Controller

Visible	6 red, single-color LEDs 1 dual-color LED for Ethernet connection

IP Controller Jumper Settings

Jumpers	Set At	Selected
J7, J8, J9	232	Primary Port (Ethernet) is used or Port 1 is RS-232 or Ethernet
	485	Port 1 is RS-485
J10	OFF	Port 1 RS-485 EOL Terminator is not on
	ON	Port 1 RS-485 EOL Terminator is on
J4	OFF	Port 2 RS-485 EOL Terminator is not on
	ON	TR2 RS-485 EOL Terminator is on
J5	OFF	Port 3 RS-485 EOL Terminator is not on
	ON	Port 3 RS-485 EOL Terminator is on

IP Controller DIP Switches – Chart

See the section "Logging into the Configuration Manager for the First Time" [115] for more information on when and why you change DIP switch settings on a controller.

You can configure the operating mode of the controller by setting the DIP switches before you apply power to the controller. Avoid changing the switch settings while the PremiSys™ IP Controller is powered, except when noted to do so. If you do change a setting while the controller is powered, cycle power off, and then on again for the setting to take effect. However, there is a point in the bulk erasing process when power must never be cycled. See the instructions for bulk erasing for details. [133]

IMPORTANT!: The first time you program this controller or after the controller has been bulk erased, the default communication parameters are in effect. The DIP switches may be set to "OFF, OFF, OFF, OFF" to program the controller. You then contact the controller using the default IP address "192.168.10.20" to program it. See the section titled "Configuring Ethernet Controllers [114]" for complete information on how to program an Ethernet controller for use in your PremiSys system.

	Switches			
Functions	**1**	**2**	**3**	**4**
Initial Configuration Mode - Use this setting after a bulk erase, when a bulk erase is needed. Normal Operating Mode - Use this setting after the controller is programmed and is ready for normal function.	Off	Off	Off	Off
Pre-Bulk-Erase Mode - Use this setting before beginning a bulk erase. See the instructions for bulk erasing for full details. [133]	**On**	**On***	Off	Off

*After you initially program your controller communication settings through the Configuration Manager, you may leave SW1 and SW 2 "Off" unless you need to perform a bulk erase and go through the initial configuration again.

DIP Switch Examples

- SW1 is On - Default username and password <u>CAN</u> log into the Configuration Manager, regardless of the "Disable Web Server" setting.

- SW 1 is On and "Disable Web Server" is enabled - Custom usernames and passwords <u>CANNOT</u> log into the Configuration Manager.

- SW 1 is On and "Disable Web Server" is disabled - Custom usernames and passwords <u>CAN</u> log into the Configuration Manager.

- SW 1 is Off and "Disable Web Server" is disabled - Custom usernames and passwords <u>CAN</u> log into the Configuration Manager, the default username and password <u>CANNOT</u> log into the Configuration Manager.

- SW 1 is Off and "Disable Web Server" is enabled, NO username and passwords work can log into the Configuration Manager. To configure the controller while the Disable Web Server is selected you must move switch 1 to "On."

Note: See the PremiSys™ Online Help for instructions about setting other IP and communication addresses as well as other configurations.

Setting End-of-Line (EOL) Resistance for the PremiSys IP Controller

Install jumpers J4 and J5 on the PremiSys™ IP Controller to set RS-485 EOL when needed for ports 2 and 3.
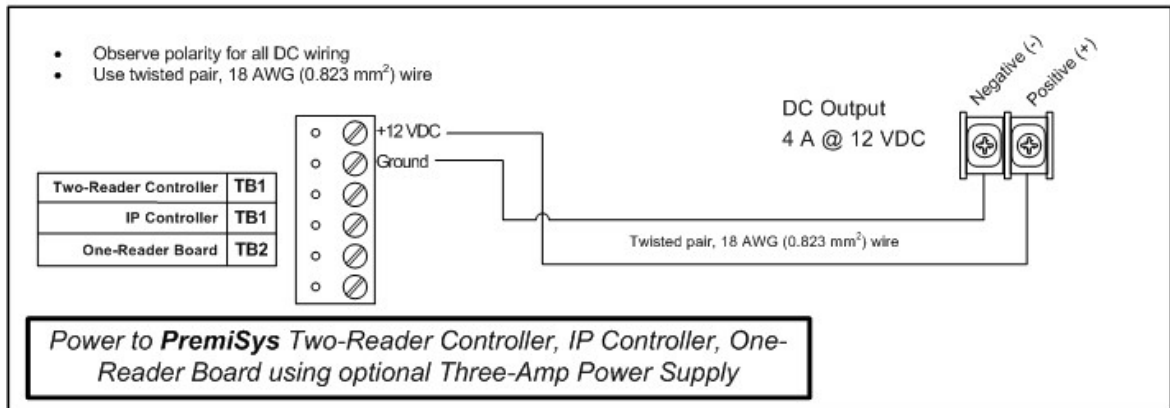
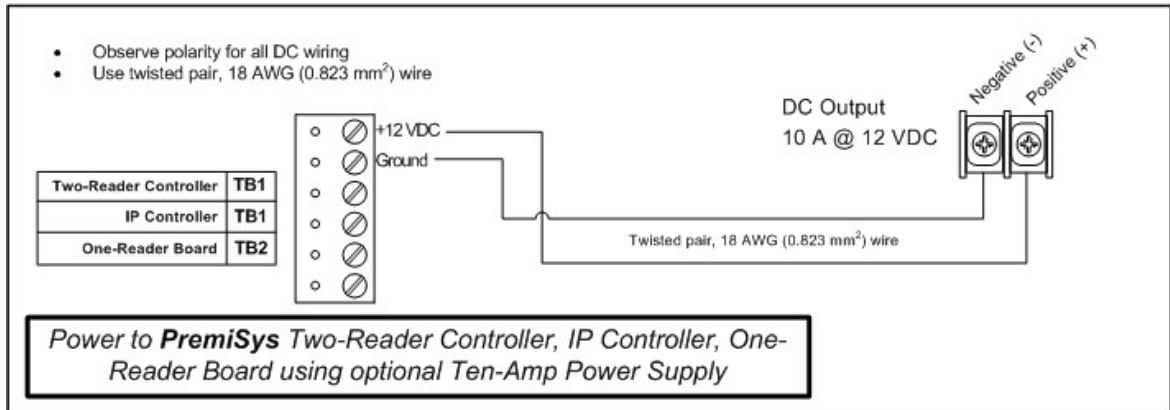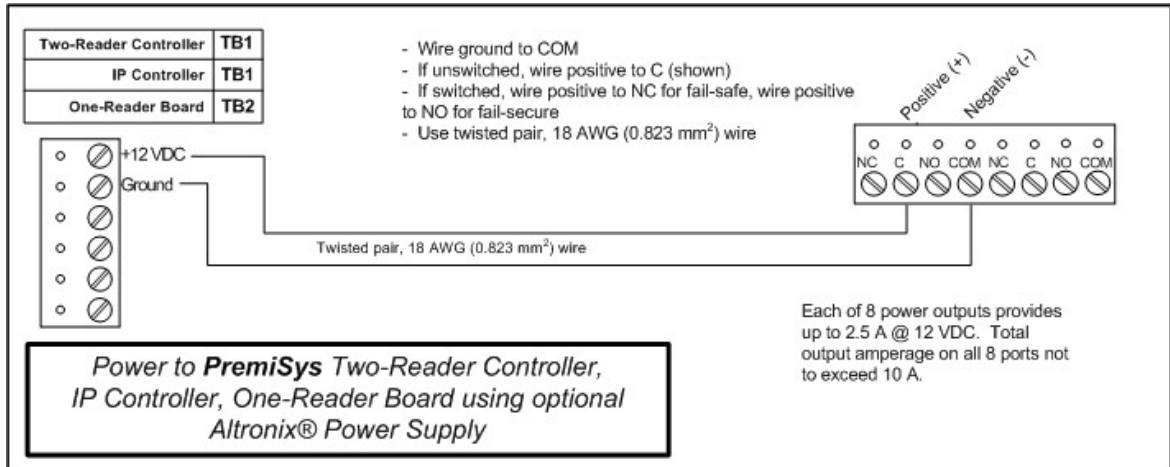In the diagram below:

Controller "C"
- J10 is set because Controller C is the last controller in the serial line
- J5 is set because at least one I/O board (C1 through C4) is an end-of-line board on the controller's Port 3. In this example, C1, C2 and C4 are all end-of-line boards.
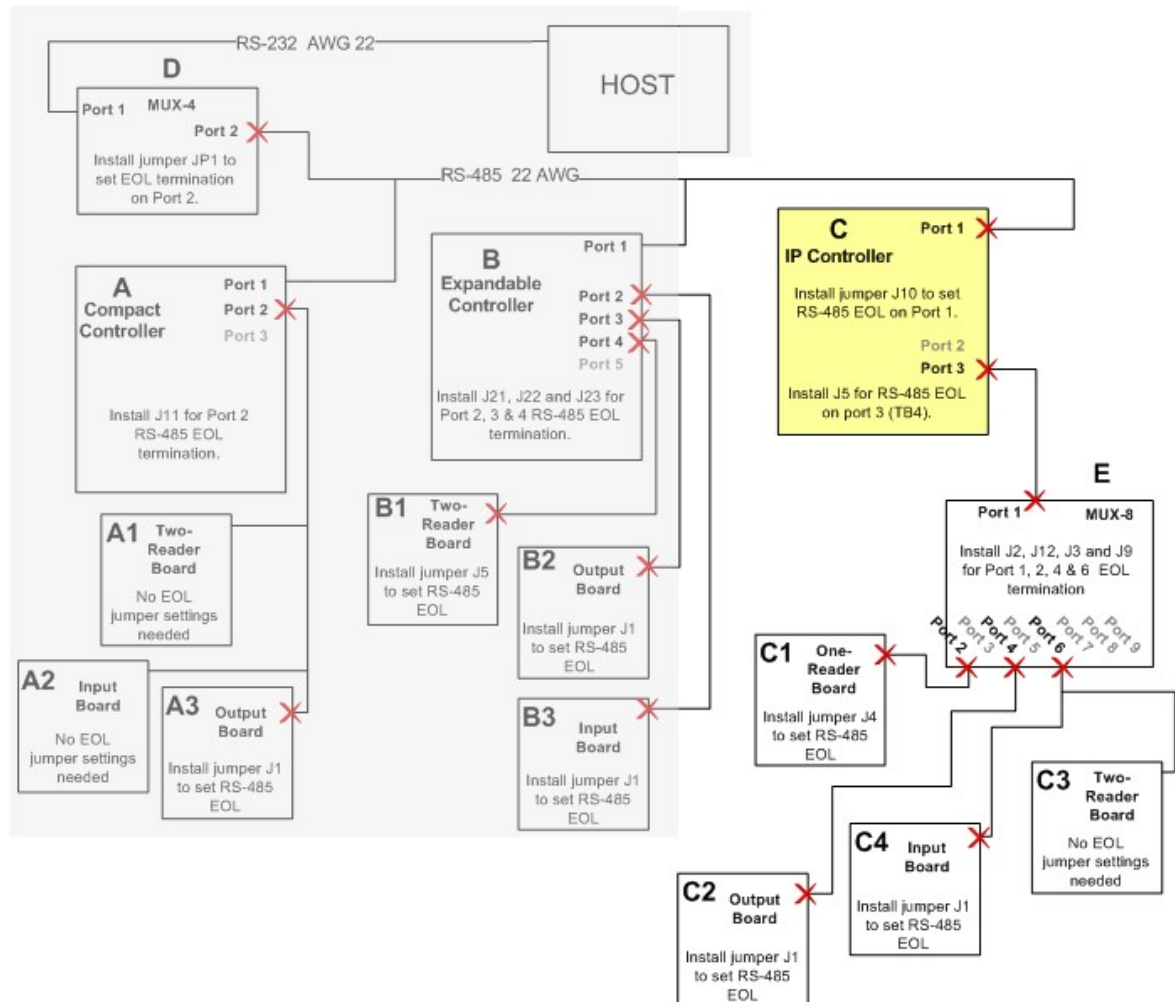
Wiring an IP Controller to a Power Supply

⚠️ **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.

Two-Reader Controller	TB1
IP Controller	TB1
One-Reader Board	TB2

- 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

o — ⊘ +12 VDC
o — ⊘ Ground
o — ⊘
o — ⊘
o — ⊘
o — ⊘

Positive (+)   Negative (-)

o o o o o o o o
NC C NO COM NC C NO COM
⊘ ⊘ ⊘ ⊘ ⊘ ⊘ ⊘ ⊘

Twisted pair, 18 AWG (0.823 mm²) wire

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.

Power to PremiSys Two-Reader Controller, IP Controller, One-Reader Board using optional Altronix® Power Supply

---

- Observe polarity for all DC wiring
- Use twisted pair, 18 AWG (0.823 mm²) wire

o — ⊘ +12 VDC
o — ⊘ Ground
o — ⊘
o — ⊘
o — ⊘
o — ⊘

Two-Reader Controller	TB1
IP Controller	TB1
One-Reader Board	TB2

Negative (-)   Positive (+)

DC Output
10 A @ 12 VDC

Twisted pair, 18 AWG (0.823 mm²) wire

Power to PremiSys Two-Reader Controller, IP Controller, One-Reader Board using optional Ten-Amp Power Supply

---

- Observe polarity for all DC wiring
- Use twisted pair, 18 AWG (0.823 mm²) wire

o — ⊘ +12 VDC
o — ⊘ Ground
o — ⊘
o — ⊘
o — ⊘
o — ⊘

Two-Reader Controller	TB1
IP Controller	TB1
One-Reader Board	TB2

Negative (-)   Positive (+)

DC Output
4 A @ 12 VDC

Twisted pair, 18 AWG (0.823 mm²) wire

Power to PremiSys Two-Reader Controller, IP Controller, One-Reader Board using optional Three-Amp Power Supply

---

Power Specifications for the IP Controller

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

Input Voltage	12 – 24 VDC ± 10%, 300mA maximum 12 VDC @ 240mA (325mA with Network Card) nominal 24 VDC @ 135mA (175mA with Network Card) nominal
Memory Backup	Lithium coin cell, 3.0 V, type BR2325, BR2330, CR2330

⚠ **IMPORTANT! Replace the coin cells (memory backup) used in the controllers annually. Use three-volt, lithium coin cell batteries of the types BR2325, BR2330 or CR2330 as replacements.**

Verifying power and operation:

When a controller is first powered up, the pattern of the LEDs' flashing indicates proper powering and response.

The IP Controller has red LEDs, 1-6 and D7 as well as one yellow and one green LED on the Ethernet port. See the schematic of the IP Controller 43 at the beginning of this section to view the location of the LEDs. See the table at the end of this topic for information indicating the status of the controller based on the LEDs.

- As you begin to power up, all LED's are off.
- While the controller is initializing, the LEDs have the following meanings:
- LEDs 1 through 6 are sequenced during initialization.
- LED's 1, 3, and 5 are turned ON for approximately 4 seconds after the hardware initialization has completed,
- The application code is then initialized. The amount of time the application takes to initialize depends on the size of the database, about 3 seconds without a card database. Each 10,000 cards will add about 3 seconds to the application initialization.

> ⚠ **IMPORTANT! When LED's 1, 2, 3 and TMP flash at the same time, data is being read from or written to flash memory, do not cycle power when in this state.**

If the sequence stops or repeats, perform one of the steps below.
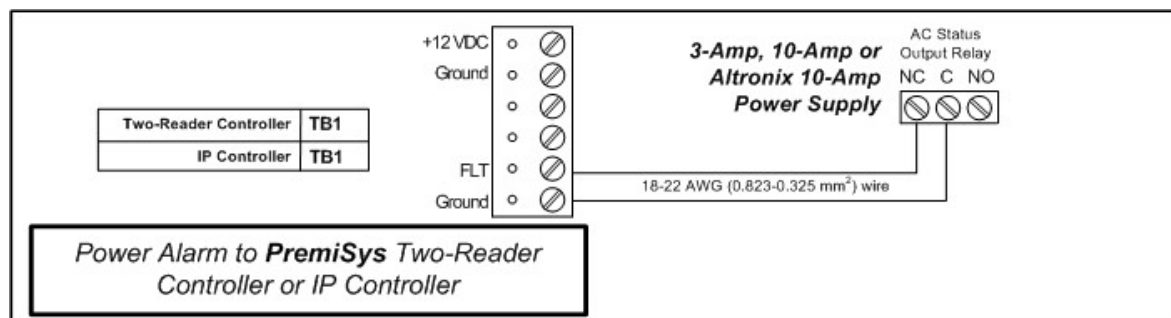
- Power-up and tag database as invalid:
    - o Remove input power to the controller
    - o Place an insulator under the battery clip and wait 5-10 seconds
    - o Remove insulator and reapply input power.

- Power-up without loading database into RAM:
    - o Remove input power to the controller
    - o Set DIP switches to a default mode (in a default mode, the database is not loaded into RAM)
    - o Reapply input power.

- Erase all of the configuration and databases (also erases card database for security reasons.) See "Bulk Erasing Ethernet Controllers 133" for instructions to erase all information on the controller.

If clearing the memory does not correct the initialization problem, contact technical support.
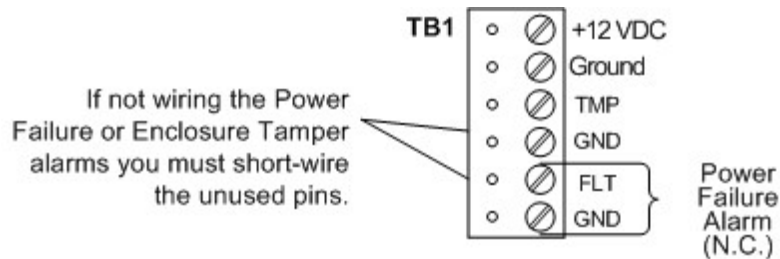
After initialization is complete the IP Controller's LEDs have the following meanings while in run mode:

LED	ON	20/80 Flash	80/20 Flash	Double Flash
1		Offline	Online	Low battery
2	Port 1 communication to host			
3	Port 2 communication to I/Os			
4	Port 3 communication to I/Os			
5	Unassigned			
6	Unassigned			

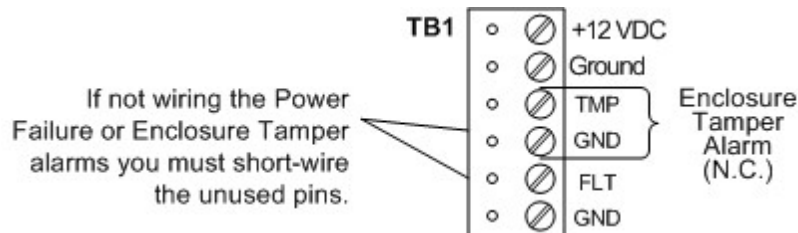| Ethernet Port LEDs	OFF	ON	FLASH
Red LED (D7)	No data transmitting	Data transmitting	
Yellow LED	10Mb/S Ethernet speed	100Mb/S Ethernet speed	N/A
Green LED	No link	Good link	Ethernet activity

Wiring an IP Controller to Monitor for UPS Power Loss

Alarm Inputs	Twisted pair, 30 ohms maximum

TB1
- +12 VDC
- Ground
- TMP
- GND
- FLT
- GND

If not wiring the Power Failure or Enclosure Tamper alarms you must short-wire the unused pins.

Power Failure Alarm (N.C.)

Wiring an IP Controller for Enclosure Tamper

Alarm Inputs	Twisted pair, 30 ohms maximum

TB1
- +12 VDC
- Ground
- TMP
- GND
- FLT
- GND

If not wiring the Power Failure or Enclosure Tamper alarms you must short-wire the unused pins.

Enclosure Tamper Alarm (N.C.)

Wiring an IP Controller to the Host

> **IMPORTANT!** Make sure that all pertinent jumper and DIP switch settings on all controllers in the system are also entered in the relevant controller setup window in the PremiSys™ software. See the PremiSys Online Help for details.

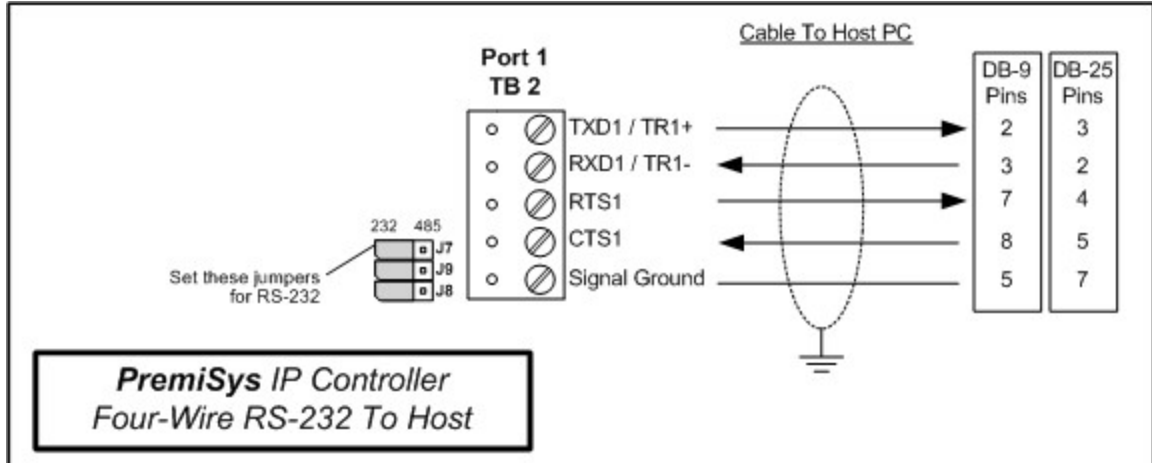## IP Controller via Ethernet to Host

Hub (Optional)

Ethernet — Ethernet —

LAN / WAN

J6

Plug Ethernet cable directly into the network port or use the optional Network Card, plugged into J6.

232   485
J7
J9
J8

Port 1 Not Used

Set these jumpers for RS-232

PremiSys *IP Controller* Ethernet To Host
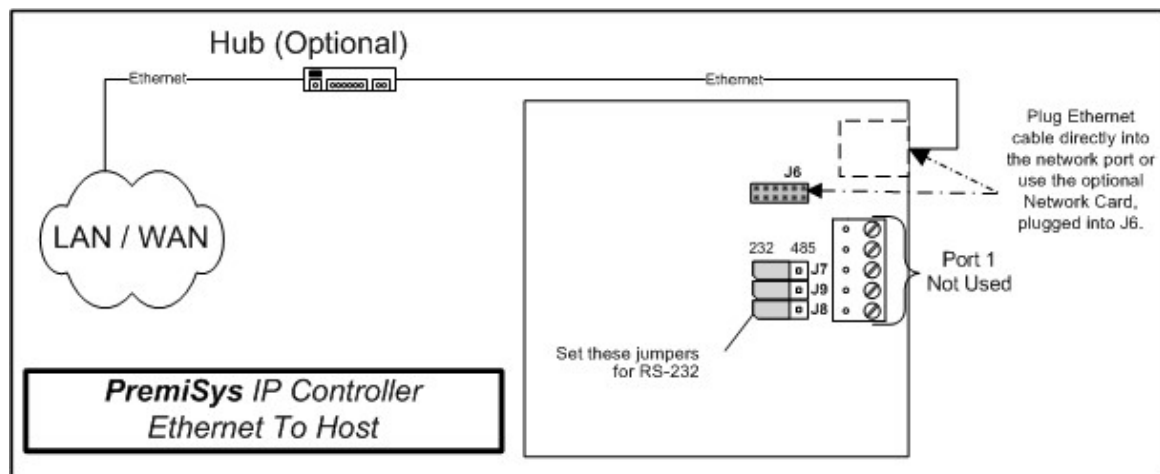
Primary Port	Cat 5 cable direct plug in

Notes:

- The number of PremiSys IP Controllers you can connect to an Ethernet network is limited by the number of IP addresses available, capacity of the server, bandwidth of the network and any other factor that affects network capacity.
- The Ethernet can be directly plugged into the Primary Port on the IP Controller.
- Each controller connected via the Ethernet must be configured in the software to have its own channel.
- Be sure to set Jumpers J7, J8 and J9 for RS-232 when you use Ethernet communications.

IP Controller via Four-Wire RS-232 to Host

RS-232 communications are limited to 50 total cable-feet (15 total cable-meters.)

TB2

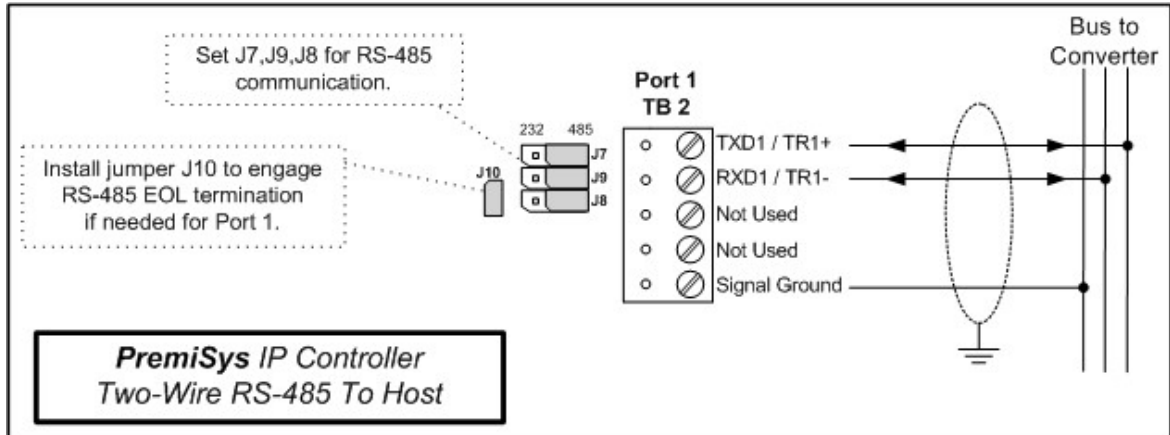|	
	GND
	CTS / R1-
Port 1	RTS / R1+
	RXD / TR1-
	TXD / TR1+

Notes:
- **You can connect one IP Controller per serial channel.**
- **Be sure to set Jumpers J7, J8 and J9 for RS-232 when you use RS-232 communications.**

IP Controller via Two-Wire RS-485 to Host

RS-485 communications are limited to 4000 cable-feet (1219 cable-meters) total copper, including drops for all controllers on one channel.

TB2

Port 1	GND
	CTS / R1-
	RTS / R1+
	RXD / TR1-
	TXD / TR1+

Notes:
- You can connect one IP Controller per serial channel.
- Be sure to set Jumpers J7, J8 and J9 for RS-485 when you use RS-485 communications.

Wiring an IP Controller to the PoE One-Door Reader Board

Communication from the PremiSys™ IP Controller to the PremiSys PoE One-Door Reader Board is handled via the Ethernet, while power to the board can be handled via the Ethernet or via a separate power supply.

Note: You can connect up to 32 PoE One-Door Reader Boards to one IP Controller.
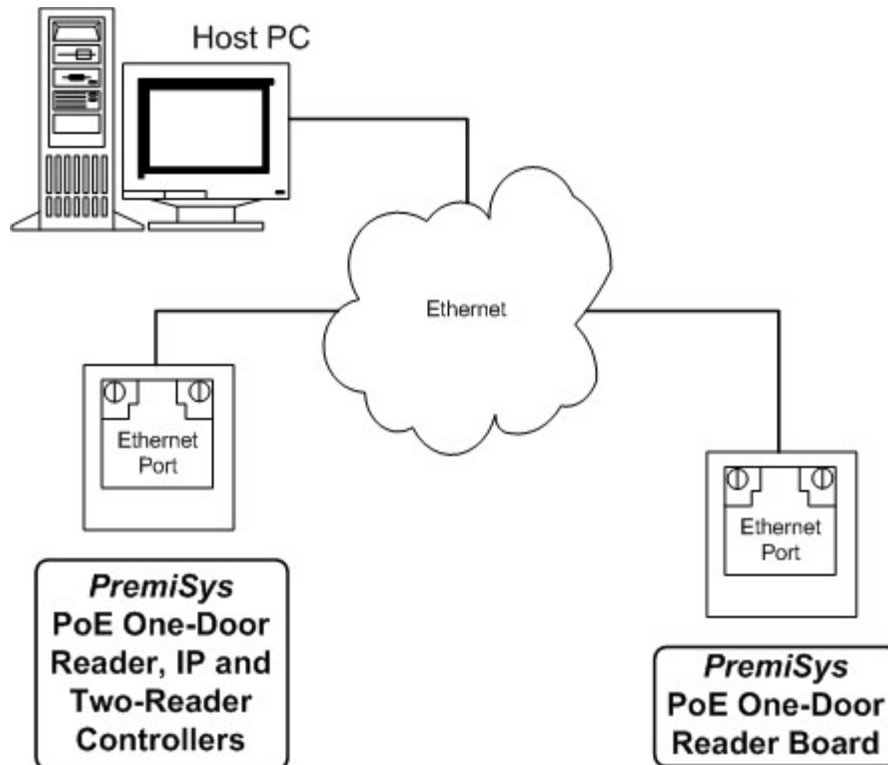
IMPORTANT! You cannot address the PoE One-Door Reader Board using jumpers; you must assign a range of IP addresses to the Ethernet controller. The controller then assigns one of those IP addresses to the PoE One-Door Reader Board. Enter the MAC address of the PoE One-Door Reader Board when you add the board to your Ethernet controller through your PremiSys™ software. The controller links the MAC address to an IP address from the range of reserved IP address.

Wiring an IP Controller to the One-Reader Board
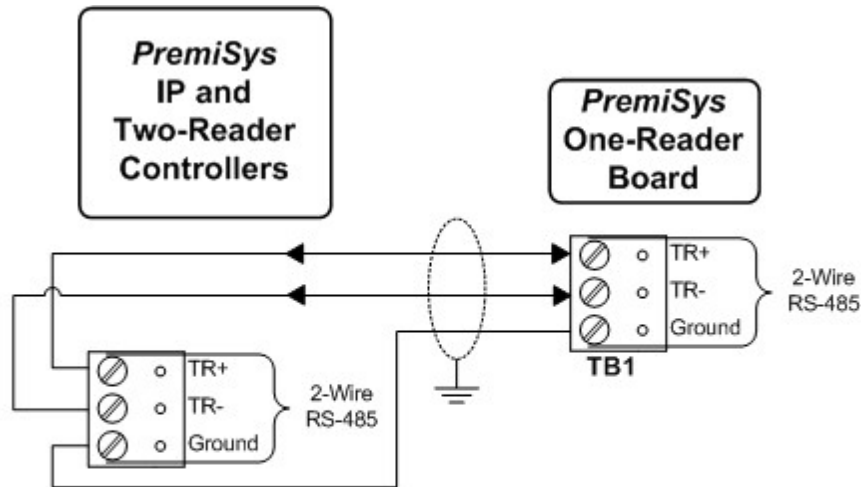
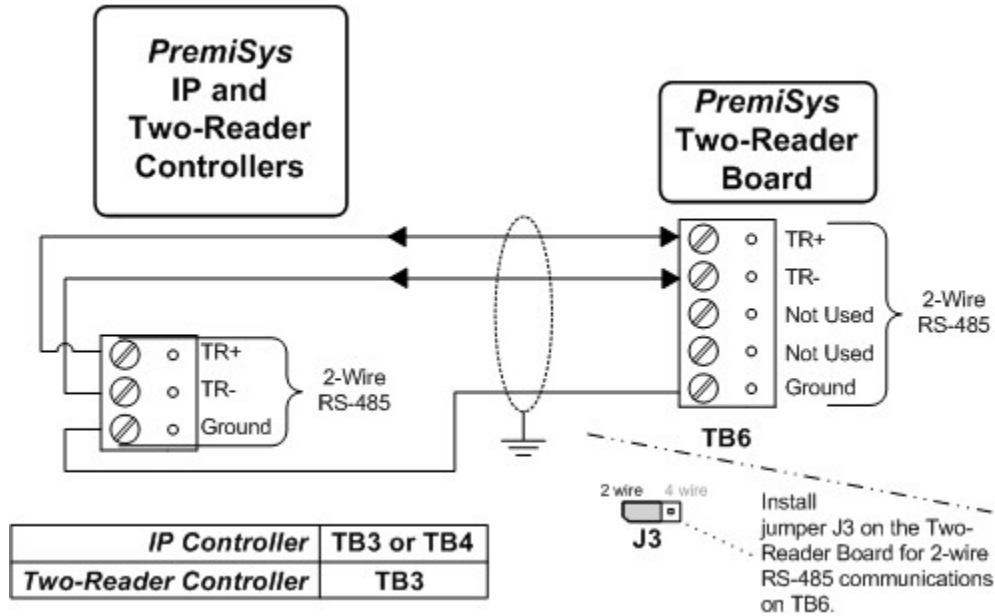| IP Controller	TB3 or TB4
Two-Reader Controller	TB3

On the PremiSys™ IP Controller, terminal blocks TB3 (Port 2) and TB4 (Port 3) are used for connection to I/O boards.

Port 2 or 3 (TB 3 or 4) on the IP Controller – RS-485 to TB1 on the One-Reader board	Two-wire RS-485 2,400-38,400 bps, asynchronous
	    Twisted pairs, 22 AWG (0.325 mm2), with overall shield
	    Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

Notes:

- You can connect up to 32 I/O boards per port for a maximum of 64 I/O boards connectable to one IP Controller.
- All data wiring between the IP Controller and I/Os is two-wire RS-485.

Wiring an IP Controller to the Two-Reader Board

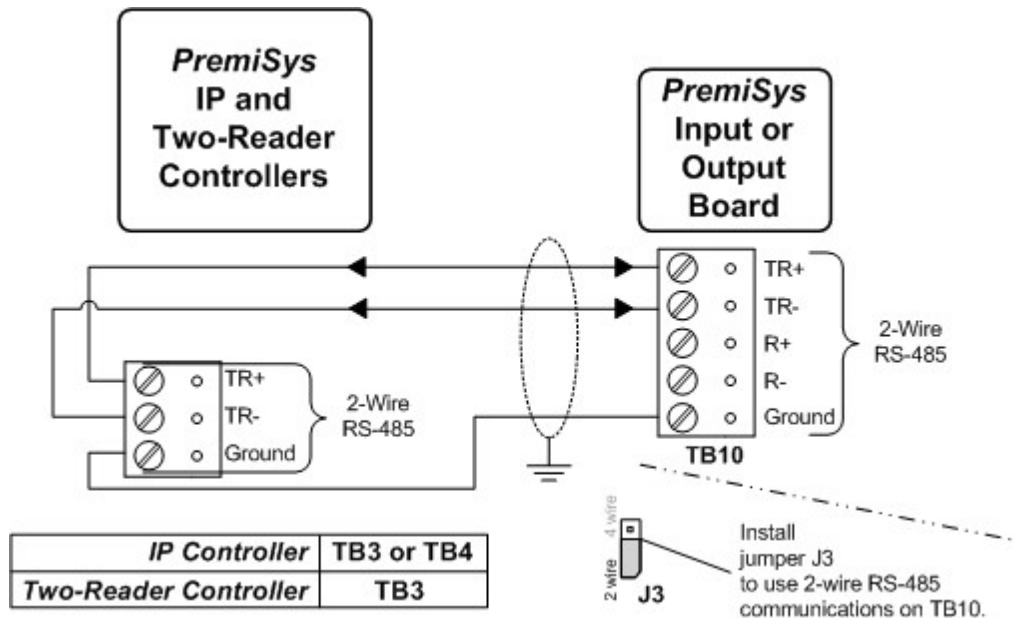On the PremiSys™ IP Controller, terminal blocks TB3 (Port 2) and TB4 (Port 3) are used for connection to I/O boards.

Port 2 or 3 (TB 3 or 4) on the IP Controller – RS-485 to TB6 on the Two-Reader board	Two-wire RS-485 2,400-38,400 bps, asynchronous
	    Twisted pairs, 22 AWG (0.325 mm2), with overall shield
	    Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

Notes:

- **You can connect up to 32 I/O boards per port for a maximum of 64 I/O boards connectable to one IP Controller.**
- **All data wiring between the IP Controller and I/Os is two-wire RS-485.**

Wiring an IP Controller to the Input Or Output Boards

IMPORTANT! Install Jumper J3 exactly as illustrated here! You cannot use four-wire RS-485!

TB 10 - Input or Output Board	
TB10-1	TR+
TB10-2	TR-
TB10-3	Not Used
TB10-4	Not Used
TB10-5	Ground

On the IP Controller, terminal blocks TB3 (Port 2) and TB4 (Port 3) are used for connection to I/O boards.

Port 2 or 3 (TB 3 or 4) on the IP Controller – RS-485 to TB6 on the Two-Reader board	Two-wire RS-485 2,400-38,400 bps, asynchronous
	   Twisted pairs, 22 AWG (0.325 mm2), with overall shield
	   Maximum cable length: 4000 feet (1219 meters) of wire, total copper, including drops

Notes:

- You can connect up to 32 I/O boards per port for a maximum of 64 I/O boards connectable to one IP Controller.
- All data wiring between the IP Controller and I/Os is two-wire RS-485.

IP Controller LEDs

After initialization is complete the PremiSys™ IP Controller's LEDs have the following meanings while in run mode:

LED	ON	20/80 Flash	80/20 Flash	Double Flash
1		Offline	Online	Low battery
2	Port 1 communication to host			
3	Port 2 communication to I/Os			
4	Port 3 communication to I/Os			
5	Unassigned			
6	Unassigned			

Ethernet Port LEDs	OFF	ON	FLASH
Red LED (D7)	No data transmitting	Data transmitting	
Yellow LED	10Mb/S Ethernet speed	100Mb/S Ethernet speed	N/A
Green LED	No link	Good link	Ethernet activity