

MODEL NUMBER:
XEA900-1-0-GB-XX XEA901-1-0-GB-XX
XEA902-1-0-GB-XX XEA903-1-0-GB-XX
XEA904-1-0-GB-XX XEA905-1-0-GB-XX

IXP121 CONTROLLER

ImproX IXP121 Controller INSTALLATION MANUAL

SPECIFICATIONS

Working Environment	Designed to work in an indoor (dry) environment similar to IP40. Both the Aluminium and the Plastic Controller are NOT sealed against water.	
Input Voltage	10 V DC to 30 V DC.	
Power Requirements	Current (mA)	Power (W)
USB and RS232 Versions		
Minimum Supply Voltage 10 V DC.....	250	2.5
Maximum Supply Voltage 30 V DC.....	83	2.5
Ethernet Versions		
Minimum Supply Voltage 10 V DC.....	375	3.75
Maximum Supply Voltage 30 V DC.....	125	3.75
Real Time Clock (RTC) and Memory Backup Battery	A 3 V Lithium Battery (CR2032).	
Anti-tamper Switch	1 Switch, detects opening of the cabinet lid.	
Ethernet Port		
Configuration.....	Standard Ethernet RJ45 connector. 10/100 Mbps, half or full duplex.	
Third-party Port	5 V DC (± 0.1 V) at maximum 200 mA can be supplied to power Third-party Readers connected to the Port.	

NOTE: *The Current and Power Specifications (above) were made with no load on the Third-party Port.*

Relays

Relay Output	3 Relays, each with NO, COM and NC contacts.
Relay Contact Ratings	10 A at 28 V DC, 5 A at 220 V AC, 12 A at 120 V AC.

Digital Inputs

Type	4 Dry-contact inputs.
Detection Resistance Range..	< 5 kOhm.
Protection Range	+50 V and -50 V continuous.

Modem Requirements

An external 56 K Serial Modem is required at the Remote Site. The following models have been tested and approved:

- The Duxbury 56 Kbps V9.2 Serial External Modem, Model number K56E.
- The 3Com or US Robotics 56 Kbps V9.2 Serial External Modem.

Please contact your local distributor before using any other Modem.

Controller Installation Interfaces

Status Indicator

Status LED	Blue LED (externally visible in Plastic versions).
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Diagnostic Indicators

Incoming RS485 Data	Flashing Green LED (internally visible).
Outgoing RS485 Data	Flashing Red LED (internally visible).
Incoming RS232 Data	Flashing Green LED (internally visible).
Outgoing RS232 Data	Flashing Red LED (internally visible).
Incoming USB or Ethernet Data	Green LED (internally visible).
Outgoing USB or Ethernet Data	Red LED (internally visible).

Antenna Reader Installation Interfaces

Status Indicator

Status LED	Bi-colour, Red or Green LED.
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Buzzer

Volume and Tone	4-Step adjustable volume, single tone.
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Blank Space

INSTALLATION INFORMATION

Accessories

Find the following when unpacking the ImproX IXP121 Controller:

- Either, an IXP121 Controller housed in a Dark Grey ABS Plastic Cabinet. The Cabinet consists of a Front and Back Cover secured with a Thread Cutter Screw (M3 x 8 mm).
- Or, an IXP121 Controller housed in a Black powder-coated Aluminium extruded Cabinet. The Cabinet consists of a Top Cover and Base, sealed at each end with a Mild Steel End Plate, secured with 8 Thread Cutter Screws (M3 x 8 mm).
- One copy of IXP120 Software, for USB or RS232 (Single Controller Version) on CD.
- A 3 V Lithium Battery (CR2032).

CAUTION: DO NOT use the Metal-oxide Varistors (25 Vrms, 500 A, 77 V max clamping) with mains power applications.

- Three Metal-Oxide Varistors, 25 Vrms, 500 A, 77 V max clamping.
- Four Wood Screws (3.5 mm x 25 mm).
- Four Wall Plugs (7 mm).
- XEA901-1-0-GB-XX and XEA903-1-0-GB-XX will each include a standard 2 m (7 ft) USB Printer Cable. The USB Cable will have a Type 'A' plug fitted at one end and a Type 'B' plug fitted at the other end.
- A MAC Address Label.
- An extra Fixed Address Label.

4 Door Support

NOTE: A single IXP120 site CANNOT support more than four doors regardless of Terminal or Reader combinations.

NOTE: Version 3 or higher Software is required.

The IXP121 Controller provides support for **up to four Anti-passback (APB) doors**.

You may connect any of the following ImproX Terminals to the RS485 Port 1 (Terminal Bus) of the Controller:

- ImproX (PT) Portal Terminal.
- ImproX (TA) Time Attendance Terminal.
- ImproX (iTA) Industrial Time Attendance Terminal.
- ImproX (TT) Twin Antenna Terminal.
- ImproX (TRT) Twin Remote Terminal.
- ImproX (MfT) Multi-function Terminal.
- ImproX (ER) Extended Range Terminal.
- ImproX (DBv) Vertical Mount Drop Box.

General

Remember the following when installing your IXP121 Controller:

NOTE: *Where we specify a Remote Reader in this Manual, we imply that the same details apply to the Multi-mode Remote Reader.*

Communications Distance

- The RS485 communications distance between the Registration Interface and the LAST IXP121 Controller in a cable run, MUST NOT exceed 1 km (1 090 yd). Achieve this by using good quality screened twisted 2-pair cable, earthed on one side.
- The Ethernet version of the Controller plugs into an Ethernet Switch or Hub (or other network device), cable runs for this must conform to ethernet cabling specifications.
- The RS232 communications distance between the IXP121 Controller and either the connected Host PC or Modem MUST NOT exceed 25 m (82 ft). Achieve this by using good quality screened twisted 4-core cable.
- The USB communications distance between the Host PC and the IXP121 Controller MUST NOT exceed 5 m (16 ft). Please note, however, that the SUPPLIED CABLE CANNOT BE EXTENDED.

Termination Resistors for RS485 Bus Communications

Long transmission lines or multiple “star” connections, may cause communication problems. Placing the Termination Resistor Jumper Link (see Figure 3) in the LAST IXP121 CONTROLLER AT THE END OF THE CABLE RUN should solve the problem (depending on the bus).

EARTH Connection

Connect the IXP121 Controller to a good EARTH point. Using either of the RS485 Ports, connect the EARTH Lead to the “SHD” Terminal. Mains EARTH can be used, but electrical noise may exist.

Antenna Readers

Antenna Reader Distance

The ideal cable distance between the IXP121 Controller and its Antenna Reader ranges between 2 m to 16 m (7 ft to 53 ft). Achieve this using a good quality shielded multi-strand **3-pair twisted cable. The cross-sectional area of the cable must not be less than 0.2 mm² (0.0003 in²).

NOTE: ***When installing an ImproX RA, use 1-pair twisted cable.*

Cable Specifications

The cable specifications should be similar to the following:

Conductor Resistance:	< 2 ohms.
Capacitance, Core to Earth:	< 160 pF/m.
Capacitance, Core to Core:	< 100 pF/m.

Distance between Antenna Readers from the SAME Controller

To avoid mutual interference Install the Antenna Readers no closer than 150 mm (6 in) apart.

Distance between Antenna Readers from DIFFERENT Controllers

To avoid mutual interference Install the Antenna Readers no closer than 500 mm (20 in) apart.

Arc Suppression

Snubber devices are recommended for EMF Flyback and Arc Suppression when driving an inductive load with the Relay, see Figure 1.

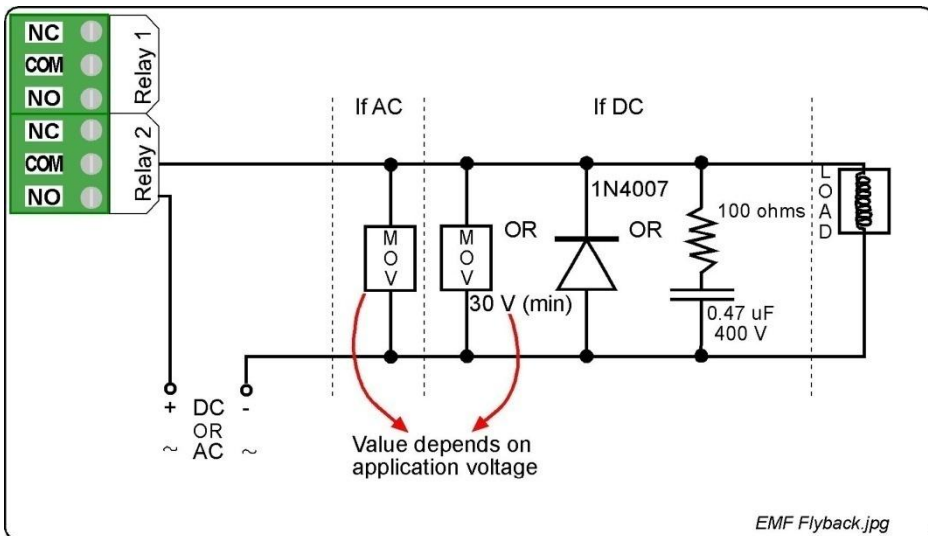


Figure 1: EMF Flyback

Installing the Real Time Clock (RTC) and Memory Backup Battery

The Battery Holder is located in the top left-hand side of the IXP121 Controllers Printed Circuit Board (PCB), directly below the DIP-switch.

Slide the 3 V Lithium Battery into the Battery Holder, from left to right, with the "+" symbol facing UP.

Mounting the Controller

CAUTION: Make certain that you mount the Controller on a vibration-free surface.

Select the mounting position of the IXP121 Controller, considering accessibility, routing of wires and visibility of the externally visible LED.

Secure the Controller to the mounting surface, using four suitable screws and wall plugs (supplied), nuts and bolts, rivets or double-sided adhesive tape.

NOTE: Do not mount the aluminium extruded IXP121 Controller with double-sided adhesive tape.

Communication Link Settings

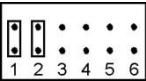
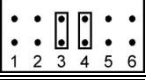
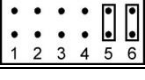
Communication Link Position (See Figure 3 for orientation)	Setting
1. 	RS232
2. 	RS485
3. 	USB or Ethernet

Table 1: Communication Link Settings

DIP-switch Settings (for the Third-party Port)

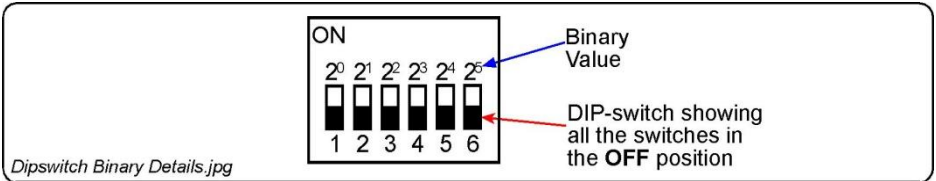
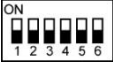


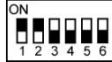






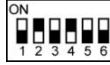





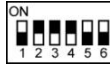
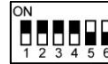
Figure 2: Binary Details for DIP-switch



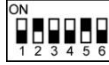

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	 Default	UHR900-0-1-GB-XX	UHR903-0-1-GB-XX	
		 ImproX RF/IR Receiver	 ImproX RF Button 1	 ImproX RF Button 2
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	Ready	-	-	-
B	Armed	Data Line	Data Line	Data Line
C	Alarm Input / Output or Zone Reset	DOS #3	DOS #3	DOS #3
D	Emergency Open	RTE #3	RTE #3	RTE #3
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Alarm Mode or Power Control or Bell Button	Reader #3	Reader #3	Reader #3

	UHR903-0-1-GB-XX			
	 ImproX RF Button 3	 ImproX RF Button 4	 ImproX RF Buttons 1 & 2	 ImproX RF Buttons 3 & 4
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	-	-	-	-
B	Data Line	Data Line	Data Line	Data Line
C	DOS #3	DOS #3	Zone Reset	Zone Reset
D	RTE #3	RTE #3	Emergency Open	Emergency Open
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Reader #3	Reader #3	Power Control or Bell Button	Power Control or Bell Button

	 Magstripe ABA Track 2	 Barcode Code- 39 + checksum	 Barcode Code-39	 Wiegand 26/44/40/37 (Sagem MA100, MA200 or MA300)
Input 1	DOS #1	DOS #1	DOS #1	DOS #1
Input 2	RTE #1	RTE #1	RTE #1	RTE #1
Input 3	DOS #2	DOS #2	DOS #2	DOS #2
Input 4	RTE #2	RTE #2	RTE #2	RTE #2
A	DOS #3	-	-	DOS #3
B	Clock Line	Data Line	Data Line	"0" Data Line
C	RTE #3	DOS #3	DOS #3	RTE #3
D	Data Line	RTE #3	RTE #3	"1" Data Line
Relay 1	Reader #1	Reader #1	Reader #1	Reader #1
Relay 2	Reader #2	Reader #2	Reader #2	Reader #2
Relay 3	Reader #3	Reader #3	Reader #3	Reader #3

	 Open Wiegand	 Motor Lock	 Repeating (Pulse) Lock	 Fail Safe/ Fail Secure Solenoid Lock
Input 1	DOS #1	DOS	DOS	DOS
Input 2	RTE #1	RTE	RTE	RTE
Input 3	DOS #2	Locked	Locked	Locked
Input 4	RTE #2	Unlocked	Unlocked	Unlocked
A	DOS #3	Ready	Ready	Ready
B	"0" Data Line	Armed	Armed	Armed
C	RTE #3	Alarm Input / Output or Zone Reset	Alarm Input / Output or Zone Reset	Alarm Input / Output or Zone Reset
D	"1" Data Line	Emergency Open	Emergency Open	Emergency Open
Relay 1	Reader #1	Motor Lock	Pulse Lock	Solenoid Lock
Relay 2	Reader #2	Motor Lock	-	-
Relay 3	Reader #3	Alarm Mode or Power Control or Bell Button	Alarm Mode or Power Control or Bell Button	Alarm Mode or Power Control or Bell Button

	 ImproX Remote Reader (Single)	 ImproX Remote Readers (Dual)	 Motor Lock (With Dual ImproX Remote Readers)	 Repeating (Pulse) Lock (With Dual ImproX Remote Readers)
Input 1	DOS #1	DOS #1	DOS	DOS
Input 2	RTE #1	RTE #1	RTE	RTE
Input 3	DOS #2	DOS #2	Locked	Locked
Input 4	RTE #2	RTE #2	Unlocked	Unlocked
A	Tx Line	Tx1 Line	Tx1 Line	Tx1 Line
B	Rx Line	Rx1 Line	Rx1 Line	Rx1 Line
C	DOS #3	Tx2 Line	Tx2 Line	Tx2 Line
D	RTE #3	Rx2 Line	Rx2 Line	Rx2 Line
Relay 1	Reader #1	Reader #1	Motor Lock	Pulse Lock
Relay 2	Reader #2	Reader #2	Motor Lock	-
Relay 3	Reader #3	Power Control or Bell Button	Power Control or Bell Button	Power Control or Bell Button


	 Fail Safe/Fail Secure Solenoid Lock (With Dual ImproX Remote Readers)	Summary of Abbreviations:
Input 1	DOS	DOS: Door Open Sensor.
Input 2	RTE	RTE: Request to Enter or Exit.
Input 3	Locked	Tx: Transmit.
Input 4	Unlocked	Rx: Receive.
A	Tx1 Line	
B	Rx1 Line	
C	Tx2 Line	
D	Rx2 Line	
Relay 1	Solenoid Lock	
Relay 2	-	
Relay 3	Power Control or Bell Button	

Table 2: DIP-switch Settings (for the Third-party Port)

ELECTRICAL CONNECTIONS

Controller Layout

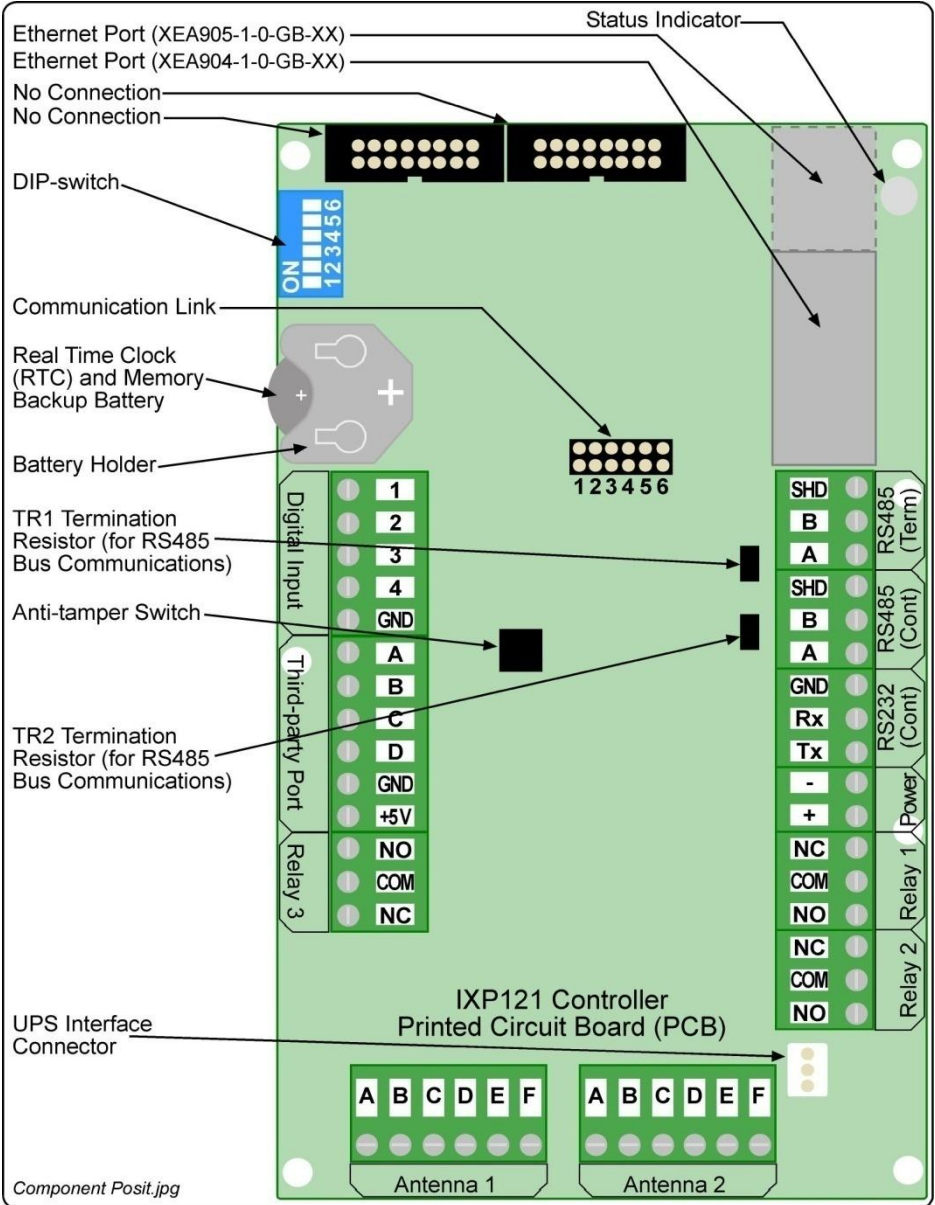


Figure 3: Key Component Positions

Connecting the IXP121 Controller

Stand alone connection options for the IXP121 Controller.

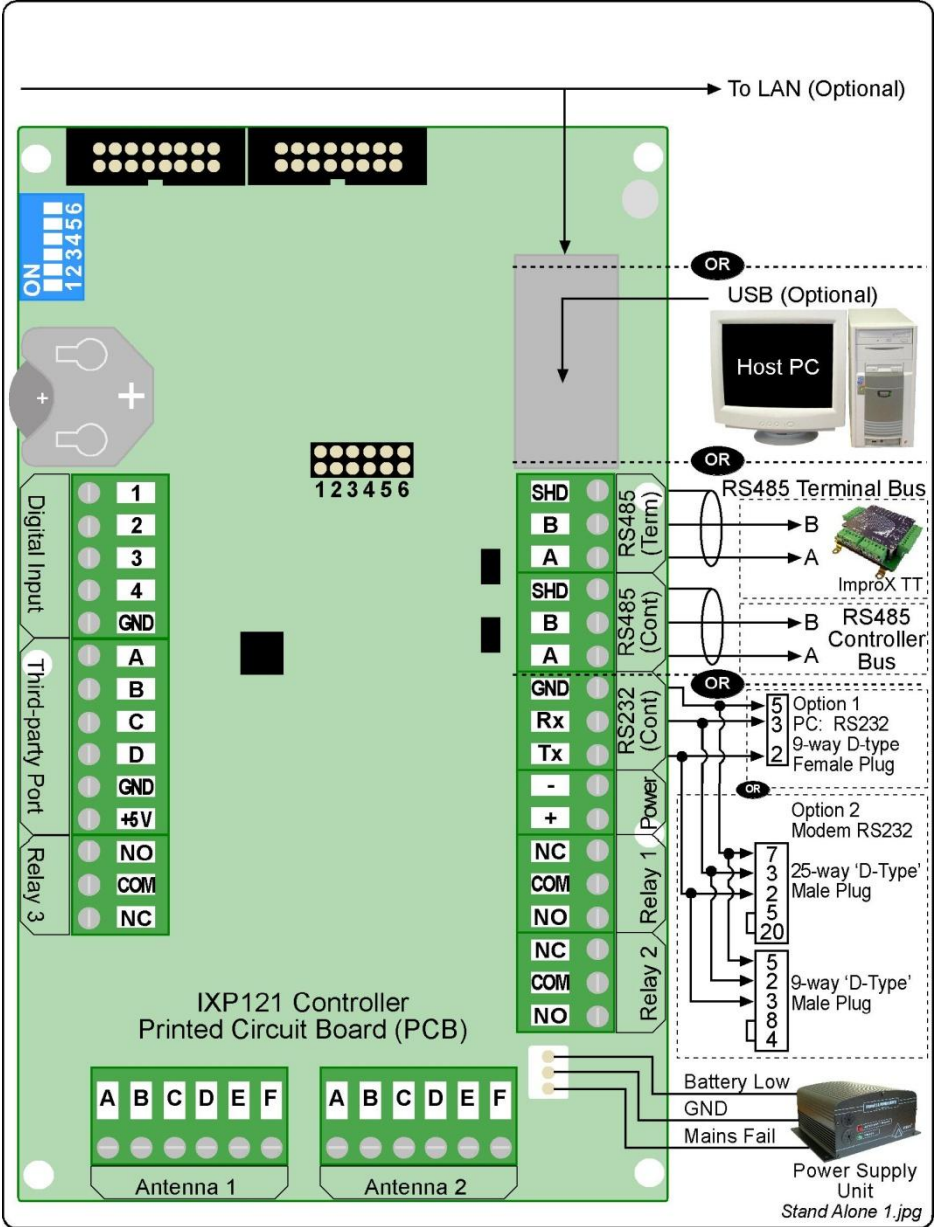


Figure 4: Host and Terminal Comms Connections

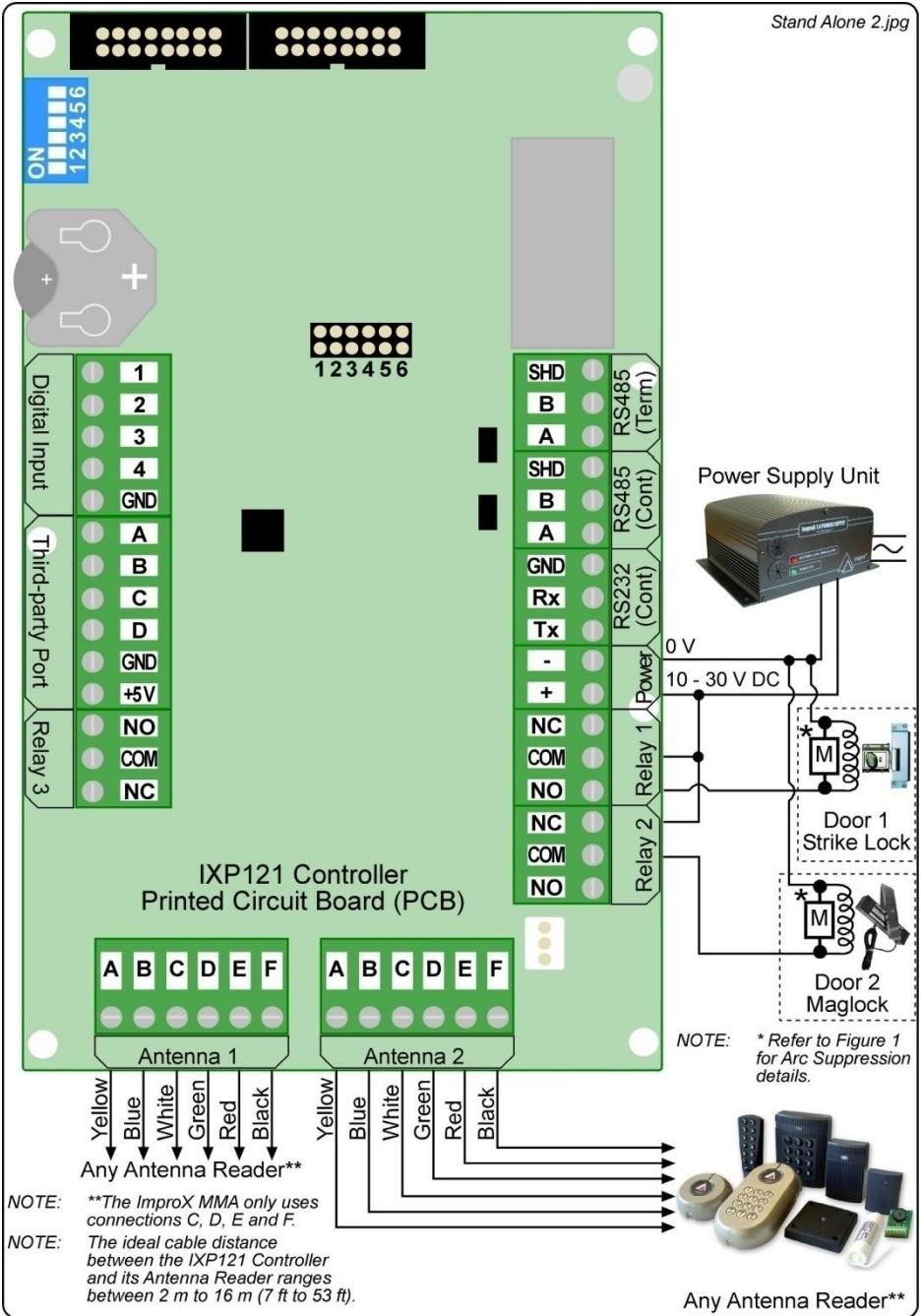


Figure 5: Power, Relay and Antenna Connections

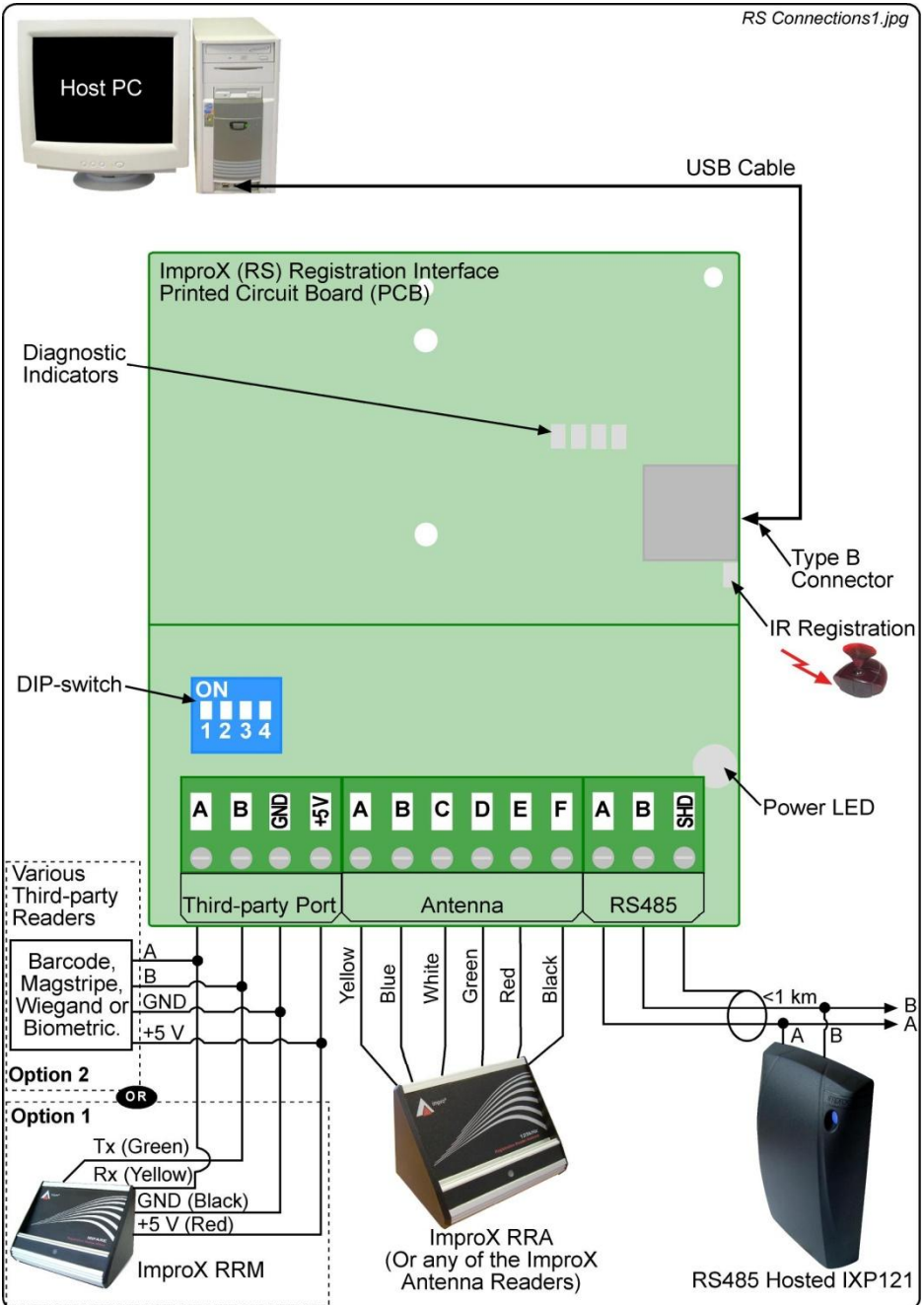


Figure 6: ImproX RS with RS485 Connection

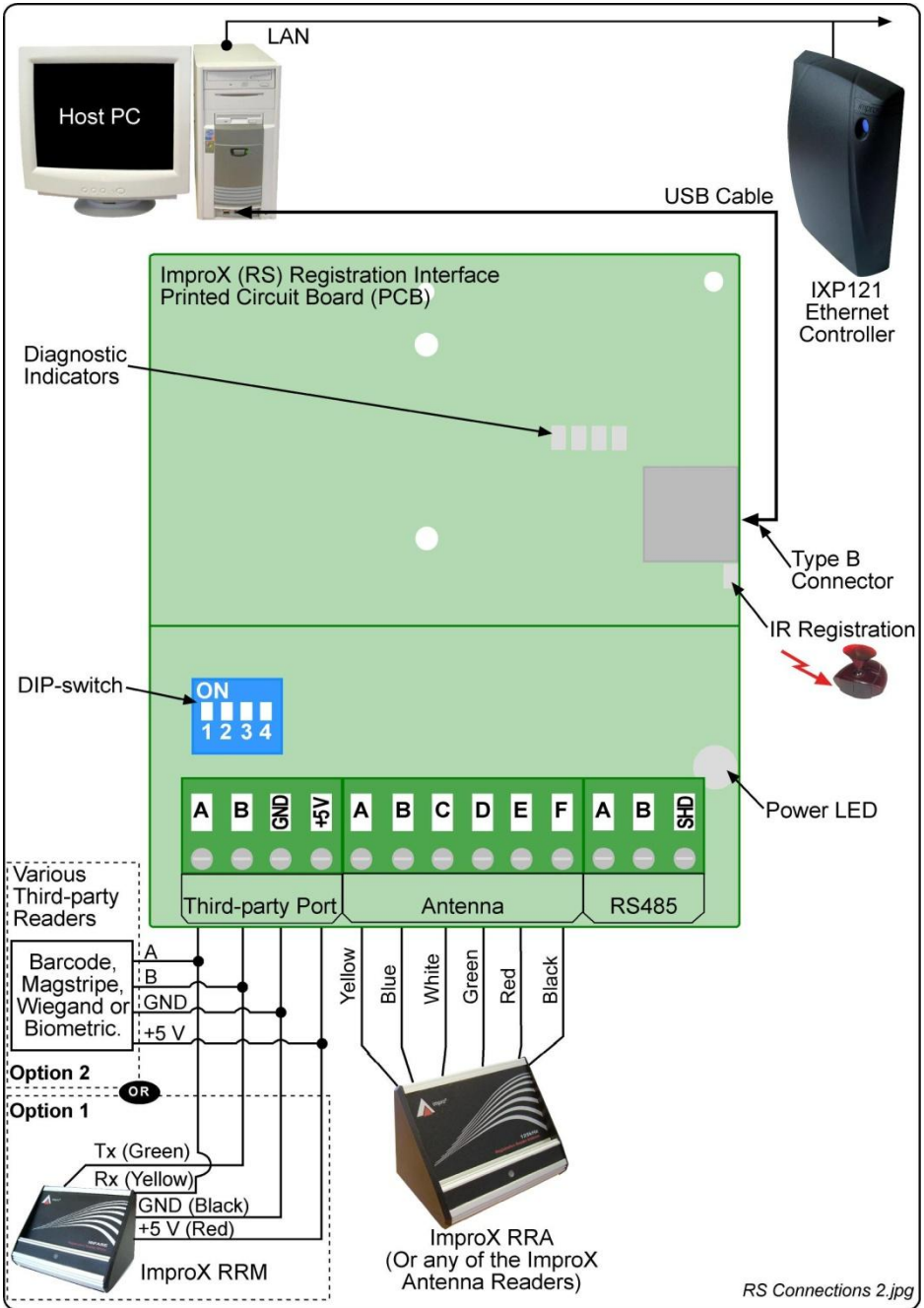


Figure 7: ImproX RS with LAN Connection

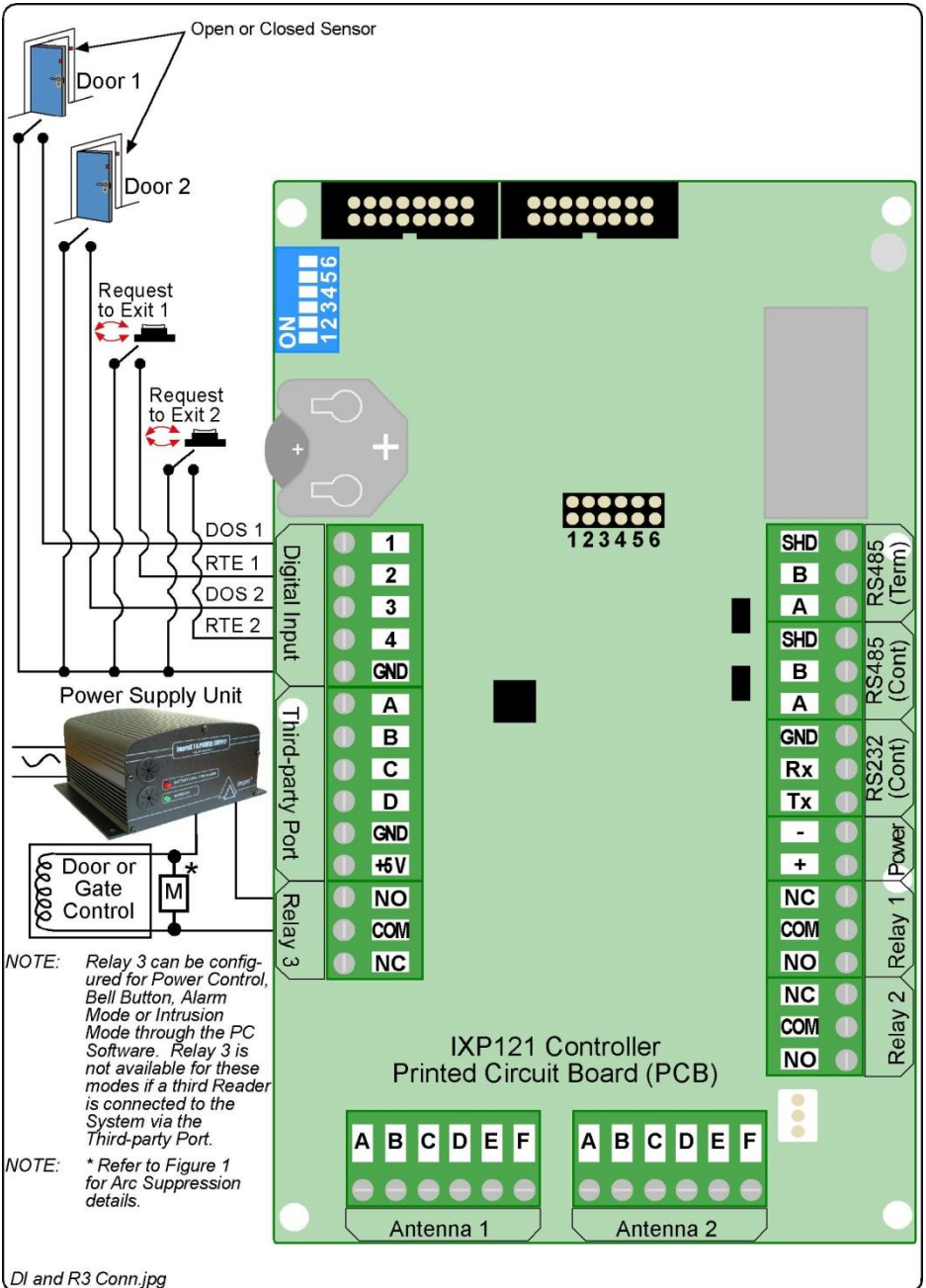


Figure 8: Digital Input and Relay 3 Connections

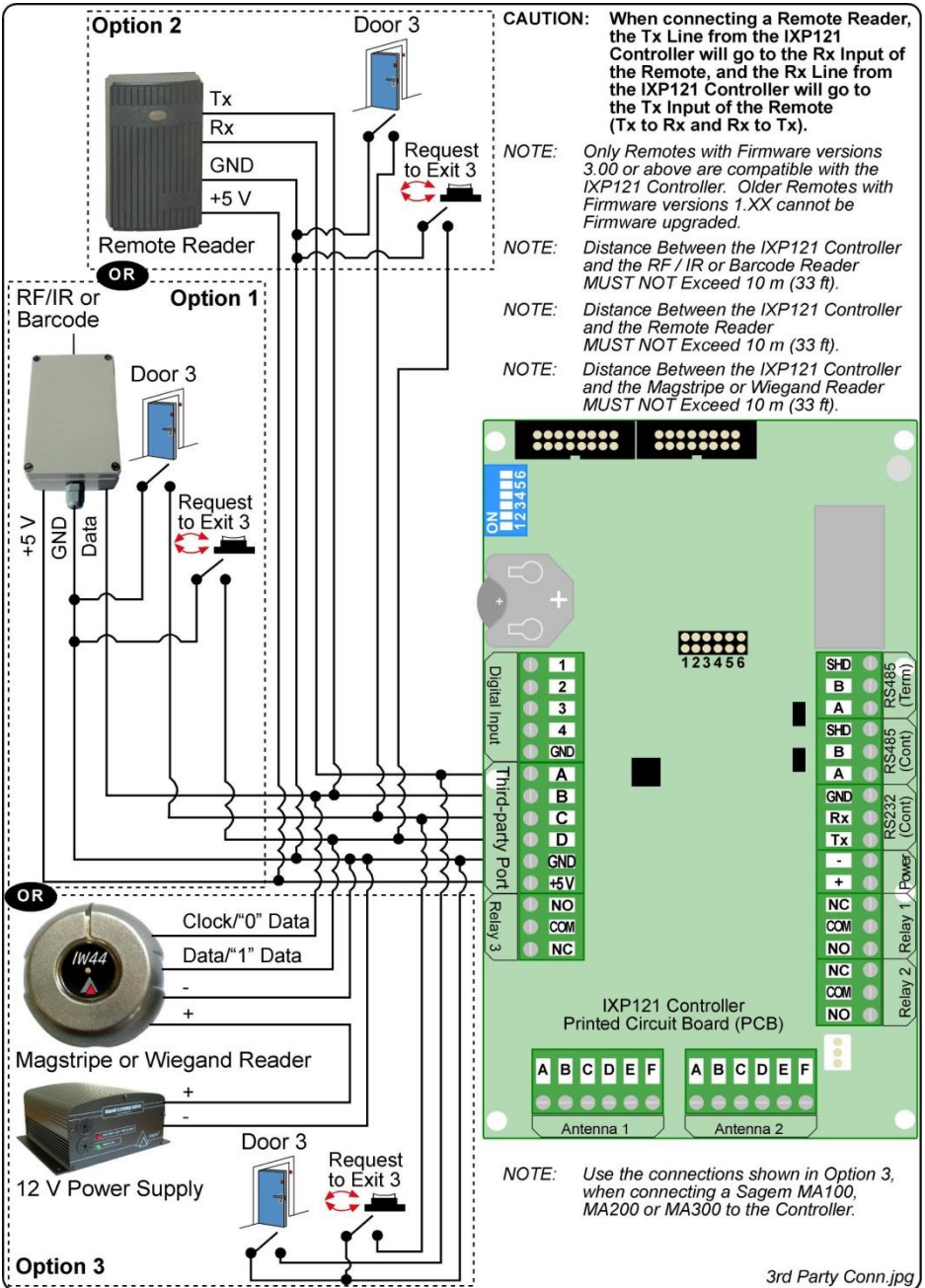


Figure 9: Third-party Port Connections

CAUTION: When connecting a Remote Reader, the Tx Line from the IXP121 Controller will go to the Rx Input of the Remote, and the Rx Line from the Remote, and the Rx Line from the IXP121 Controller will go to the Tx Input of the Remote (Tx to Rx and Rx to Tx).

NOTE: Only Remotes with Firmware versions 3.00 or above are compatible with the IXP121 Controller. Older Remotes with Firmware versions 1.XX cannot be Firmware upgraded.

NOTE: Distance Between the IXP121 Controller and the Remote Reader **MUST NOT** Exceed 10 m (33 ft).

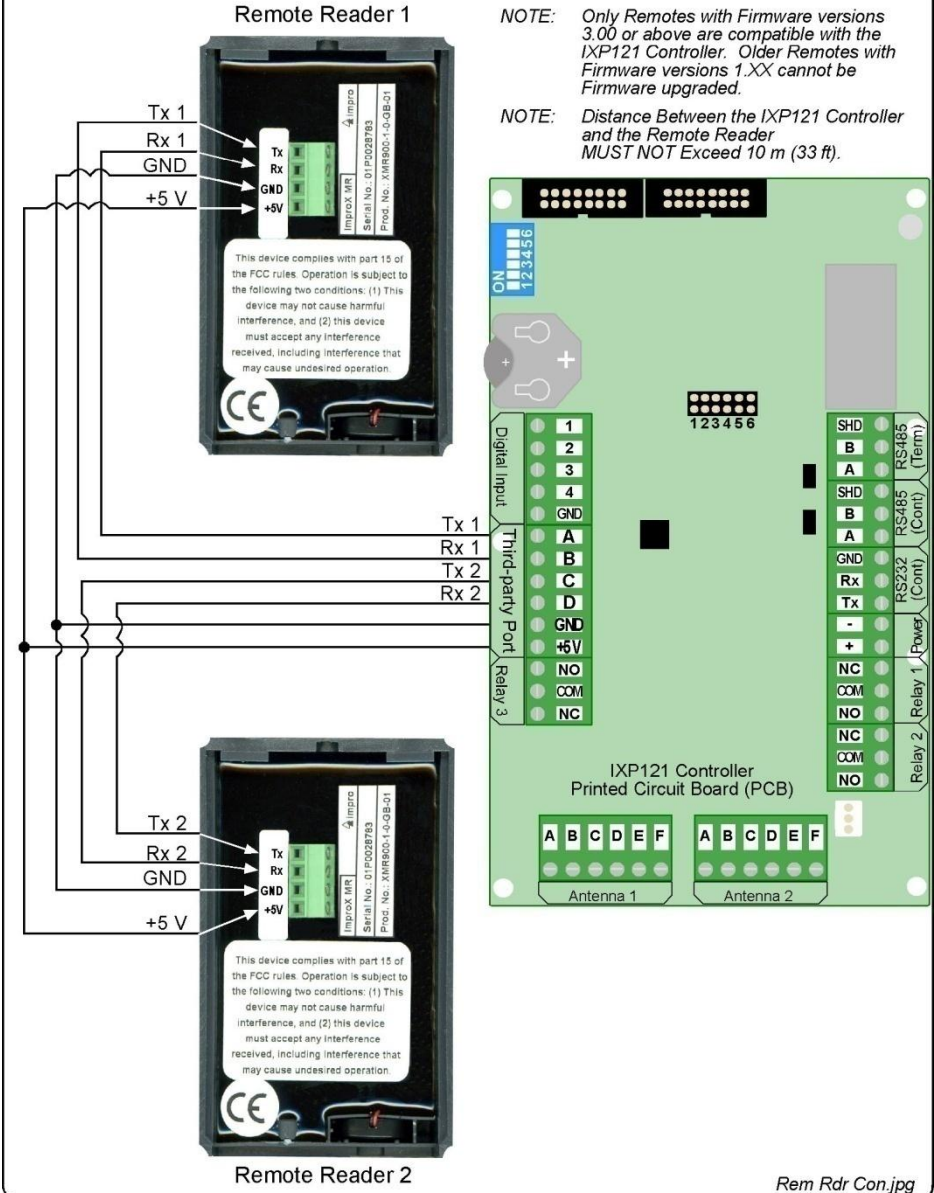


Figure 10: IXP121 Controller Connected to two Remote Readers

Modes of Operation

Alarm Mode

In this Mode, the Controller interfaces with an Alarm Panel to either, arm or disarm, or trigger the Alarm Panel.

Arming

1. In the IXP120 Software, designate a Reader as an “Alarm Arming Reader”, by selecting the Alarm Arm checkbox.
2. Present an Administrator or Supervisor Tag to the “Alarm Arming Reader”.
3. Press the “#” key on the Keypad Reader, within 10 seconds of presenting the Tag. The Reader beeps for 30 seconds, before activating the Arming Relay (Relay 3), giving you sufficient time to vacate the Alarm Zone.

If the “Ready” Input is not closed, then the arming countdown will NOT begin.

The “Armed” Input is used to detect if the Alarm Panel is armed. This Input sets the “Alarm Arming Readers” Status LED to blink, indicating that the Alarm is armed.

When the System is armed, the “Alarm Arming Reader” will deny Normal or Visitor Tags access.

Disarming

Present an Administrator or Supervisor Tag to the “Alarm Arming Reader”. Relay 3 will deactivate, signaling the Alarm Panel to disarm.

Alarm Events

The Controller has several Events that can trigger the Alarm Panel when it is armed. These are:

- Door Forced.
- Anti-tamper.

Intrusion Mode

In this Mode, there is no installed Alarm Panel, and a simple Intrusion Alarm is required.

You may connect Passive Infrared or other types of sensors to the IXP120 System’s Digital Inputs (Inputs 1 and 2). If any of these sensors trigger, the IXP120 System receives an input signal, activating Relay 3. Relay 3 then drives the siren.

Arming

1. In the IXP120 Software, designate a Reader as an “Intrusion Arming Reader”, by selecting the Alarm Arm checkbox.
2. Present an Administrator or Supervisor Tag to the “Intrusion Arming Reader”.
3. Press the “#” key on the Keypad Reader, within 10 seconds of presenting the Tag. The Reader beeps for 30 seconds, after which Intrusion Mode activates.

When the System is armed, the “Intrusion Arming Reader” will deny Normal or Visitor Tags access.

Disarming

Present an Administrator or Supervisor Tag to the “Intrusion Arming Reader”.

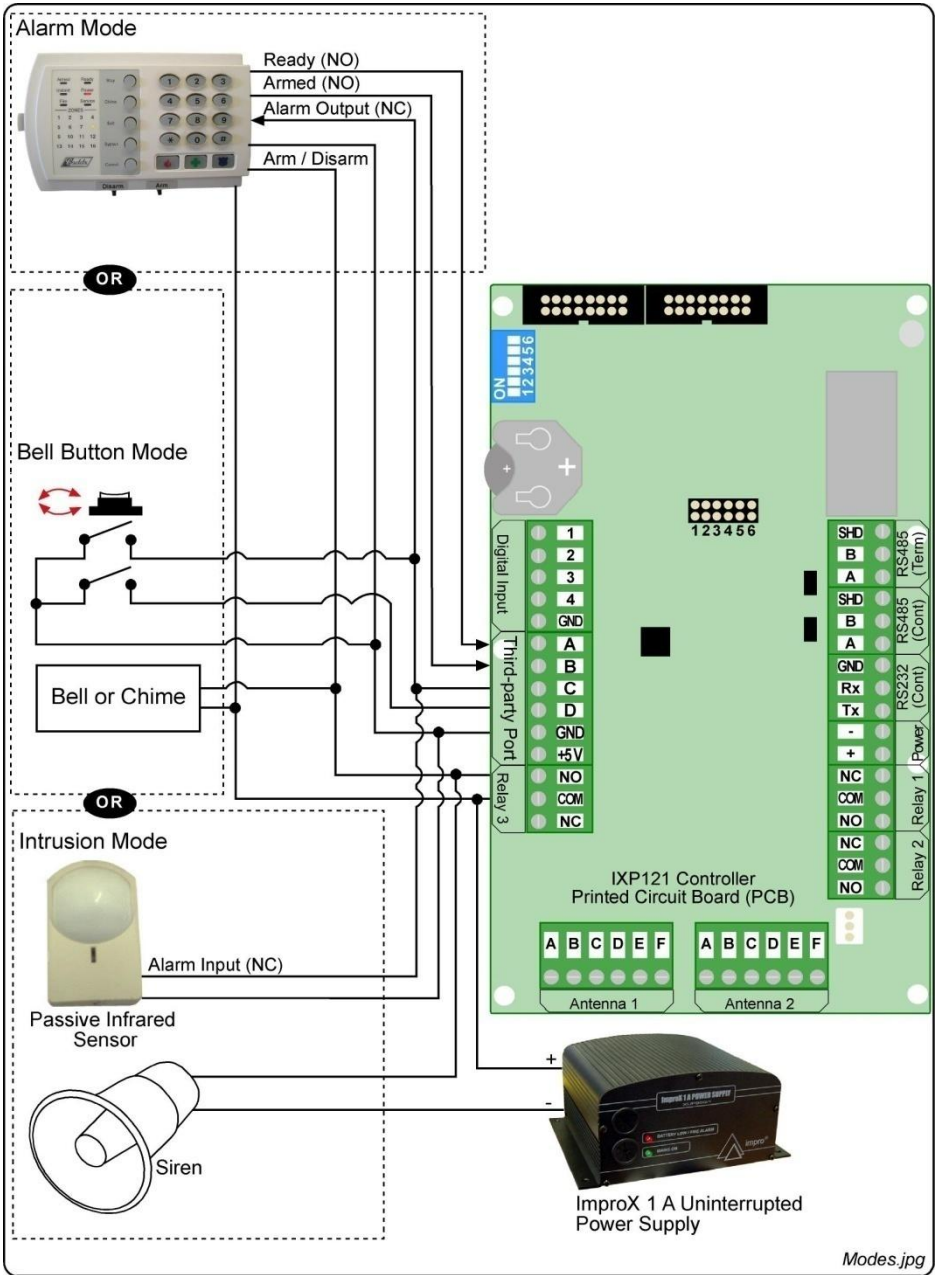


Figure 11: Modes of Operation

Modem Connection

Connect the Modem to the IXP121 Controller as shown in Figure 12.

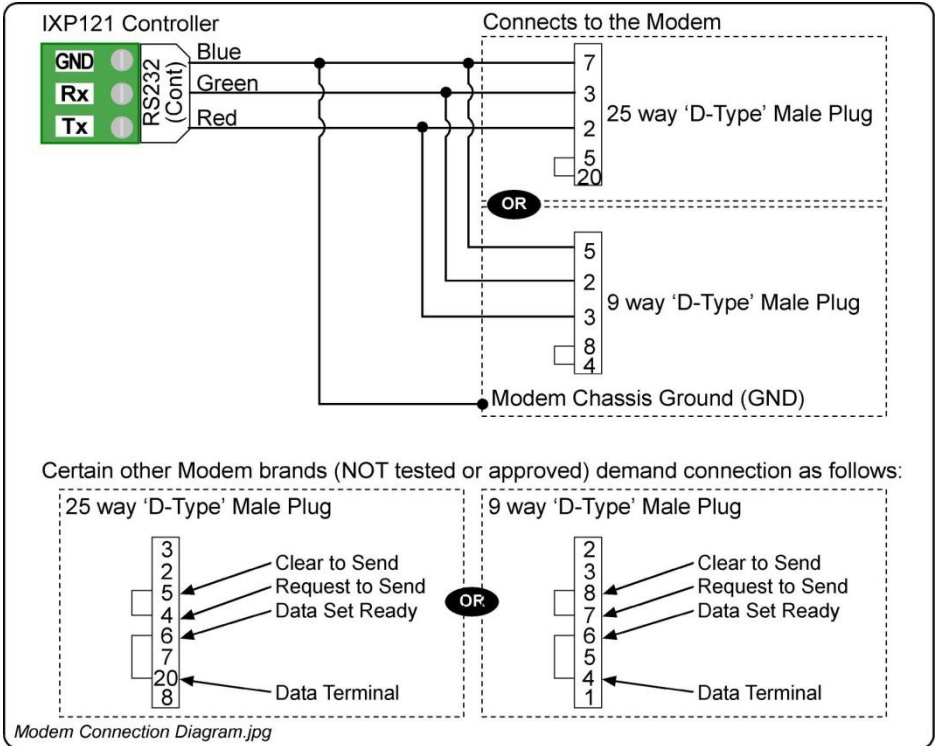


Figure 12: Modem Connection Diagram

NOTE: We have approved the use of the Duxbury 56 Kbps V9.2 Serial External Modem, Model number K56E and the 3Com or US Robotics 56 Kbps V9.2 Serial External Modem. Although we supply guideline connection details for certain other Modem brands, these brands have NOT been tested or approved by us.

NOTE: After connecting the Modem to the IXP121 Controller, power up the Modem and then the IXP121 Controller. If the Controller detects the Modem's presence, the Controller's Blue Status LED blinks slowly. When the PC Software connects with the Controller, the Controller's Status LED blinks rapidly. The Controller tries to auto-detect the Modem every 5 minutes, if the Modem is not present.

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Fixed Address Label

Once the IXP121 Controller is installed, sketch a rough site plan. Attach the loose (additional Fixed Address Label packaged with the Controller) Fixed Address Label in the position of the Controller on the sketched site plan. When the system installation is complete and all the units are represented on the site plan by their Fixed Address Labels, file the site plan for future reference.

The IXP121 Controller reports up to four Fixed Addresses. The Fixed Address Label included with the Controller is the Fixed Address for the Controller only. Antenna 1's Fixed Address is calculated by the Software using the Controllers Fixed Address +1. Antenna 2's Fixed Address is calculated using the Controllers Fixed Address +2. And the Third-party Readers Fixed Address is calculated using the Controllers Fixed Address +3.

When the Third-party Port is set up for two Readers (Multi-mode), their Fixed Addresses are calculated by the Software using the Controllers Fixed Address +1 and the Fixed Address +2 respectively.

MAC Address

The MAC Address identifies the Lantronix® XPort™ component placed in each IXP121 Controller. The MAC Address and the description of the Controllers location are required by the Software Installer to enable an IP Address to be assigned to the Controller.

We recommend that you attach the Fixed Address Label (with the MAC Address) to the site plan in the Controllers installed location.

TROUBLESHOOTING

Duxbury Modem (Model - K56E)

Problem

Unable to connect to the Remote Site when using a Duxbury Modem (Model K56E): Some Duxbury Modems have no GND connection on pin 5 of the RS232 DB9 Connector and therefore you cannot make a connection to, or communicate with the Remote Site.

Solution

To solve this problem connect the Yellow or Green EARTH Wire to the "GND" Input of the RS232 (Cont) Port on the Controller.

We recommended that you test the Modem using a multi-meter (to see if there is a connection between pin 5 of the RS232 Connector and the Yellow or Green EARTH Wire), before installing the Modem at the Remote Site (refer to Figure 12).

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GUARANTEE OR WARRANTY

CAUTION: We reserve the right to nullify the products guarantee or warranty where you have not properly installed the Metal-oxide Varistors.

This product conforms to our Guarantee or Warranty details placed on our Web Site, to read further please go to www.impro.net.

USER NOTES

USER NOTES



This manual is applicable to the ImproX IXP121 Controller, XEA900-1-0-GB-01, XEA901-1-0-GB-01, XEA902-1-0-GB-03, XEA903-1-0-GB-03, XEA904-1-0-GB-01 and XEA905-1-0-GB-03. (The last two digits of the Impro stock code indicate the issue status of the product).

XEA300-0-0-GB-11	Issue 12	May 2008	IXP120\Controller\English Manuals\ LATEST ISSUE\IXP121C-insm-en-12.docx
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