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Introduction

Welcome to the IQX, the revolutionary system of intelligent access control from PCSC. The IQX was designed for ease of installation.

This manual explains how to install the IQX system and connect to a Personal Computer (PC). The IQX Manual is divided up into seven sections:

- **Step 1** - Unpacking the IQX
- **Step 2** - Theory of Operation
- **Step 3** - Installation
- **Step 4** - Powering Up the System
- **Step 5** - Additional Panels and Components
- **Step 6** - Starting the System
- **Step 7** - Troubleshooting

Before turning on the IQX or the PC, take a moment to read through this manual. It has been designed to allow you to move through the installation process quickly and with a minimum of frustration.

The **Theory of Operation** is a short introduction to the basics of access control and the elements that are necessary to run the IQX system.

**Step 1** List the elements that have been included and the tools that are necessary.

**Step 2** Discusses access control and the best way to plan for your IQX installation.

**Step 3** Shows pictures from an installation of the IQX and discusses the specific connections for each element of the IQX system.

**Step 4** Shows the proper sequence of events for powering up the system.

**Step 5** Covers everything you need to know about adding additional IQX controllers and components to the system.

**Step 6** Provides a step-by-step procedure for starting the system and setting up the beginning parameters.

**Step 7** Guides you through trouble shooting the system if it does not act properly upon bringing it up.

**NOTE** Specifics about the IQX and its component systems can be found in the Appendix IQX Specifications.
Step 1- Unpacking the IQX
Step 1- Unpacking the IQX

As you unpack the IQX, inspect it for missing items or damage. Contact the dealer if there are any irregularities. Keep ALL packing material for protection in case you have to return the unit for any reason.

What you get -

- [ ] 1 LiNC-Ez PC Based Software on CD-ROM
- [ ] 1 IQX 2 Door Controller in 5-gang electrical box with cover
- [ ] 2 PCSC PR732 Proximity Card Reader
- [ ] 50 PC-73 Proximity Cards
- [ ] 1 RS232 to RS485 Communication Converter with power supply
- [ ] 2 Transorbs
- [ ] 1 Card Re-order Form
- [ ] 1 Screwdriver
- [ ] 1 Software Manual
- [ ] 1 Hardware Installation Manual
- [ ] 1 Quick Installation Guide

What you may also need -

- [ ] 1 12VDC Power Supply
- [ ] 1 12VDC Backup Battery
- [ ] 2 Door strikes or Maglocks
- [ ] 2 REXs or PIRs
- [ ] 1 Dedicated PC computer
Step 2 - Theory of Operation
Step 2 - Theory of Operation - Access Control and the IQX

The advent of electronic access control has revolutionized the world of locksmiths and security. The safety and trust of one’s surroundings is essential for a person to work to his/her capacity as an employee. In the years before electronic access control, trust of one’s employees was necessary and had to be developed over time. With electronic access control, where electronic cards replace keys, a person’s access to his/her place of employment can be monitored and controlled. Strangers or guests are limited in their access to a facility and employers and employees can feel safe in knowing that their possessions and work environment is safe from those outside their department or office.

Creating one or a series of access control points in an environment creates an access control environment. An access control point is usually a door to which a person’s access is assessed by time, duration and privilege. Is this person allowed to enter this door? At what times of the day and week is this person allowed in? How long is this person allowed in through this door before they have to come out?

An access control system that can be created by the PCSC IQX series can have two access control points per panel, or two doors. Additional panels added to the first then increases the number of doors one IQX system can control and monitor. With two IQX panels hooked together, one can monitor four doors; with three IQX’s hooked together, one can monitor six doors, and so on.

An IQX access control environment can vary by the number of panels in a system and the number of doors that can be monitored. Likewise the equipment or elements in an access control point may vary due to the level of security needed, or the kind of access allowed.
In every case, an access control system will require the set up and placement of an IQX, its 12VDC power supply via its connection to a 110VAC junction box (which will also power the door lock), and a dedicated computer that monitors the access control system. At the access control point, there must be a reader that determines access, and a functional electronic door lock that allows access through the access point.

On the system level, the necessary elements are relatively obvious. The IQX runs the access control system and receives instructions from the dedicated computer that it is connected through a RS485 cable. In order for the IQX to run properly, it requires a power supply that will convert standard 110VAC power to the 12VDC.

The IQX system uses the PCSC Proximity Reader (PR) 732 as its standard reader. Each IQX panel will power two readers and the accompanying door sense equipment. The door lock, usually a door strike or maglock, are usually powered by the same power source that power the IQX. There is often a separate door sense that is used to monitor if the door is closed, open or forced open.

Other door sense equipment that can be used are a R.E.X. (Request To Exit), which is a push button that releases the door lock to allow one to exit through the door, or a P.I.R. (Passive InfraRed Detector) which has the same function, but is activated by body temperature.
Determining Your Needs

The first and most important decision is to decide what kind of installation you need. Some sites require a tremendously enhanced level of access control, coupled with a security staff. However, most systems require only a fraction of that amount of time and money. Which kind of access control system do you need?

It’s best to start with a detailed description of what your system needs to accomplish. Realize that every system will be different because the objectives and requirements of each system will be different. Some examples are:

A store will need to limit shoplifters from leaving through unauthorized exits, and will need to maintain control of the delivery areas, stock rooms and the store when it’s closed.

An office building will need to monitor when employees enter and leave departments, inhibit entrance by unauthorized people, and control exits.

An institution or hospital requires that individuals stay in certain areas and out of other ones during normal operation, but then have the ability to exit the site in the case of emergencies.

There are obviously many more examples that we could offer, but suffice to say, one must know what each particular site will require, and the level of control that will be required.
Planning Your Site

A detailed plan of your site is probably the most important element of installing a system in a matter of hours versus a matter of weeks.

Before we proceed, be aware of the necessities and limitations of different parts of the IQX system.
IQX

The proper placement of the IQX is the most important decision in planning your installation. As the brain of your system, the great care must be afforded in finding a location that is dry, safe from large temperature variations, and most importantly, secure from the unexpected.

The IQX is designed to fit into a standard 5-gang electrical box (included). The recommended installation locations are:

1. Telephone/ PABX Rooms
2. In a Computer Rooms
3. In a Wall near one of the Readers (protected area)
4. Above a False Ceiling

To keep your IQX working properly, locate where:
- the temperature range is between 45-135 F (non-condensing)
- Maximum Distance from Reader to IQX is 500 Feet
- Distance from the PC to the last IQX (if you are using more than one) less than 2,000 ft.

You should select an area that is the most convenient for cabling and future maintenance.
Readers

Readers should always be a maximum distance of 500 feet from the IQX.

In deciding the proper place to put your readers, keep in mind a few elements. PCSC recommends that you place your reader between 36-48” (90cm-120cm) from the floor, though installation should conform to the local, city, county and state installation codes.

Door Strike, Door Sense, PIRs and REXs

Like the reader and the door lock, the door sense and REX must be positioned within 500 feet of IQX. The door sense is most often placed at the top of the door in order to “sense” the position of the door (open, closed, forced).

The PIR and the REX are placed on the opposite side of the door and function to allow people to exit the establishment. The PIR is used for automatic exit procedures or motion-detectors, while the REX is used for manual exits.
Worksheet

Ask yourself a few questions:

How many access control points (doors) will need to be monitored?

Do you require a R.E.X. or P.I.R. for proper system functioning?

What kind of door lock mechanism is required? Door strike, mortise lock, or mag-lock? What are the voltage and current requirements?

Where is an 110VAC junction box located for easy use? Or will a dedicated circuit and breaker be required?

Where will you place your power supply and IQX that best protect them from tampering and environmental variations?

Where will be the dedicated computer system that will monitor access?
Step 3 - Installation of the IQX
Step 3 - Installation of the IQX

Installing your IQX system

Installing the IQX should be fairly straightforward procedure. The first step is to review the safety guidelines that follow.

Installation of your system should take approximately 1-3 hours per access control point (depending on your familiarity with the IQX system and access control installation).

**NOTE:** For UL 294 Installations the IQX panel shall be installed in the protected area

Grounding

**Properly Routing Your Cables**

Do not route data and power cables in the same conduit. Cross-talk and transmission of electrical noise may result. The IQX printed circuit boards will become damaged if the power cable grounds to the data cable.

**Grounding your 110vac Power Lines**

All high voltage grounding and wiring should comply with local, state, and federal regulations, as well as conform to NEC standards. In general, use a third green wire ground with 110vac power runs. Ground wire should be appropriately connected to source ground, as well as junction boxes, back-boxes, and enclosures.

**Grounding the Reader and Data Lines**

Each cable has a set of drain lines that can be attached on the Host or controller end of the cable to any screws mounted in the optional enclosures. If other non-metallic enclosures are used for controller housing, ensure that an alternative source for earth grounding is available.

**Procedure:**

1. Reader and Data Lines should be properly earth grounded for uninterrupted reads. Use “Open ended grounding”, or “drain wire” techniques for both. This technique means to tape back, or isolate one end of the shield drain wire, and earth ground the other. An example would be to tape back the shield at the reader side, and to tie the shield at the IQX panel side to earth ground. Please be aware that operation is affected by the amount of static present during certain times of the year.
2. At the reader site, it is important to be aware of both the static generated from electrical grounding from the data and reader cabling as well as the user site. If at all possible, the reader mounting plate should be attached to a grounded junction box or to another source, if the junction box is non-metallic. This alleviates the possible damage caused by static electricity.

3. If grounding locally is not possible, connect drain wires to provided ESD (Electro Static Discharge) hardware at the controller site (enclosure) or to an earth-grounded conduit. As each reader port is progressively farther away from the ESD hardware location (left-rear side of the cabinet for IQXs), allow for enough drain line to reach the ESD hardware on the controller end of the cable. Allow enough strain relief to avoid touching other circuitry or creating excessive tension.

**Noise Suppression**

PCSC has designed its products to withstand most inductive voltage spikes without affect. However, some noise found in power supplies and door strikes, in addition to static discharge, may cause the control unit to momentarily shut down, lock up, or in extreme cases, become damaged. Unexplained lockups and intermittent system behavior are common symptoms of static or noise problems. If cycling power will remedy your problem, carefully follow these instructions:

1. For DC powered door strikes install a reversed biased diode (IN4007 or equivalent). For AC powered door strikes install a M.O.V. (metal oxide varistor) rated at 50 volts or higher, or Transorbs (P6KE15A or equivalent) at each door strike. When installed, they will suppress most problem door strikes.

2. Properly grounding all readers and hardware, in addition to suppressing noise in the peripheral equipment, should allow for many problem free years of use with PCSC products.

3. In addition, PCSC recommends using a separate filtered, electronically regulated output, switch-able power supply for door strikes.

4. Before installing the reader, please read the following instructions. Damage may occur if this is disregarded.

5. Installation must meet all local, state, and federal regulations and codes for electrical installation. If these codes conflict with the installation methods described in this manual, please call your service representative.
Installing the IQX

Preparation

Locate an 110vac junction box that will be suitable for your IQX installation.

As the junction box, in most situations, will already have been previously installed during a building’s installation, it should be a determining factor as to where your installation should take place.

Determine which breaker in the breaker box powers the 110VAC junction box.

With any high-voltage electrical work, a qualified electrician will need to know which breaker powers the local junction box. Be aware that power to the local junction box will need to be off during the connection between the junction box to the 12VDC power supply. You may need to supply extra lighting to the installation area during the time that power is off.

- Review and pick out locations for your IQX 5-gang box and 12VDC power supply box.
  Remember to look for locations that are within 500 ft of your access control points. Make sure that your location is also safe from temperature variations, environmental changes, and access from outsiders.

- Review Reader and Door Hardware materials for mounting requirement.
  Will you require special tools when installing your system? Always follow the directions of the reader.

  NOTE: For more product information on the proximity reader, refer to the AWID Applied Wireless ID, Model SR-2400 Installation Manual - P/N 002-98-A.

- Prep and cut door frames for lock and door sense hardware.
  In most cases, the doorframes will be metal. You may need to use metal snips and a drill to size and secure the lock hardware and your door sense to both the frame and the door itself for wooden frames you may need wood working tools.

- Cut out dry wall access points for the door hardware and reader.
  Where will your readers be located? Make sure that your access points correspond to the locations where you plan to have your hardware. If you are using REXs or PIRs make sure placement of access points are on the opposite side of the wall from the readers.
Installing the Power Supply and IQX Box

Connecting the 12VDC power supply to the 110VAC junction box

Do not attempt to connect the 110VAC junction box to the 12VDC power supply unless you are a qualified electrician. All connections from the 110VAC junction box to the 12VDC power supply should meet National Electrician Code (NEC). High voltage accidents can be fatal to you or others.

Mount power supply box (see figure)

After finding an appropriate location for the power supply box, drill holes that will secure it into place. It’s imperative that the box’s location is stable that the wall behind it will support the weight of the metal box, the power supply hardware and a rechargeable 12VDC battery.

NOTE: For UL installations, the following power supply(s) shall be used: manufacturer ESD, model # SPS-3.6M2 (12VDC., 3.0A, 2 Outputs)

Mount IQX box (see figure)

Drill holes that will secure the 5-gang box to the wall. The location of the IQX should be near the power supply and with easy access to the access control points and their hardware. The box may be surface, or flush mounted.

Hook up Battery leads in power supply for your backup power supply.

Follow the instructions offered with the power supply for the proper connection of leads for the backup battery supply. Though not essential, a backup battery is highly recommended in case of a power failure. Do not hook up actual battery until you are ready to power up the IQX system.

(Optional) Install power distribution block to the power supply (see figure)

You may wish to install a power distribution block that will allow separate leads for both the IQX and the different door hardware. This will provide separate fused circuits for each device.
Remove knockouts from the 5-gang box and secure connectors

Connections for the IQX will enter the 5-gang box in three areas (though actual installation and entrances may vary).

- Power connections - Top Entrance
- Door Connections - Right Entrance
- Reader Connections - Left Entrance
- PC Connections - Left Entrance

You may also wish to mark the entrances around the mounted 5-gang box to show where connections will be made to the IQX. To simplify the installation process, decide which access control point will be Door 1 and which will be Door 2. This will help you decide where door hardware and reader should be connected first to the IQX.

Connect and pull 12VDC wire between power supply and 5-gang box

After removing the knockouts and placing connectors on the 5-gang box, string the connecting wire between the power supply and the 5-gang box. Do not attempt to install the IQX at this time.
Installing the Reader and Door Lock

Pull lock/reader wire to the target doors.
Using an appropriate method run wiring from the 5-gang box to both Doors 1 and 2. Remember that wiring for door hardware and readers differ in both the types of wiring and where wiring is necessary:

- **Readers:** Since the IQX monitors and powers the PR-700 readers, string 6-conductor 22-gauge wire from the 5-gang box to the target doors.

- **Door Hardware** Locks and PIRs are monitored and controlled by the IQX but powered directly from the 12VDC power supply. When connecting the door hardware, use 2 conductor 18-gauge wire.

Work door jam and reader location to pigtail wire out for each device
Once wiring as been run from the 5-gang box and power supply to Doors 1 and 2, pull reader wiring through the hole-punch created in the drywall. Repeat the process with wiring from the different door hardware. Make sure you give yourself an extra few feet of wire for room to maneuver when making connections.

Splice and mount both readers
Position the Reader at the appropriate mounting position on the doorframe (remember to observe ADA height requirements).

Pull the shielding off both the reader cable and the wiring pigtailed through the drywall. You will see that the reader cable includes 10 wires, though only five carry current to the IQX.

Connecting the PR-732 Reader to the IQX is as follows:

- **VCC** = red wire
- **DATA1** = white wire
- **DATA0** = green wire
- **RTN** = black wire
- **LAMP** = brown wire

Splice the wires together and secure using wire nuts or splice caps.

Be sure to cut back drain wires and tape back along with non-used reader wires.

Drain wire (shield) should be earth ground at the IQX panel location.
Position the reader against the wall. Use a level to assure that the reader is mounted straight. Mount the reader and to the wall using screws.

**Splice and Mount the Door Hardware**

The proper placement and connections for your door hardware depends on the type of equipment being used. Follow the instructions offered your door hardware on the best way to splice and mount your hardware. Remember to install your transorb, diode, or mov, at door lock location.

**Wire door hardware to the power supply**

Follow the instructions offered for proper wiring connection to the 12VDC power supply.

Follow the same procedure for the other door elements that will be used.
Installing the IQX Panel

(Optional) Splice switch leg to IQX
The IQX was designed to function with a permanent power connection. You may wish to install a power switch to the connection from the power supply so that you can turn the IQX on and off.

Make all IQX hardware terminations
(see the illustrations on the following pages for proper wiring)

Terminate IQX to power supply.
Once the IQX has been connected to its peripheral hardware, wire the connection to the power supply at the upper edge (normal orientation) of the board.

Mount IQX in 3-gang ring.
At this point the power supply, readers and door hardware have been connected to the IQX. Carefully turning the IQX around so that the 10-segment LED faces forward, mount and secure the IQX into the 5-gang box.

Complete the circuit from 110VAC junction box to Power Supply
At this point, you may finalize the connection between the 110VAC junction box to the 12VDC power supply. Remember to switch the local breaker to the off position during this step of the installation. Do not attempt this connection unless you are a qualified electrician!
Running cable to Dedicated PC

You will need to set up the connection that will connect the IQX to its dedicated PC. The IQX communicates to the PC using the RS-485 Converter. Thread a wire through the IQX to where your dedicated PC is located.

Power the system via the circuit breaker
Once the connection between the junction box and the power supply is secure, power the main system by returning the building circuit breaker.
Wiring the IQX

Reader Wiring (detail)
Connecting the REX to the IQX (detail)

Connecting the Door Sense for IQX (detail)
Connecting the Power Supply to the IQX (detail)

[Diagram of power supply connection]

Connecting the Open Collector Output (detail)

Open Collector Output: Open collector outputs are designed to drive an external relay. This output is for door held and forced alarm output. The open collector outputs are capable of 100 mA current @ 12VDC.

[Diagram of open collector output connection]
Lock Wiring (detail)

Wiring the door locks will vary on the type of "environment" you wish to have- fail-safe or fail-secure.

**Fail-safe**: In the case of removal of power from the lock (i.e.- a power failure), the door will unlock.

**Fail-secure**: In the case of removal of power from the lock (i.e.- a power failure), the door will remain locked.

Obviously, determining which type of environment to use is of utmost importance. Is the access control point an area where people need to exit in the case of emergencies? Does the area within the access control area require vigilance even in situations where there has been a power failure?
Connecting the Door Lock to the IQX Panel in a Fail-Safe Environment (detail)

Example of the IQX with a Doorstrike in a Fail-Secure Environment

Example of the IQX with a Maglock in a Fail-Safe Environment
Connecting the Door Lock to the IQX Panel in a Fail-Secure Environment (detail)

Example of the IQX with a Doorstrike in a Fail-Safe Environment

Fail Safe Strike

Open Collector

Common Relay Contact

Normally Closed Relay Contact

Diode for counter EMF protection

MCV (metal Oxide Varistor) Bianners, S16K30 or equivalent

Door Strike P/S (Battery backed)

Supervised Egress Sense

Sense 2

Ground

Sense 1

Ground

Supervised Door Sense

Dashed lines illustrate Relay on Circuit Board. Contact Rating for 2 Amperes Continuous @ 24V DC power

+12V, 160 mA max.
Direct Connecting with One IQX (detail)

The PC Host is connected to the IQX twisted pair cable for RS-485 communication. The following diagrams illustrate the RS-485 and RS-232 DB9 connections.
Step 4 - Powering Up the IQX Controller
Step 4 - Powering Up the IQX Controller

NOTE: We are going to check the IQX controller by itself before connecting it to the PC for system operation.

At this point, all the connections have been completed and we have not yet started the LiNC-Ez program.

1. Apply power to the IQX Board.
2. Check that the IQX Red Power Indicator is ON.
   
   This is the left most indicator on the LED strip on the front of the board.

   If the LED does not come on, go to symptom 1 of the troubleshooting guide in chapter 7.

3. Check that the Power LEDs on the Proximity Reader are ON (Red).

   If the reader LEDs don’t come on, go to symptom 2 of the troubleshooting guide in Step 6 - Problem 2 – Pg. 40

4. Take any one of the proximity cards you received with the system that is not currently connected to a PC and hold it up to a reader connected to this controller.

   This should cause the door strike to energize.

   If the door strike doesn’t energize, go to symptom 3 of the troubleshooting guide in Step 6 – Problem 3 – Pg. 41.

5. Press the REX (Request to Exit) button if you have installed one.

   This should cause the door strike to energize.

   If the door strike doesn’t energize, check the wiring connection from the REX button to the power supply.

6. Perform this set of steps for each of the controllers you have installed.
7. Do not run LiNC-Ez until all the panels and readers have been powered and checked.

After complete hookup of IQX to power, door and REX, it will be in test mode. All cards will open door and Rex will function for installation test. After LiNC-Ez software communicates with IQX, all functions will follow program.

**POWER-UP CHECKLIST - IQX**

- [ ] The IQX Red Power Indicator must be ON (left-most indicator on LED strip on front of board).
- [ ] The Proximity Reader(s) Red Power LED Indicator must be ON.
- [ ] Present any of the 50 cards that come with the system.
- [ ] The Door Strike should energize to open door.
- [ ] Press the REX button. Door Strike should activate. If not, check connection from the REX button to the IQX.
- [ ] Once all readers and REXs are verified, connect the PC to the System.
- [ ] Setup operational parameters. The System will automatically download to the connected IQX’s. The System should now be fully functional.
Using the Ten-Segment LED Array

LED Status Chart for IQX Supervised Sense Inputs L1 through L4

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Circuit is normal</td>
</tr>
<tr>
<td>OFF</td>
<td>Circuit is in an alarm condition</td>
</tr>
<tr>
<td>2-second blink</td>
<td>Fault condition.  Open circuit</td>
</tr>
<tr>
<td>1-second blink</td>
<td>Fault condition.  Short circuit.</td>
</tr>
<tr>
<td>1/2-second blink</td>
<td>Circuit is NOT calibrated &amp; NOT functional.</td>
</tr>
</tbody>
</table>

![LED Array Diagram](image-url)
Step 5 - Additional Panels and Components
Step 5 - Additional Panels and Components

Communicating with Multiple IQXs (via RS-485)

Once the PC host is connected to one IQX, the next IQX can be connected by wiring from P3 from the first IQX to P4 in the next IQX. This format can be repeated in up to 16 IQXs. In addition, IQXs can be configured up to the 32 total limit on a single RS485 channel.
Addressing Individual IQXs through the DIP Switch

The IQX communicates over a RS485 serial direct connection.

The Dipswitch Sw1 is located at the lower left of the center of the board. Address each additional IQX uniquely in sequential order, starting with Address

NOTE: IQX 17 to IQX32 follows the same progression with Switch #6 ON.
Step 6 - Troubleshooting
Step 6 - Troubleshooting

Check for these problems first:

1. Faulty Cable connections.

2. Inadequate Power Supply.
   IQX with two proximity readers require a continuous 1 amp at 12 VDC. Any door strikes connected to the power supply must be properly rated. Be sure to make allowance for the in-rush current of door strikes (X2). Magnetic locks have a high in-rush current, as high as 1.5 amps. This must be considered during sizing of the power supply.

Possible Problems

Problem 1:

IQX Power LED indicator is not on.

Checklist:

[ ] Check power. It could be a defective power supply.

[ ] Does the power supply have a minimum continuous output of 1 Amp at 12 VDC?

[ ] Check wiring from power supply to IQX.

You may have a possible polarity problem. Be sure that the plus (+) lead from the power supply is inserted into the plus (+) power connection point. Likewise, check that the negative (-) power supply is inserted into the ground connection point

Problem 2:

Reader LED on the board is not on.

Checklist:

[ ] Check wiring from IQX to Proximity Reader
Problem 3:
Cards are not being read.

Checklist:

(Card reader will ‘beep’ when successfully read and sent to the IQX.)

[ ] Check the card reader to see that the LED is showing red.
   If not, refer to Problem 2.

[ ] Does the reader ‘beep’ when the card is presented? If not, try other cards.
   If the other reader ‘beeps’ all the cards, check the reader wiring.

[ ] Check the card reader to see that the LED is showing red.
   If not, refer to Problem 2.

[ ] Does the reader ‘beep’ when the card is presented? If not, try other cards.
   If the other reader ‘beeps’ all the cards, check the reader wiring.

Problem 4:
The system finds one-too-few IQXs hooked up.

Checklist:

[ ] Verify that all IQXs are powered up.

[ ] Verify that all IQXs have unique address and are sequentially numbered.

[ ] Verify the RS-485 connections between the IQXs.

Problem 5:
Software shows status of all IQXs as red dots meaning there is no connection from the IQX to the PC.

Checklist:

[ ] Verify that the CMX (RS485 connector) is connected to the PC’s COM1 port.
   Consult your PC manufacturer’s manual.

[ ] Verify the Connection at CMX.
   Check CMX 12VDC power transformer.

[ ] Verify communication termination (W2 jumpered).
   Is the Receive (Rx) LED (Green) flickering?
   No- A CMX fault, COM1 fault, or cabling error or the program is not running.

NOTE LiNC-Ez should be displaying the controller as a “green” or “yellow” dot at the bottom of the screen.
<table>
<thead>
<tr>
<th>Communication Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem: Invalid Site Code</strong></td>
</tr>
<tr>
<td>Site code of LiNC-Ez does not match that of the card. The Card is not valid for this system.</td>
</tr>
<tr>
<td><strong>Problem: Card Not Active</strong></td>
</tr>
<tr>
<td>The “Active” flag has not been selected for the cardholder</td>
</tr>
<tr>
<td><strong>Problem: Expired Card</strong></td>
</tr>
<tr>
<td>The cardholder’s “Expiration Date” has been met. Update the date to expire.</td>
</tr>
<tr>
<td><strong>Problem: Invalid Card</strong></td>
</tr>
<tr>
<td>The card in question has not been activated or is not in the database of LiNC-Ez. Add this card.</td>
</tr>
<tr>
<td><strong>Problem: Invalid Time Use</strong></td>
</tr>
<tr>
<td>Cardholder has presented their card outside of the scheduled “Time Period.” Select another Authorization Group that has the desired time schedule.</td>
</tr>
<tr>
<td><strong>Problem: Invalid Day Use</strong></td>
</tr>
<tr>
<td>The Cardholder has tried to gain entry during an invalid day. Select the appropriate Authorization Group that best suits their schedule.</td>
</tr>
<tr>
<td><strong>Problem: Invalid Card Reader</strong></td>
</tr>
<tr>
<td>The Cardholder has presented card to a reader that has not been defined for use. Select the appropriate Authorization Group that best suits their schedule.</td>
</tr>
<tr>
<td><strong>Problem: Entry Exit Error</strong></td>
</tr>
<tr>
<td>Cardholder has not followed the Entry Exit rules. Entry Exit selection may be disabled for the cardholder.</td>
</tr>
<tr>
<td><strong>Problem: Card Reader Error</strong></td>
</tr>
<tr>
<td>The system did not recognize the card format or the data within the card.</td>
</tr>
</tbody>
</table>
Glossary
Glossary

Address
Each IQX controller in the loop must be assigned with a unique number. This number is the address of the IQX. Similar to a street address for homes. In the LiNC-Ez Kit, the IQX is already addressed as controller 1.

Door Left Open Too Long
Door is left open beyond the Door Access Time after a valid opening, by card or REX. A Door Status Contact must be installed for this condition to be reported.

Door Forced Open
Door is illegally opened without card or REX being a used. A Door Status Contact must be installed for this condition to be reported.

Door Status Contact
Usually a magnetic contact device (N.C.) used to provide the status of the door, if it is closed or open.

Normally Open (N.O.)
A device is considered N.O. if the “normal” condition of the circuit is not completed or in the “open” state. For a N.O. push buttons, one will need to push the button to complete the circuit or “Close” the circuit. For a N.O. Door Strike, the N.O. condition will “lock” the door lock. When the circuit is closed, the door lock will unlock.

Normally Closed (N.C.)
A device is considered N.C. if the “normal” condition of the circuit is completed or in the “Closed” state. For alarm devices, the “normal” condition is the completed or closed circuit. When the circuit is open, it would become an alarm. For N.C. Door Strikes, the N.C. state is that the strike will remain locked. The lock will unlock in the N.O. state.

PIR- Passive InfraRed detector
A device to detect body heat and produce a N.O. and/or N.C. output. Used for automatic exit devices and motion detectors. Requires an external power source (available in 12 VDC or 24 VDC).

REX- Request to Exit
A device used to provide exit out of a protected door without causing an alarm. A REX device for IQX must be N.O. device.

Transorb
Is a device that protects the IQX from power transients that could be caused by static or by some door strikes. The IQX is built with transorbs for added protection, however transients from a door strike need to be stopped at the strike itself. The supplied transorbs need to be installed at the door strike.
Appendix
Appendix - IQX Specifications

IQX Features
1 Supervised Tamper Sense Input (S13)
2 Reader Ports:
  2 Form C Door Strike Outputs
  2 Supervised Door Senses
  2 Request to Exit Inputs

System Capacities
Cardholder Capacity: 3,000
Time Periods: 32
Holiday Time Periods: 32
Holiday List: 365 Days
History Transactions: 5,000

Cable Requirements and Maximum Lengths

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Conductors</th>
<th># of Gauge</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS485 Converter IQX</td>
<td>2</td>
<td>22 AWG twisted/stranded/shielded</td>
<td>2000 ft</td>
</tr>
<tr>
<td>Proximity Reader to IQX</td>
<td>5</td>
<td>22 AWG twisted/stranded/shielded</td>
<td>500 ft.</td>
</tr>
<tr>
<td>Door Strike to IQX</td>
<td>2</td>
<td>18 AWG twisted/stranded</td>
<td>500 ft.</td>
</tr>
<tr>
<td>REX (Push Button)</td>
<td>2</td>
<td>22 AWG twisted/stranded/shielded</td>
<td>1000 ft.</td>
</tr>
<tr>
<td>REX (PIR)</td>
<td>4</td>
<td>22 AWG twisted/stranded/shielded</td>
<td>1000 ft.</td>
</tr>
<tr>
<td>Door Status Contact</td>
<td>2</td>
<td>22 AWG twisted/stranded/shielded</td>
<td>500 ft.</td>
</tr>
</tbody>
</table>

NOTE  Door strike/lock wire gauge may vary with actual loads of device

Power Supply
The IQX controller requires a 12VDC power supply for operation with a 12VDC battery backup
For UL installations, the following power supply(s) shall be used: manufacturer ESD, model #
SPS-3.6M2 (12VDC, 3.0A, 2 Outputs).

The IQX Reader Power interface provides either +5V or +12V power (jumper selectable) to the
two external readers. These reader power outputs are fused with a common 2.5A self resetting
fuse, and the reader power return lines are individually fused at 200mA, self resetting.

Factory Settings
At the factory the IQX is set as IQX #1, communications as direct connect (RS485).
IQX Door Sense and Egress Inputs

1. Equivalent input circuit:

![Equivalent input circuit diagram]

2. Supervised Alarm Input Thresholds (for typical sense circuit shown above)

<table>
<thead>
<tr>
<th>Sense Circuit Condition</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN CABLE</td>
<td>4.2V</td>
<td>5.0V (VCC)</td>
</tr>
<tr>
<td>SWITCH OPEN</td>
<td>1.35V</td>
<td>2.1V</td>
</tr>
<tr>
<td>SWITCH CLOSED</td>
<td>.6V</td>
<td>1.2V</td>
</tr>
<tr>
<td>SHORTED CABLE</td>
<td>0V</td>
<td>.5V</td>
</tr>
</tbody>
</table>

An Analog-to-Digital converter converts the Supervised Alarm Input Voltage to a digital format, and the control processor uses this to determine the state of the Sense Circuitry.