ISONAS™
PURE IP ACCESS CONTROL

How to Install an ISONAS PureIP™ Reader-Controller

ISONAS Inc.

FCC ID: OCZRC-04M, OCZRC-04S, OCZRC-04SK
IC: 8431A-RC04M, 8431A-RC04S, 8431A-RC04SK,

This device complies with **Part 15 of the FCC Rules**.
Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: 1) Reorient or relocate the receiving antenna. 2) Increase the separation between the equipment and receiver. 3) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected. 4) Consult the dealer or an experienced radio/TV technician for help.

This device complies with **RSS-210 of Industry Canada**.
Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

For RF Safety and per FCC and Industry Canada regulations, the product should never be installed within 8-inches (20cm) of typical people locations.


Table of Contents

Document Version

Date of Revision	Revision	Author	Description
11/03/2016	**1.00**	**Shirl Jones**	**Initial Release**

1: BEFORE YOU BEGIN

To install an ISONAS Reader-controller unit, you must complete three key wiring tasks:

1.1. Mount the PureIP reader in the appropriate location. Recommended locations and wiring methods shall be in accordance with the National Electrical Code, ANSI/NFPA 70.

1.2. Supply power to the PureIP reader. This may be accomplished with power being provided on the Ethernet data cable (Power over Ethernet [POE / POE+) or through an external DC power source (12VD). When powering from POE or POE+, in order for the system to be UL294 V6 compliant, the Power Sourcing Equipment (PSE) injector or end point must be compliant to UL294 or UL294B standards.

1.3. Wire the unit to the door's locks and other components for physical access control.

1.4. Connect the unit to the data network for communication with the server/workstation host PC.

1.5. The PureIP reader complies with UL 294 V6 and is rated for the following performance levels:

1.5.1. Standby power = Level I.
1.5.2. Endurance = Level IV.
1.5.3. Line Security = Level IV.
1.5.4. Destructive Attack = Level TBD.

This guide discusses each wiring process separately. Understanding all of these processes makes a project much simpler and helps guarantee success.

1.1: GENERAL REQUIREMENTS:

- If PoE is not being used, then use only UL-listed, access control, power-limited power supplies with an 'AC on' indicator light clearly visible on the enclosure. Power supplies should provide at least four hours of standby power.

- Never connect power supplies to a switch-controlled receptacle.

- Install the ISONAS system in accordance with the National Electrical Code NFPA 70. (Local authority has jurisdiction.)

- Use only UL-listed wire or cabling recognized suitable for ISONAS power supply and data communications, in accordance with the National Electrical Code.

- Where possible, separate ISONAS equipment and cabling from sources of electromagnetic interference (EMI). Where this is not possible, take other steps to reduce the effect of EMI on cabling or equipment.

- Protect input and output terminals adequately from transient signals. Also, connect these terminals to power-limited circuitry.

1.2: PureIP RC (PureIP RC) SPECIFICATIONS:

Input Voltage	12 VDC (8.0V absolute minimum to 14.5V absolute maximum) PoE per IEEE 802.3af
Input Current Draw (Without external loads)	PoE: 2.3 watts 12VDC: 150 mA
Supplied Power for External Devices (when PoE power is being used)	0.60 AMPS @ 12VDC
Read Range	2 TO 5 inches typically
Read Speed	<250msec (Prox)
Exciter Field Frequency	Proximity -- 125khz Multi-Tech - 13.56 MHz
Modulation Schemes	Proximity – FSK Multi-Tech --ISO 14443 type A and type B
Communication Interface	TCP/IP Over Ethernet 10 Mbps Auto Negotiate Half-duplex / Full-duplex
Inputs	1 Door Sensor / 1 REX/AUX
Outputs	1 Lock Power Output / 1 EDK control output
Standalone Memory Capacity	64000 Cards/ 5000 Events/ 32 Time zones
Visual Indicators	LED for Normal Operations
Operating Temperatures	-40° To 135° Fahrenheit -40° To 57° Celsius
Weight	Mullion 6.5 Oz WallMount 8.0 Oz WallMount w/Keypad 9.5 Oz
Size	Mullion 5.10 x 1.70 x 0.71 WallMount 5.10 x 3.25 x 0.71 WallMount w/Keypad 5.10 x 3.25 x 0.75

1.3: INSTALLATION LOCATION GUIDELINES

When selecting the location where you are going to mount the ISONAS reader-controller, a few guidelines should be observed.

1) The reader-controller should be kept at least 2 feet from another ISONAS reader-controller, and 6 feet from any other RF emitting device.

2) In an exterior location, the reader-controller's mounting should be sealed to prevent water from running down between the mounting surface and the back of the reader-controller.

3) For the PureIP RC, a dielectric insulating compound (Dow Corning DC-4 or equivalent) can be used to obtain extra water protection of the reader-controller's cable connections.

4) In humid environments, it is recommended that a drip-loop be formed in the PureIP's cables, before the cables enter the reader-controller.

5) The reader-controller should be protected from extreme heat and sunlight. It is rated for conditions up to 135 F. A direct southern exposure, in the Southwest area of the United States may exceed these ratings.

6) The cables extending from the back of the PureIP's Pigtail cable is available in a two standard lengths (10 foot or 25 foot). Plan for the termination of the door wiring within that distance of the reader-controller.

7) The wall mounting features required for the reader-controller are shown in the next figure. It is recommended to use the RC04's detachable metal bracket as a drill template for locating the mounting screws.

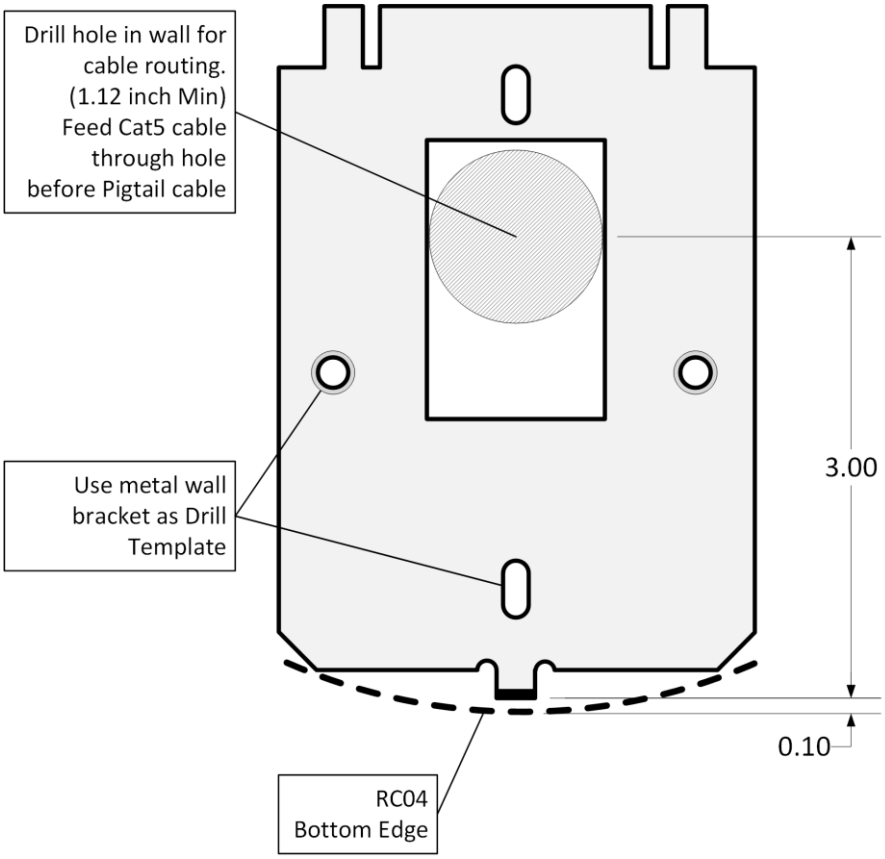


Figure 1

PureIP Wallplate
Mounting Diagram

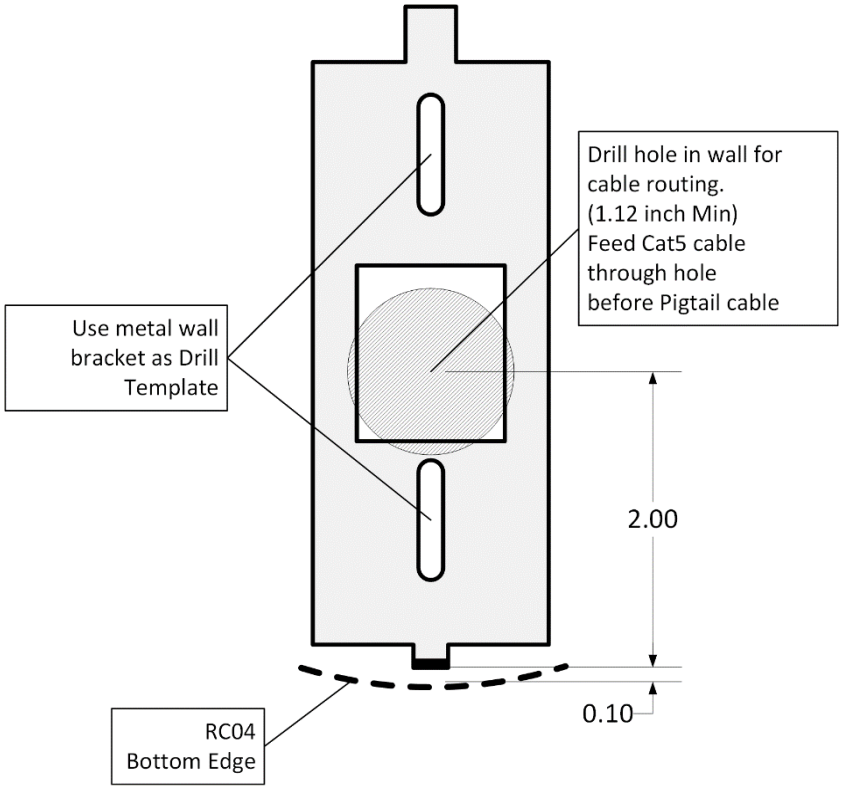


Figure 2

PureIP Mullion
Mounting Diagram

1.4: INSTALLER TOOLKIT COMPONENTS

Before an installer goes to a customer site, they need to put together their supplies and tool-kit. The ISONAS solution is simpler to install than other Access Control Systems, but materials are still needed. And some of those materials may be different than what you are use to carrying. The list below identifies some important items that you should make sure to bring with you, to the customer's site.

A prepared installer will have:

Installer completed the on-line reseller training program.

An installer's Tool Kit should include the following:

1. **The copy of the PureIP RC Installation and Wiring Guide**
2. **A Volt-Ohm Meter**
3. **Pin-in-Torx Screwdriver**
    - **T-8 (Tamper Resistant)**
4. **1 1/8 inch hole-saw (If mounting is done without a J-box)**
5. **A PoE Injector**
6. **A Cross-over Cat5/Cat6 cable**
7. **A straight-thru Cat5/Cat6 patch cable.**
8. **Basic Ethernet network cable tester (Tests for: Opens, Shorts, Split Pairs, Mis-wires & Reversals)**
9. **A spare PureIP RC**
10. **An extra PureIP RC Pigtail**
11. **Silicon Caulking for sealing the PureIP to exterior walls**
12. **Dielectric Silicon Grease (Dow DC-4) for protecting cable connections.**
13. **The ISONAS PureIP As-Built forms, which is used to record the details of the door's installation.**
14. **Credentials that match the customer system's technology**
    - **ISONAS Proximity**
    - **HID Proximity**
    - **DESFire EV2 Smart Cards**

1.6: PUREIP RC RESET BUTTON

The PureIP RC has a Reset Button located on the back.
It can be used for two different types of resets.

It is helpful if the PureIP's Ethernet cable is connected, and functioning (the network status LED is lit). Monitoring the RC04's main status LED allows you to determine the status of the reset operation.

- **Reset CPU:** Press, hold (approx. 2 seconds) and release the Reset button. Once the Reset Button is released, ~~the Amber LAN Status LED should turn off (approx. 6 seconds), and then turn back on. If the Amber LED does not turn off, then the reset did not occur.~~

- **Reset Configuration:** Press and hold the Reset button (approx. 10 seconds), until the RC04's Main Status LED turns AMBER. Selected reader-controller configuration settings are reset to factory defaults. Setting that are changed include:
  - DHCP (Default value: On)
  - IP Address (Default value: 192.168.1.119)
  - IP Port (Default value: 10001)
  - Subnet Mask (Default value: 255.255.0.0)
  - Gateway (Default value: 0.0.0.0)
  - ACS Alias (Default value: {blank})
  - ACS Server IP (Default value: 0.0.0.0)
  - Communication Type (Default value: Server)
  - Remote Host Name (Default value: {blank})
  - Remote Host IP (Default value: 0.0.0.0)
  - Remote Host IP Port (Default value: 55533)
  - Remote Host DNS (Default value: 0.0.0.0)
  - Clear AES Encryption Configuration
  - Reset PureIP's Passwords

2: WIRING AT THE DOOR AND READER-CONTROLLER

2.1: POWERING THE READER-CONTROLLERS

All ISONAS Reader-controller models require a direct connection to a power source.

The PureIP RCs can be powered with **12 volts DC or PoE (IEEE 802.3af) power** and the supply must be regulated. Many brands of power sources work well with ISONAS equipment.

2.1.1: POWER OVER ETHERNET (PoE) OPTION

If you are installing ISONAS PureIP RCs, then you can use the Power Over Ethernet (PoE) option. PoE allows one cable to supply data and power to both the Reader-controller and an Electronic lock. The obvious savings here is that you only need to run a single CAT5 cable to the door which will provide enough power to run both the ISONAS Reader-controller and an electronic lock.

If your network switch is equipped to provide PoE power, then the separate PoE Injector is not required.

If used, the PoE Injector is normally located close to your existing network hub/switch, and the PoE Injector itself is plugged directly into a standard AC outlet, or for extra reliability, a UPS with battery backup.

Figure 3 is an overview of how to use PoE to power both the ISONAS PureIP RC and an electronic locking mechanism.

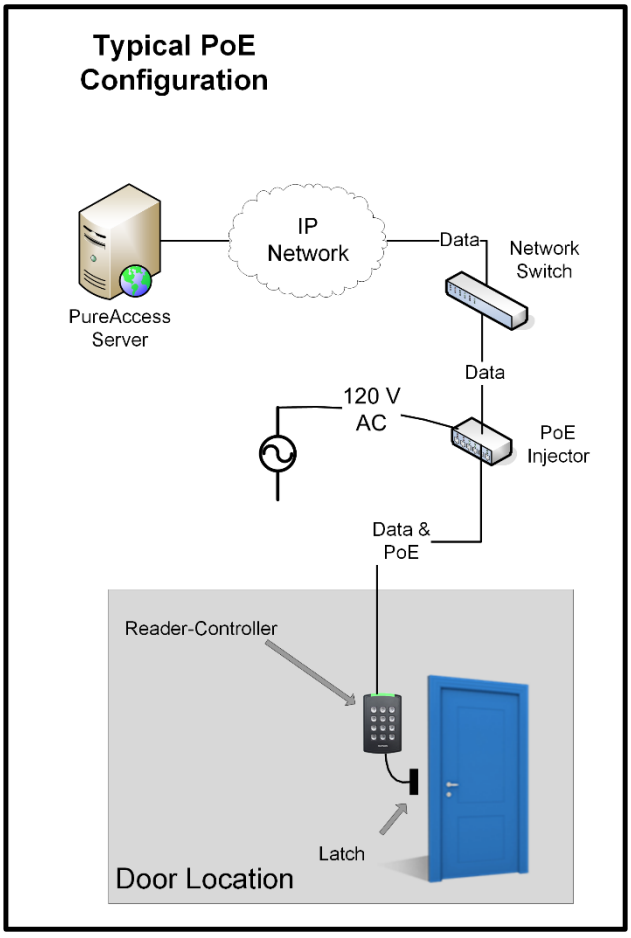


Figure 3

A standard CAT5 cable is then run between the PoE source (Injector or switch) and the PureIP RC which will be located right next to the door. The CAT5 cable can be up to 100 Meters (328 feet) long.

Supplying 12 VDC to Door Components from the PoE powered PureIP RC

When the PureIP RC is powered by PoE, the reader can supply 0.6 amps @12 VDC power for external components. This DC power is available via two pigtail wires.

The Red pigtail wire is typically used to control the door's lock. The Red wire's 12VDC output will be activated /deactivated when the reader is operating the door's lock. This connection has a built-in current limiting feature, to prevent the lock from consuming too much electrical power.

The Orange pigtail wire provides a source of continuously-available 12 VDC power. You might use this 12VDC source to power a PIR Motion Detector located at the door location.

PoE Power Budget Calculations

When planning an installation using PoE, you need to assure that the PoE source (PoE Injector or PoE equipped Network Switch) supplying the PoE power is sized properly for the power draw of all the doors. To do this, you total up the power draw (in watts) of the PoE connections, and compare that total power draw to the rated capacity of the PoE source.

Below is a chart of expected PoE power draws of the ISONAS Reader-controllers.

Door Location Configuration	PoE Power Requirement ** (Watts)
PureIP RC	2.3 Watts
PureIP RC with Electronic Lock (300 mA @ 12V)	6.2 Watts
PureIP RC with Electronic Lock (600 mA @ 12V)	10.4 Watts

*** Ethernet cabling power losses not included. Losses range from being negligible for short Cat5 cables up to about 16% for 100 meter Cat5 cables.

To meet the PureIP's variable PoE power requirements, the PureIP will classify itself with the PoE source as a "Class 0" PoE device. The power usage of a Class 0 device can range between 0.4 to 13.0 watts at the device (up to 15.4 watts from the PoE source).

Some network PoE equipment will budget and allocate it's distribution of PoE power based upon the maximum power usage of the each attached device's classification. If your network equipment uses this power provisioning technique, then you should budget 15.4 watts for each PureIP. Such network PoE Equipment may allow you to manually configure the amount of power that should be allocated to each device. Configuring the PoE equipment for an allocation of 3.0 watts or 11.0 watts per connection would be appropriate. When powering from POE or POE+, in order for the system to be UL294 V6 compliant, the Power Sourcing Equipment (PSE) injector or end point must be compliant to UL294 or UL294B standards.

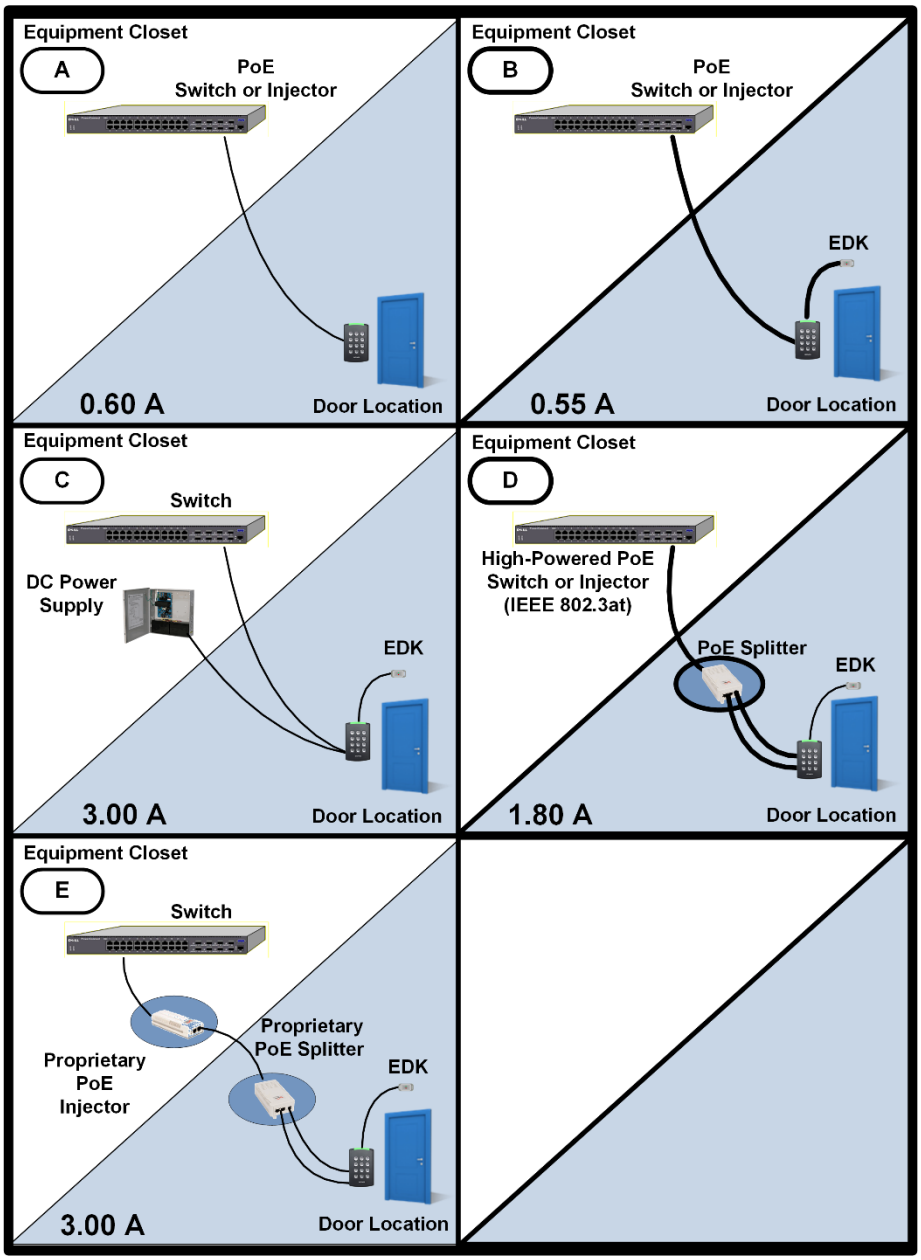
2.1.2: ADDITIONAL POWER OPTIONS

Most installations will use PoE for the PureIP and door locks.
That is a clean way to control a door using a single, standard network cable.

There are many additional options available, that can be used, if the door location requires more power than a standard PoE-powered PureIP can provide.

The different options require different configurations of the supporting equipment and /or building wiring. The following chart and **Figure 4** describes some of these power options.

Power Source	Switchable Power (Max)	Equipment at the Door	Limiting Factor	Topology Diagram
PoE (802.3af)	0.60 amps (12VDC)	PureIP	PureIP's available PoE Output	A
PoE (802.3af)	0.55 amps (12VDC)	PureIP EDK	PureIP's available PoE Output {minus} the power required by the EDK	B
DC Power Supply 12 VDC	3.0 amps (12VDC)	PureIP EDK	Rating of EDK's lock relay (12VDC required by EDK's internal circuitry)	C
High-Powered PoE (802.3at)	1.8 amps (Approx) (12VDC)	PureIP EDK PoE Splitter Example PoE Splitter PowerDsine PD-AS-701/12	Rating of PoE Splitter {minus} power required to operate PureIP & EDK	D
High-Powered PoE (non-standard) Example PoE Injector PowerDsine PD-9501G	3.00 amps (12VDC)	PureIP EDK PoE Splitter Example PoE Splitter PowerDsine PD-AS-951/12-24	Rating of EDK's lock relay	E



Power Options
Figure 4

2.2: WIRING THE DOORS

After you connect power to every Reader-controller, the next step is to connect the wiring at each door.

Wiring a door may involve connecting:

- An electronic door latch
- A request to exit (REX) like:
  - REX Button
  - Motion Detector
- Door sensors

Figure 5 shows the typical configuration of equipment at the door.

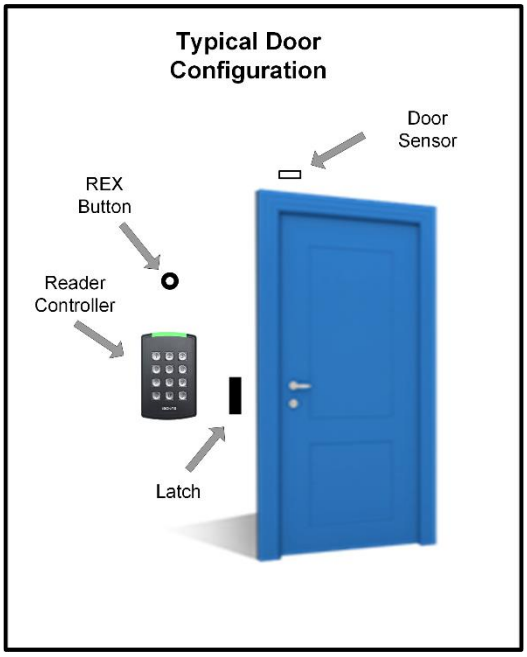


Figure 5

2.2.1: READER-CONTROLLER CONTROL-LEADS DESCRIPTION

The reader-controller has a cable extending from its back plate that is referred to as "the pigtail". The pigtail consists of 8 wire leads (22 awg) which are used to connect to the various components at the door location. Most installations do not require the use of all the leads. The typical usage of each available lead is shown in **Figure 6**.

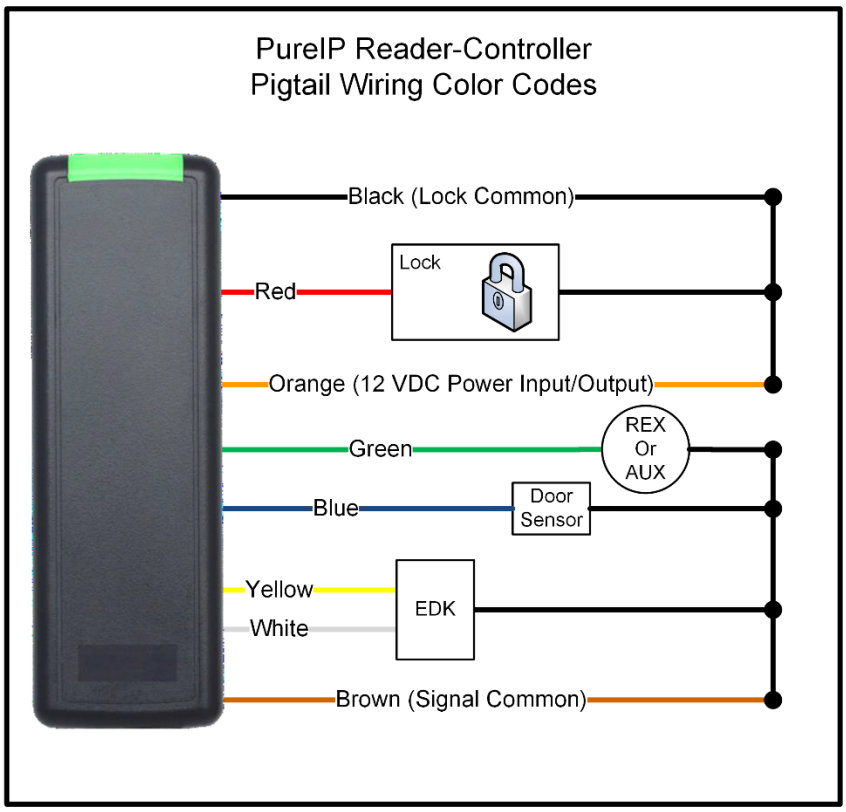


Figure 6

One of the wires is for a door sense switch. Another is for a REX (Request for Exit) signal coming from a switch, infrared sensor or other REX device.

The controllers have a lock-control circuit. This circuit provides conditioned 12VDC power and can be directly connected to the electronic lock to unlock the door when a valid credential is presented.

The usage of each lead will be detailed in the next few pages.

2.2.2: LOCK WIRING -- BASIC

Electronic door lock Overview:

If the door does not already have an electronic lock, first install the lock hardware according to the manufacturer's instructions. Examine the lock to determine whether applying power will lock or unlock the door.

- **Fail Safe:** Applying power *locks* the door (usually magnetic locks).

- **Fail Secure:** Applying power *unlocks* the door (usually electric strike locks).

Most locking mechanisms have **two leads for the power coil**. On an electric strike, the leads power a solenoid. On a Mag Lock, the leads power an electromagnet.

The PureIP's lock control circuit can control either a fail-safe or fail-secure lock. This selection is typically configured within the host computer's door settings.

Installation Tip

For non-PoE installations:

Before you start wiring an electronic door lock, verify that the lock's power source is separate from the power source for the Reader-controller.

Otherwise, supply voltage fluctuations induced by the lock's operation may cause the reader to malfunction.

Lock Wiring, using PoE:

The PureIP supports a simplified configuration when PoE is being used to supply the lock's power.

1. Connect the **Red** wire on the ISONAS Reader-controller to one lead of the electric lock. See **Figure 7**
2. Connect the other lead of the lock to the **black** wire on the ISONAS reader-controller.
3. See this manual's BackEMF diode section for more info regarding the use of the BackEMF diode.

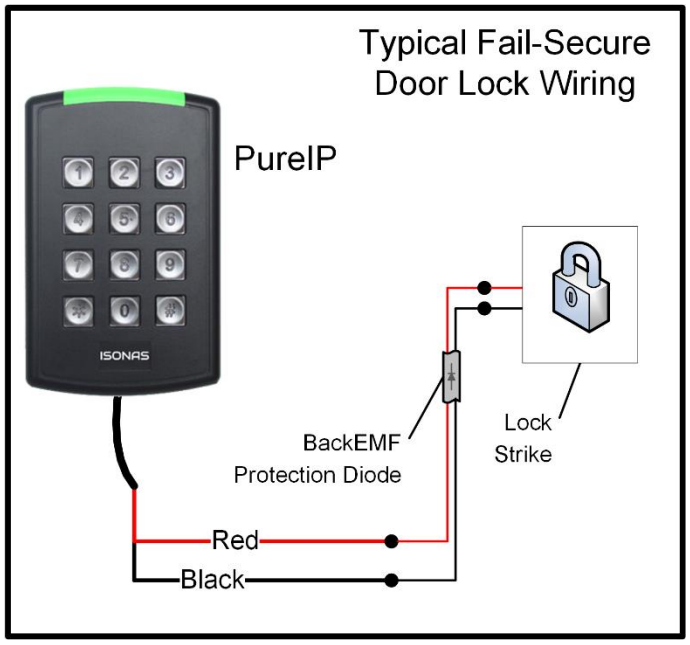


Figure 7

2.2.3: WIRING THE REX/AUX INPUT

The PureIP RC 's REX / AUX input expects a **momentary closure**. You can generate this signal with a pushbutton, infrared motion detector, or other simple device.

The host computer configures the reader to know if the input's action is treated as a REX event or an AUX event.

Typically the REX is placed adjacent to the door so that people can press the button and let themselves out the door without setting off the alarm. When pressed, this button tells the ISONAS Reader-controller that that someone wishes to pass through the door, and the latch releases.

About REX / AUX

REX / AUX is a normally open input. No action is taken until the input is closed.

The reader could be configured to create an AUX event. An example usage of the AUX input is being connected to a panic button under a cashier's desk. The AUX event could then generate a system alert message.

You must wire the switch through the ISONAS Reader-controller. (See **Figure 8**) First, connect one terminal of the momentary switch to the Reader's **green wire**. Then, connect the switch's other terminal to the Reader's common **ground wire (brown)**.

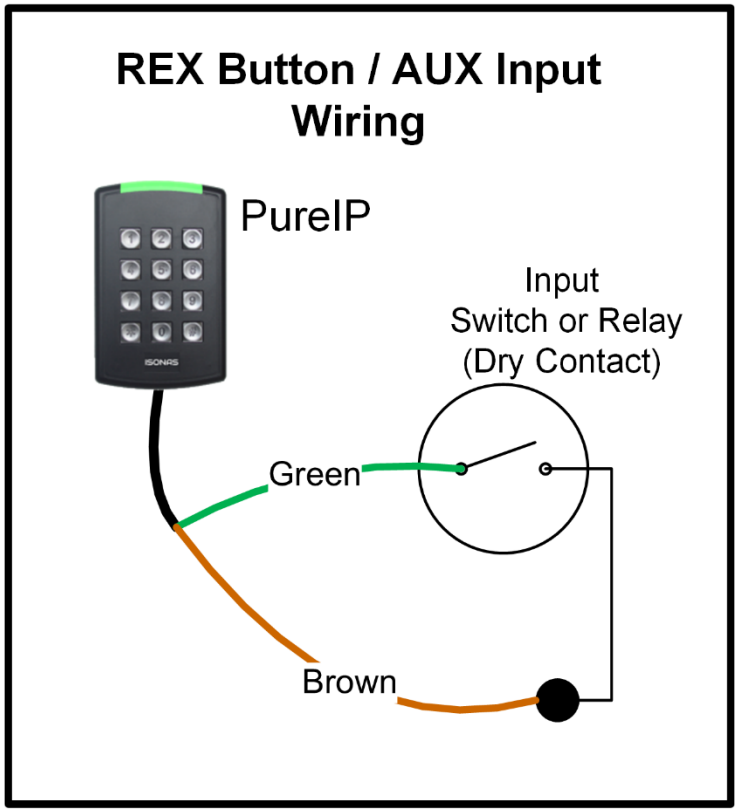


Figure 8

2.2.5: WIRING THE DOOR SENSE

Connecting the ISONAS Reader-controller to a door sensor allows the host software to determine whether that door is physically open. Then the host system can create alarms based on the door's state. This wiring task is similar to wiring the REX / AUX input.

First, connect one terminal of the door sensor to the Reader's **blue wire**. Then connect the door sensor's other terminal to the Reader's common **ground wire (brown)**.

Figure 9 shows how to wire the door sensor.

About the Door Sense

The door sense is a normally closed input. No action is taken until the input is opened.

IMPORTANT: If There's No Door Sense Switch

If you choose NOT to install a door sense switch, then you **must permanently ground** the door sense input (blue wire) to the reader's Brown wire, so the system will not see the door as "open."

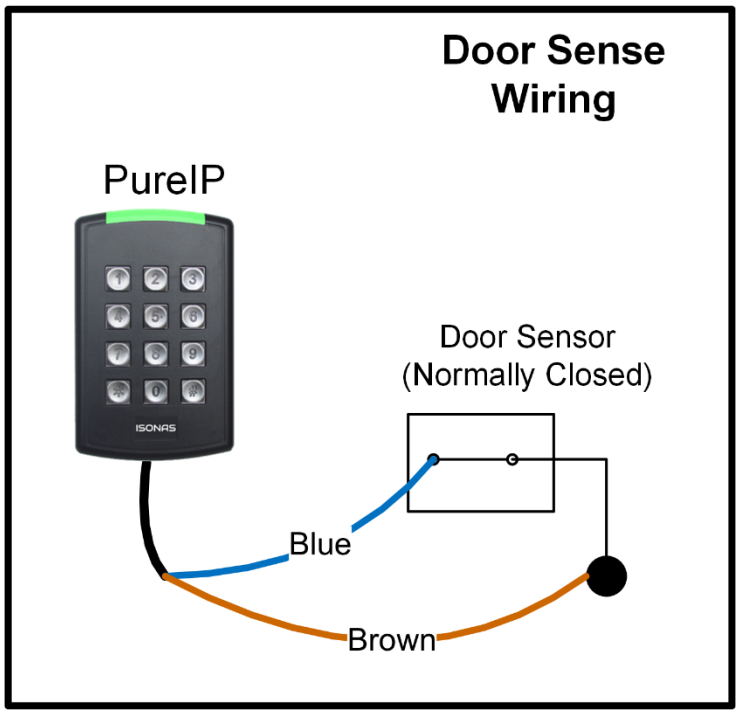


Figure 9

2.2.7: LOCK WIRING -- EXTERIOR DOOR KIT

The PureIP RC has an optional Exterior Door Kit (EDK), which allows you to isolate the door's lock control circuitry on the secure side of the building.

The EDK contains a form-C relay with dry-contracts that are rated for 3 amps of current @ 30 Volts. It can also be used in cases where the reader-controller is switching an externally supplied voltage or an external control signal. Examples of such usages include operating a 24VDC lock, or switching a logic signal for a garage door opener.

Two methods of connecting the EDK are shown

The 1st example shows powering both the lock and the EDK with the Reader-controller's PoE power See **Figure 10**

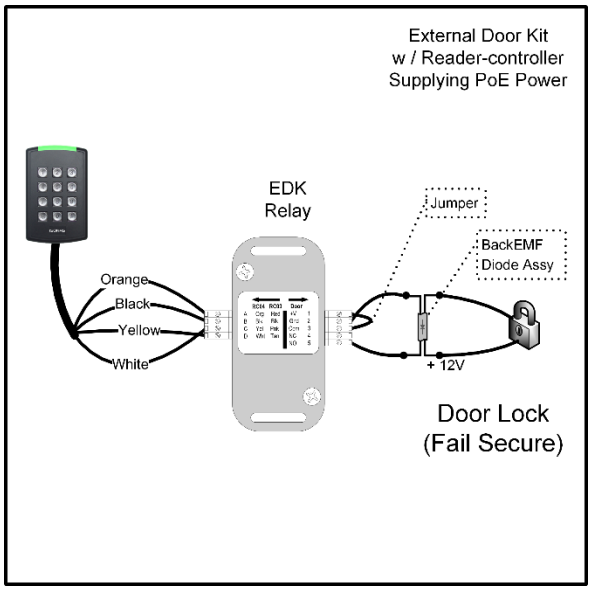


Figure 10

Label	Reader Side Connection	Label	Lock Side Connection
A	Pigtail's Orange wire (12 V Input Power)	1	12V Output Power
B	Pigtail's Black wire (Ground)	2	Power Ground
C	Pigtail's Yellow wire	3	EDK Relay's Common Contact
D	Pigtail's White wire	4	EDK Relay's Normally Closed (NC) contact (Fail-Safe Lock)
		5	EDK Relay's Normally Open (NO) contact (Fail-Secure Lock)

EDK Wire Conductor Preparation:
Strip back the wire insulation: .25 to .275 (1/4 to 9/32) inches

Acceptable single conductor sizes: 26 gauge to 15 gauge
Acceptable two conductors sizes: 26 gauge to 15 gauge
Note for multi-stranded conductors:
Avoid allowing any stray wire strands from contacting the adjacent terminal block connection.

Twist the multi-strands together prior to insertion.
Lightly solder-tinning the exposed wire can help prevent stray strands.

The 2nd example shows powering the EDK with the Reader-controller's PoE power output, and the lock with an external 24 volt power supply. See **Figure 11**

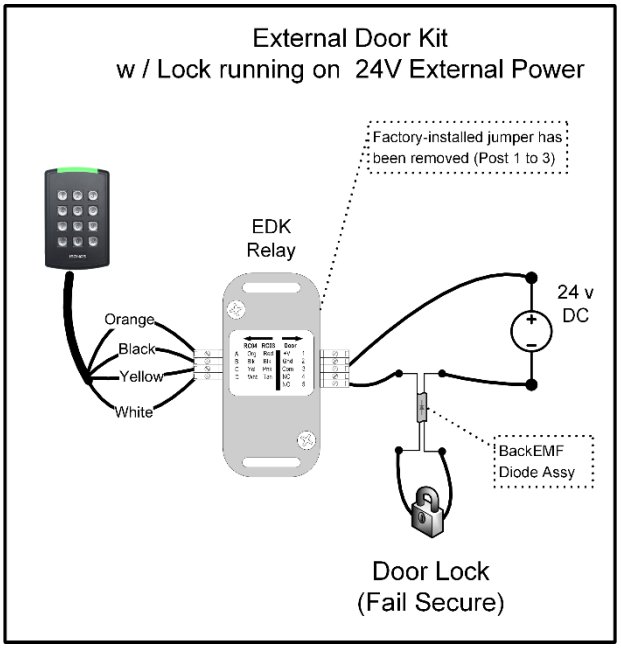


Figure 11

Label	Reader Side Connection	Label	Lock Side Connection
A	Pigtail's Orange wire (12 V Input Power)	1	Not Used
B	Pigtail's Black wire (Ground)	2	Not Used
C	Pigtail's Yellow wire	3	EDK Relay's Common Contact
D	Pigtail's White wire	4	EDK Relay's Normally Closed (NC) contact (Fail-Safe Lock)
	Not Used	5	EDK Relay's Normally Open (NO) contact (Fail-Secure Lock)

2.2.8: EDK LED STATUS INDEX

The EDK has two status LEDs

Power LED:

Located on the side towards the PureIP's pigtail.
A Red LED indicates 12VDC power is being supplied to the EDK.

Communication Status LED:

Located on the side towards the Lock wiring.
LED status meaning are described in the table below.

PureIP Locked	PureIP Unlocked	Lock State when PureIP is unlocked	Description or Item to Check
Off	Green	Normal Operation	
Flash Amber	Flash Amber	No Operation	Yellow wire may be disconnected
Off	Flash Amber	No Operation	White wire may be disconnected
Off	Flash Amber	No Operation	Invalid encryption key received from PureIP
Off	Off	No Operation	If PowerCycle of PureIP allows for one or more lock operations,and then the lock stops operating, then the BackEMF diode may not be installed correctly.

2.2.9: LOCK WIRING -- 2 READERS TO 1 LOCK

If you are wiring both sides of the door to control IN and OUT access, then you will have the special condition of wiring 2 Reader-Controllers to a single locking mechanism.

The "Inside" Reader controls the door, and is wired to the door's components, such as the lock and Door-sense switch. Use the following steps to cause the "outside" Reader to activate the REX input on the "Inside" Reader.

Two Readers & One Lock Wiring Steps: See **Figure 12**

1. Wire the "Inside" reader normally
2. Connect an EDK to the "Outside" reader
3. Connect the "Inside" reader's REX input to the "NO" terminal of the EDK.
4. Connect the "Inside" reader's Brown wire to the Common terminal of the EDK.
5. If the door also has a REX device, wire the REX device "in parallel" to the EDK.

Programming

"Inside" Reader must be programmed to activate the lock upon a REX input event.

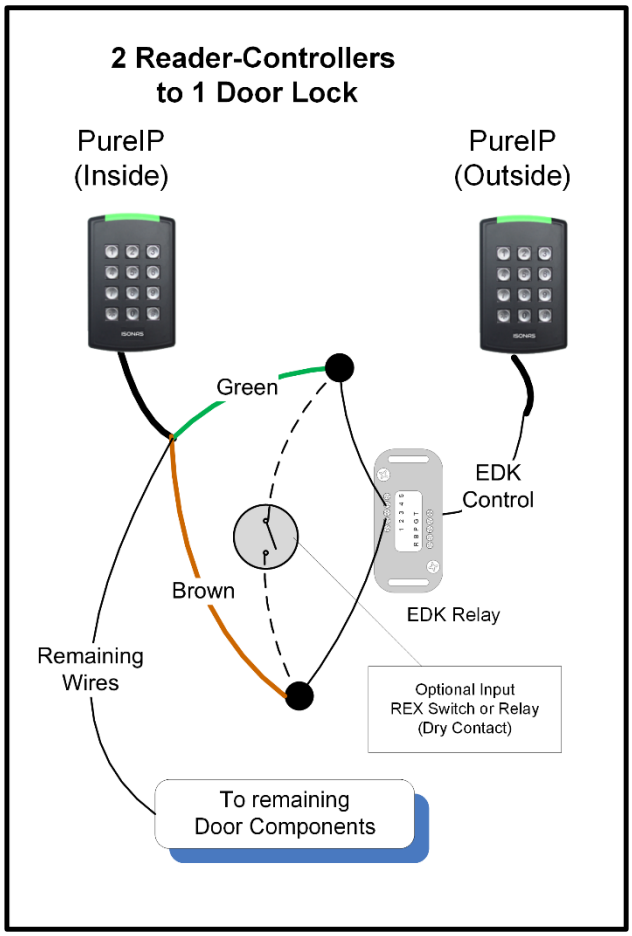


Figure 12

2.2.15: MANAGING INDUCTIVE LOAD CHALLANGES

Most door latches use a **relay coil** that powers up and down, when the door is unlocked and locked. When this happens, a pulse of electrical energy is produced by the lock's coil. This pulse is called **back EMF,** and can interfere with the reader's operation.

Switching off a typical 12 VDC relay coil can produce a back EMF pulse of 300 volts or more. If this voltage pulse is allowed to flows back into the reader, it can cause the reader to "brown out" and the reader will reboot.

Figure 13 shows a solution. You can virtually eliminate back EMF by installing a **transient suppression device (diode).** Each PureIP RC is supplied with a diode assembly, which simplifies the installation process. A standard diode, from any electronic supply store, can also be used. Always check that the diode is correctly rated for the circuit voltage. For optimum performance, the diode should be installed at the lock or close to the lock. Standard diodes have a stripe-band marking on one side. That side of the diode should be connected to the "+" wire of the lock circuit.

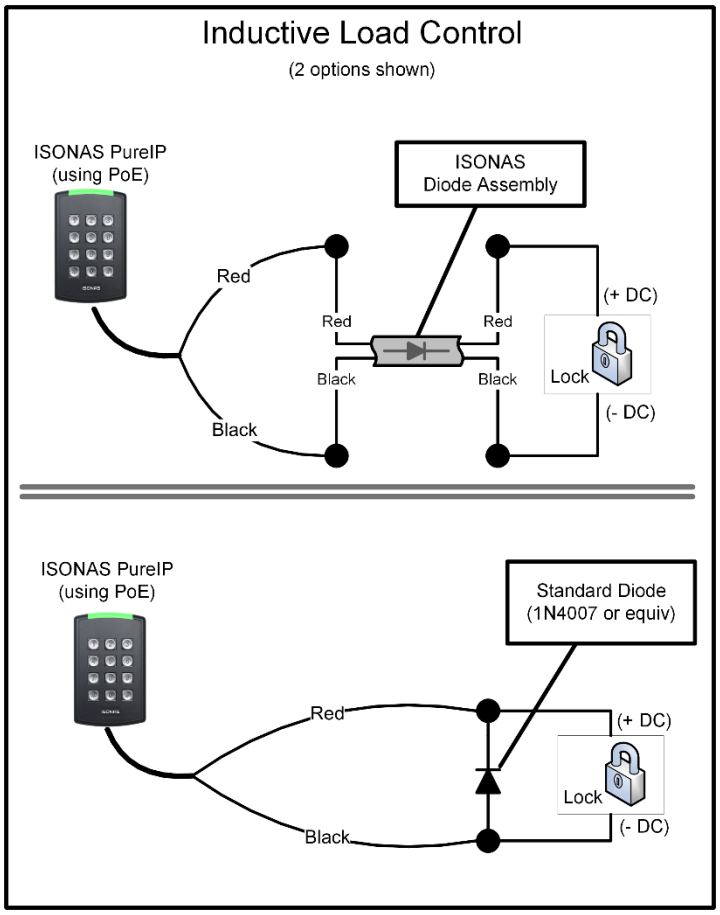


Figure 13

Protect the Digital Output

Which type of transient suppressor should you install? This depends mainly on the type of inductive load being switched. Some locks have Back EMF protection built into the lock itself.

For Back EMF in low-voltage DC applications, a 1N4007 diode will suffice.

However, for protection against other transient voltages (i.e. lightening), we recommend using a fast-switching transient voltage suppressor, such as a bipolar TranZorb.

2.3: CONFIGUATION EXAMPLES

2.3.1: PoE --- ELECTRIC STRIKE

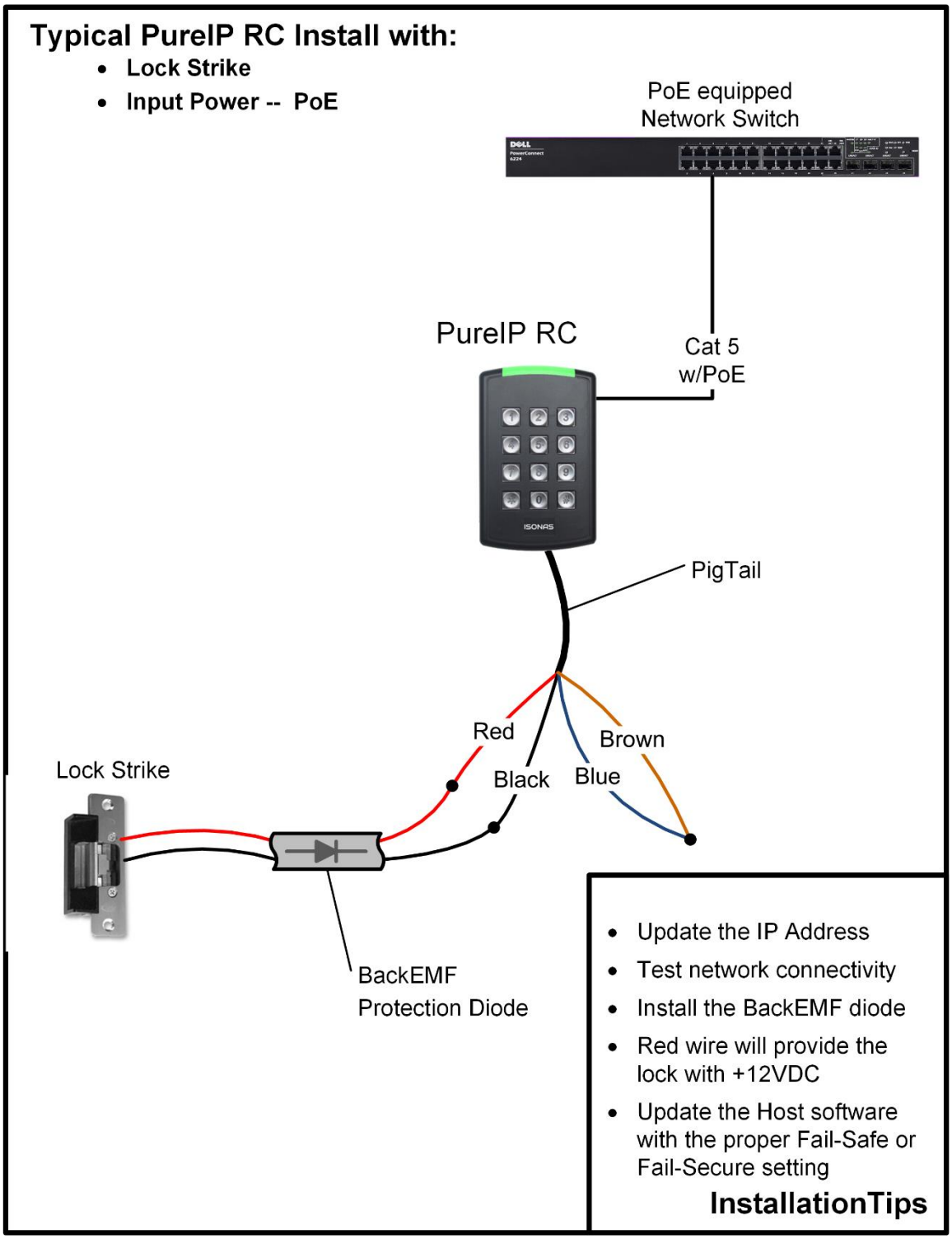


Figure 14

2.3.2: PoE --- MAGNETIC LOCK, EDK & PIR

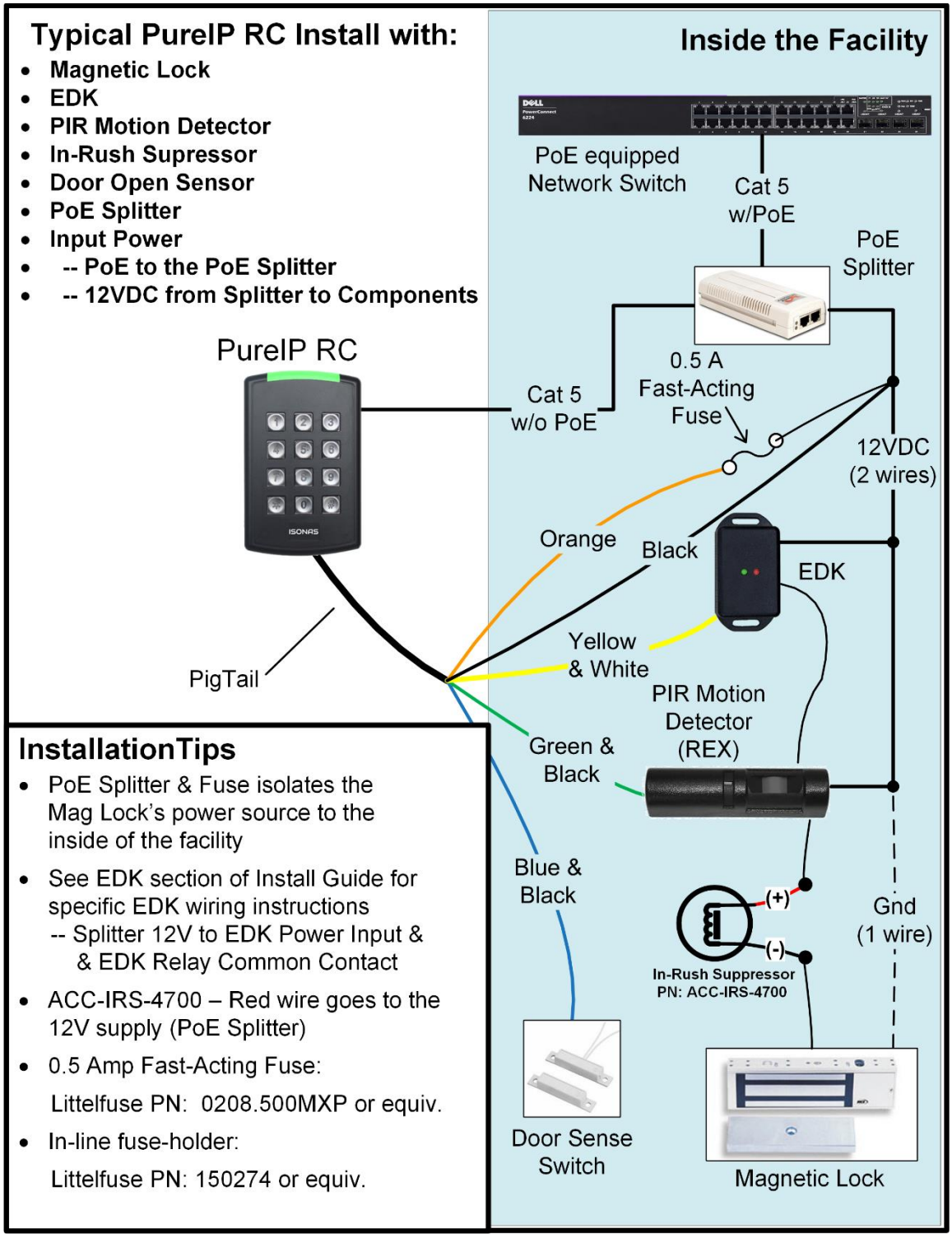


Figure 15

2.3.3: DUAL POWER SOURCES

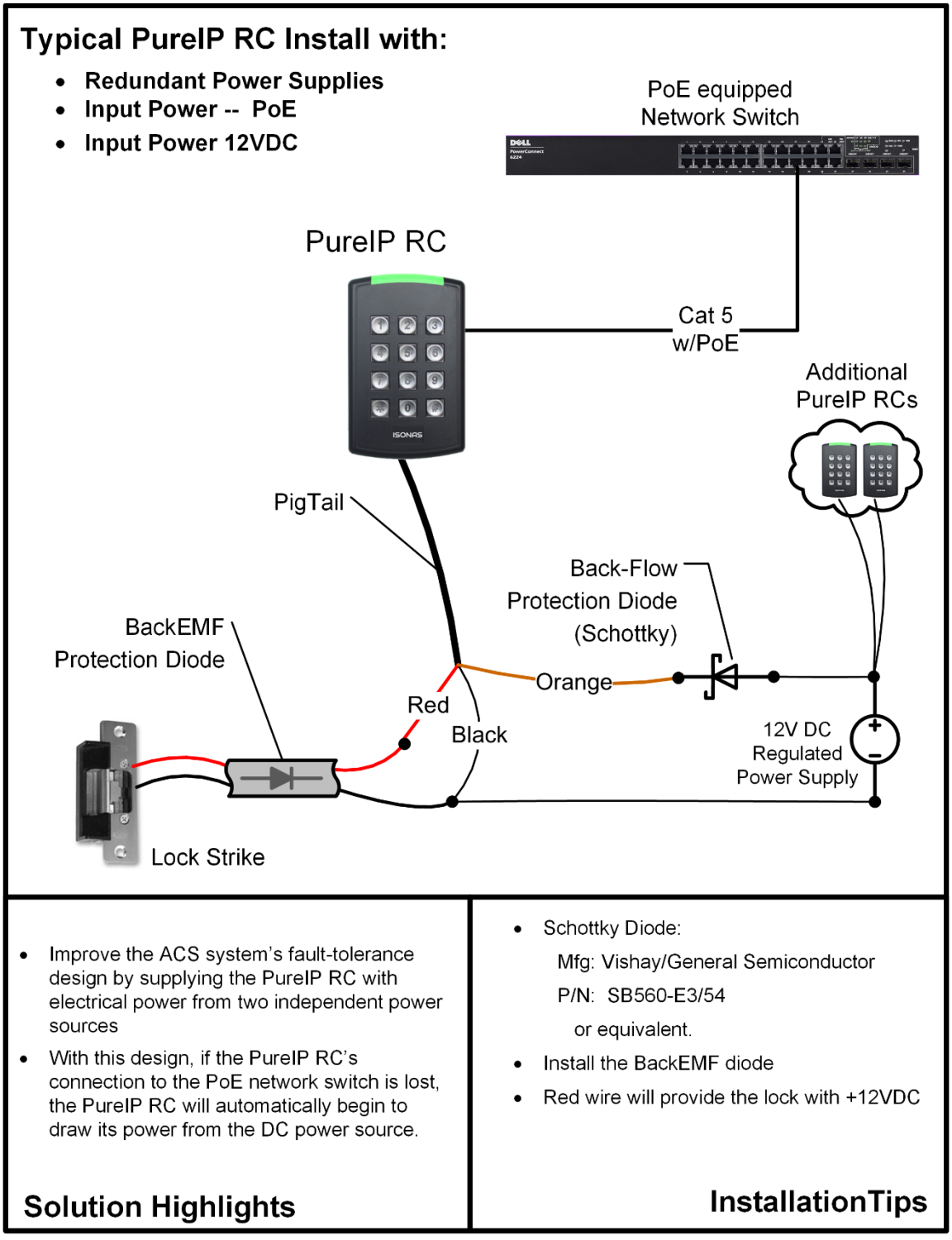


Figure 16

3: CONFIGURING THE READER-CONTROLLER'S COMMUNICATIONS

The Reader-controllers communicates with the **ISONAS PureAccess software** over the organization's data network.

3.1: ETHERNET-BASED TCP/IP READER-CONTROLLERS

There are many Ethernet network topology permutations, too many topologies to cover in this guide. Here are two common Ethernet configurations used by ISONAS customers:

- **PureIP RCs to PureAccess-Cloud Software**:
  This is the simplest type of network connection. ISONAS provides a cloud instance of the PureAccess software. The readers are configured to automatically connect to hosted PureAccess software.

  Addressing:
  The recommended best-practices is to let the local network's DHCP service assign the IP Address to each reader.
  As an alternate, you can manually assign the reader's IP Address. To allow the reader to successfully reach the host software, the following setting are typically required:
  - Static IP Address that is valid on the local subnetwork
  - Proper Subnet Mask
  - IP Address of the local subnetwork's gateway.

  Here are a couple guidelines to follow to assure that your network's configuration will support the ISONAS access system.
  - The ISONAS reader-controller is a standard "network appliance". Standard TCP/IP networking rules apply.
  - ISONAS can provide a simple utility, that will redirect any currently installed reader-controllers to the cloud instance of PureAccess

- **PureIP RCs to PureAccess-Manager Software**:
  Some locations may have a version of PureAccess installed on a local server. The software package that is designed for such on-site installation is named: PureAccess-Manager.

  These installations will require that the reader-controller's configuration be modified to direct the reader to connect to the local server's location.

  ISONAS can provide a simple utility, that can be used to redirect the reader-controllers to the local instance of PureAccess-Manager.

  Addressing:
  The recommended best-practices is to let the local network's DHCP service assign the IP Address to each reader.
  As an alternate, you can manually assign the reader's IP Address. To allow the reader to successfully reach the host software, the following setting are typically required:
  - Static IP Address that is valid on the local subnetwork
  - Proper Subnet Mask
  - IP Address of the local subnetwork's gateway.

3.2: SECURING MESSAGES ON YOUR NETWORK

You can configure ISONAS Readers and software to *secure each and every message* to and from the Reader using **Advanced Encryption Standard (AES).**

When you enable AES in both an ISONAS Reader-controller and the PureAccess software, every message to and from that Reader-controller is encrypted. Therefore, anyone who manages to hack into your data network would still face a daunting task to decrypt the actual messages to the reader-controllers. This is a significant strength of the ISONAS solution in protecting the customer's reader-controllers from hackers.

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