



Knowledge Base Article

**Securing Magnetic Locks with Powernet™
and Pure IP™ Reader Controllers**

***Copyright © 2009-2017, ISONAS
All rights reserved***

Table of Contents

Table of Contents

1: INTRODUCTION.....	3
2: SECURING MAGNETIC LOCKS	3
2.1: THE ISONAS ASM	3
2.1.1: How it Works	3
2.2: SECURING THE POWER	4
2.2.1: Using Power over Ethernet.....	4
2.2.2: Using a Power Supply	5
2.2.3: Protecting Against Malicious Short Circuit (if Necessary)	6

Table of Figures

Figure 1 - Side Section of Access Control Door	3
Figure 2 - ASM Overview	4
Figure 3 - PoE(+) Splitter	5
Figure 4 - ASM and Power Supply	5
Figure 5 - Inline Fuse	6
Figure 6 - Fully Secured Magnetic Lock with PoE+ Splitter (RC-04)	7
Figure 7 - Fully Secured Magnetic Lock with Power Supply (RC-04)	7
Figure 8 - Fully Secured Magnetic Lock with PoE+ Splitter (RC-03)	7

Document Version

(KBA204SecuringMagneticLocks.docx)

Date of Revision	Revision	Author	Description
1/30/2017	1.0	Jason Clement	Initial Release

1: INTRODUCTION

This knowledge base article will review securing magnetic locks with ISONAS Powernet™ and Pure IP™ reader controllers. In this article we will review two options for installing the ISONAS reader controllers and a magnetic lock; one option involves using a PoE(+) splitter and the other involves an external power supply. For the installation of a magnetic lock there are some additional items needed, the ISONAS Advanced Security Module (ASM, previously referred to at the EDK), a PoE(+) splitter and the ISONAS Magnetic lock kit (in-rush suppressor to protect the relay in the ASM)

This knowledge base article (KBA) is a guide to assist in the design and wiring of these systems. ***This guide does not over rule any local codes, ordinances or the Authority Having Jurisdiction (AHJ).*** The AHJ has final say on how the system should work. If there is any doubt on how a door should be configured always contact the AHJ.

2: SECURING MAGNETIC LOCKS

2.1: THE ISONAS ASM

2.1.1: How it Works

The ASM secures the electric lock relay on the secure side of the door. This is not exclusive to magnetic locks, the ASM can be used with any electric lock for additional security. The ASM needs 12vdc power to operate so in order to fully secure a magnetic lock the power must be isolated on the secure side of the door as well (*see Figure 1 below*). The next section of this KBA will review securing power.

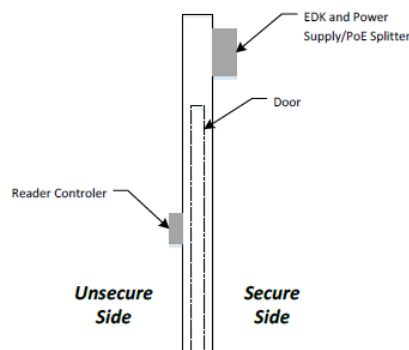


Figure 1 - Side Section of Access Control Door

To ensure the ASM is secure, the reader controller (either RC-03 or RC-04) sends a secure signal to ASM. If the signal matches what is programmed in the ASM then it will unlock the door. If the signal does not match, the ASM will keep the door locked. This code is initially configured in the factory, after the door is fully configured the code can be changed if desired. See *Figure 2* below. This ensures anyone attempting to tamper with the reader controller and lock they are not able to simply “hot wire” the lock.

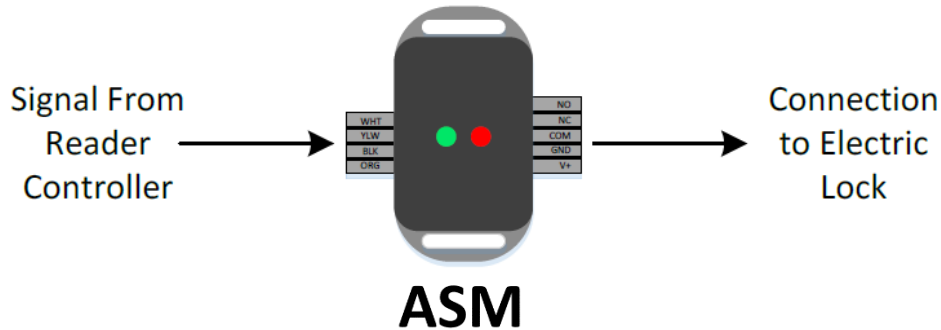


Figure 2 - ASM Overview

2.2: SECURING THE POWER

2.2.1: Using Power over Ethernet

First the PoE source must be backed up by a UPS or some other alternative power source. There are several methods for providing this. The network switch itself can be plugged into a UPS and, if available, generator power. This will ensure that in a power loss situation PoE is still supplied to the reader controller. In some cases this may not be cost effective. A second option when using PoE is to install midspans and plug only the midspans into a smaller, less expensive UPS. The midspans will have less power draw than the total draw of the switch enabling a less expensive method to provide backup power.

Secondly we must install a PoE splitter at the door. This will split the Ethernet and power from your cabling. The PoE splitter has an input for PoE and two outputs – an Ethernet connection and 12vdc (see *Figure 3* on next page). This will ensure that the power for your lock is on the secure side of the door (refer back to *Figure 1* on page 3). With the power split on the secure side of the door it will not be able to be tampered with (extra protection for the power may be needed, see Page 6). This can be done with PoE or PoE+ depending on how much power is needed at the door for the reader controller, electric lock and any other peripheral devices connected. Verify with the manufacturer total power available but in general PoE will provide 12vdc @ .8a and PoE+ will provide 12vdc @ 1.6a of total power.

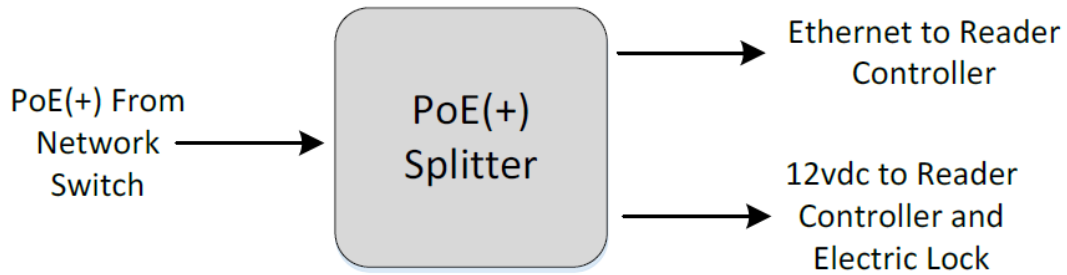


Figure 3 - PoE(+) Splitter

2.2.2: Using a Power Supply

Using a power supply is very similar to using a PoE splitter. The power supply can be located anywhere on the secure side of the door. This can be directly at the door, back in an electrical closet, in a network closet, etc. Ensure the power

Tech Tip!

If you have multiple locks connected to a power supply use a multiple output power supply that is fused for each output. This will ensure one blown fuse does not unlock multiple doors!

supply is properly sized for the number of locks and total power draw. In addition to securing magnetic locks this is optimal for Fire Alarm integration as many magnetic locks can be released via one Fire Alarm input (See our KBA on Fire Alarm and Life Safety). Power supplies typically have connections for battery backups as well making it easier to supply power to the lock in the event of a power loss.

When using a power supply it is still possible to power the reader controller by PoE and the electric lock by the power supply. The goal of the power supply is to isolate the lock power on the secure side of the door. Since the ASM controls the electric lock this is accomplished while still powering the reader controller via PoE (see Figure 4 below). ***Important*** - When the ASM loses power, whether it's from the reader controller or power supply, the relay does not change state! This ensures the door stays secured in the event of a power loss.

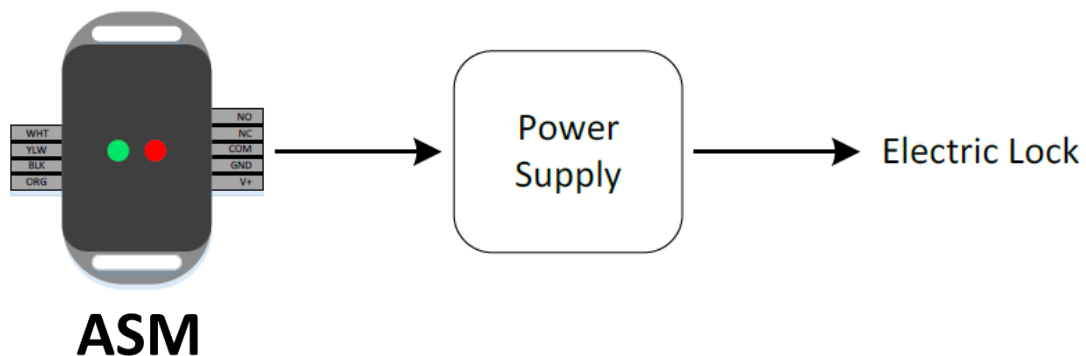


Figure 4 - ASM and Power Supply

2.2.3: Protecting Against Malicious Short Circuit (if Necessary)

The last piece we need to protect our fail safe lock is protecting against a short circuit on the power wires. This only becomes an issue if you are using the same power source to power the electric lock and the reader controller. For example, this is not an issue if the reader controller is powered by PoE and the electric lock by a power supply through an ASM. In this case you will need a fast acting fuse in line with the power to the reader controller (see *Figure 5* below).

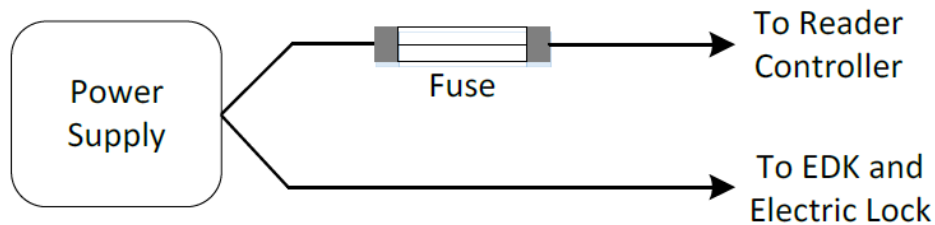


Figure 5 - Inline Fuse

- Fuse Part Number – 0208.500MXP or Equivalent
- Fuse Holder – 150274 or Equivalent

This fuse is only needed in the following scenarios:

1. You are using a PoE(+) splitter at the door to power the magnetic lock and the reader controller (typical). In this case shorting the power to the reader controller could damage the splitter causing the 12vdc output to fail and unlocking the door by loss of power.
2. You are using the same fused output to power the reader controller and electric lock. In this case shorting the power at the reader controller will damage the fuse unlocking the door by loss of power.

Note that in Figure 6 on Page 7 a fuse **is needed** because the reader controller and lock are powered by the same source – the PoE+ splitter. Note that in Figure 7 on Page 8 the fuse **is not needed** because the reader controller and electric lock are powered by different sources. In this case the reader controller by PoE and the electric lock by a power supply.

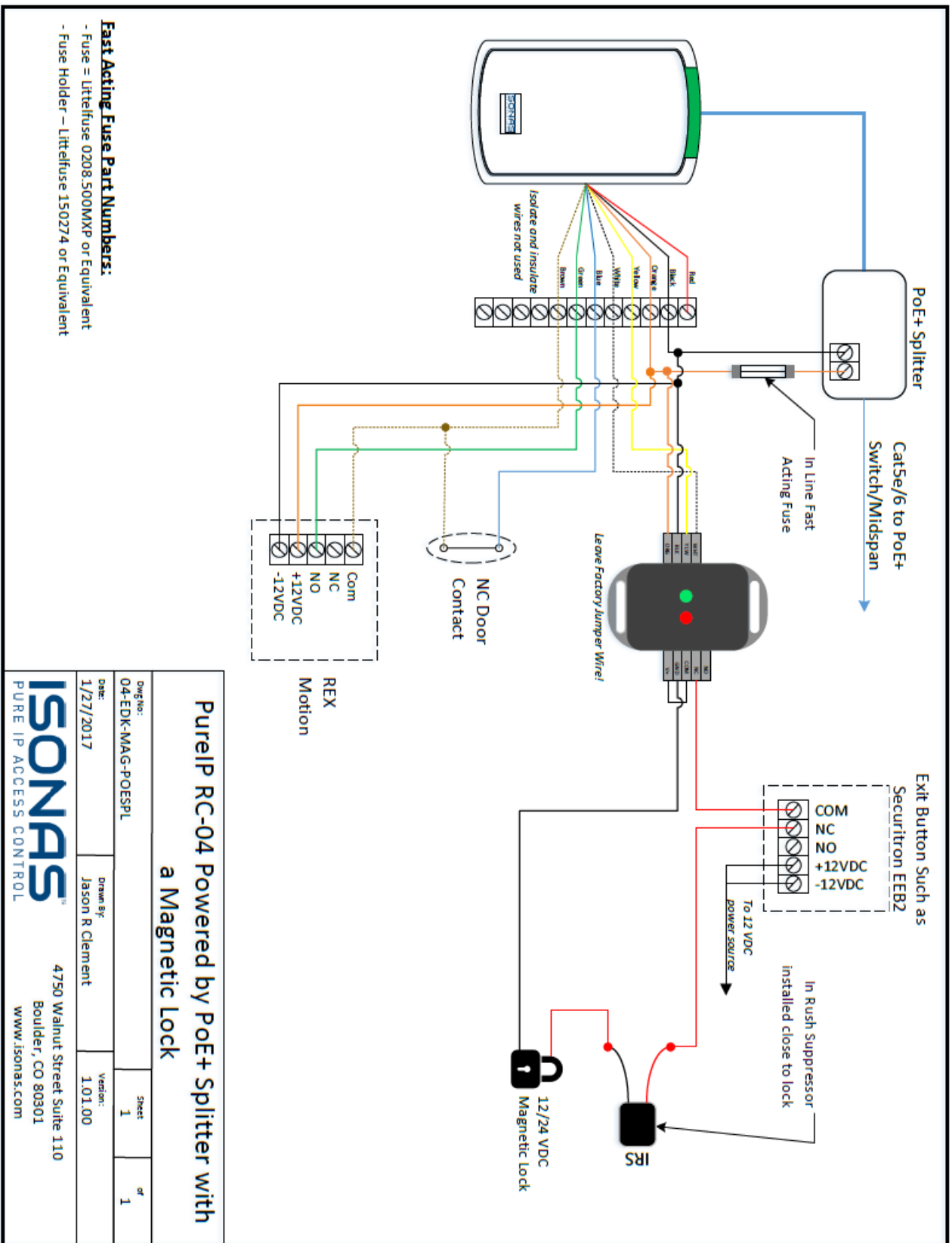


Figure 6 - Fully Secured Magnetic Lock with PoE+ Splitter (RC-04)

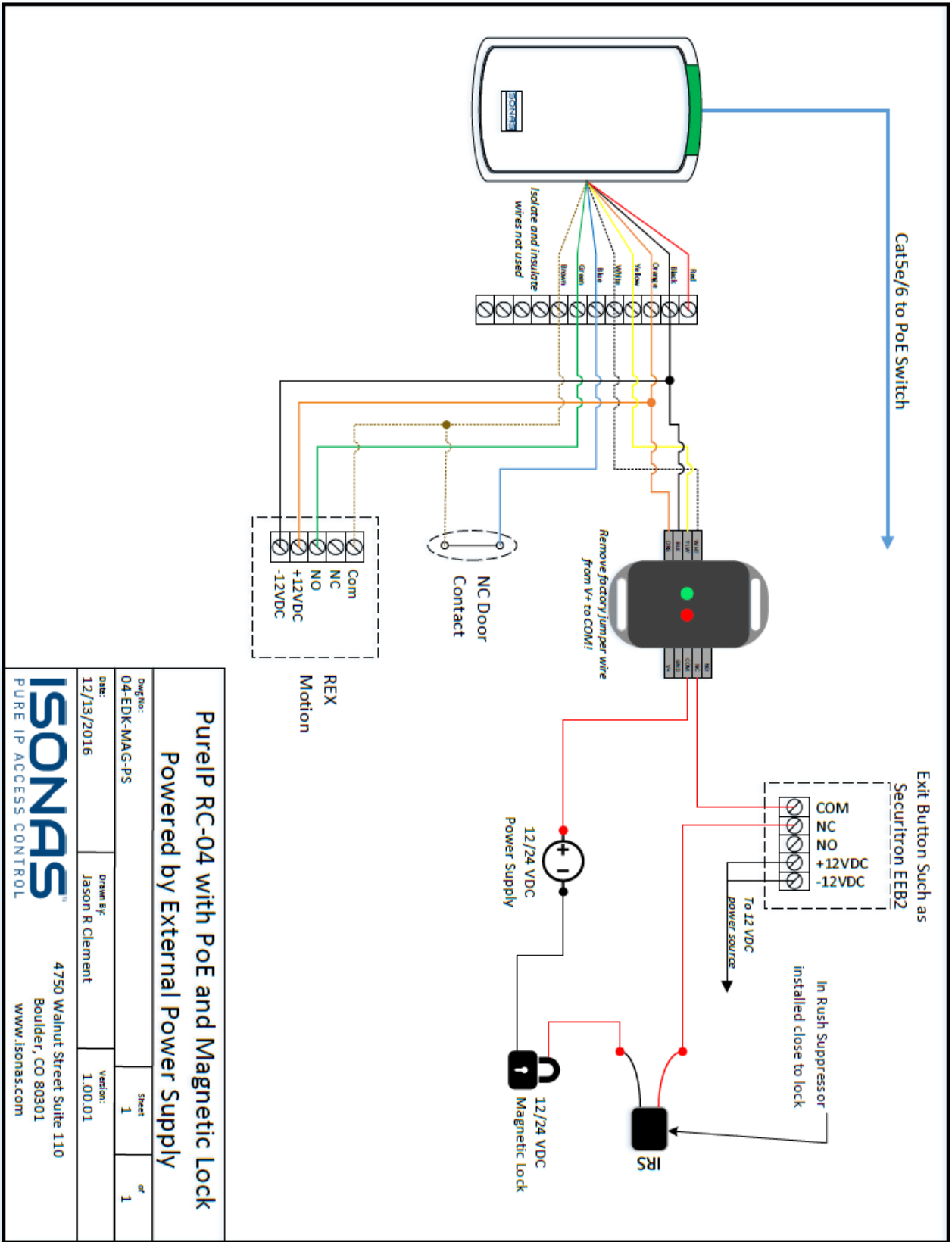


Figure 7 - Fully Secured Magnetic Lock with Power Supply (RC-04)

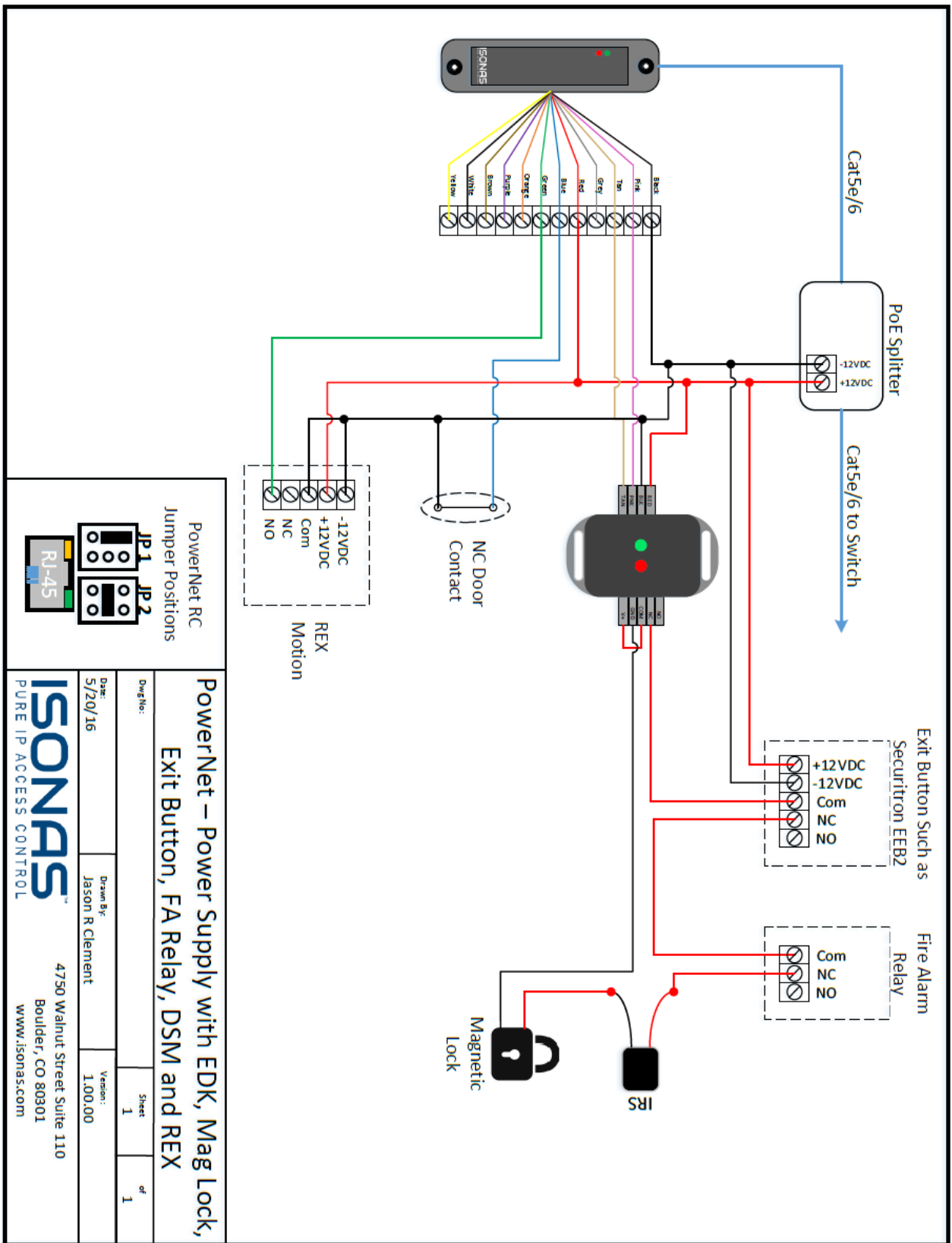


Figure 8 - Fully Secured Magnetic Lock with PoE+ Splitter (RC-03)

For more information:

Web: www.ISONAS.com **E-mail:** sales@ISONAS.com

Tel: 800-581-0083 (toll-free) or 303-567-6516 (CO)

Fax: 303-567-6991

ISONAS Headquarters:

4750 Walnut Street, Suite 110, Boulder, Colorado 80301 USA