QUICK START GUIDE FOR ACCESS CONTROL BOARDS

D Series One Door TCP/IP Web Server Controller

Model: AB-D1EWN

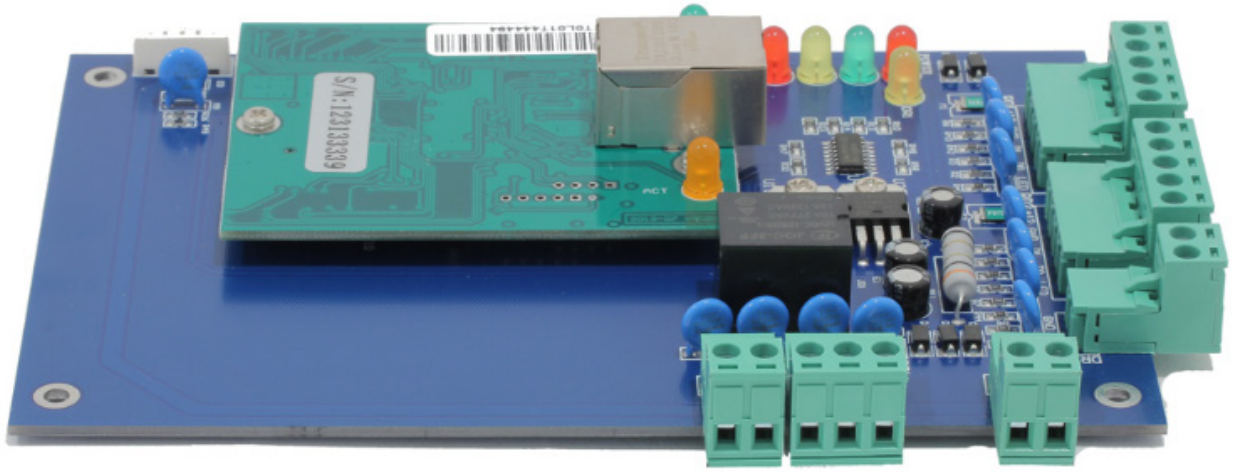
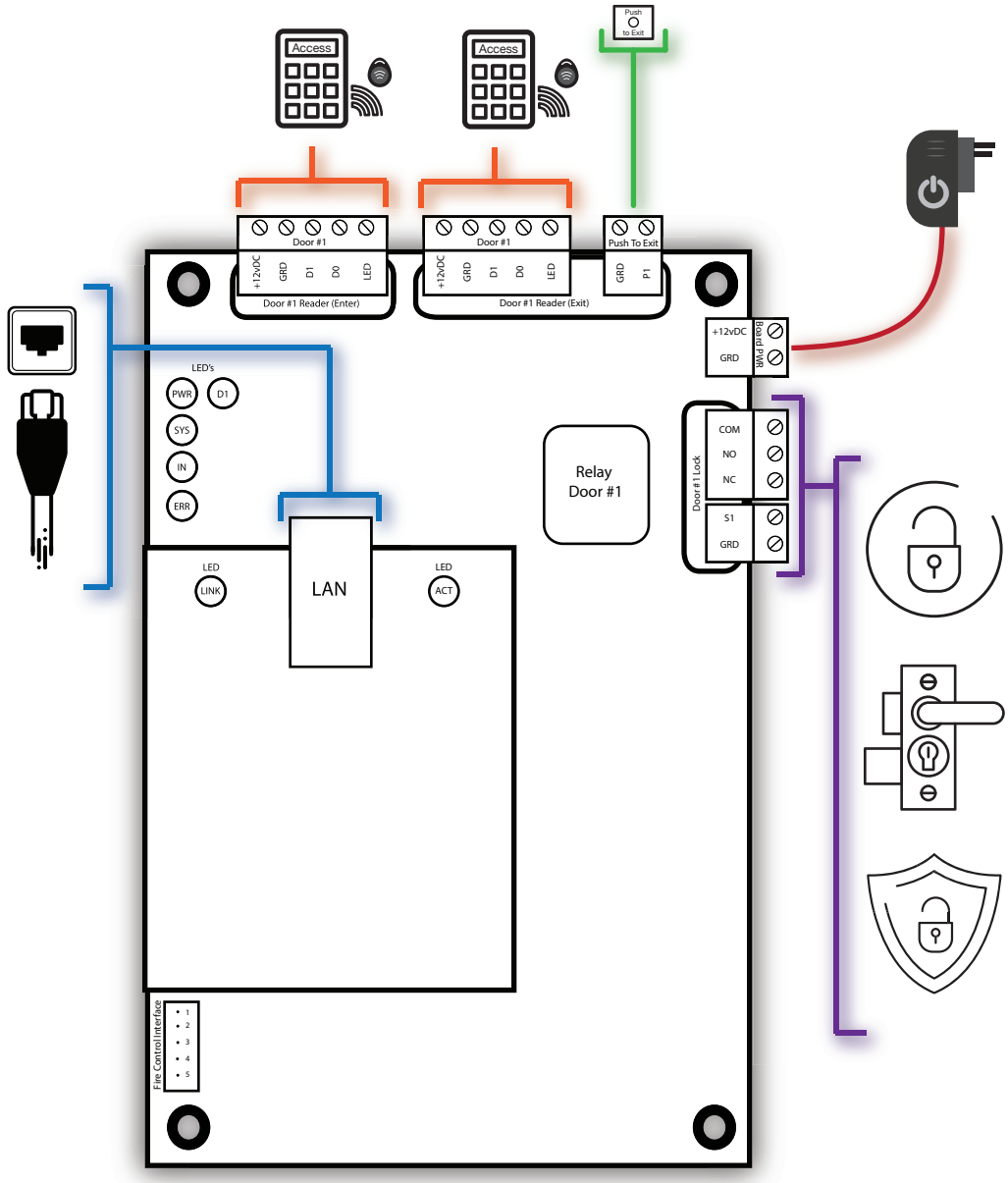


Table of Contents

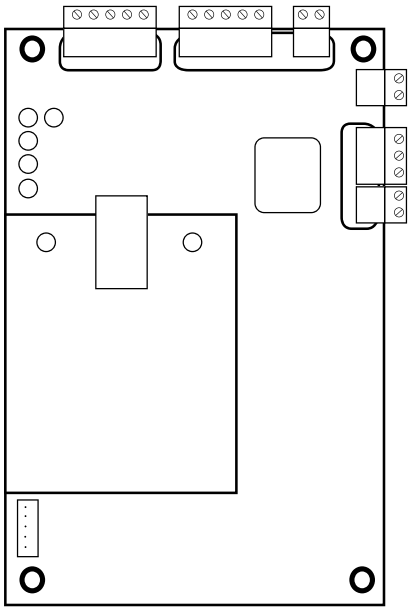
01 - Introduction

The world of Access Control can be a challenging yet rewarding solution for the Entry and Exit of any application. This guide will help you understand the Access Control board so you can properly connect Readers, MagLocks, Push to Exit buttons, ETC. These boards have many capabilities and functions they can produce. They offer services, such as, normal shift and multi-shift time attendance management system; fixed ration dining management system; meeting attendance management system; Online patrol management system and security alarm management system (features vary by boards). When dealing with Access Control the possibilities are nearly endless.

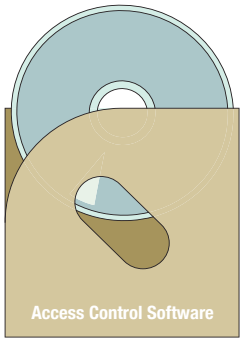


02 - Overview

02.1 - Package Contents



Access Control Board

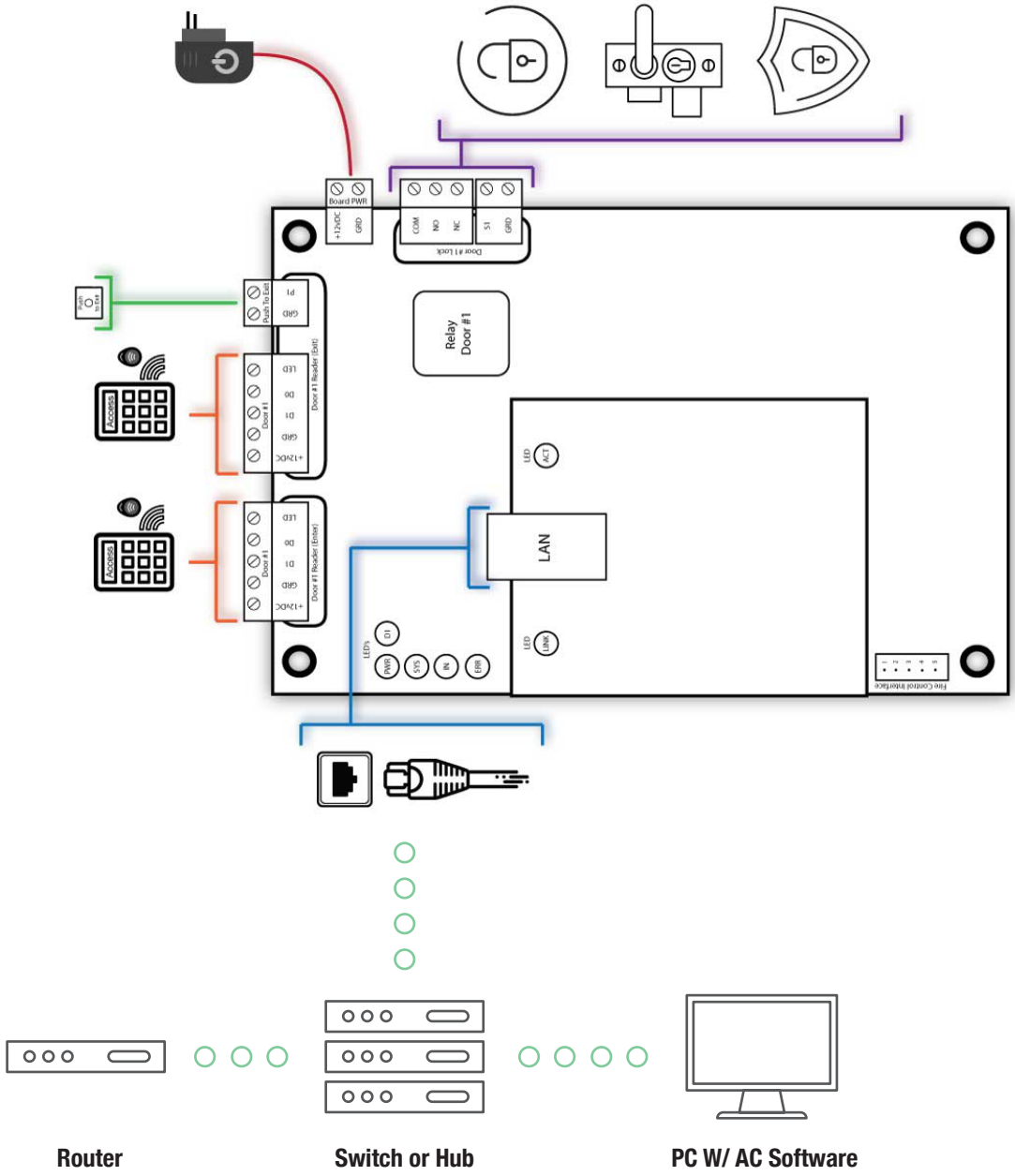


Access Control Software

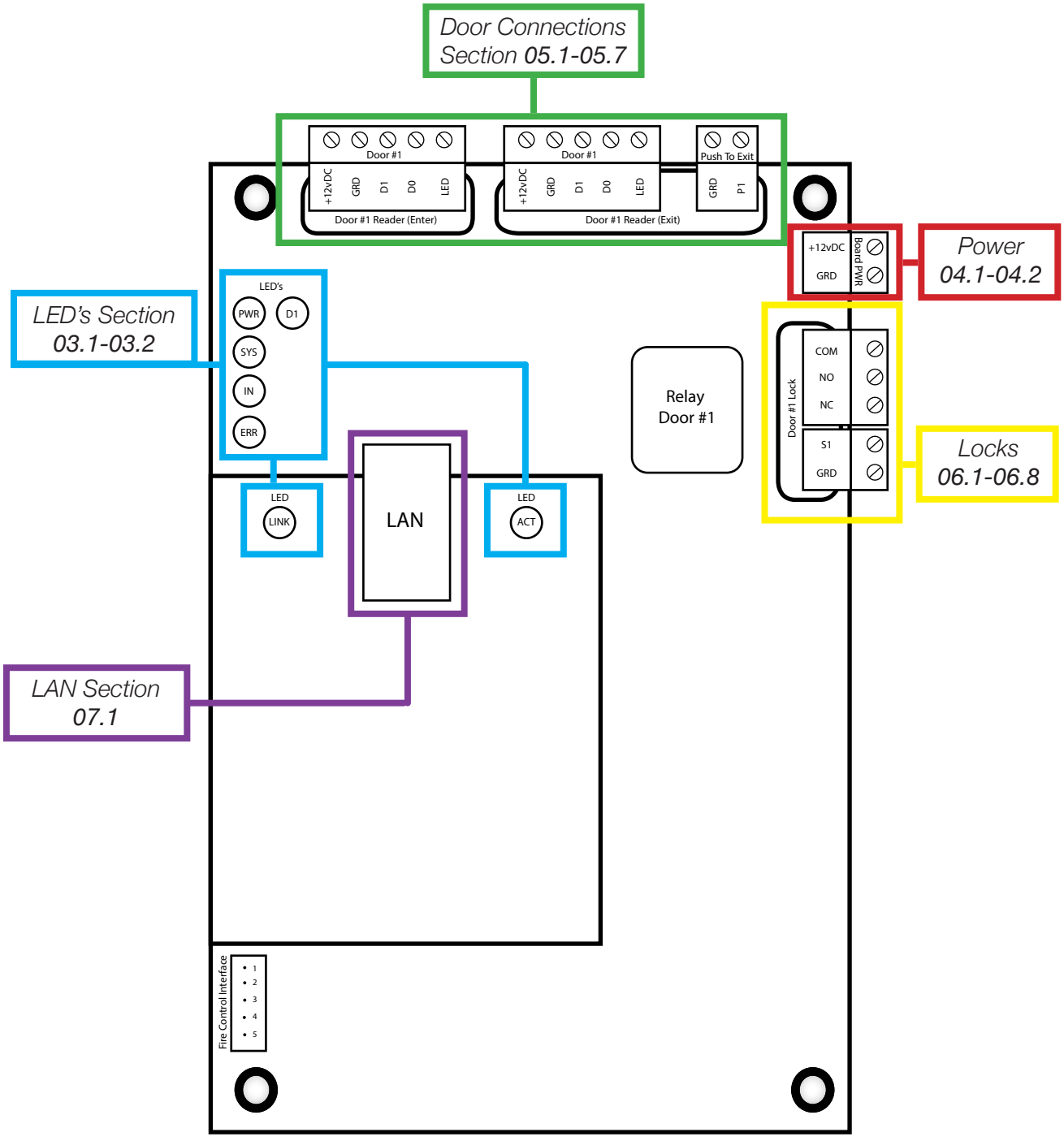
02.2 Installation Requirements

- Power Distribution Panel
- Access Control Readers
- Access Control Locks
- Push to Exit buttons
- Cat 5/6 Cable
- Security Wire (22/4 {Shielded} or better)
- Windows XP or Newer PC

02.3 - Network Overview



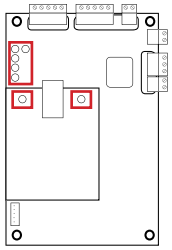
02.4 - Board Overview



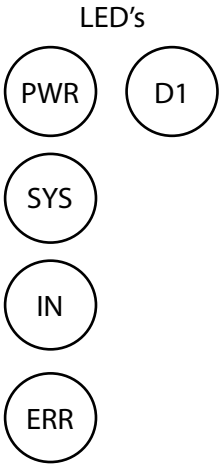
03 - LED's

03.1 Main Board LED's

Location On Board

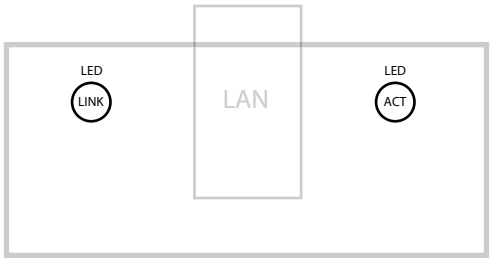


The Access Control board possess a collection of LED indicator lights to give you visual information of the activity or errors that occur on the board. This can be useful if you are having problems with communication or to verify if it is operating correctly. The figure to the left is a layout of the main board LED's. Each one has its own purpose and with the details laid out below.



- **PWR LED**: This LED shows the status of the Access Control Board. This LED will show a **Solid Red** light when the board receives power.
- **SYS LED**: This LED represents the status of the board. When everything is functioning correctly it will show a **Blinking Green** light.
- **IN LED**: This LED will have a **Blinking Yellow** light when an Enter reader request entry to a door.
- **ERR LED**: This LED illuminates **no light** if everything is functioning correctly. When the board receives an Error it will project a **Solid Red** light.

03.2 - LAN LED's



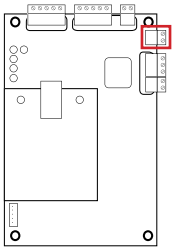
The last 2 LED's are located on the LAN card. Below will give you a better explanation of the purpose.

- **LINK LED**: This LED will have a **Solid Green** light when you have established connection through the LAN port.
- **ACT LED**: This LED will blink with a **Amber** light when there is network activity.

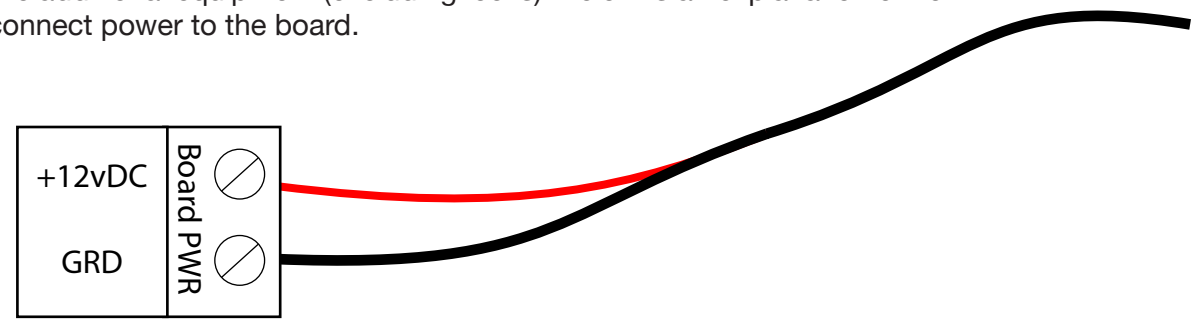
04 - Power

04.1 Powering the Board

Location On Board



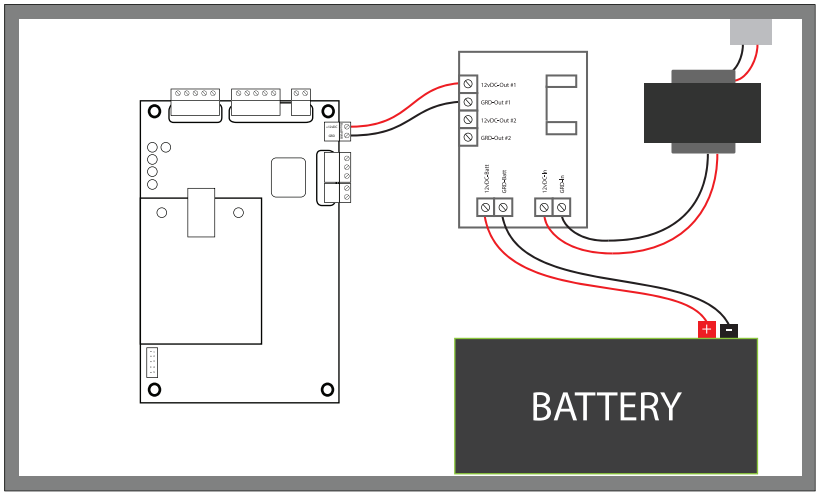
This next section is for powering your Access Control board. This board has minimal power requirements of only **100mA** ***(12vDC)*** but it will require extra power when connecting Readers and Push-to-Exit buttons. It is recomended to use a NEMA box that can house the board and Power Supply. We recommended using a **3 amp** Power Supply to provide enough power for all the additional equipment (excluding locks). Below is an explanation of how to connect power to the board.



- **+12vDC**: This port is the 12vDC input from the Power Supply. It is typically a **Red** Wire.
- **GRD**: This port is the Ground input from the power supply. It is typically a **Black** Wire.

04.2 - Power Boxes

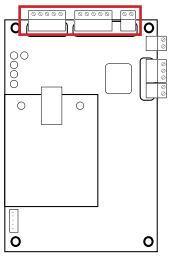
Choosing the right power supply can be tricky because you also need a Box that can power and house your Access Control Board. You also want to make sure it includes other features like Battery Backup and Fire Control.



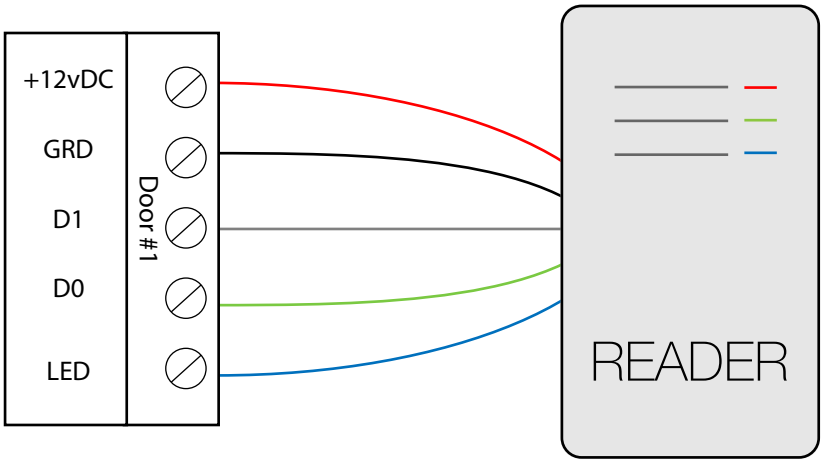
05 - Door Connections

05.1 Connecting a Reader

Location On Board



Access Control Readers are what allows you to gain access to an entry door. Connecting them is easy as long as you know what you are doing. Most of the labels on the board for each port correspond to the reader but below will explain in more detail how it works.



Tips 01

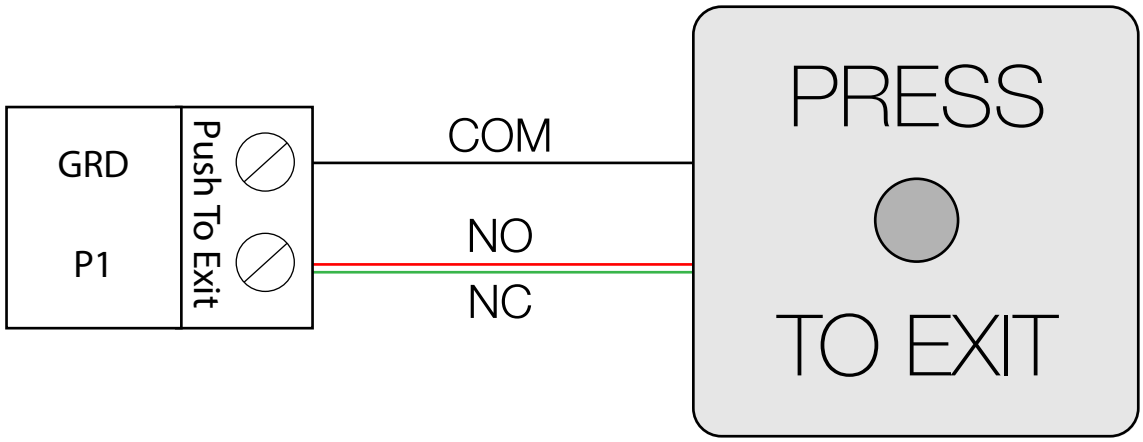
The colors used in this example are only for example. Please refer to the reader's user manual for an accurate color chart to avoid any Connection issues.

- **+12vDC**: This port is the 12vDC output to provide power to the reader. It is typically a **Red** Wire.
- **GRD**: This port provides Ground to the reader. It is typically a **Black** Wire.
- **D1**: This is a Data port to transmit data from the reader and send it to the board. It is typically a **Gray** or **White** Wire.
- **D0**: This is a Data port to transmit data from the board and send it to the Reader. It is typically a **Green** Wire.
- **LED**: This is the port where you connect the LED cable from the reader to. It is only required if the reader needs it. It is typically a **Blue** Wire. (Optional) you can also connect your ***BEEP*** wire to this port for added features.

Access Control Readers come in different forms but function all the same. They use input from either a Card, Fob, Finger Print, or Numerical text input as a form of identification.

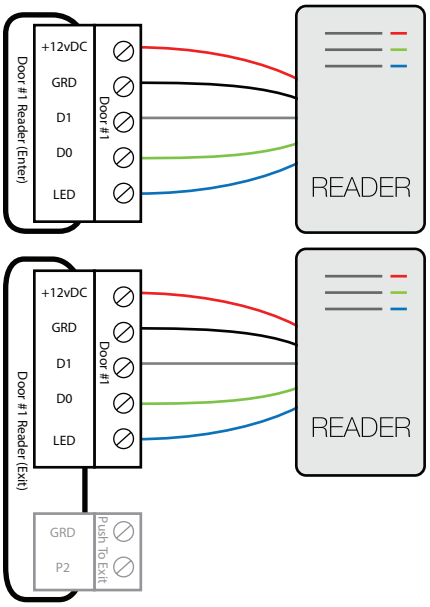
05.2 - Connect a Push-to-Exit

Push-to-Exit buttons are usually put on the interior part of the door and allows you to exit once pressed. Connecting them is a breeze and below will provide the guide.



- **GRD**: This port provides Ground to the Push-to-Exit Button. The wire that is connected to this port is typically called the **Common** Wire.
- **P1**: This port is the signal port to tell the board to open the corresponding door. When connecting a simple button there is only one combination involved which is ***NO*** (Normally Open). This means that the door in normally *locked* until the button is pressed. With more advanced buttons you have 2 options ***NO*** and ***NC*** (Normally Closed). The ***NO*** operates as explained above but ***NC*** will keep the door *open* until the button is pressed. ***The default is NO***. The 1 in P1 is the door number the Push-to-Exit Button corresponds to. For example, P2 is for Door 2.

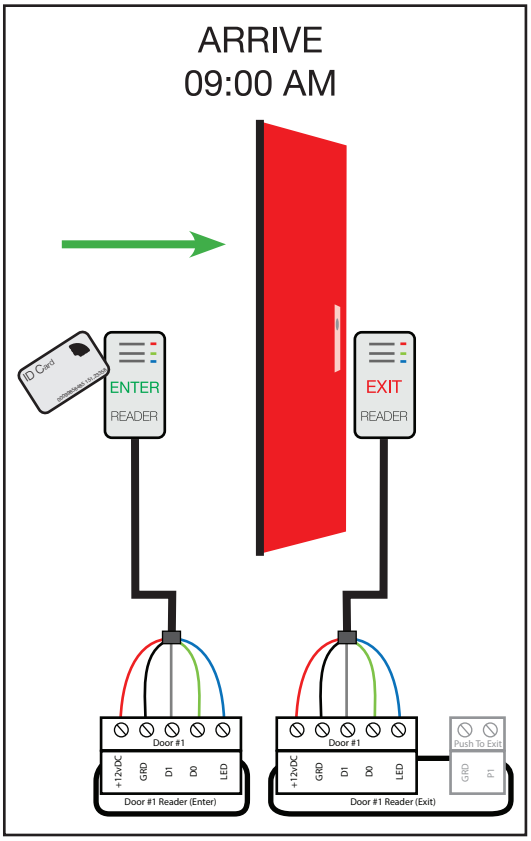
05.3 - Connecting Multiple Readers



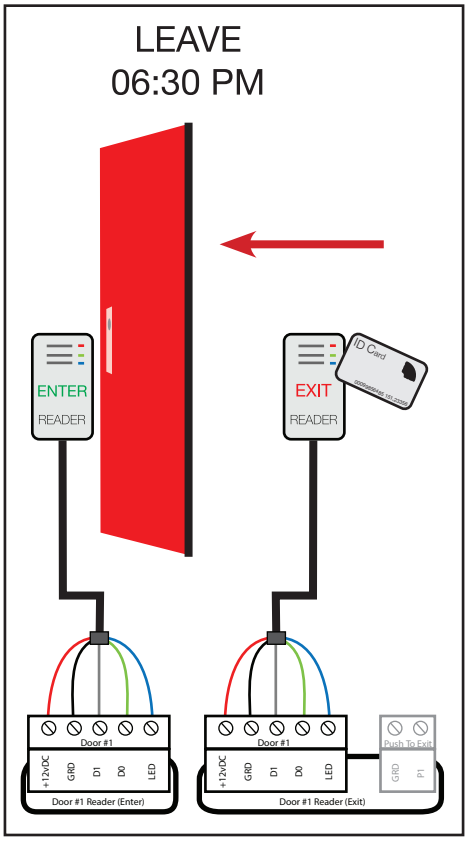
Exclusive to the 1 and 2 door access control boards is the option to connect multiple readers per door. This is used for attendance and anti-passback. As shown in the figure to the left, you could connect 2 readers to the board (one connected to the enter side and the other to the exit.) You would then proceed to place the Enter reader on the exterior part of the door and the exit reader to the interior. This means that instead of using a Push-to-Exit button to leave you will have to use the reader instead. Please make sure you connect the Enter reader to the “Enter” reader ports and the same with the Exit reader. You can see an example of this in Section 05.6 labeled “Dual Readers”.

05.4 - Attendance

Keeping track of employees attendance can be time consuming and hard to keep accurate. This access control board can do all this for you. It can track time arrived, lunch breaks, and time of departure.



In the illustration to the left you can see how someone would use their ID Card to enter the building and the Access Control board records their time. On the right you can see that same person leaving the building and the board recording the time of their departure. When set up you can also track when a person leaves and arrives for lunch.

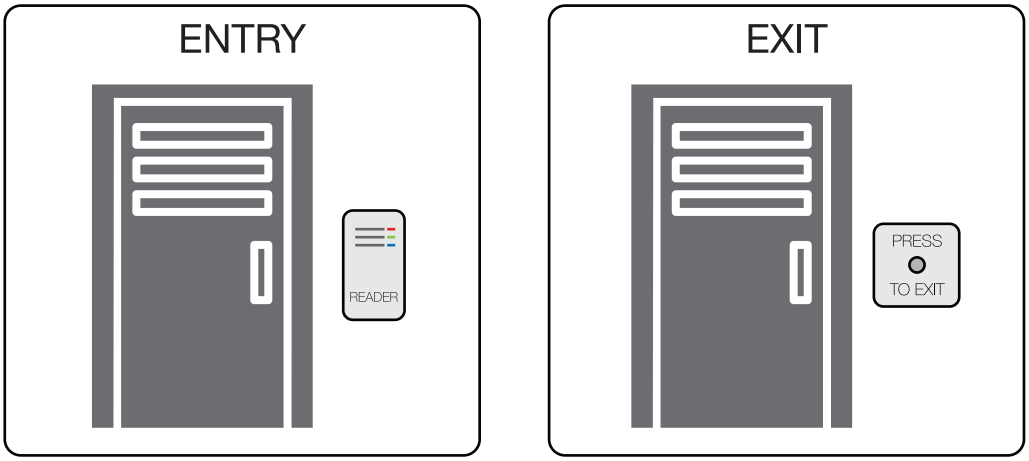


05.5 - Anti-Passback

To be used in conjunction with attendance or, on its own, Anti-Passback can be a very useful tool for people entering or exiting a building. It's purpose is to make sure a person checks in and checks out. For example, if a person enters a building with their ID Card and does use their ID Card when they leave they will not be able to re-enter. In order for the person to re-enter they will either have to talk to someone to reset their card or clock out from the exit reader. This feature requires 2 readers per door just like attendance.

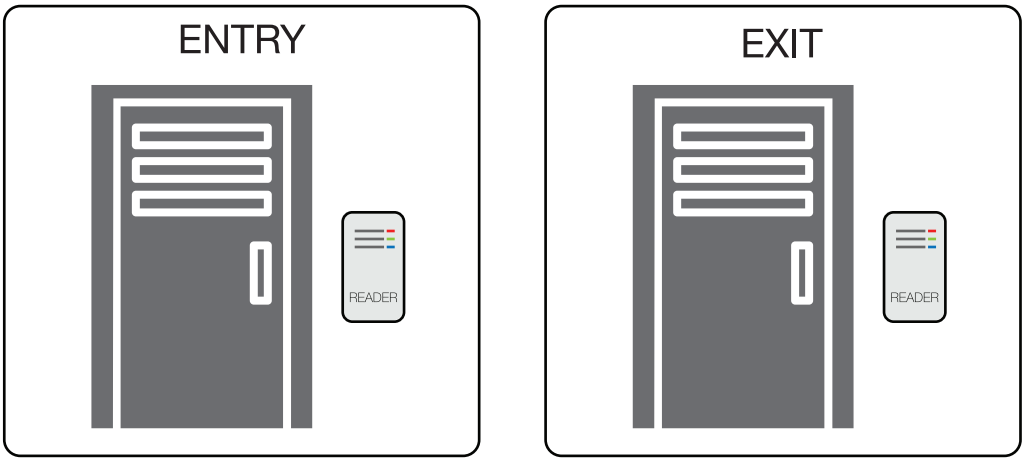
05.6 - Door Example's

Standard



Above illustrates how you would connect a standard entry and exit for a single door. The reader would be on the exterior of the door and the Push-to-Exit button would be placed on the interior.

Dual Readers

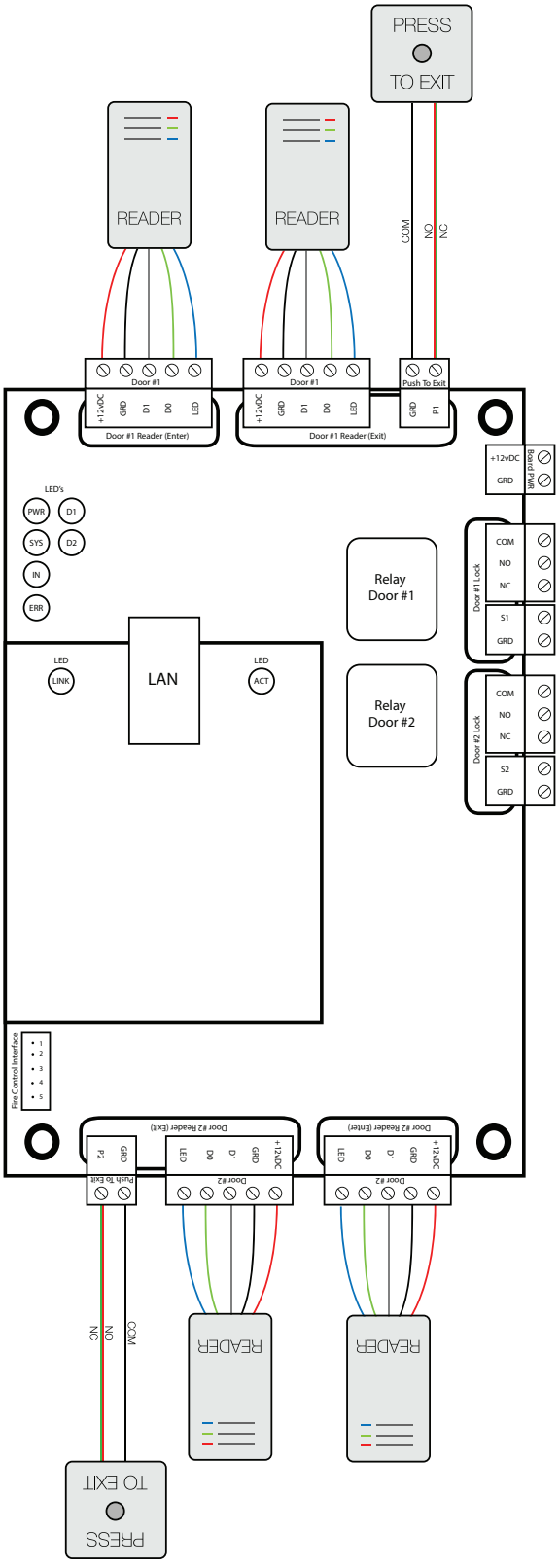


Above illustrates how you would connect a dual reader for a single door. On this board you have the option to connect not only an Enter reader but also an Exit Reader. This will allow you to perform the attendance and anti-passback features.

05.7 - Board Example

This example illustrates how you would connect a Reader and a Push-to-Exit button, or 2 readers for each door. Because this is a 1 door board you can connect 1 reader and 1 Push-to-Exit button or 2 readers (2 per Door). For Standard Installations, the reader functions as a form of entry and is usually placed on the exterior. You would then use a form of identification such as a ID Card, Fob, Fingerprint, or Numerical text input. If valid it will allow you to enter. The Push-to-Exit will provide a convenient way to exit a locked door. As explained in the previous page you can connect an interior reader to exit and remove the Push-to-Exit function.

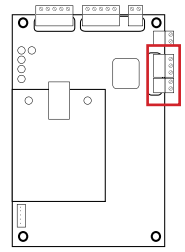
Also if you want to use multiple Push-to-Exit buttons you can simply input another button. Please be sure to continue the same function (***NO*** or ***NC***) as you can only use one at a time.



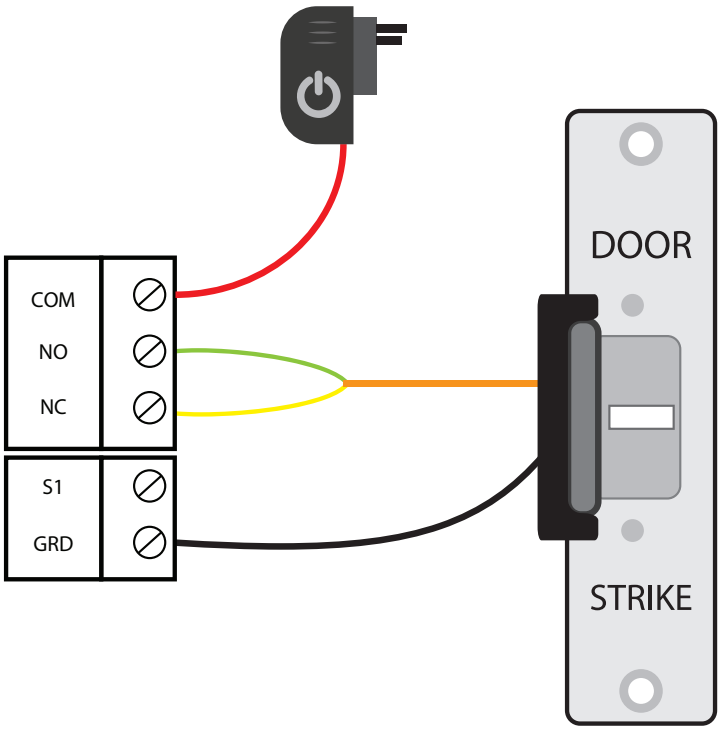
06 - Locks

06.1 Connecting a Lock

Location On Board



The type of lock that you use will depend on the application and door. You have a few options to choose from and you can use multiple locks at a time. Some examples include Strikes, Maglocks, and Deadbolts. Below will explain how to connect these locks to the board.



- **COM**: This port is your +***12vDC input*** from your power supply. The locks don't receive power from the board directly and need to be wired, from the **COM** port, to the power supply individually. You can use the same power supply as the board or a separate PWR Supply depending on power consumption of all the equipment

- **NO**: This port stands for ***Normally Open***. This means there is no electricity flowing through this port in its normal state. The type of lock you would connect to this port would be a Fail Secure lock. This is where you would connect the + wire from the lock. ***(Please See Notice 01)***

- **NC**: This port stands for ***Normally Closed***. This means there is electricity flowing through this port in its normal state. The type of lock you would connect to this port would be a Fail Safe lock. This is where you would connect the + wire from the lock. ***(Please See Notice 01)***

- **GRD**: This port is where you would connect the ***Ground*** (-12vDC) wire from the Lock. You can also run the ground cable to the Power Supply if the port is getting too congested.

NOTICE 01

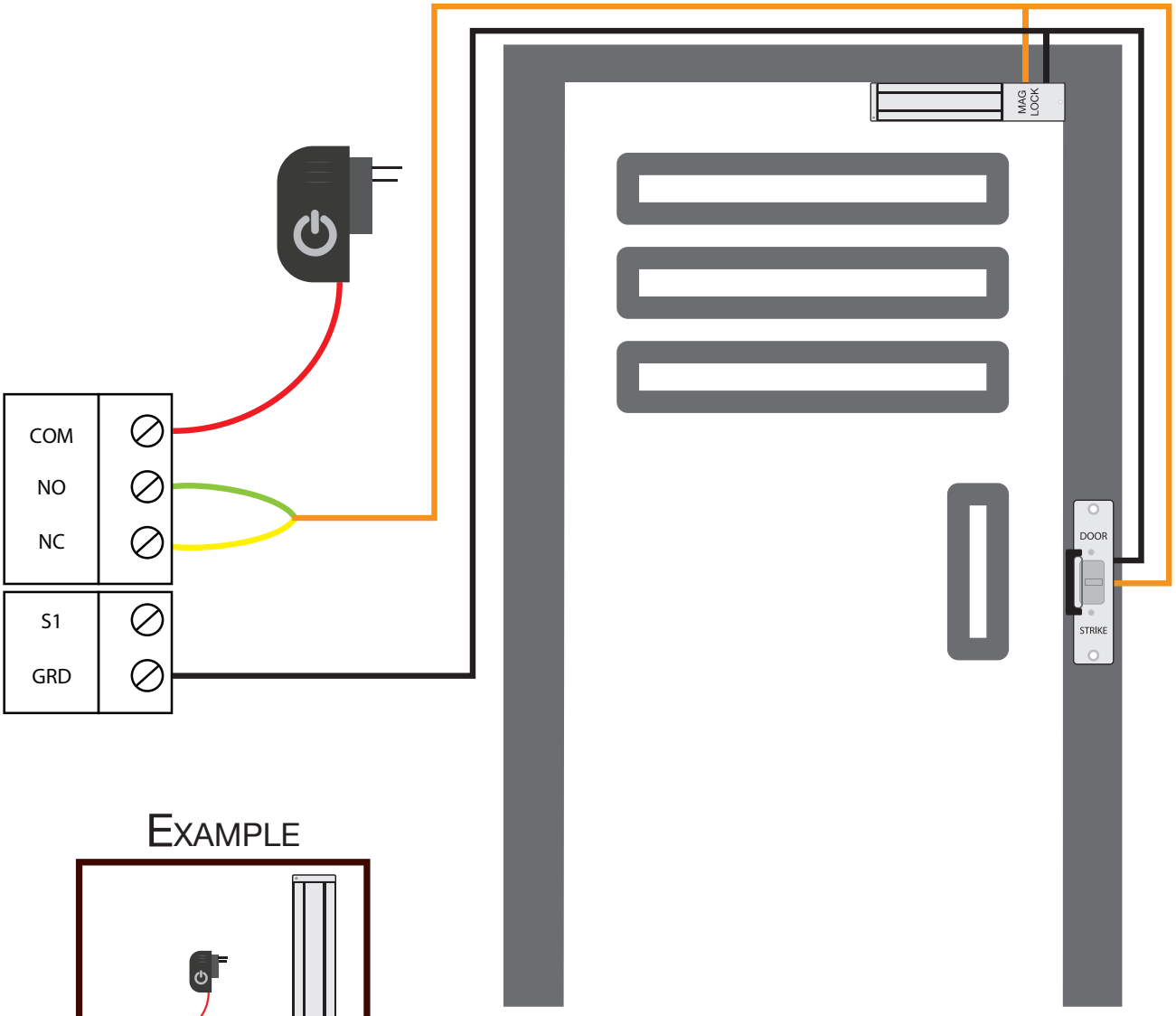
Please make sure when connecting a single lock to only use one of the 2 choices (**NO** or **NC**).

TIPS 02

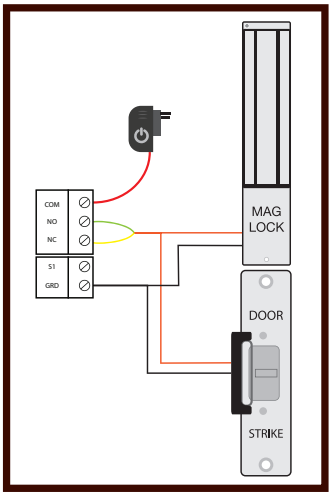
To find out more information about Normally Open, Normally Closed, Fail Safe, or Fail Secure please go to sections 06.6 - 06.8

06.2 - Connecting Multiple Locks

The example below shows how you would connect 2 or more locks to a single door. You would just run **separate cables** to the locks and depending on what types of locks you are using you would connect them to either ***NO*** or ***NC***. Please make sure you use ample amount of power for all the locks connect to the board.



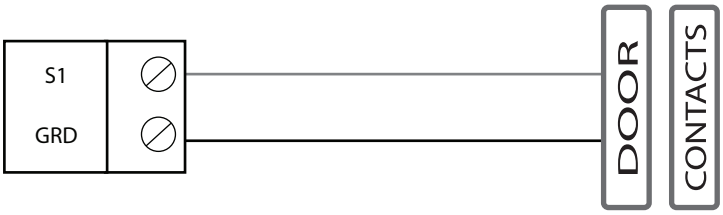
EXAMPLE



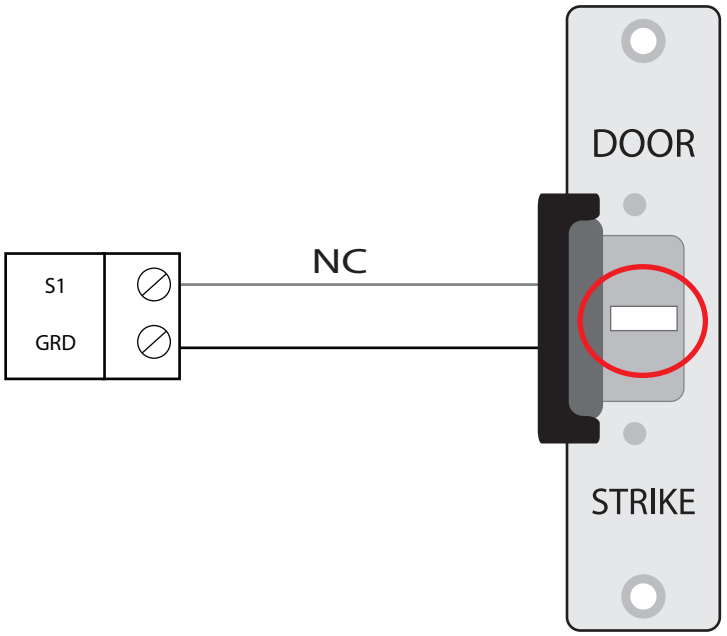
06.3 - Connecting Signal Wire

The Signal port is used to tell the Access Control board if the door is open or closed. This is important because when you enter or exit a door the locks will reengage even if the door is still open. If you want to know this information or have an alarm go off for having the door open for an extended period of time this port will allow you to do so.

- **S1**: This port is what you will connect your signal wire to. If you have a choice between NO and NC, you will want to choose ***NC*** because the door is normally closed and you want to know when it is open. The example to the right shows a simple door contact you would use on an alarm system to help indicate if the door is open. You will need to run one for each door and put them in the correct "S" port.



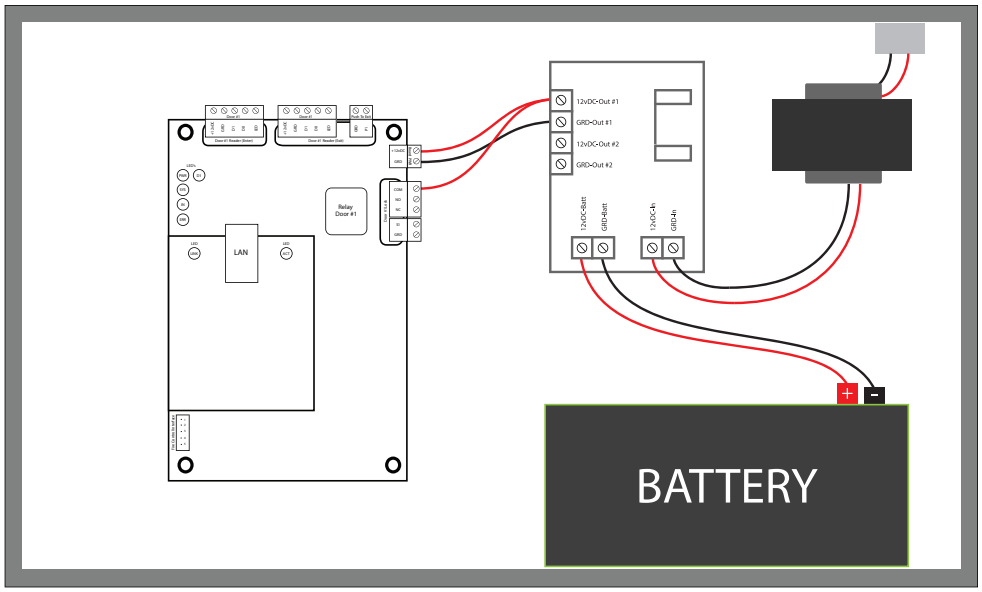
- **GRD**: This port is where you would connect the COM or negative side of the contact. With the example above it does not matter what cable you use because you are just trying to complete the circuit. You can also connect to the ***GRD*** cable powering the strike as this is the same ground. This will cut down on the amount of cable needed.



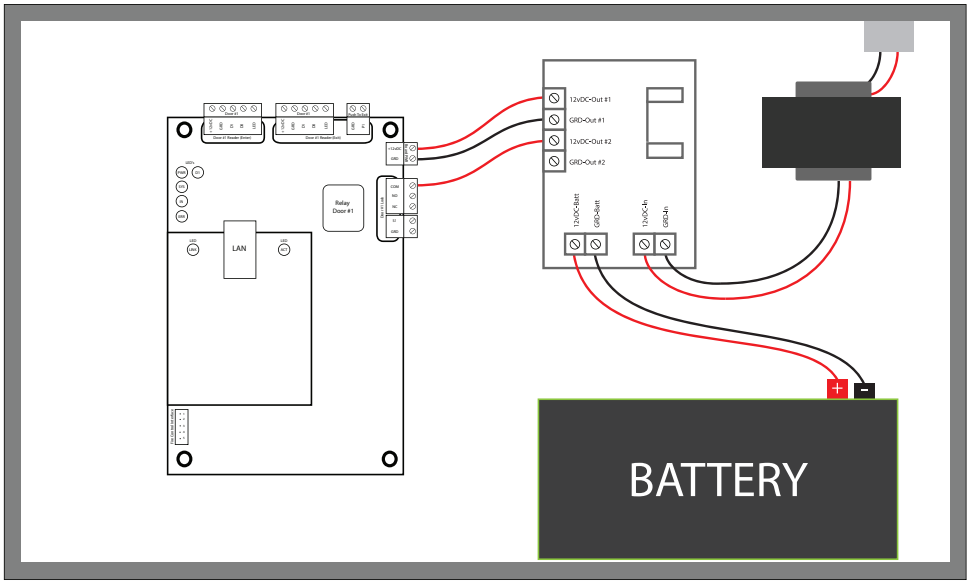
The example to the left is using a Strike that has the door signal built in. This is seen in more expensive models and is located typically in the middle of the strike plate. There are usually 3 wires with the first being ***COM***. This cable you will connect to the **GRD** port. The other 2 cables will be ***NO*** & ***NC***. As explained above you will use ***NC***.

06.4 - Powering Locks with Same PWR Supply

This example will illustrate how to power your locks with the same power source as your board. As you might have noticed your locks do not get powered from the Access Control board and need to be powered separately. If your Power Supply for your board is powerful enough for your board, readers, and locks you can use the same supply. You would simply connect the ***12vDC*** output from your power supply to each ***COM*** port for each lock.

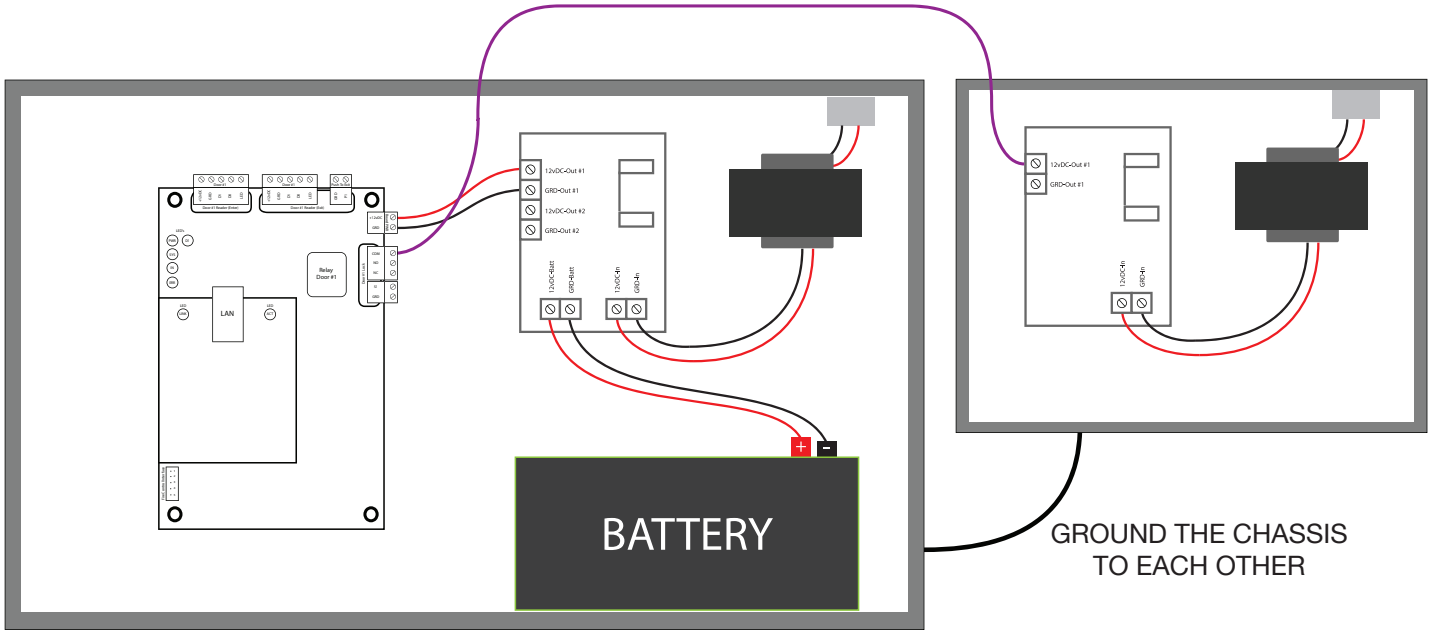


If you have a power supply with **multiple channels** you can connect to different channels on the supply. This will help distribute power. You don't have to worry about the ***GRD*** because that is something the board does share with the locks.

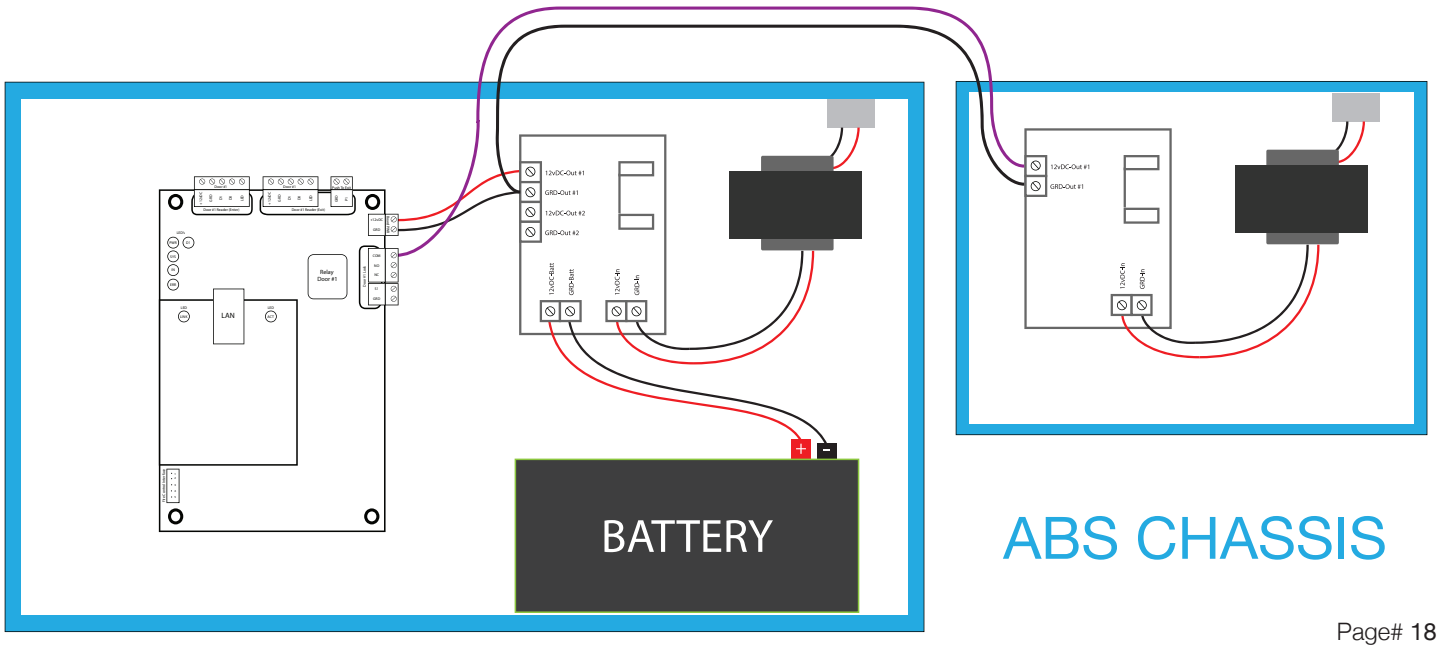


06.5 - Powering Locks with Seperate PWR

This example will illustrate how to power your locks with a separate Power Supply. Since your locks share the same ground as your Access Control board you have to Bond the two Power Supplies together. You would simply connect the ***12vDC*** output from your separate power supply to each ***COM*** port for each lock. Below is an example 2 Metal Power Supply Boxes. The chassis themselves are grounded so connect a 14 gauge wire to both chassis to bond them together. This will allow them to share the same Ground to complete the circuit.



For ABS housings, you cannot bond the two Chassis together so instead you will have to connect them differently. You will have to run a 14 gauge wire from the Ground output on the separate Power Supply to one of the ground ports in the Main Power Supply. As for the 12vDC you will copy the same set up as before.

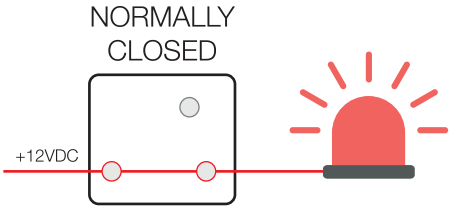


06.6 Normally Open and Normally Closed

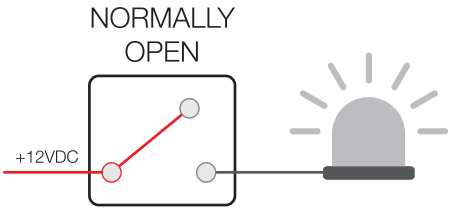
What is open and closed? Before we get too far we need to explain what is “open” and “closed”. With electricity “closed” means the circuit is connected and electricity is flowing. “Open” means the opposite. The electrical current is open and no electricity is flowing.

Normally? The idea that something is “normal” means that it is a constant unless a force changes it. Relays will need to be energized and switches such as Door contacts need to be disconnected.

Normally Closed - This is when there is a constant current of electricity in its normal state. Energizing or changing the state will open the contact and disrupt the current.

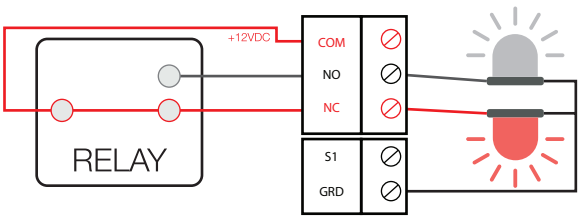


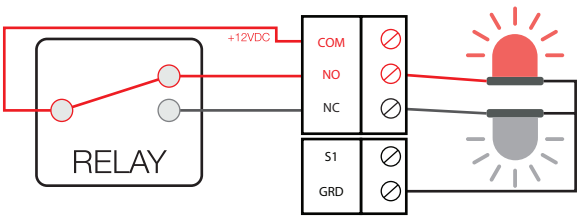
Normally Open - This is when there is no current of electricity in its normal state. Energizing or changing the state will close the contact and allow the current to flow.



Do not over think the concept. It is as easy as it sounds. Now lets see how this is interpreted on the Access Control Board.

Below is a description of a Normally Closed device connected to the Access Control board. When power is given through the relay and the relay is not energized it stays in a Normally Closed state. The Normally Open port stays with no current. When the Access control board energizes the relay (From a Reader asking to open the door) the relay switches the current to Normally Open and the Normally Closed port looses current. So it is safe to say that the Access control boards are Normally Closed devices by default.





06.7 Fail Safe Vs. Fail Secure

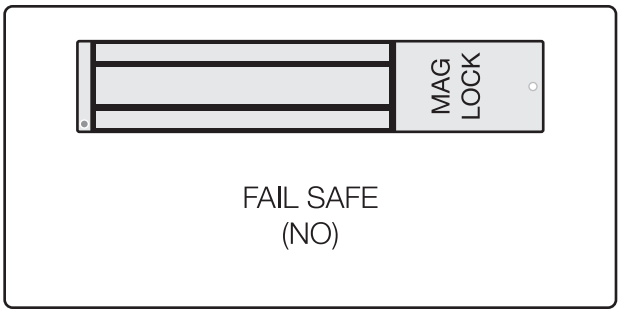
This section is very easy to understand but should not be overlooked. When incorporating these protocols in your installation you should always talk to your local code enforcement to ensure it is correct.

Fail Safe? These products are designed to unlock when power is lost. This ensures that if there is a problem you can quickly exit. Since this is Normally Open device you will want to provide power in order for it to be locked.

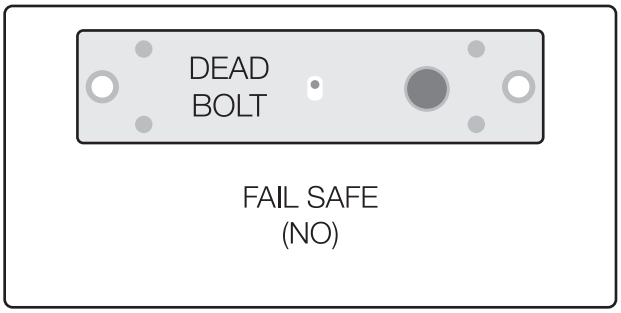
Fail Secure? These products are designed to stay locked when power is lost. This ensures your door will stay locked even in the event of a power loss. This might seem like the best option but you have to remember that if it stay locked everyone inside is also locked in. Please make sure to have an internal mechanical exit function to overcome this. Since this is Normally Closed device you will only provide power when needed to unlock.

06.8 - Types of Locks

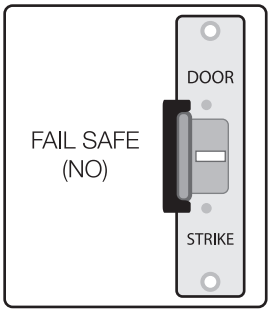
Magnetick Lock - These locks work off magnetic energy to clamp the door shut. They are very strong ranging from 350lbs to upwards of 1200lbs of holding force and can easily be released. MagLocks are Fail Safe devices which makes them Normally Open. This means you want to connect the Maglock to the NC port to provide power and keep the door locked until requested open. You can place these devices in the frame or door itself.

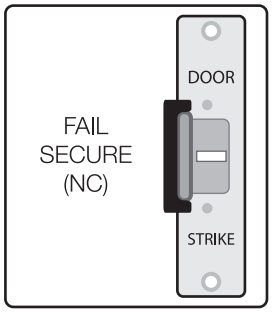


Dead Bolt - These locks work same way a mechanical DeadBolt by inserting a metal bolt into the door to prevent opening. They have a tremendous holding force upwards of 2200lbs. DeadBolts are Fail Safe devices which makes them Normally Open. This means you want to connect the DeadBolt to the NC port to provide power and keep the door locked until requested open. You can place these devices in the frame or door itself.



Door Strike - These locks are located in the door frame and hold a door back when the strike is inserted. They also come in two forms, one being Fail Safe (NO) and the other Fail Secure (NC). Fail safe works like explained with the DeadBolt and MagLock. Fail Secure is a Normally Closed device and keeps the door locked until power is received. This means you connect the Fail Secure device to the NO port.

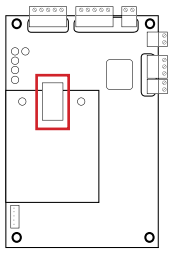




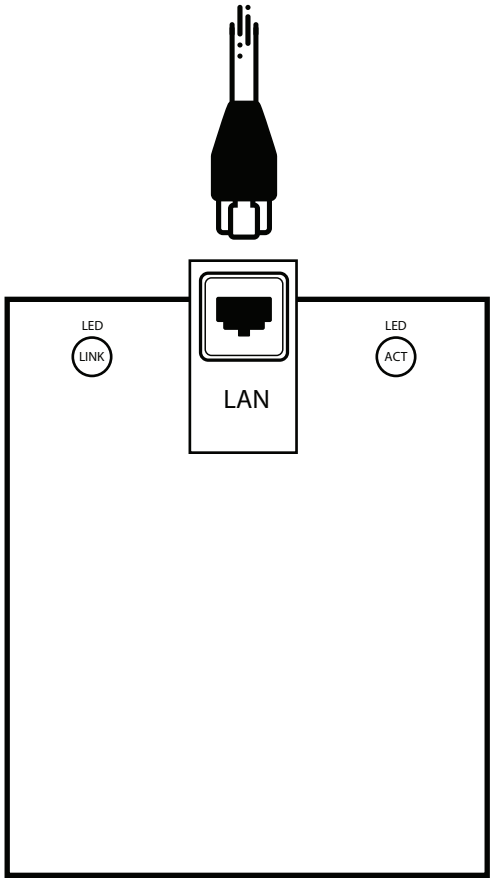
07 - Lan

08.1 Connecting to the Network

Location On Board



Connecting to the network is very easy and only requires one Ethernet Cable. You will simply connect the Ethernet cable to the Lan Card located on the board. then you connect the other end of the Ethernet cable to a HUB on your network the your Computer with the Access Control Software is located. For an even more secure connection you can plug directly into the computer. This will ensure no one can intercept connectivity through the network.



IP Address

192.168.0.0

Subnet

255.255.255.0

Gateway

0.0.0.0

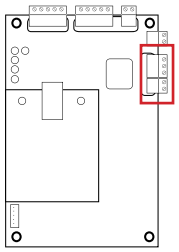
All of this information can be changed on the Access Control Software you install on the PC. You will be able to connect to the board regardless of your network configuration. The software has a finder tool built in so you can access a new board easily.

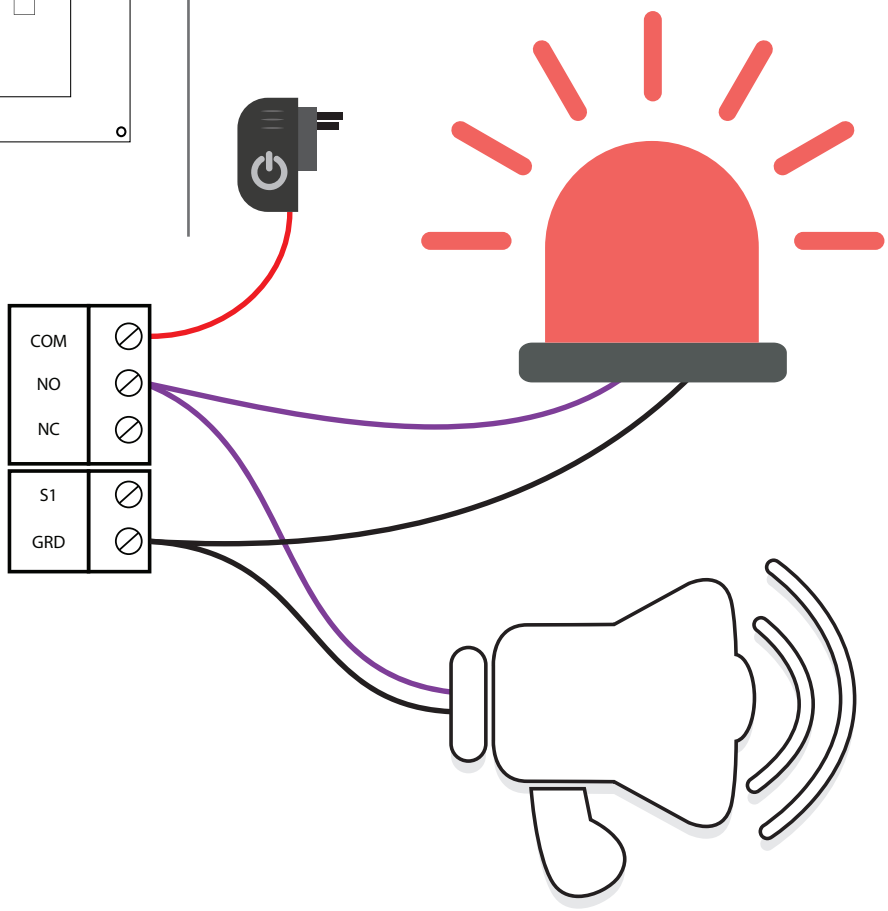
08 - Extras

08.1 Connecting a Siren, Buzzer, or Light

Access Control can allow you to do some impressive things to help indicate the door is open or closed. Below will explain how to connect these devices.

Location On Board





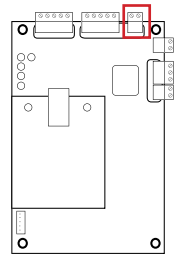
- **COM**: This port is your ***12vDC input*** from your power supply. Since this is the same section as where your locks would go you can refer to **Section 06** for further information.
- **NO**: This is the port where you will connect the +12VDC for the alarm you choose. Connecting to this port will start your alarm and provide indication of when the door is unlocked.
- **GRD**: This port is where you would connect the ***Ground*** wire from the alarm. You can also run the ground cable to the Power Supply if the port is getting too congested.

You can use these devices for multiple applications. For example, you can use a light above the door to indicate that it is unlocked, informing someone trying to enter or exit that they can do so. This is a good solution for low light situations. Another example, which can be used in conjunction with a Push-To-Enter button, when the button is pressed a buzzer alerts the person that the door is now unlocked and can be opened. These ideas and more can be used separately or together to create customizable experiences for you and your client.

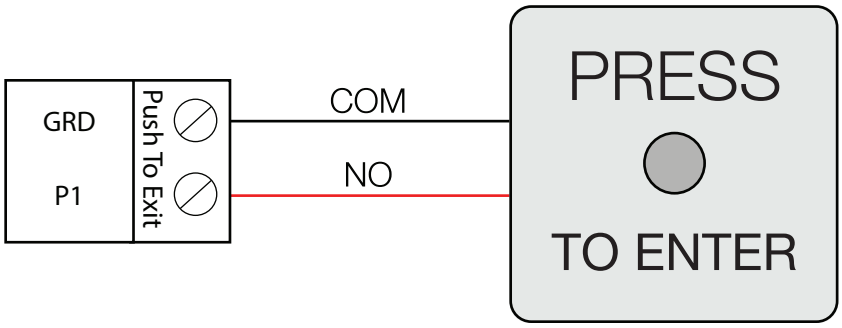
Just remember, if you connect these devices, when you leave the door unlocked the buzzer will continue to go off. A simple relay connected to the Push-to-Enter button will work better for that installation. Please call our tech support for further instruction.

08.2 Connecting a Push-to-Enter Button

Location On Board

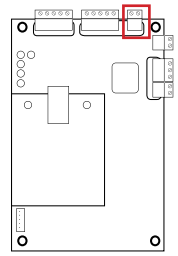


Push-to-Enter buttons are the same as Push-to-Exit but placed near a receptionist to let someone in. They are also connected the same way. Follow the steps for the Push-to-Exit button found in **Section 05.2** but only connect the ***NO*** cable to the (**P1 [1-4]**) port. You can connect as many Push-to-Enter or Push-to-Exit buttons as you like but make sure they are all running the same cable (***NO*** or ***NC***).



08.3 Connecting a Request-to-Exit "PIR"

Location On Board



PIR Request-to-Exit devices allow you to use motion to open the door. This means when you approach the door the sensor will detect your movements and open the door. A good example is when you walk into a convenience store, the PIR will detect you are getting close to the door and the automated doors will open. These are connected to the same ports as the Request-to Exit & Request-to-Enter buttons.

PLEASE MAKE SURE YOU HAVE A TRAINED ELECTRICIAN INSTALL THIS EQUIPMENT.