

# Wiring Instructions v4

## GateKeeper h4.2

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## Preface

This wiring guide is for the technician or electrician responsible for installing the GateKeeper h4.2, door readers, and access control units as supplied by Treshna Enterprises Ltd.

This guide includes an overview of the hardware involved, example wiring diagrams for both Fail-Secure and Fail-Safe access control devices, emergency buttons, as well as diagnostic tests and basic troubleshooting. A more [comprehensive troubleshooting guide](#) can be found on our [support page](#).

**Please read this manual carefully before the installation of the GateKeeper and readers.**

## Hardware Checklist

- ☐ GateKeeper computer
- ☐ Power supply (basic unit provided)

**You will also have one or more:**

- ☐ Desktop reader with Standard USB type A data cable
- ☐ Wall-mounted card reader (with diodes, supplied with stub-wiring for bench testing)

**You will also need the following items:**

- ☐ **Internet Connection**, with access on port 22, 80, 443, 5432 and for Internet Control Message Protocol (ICMP) communications.
- ☐ **Router or Network switch**
- ☐ **Standard Network cable** (Cat5) to connect the GateKeeper to router, network or switch
- ☐ **[Uninterruptible Power Supply](#)** (UPS) to maintain constant power for the GateKeeper, door readers, Internet router and all network components (**Strongly recommended**)
- ☐ Additional door hardware as required (exit button, emergency exit, door lock, turnstile etc)  
**Please note: These extras are not supplied by GymMaster.**
- ☐ **Door Lock should be preferably 12V DC magnetic lock or electric strike.**

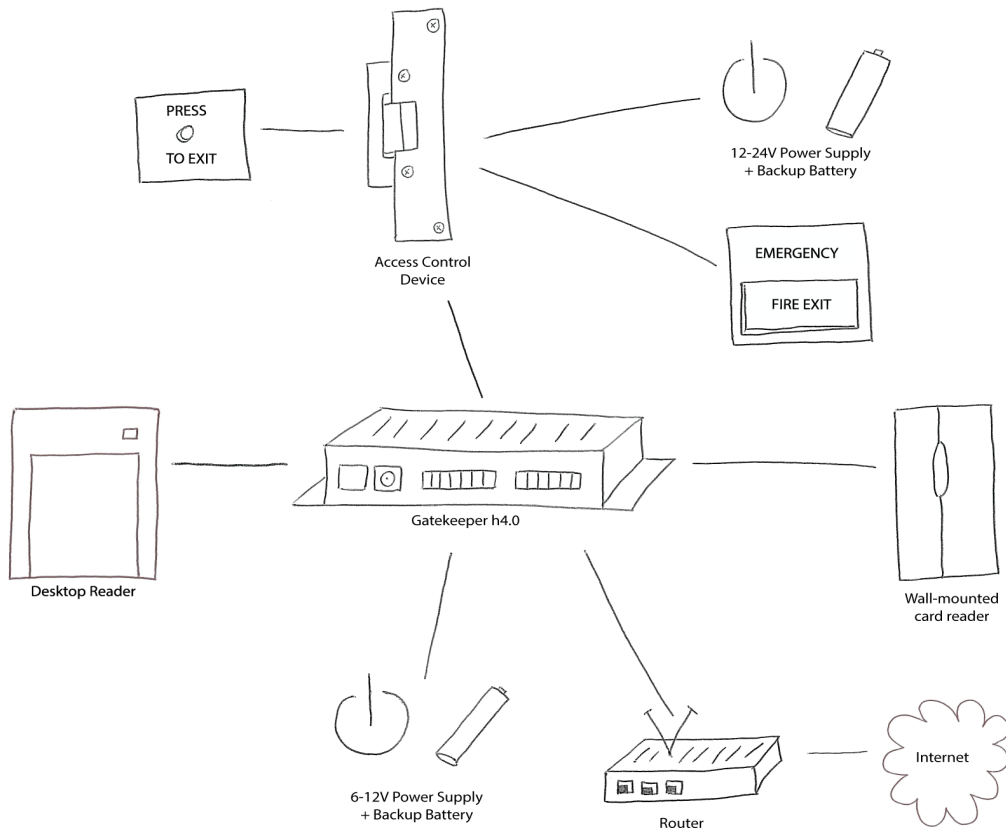


## GateKeeper Overview

The GateKeeper h4.2 contains both the GateKeeper computer and relay unit required to operate the access control that works with GymMaster. The GateKeeper needs to be powered AND connected to the Internet to work correctly. The GateKeeper can also be used to operate desktop readers and receipt printers, which connect to the USB ports.

We strongly recommend that you use [an Uninterruptible Power Supply](#) (UPS) with line smoothing to provide a constant power supply to the GateKeeper, Door Readers, Internet router and any network components. Desktop PCs and other computer devices are high power-drain, and should not be connected to the UPS. The UPS will assist in maintaining normal member access and system operation in the event of a power failure or fluctuations.

You will need to check your own local and regional legal requirements for emergency entrance and exit. It is strongly recommended that you install an **Emergency Fire Exit Button** and/or a general **Exit Button** for members in your door setup, and that you have **alternative and separate key-lock access** or similar.



## Power Supply

The GateKeeper requires a 12 power supply capable of at least 1000mA. The GateKeeper is calibrated to work with input voltage from 9V to 12V. Do NOT use a power supply with voltage greater than 12V or current lower than 1000mA. There are two power supply sockets that suit: (1) a screw-terminal connector or (2) a 2.1x5.5mm barrel connector with the centre positive. You can use the power supply shipped with the GateKeeper for the screw-terminal socket.

It is **strongly recommended** to [use an Uninterruptible Power Supply](#) (UPS) to maintain constant power for the GateKeeper, door readers, Internet router and all network components.



Door lock **MUST** have its own separate power supply. Do **NOT** use the GateKeeper or the GateKeeper power supply to power any mag locks or door strike.



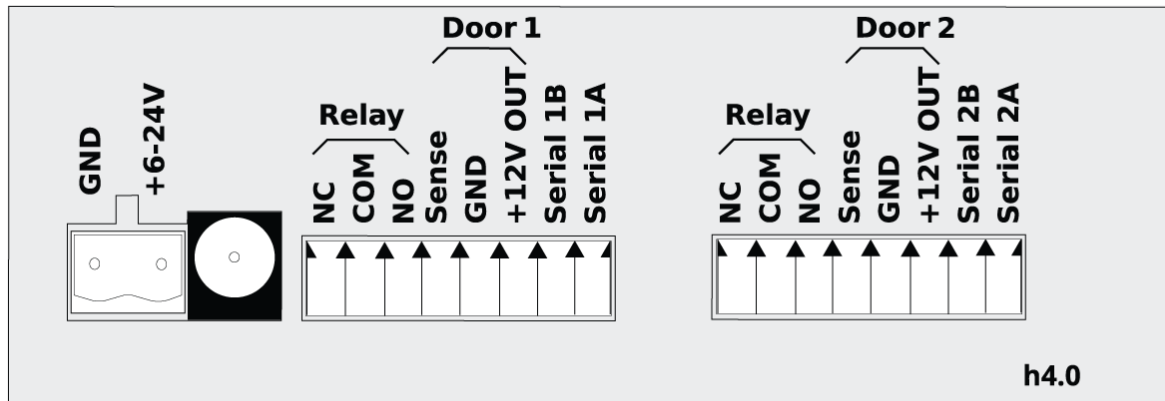
If you have a maglock, your door reader **MUST NOT** be mounted on conductive metal without an earth, or this may cause interference issues.



**Note:** Maximum length of RS232 serial cable connection is 15 metres (50 feet).  
Maximum length of a standard USB cable connection is 3 metres (10 feet).



# GateKeeper Interface



## Relay Terminals

These terminals are for signalling the access control device. For loads over 2A, we do not recommend connecting directly. Use a secondary relay as a buffer instead.

**NO** Relay normally-open contact

**COM** Relay common terminal

**NC** Relay normally-closed contact

As access control devices are often inductive, switching off the current can cause a voltage spike on the wires to the access control, damaging the reader. A snubber should be fitted near any switch or relay contacts, for DC circuits a silicon rectifier diode such as IN4001 (supplied) is well suited. Please note that the diode must be wired according to the diagram. The wrong polarity will cause a short circuit, and damage the power supply.



The diode **MUST** be wired correctly according to the diagram, otherwise there may be cumulative electrical damage to the GateKeeper board, the reader unit, or the device power supply.



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## Exit Button Terminals





The GateKeeper expects a low level voltage trigger signal in the sensor terminal to activate the relay to open the door. You can wire a normally-open push button (2 terminals) to Sensor and GND on the Door 1 or Door 2 socket, refer to the [sample wiring diagram](#).

You need to enable the push button sensor in the door setting page in GymMaster at Settings -> Door and Readers -> [Specified Door].

## RFID Reader Sockets

The rear of the GateKeeper has two sockets. Up to 2 door readers can be connected. Each reader socket has 4 terminals for reader, namely Serial A, Serial B, +12V OUT, GND.

The RFID reader has a number of wires, but only 4 of them are used. The unused wires should be insulated from the rest. The 4 wires that are used are coloured green, white, red and black. The default connection relationships between the reader terminals and readers are:

Terminal	Wire Colour	
A	Green	
B	White	
VCC	Red	
GND	Black	

The RFID reader must be mounted in a location where the electrical noise is quiet. If there is a lot of electrical noise, read performance will be reduced. Electrical noise can be generated from the usual source (motors, VSD's, switch mode power supplies, CRT monitors, fluorescent lights etc). New electrical equipment (if installed correctly) is usually ok, as it should already meet EMC requirements.

If you have two door readers, they should be physically separated by a minimum of 5 cm, or 2 inches, to avoid interfering with each other.

## Network Port

The GateKeeper requires an Internet connection via the Network port to function normally. You will need a CAT5 or CAT6 Network cable (not supplied), one end connected to the Network port on the



GateKeeper, the other end connected to an Network port on the router or a switch. Please ensure non-firewalled Internet access for this connection.

The GateKeeper can operate for short periods in Offline Mode during a network outage, as long as the GateKeeper, door lock components, and facility network components have electrical power. **It is strongly recommended to [use an Uninterruptible Power Supply](#) (UPS)** to maintain constant power for the GateKeeper, door readers, Internet router and all network components.

The GateKeeper network port has a green/amber LED at the top left corner, and an amber LED at the top right corner. The left LED shows whether the cable is correctly inserted. The right LED shows network activity. When powered and connected to the router, you would normally expect to see a solid left LED and a flickering right LED, indicating correct connection and ongoing activity.

## USB Ports

Desktop readers and receipt printers are connected by USB cable to one of the USB ports at the front of the GateKeeper.



The Gatekeeper USB ports **MUST** be used **ONLY** for GymMaster devices. If you attempt to connect or charge any electronic device, such as mobile phone, digital camera, etc, this can cause reader faults.





## Sample Wiring Diagrams

These wiring diagrams are intended only as examples of how the relay unit and RFID device may be installed. Actual installation wiring may differ. The GateKeeper is supplied with stub wiring so that the system can be bench-tested.

Typically, the GateKeeper will be positioned or mounted at or near the facility reception desk. This enables the desktop reader to be connected, and door readers to be connected by longer cabling fitted to wall and floor edges. This positioning also typically allows the GateKeeper to use the same network cable access to the Internet router as used by the reception computer.

**Fail Secure** locks will **LOCK** the door when the power goes off.

**Fail Safe** locks will leave the door **UNLOCKED** when the power goes off.

Check with your local fire regulations as to which you should use.

Door lock, door lock power-supply, and any Push To Exit buttons are NOT supplied by GymMaster, and should be sourced in advance by installer.



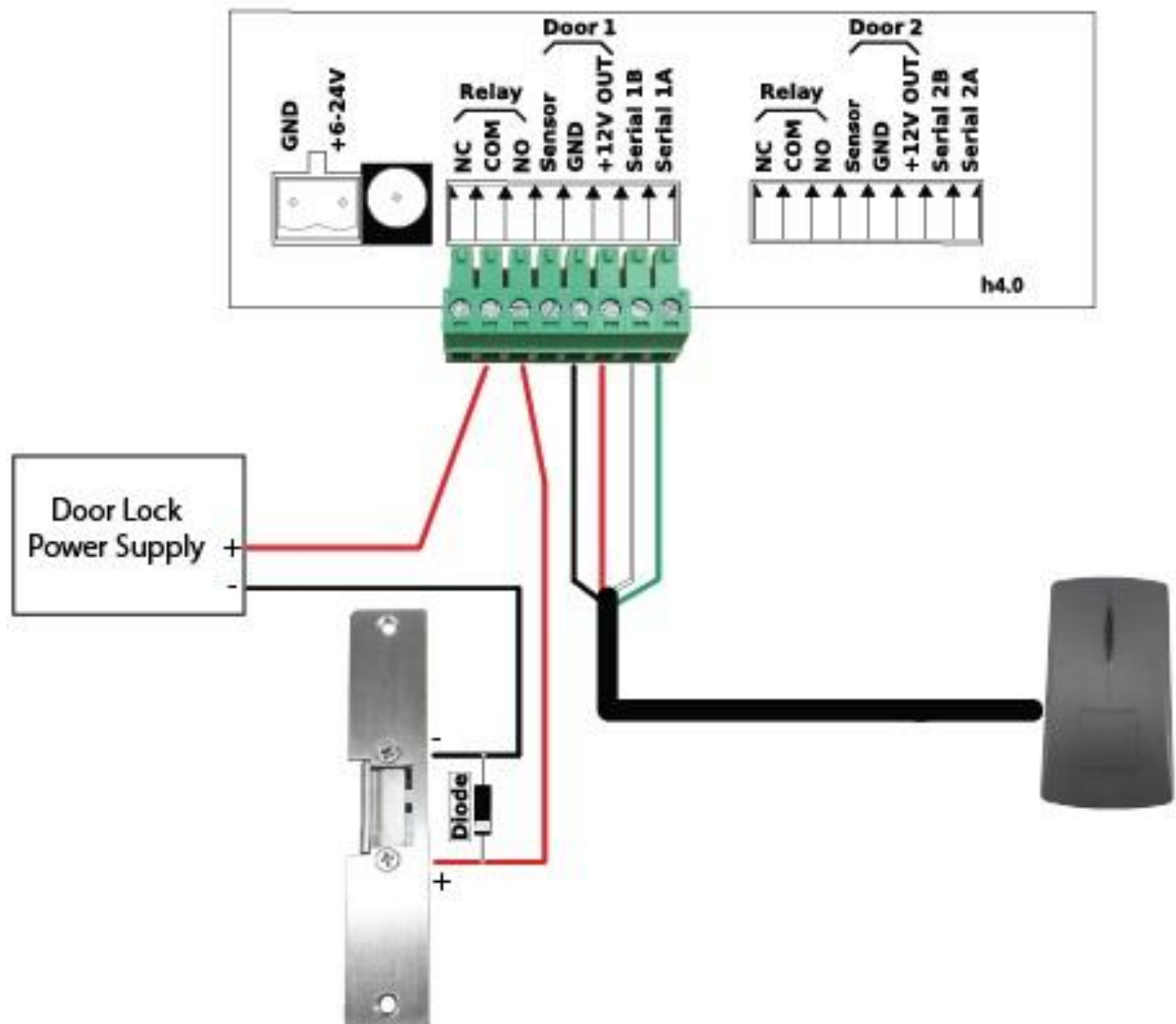
Note: If you use **Fail Secure** locks, it is **STRONGLY recommended that you have alternative means by which you can physically unlock the door** in case of outage (loss of power, or no connection to Internet for a long period, etc).



Door lock **MUST** have its own separate power supply. Do **NOT** use the GateKeeper or the GateKeeper power supply to power any mag locks or door strike.



## Fail-Secure



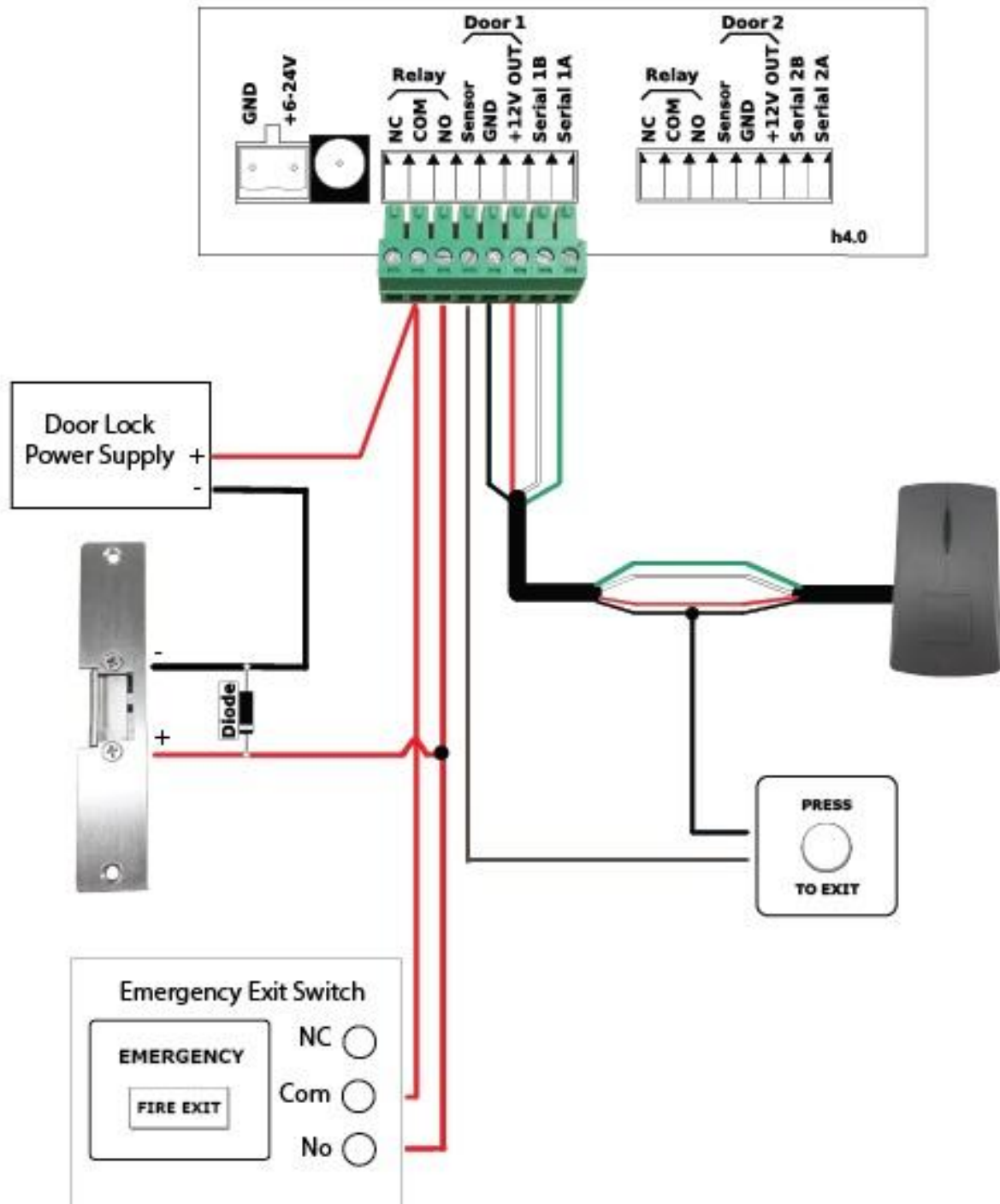
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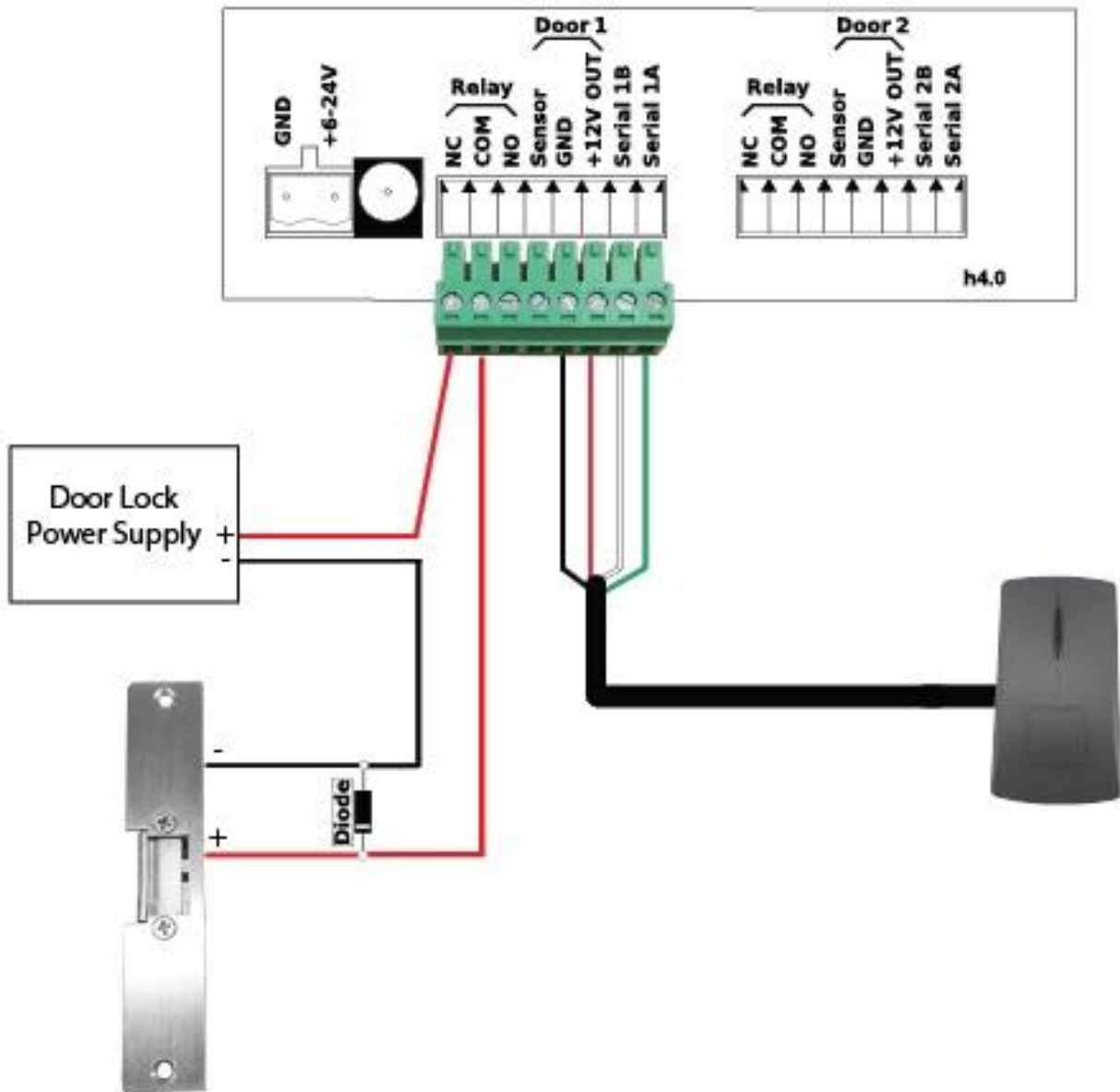
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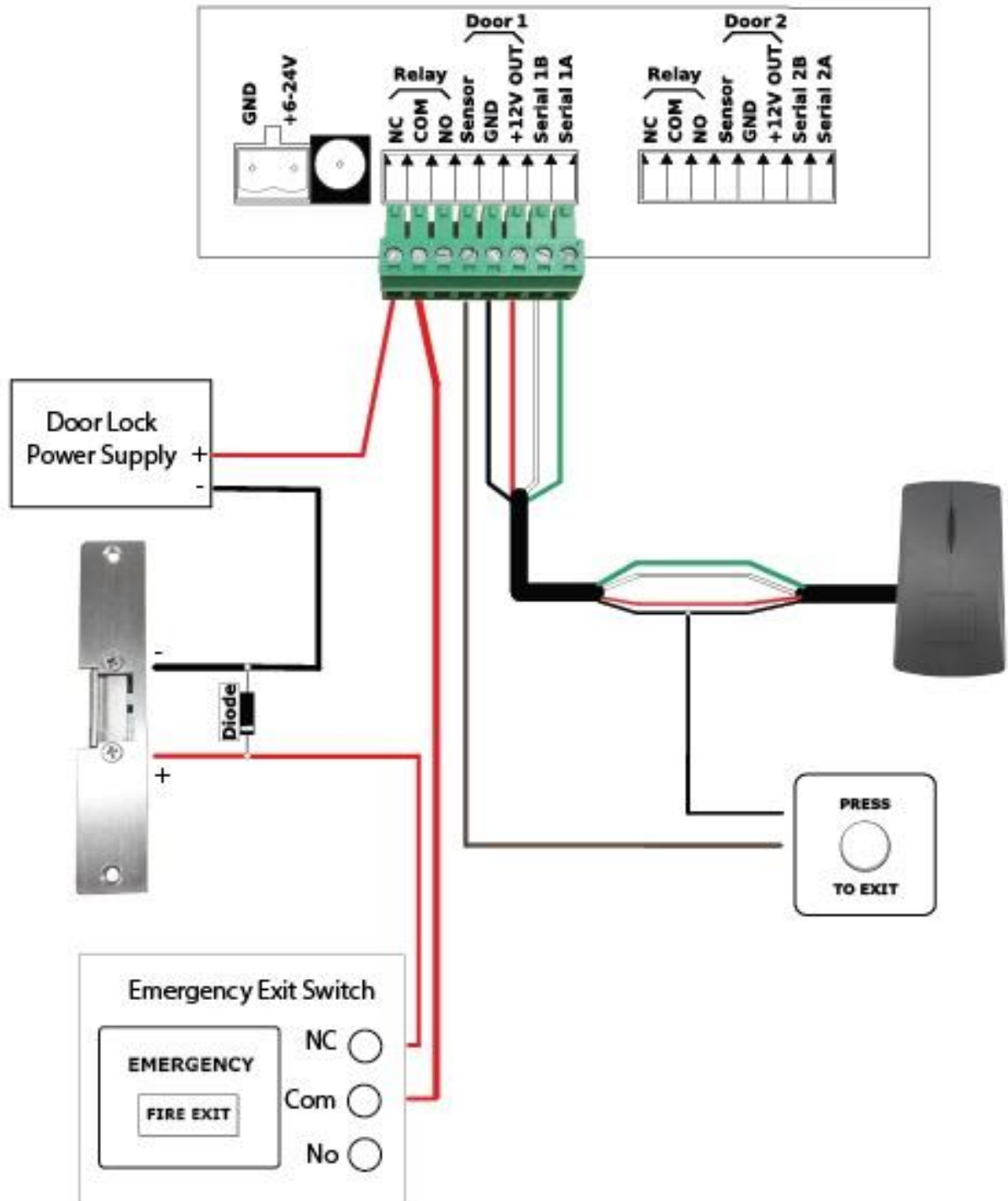
## Fail-Secure with Emergency Exit



## Fail-Safe



## Fail-Safe with Emergency Exit



# Combinations of Relay Units

There are several useful ways in which multiple relay units can be interconnected. In these illustrations, the data connections to the door reader and PC are not shown.

## Bi-Directional

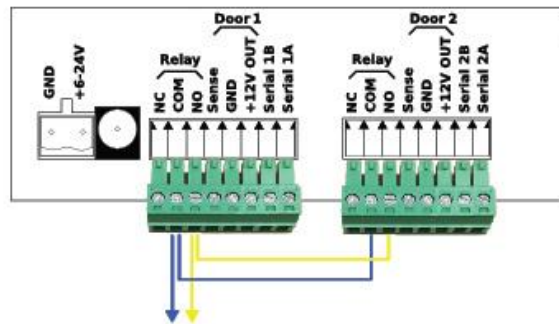
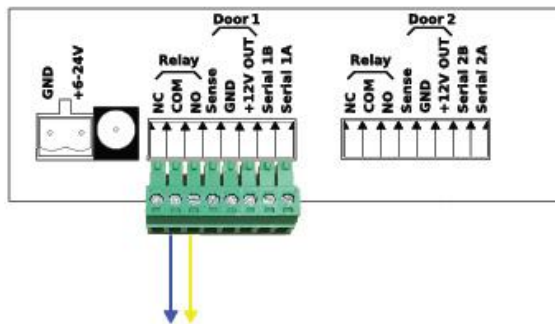
When you want to have readers both sides of the door, you need to combine the relay contacts. These wiring patterns can be used in combination with the power supply sharing wiring pattern above. The wiring pattern you should use depends on which relay contacts are being used.

### Normally Open Contacts

In arrangements where the normally open (NO) contacts are used, wire the relays in parallel.

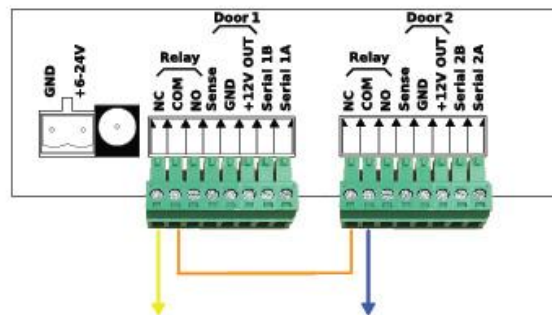
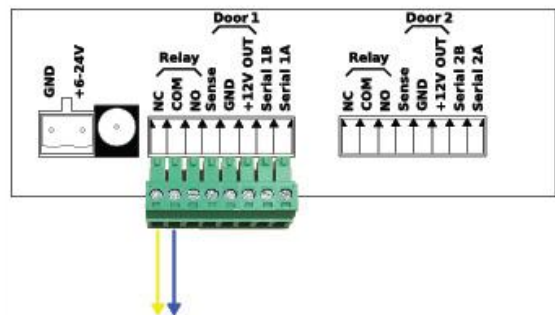
Change from this:

To this:



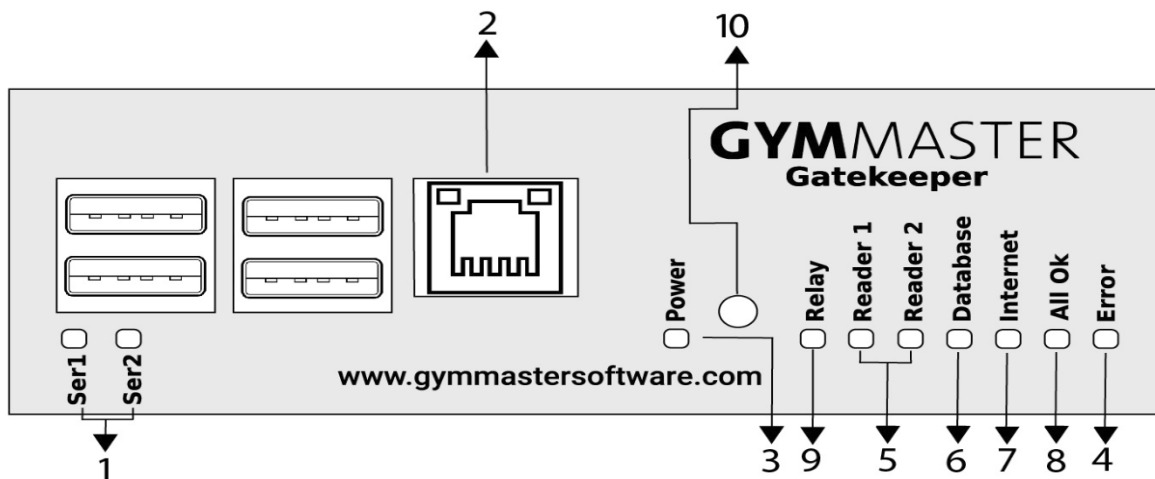
### Normally Closed Contacts

In arrangements where the normally closed (NC) contacts are used, wire the relays in series.



## GateKeeper Status

The front of the GateKeeper h4.2 makes it easy to diagnose whether there is a problem, and the nature of any such problems.



### What Do the Lights Mean?

Ref	Light	Activity	Indicates
1	Ser1 (or Act1) Ser2 (or Act2)	Flickering/Off	Flickers when the GateKeeper is able to talk to the attached readers
2	Network Port	Amber & Green On/Off	Network connection (both should be on)
3	Power	On/Off	Power to the GateKeeper unit
4	Error	Red/Off	There is an error
5	Reader 1 Reader 2	On/Off	Reader/s are connected
6	Database	On/Off	Connection to the cloud server
7	Internet	On/Off	Internet Connection
8	All OK	On/Off	Everything is working as it should be.
9	Relay	Flickering/Off	Should turn on when the door opens.
10	Not used	Not used	Not used



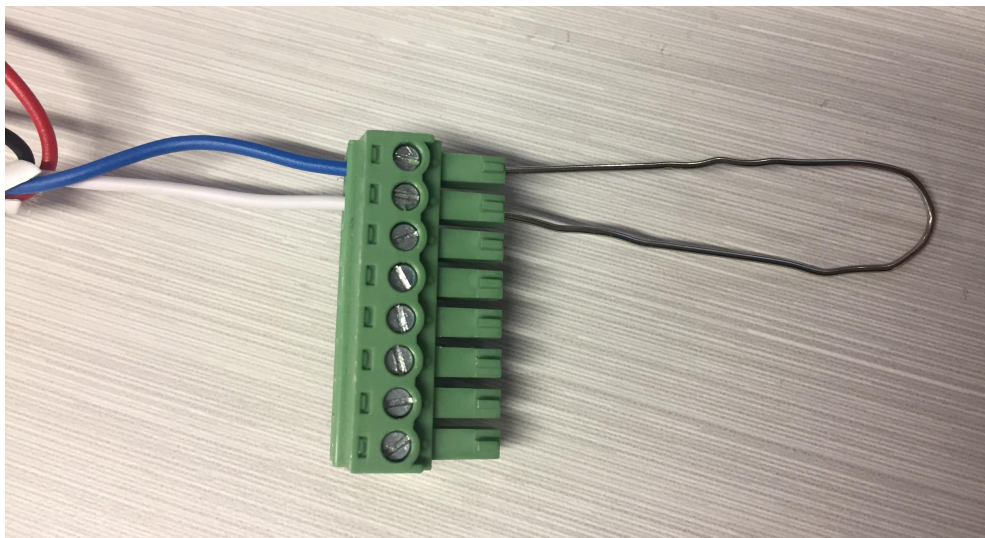
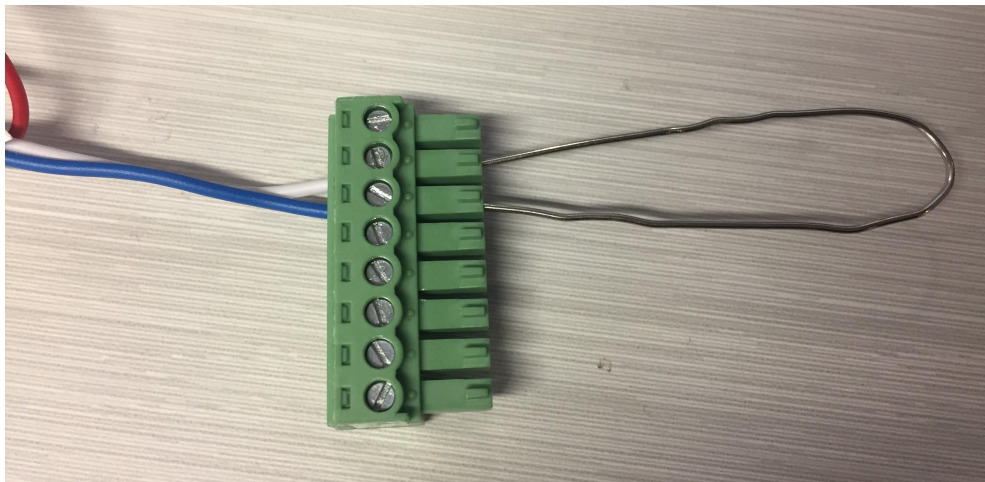


# Troubleshooting

## Test the relay wiring to the magnet lock

Once you have finished the wiring, you should test if the wiring is correct and working by using a paperclip. Do this before plugging the connector into the GateKeeper socket.

Find a paperclip, straighten it and then bend it as depicted below. Connect the paperclip into the two holes where the two wires connect to the magnet lock. You should be able to see the door lock activate or deactivate, depending on the type of lock.





To demonstrate, if the lock mechanism is unengaged (unlocked) before you connect in the paperclip, it should be engaged (locked) after you connect the paperclip.

If the lock is engaged (locked) before you plug in the paperclip, it should become unengaged (unlocked) after the paperclip is connected.

If that does not happen, it means that the wiring has not been done correctly on the lock mechanism. Please check power supply for the lock and other related wiring.

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