Alarm Bypass

The Short Version

Door contact sensors use a simple magnet and reed switch where opening the doors removes the magnet and triggers the alarm. A magnet can bypass this sensor.

The Long Version

The alarm is a simple **door contact sensor**. There are many variations on this. Some are integrated into the frame, especially when integrated into modern PACS systems. Aside from simple alarms, the systems can usually be configured to let you know if a door is open for a prolonged period, potentially within a specific time period.

First, you have to **locate the alarm sensor**. Usually the sensor is a **simple reed switch** which is mounted on the **frame**, whilst the **magnet** is on the **door**. Take the **magnet detector** and **run it around the door**, ensuring that the parts are moving freely by using your large magnet. You'll get an **indication** on the **location** of the **magnet behind the door**.

Then, you **position a powerful magnet** in the right location, slip the latch, and **open the door**.

The alarm should stay silent, but there's an additional part to this that you'll have to figure out...

Enquiries@StyxSecurity.org

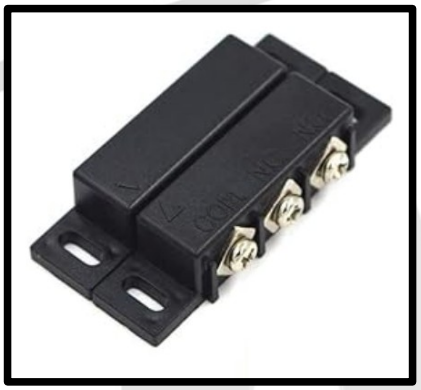
We don't knock.

Sensor Types

Alarm Bypass

There are two types of door contact sensor to try out. The differences are small but actually very important.

Reed Switch



This is the old, mechanical type where two pieces of metal are drawn together by the magnetic field. Critically, the bits of metal become magnetised themselves and therefore it's important to pay attention to the polarity of the override magnetic field you're applying with respect to the door magnet. Applying the opposite N-S polarity can trigger the alarm without even opening the door. You can try seeing how far away the override magnet can be placed and still trigger the reed switch.

Solid State

This is a newer design which is found in Bill and Ben (white alarms). These measure the strength of the magnetic field and may be a Hall Effect sensor or similar. You can download apps for your phone which allow you to monitor the magnetic field strength. Whilst I don't know what parameters these particular alarms use, it appears to be degree and / or rate of change of the magnetic field. Try putting a magnet really close to the alarm and see what happens – you may well trigger it regardless of the N-S polarity. You can also see how far away you can place the override magnet and still arm the alarm (it'll complain if you try and arm it without the "door closed").

The Lesson

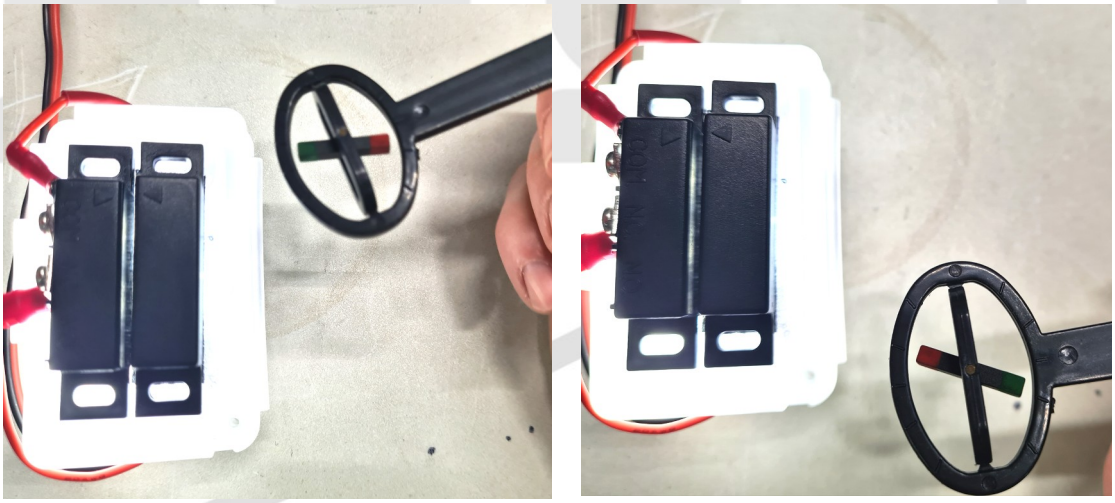
More PPOOOOWWWAARRR isn't always better. You may trigger the alarm by having the override magnet too close or the wrong way round. A magswitch will often work from 15cm away and doesn't need to be up close and personal.

The Process 1/2

Alarm Bypass

First, use the probe to determine north and south of your override magnet:

Then, use the probe to determine north and south of your door contact magnet:

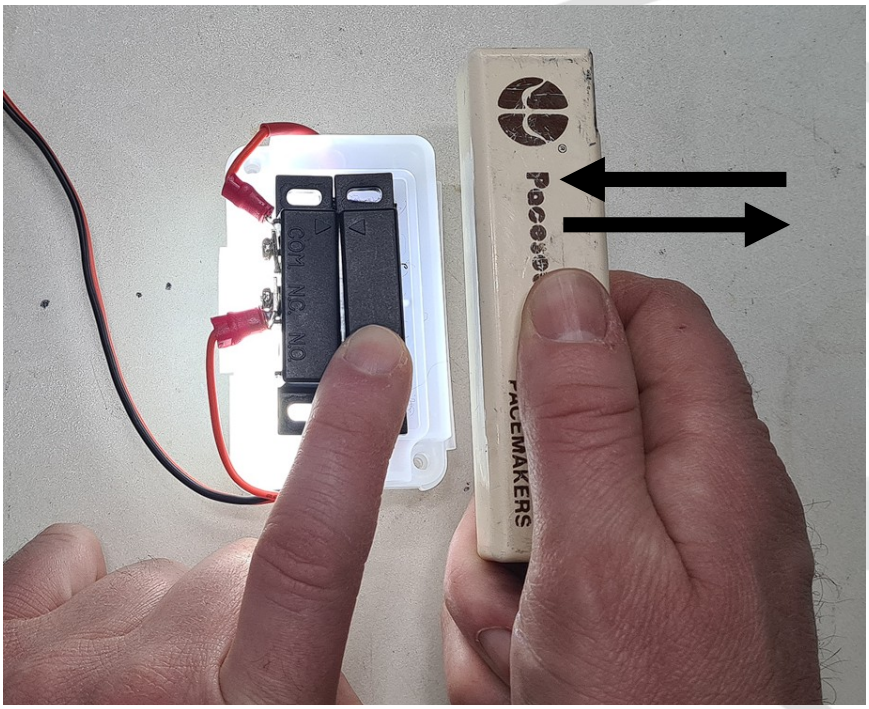


This north and south orientation matters in practice, as we'll see.

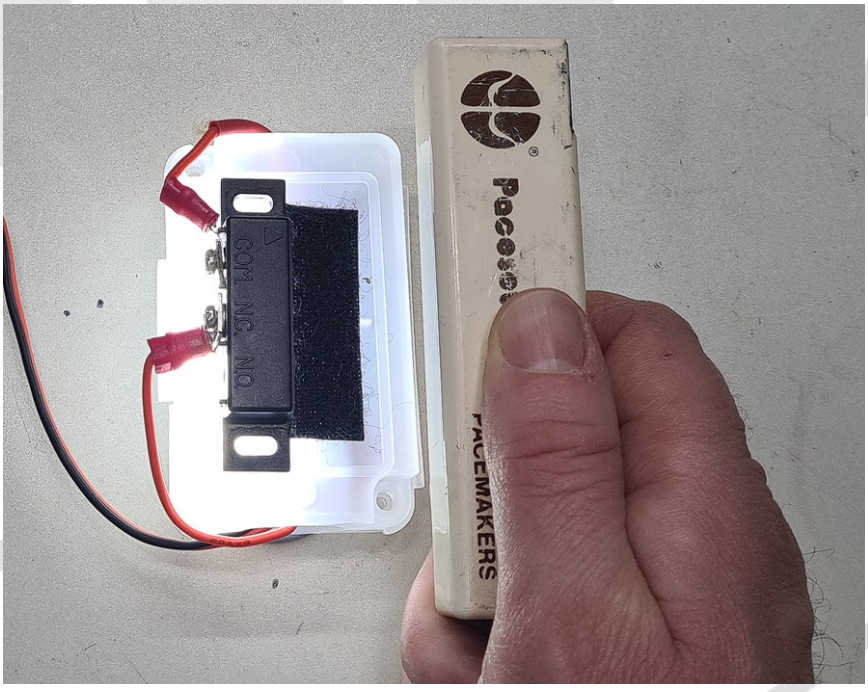
The Process 2/2

Alarm Bypass

Try moving the override magnet back and forth with the door contact sensor magnet in place. Try this with the N-S poles matching and opposing. The light will go off when the sensor detects the door is open:



When you're happy, you can remove the door contact magnet:

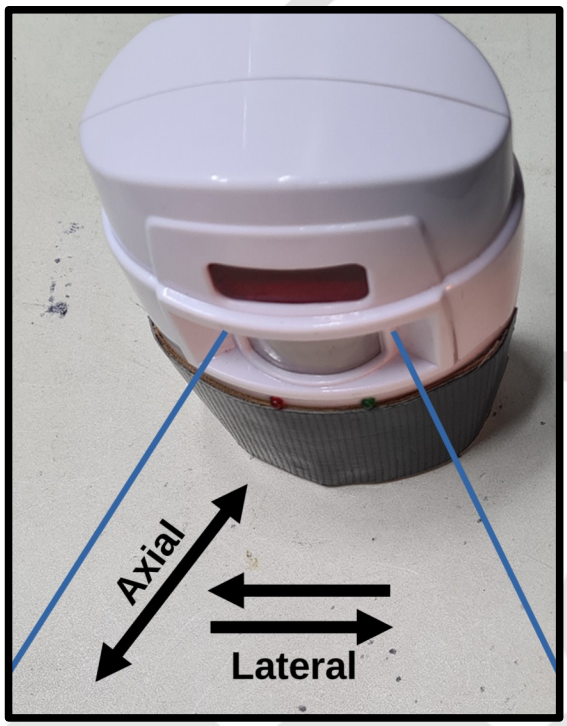


Try Avoiding PIRs

PIR Evasion

A **passive infrared (PIR)** detector / sensor is a passive sensor in that it does not need to radiate or otherwise emit anything, only working on receiving what is being emitted by the environment around it.

PIRs are useful in security as they don't have a signature you could detect from around a corner, unlike a night vision camera with infra red LEDs. **But they must be positioned correctly.**



A PIR has an **expanding field of view** as you get further from the device (blue lines).

A **lens focusses** this captured infrared radiation onto a sensor.

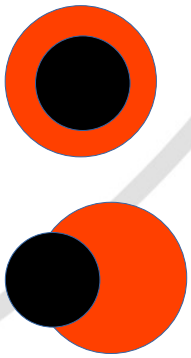
Axial movement means you're moving at 0 degrees relative to the IR the sensor is collecting.

Lateral movement means you're moving at 90 degrees relative to the IR the sensor is collecting.

This Matters.

Because of the **inverse square law**, the strength of the IR as it reaches the sensor significantly reduces with distance. Sensors therefore have a **finate range** and look for a **significant change in input over a specified duration**.

Now imagine you are **moving axially towards the sensor** (top blobs) and you can **imagine the change the sensor sees (red)**. You can also slow this down significantly to **reduce the change over time**. But what if you're moving **laterally and axially** (bottom blobs). The change (in red) becomes **much larger** and therefore you're more likely to **breach the change over time threshold**.



Enquiries@StyxSecurity.org

We don't knock.