

**SECURITRON MODEL MSS-1C SERIES MAXIMUM SECURITY SWITCH
INSTALLATION & OPERATING INSTRUCTIONS**

1. DESCRIPTION

Securitron’s concealed maximum security magnetic switch is intended for 4 7/8” ANSI cut-out door/frame mortise mounting in critical environments where an attempt to defeat the switch is a concern. The MSS-1C consists of two pieces: the switch module and the magnet pack. A remote test option is available (add “RT” to the part number). See Section 5.

2. DEFEAT RESISTANCE ISSUES

The MSS-1C is virtually impossible to defeat with a single external magnet. A threat can exist if an intruder attempted to defeat the switch by obtaining a second MSS magnet pack. The MSS might be defeated by positioning the second magnet pack near the switch module in a manner that permits the door to be opened without an alarm being signaled.

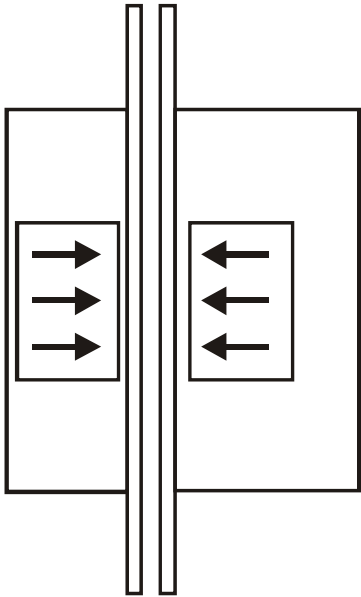
The fact that the switch module and magnet pack are mortised into the door frame and door is a major defense against this threat. This is particularly the case when the door frame is made of steel as steel will constitute magnetic shielding against an attempt to defeat the switch with an externally applied second magnet pack. The MSS also includes an extra defense against this. The product is **manufactured in different types**. The magnet pack must be of the same type as the switch module to work. The MSS is delivered as a matched pair with no marking that identifies its type. Therefore, a person attempting to introduce a second MSS magnet pack in an attempt to defeat the switch may well have the wrong type pack.

3. PHYSICAL INSTALLATION

The MSS-1C includes **a minimum and maximum operating distance**. The unit will report secure only when the separation distance is between this maximum and minimum. If the magnet pack is too close to the switch module or too far away, the unit will alarm.

The distance between the minimum and maximum separation points is called the gap. The MSS provides **a gap of 4/10”-1/2” (10-12.5MM)**. When looked at in terms of actual separation distance, typical operating range is from **1/10” to 6/10” (2.5MM to 15MM)**. The actual separation distance in a mortise mount, however, is generally controlled by the way in which the door is mounted. It almost always falls well within the separation distance range of the MSS-1C but in the event of an unusual door, you may have to shim the magnet pack or switch module to achieve proper separation. Note that you can also choose whether to mount the MSS-1C on the **vertical or horizontal** section of the door frame as a means to achieve a reliable separation distance.

When the door is closed, the magnet pack and switch module should **line up with each other** as accurately as possible with respect to the length and width of the respective face plates. Misalignment in either axis can lead to unreliable operation. NOTE: the arrows on the labels must align as indicated in the diagram to insure proper switch biasing and operation.



4. WIRING

The MSS1-C has three wires that are assigned by color as follows:

- White = Common
- Red = NC
- Black = NO

Because we’re using the terms normally open and normally closed, it’s necessary to define what we mean by “normal”. **The normal condition of the MSS is when it is reporting secure** (the magnet pack is at the separation distance from the switch module). So, for example, you’ll

read a closed circuit between White and Black if you meter the switch module in alarm condition (magnet is not near the switch module) but you'll read open if you meter it in the secure condition.

Maximum contact ratings depend on the voltage put through the switch. **They are 250 mA at 12V or less and 125 mA at 24V.** In special applications, the switch can accept up to 100V but the current must be proportionately limited to a maximum 3 watt power rating (60 mA at 50V; 30 mA at 100V).

5. REMOTE TEST OPTION

Units with the remote test option have a six wire cable and include the suffix **"RT"** in the part number. The remote test feature generally serves the following function. Consider a building with a large number of MSS-1C switches mounted. When the alarm system is armed (at night for example), it is expected that all switches are reporting secure. In this condition, the user cannot be assured that all switches are operating correctly. This security concern is heightened by the possibility that a **switch may have been tampered with** when the alarm system was disarmed.

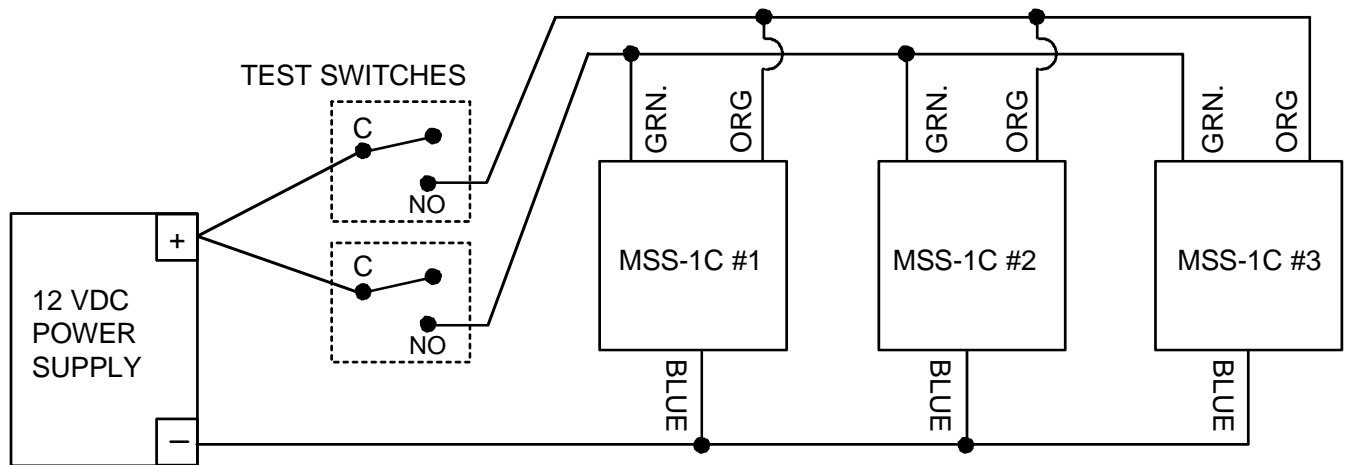
Remote test allows the user **to electronically put all the switches into alarm from a central point.** This avoids the awkward procedure of opening all the doors. The fact that each switch does go into alarm is monitored by the alarm system in this test mode.

Beyond the simple function of putting the switch into alarm, the MSS-1C has a special remote test feature which requires an explanation. Putting each switch into alarm does verify that it will go into alarm if the door opens, but does not verify that it is working in full high security mode. To explain, the MSS-1C employs two internal reed switches. For it to report secure, both switches have to be put into the secure mode by the proximity of the magnet pack. If either or both switches are not in the secure mode, the unit will report an alarm condition. Suppose that one of the reed switches suffered an internal failure such that it was always in the secure mode. The MSS-1C would appear to work but with only one working reed it would be functioning as an **ordinary magnetic switch** which can be defeated with a single external magnet. The chances of such failure are extremely low in a sealed unit, but they are not zero and they can be detected with the MSS's unique remote test procedure.

The remote test circuit employs three wires. Blue is common and green and orange constitute two separate test points. By applying +12V to green, you put one of the internal reeds into the alarm condition. The output of the MSS-1C will then also be in alarm condition. Next, by applying +12V to orange, you put the second internal reed into the alarm condition and the MSS should go into alarm once again. If both tests fail to put the MSS into alarm, it is either entirely defective or (more likely) there is a problem with its wiring to the alarm panel. If one test fails, the MSS is operating on a single reed as an ordinary magnetic switch and must be replaced. This test procedure **assures full high security operation** of the MSS-1C.

Naturally in an actual installation, the switches are tested **simultaneously**. All blue, green and orange wires are tied together with like colored wires and connected to a 12V power supply through two normally open test switches. First one "side" of all switches are tested and then the second side is tested. You interpret the results as described in the preceding paragraph. Note that each test point will draw **15 mA** for each switch so you need to plan your power supply capacity by multiplying 15 mA times the number of switches wired together. For example, a 100 switch installation would draw 1.5 Amps during each of the two tests so you should employ a two Amp supply to have some headroom. Make sure it is a **UL listed Class II or Power Limited** power source. Also insure that the **normally open test switch contacts** are able to handle the current. Finally, be sure never to perform both tests at the same time or they will be meaningless and you may overload your power supply.

The drawing on the next page shows typical remote test wiring for three units. Naturally it can be expanded to any number of MSS switches. Note that the 12V power supply **need not be regulated**. Full wave rectified DC power is acceptable. Also, you may realize that the remote test function energizes small coils within the units which generate a magnetic field to put the switch into alarm. These coils do not produce any inductive kickback as they are internally suppressed. There will be no arcing across the test switch contacts.



REMOTE TEST WIRING SHOWN WITH THREE MSS-1C SWITCHES. ANY NUMBER OF MSS SWITCHES CAN BE CONNECTED IN THIS WAY. NOTE THE TWO NORMALLY OPEN TEST SWITCHES. THEY SHOULD BE CLOSED ONE AT A TIME AND ALL MSS SWITCHES SHOULD GO INTO ALARM TWICE TO PASS THE TEST.

PATENT NOTE: The products discussed in this manual are covered under US patent #5,668,533

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