MFD-01

3in1 Multifunction Detector

Sigma

INTRODUCTION

MFD-01 is an extremely reliable multi-detector: seismic detector, tilt detector and rotation detector, which is used to protect against vandalism, wall penetration or, glass breakage and generally for the protection of large solid surfaces.

Also, the same detector can simultaneously detect tilt variation or rotation of a protected door or window, in any direction without having to protect it with **an extra magnetic contact**.

For its operation it uses latest technology state of the art sensors, such as:
• 3-Axis Accelerometer, for the detetion of angle variation and the noises which are developed on the surface to which the detector is mounted.
• 3-Axis Digital Magnetometer, which detects the angle of rotation of the object on which the detector is mounted.

Applications

MFD-01 can be used in the following applications:

- **MFD-01 can be used in the following applications:**
  Detects noises and impacts at a distance of 1.5 meters around the point where it is mounted.
  Its sensitivity is set to "GAIN" so that it adequately covers the protected surface.
  At the same time, the sensitivity must not be very high at there is possibility of false alarm.

- **For the protection of doors or windows:**
  Mount the detector on the door or window in one of the positions you see in the photos and you
  will be protected from breaking, opening or changing the angle of the door or window, without
  having to protect it with extra magnetic contact.
  By placing the detector in one of these positions, you can leave the door or window open or in a
  retracted position - and arm the system.
  The detector will consider the position at which it will be at the end of exit delay (system armed) as
  a rest position and will trigger an alarm if the glass breaks, as well as any change in the inclination
  or opening of the door or window.

- **For the protection of paintings or valuable objects:**
  To prevent moving or removing paintings or other valuable items from museums, galleries or
  exhibitions.

DESCRIPTION OF OPERATION

The detector analyzes all the variations it detects through, three different channels:

1. The first channel analyzes very low noise (blows, oxygen flame, drill sound, etc.) and its sensitivity is adjusted according to the surface we want to protect. In this case, the detector works cumulatively, adding the pulses generated by the detected noises and triggers an alarm when it exceeds the set limit while, on the other hand, removes pulses when it stops receiving noises for some time (this is shown by the change of brightness of the yellow LED). In this way, we limit the possibility of having false alarms, despite the increased sensitivity of the detector.
2. The second channel detects high-impact knocks that are created on the protected surface and triggers an alarm if these knocks exceed a certain limit.
3. The third channel analyzes the tilt or rotation variations of the area or object on which the detector is mounted and triggers an alarm if the slope or rotation changes from the initial position of 5° to 45° (adjustable). Also, the detector triggers an alarm if someone tries to open the lid or detach it from the fixed position (wall, door or window).

EXPLANATION OF LED's INDICATION

Red:
- It turns on steadily whenever the detector triggers an alarm. Turns off when the "ALARM" output relay returns to stand by position.
- It flashes every ten seconds to indicate that the detector is operating normally, or every five seconds when the "TC" input is actevated.
- It flashes 5 times, along with the yellow LED, the first time a 12 VDC voltage detector will be applied or when there is no voltage on "TC" input. During this time, the device is self-calibrating and memorizing its location at that time. As long as the self-calibration process takes place, the position of the device must not be changed and vibrations should not be created on the object being mounted.
- It turns on steadily whenever the detector triggers an alarm. Turns off when the "ALARM" output relay returns to standby position.

Yellow:
- It indicates the noise level. It illuminates and increases its brightness whenever the detector detects noise and, when the device stops detecting noises, reduces its brightness accordingly.
- It flashes 5 times, along with the red LED, each time it is powered with 12 VDC or when there is no voltage on "TC".

INSTALLATION EXAMPLES

Hopper window

Window

O Suitable points for positioning the MFD-01 detector

EXPLANATION OF CONNECTION TERMINALS

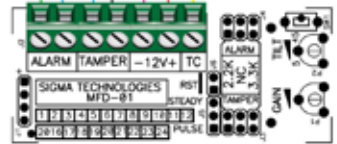|		
ALARM	⊘ ⊘	Alarm output (NC or 2.2KOhm or 3.3KOhm) Selection of output type is made via jumper "ALARM"
TAMPER	⊘ ⊘	TAMPER output (NC or 2.2KOhm or 3.3KOhm) Selection of output type is made via jumper "TAMPER"
12V **+** **-**	⊘ ⊘	Power supply input 12V for the detector
TC	⊘	Input 12V for adjusting the reference position of the detector. It is also used for testing the operation of the detector

INSTALLATION - CONNECTIONS

• Mount the detector on the protected area.
Attention: Use the screws supplied with the detector to mount it. Avoid using Double-sided tape or silicone, as they both substantially, decrease sencitivity of the detector.
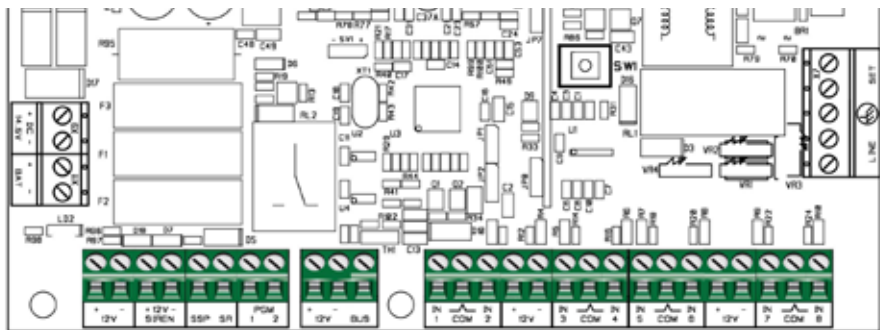
S-PRO CONTROL PANEL

MFD-01

ALARM TAMPER −12V+ TC

SIGMA TECHNOLOGIES
MFD-01

ALARM
TAMPER

RST
STEADY
PULSE

2.2K
NC
3.3K

TLE
GAIN

- Pass the cable connecting the detector to the panel, from the hole which is at the bottom of the detector.
- Connect the "ALARM" out put to one of the Alarm control panels zone inputs.
- Connect the "TAMPER" output to a 24hours zone input of the alarm control panel.
- Connect the power supply "12V" to the relative terminals of the Alarm Control Panel. Please, beware to use correct polarity.
- Connect the "T.C." input to a "PGM" output of the alarm control panel (this output must be programmed to operate as needed) or to the "T.C." input if you have a SIGMA Security Control panel.

Selecting the "ALARM" output operation

With jumper "J5" we select the type of alarm. In the "PULSE" position, the "ALARM" output is activated for two seconds each time an alarm is triggered and then returns to stand by while in the "STEADY" position the "ALARM" output is activated and remains in this state for as long as there is cause of the alarm. Returns to Stand By only when the cause of the alarm stops.

"TC" Operation

The "TC" input of the detector is connected to a "PGM" output of the control panel. This PGM output must provide 12V wen the system is disarmed and "0 V" when the system is armed. It is used in the following 2 cases:

1. When we want the detector to understand as resting position, the position at which it will be when the security system is arming.
2. If we do not wish the the detector to detect when the system is disarmed.

Note: If you do not wish to reset the rest position on every arming (first case), but also if the detector does not work when the system is disarmed (second case), you should use "TC" again but remove the jumper "RST".

Adjusting the detector's sensitivity

- Use the potentiometer "GAIN" (P1) to adjust the detector's sensitivity on very low noise. Turning the potentiometer clockwise increases the detector's sensitivity on low noise while turning anti-clockwise the sensitivity decreases.
- Adjust the inclination of the detector with the "TILT" potentiometer (P2). Turning clockwise increases the angle of inclination that the detector should exceed to trigger an alarm (adjusted from 5° to 45°) while turning anti-clockwise, the angle of inclination decreases. The detector's resting point is the position of the detector when powered up for the first time, or if you use "TC", is the position where the detector will be when the system is armed.
- The rotation angle is factory adjested and ther is no need for the installer to adjust it.

ATTENTION!
For improved security the testing and adjustment of the detector must be performed regularly.

TECHNICAL SPECIFICATIONS

Power Voltage	11- 14 V DC
Consumption (Stand By)	20-22 mA
Consumption (Alarm)	26 mA
Alarm output	Solid State Relay with N.C output (16Ω at 50mA)
TAMPER output	Έξοδος N.C.: 50mA / 12 V DC.
Noise detection area	>1.5 meters circumferentially from the detector
Tilt or rotation angle	5º to 45º from resting point
Weight	
Dimensions	86 x 31 x 27 mm

NOTES

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