



For a smart and secure lifestyle

MCT-303 Shock Sensor

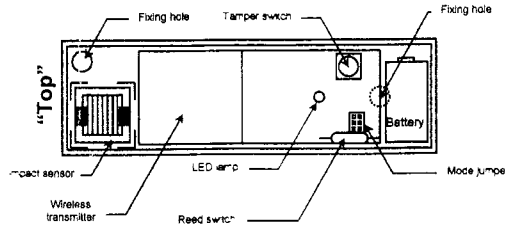
1. Introduction

MCT-303 is a single or dual zone wireless sensor designed to provide perimeter protection without the need for expensive and time-consuming cabling. The unit has two modes, a shock sensor digitally detects impacts made to the mounting surface whilst a reed switch can be used to monitor opening sections of doors and windows. Each of these signals is used to trigger either the MCR-304/308 Powercode receiver, or the Powermax 30 zone control panel.

The sensor is encrypted with two unique identifier codes. These ID codes are enrolled into the choice of receiver and can be used to determine which channel has been triggered. To allow maximum use of receiver channels the MCT-303 can optionally send one ID code for both modes.

Other features of the MCT-303 include: -

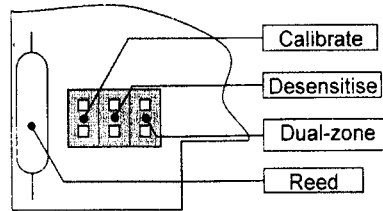
- Anti Collision – randomly timed intervals between signals ensure less chance of collision.
- Intelligent Powersave (IP) – immediately after an alarm condition, only shocks with a greater magnitude will cause an alarm signal. The sensor returns to its original sensitivity after 5 minutes.
- Up to 2 years battery life (868 version 14 months) – using Intelligent Powersave (IP) battery life is maximised



2. Initial Set-up

Before fitting the MCT-303 it is advisable to complete the enrolling process locally to the receiver.

To do this, firstly decide how the reed switch is to be configured. In the **dual mode** (link on) the reed switch will send a separate signal every time it is triggered, and will need to be enrolled to the receiver separately. In the **non-dual mode** (link off) the reed switch is either **not used** or sends the **same signal** as the impact sensor. Eventually this configuration will decide whether one or two zones are used back at the control panel. **Note: Tamper signals will always be sent on the same channel as the shock sensor.**



Check polarity and fit the battery by pushing firmly into the housing. During **power-up** the **LED will flash** as the unit performs its self-test procedure. Once this has finished you are now ready to enrol the MCT-303 to the receiver.

Place the receiver in to the enrolling mode and trigger either the reed or impact sensor. Repeat the process for the other sensor if the unit is to be used in the dual mode.



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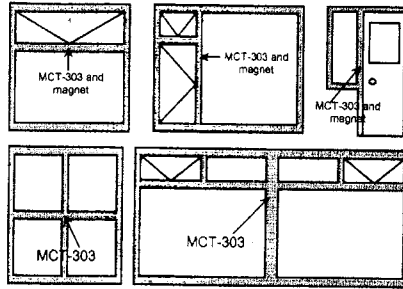
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3. Installation

Note – It is recommended that you enrol MCT-303 locally at the receiver before installation, together with any other detectors (see set-up).

Select the mounting point according to the diagram below. The unit should be firmly fixed using both mounting screws. This will ensure that impacts are efficiently conducted into the sensor. Additionally, mounting the unit vertically will maximise the radio range.

The reed switch allows monitoring of opening sections of doors or windows*. Position the magnet on the opening section within 10mm of the reed. The unit can be configured to send reed switch alarms as a separate ID code or with the same ID code used for shock alarms.



* Note - If the opening section is in frequent use battery life will be reduced

The MCT-303 can be installed in any position however it is important that the impact sensor is correctly orientated. To do this remove the sensor from its cradle and rotate until the arrow is point upwards, then refit.

When a mounting site has been chosen and the MCT-303 has been enrolled with it's receiver, it should be screwed firmly into position. Do not use double-sided tape, as this will tend to insulate the detector from vibrations. If necessary the PCB and sensor may be removed from the housing whilst it is being fixed to reduce the risk of damaging the module.

4. Calibration

The MCT-303 is calibrated by teaching the unit the background noise of the environment, typically false alarms. Using digital processing the MCT-303 can make intelligent decisions on received signals and signal real alarm conditions.

Begin the calibration procedure by placing the jumper link on to the calibrate pins (a diagram of jumper links can be found on the inside of the MCT-303 lid). During this process other jumper link settings will have no effect.

Press the MCT-303 tamper switch once and release (the LED will begin to flash rapidly while the tamper switch is pressed). The unit is ready to learn background signals.

Expose the MCT-303 to the background noise by tapping the window with the butt of a screwdriver or operating machinery nearby. You should note that it is very difficult to produce similar vibrations time after time. The MCT-303's integrating shock filter has a time constant, approximately three seconds. It will respond more strongly to rapidly repeated shocks than to more slowly repeated shocks. If part of the training is to include a large shock, it may be repeated several times provided there is sufficient time (10 seconds should be suitable) between repetitions to allow the filter to "forget" the earlier occurrences. There is no overall time limit to the calibration process.

Press the MCT-303 tamper switch again to complete the calibration process and **remove the jumper link**. You must repeat the calibration process if the unit is moved for any reason.

Note: If you do not remove the calibration jumper link the unit will not operate



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5. Final Testing

MCT-303 incorporates an engineer friendly test facility. While the MCT-303 lid remains open the unit is automatically in test mode and the Intelligent Powersave system is not active. Once the lid of the MCT-303 is replaced the unit remains in the test mode for up to 3 minutes. This allows you to send a tamper restore to the panel and real time alarm signals. The LED will also flash every time an alarm signal is sent.

Begin the test process without the desensitise jumper fitted and subject the unit to shocks that should be ignored. If the unit signals an alarm condition try refitting the de-sensitise jumper or if necessary, repeat the calibration process.

Note: The de-sensitise jumper has an immediate effect and does not require the unit to be recalibrated.

You may simulate a real alarm condition by subjecting the surface near to the sensor with a series of rapid shocks, being careful not to cause any damage. The LED will light as the alarm signal is sent and you should check that a signal was received at the control equipment.

If you are using the reed switch option check that opening the door or window causes the LED to light and a signal to be received at the control equipment. You should be careful not to cause excessive shock as signals could be confused with the impact sensor.

Once the test process has been completed and the lid is closed the unit will return to its normal operation after 3 minutes. If the LED continues to flash the calibrate jumper has not been removed.

Note: A brief flash from the MCT-303 once every second means that the unit has failed its self-test procedure. Check the inertia sensor is fitted with the arrow up and if necessary replace the unit.

6. Operation and Trouble Shooting

When MCT-303 is operating normally (i.e. the cover is fitted) it will send an alarm message in response to a recognised shock, tamper or a reed switch event. The Intelligent Powersave feature will conserve battery energy by only reporting progressively larger shock events until a "quiet" time has elapsed. The timer that controls this function is reset each time an alarm is reported. **The LED only indicates when MCT-303 is in test modes.** It is not recommended to test the MCT-303 in normal mode.

Whilst using the MCT-303 should be a simple and trouble free experience we have detailed below some frequently asked question that may be helpful.

Q: The unit does not operate or calibrate and the LED continues flash every second.

A: Check the inertia sensor is fitted with the arrow pointing upwards. Disconnect the battery and reconnect.

Q: The reed switch signal is not received at the control equipment.

A: Reed switch signals can be sent with the shock sensor channel or separately. Either learn the reed signal at the receiver or remove dual-zone jumper link to signal on the same channel.

Q: The customer reports that the unit occasionally send tamper signals.

A: This could be due to the unit's lid not being fitted correctly.

Q: The unit has false alarmed on several occasions even after being recalibrated.

A: Try setting the "desensitise" jumper link to on. Alternatively the MCT-303 needs to be recalibrated and tested to reject larger background disturbance signals.



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7. Specification

7.1 Electrical

Battery voltage: 3.6V Nominal (e.g. LiSOCl₂) low battery indication given when on-load voltage drops below 2.7V at the wireless transmitter

Battery size: 1/4AA cell

Battery capacity: 1 amp hour

Standby current: less than 30µA

Battery life: Up to 2 years dependent on usage (433MHz version)
Up to 14 months dependent on usage (868MHz version)

Indicator lamp: Narrow viewing-angle clear red LED
Lights during transmission when MCT-303 is in test mode
Flashes rapidly ($\approx 2\frac{1}{2}$ Hz) whilst the tamper switch is closed on the calibrate jumper is fitted
Flashes briefly once per second (1Hz) if MCT-303 goes faulty

Sensor: Proprietary mechanical sensor with selective frequency response to reduce nuisance alarms

Signal processing: shock-energy estimator and integrator with inverse exponential window, ($\tau \approx 3s$)

Re-arm timer: 5 minutes from the last alarm – the timer is overridden if a shock with higher energy than that causing the alarm is detected.
The timer is disabled when MCT-303 is in test mode (cover removed)

7.2 Wireless

Carrier: 433.92MHz or 868.95MHz radio, on-off keyed

Message repeats: 3, with anti collision timing. Certain messages may be superseded by others, e.g. a "tamper" message may terminate a "tamper-restore" sequence before the message has been sent thrice (but not vice versa)

Messages: Alarm (includes battery-status and tamper) primary zone
Tamper (includes battery-status) repeated at three-minute intervals primary zone
Tamper-restore (includes battery-status) primary zone
Supervision (includes battery-status) repeated at 14-minute (868 version 30-minute) intervals primary zone
Reed (if dual-zone mode jumper is fitted) secondary zone
Reed-restore (if dual zone mode jumper is fitted) secondary zone

7.3 Physical

Weight: 52g

Dimensions: max overall H92 x W33 x D20mm (3.62" x 1.30" x 0.80")

Temperature: Operating 0°C to +49°C
Storage -40°C to +85°C

Warranty Statement

Visonic Ltd. and/or its subsidiaries and its affiliates (the "Manufacturer") warrants its products hereinafter referred to as "the Product" or "Products" to be in conformance with its own plans and specifications and to be free of defects in materials and workmanship under normal use and service for a period of twelve months from the date of shipment by the Manufacturer. The Manufacturer's obligations shall be limited within the warranty period, at its option, to repair or replace the product or any part thereof. The Manufacturer shall not be responsible for dismantling and/or re-installation charges. To exercise the warranty the product must be returned to the Manufacturer freight prepaid and insured.

This warranty does not apply in the following cases: improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than the Manufacturer.

This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the Manufacturer be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.

This warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by their own warranty, if any. The Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to products, accessories, or attachments of others, including batteries used in conjunction with the Product.

The Manufacturer does not represent that its Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Product will in all cases provide adequate warning or protection. User understands that a properly installed and maintained alarm may only reduce the risk of events such as burglary, robbery, and fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no death, personal damage and/or damage to property as a result.

The Manufacturer shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the Product failed to function. However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, the Manufacturer's maximum liability shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.

Warning: The user should follow the installation and operation instructions and among other things test the Product and the whole system at least once a week. For various reasons, including but not limited to, changes in environmental conditions, electric or electronic disruptions and tampering, the Product may not perform as expected. The user is advised to take all necessary precautions for his/her safety and the protection of his/her property.

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