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# SH-MAG2 - 8F/9F

**FREEWAVE2™ TWO WAY WIRELESS  
MAGNETIC DOOR/WINDOW CONTACT**



**INSTALLATION INSTRUCTIONS**

P/N 7105689\_B

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## INTRODUCTION

The SH-MAG2 is an advanced magnetic contact sensor with integrated RF transceiver designed to be a fully supervised low-current device.

The FW2-MAG is a part of the FREEWAVE2™ which is a supreme wireless line of devices that uses an advanced 2way RF transceiver combined with an intelligent communication protocol.

A built-in reed switch and/or an external wired input may be applied in this device.

To maximize security, an 200k end-of-line resistor is monitored on the external wired input.

SH-MAG2 uses smart message control, which verifies that all messages are successfully transmitted, so that no intrusion event will be uninformed to the system.

Each SH-MAG2 has a unique factory set ID code (24bit) which by registration is set into memory of the paired Shepherd system enabling more secured communication and devices to be remotely controlled from a specific RF transceiver.

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## FEATURES

- State-of-the-art 2-way wireless security system
- Freewave2 advanced & secured RF protocol
- GFSK with 5 frequencies & LBT
- Low current Technology
- Powered by a single 3V Lithium battery
- Battery life: more than 5 years
- Available Frequencies: 868MHz /916MHz
- Contact Open/Close transmission
- Tamper Open/Close transmission
- Supervision transmission
- Battery status send on every transmission
- LED indications for monitoring
- Range up to 500m on open space.
- Unique ID number
- Front and back tamper.
- Alarm trigger either by the internal reed switch and / or by wired terminal
- Wired terminal with E.O.L 200K resistor.

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## OPERATION

The Wireless Magnetic detector transmits the following events data:

**SUPERVISION** - a periodical transmission every 7 min. by default, indicates detector's presence.

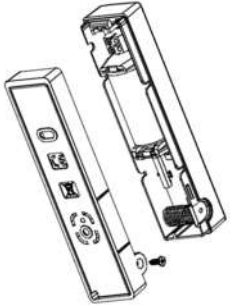
**ALARM** - Alarm transmission triggered by intrusion detection by REED SWITCH and WIRE input.  
(Selectable, see section 18)

**LOW BAT** - Whenever the battery reaches a pre-set low level (~2.9V) Battery Low signal will be sent with the next scheduled message (Supervisor, Alarm, etc.).

**TAMPER** - Whenever the SH-MAG2 cover is removed or tore off wall, a message will be transmitted with "Tamper" signal.

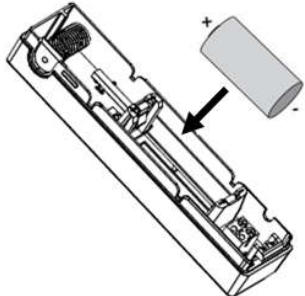
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## FIG. 1 - REMOVAL OF FRONT COVER



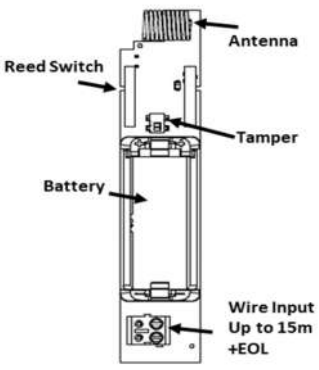
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## FIG. 2 - BATTERY PLACEMENT



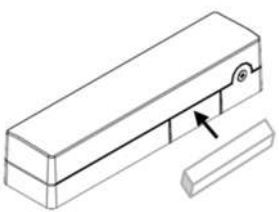
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## Fig. 3 - CIRCUIT LAYOUT



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## MAGNET LOCATION



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## LEARNING PROCESS

For pairing process, please refer to your control panel instructions.

To pair your device with Shepherd™ panel, please proceed as follows:

1. Enter in installing mode via the "Installer Webpage"
2. Go to "Zones" and select the zone # you want to learn
3. Add Zone - (Reminder: insert Link Type "ISM", device's ID, Device Type "Magnetic Contact".)
4. Set the detector configuration: supervision time, internal switch...and etc, and save configuration.
5. Place a battery as instructed in Figure 2 and wait until the Red / Green LED stops blinking.
6. The device should register to the Control Panel.
7. When registration process is successfully completed, the Green LED will constantly light ON for 3 seconds and then turn OFF.
8. If Green LED continues flashing more than 5 minutes and stopped, please check SH-MAG2 settings details, remove battery and repeat steps 3,4,5.

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## SELECT MOUNTING LOCATION

It is recommended to mount the SH-MAG2 vertically on a flat area to get maximum range. As the detector is a wireless transceiver, and in order to take full advantage of its sophisticated operation, do not install the detector in areas where large metal objects could interfere with the transmission of signals.

It is recommended to attach transmitter to the fixed frame and the magnet to the moveable part (door or window), as shown on section 14. Installation is not allowed on a ferromagnetic surface.

*For detector installation it is recommended to use*

**SCREW 3x30 PH. FLAT HEAD**

**CAUTION: using a different or a bigger screw can damage the electronic board.**

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## RSSI – RF SIGNAL INDICATION

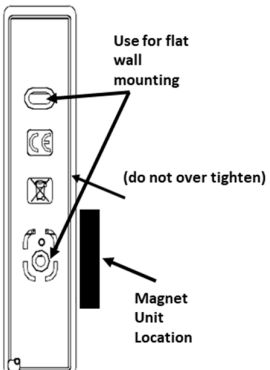
The shepherd control panel has "RF Signal Strength Indication" (RSSI) for each transceiver in order to help the installer to define the best location for the detector from RF perspective.

RSSI level display

1. Enter to installer programming via installer webpage
2. Option 1: go to zones level
3. Option 2: go to Overview level
4. Option 3: Mobile App.

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## FIG. 4 - KNOCKOUT HOLES



**MOUNTING THE DETECTOR**

- To remove the front cover, unscrew the holding screw, insert a flat screwdriver in the slot between the front and the bottom while pushing and twisting it gently until the front cover is disengaged. (Fig. 1)
- Mount the detector base: place all 3 screws and make sure you tighten the tamper screw (the middle screw) easily, so the back tamper switch will press the switch successfully when PCB is placed back - over winding may result in false mechanical adaptation and lack of tamper press.
- Mount the Magnet Unit near the Marking.
- Place the CR123A BAT according to the right polarity
- Place the cover by inserting it back in the appropriate closing pin and screw the holding screw.

**TAMPER TRANSMISSION TEST**

Pressing and releasing the tamper (push button) enables the TAMPER transmission test feature.

Verify the Control Panel indicates "Zone Tamper open" and TROUBLE LED is ON.

Close the Tamper and verify the Control Panel Indicates ZONE TAMPER OPEN is restored and TROUBLE LED is OFF.

In some control panels READY LED will turn OFF when tamper is open and ON when closed.

Transmission can also be reviewed on the transceiver unit as a rapid Red-Green-LED blink.

**REGULATORY APPROVALS**

The SH-MAG2 conforms to the essential requirements set out by:

- RTTE directive: 1999/5/EC
- EMC directive: 2004/108/EC
- Low Voltage directive: 2006/95/EC

Harmonized Standards applicable to this products are:

- EN300220-2
- EN301489-3
- EN301489-1
- EN50130-4
- EN61000-6-3
- EN60950-1
- EN50131-6
- EN50130-5
- EN50131-5-3

Security Grade 2 Environment Class II Certification body: Telefication B.V.

Additional Standards and Directives applicable to this product are:

- RoHS directive: 2002/95/EC
- EN50131-2-6

**CROW ("CROW") - WARRANTY POLICY CERTIFICATE**

This Warranty Certificate is given in favor of the purchaser (hereunder the "Purchaser") purchasing the products directly from Crow or from its authorized distributor. Crow warrants these products to be free from defects in materials and workmanship under normal use and service for a period of 12 months from the last day of the week and year whose numbers are printed on the printed circuit board inside these products (hereunder the "Warranty Period").

Subject to the provisions of this Warranty Certificate, during the Warranty Period, Crow undertakes, at its sole discretion and subject to Crow's procedures, as such procedures are from time to time, to repair or replace, free of charge for materials and/or labor, products proved to be defective in material or workmanship under normal use and service. Repaired products shall be warranted for the remainder of the original Warranty Period.

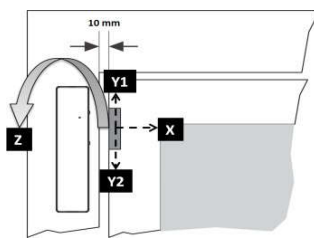
All transportation costs and in-transit risk of loss or damage related, directly or indirectly, to products returned to Crow for repair or replacement shall be borne solely by the Purchaser.

Crow's warranty under this Warranty Certificate does not cover products that is defective (or shall become defective) due to: (a) alteration of the products (or any part thereof) by anyone other than Crow; (b) accident, abuse, negligence, or improper maintenance; (c) failure caused by a product which Crow did not provide; (d) failure caused by software or hardware which Crow did not provide; (e) use or storage other than in accordance with Crow's specified operating and storage instructions.

There are no warranties, expressed or implied, of merchantability or fitness of the products for a particular purpose or otherwise, which extend beyond the description on the face hereof. This limited Warranty Certificate is the Purchaser's sole and exclusive remedy against Crow and Crow's sole and exclusive liability toward the Purchaser in connection with the products, including without limitation - for defects or malfunctions of the products. This Warranty Certificate replaces all other warranties and liabilities, whether oral, written, (non-mandatory) statutory, contractual, in tort or otherwise.

In no case shall Crow be liable to anyone for any consequential or incidental damages (inclusive of loss of profit, and whether occasioned by negligence of the Crow or any third party on its behalf) for breach of this or any other warranty, expressed or implied, or upon any other basis of liability whatsoever. Crow does not represent that these products can not be compromised or circumvented, that these products will prevent any person injury or property loss or damage by burglary, robbery, fire or otherwise; or that these products will in all cases provide adequate warning or protection. Purchaser understands that a properly installed and maintained product may in some cases reduce the risk of burglary, fire, robbery or other events occurring without providing an alarm, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss or damage as a result.

Consequently, Crow shall have no liability for any personal injury, property damage or any other loss based on claim that these products failed to give any warning. If Crow is held liable, whether directly or indirectly, for any loss or damage with regards to these products, regardless of cause or origin, Crow's maximum liability shall not in any case exceed the purchase price of these products, which shall be the complete and exclusive remedy against Crow.

**INSTALLATION**

Basic installation at 10mm between SH-MAG2 and Magnet Unit.

	Opening	Closing
X (Slide)	15mm	14mm
Y1 (Slide Up)	15mm	14mm
Y2 (Slide Down)	15mm	14mm
Z (pivoting)	17mm	14mm

**BATTERY REPLACEMENT**

- Remove the front cover.
- Pull out the old battery.
- Install a new battery according to polarity marking.
- After assembling the battery the LED will flash Green then Red alternately for 45 seconds. During this time the detector does not function, wait until the LED stop flashing.
- Press tamper for 2 sec and then release it.
- Note LED indications:

**Green/Red LED flashes 6 times alternately:**

The detector was successfully registered in system. The cover may be placed back and closed.

**Green LED blinks 20 times:**

No response from Transceiver / device was not assigned on CP - Repeat installation procedure.

**Red LED blinks continually (over 20 sec):**

Battery voltage is critical low device won't function - Replace battery.

**TECHNICAL SPECIFICATIONS**

Data Protocol	FreeWave2
Modulation Type	GFSK(5 Frequencies)
Frequency	868MHz / 916MHz
Identification	Unique ID serial number – 24 bit
Event Transmission	Alarm, Tamper, Supervision, Low Bat Supervision
Detection Method	Internal Reed Switch or External Magnet Device
Range in open space	500m
Battery	Lithium. 3V Type: CR123A Size: 2/3AA
Battery life expectancy	>5 years ( 10 activation per day)
Current Consumptions:	
Standby	~3 µA
Receive mode	~29 mA
Transmit mode	~38 mA
Low Battery	<2.9Vdc
Transmit power:	< 14dBm
Tamper Switch	Front Cover Removal; Back Tamper
External Input	Up to 15m with 8.2Kohm EOL resistor
Operating temperature	-10°C to +50°C
Dimensions	100mm x 23mm x 22mm
Weight (inc. battery)	40 gr.

**ALARM TRANSMISSION TEST**

Go to OVERVIEW level in installer webpage programming mode, Identify and locate the tested Zone.

Physically Remove the magnet from the sensor, the open alarm appears in STATE column, return the magnet back and verify ready state.

**Note:** refresh the web page display in case you don't see the change

**Zone # X Open**

NOTE: the test can be a part of walk test procedure in Overview display level.

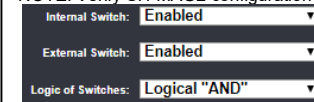
**EXTERNAL MAG**

It is optional to use additional magnet units connected to the MAG terminal input. This connection is protected by End Of Line resistor value 200Kohm

Alarm transmission, triggered by intrusion detection at WIRE terminal input, provides signals of door/window open/close up to 15m.

Connect two wires communication cable to the MAG terminal block inputs. See Fig.3.

NOTE: Verify SH-MAG2 configuration settings



Logic of Switches options : "OR" / "AND"

**CAUTION !!!**

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY DIFFERENT TYPE / MODEL.**

**DISPOSE USED BATTERIES ACCORDING TO ITS INSTRUCTIONS**

**The battery must be replaced by 3V Lithium battery Size 2/3A Models such as:**

1. VARTA CR123A
2. GP CR123A

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70100 Israel

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