

M-5815 DFIR™ Motion Sensor

Operation and Specifications

SUREN

The M-5815 a professional state-of-the-art motion sensor engineered with the world's best components and materials. Every aspect of these sensors provides the most reliable motion sensing with freedom from false alarms. M-5815 include two motion sensing systems: microwave Doppler motion sensing and DFIR™ motion sensing, with directional motion sensing to reject false alarms caused by swaying objects. Together, the two systems' signals are evaluated by proprietary signal processing algorithms, which reject false alarm conditions while detecting intruders.

The M-5815 microwave system includes a modern, compact, DRO-based micro-strip Doppler transceiver, with PCB "patch" antennas. The Doppler signal is digitally processed to detect intruders and reject distractions. Constant-motion signals (such as fans) are de-emphasized, and fluorescent light frequencies are digitally removed. The optical side starts with a EvenEye™ lens and a top-quality specially-designed DFIR™ infrared detector. Next, a modern microcontroller converts the infrared detector signal into digital form, for best reliability and stability. Finally, the signal is evaluated with DFIR™ anti-sway processing, for "best-in-class" false alarm rejection with excellent intruder detection.

ANTI-SWAY FUNCTION

The M-5815 is a motion sensor, and it will normally detect swaying motion. However, the outdoor environment may contain swaying objects that are not intruders (for example, wind-blown trees). Thus, to suppress "nuisance alarms", the M-5815 provides an "anti-sway" function to require that, before motion is indicated, a moving object must make directional progress across the sensor's fields of view. This function can be enabled or disabled by a programming jumper. Naturally, when enabled, a longer motion in front of the sensor is required before a motion Alarm is indicated. See Installation Instructions steps 8 and 9 for details.

SENSOR INITIALIZATION

Following power-on, M-5815 Motion Detector sensor is fully operational after a two-minute warm-up. During warm-up, the red Alarm LED is ON.

WALK TEST: (RED LED)

Note: The M-5815 should be tested once per year.

In Normal Operating Mode: Enable the LEDs (JP1 ON). If the Alarm LED is not enabled, then, set JP1 to ON, remove power and re-instate power. Walk across the monitored area (within the sensor's optical fields-of-view). With anti-sway disabled, and with sensitivity set at STANDARD, the red Alarm LED should turn ON (for Alarm) after about two to three normal steps. With the sensitivity set at HIGH, the LED should turn ON (for Alarm) after about one to two normal steps. Each time the LED turns ON, wait for it to turn OFF. Then, wait 12 seconds before continuing the walk-test. When there is no motion in the monitored area, the LED should remain OFF.

In Special Modes: Cycle power-off/power-on, then Walk-test immediately after warm-up in the 10-minute walk-test mode.

SINGLE-SYSTEM TEST: DFIR (Green LED), MICROWAVE (Yellow LED)

The function of each motion sensing system can be monitored separately during the first 10 minutes after power-on. To test the DFIR system, walk across the monitored area (within the sensor's optical fields-of-view). Each time a field-of-view is entered, the green LED should flash. To test the microwave system, move within the monitored area. During movement, the yellow LED should flash. In this mode, the red LED indicates Alarms. Adjust RV1 to change microwave detection range as required. 10 minutes after power-on, the yellow and green LEDs will be disabled.

SUPERVISION

M-5815 supervision functions include these tests:

- Ambient temperature in-range;
- Detector electronics okay;
- Supply voltage between 8-16Vdc;

When a failure is detected, then:

- 1) The red alarm LED blinks ON/OFF every second.
- 2) Alarm relay does not re-close after an alarm signal event.
- 3) The trouble signal output transistor turns OFF.

NOTE : The sensor will NOT initiate an alarm upon failure.

REMOTE CONTROL INPUT

The LED remote input allows remote LED enable control.

* For remote operation JP1 OFF, See specifications for High/Low signal levels.

M-5815 Remote Control Inputs			
FUNCTION	High Signal	Low Signal	INPUT TYPE
Alarm LED*	ENABLE	DISABLE	Pull-down to GND

Limitations of Security Products: Security products and alarm systems do not offer guaranteed protection against burglary, fire, or other emergencies. They may fail to warn for diverse reasons, including (but not limited to): power failure, dead batteries, improper installation, coverage "blind spots", coverage areas overlooked during installation, defeat by technically sophisticated intruders, component failure, or inadequate maintenance. Alarm systems should be checked weekly to ensure that all devices are working properly. AN ALARM SYSTEM IS NOT A SUBSTITUTE FOR INSURANCE.

SUREN LIMITED WARRANTY

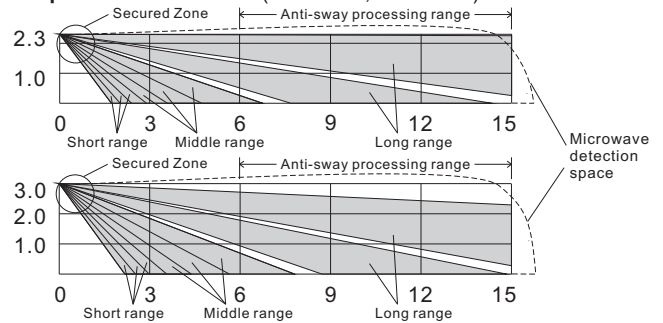
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There are no warranties, expressed or implied, of merchantability, or fitness for a particular purpose or otherwise, which extend beyond the description on the face hereof. In no case shall seller be liable to

SPECIFICATIONS

Range: 15 meters in sensor-facing direction
15 meters at 45° angle from sensor-facing direction

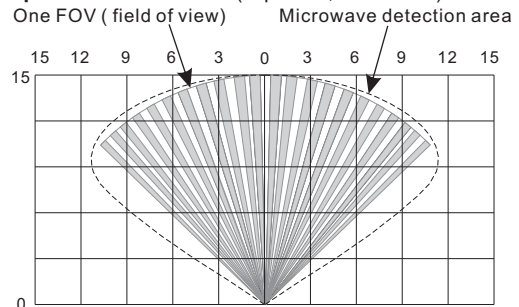
Sensor Optical View Pattern (side view, in meters)



Optical Fields-of-View:

Long-range 88 Mid-range 38 Short-range 26

Sensor Optical View Pattern (top view, in meters)



IR Sensors (2):

Dual-element + Quad-element

Power Supply:

8-16 Vdc; 50 mA at 12 Vdc

Alarm Relay:

Solid state, Form A (NC). 50 mA at 30 Vdc, 1500 V_{rms} isolation

Trouble, Alarm Signal Outputs:

NPN open-collector to (-), 50 mA Max., NC no trouble

Remote LED Enable Input:

Logic levels from (-): ≤1Vdc=LOW; ≥3Vdc=HIGH; Max.=16 Vdc

Tamper Switches (cover/wall):

Form A (NC). 50 mA at 30 Vdc

Housing Material:

PC housing, HDPE lens

Dimensions:

171 x 76 x 61 mm (H x W x D)

Lighting Rejection:

Selectable: 50 or 60 Hz

Approvals/qualification:

CCC (Pending)

CE (Pending)

Microwave Operating Freq:

Around 10 GHz. See unit label

Events Detection:

DFIR™ anti-sway false alarm rejection processor

RF Immunity:

20 V/m, 10-1000 MHz;
10 V/m, 1-2 GHz

White Light Immunity:

25000 lux

Sensitivity: DFIR

Selectable: short-walk or long-walk

Range: Microwave

20%-100% adjustable

Operating Temperature Range:

-30°C to +55°C (-22°F to +131°F)

Storage:

-40°C to +60°C (-40°F to +140°F)

ACCESSORIES OPTIONS

Mounting bracket: MB-200

Anti-masking:

Order Model M-5815AM

Note: Specifications are subject to change without notice.

anyone for any consequential or incidental damages for breach of this or any other warranty, express or implied, or upon any other basis of liability whatsoever, even if the loss or damage is caused by its own negligence or fault.

Seller does not represent that the products it sells may not be compromised or circumvented; that the products will prevent any personal injury or property loss by burglary, robbery, fire or otherwise; or that the products will in all cases provide adequate warning or protection. Customer understands that a properly installed and maintained alarm system may only reduce the risk of a burglary, robbery, or fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no personal injury or property loss as a result.

Consequently, seller shall have no liability for any personal injury, property damage or other loss based on a claim the product failed to give any warning. However, if seller is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, seller's maximum liability shall not in any case exceed the purchase price of the product, which shall be the complete and exclusive remedy against seller.

This warranty replaces any previous warranties and is the only warranty made by Seller on this product. No increase or alteration, written or verbal, of the obligations of this Limited Warranty is authorized.

U.K. Patent No: GB2414551; Russ Patent No: 2353006; A.U. Patent No: 2003291108;

U.S. Patent Nos: 7,183,912; 7,399,969; 7,399,970; China Patent No: 101167110;

Patents issued and pending worldwide. Patent information at www.surensys.com.

M-5815 Installation Instructions

1: Mounting Location

A. Wall mounting:

1. Sensor base fastened flat on vertical wall (± 2 degrees)

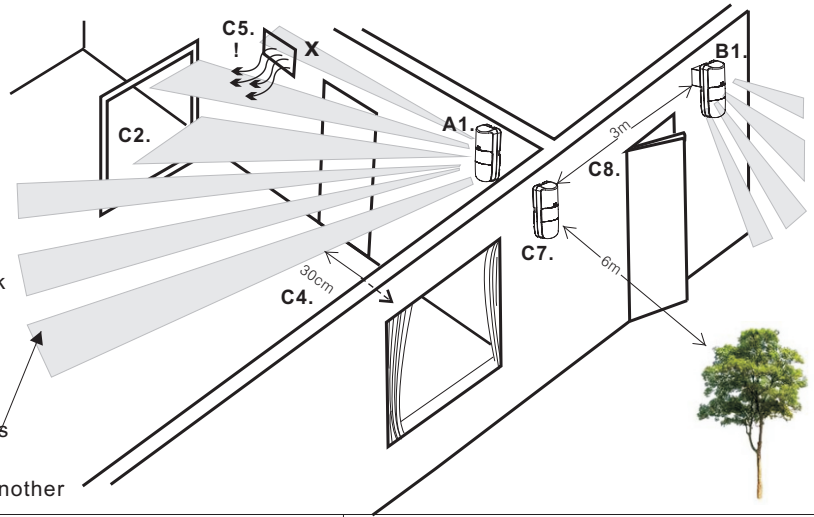
B. Bracket mounting:

1. Bracket fastened to semi-vertical surface (± 15 degrees)
2. Sensor on bracket in vertical position (± 2 degrees)

C. All mounting:

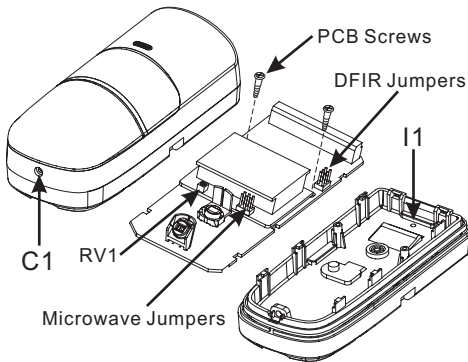
1. Height = 2.3 m or 3m or 4m above floor of monitored area
2. Clear line-of-sight from sensor to monitored area
Note: glass will block DFIR sensor's view; metal will block microwave sensor's view

3. Wall temperature similar to walls/floor of monitored area
4. Sensor aimed away from windows and reflected sunlight
5. Sensor aimed away from heaters or heater/cooler outlets
6. Sensor aimed so that likely intruder paths cross two views
7. Keep 6m distance to swaying objects
8. Sensors should be separated by 3m, and not facing one another



2: Sensor Disassembly

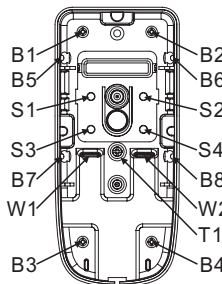
- (1) Loosen screw C1 to open front cover.
- (2) Loosen PCB mounting screws, remove PCB.
- (3) Loosen screw I1 to release internal base.



3: Base Hole Preparation

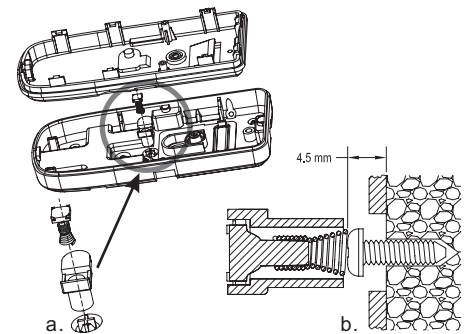
Open base knockouts as required.

- S1-S4: Screw knockouts for the mounting bracket.
- W1/W2: Wire-entry knockouts.
- B1-B4: Wall-mounting knockouts.
- B5-B8: Corner-mounting knockouts.



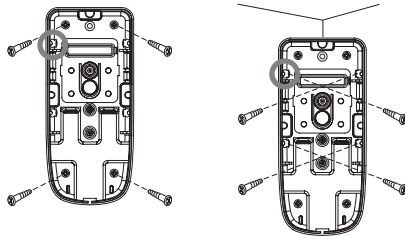
4: Base/Wall tamper Switch

For base to inner-housing tamper detection, install as in a. For wall to inner housing tamper detection, remove knockout T1 and provide screw in wall as in b.

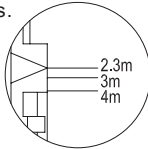


5: Mounting

Use screws to mount on wall or in corner.

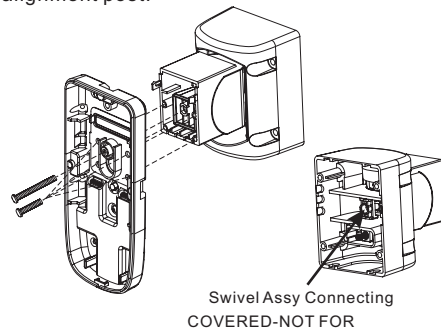


Set circuit board graduation in position "2.3m" or "3m" or "4m" to select mounting height. Tighten PCB mounting screws.



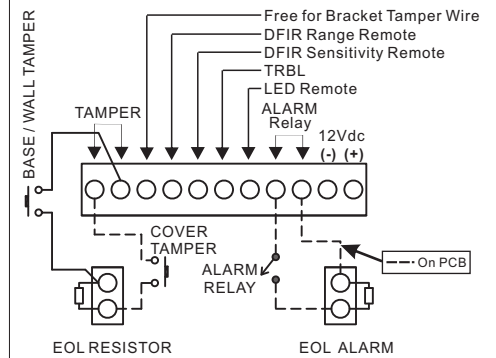
6: Bracket Mounting

Use screws to mount bracket in desired location. Use screws to mount sensor base onto bracket. Use long screw to tighten mounting bracket at desired angle. Replace internal base and circuit board, referring to 5 for setting circuit board alignment post.



7: Wiring

Cut cable wires to appropriate length and connect wires to sensor terminal block.



8: Operation Programming Jumpers

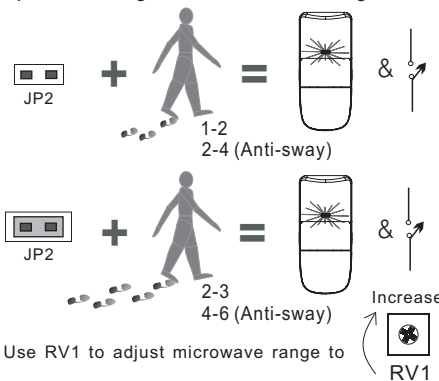
On microwave unit set JP1 to control Alarm LED, and lamp-immunity JP3 to match local power frequency.

On main DFIR board if there is a way for intruders to pass only a very short distance in the sensor's view, or if aggressive detection is required, then use high sensitivity (JP2 OFF), without anti-sway. Otherwise, standard sensitivity (JP2 ON) is fine for ordinary applications. At either sensitivity, anti-sway (JP3 ON) can be used to reject swaying objects 6-15m from the sensor. Factory-set jumper positions are shown in gray. *Position for remote control. JP4, JP5: reserved for future use.

	FUNCTION	JP	ON	OFF
DFIR Jumpers	Anti-Sway	3	ENABLE	DISABLE
	Sensitivity	2	STANDARD	HIGH
	Reserved	1	—	—
Microwave Jumpers	Light Imm.	3	60Hz	50Hz
	Reserved	2	—	—
	Alarm LED	1	ENABLE	DISABLE*

9: DFIR Motion Sensitivity

When a person walks across the sensor's fields-of-View, detection occurs after a number of steps, according to JP2 and JP3 settings.



10: LED Indicator Operation

The chart below shows possible LED indications.

LED	M-5815	
	Sensor State	LED Display
Red	Warm-up	ON
	Test Mode	ON 1 Second
	Alarm	ON 5 Seconds (IF LED ENABLED)
	Mask	Flashing
Yellow	Normal	OFF
	MW Event	ON
Green	NO Event	OFF
	DFIR Event	ON
Green	NO Event	OFF
	NO Event	OFF