REVISIONS

ECO	Description	Checked By	Date	Engineer	Date	Eff. Date

Notes:

1. Material: 80g printing paper, white. A4 size.
2. Printing: Black
3. Pack and tie a label with part number 0-ML00-0036-01-1.

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-5815AM 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 (S2.10 ON). If the Alarm LED is not enabled, then, set S2.10 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 three to five normal steps. With the sensitivity set at HIGH, the LED should turn ON (for Alarm) after about two to four 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 30-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 30 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 sensitivity as required. 30 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.
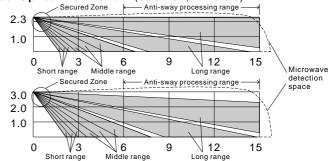2) Alarm relay does not re-close after an alarm signal event.
NOTE : The sensor will NOT initiate an alarm upon failure.

SPECIFICATIONS

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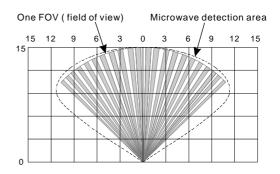15 meters at 45°angle from sensor-facing direction

Sensor Optical View Pattern (side view, in meters)

Optical Fields-of-View:

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

Sensor Optical View Pattern (top view, in meters)

IR Sensors (2):
Dual-element + Quad-element

Power Supply:
8-16 Vdc; 30 mA at 12 Vdc

Alarm Relay:
Solid state, Form A (NC). 50 mA at 30 Vdc, 1500 V$_{rms}$ isolation

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)

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

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-5815

Note: Specifications are subject to change without notice.

M-5815 Installation Instructions

1: Mounting Location

A. Wall mounting:
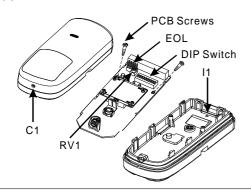1. Sensor base fastened flat on vertical wall (± 2 degrees)

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
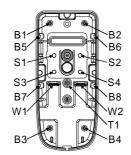

2: Sensor Disassembly

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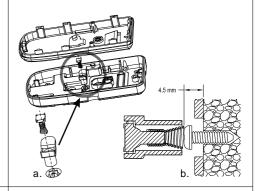(3) Loosen screw I1 to release internal base.

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.
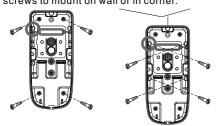- B5-B8: Corner-mounting knockouts.

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

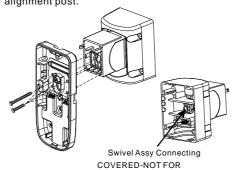4.5 mm

a.   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.
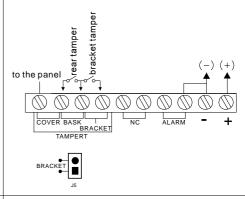
2.3m
3m
4m

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.
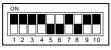

Swivel Assy Connecting
COVERED-NOT FOR

7: Wiring

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

rear tamper
bracket tamper
to the panel
(−) (+)

COVER BASK BRACKET   NC   ALARM   -   +
TAMPERT

BRACKET

J5

8: DIP Switch Setting

ON
1 2 3 4 5 6 7 8 9 10

Factory Default

DIP 4: Alarm condition
ON: PIR+MW
OFF: PIR

DIP 5-6: Detect operation

DFIR Range	DIP5	DIP6
6M	ON	ON
9M	OFF	ON
12M	ON	OFF
15M (Default)	OFF	OFF

DIP 7: Anti-Sway
ON: Enable
OFF: Disable

DIP 8-9: PIR Sensitivity

Sensitivity	DIP8	DIP9
High	ON	ON
Normal (Default)	OFF	ON
Mid	ON	OFF
Low	OFF	OFF

DIP 10: LEDs operation
ON: LEDs Enabled
OFF: LEDs Disabled

Microwave Adjustment
Use RV1 to adjust microwave sensitivity.

Increase

RV1

9: LED Indicator Operation

The chart below shows possible LED indications.

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