# L7 legrand®

Wattstopper®

DLM Integrated Fixture Sensor and Controller, Occupancy, Daylight Harvesting, and IPv6/Bluetooth® Low Energy Technology

No: 30769 – 07/20 rev. 1

Installation Instructions • Instructions d'Installation • Instrucciones de Instalación

Catalog Numbers • Les Numéros de Catalogue • Los Números de Catálogo: LMFS-601-W

Country of Origin: Made in China • Pays d'origine: Fabriqué en Chine • País de origen: Hecho en China
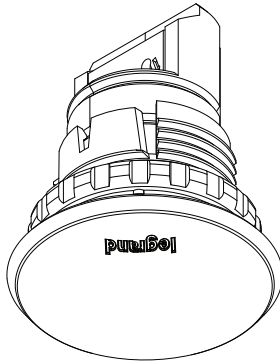
Installation shall be in accordance with all applicable regulations, local and NEC codes. Wire connections shall be rated suitable for the wire size employed.

For Class 2 DLM devices and device wiring: To be connected to a Class 2 power source only. Do not reclassify and install as Class 1, or Power and Lighting Wiring.

SPECIFICATIONS

Input Voltage 12–20V
Power Consumption from DALI Bus 16mA
Power Supply ...... Wattstopper Fixture Interface (LMFI-111)/ DALI v1.0 compliant driver
Wiring .... 18–20 AWG
Terminal Connection... DA+, DA-
Connection DLM Network .... Wireless via LMFS-601 fixture sensors
Wireless Radio .... Single, Concurrent 802.15.4 and Bluetooth Low Energy, 2.4 GHz
Wireless Communication:
    IPv6 Mesh (6LoWPAN) Range.. up to 60ft
    Bluetooth Low Energy Range .... up to 30ft
Wireless Encryption... AES-128 bit symmetric key
Operating Temperature .... 32–122°F (0–50°C)
Relative Humidity .... 0 to 90% (non-condensing)
Enclosure IK05
Compatible Border Router.. Wattstopper LMBR-650
BACnet IPv6 capable

DESCRIPTION

The LMFS-601-W is a wireless fixture sensor and controller that is compatible with all Wattstopper IPv6/Bluetooth low energy technology wireless DLM devices. The LMFS-601-W is a PIR occupancy sensor and a closed loop photo sensor. It measures both motion and daylight contribution in order to automatically switch or dim lighting.

The LMFS-601-W can also be joined to a multi-room mesh network by adding an LMBR-650 border router. The integrated fixture sensor can join an LMBR-650 network using the wireless DLM Config App or LMCS v4.7 and later.

INSTALLATION

- Ensure knockout and adjacent surfaces are free from burrs, oil, chemicals, debris, etc.
- Clean only with soft, damp cloth. Do not use chemical cleaners.
- Do not paint.
- LMFS-601-W should be mounted to fixture surface that is parallel to the floor in final installation.
- Do not install in direct view of the light source or reflecting surface.
- Install in a location that allows the sensor to have an unobstructed view of the area. Do not mount behind glass or clear plastic.
- Sensor not intended for hanging pendants - occupancy coverage area is reduced.
- Install away from radiated heat given off by the light source

Materials Required:
- Solid core wire (18-20 AWG)
- A DALI Driver with Integrated Self Powered DALI Link Or A Wattstopper Fixture Interface (LMFI-111)

Installation

The LMFS-601-W comes equipped with a carrier a sleeve and collar in which it snaps into during installation into the fixture.

The carrier sleeve fits into industry standard 1/2" knockouts and/or a 7/8" hole. The carrier sleeve is intended to be mounted into lighting fixtures or directly into ceiling tiles.

1. To install the carrier sleeve into the desired knockout, apply pressure and turn counterclockwise until the carrier sleeve is flush with the mounting application.
2. Screw the collar onto the inside of the carrier sleeve threading.
3. Slide the sensor into the carrier sleeve until it securely snaps into place.

❶ Collar
Fixture
Carrier Sleeve

❷
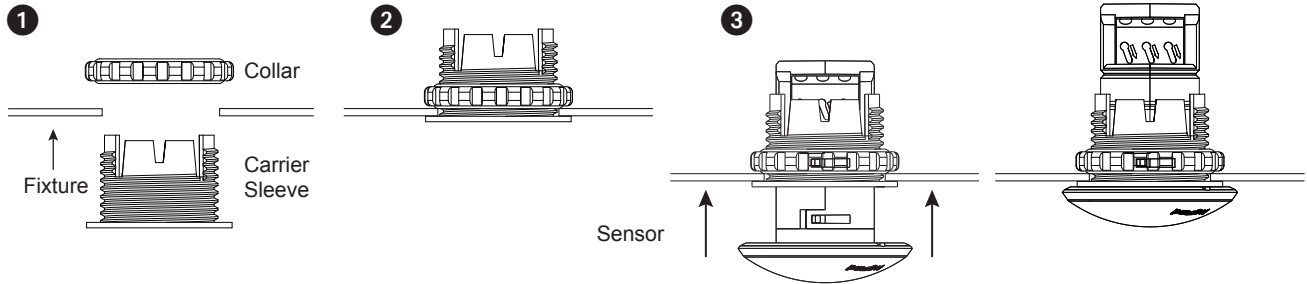
❸ Sensor

WIRING

When wiring the LMFS-601-W to either a DALI driver or LMFI-111 Fixture Interface, use only solid core wire (18-20 AWG).
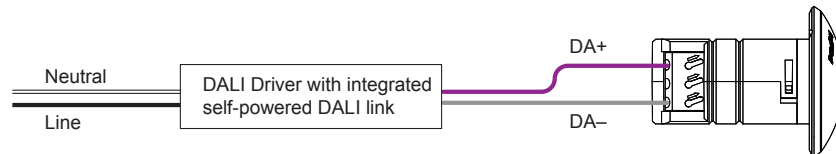
NOTE: The middle connector is unused on the sensor.

⚡ **WARNING: TURN THE POWER OFF AT THE CIRCUIT BREAKER BEFORE WIRING.** ⚡

**LMFS-601-W with 0-10V LED Driver and LMFI-111 Fixture Interface**

Load — DIM+
Ballast or LED Driver
Neutral — DIM−
Neutral
Line
LMFI-111
DA+
DA−
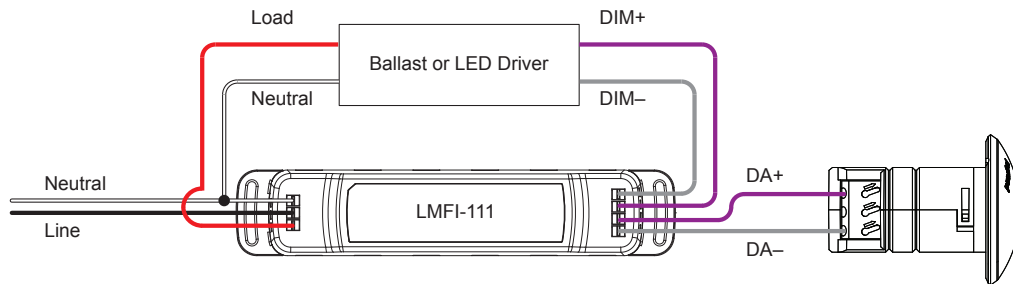
LMFS-601-W with DALI Driver

Neutral
DALI Driver with integrated self-powered DALI link
Line
DA+
DA−

SENSOR COVERAGE

The LMFS-601-W provides a 360° coverage pattern. The coverage shown represents maximum coverage for walking motion at a mounting height of 8 feet. The lens is designed for mounting heights ranging 8'–12' and covers up to 300 sq/ft of space.

Coverage Top View @8ft

10' 8' 6' 4' 2' 0' 2' 4' 6' 8' 10'
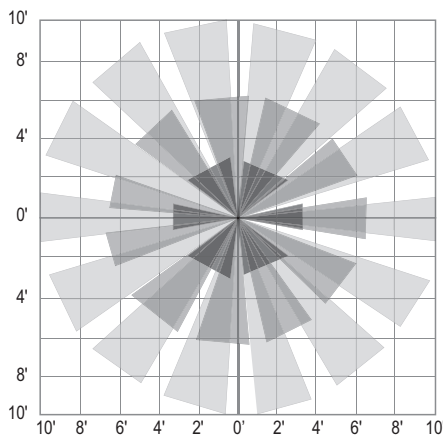
Coverage Side View

0'
2.5'
5'
8'
10' 5' 0' 5' 10'
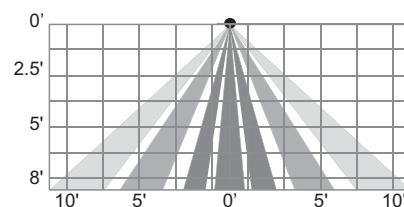
Sensor Placement

- Mount sensor at least 6' away from air supply.
- Avoid obstacles that block sensor's line-of-sight.

NOTE: When the luminaire and LMFS-601-W are powered, the fixture turns ON and reaches its full output. The sensor module then cycles through the entire dimming range starting from 100% output level to OFF* two times. After the power cycle, the light level will return to 100%. This sequence of operation will take place after every power cycle until the sensor is commissioned using the DLM Config App. The DLM Config App **must** be used to startup and commission the LMFS-601-W.

PIR Sensor · Light Sensor · Antenna · LED

The DLM Config App is available for both iOS® and Android® devices. Search "DLM Config" on your device to download. The app provides the ability to pair various devices in a room. Additionally, you can modify load binding and edit various DLM parameters for each device, and update the firmware in each device. For details on the features and operation, download the DLM Config App User Guide from the Wattstopper web site at :https://www.legrand.us/wattstopper.aspx

IMPORTANT: In an effort to streamline startup time of the LMFS-601-W and to reduce the number of wireless devices showing up during Device Discovery, the LMFS-601-W has the following feature set:

The LMFS-601-W for which the user wants to commission will show up during Discovery in the App when Occupancy is triggered by the fixture sensor. When Occupancy is triggered the Bluetooth radio turns ON and the LMFS-601-W will show up on the App screen. Devices on the App screen will be sorted by wireless signal strength and the user can also flash the load by clicking the "eye icon" for certainty.

Once logged into the DLM Config App and ready to Create Room:

1. Create Room by Naming the Room and then select the Central Device in the Room. It is recommended that the LMFS-601-W near the center of the room be selected as the Central Device.
2. Walk underneath the desired device and with occupancy triggered, the device will appear on the App screen.
3. Identify the device by clicking the "eye icon" on the left side of the screen
4. The user now has the option to Name the Device and assign Primary Tags for Grouping if desired.
5. Users should repeat steps 2-4 for as many devices needed to be added to the Room.
6. Once the LMFS-601-W has been added to the DLM Room, users can manage Groups created during Discovery and set device parameters for desired sequence of operation. Parameters can be set for a Group and those parameters will apply to ALL devices in that Group

Grouping Devices in the DLM Config App

Grouping is intended to enable the user to meet advanced energy codes where Occupancy-based zones and sequences of operation are required. Groups set up within a DLM Room are meant to identify devices that should follow an identical rule set and functional behavior.

NOTE: An LMFS-601-W that is added to a DLM Room, but not assigned a Group tag will operate independently of any other LMFS-601-Ws in the DLM Room.

A user can create up to 32 Groups per DLM Room. A LMFS-601-W can be in any or all 32 DLM Room-level Groups.

Recommended Group Creation and Sequence of Operation to meet Energy Codes:

Once the user has created desired Groups in the DLM Room, the below are the recommended settings for the Groups.

1. When occupancy is detected, the lighting in the motion event Group shall Auto ON to the last non-zero level set by the user via the wall switch. The other individual groups in the DLM Room outside of the motion event Group shall Auto-ON to 20% lighting power.
2. The lighting in all individual Groups shall have manual On/Off/Dim and light reduction control with dimmer switches located at space entry locations.
3. Daylighting will operate independently for each LMFS-601-W and will continuously dim based on daylight contribution to maintain at least 35FC at task level. Daylighting control shall not be allowed to raise the light level above user setpoints, established by user manual switch operation, or above 20% light level when individual control zones are unoccupied.
4. Reduce lighting to 20% lighting power within 20 minutes of occupants leaving an individual Group.
5. Auto Off lighting in all individual Groups within 20 minutes of all Groups becoming unoccupied.

End of Line Testing

To facilitate OEMs to conduct system operation at the end of the manufacturing line, an end-of-line testing routine is pre-programmed into the device that confirms the wiring and the wireless readiness of the device.

Wattstopper tests the performance of the occupancy and daylight sensors in this product and does NOT expect the OEM to test those features.

When the luminaire is powered, the fixture turns ON and reaches its full output. The sensor module then cycles through the entire dimming range starting from 100% output level to OFF* two times. After the power cycle, the light level will return to 100%. OEMs can expect the test to last 20-30 seconds total.

This confirms that the module is receiving power and can communicate the 0-10V dimming signals to the power supply. The end-of-line testing routine repeats at each power cycle until the device has been commissioned using the DLM Config App.

Before commissioning, this routine can be used to determine if a device has been paired to a network.
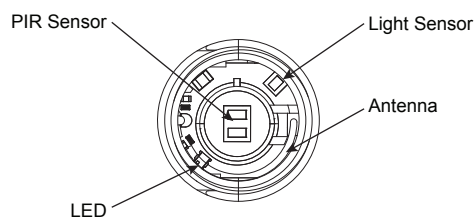
LMFS-601-W DEFAULT SETTINGS

Occupancy Behavior – Auto On to 80% of maximum light level. All other Groups outside of occupancy sensed Group power ON to 20% of maximum light level.

Time Delay – 20 min

Time Delay Dim Level – 20% Max Light output

High End Trim Preset – 80%

Low End Trim – 1%

Daylight – Disabled by Default

Daylight Function – Closed Loop

FCC Notice:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by The Wattstopper, Inc. could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

IC Caution:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Avertissement d'exposition RF

Cet équipement est conforme aux limites d'exposition aux radiations de la IC définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

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