

WIRELESS DIGITAL LIGHTING MANAGEMENT



- A platform extension with a new wireless room controller, occupancy sensors, switches, and more
- Quick and easy mounting and installation – no Cat 5e cables in the room
- Dual IPv6 antennas provide optimal signal quality with diversity for reliable mesh communication
- Bluetooth® low energy technology based commissioning using DLM Configuration App
- Industry's most advanced wireless security, backed by Secure Commission and Secure Control technology
- Ten-year battery life, with product LED alert indication and software accessible voltage reading
- Clean, updated product design
- Optional wireless networking with schedule creation and remote system management using DLM Dashboard software
- BACnet integration for monitoring and management

Description

Wireless DLM is a new product family within the Digital Lighting Management (DLM) platform. It is an intelligent, distributed control system that automatically maximizes lighting energy efficiency while minimizing the installation cost associated with using wire to connect devices together. The wireless DLM family includes a room controller, occupancy sensors, switches, a daylighting sensor, a wireless bridge, a border router, a DLM Configuration app for smart phones or tablets, and DLM Dashboard software which works as a front end for networked systems.

Wireless DLM also integrates with wired DLM products, allowing for easy addition of dual technology sensors, plug load controls (wired or wireless), Human Centric Lighting controls, touchscreens, lighting control panels, and other interfaces and accessories that provide convenient, energy-saving control of dimmed and switched loads. DLM can be used for stand-alone control of individual building spaces, or for centralized control of a floor, a building, or an entire campus.

Operation

Wireless Digital Lighting Management creates local and room-to-room networks using IPv6 technology. Each DLM local network is managed by one or more load controllers that, upon startup, automatically configure system components for the most energy-efficient sequence of operation using Plug n' Go technology. Individual rooms can be combined into a larger room-to-room network using an LMBR-650 border router.

Devices may be personalized using the DLM Configuration App (available for iOS® or Android® devices) to view and modify system parameters, and store occupancy sensor settings.



Additionally, multiple local networks may be connected to a BACnet-compatible segment network for centralized monitoring and management (see Segment Network section).

Push-to-Pair and Plug n' Go

Installers can easily pair wireless devices to a room controller, creating a secure individual room network and enabling Plug n' Go operation by using Push-to-Pair (PtP) mode on the room controller and all other wireless devices, or by using the DLM Configuration App.

Plug n' Go establishes default functionality based on the installed components. If a local network includes only a room controller and an occupancy sensor, it will default to auto-on/ auto-off operation. If it includes a wireless room controller, a wireless occupancy sensor and a wireless switch, it will default to manual-on/ auto-off operation.

Energy Savings Beyond Code

Wireless DLM has been engineered to meet and exceed energy codes, facilitate sustainable development and provide an unprecedented return on investment for both new construction and retrofit projects. Features such as dimming, daylight harvesting, and power monitoring are provided to control multiple lighting sources in a wide variety of applications. DLM simplifies designing for ASHRAE 90.1, IECC, California Title 24, and LEED.

PROJECT		LOCATION/ TYPE	
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Features

- Quick and easy mounting and installation – no Cat 5e cables in the room
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- Bluetooth® low energy technology based commissioning using DLM Configuration App
- Industry’s most advanced wireless security, backed by Secure Commission and Secure Control technology
- Ten-year battery life, with product LED alert indication and software accessible voltage reading
- Clean, updated product design
- Optional wireless room-to-room networking for scheduled control and remote system management using DLM Dashboard software
- Integrates plug load and lighting control
- On/off and dimming control options
- Includes open loop daylighting sensor, so only one device required per exposure
- Over the Air firmware upgrades
- All DLM products are RoHS compliant

Wireless DLM Room Network Overview

- Power provided by CR123A batteries for switches and sensors. Room controller powered by line voltage. Bridge and border router receive 24VDC power
- Wireless signal range (Bluetooth): 30’ maximum to nearest DLM device
- Wireless signal range (IPv6 mesh / 6LoWPAN):
 - 100 ft.* between routing devices receiving constant power from 24VDC or 120VAC (Room controller, bridge, and border router)
 - 60 ft. for switches and sensors to the closest routing device

*If LMBR-650 or LMBC-650 is mounted inside a metal enclosure, range reduced by up to 25%

Room Capacity Specs	Maximum
Communicating devices per wired, wireless, or hybrid room	48
Loads	64
LMBC per wired or hybrid wired/wireless room*	1
LMRJ cable length per device (for hybrid wired/wireless rooms)	150ft
LMRJ cable length per room (for hybrid wired/wireless rooms)	1000ft

* LMBC is not used in a wireless room because LMRC includes bridge functionality

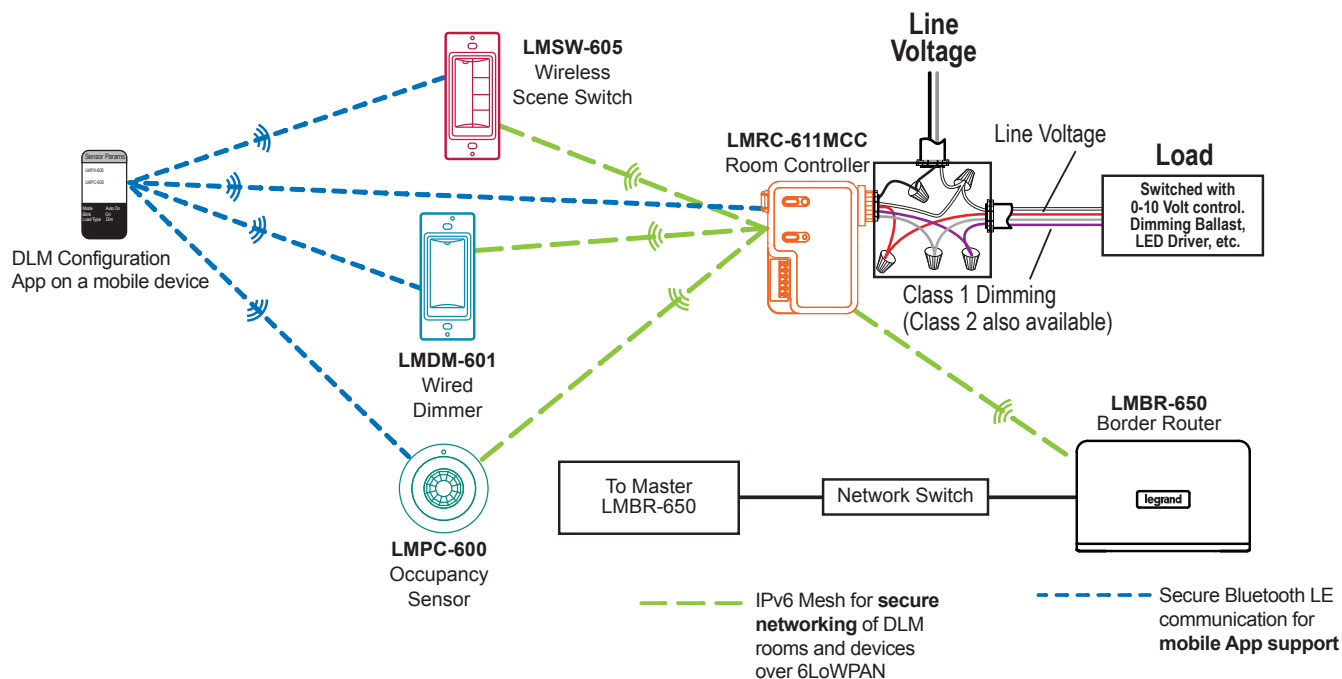
Wired DLM Segment Network Overview

- RS485 network, BACnet MS/TP twisted pair, baud rate 9600, 19200, 38400, 76800 or 115200 selectable
- Wattstopper LM-MSTP wire, rated for BACnet MS/TP (RS485)
- Linear topology (daisy chain wiring); 4,000’ max per segment
- Up to 40 DLM local networks, or up to 300 DLM devices, connected via LMBC-650 Network Bridge. LMCP panels added via equivalency chart (see TB# 189).

Wireless Zone Capacity	Maximum
Rooms with a wireless bridge or wireless room controller(s) per zone ¹	50 ²
Communicating devices (wired or wireless) per zone ¹	400 ²
Ethernet cable length from LMBR to nearest switch or enclosure	328 ft.
LMBR per floor	No Limit
LMBR per building	No Limit
LMBR per campus or enterprise site	No Limit
¹ Each LMBR managing wireless devices becomes a wireless zone (also known as a PAN)	
² Recommended design is 80-90% capacity	

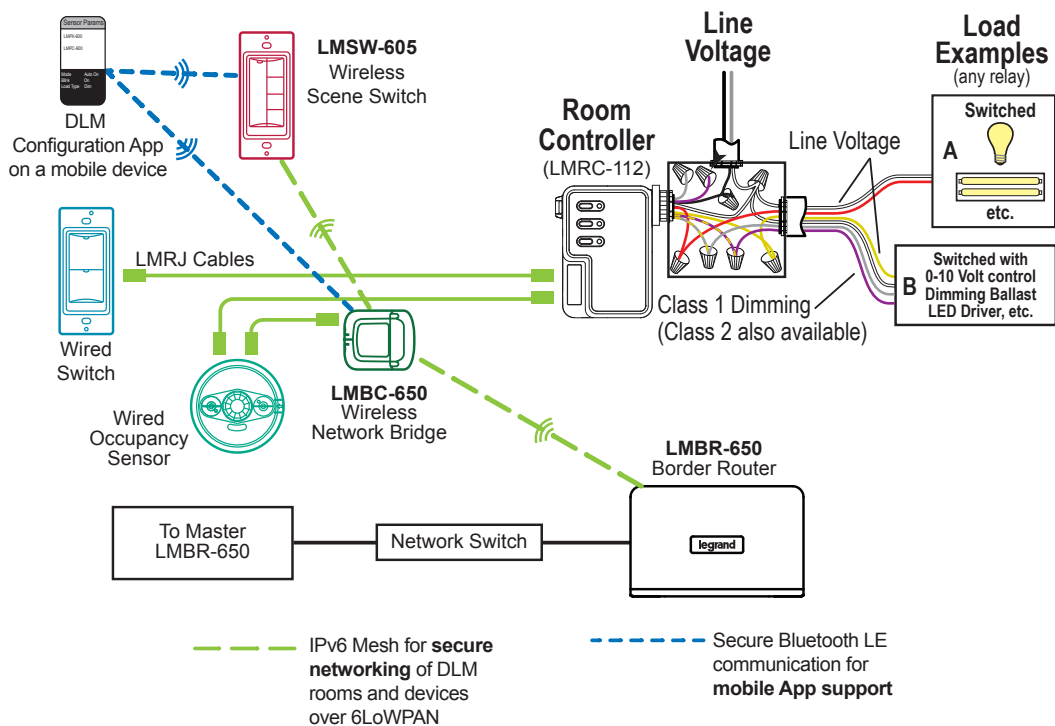
Connection Diagrams

Wireless Room, Using a Wireless Room Controller



Note: More than one room controller can be networked in a room when multiple loads are required. Any and all loads in that room can be controlled by any and all switches, dimmers, and sensors. Each LMBR-650 can communicate with up to 50 rooms (with an LMBC-650 bridge, or multiple wireless room controllers), and 400 devices.

Hybrid Room, Using an LMBC-650 Wireless Bridge



Segment Network Control Options

Description

Digital Lighting Management is designed to scale from individual rooms to whole buildings and campuses. For building-wide monitoring and management, multiple DLM local networks may be connected to an industry standard open protocol Ethernet network for control by DLM Dashboard, a segment manager, or via BACnet a building automation system (BAS). Networking also allows lighting control panels to be incorporated into a DLM system.

Operation

DLM uses a robust bottom-up design architecture, with a scalable hierarchy of individual rooms that can be easily networked to create zones, floors, buildings, and campuses. Individual rooms can be managed by the DLM Configuration App, and larger building networks can be managed by the DLM Dashboard software and remotely supported by RACCESS.

Building operators can create normal and after hours lighting control schedules and conveniently monitor and fine tune DLM operation for even greater energy savings. The LMRC-611MCC

Features

- Enables centralized control of individual DLM local networks
- Connects to LMCP lighting control panels
- Allows scheduling of DLM devices
- Enables remote system management that includes real-time current monitoring
- User interface can be accessed via direct TCP/IP connection, local LAN or via the Internet
- Easy integration with BAS through use of standard BACnet objects to represent DLM local network device settings and states

also monitors voltage and power consumption for advanced real time monitoring with extreme accuracy (+/- 2%).

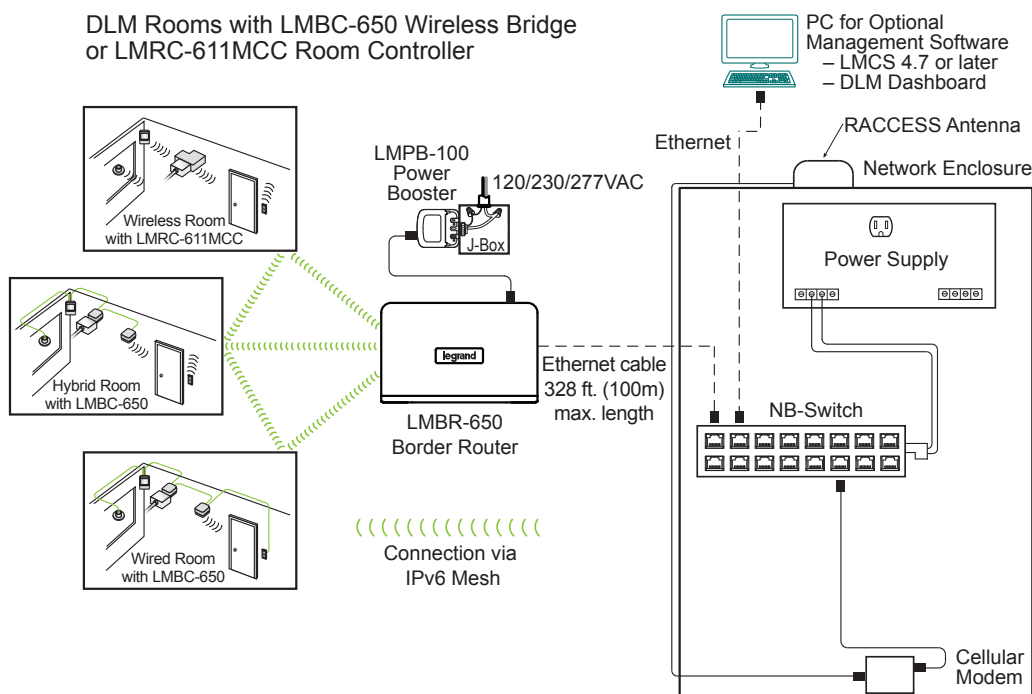
BACnet Compatibility

System integrators can quickly and easily incorporate new DLM wireless systems since they can communicate via BACnet IP. By connecting to the border router, information for each individual DLM device can be accessed.

Applications

Remote access is easily added to any Networked DLM System. It can help energy managers take advantage of demand response opportunities and help cut operating costs. It is also recommended for control of lighting in areas best suited to schedule-based control, such as lobbies, corridors and exteriors. If enhanced Room Controllers or Plug Load Controllers are used, energy data can also be made available to a BAS.

Wireless Single Zone Network Architecture



Multiple Rooms Connected to DLM Dashboard Software via Network Enclosure with RACCESS Remote Services

DLM CONFIGURATION APP



Description

The DLM Configuration app from Legrand is supported on iOS and Android and allows users (electrical contractors, installers, or technicians) to wirelessly scan for, pair together, and configure Wattstopper Wireless DLM devices and networks. From the convenience of a smart phone or tablet and using Bluetooth Low Energy (BLE), the app creates a secure environment to easily create and manage DLM wireless rooms across a project.

Wattstopper code compliant rooms are now easier and more secure to set up than ever before. Giving end-users comfort that their wireless rooms and floors are protected in a wireless and mobile environment. Replacing the traditional LMCT infrared remote, no other specialized or additional hardware or tools are needed for wireless DLM devices.

Highlights and Features

- Works with Wattstopper wireless DLM sensors, switches and room controllers
- Scan for, pair together, test and configure devices to create Energy Code compliant rooms
- Update device firmware via BLE
- Flash to identify wireless room controllers
- Manually adjust dimming levels



- View wireless network diagnostics and battery levels
- Set time delay and sensitivity for wireless motion detectors
- Enable light level settings for wireless daylighting control
- Program wireless room controller's ramp and fade rate (Note: In DLM, Ramp and Fades can be up or down)
- Individual user account and site management settings
- Create and assign scenes to scene buttons

DLM Dashboard

Description

The DLM Dashboard is a PC installed software package that brings Wattstopper's industry leading networked lighting control technologies into a single powerful platform. With wired, hybrid, and wireless DLM rooms working together, DLM Dashboard provides users with a simple and easy to use interface for configuring and managing the behavior of the lighting system to meet the dynamically changing needs of the building.

Operation

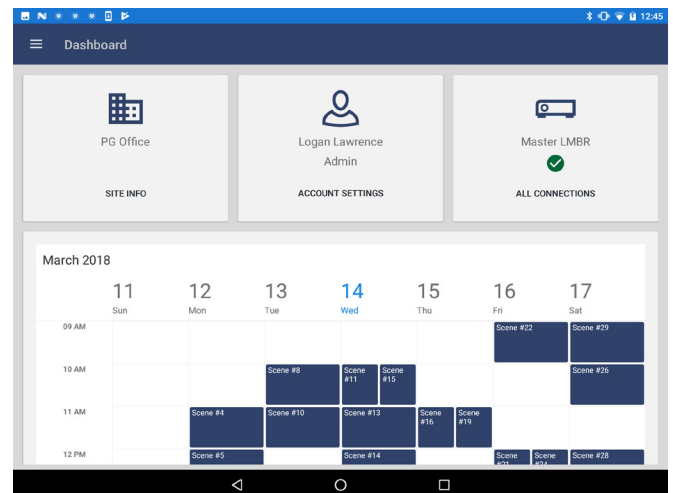
The DLM Dashboard communicates with wireless DLM and wired DLM hybrid rooms via an Ethernet network connection to the LMBR-650. A building automation system (BAS) may communicate with an LMBR via BACnet/IP, accessing an Export Table that exposes a selection of project-specific BACnet objects. Replaces the need for Segment Manager on a project that includes a border router.

Scheduling, Scenes and Adjustment

Users can easily monitor lighting in rooms and floors via a dashboard or building tree view that displays lighting status. Configuration enables basic adjustment of DLM device parameters including occupancy and daylighting sensor settings, load parameters, digital switch button configuration and dimming parameters. Normal hours and after hours parameters can be set or adjusted and users can create, view and edit daily, weekly or monthly repeating event-based schedules as well as create and edit scenes for a room, floor or building.

Features

- Works with wireless DLM, wired DLM hybrid rooms, and wired DLM rooms with a wired network segment
- Uses secure encryption technology to communicate with LMBR-650 via direct TCP/IP connection, LAN or remotely with RACCESS via cellular modem
- Create and edit room and building scenes and assign to devices as needed



- View wireless network diagnostics and battery levels
- Create daily, weekly, monthly repeating schedules based on specific time of day or astronomical time. US Holidays supported
- Allows central changes to occupancy sensor and daylighting sensor settings in real time
- Adjust scheduling of Normal/After Hours, On/Off, and Scenes

Wireless DLM Components

Load Controllers

LMRC-611MCC – 10A, 1 Relay Wireless Room Controller, 0-10V dimming, with metering and contact closure

Occupancy Sensors

LMPC-600 – PIR Ceiling Mount Occupancy Sensor

LMPX-600 – PIR Corner Mount Occupancy Sensor

Personal Controls

LMDM-601 – 1-Button Dimming Wall Switch

LMSW-605 – 5-Button Scene Switch

Daylighting Sensors

LMDL-600 Open Loop Photosensor, Single or Multi-Zone

Network Components

LMBC-650 – Network Bridge

LMBR-650 – Border Router

Configuration Tools

DLM Configuration App – available for iOS® or Android®

DLM Computer Interface Tools and Software (LMCS-100 and DLM Dashboard)