Fixture-Integrated Sensor based on Bluetooth® mesh

Converts Luminaires into Multifunctional IoT Devices

Bluetooth® mesh

0-10V Dimming Control

Motion Sensor

Fixture Integration

Ambient Light Sensor

Auto-nomous Control
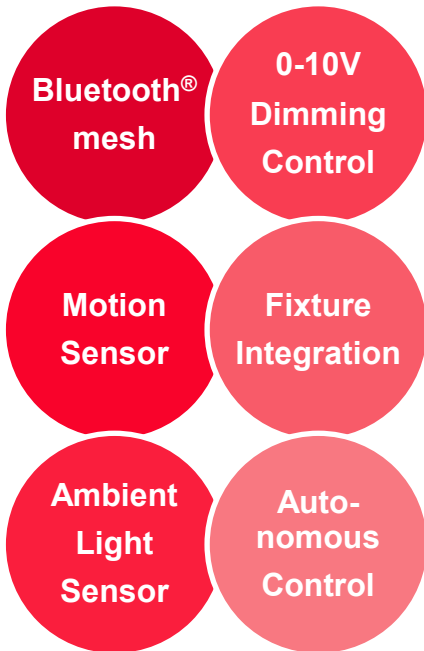
Murata's Fixture-Integrated Sensor combines occupancy sensing, daylight harvesting, 0-10V dimming and Bluetooth® mesh radio circuits into a small package that fits into various luminaires. When used with 0-10V dim-to-off LED drivers, it enables any lighting manufacturer to deliver wirelessly-controllable and sensor-equipped fixtures with minimal engineering effort. Murata's Sensor-equipped luminaires just need to be connected to mains power and can be simply configured using an intuitive mobile app. The result is increased occupant comfort and significant energy savings that meet the most demanding building energy codes. By leveraging Bluetooth® mesh, the first wireless standard for professional lighting applications which ensures unmatched scalability and reliability, the wireless lighting control system can be seamlessly expanded with Bluetooth® mesh-certified products and/or compatible Bluetooth® switches as needed.

Key Features

- Bluetooth® mesh compliant
- PIR occupancy detection
- Daylight harvesting
- Task tuning
- Compact form factor
- Works with 0-10V dim-to-off LED drivers
- Autonomous sensor-based control
- OTA firmware upgrade
- Scheduler control (plan)

Benefits

- Cost-effective solution for energy savings
- Energy code compliance
- Fits into existing and new-design luminaires
- Robust mesh network
- Decentralized control (no single point of failure)
- Gateway-less configuration & operations

Applications

- Open offices
- Individual offices
- Conference rooms
- Classrooms
- Retail stores
- Hospitals
- Lobbies

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Product Data

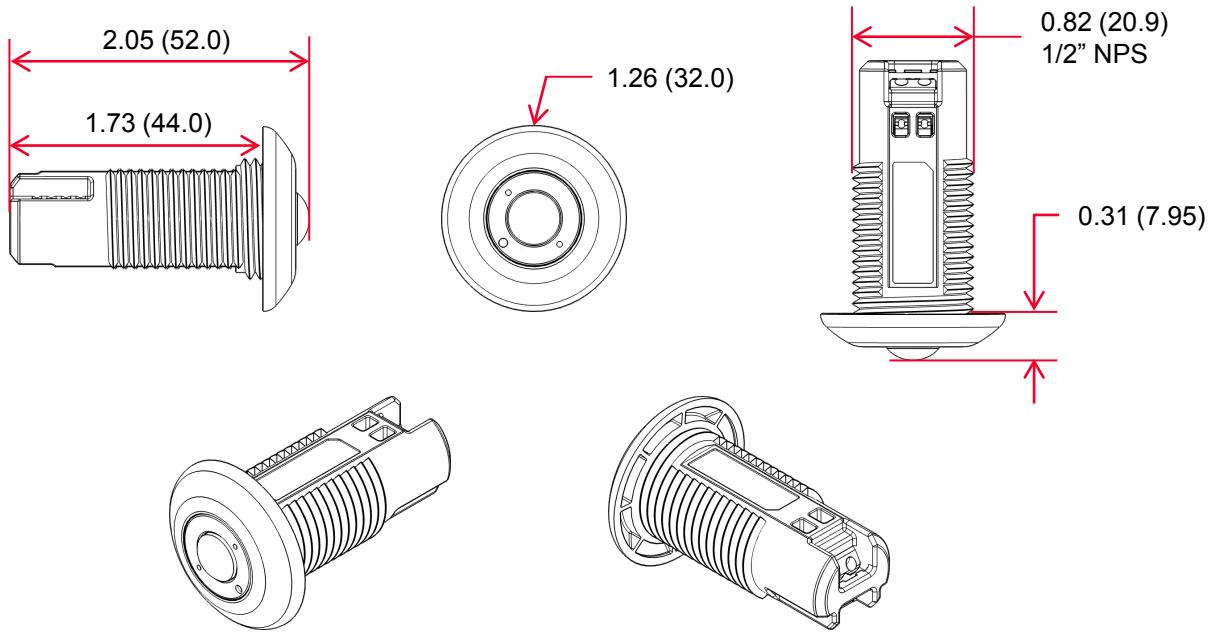| Ordering Information	
Sensor Controller	LBCC2ZZ1PR-TEMP (Sample P/N) / LBCC2ZZ1PR-280 (Production P/N)
Sensor-less Controller	LBCC2ZZ1UY-TEMP (Sample P/N) / LBCC2ZZ1UY-408 (Production P/N)

Physical Information	
Dimensions / Weight	See Dimensions / 12.3g (without locknut) / 21.3g (with locknut)
Mounting (Luminaire Hole)	1/2" trade size knockout (22.2-22.3mm)
Material / Color	ABS / White
Connectors / Wire Gauge	(2) two-pole connectors / 24-18 AWG (0.2-0.75 mm^2□)
Strip Length	0.28-0.35 in. / 7-9 mm

Electrical Information	
Input Voltage	12 VDC +/- 10%
Current Consumption	< 30mA (when dimming method = sink)
Dimming Control / Dim-to-off Threshold	Analog (0-10V) / Dim-to-off Threshold = 1.25V
Dimming Output	4mA (sink) / 10mA (source)
Factory Reset	Magnetic Reset
Status Indicators	Green (network status), Red (occupancy detection) **

Wireless Communication	
Radio Frequency	2.4 GHz
Wireless Protocol	Bluetooth® mesh / Bluetooth® 5
Wireless Range	100 feet (30m) Line of Sight
Radio Certification	FCC/IC, CE

Lighting Control	
Features	Continuous dimming , Individual/group addressing, Scene control, Task tuning (0-100%)
	Autonomous sensor-based control (Sensor-Controller), Scheduler control (plan)
	Decentralized control (no single point of failure)

Sensing (Sensor-Controller)	
Occupancy Sensing Type	Murata passive infrared (PIR) sensor **
Occupancy Viewing Angle	92º (see Occupancy Detection Pattern) **
Occupancy Detection Range	10 feet (3m) **
Occupancy Warm Up Time	40 seconds **
Daylight Harvesting Type	Ambient light sensor/light pipe (closed loop) **
Sensing Information	Can be shared within Bluetooth® mesh network **

Switch	
Compatible EnOcean Switch	EnOcean ESRPB/ EDRPB / EWSSB / EWSDB

Environment	
Operating Temperature Range	32ºF to 104ºF / 0ºC to 40ºC (indoor use only)
Operating Humidity	0-95% (non condensing)
Safety Certification	cULus Listed, Plenum Rated, CE

* All specifications are typical and at 25ºC unless otherwise specified
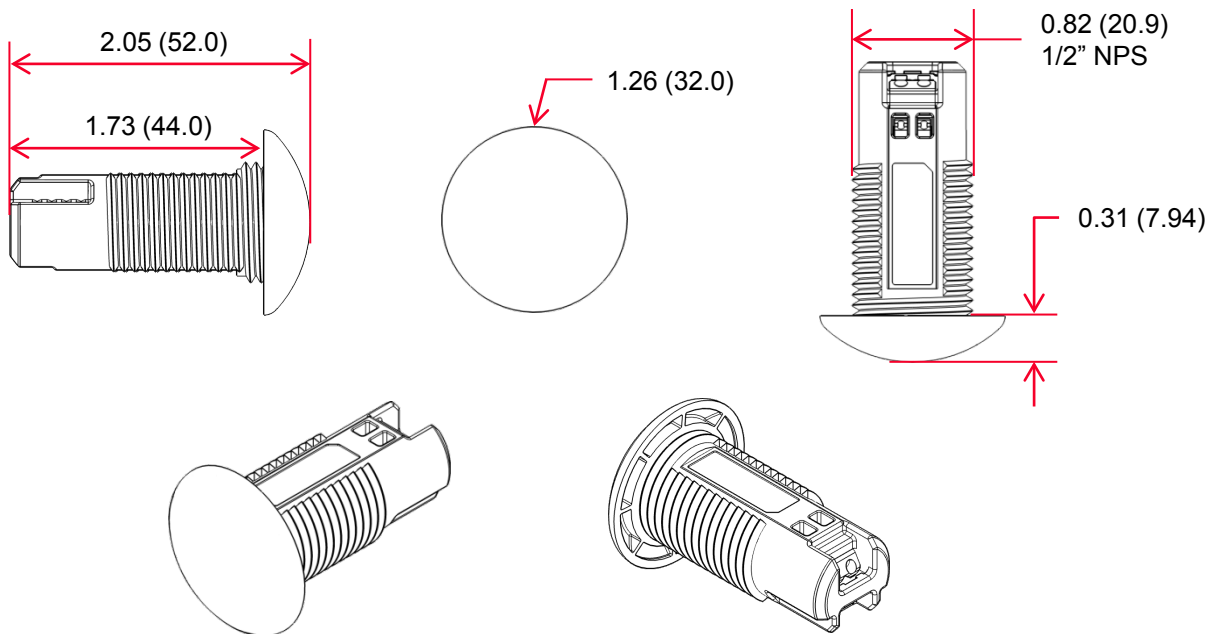**** Not available in Sensor-less Controller**

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Dimensions and Appearance (Sensor Controller)

2.05 (52.0)

1.73 (44.0)

1.26 (32.0)

0.82 (20.9)
1/2" NPS

0.31 (7.95)

* in (mm)

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Wiring Diagram – Single or Multiple LED Drivers

L

Non-AUX
LED Driver

N

DC+ — *(To LEDs)*
DC-
Dim+
Dim-

⋮

L

Non-AUX
LED Driver

N

DC+ — *(To LEDs)*
DC-
Dim+
Dim-

L

AUX
LED Driver

N

DC+ — *(To LEDs)*
DC-
Dim+
Dim-
12V
GND

AWG 24-18
(strip 7-9mm)
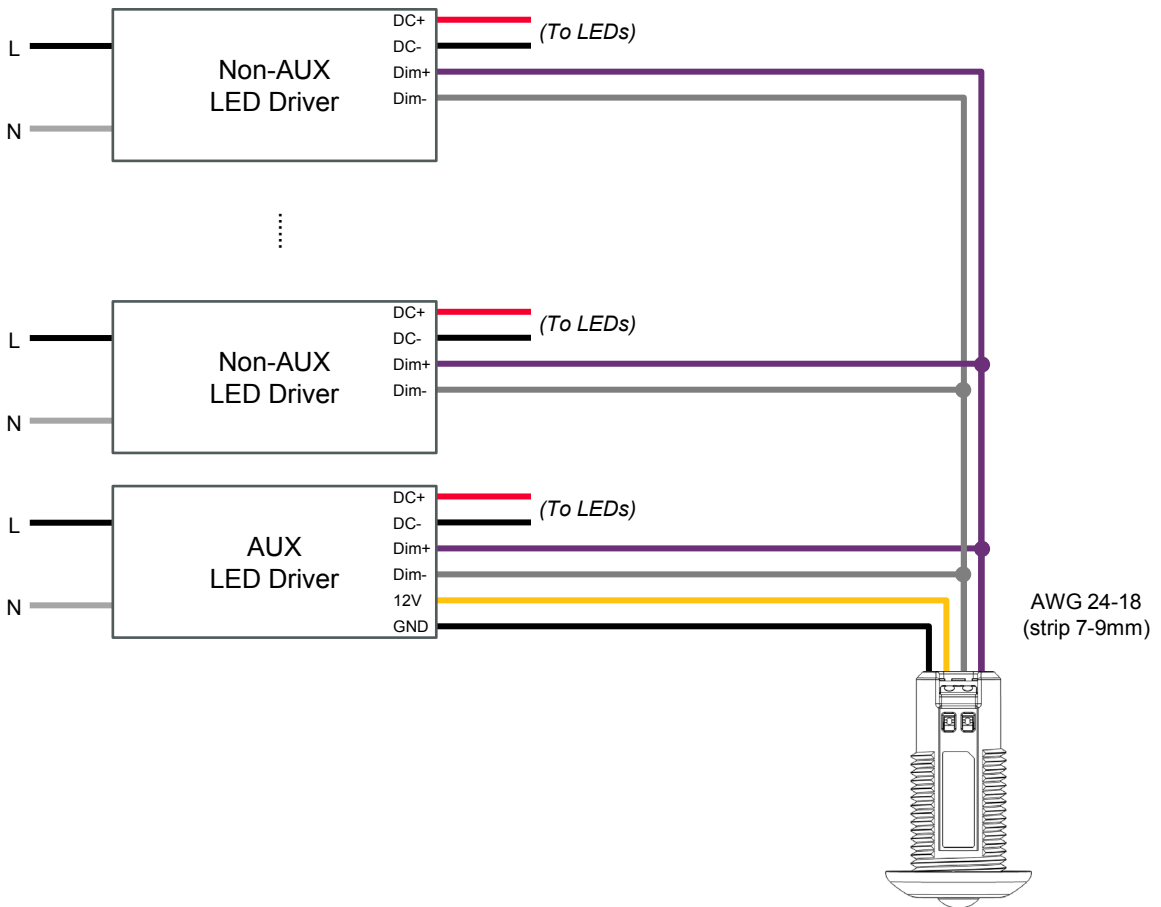
Wiring Diagram – External Power Supply

L

Non-AUX
LED Driver

N

DC+ — *(To LEDs)*
DC-
Dim+
Dim-

L

External
Power Supply

N

12V
GND

AWG 24-18
(strip 7-9mm)

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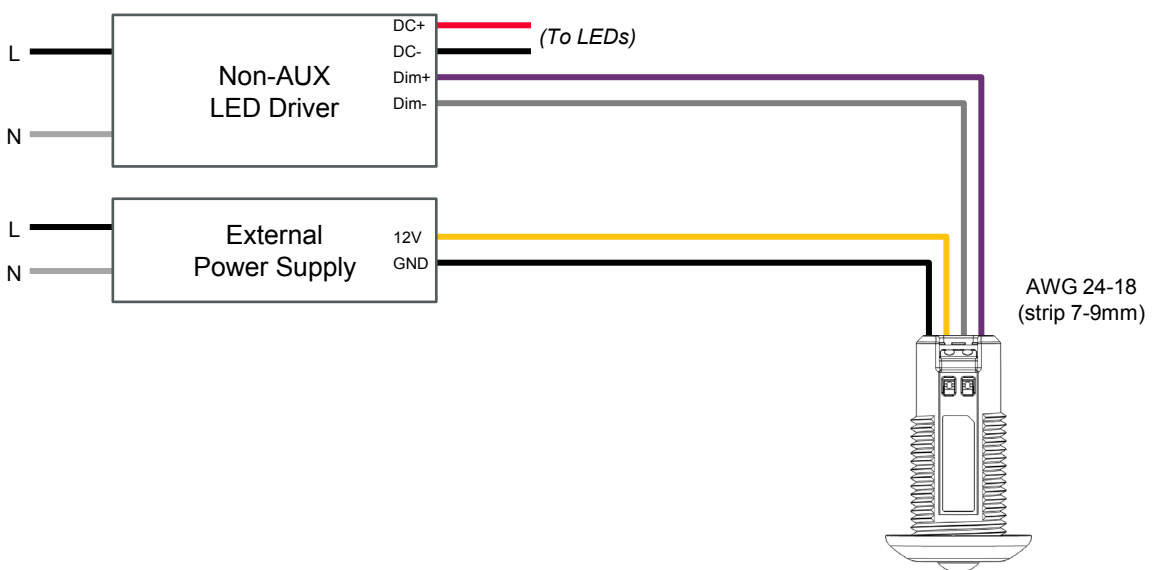
LED Indicators

Green LED (Network Status)	
Fast blink (300ms cycle)	Unprovisioned
Slow blink (2000ms cycle)	Provisioned
Blink twice	Mesh packet received
Long blink	Factory reset
Red LED (Motion Sensor Status)	
Blink once	Motion detected

Occupancy Detection Pattern

H	X	Y
7.9' (2.4m)	16.4' (5.0m)	16.4' (5.0m)
8.9' (2.7m)	18.4' (5.6m)	18.4' (5.6m)
9.8' (3.0m)	20.3' (6.2m)	20.3' (6.2m)
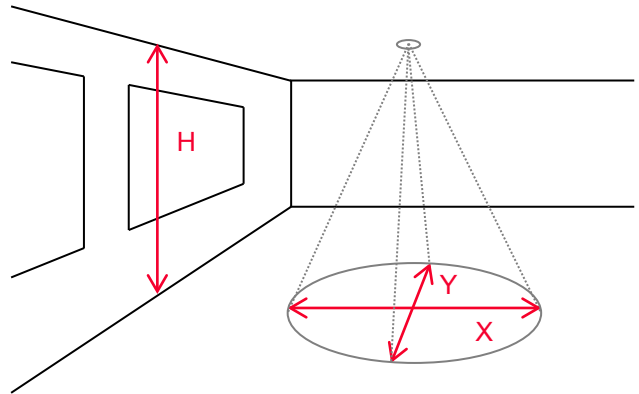
Orientation Indicators

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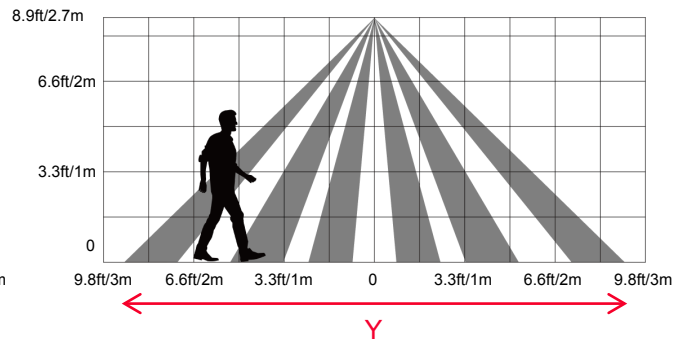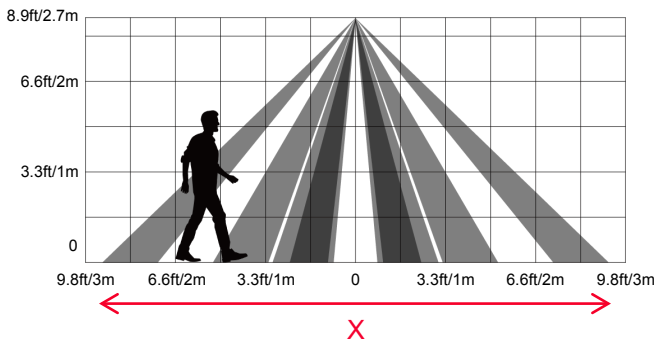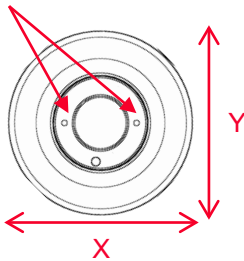
Supported Bluetooth® mesh Models

Bluetooth Mesh Models Messages

Mesh Model Generic Default Transition Time Messages	Mesh Model Sensor Cadence Message
Mesh Model Generic Delta Message	Mesh Model Sensor Column Message
Mesh Model Generic Level Message	Mesh Model Sensor Descriptor Message
Mesh Model Generic Move Message	Mesh Model Sensor Message
Mesh Model Generic OnOff Message	Mesh Model Sensor Series Message
Mesh Model Generic On Power Up Message	Mesh Model Sensor Setting Message
Mesh Model Light LC Light OnOff Message	Mesh Model Sensor Settings Message
Mesh Model Light LC Mode State Message	
Mesh Model Light LC Occupancy Mode State Message	
Mesh Model Light LC Property Message	
Mesh Model Light Lightness Default Message	
Mesh Model Light Lightness Last Message	
Mesh Model Light Lightness Linear Message	
Mesh Model Light Lightness Message	
Mesh Model Light Lightness Range Message	

Bluetooth Mesh Models Servers

Mesh Model Servers	Mesh Model Sensor Server
Mesh Model Generic Default Transition Time Server	Mesh Model Sensor Setup Server
Mesh Model Generic Level Server	Mesh Model Sensor Setup Server Private
Mesh Model Generic OnOff Server	Mesh Model Sensor Server Publisher
Mesh Model Generic Power On Off Server	Light Lightness Controller Server
Mesh Model Generic Power On Off Setup Server	
Mesh Model Light LC Server	
Mesh Model Light LC Setup Server	
Mesh Model Light Lightness Server	
Mesh Model Light Lightness Setup Server	

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