LDT-DALI-PIR-LUX

DALI-Bus Powered PIR Motion & Illuminance Sensor

A ceiling PIR and daylight sensor powered by the DALI bus. It reports events to a compatible application controller, which determines the lighting response.

Supply voltage	DALI bus; current specified at 16 VDC
Output type	DALI motion and illuminance events
Maximum bus current draw	8 mA at 16 VDC
Sensing inputs	PIR motion + ambient illuminance
Motion instance	IEC 62386-303
Illuminance instance	IEC 62386-304
Required controller	Compatible DALI-2 multi-master application controller
Maximum sensing coverage	12 m diameter x 3.5 m mounting height
Detection angle	120 degrees at ceiling mounting
Report-time settings	10 / 25 / 50 / 75 / 100 seconds
Hold-time settings	10 / 30 / 90 seconds; 3 / 10 / 30 minutes
Illuminance hysteresis	5 / 10 / 15 / 20 / 25 lux
Ceiling opening	86 mm diameter
Operating temperature	-20 to +55 °C
Maximum case temperature	+55 °C
IP rating	IP20
Body dimensions	95 diameter x 51 mm

This device consumes DALI bus power; it is not a DALI bus power supply, direct LED driver or standalone mains load switch.

The following reference pages include the complete wiring, dimensions, settings and operating instructions. Use the lighting and hardware variant identified above; shared references may illustrate other separate models.

DALI

DALI PIR Sensor

Features



- **Ceiling-mounted DALI PIR sensor, with a built-in motion sensor and light sensor,** complies with the DALI IEC62386-303/304 standards.
- Combination with a multi-master application controller that complies with the DALI-2 standard.
- Supports parameter configuration via the multi-master application controller.
- **Supports setting the report time, hold time and illuminance hysteresis value through the knob.**
- **Powered by DALI bus power supply.**
- Apply to halls, corridors, office buildings, hotels, ect.

Technical Parameters

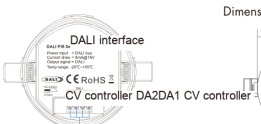
Input and Output	
Power	DALI Bus
Current draw	Max. 8mA@16V
Input signal	PIR + Light sensing
Output signal	DALI
Warranty	
Warranty	5 years
Package	
Size	L122 x W100 x H65mm
Gross weight	0.142kg

Sensor data	
Movment sensing (62386-303)	PIR sensor
Light sensing (62386-304)	Event: 0-1000lux(10bit) Resolution: 10lux
Detection angle	120°(ceilling installation)
Mounting height	3.5m
Sensing range	Max.(DxH) 12 x 3.5m
Report time	10s/25s/50s/75s/100s
Hold time	10s/30s/90s/3min/10min/30min
Illuminance hysteresis	5lux/10lux/15lux/20lux/25lux

Safety and EMC	
EMC standard	EN IEC 55015/ EN IEC 61547
Safety standard	EN 61347-1/-2
Certification	DALI-2 CE RoHS
Environment	
Operation temperature	Ta: -20°C ~ +55°C
Case temperature (Max.)	Tc: +55°C
IP rating	IP20

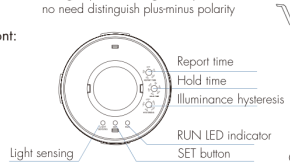
Mechanical Structures and Installations

Back:

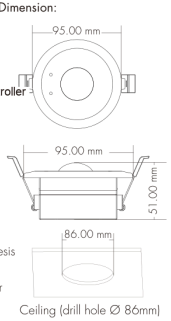


Two groups of DALI signal output, no need distinguish plus-minus polarity

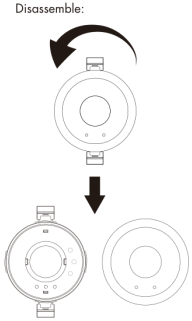
Front:



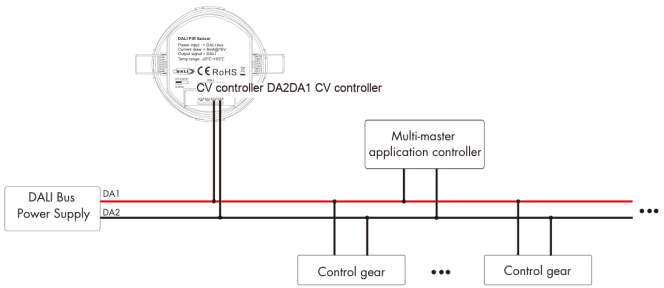
Dimension:



Disassemble:



Wiring Diagram



Control Gear: Includes DALI ballast, DALI dimming controller, DALI dimming driver, etc.

RUN LED Indicator status:
RED: Indicator light is always on red when the device detects human motion.
Green: Indicator blinks green when receives a DALI signal from the application controller and reports an event message to the application controller.

Note: If the application controller has a built-in DALI bus power supply, there is no need to connect a DALI bus power supply to the bus.

Knob and SET Button Function

Knob function



Report time:
The time interval during which the sensor reports the detected motion status to the DALI system.
When using a motion sensor to detect the motion status,
the reporte time determines how often the sensor sends information about the current motion status to the system.



Hold time:
The time during which the sensor detects a triggering event and maintains the current event status.
For example, when the sensor detects motion, it turns on the lights,
the hold time means during which the lights hold on after a person leaves the sensing area.



Hysteresis:
The event information will only be sent to the DALI system when the change in illuminance exceeds the preset hysteresis value.

Note:
The parameter values of the reporting time, hold time, and illuminance hysteresis value need to be set when the device is powered on.
Set the three parameter values through the knob. The data will not be synchronized to the central controller and requires manual update.
The Report time and Hold time parameters are used to configure the motion sensor (62386-303),
while the Hysteresis parameter is used to configure the light sensor (62386-304).

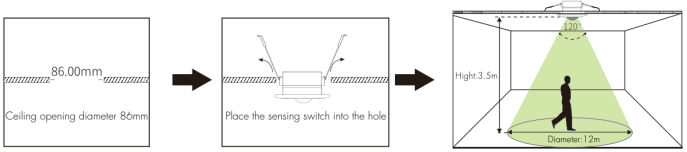
SET button function

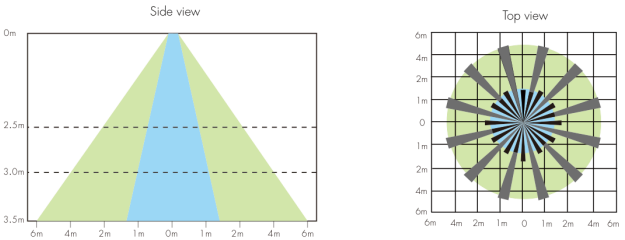


Short press: Enter the knob parameter setting state, the LED indicator light will flash rapidly.
If there is no operation within 5s, it will automatically exit the knob setting state.
Long press 5s: Restore the factory settings, the LED indicator light will flash rapidly five times.
See the factory default parameters in the "Instance factory default parameters" section (Pages 5-6).

Installation Example

Celling installation:





The detection area of the motion sensor can be divided into two parts:

High-sensitivity area (for fast movement, where the moving speed of a person is > 0.4 m/s)

Low-sensitivity area (for slow movement, where the moving speed of a person is < 0.3 m/s)

Installation Precautions

1. The sensor should be powered by the DALI bus.
2. A maximum of 64 sensors can operate in a single DALI circuit.
3. Ensure that the detection range of the sensor is within the illuminated area of the controlled luminaire.
4. Ensure that the detection ranges of each sensor do not overlap, as this may affect the lighting control logic.
5. When the installation height deviates from the recommended value (3.5 meters),
   the characteristics of the sensor may change:
   the higher the installation height, the lower the sensitivity;
   the lower the installation height, the smaller the detection range.
6. Heaters, fans, printers, and copiers within the detection area may cause presence detection errors.
7. Avoid direct exposure of the sensor to light sources.

Instance Settings Instructions

Instance: general
Each instance can be configured individually.
Some settings have the same function for all sensor instances, so they are described in this section.

Enable / disable
When the event is enabled, the sensor can send event messages to the system when the corresponding status changes,
so that the system can respond.
When the event is disabled, event messages will not be sent and can only be queried through the "Query" instruction.
Moreover, DALI-2 configuration commands and queries are still supported.

Event scheme
The event scheme determines which information is transferred with the event. This information is required, to enable recognition and / or filtering of events on the bus. The following 5 options are available:

Event scheme	Composition instructions
Instance addressing	instance type + instance mumber
Device addressing	device address + instance type
Device/Instance addressing	device address + instance number
Device/Instance addressing	device group + instance type
Instance group addressing	instance group + instance type

Instance group: Group the instances of different input devices into the same group.
Each instance of an input device can be assigned to up to 3 instance groups. The primary group is used to reporting events.
Instance type: The category of the functional units in the input device describes the functional attributes of the instance.
Instance number: The serial number of the functional unit in the input device is used to distinguish different instances
within the same device.
Device group: Group different DALI devices together. A device can be assigned to a maximum of 32 device groups (0 - 31).
Device address: Assign one device address to each device, with a total of 64 (00 - 63).

Event filter
Used to enable and disable specific event.
While the event filter of a specific event is disable, the specific event shall not be generated.

Event priority
The event priority determines the order in which events are sent when they occur simultaneously on the bus.
Priority 2 = highest and 5 = lowest.

Dead time
The dead time can be set for each instance. It determines the time that must pass before an event can be sent again.
This also applies if the event information (measured value) changes. If no dead time is required, it can be deactivated.

Report time
If the event information does not change, the event will be sent in a loop according to the reporting time.
The reporting time can be set for each instance.
It determines the maximum time interval between the sending of an event and the resending of the same event.

Hysteresis
Not every change in value leads to an event being generated.
The hysteresis can be used to set which percentage change is necessary to trigger a new transmission.
Attention, the hysteresis band is not arranged symmetrically. The following applies:
Increasing value:
The condition for an event is only fulfilled if the next value falls below the previous value minus the hysteresis or if the next value is greater than the previous value.
Decreasing value:
the condition for an event is only fulfilled if the next value exceeds the previous value plus the hysteresis or the next value is smaller than the previous value.

Hysteresis Min
Is the minimal hysteresis value that cannot be fallen below of.

Instance factory default parameters

Motion sensor instances and light sensor instances require instance-specific settings when used with the central controller. These settings are preset in the factory as shown in the table below. All that is required is to activate the event messages, which can be done manually with the DALI command "Enable instance" in DALI Cockpit.

Instance 0 - Motion:

Event messages	Active
Event schema	Instance addressing
Event fliter	Occupied Vacant
Dead time	100ms
Report time	20s
Hold time	15min

Instance 1 - Light:

Event messages	Disable
Event schema	Instance addressing
Event fliter	Illuminance level
Dead time	1.5s
Report time	30s
Hysteresis min	10lux
Hysteresis	5%

Instance 3: Occupancy sensor (Used for movement detection as speci3ed in the DALI-2 standard IEC62386 - 303)

The sensor switches between the following states:

Input value	Area atate	Movement
0x00	Vacant	Empty room
0xAA	Occupied	Room occupied but inactive
0xFF	Occupied	Room occupied and active

If the detects movement, the state change to "Room occupied and active". If no further movement is detected, it will exit this state at the earliest 1s later. At this time, the state will switch to "Room occupied but inactive". After the time delay ends, the state will change to "Empty room".

Report time: Can only be set if the event filter "Repeat" is activated and the events: "Vacant" and "Occupied" are enabled. The events between sending "Quiet events" again are determined by the report time.

Hold time: Is the time that must pass before the state "Room occupied but inactive" is changed to the state "empty room". If movement is detected during this time the state is changed back to: "Room occupied and active" (min. 1 second).

Event: the sensor status is transmitted by events. The following event information is available.

Event name	Event information	Description
No movement	00 0000–0b	No movement detected. Corresponding trigger is the "No movement" trigger.
Movement	00 0000–1b	Movement detected. Corresponding trigger is the "Movement" trigger.
Vacant	00 0000-00-1b	The area has become vacant. Corresponding trigger is the "Vacant" trigger.
Still vacant	00 0000-10-1b	The area has become vacant. The event occurs at regular intervals as long as the vacant condition holds. Corresponding trigger is the "Vacant" trigger.
Occupied	00 0000-01-1b	The area has become vacant. Corresponding trigger is the "Occupied" trigger.
Still occupied	00 0000-11-1b	The area is still occupied. The event occurs at regular intervals as long as the occupied condition holds. Corresponding trigger is the "Repeat" trigger.
Presence sensor	00 0000 0–b	The current event is trigger by a presence based sensor.
Movement sensor	00 0000 1–b	The current event is trigger by a movement based sensor.
	1x xxxx xxxxb 01 xxxx xxxxb 00 1xxx xxxxb 00 01xx xxxxb 00 001x xxxxb 00 0001 xxxxb	Reserved

Event filter: The event filter defines for which status change an event is generated. Filter arrangement:

Bit	Description	Value	Default
0	Occupied event enable?	"1" = "Yes"	1
1	Vacant event enable?	"1" = "Yes"	1
2	Repeat event enable?	"1" = "Yes"	0
3	Movement event enable?	"1" = "Yes"	0
4	No movement event enable?	"1" = "Yes"	0
5	Reserved	0	0
6	Reserved	0	0
7	Reserved	0	0

Instance 4: Light sensor (Used for light detection as speci3ed in the DALI-2 standard IEC62386 - 304)

The current illuminance value (lux) is measured by the sensor. It can be queried using the "query" command or automatically provided by the sensor over time.

The measurement range is 0 - 1000 lux. The resolutions differ between queries and generated events. Queries support an event resolution of 10 lux (10-bit).

Hysteresis: For information about hysteresis, please refer to the "Instances - General: Hysteresis" section.

Hystereis min: Settings are in lux. For information on the minimum hysteresis, see the "Instances - General: Hysteresis Min" section.

Event filter: The instance only generates one event with a resolution of 10 bits (0 - 1000 lux, step size 10 lux). If the filter is disabled, no events will be sent.

Events: Illuminance values are transmitted by events, the following event information is available.

Event name	Event information	Description
illuminance level report	illuminance event	The illuminance value report is used to transmit the actual illuminance value.

Event filter: The event filter defines for which status change an event is generated. Filter arrangement:

Bit	Description	Value	Default
0	illuminance level event enable?	"1" = "Yes"	1
1	Reserved	0	0
2	Reserved	0	0
3	Reserved	0	0
4	Reserved	0	0
5	Reserved	0	0
6	Reserved	0	0
7	Reserved	0	0