User manual

version 1.1

DALIpir1, DALIpir2, DALIpir3

Motion sensor

Sensor for light measurement

Control for constant illumination

Range 0-1023lx

Powered from DALI bus

DALI2 compatible

DALIpir is a combined motion and illuminance sensor with control to a constant illuminance level on the DALI bus.

Technical specifications		
bus	DALI / DALI2	
number of regulated groups	3	
DALI bus power supply	8	mA
maximum cross-section of conductors	0,08 – 1,5	mm^2
degree of coverage	IP40	
ambient working temperature	5 ÷ 50	°C
storage temperature	-10 ÷ 70	°C
weight	60	g

Functions

DALIpir is a combined motion and illuminance sensor that allows control to a constant illuminance. In addition to the main controlled group of lights, it allows the control of two more secondary groups. The lighting is directly controlled by the DALIpir unit without the need for an additional controller. Depending on the movement, it can be controlled to two different illuminance levels.

Addressing and setting is done with the DALIconfig program, which is available free of charge on the manufacturer's website via DALIusb, DALI232, DALInet or DALI2net converter.

Switching on and off the control or setting the lighting level to be controlled is also possible from any DALI controller with standard DALI bus messages using scenes.

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Motion sensor- DALI2

The motion sensor has functions according to the DALI2 specification.
Therefore, they can send information about the following events to the bus.

Occupied	The space is occupied (the occupancy of the space is extended from the last movement for the time according to the "Hold timer" parameter)
Vacant	The space is empty
Repeat	Periodic sending of motion information (according to the "Report timer" parameter)
Movement	Motion detected
No movement	End of motion detection

It is configurable whether events send information to the bus, but if information is sent, it has the same 10 bit format for all events:

9b.	8b.	7b.	6b.	5b.	4b.	3b.	2b.	1b.	0b.
-	-	-	-	-	-	1	Occupancy unchanged	Space occupied	Motion detected

Configuration

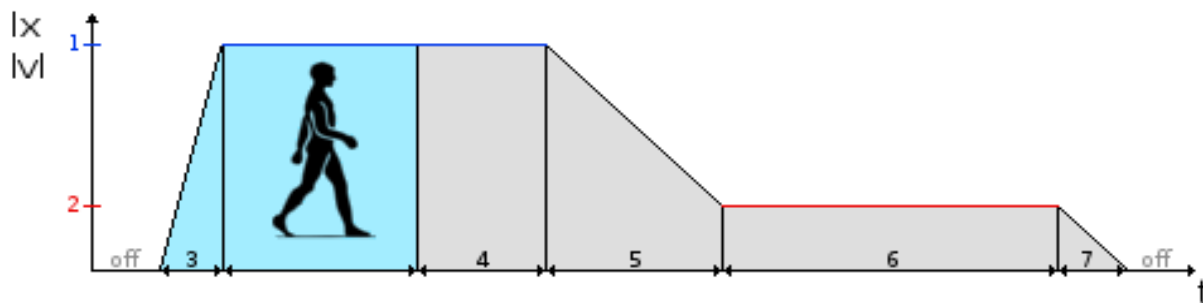|	
Report timer	Frequency of periodic transmission of movement information (1 - 255s or 0 - off)
Hold Timer	Occupied extension from the end of motion detection (No movement) (0-42.3min, after 10sec)
Dead timer	Maximum frequency of sending the illuminance value (0-12.75s).

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Motion sensor - DALI2+ extended functions

On top of the DALI2 standard, an extension called DALI2+ is implemented in DALIpir, which allows direct control and regulation of lighting on the DALI bus without the need to install a higher-level control system.

A motion sensor is used to automatically turn on lights when there is movement and dim/turn off lights when there are no people in the area. The lights can be switched on to a defined percentage value or can be controlled by the illuminance sensor to preset constant illuminance values.

The "Application controller enabled" option must be activated in the DALI2 device for the DALI2+ functions to be available.

The settings are made with the DALIconfig program, which is available for free download at www.foxtron.cz , via the DALIusb, DALI232, DALInet or DALI2net converter.

Configuration

Motion control enable		Enabling the motion sensor function
Motion mode – režim pohybovéh o senzoru	Temporily disable	Temporarily switched off control of luminaires during movement.
	Enable	On function for controlling the lights when moving. Lights are on when moving and dimmed or off when absent.
	Enable (only off)	On function for controlling the lights when moving. Lights must be be switched on manually and then dimmed or switched off in their absence.
Luminaire group Gmain		Main controlled group
1: Presence value		The absolute level to which the luminaires are set when present. Setting range 0-100%. In case the regulation to constant illuminance level is switched on, the value is unused and regulated to "Desired level 1" in the "Light sensor" section.
2: Absence value		The absolute level to which the luminaires are set in case of absence. Setting range 0-100%. In case the regulation to constant illuminance level is switched on, the value is unused and regulated to "Desired level 2" in the "Light sensor" section.

3: Fade time (to presence)	The speed of lighting when moving to "1: Presence value" if it is set to a percentage value. The "not used" value means that the value set in the fixture will be retained.
4: Run-on time (Presence)	Time from the end of movement for which absence is declared (5s-60min, or "infinity" which means that absence is not automatically declared).
5: fade time (to absence)	The rate of darkening at the end of the movement to "2: Absence value" if it is set to a percentage value. The value "not used" means that the value set in the fixture will be left.
6: Switch-off delay (Absence)	The period of time in absence during which the lights are dimmed. After that, unless "never-off" is set, the lights will turn off. If "never-off" is set, the lights will remain at "2: Absence value".
7: fade time (to off)	Extinction rate at the end of the absence period (Absence) A value of "not used" means that an OFF command will be sent and the lights will be turned off immediately.
Dead time (manual off)	The period of time the sensor ignores motion after receiving an "OFF" command on the luminaire. This allows leaving the room without turning the lights back on (0sec - 20min).
Sensitivity	Sensitivity of the sensor to motion. Setting range 0-250. Smaller number means higher sensitivity. For a value less than 70, false motion detections may occur depending on conditions.
LED function	**Auto** – the light in the sensor illuminates when motion is detected. When the control is switched on to a constant light level, this function is suppressed. **Off** – the indicator light in the sensor is off. **On** – the indicator light in the sensor is on.

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In addition to motion detection, it is possible to influence the status of the motion sensor over the DALI bus by means of sequence recall messages. On each scene recall that is sent for the main controlled group (Luminaire group Gmain) one of the following events can be recalled in the "Response to scene recall" section.

DISB	temporily disable	Turning off the motion sensor function (Motion mode=temporily disable)
ENAB	enable	Turning on the motion sensor function (Motion mode=enable)
EOFF	enable only off	Enable the motion sensor function to turn off (dim) the lights without motion. Switching on must be manual. (Motion mode=enable only off)
SMOV	simul. move	Motion simulation
SEPR	simul. end of presence	Switching to end-of-presence state "Presence"
SEAB	simul. end of absence	Switch to end-of-absence status "Absence"
SEDT	simul. end of dead time	Switching to the end-of-time state "dead time"
SSPR	simul. start of presence	Switching to the state of the beginning of the presence period "Presence"

Expansion sensors

If the sensed area of the sensor is insufficient, it is possible to set up up to two more sensors to extend the sensed area. In the main sensor, the addresses of the extension sensors (cA) and their motion sensor instance number (IN - for DALIpir1, DALIpir2, DALIpir3 and DALImiw it is 0) are set in the "Extended sensor addressess" section. Movement under the extension sensors then has the same effect as movement under the main sensor.

In the extension sensors the sending of "Movement event enabled" and "No movement event enabled" must be enabled and their other settings are not applicable for control.

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Illuminance sensor – DALI2

The light sensor has functions according to the DALI2 specification.
It can therefore send the following event to the bus.

Illuminance level	Illuminance value in the range 0-1023lx

Configuration

Event filter Illuminance level	Illuminance value sending turned on
Report timer	Frequency of periodic sending of illuminance value (1 - 255s or 0 - off)
Hysteresis	Sending the illuminance value when the value changes by more than the hysteresis value (5-25%)
Hysteresis min	Minimum hysteresis value (0-255lx) regardless of the "Hysteresis" parameter
Deadtime timer	Maximum frequency of sending the illuminance value (0-12.75s), regardless of the "Hysteresis" and "Hysteresis min" parameters.

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Iluminance sensor - DALI2+ extended functions

On top of the DALI2 standard, an extension called DALI2+ is implemented in DALIpir, which allows direct control and regulation of lighting on the DALI bus without the need to install a higher-level control system. The control can be done alone or in synergy with a motion sensor.
The "Application controller enabled" option must be activated in the DALI2 device for the DALI2+ functions to be available.

Setup is done with the DALIconfig program, which is available for free download at www.foxtron.cz, via the DALIusb, DALI232, DALInet or DALI2net converter.

Configuration

Ambient light control		Enable constant illuminance control
Luminaire group Gmain		Main regulated group
Desired level 1		The value of the illuminance to which the motion will be controlled (Presence). A value of 0lx means that the control is disabled and in case of an active motion sensor, it will be illuminated to the "Presence value" percentage.
Desired level 2		The illuminance value to which the illuminance will be controlled during the fade after motion (Absence). A value of 0lx means that the control is disabled and in case of an active motion sensor, the dimming will be set to the percentage "Absence value".
Control speed		Speed of regulation. 0 (slow) - 7 (fast) For normal applications, the default value of 3 can be left.
Switch-on level	Control behaviour at the start of movement	
	Minimum level	starting at the minimum value
	Maximum level	starts at the maximum value
	Calculated	starts at the calculated value depending on the current illumination conditions
	Flying	starts at the last value used

Sensor status control via DALI bus

In addition to motion detection, it is possible to influence the status of the light sensor over the DALI bus by means of sequence recall messages. For each scene recall that is sent to the main controlled group (Luminaire group Gmain), one of the following events can be recalled in the "Response to scene recall" section.

–		No action
STOP	stop regulation	Zastavení regulace
ON1	start regulation level 1	Switching on the control to the value "Desired level 1"
OFF	stop regulation and OFF	Switching off the control and lights
ON1S	start reg. + set level 1	Set the current illuminance value as "Desired level 1" Switching on the control to the value "Desired level 1"
ON2	start regulation level 2	Switching on the control to the value "Desired level 2"
ON2S	start reg. + set level 2	Set the current illuminance value as "Desired level 2" Switching on the control to the value "Desired level 2"

The control is also automatically deactivated by a standard DALI command, which the controlling master system or for example the DALI4sw wall button controls the lights (Gmain). These are for example the commands Ditect arc power, Off, Up, Down, Step Up, Step down, Recall max level, Recall min level.

Complete switching off of lights by regulation

The constant light control can set the lights to the minimum or switch them off completely when there is enough light.
To enable full dimming, check the "Enable dimming off" option.
To prevent flickering it is advisable to set the hysteresis with the "Treshold" option and the "Delay time". If the lights are dimmed by the control and there is a lack of light, then the lights are lit immediately (by turning off "Enable dimming on" this behaviour can be suppressed and the lights will remain permanently off until subsequent manual control)

Enable dimming off	Enabling the function of switching off the lights by regulation
Treshold	Excess illuminance required to switch off the lights completely
Delay time	Minimum time of excess illuminance for complete switching off of lights
Enable dimming on	Enabling the function of switching on the lights by regulation (from full off)

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Subsidiary groups

In addition to the main controlled group of lights, the sensor can control two other secondary groups.

The secondary groups are used if, for example, the sensor is under a skylight and in addition to the main group of lights (Gmain) under the skylight there is a secondary group of lights outside the skylight (Gside).In the configuration, it is possible to specify how much less light falls on the secondary group and the sensor controls the two groups differently so that they have the same illuminance.

Max. Illumin. By Gmain	Contribution of luminous intensity of luminaires in Gmain to 100% at location Gmain.
Light device min. level	Set minimum value (Min level) in the luminaires..
Luminaire group Gside 1	Group of the first subsidiary group
Daylight ratio Gside 1	the ratio of the light gain in the first sub-group from outdoor lighting compared to the main group
Illumin. ratio Gmain/Gside1	the ratio of the light increment in the main group to the first sub-group
Illumin. ratio Gside1/Gmain	the ratio of the light increment in the first sub-group to the main group
Illumin. ratio Gside1/Gside2	the ratio of the light increment in the first side group from the second side group
Luminaire group Gside 2	Group of the second subsidiary group
Daylight ratio Gside 2	the ratio of the light gain in the second secondary group from outdoor lighting compared to the main group
Illumin. ratio Gmain/Gside2	the ratio of the light increment in the main group from the second sub-group
Illumin. ratio Gside2/Gmain	the ratio of the light increment in the second secondary group to the main group
Illumin. ratio Gside2/Gside1	the ratio of the light increment in the second side group from the first side group

Light correction

If the controlled lights and natural light are coming from different directions, the different reflectance of the space may cause slightly different illuminance measurements when the lights are on and when they are off. For correction, it is possible to specify "Light correction" which is a multiple of the illuminance value when the lights are on at maximum. By default the value "times 1" (128) means that the correction is off.

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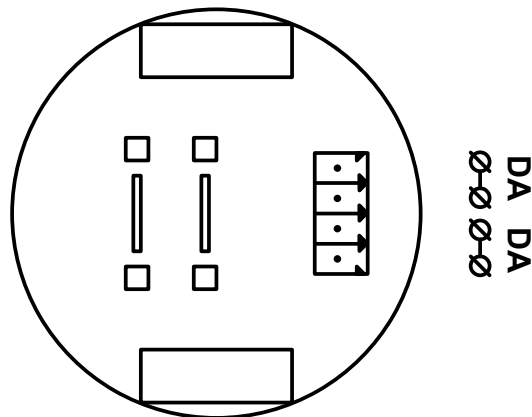
| clamp marking	description
DA	DALI bus, two wires interchangeable

Installation

The DALIpir sensor has two basic installation methods:

Installation in the suspended ceiling

Springs are supplied for installation in the ceiling and are factory fitted on the sensor.
The mounting hole is 60-63mm.

Installation on the surface using the mounting kit

Remove the fitted springs for a snap-on installation.
The mounting kit has two 4mm diameter holes for bolting.
When inserting or removing the sensor into the mounting kit, lightly squeeze the kit at a point perpendicular to the cable to facilitate removal.
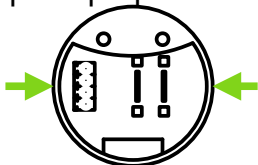

When installing the sensor, the position of the sensor should be selected with the following recommendations in mind.
   - No light source (sensor controlled or not) should directly illuminate the sensor.
   - The sensed area of the sensor must not face the windows.
   - The sensed area must not contain shiny objects (glass, metal) whose reflections are directed towards the sensor.
   - If several sensors are installed in one room, the sensor must not be affected by the light from the other group.

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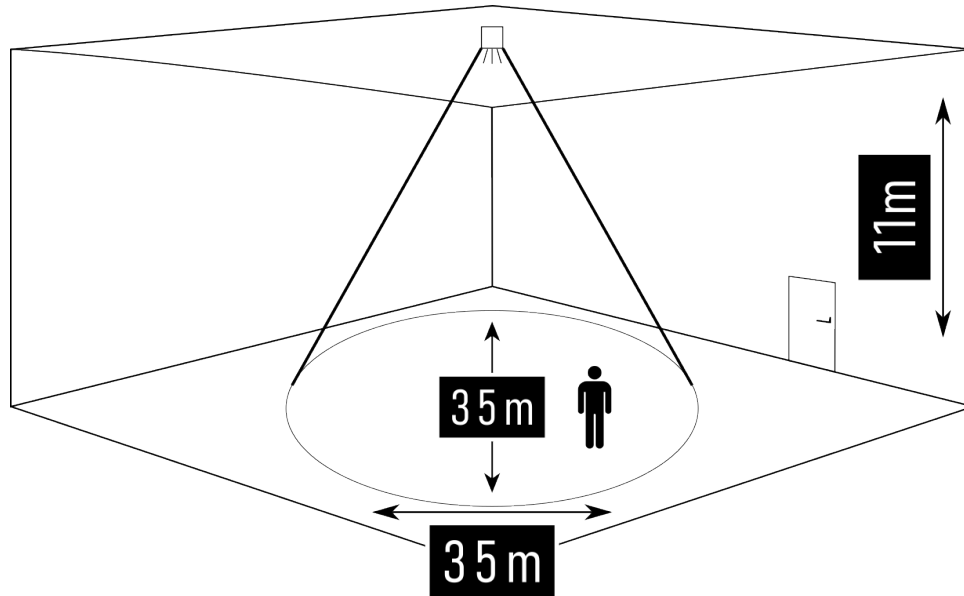
DALIpir1

DALIpir2

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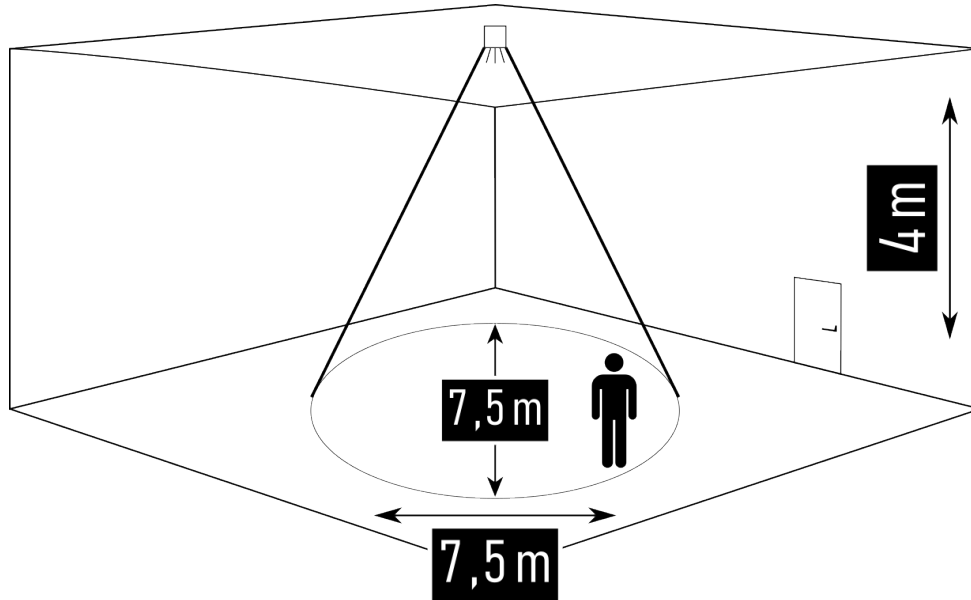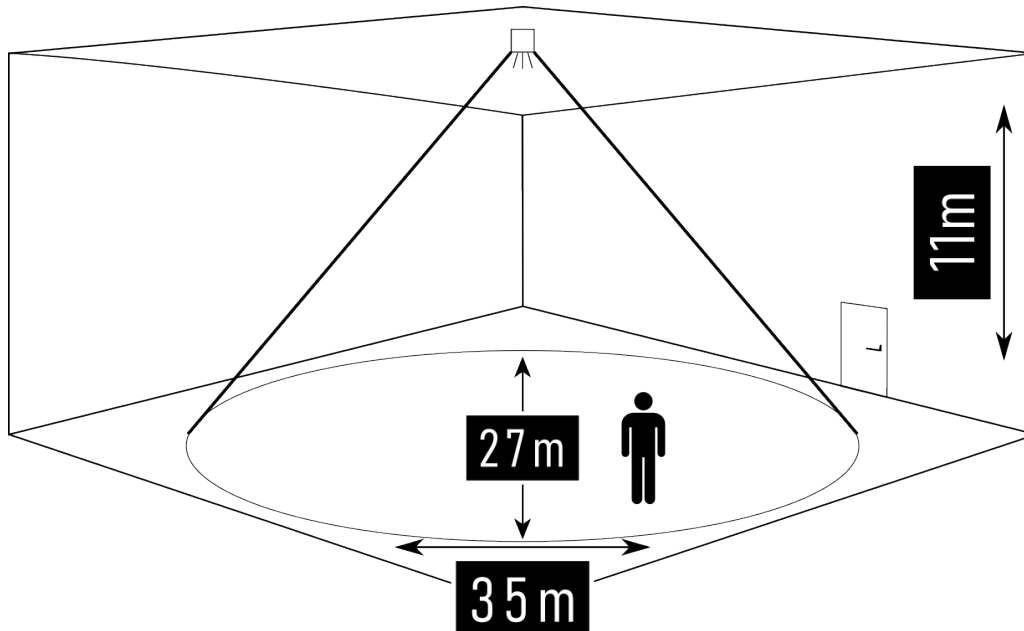
DALIpir3

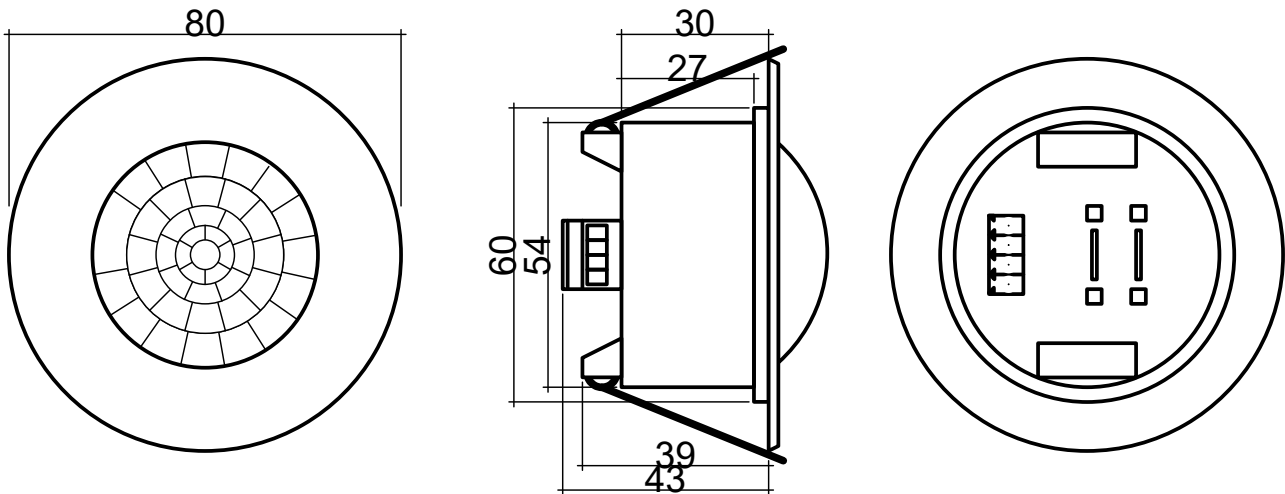|	maximum detection zone	optimal detection zone	maximum mounting height	typical use
DALIpir1	13m	7,5m	4m	offices, classrooms..
DALIpir2	40/32m	35/27m	11m	corridors, alleys..
DALIpir3	40m	35m	11m	Halls, warehouses..

U instalační výšky jsou uvedeny maximální hodnoty.
Při nižší montážní výšce se úměrně snižuje detekovaná oblast.
Ve směru pohybu po obvodu je PIR detekce účinější, a proto je ve směru ke středu počítat s nižší citlivostí.

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Installation in the suspended ceiling

Attached mounting

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