PHILIPS

Sensors

EasyAir

SNS212 MC

LED

Design-in Guide

Single, compact, **cost-effective luminaire control**

Philips EasyAir SNS212 MC

April 2023

Contents

Introduction to this guide

Philips EasyAir SNS212 MC

Thank you for choosing Philips EasyAir SNS212 MC. In this guide luminaire manufacturers will find the information required to design this product into a luminaire and configure it to suit specific applications. This design-in guide covers sensor functionality, mechanical mounting, wiring details, configuration and commissioning (grouping) method, application notes and frequently asked questions. For sensor specifications, please see the datasheet available at www.lighting.philips.co.uk/oem-emea/products/connected-lighting.

More information or support
For further information or support, please consult your local Philips sales representative or visit www.lighting.philips.co.uk/oem-emea/support/technical-downloads.

Warnings and instructions

- EasyAir SNS212 MC must be used with SR LED drivers, e.g. Philips Xitanium SR drivers.
- Do not apply mains power directly to the sensor.
- Do not cover the sensor during operation or mount the sensor internal to the luminaire.
- External infrared light source in the space might have influence on occupancy detection.
- Incorrect location of sensor (e.g., with setting up of multiple SNS212 devices into a single network or a group with addition of qualified wireless switches obstructions in viewing angle) will result in incorrect functioning of occupancy detection.
- Faulty settings of the sensor might result in undefined startup.
- Make sure the sensor, especially the occupancy detection lens, is protected from damage during shipment and handling. A drop of the unpacked sensor can compromise its function, even if no damage is visible from the outside.
- The application area of EasyAir SNS212 MC is designed for a typical indoor environment (open/private offices, conference rooms, classrooms, corridors, etc.) in normally heated and ventilated areas. EasyAir SNS212 MC has no protection against aggressive chemicals or water.
- Make sure that the EasyAir SNS212 MC Zigbee/Bluetooth antenna is not covered by metal for proper RF communication.

Introduction of EasyAir SNS212 MC

The Philips EasyAir SNS212 MC is the ideal solution for per-luminaire control of smart luminaires. It is the future proof successor of Philips EasyAir SNS210 MC. Occupancy sensing, daylight harvesting and task tuning are combined in a single, compact package for easy OEM luminaire assembly. EasyAir SNS212 MC operates with the established D4i open standard digital interface to make a simple two-wire connection between sensor and driver, thus eliminating the need for multiple components and auxiliary devices. The result is a cost-effective and easy-to-design-in solution ideal for energy-savings. An intuitive MasterConnect app makes commissioning and configuration during and after installation fast and easy.

EasyAir SNS212 MC enables grouping allows scene setting on a wireless switch (e.g., presentation mode for a conference room) as well as occupancy sharing (i.e., luminaires within a group can be programmed to remain at prescribed light levels so long as occupancy is detected anywhere in the group).

For more details on specification and ordering codes, please refer to the SNS212 MC datasheet on the technical downloads page.

www.lighting.philips.co.uk/oem-emea/support/technical-downloads

Product characteristics

EasyAir SNS212 MC overview

EasyAir SNS212 MC contains multiple functions in one housing and uses two wires to connect with an SR driver. (See wiring diagram in the Mechanical design-in section.) Functions include:
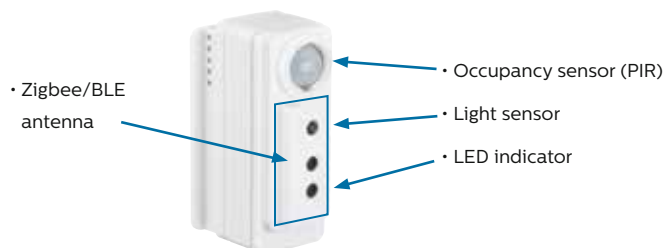

EasyAir SNS212 MC is designed for a typical indoor environment (open/private offices, conference rooms, classrooms, corridors, etc.) in normally heated and ventilated areas. The sensor is normally mounted to a luminaire and is optimized for a sensor mounting height of 2.5 m to 3 m.

Zigbee and Bluetooth Low Energy (BLE)

The Zigbee-BLE antenna should not be covered by metal and should be exposed to free air to ensure there is sufficient range.

For more information on mechanical design in of the sensor, please refer the section on .
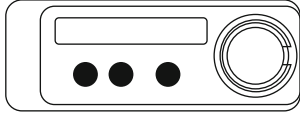
Motion detector

The occupancy sensor is a PIR (Passive Infrared) sensor that detects movement with an X–Y cross-area under an angle of X = 62° and Y = 84°. Two types of movements are defined as follows:
- **Major movement:** movement of a person walking into or through an area.
- **Minor movement:** movement of a person sitting at an office desk reaching for a telephone, turning the pages in a book, opening a file folder, picking up a coffee cup, etc.

When installed in a typical office ceiling at height, the sensor is sensitive to minor movements within X1 by Y1 area. It will respond to minor movements down to a few centimeters at the task area of a desk and is sensitive to major movements within a range of X2 by Y2. The directions X1, X2 are parallel to direction X; likewise for Y1, Y2 being parallel to Y. The maximum recommended height to place the sensor in the ceiling is 3 m to assure movement coverage and detection. The PIR sensor reacts on movement by means of a temperature difference, such as the human body temperature versus its surrounding temperature e.g. people. People sitting behind a transparent shield or glass window are not seen by PIR sensor of SNS212 MC. Please refer to the table below for coverage area details.

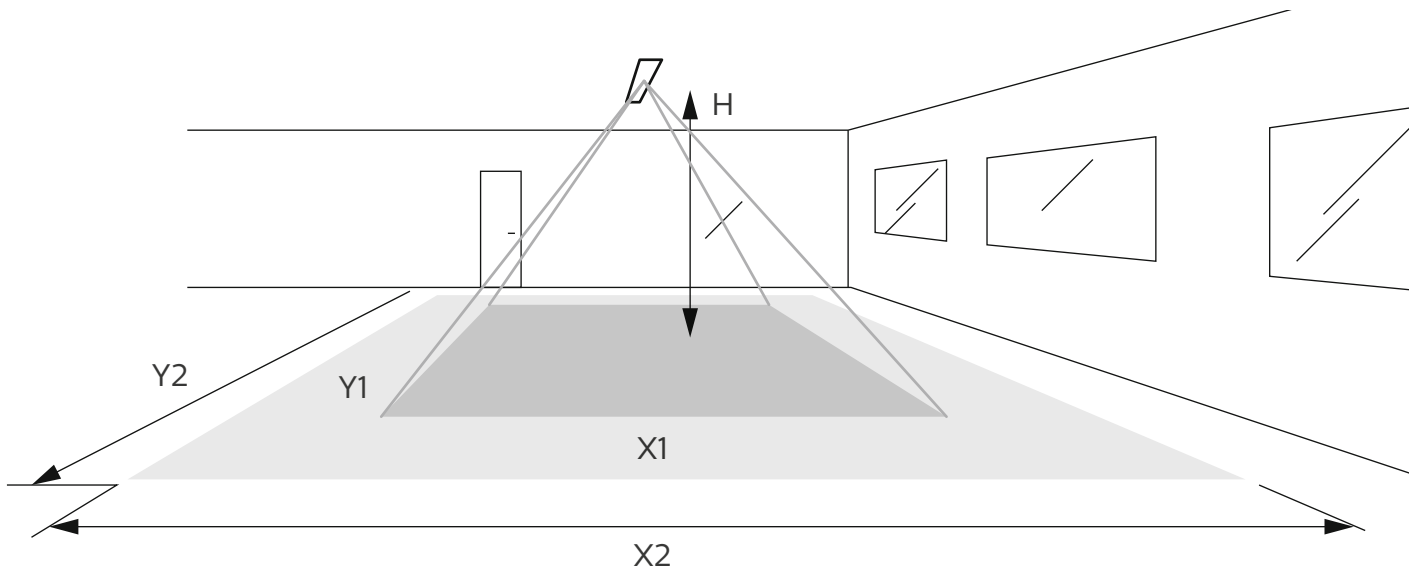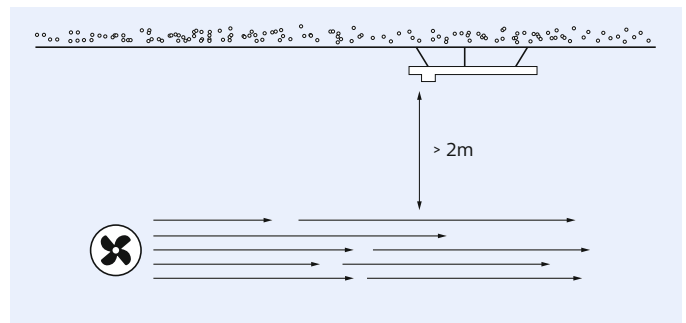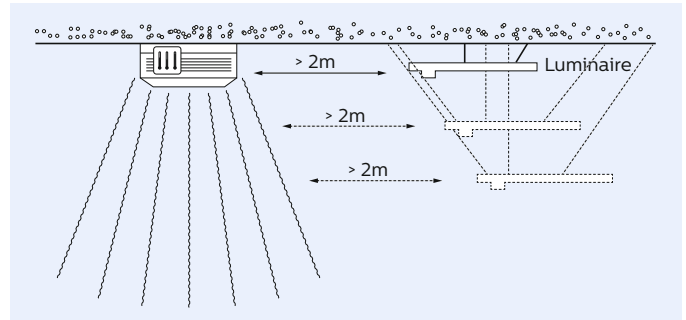|	Minor movement		Major movement	
Height (H)	X1	Y1	X2	Y2
2.4m	1.9	2.9	2.9	4.3
3.0m	2.4	3.6	3.6	5.4

Figure 1. Motion detection area. H: sensor installation height from floor. Minor movement detection area: X1 by Y1. Major movement detection area: X2 by Y2.

To prevent false triggers, the EasyAir SNS212 MC must be mounted more than 2 m away from air vents in all directions, see figures below:

Sensor view shield
The sensor comes with an occupancy view shield that can be used to block the movement detection by the sensor in a certain area. The shield comes inverted. (See Figure 2.) This view shield can be pulled out, flipped and inserted back in the sensor and then rotated so the correct area is shielded off from the detection area. If such shield is not needed in the application, it can be easily pulled out from the sensor or left as in the original position.
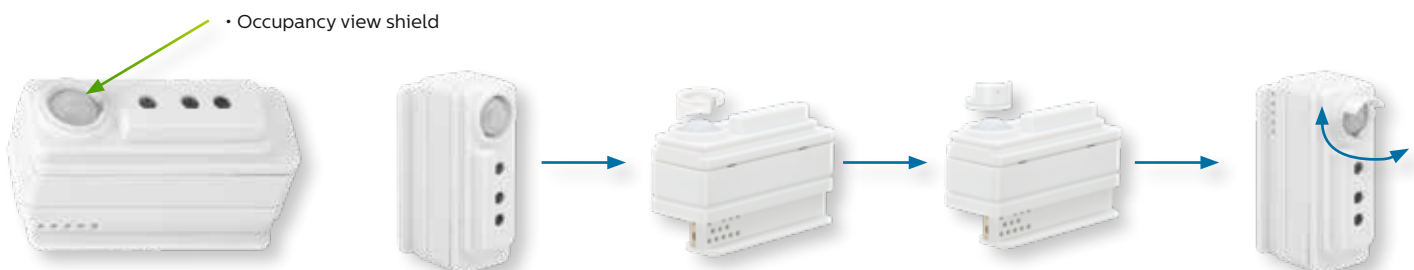The shield is not suitable to shield against air flows.

Figure 2. Sensor view shield.

Figure 3. Sensor placement.

Field of view

Y (cm)

h (cm)

Figure 4. Sensor mounting height from window sill (Y) vs. sensor horizontal distance from window sill (h).

Light sensor

The light sensor is a photo diode that reads the average light level captured under an angle of approximately 40°. This level depends on the amount of artificial and/or natural light supplied in the office, as well as how this light is reflected toward the ceiling/sensor. The EasyAir SNS212 MC converts the illuminance signal into ON/OFF or dimming commands to the Philips Xitanium SR LED driver in order to maintain a constant light level on the desk.

The sensor should be installed with a minimum distance of 0.6 m to the window to avoid the sensor looking outside. When the sensor is mounted too close to the window it will look partly outside. Sun reflection from cars or snow can reflect directly into the sensor. The sensor will then measure such high illumination levels that it will drive the artificial light to its minimal level or even switch off the artificial lights. The optimum distance [Y] from the window to EasyAir SNS212 MC can be obtained from Figure 4. This graph shows the relation between the horizontal distance from the window to the sensor [Y] and the height [h] of the sensor (h, vertical height of the sensor measured from the window sill).

LED indicator

The product contains a LED indicator. This is enabled by default, and it can be disabled through the app. The behavior of the LED is as follows:

Yellow LED on: = vacancy & light sensor are functional.

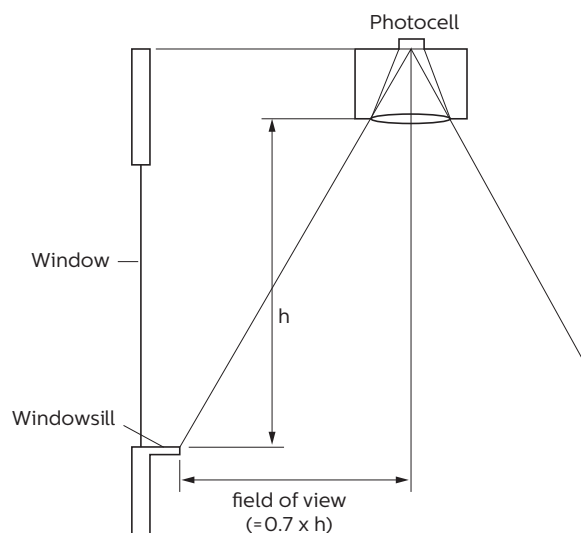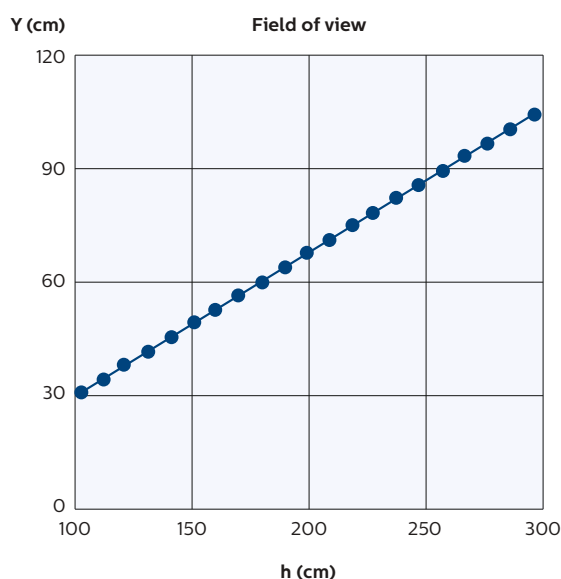Red LED on: = motion is detected and hold time is not expired yet.

Daylight regulation and calibration

Daylight regulation without calibration

When daylight-based control is switched on and no calibration is performed, the light output adjusts approximately to 500 lux times the value set for the Eco-on level. If the Eco-on level is set to 80% for example, the light output from the luminaire adjusts to approximately 400 lux in the working area.

The sensor doesn't read lux levels in the working area directly but measures the amount of reflected light that it captures. In the presence of daylight the sensor keeps the detected level constant by adjusting the light output of the luminaire.

The reflective properties of the surfaces in the field of view of the sensor, e.g. light desks or dark carpets, impact the amount of light that is directed towards the sensor and consequently influence the luminaires light output and actual lux levels in the working area.

In case the reflective properties of objects below the luminaires of a room vary, the luminaires can show different light output, even in absence of daylight. Luminaires above dark surface areas emit more light than those above light areas.

How to set the light level:
- In a dark environment adjust the output current of the luminaire and the Eco-on value for the required lux value in the working area. It is recommended to measure the value with a lux meter.

Daylight regulation with calibration

Any time after configuration a calibration routine can be initiated. When the calibration routine is run the light level adjusts to the full light output (given by the operating current of the luminaire) times the percentage value set for the Eco-on level.

In a dark environment all luminaires configured with the same Eco-on level show the same light output, independent of the reflective properties of surfaces below the luminaires.

The individual sensors store the dark reading of the daylight sensor and keep the value constant in the presence of daylight by adjusting the light output of the luminaires.

All luminaires react individually on the amount of daylight in the field of view of their sensor.

How to set the light level:
- Disable daylight regulation in the MasterConnect app.
- In a dark environment adjust the output current of the luminaire and the Eco-on value for the required lux value in the working area. It is recommended to measure the value with a lux meter.
- Place the smartphone at the center of the working area. Enable daylight regulation in the app again and press "Calibrate Daylight Sensor". Leave the room.
- To calibrate, the light output of the luminaires first goes to a low level and to a high level before it regulates to the set light level.
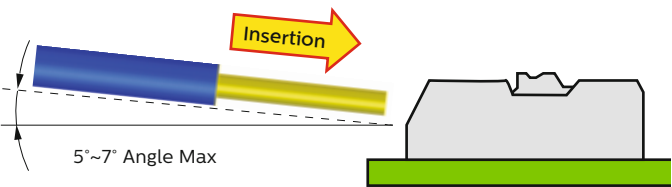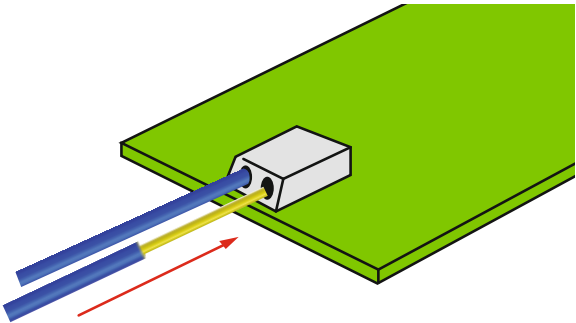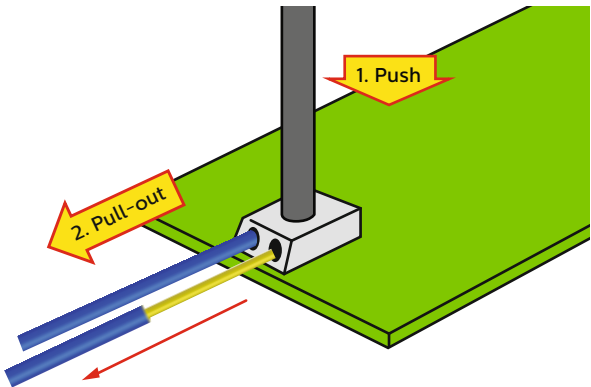
Mechanical design-in

Wire strip length

Strip length
8.0 ± 0.5 mm

Conductor

Insulation
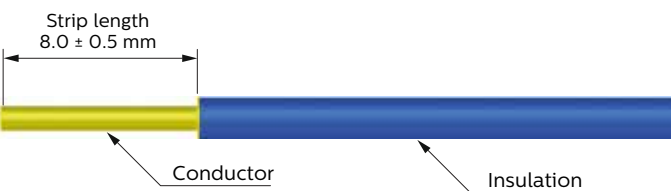
[Conductor: Bare Copper / Strand wire]

Wire insertion

Insertion

5°~7° Angle Max

Inserting solid conductors via push-in terminal

Wire separation from the connector

1. Push

2. Pull-out

Wiring Information

Applicable wires

Conductor size: solid	0.2 – 0.75 mm²
Conductor size: fine-stranded	0.2 – 0.75 mm²
Conductor size: fine-stranded	0.25 – 0.34 mm² (with insulated formule)
Conductor size: fine-stranded	0.25 – 0.34 mm² (with insulated formule)
AWG	24 – 18
Strip length	7 – 9 mm / 0.28 – 0.35 in

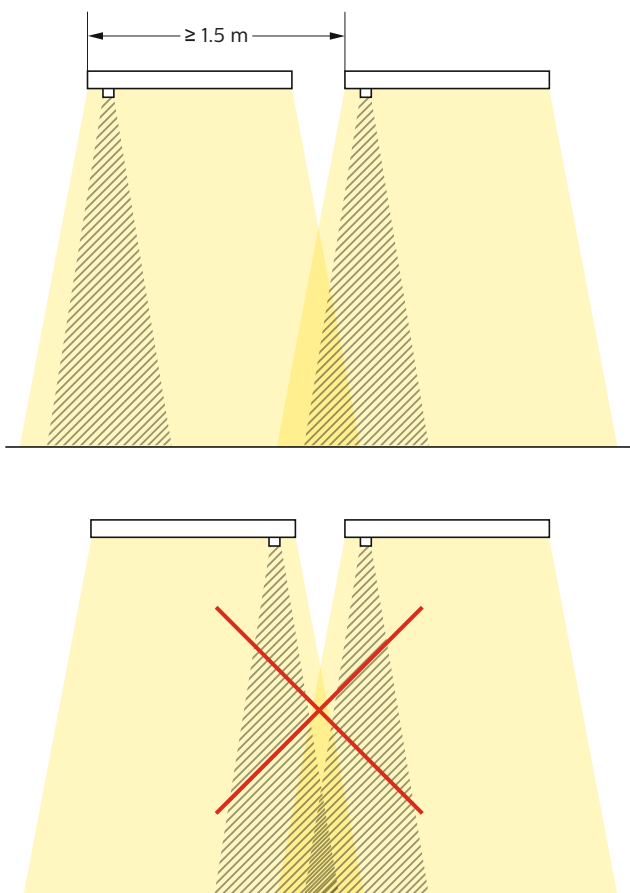**Note:** Stranded wires without ferrule should be soldered

Figure 5. Distance between sensors should be at least 1.5m apart.

Wire distance for remote mounting

It is recommended to keep the wire distance from sensor to Xitanium SR LED driver less than 2 m and meet the wire gauge requirement to guarantee the performance.

Luminaire-to-luminaire distance

If multiple luminaires with EasyAir SNS212 MC are used in the same area, the distance between the different sensors should be kept at least 1.5 m. This distance will minimize a sensor from "seeing" the light variation of neighbouring luminaires and reacting.

Recommendations to design-in EasyAir SNS212 MC with good RF signal

It is recommended to have one side metal wall distance from EasyAir SNS212 MC antenna greater than 100mm (assuming other metal walls are further away, see figure 6 below).
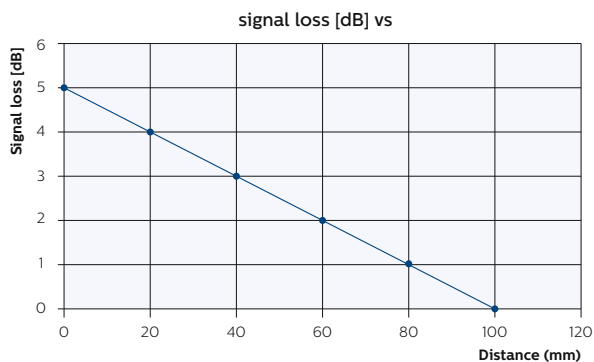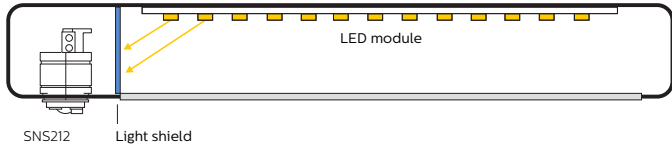

Figure 6. Transmission signal loss [dB] with distance to metal wall [mm].
Closer the metal wall, higher the signal loss.

SNS212   Light shield

Mounting in a luminaire

EasyAir SNS212 MC is a luminaire-mount sensor that is directly powered by a Xitanium SR LED driver. It can be mounted to a slot or a cut-out in sheet metal.

Note: When daylight sensing is enabled, it is advised to add a light shield in between LED module and EasyAir SNS212 MC in case the sensor is placed close to the LED module and in the same cavity. Without the shield some light can tunnel through the white housing and impact daylight sensing.

65 Max.

26 Max.

64 Max.

24 Max.

8 Max.
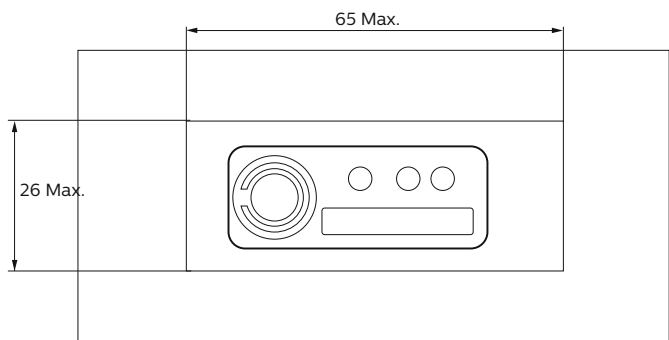
Mounting in a bracket (SMB-50)

The EasyAir SNS212 MC can be mounted in a bracket (SMB-50). Refer the figures for details on mounting and design-in into luminaire. All dimensions are in mm.


60 ± 0.2

22 ± 0.2
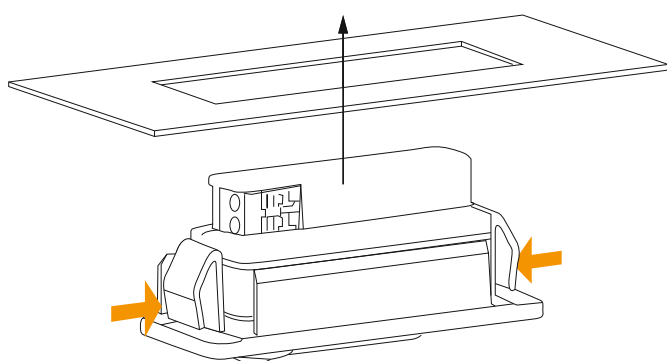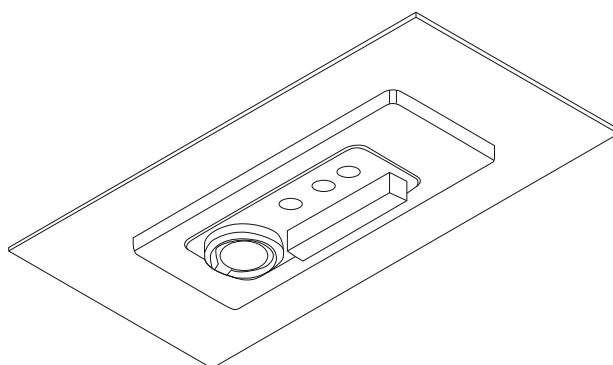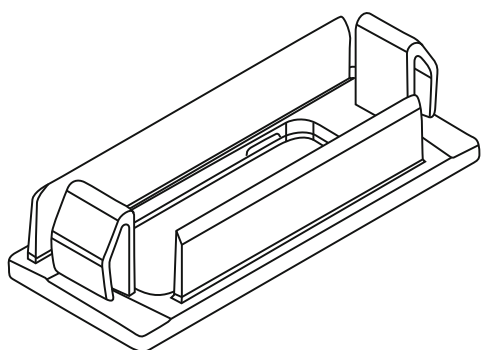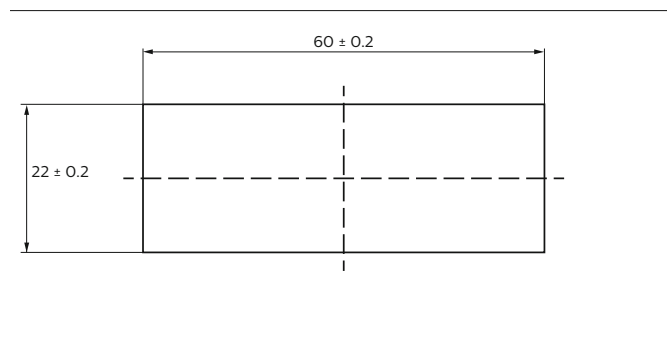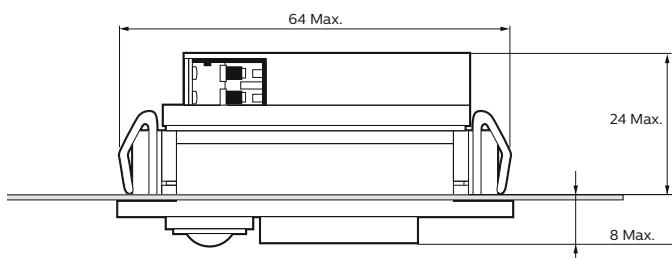
Press springs inwards on both sides before the bracket can slide-in the luminaire hole.

Installing EasyAir SNS212 MC with ceiling mount bracket (CMP/W)

The ceiling mount CMP bracket is available as a bracket without any pre-mounted sensor or cable. The luminaire manufacturer needs to mount the sensor in the CMP bracket and attach cable to it. The cable and screws are available with the accessory.

Caution: The cable length from the EasyAir sensor to SR driver should be kept <2m.

For cut-out in the ceiling and mounting, refer to the figures below. All dimensions are in mm.
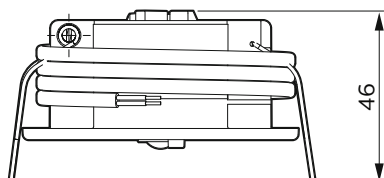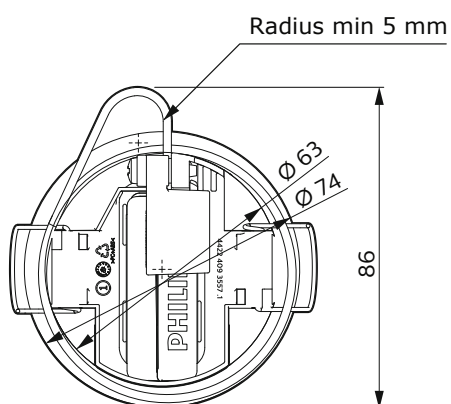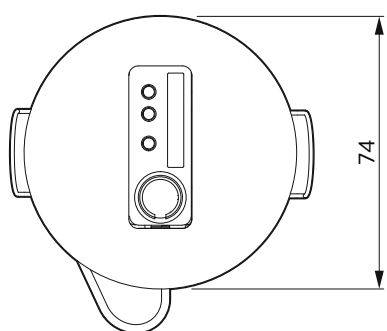
Labels

SNS212 MC sensors are supplied with three labels which each contain the assigned ZigBee MAC Address. For a typical application, the top two labels can be removed and discarded.
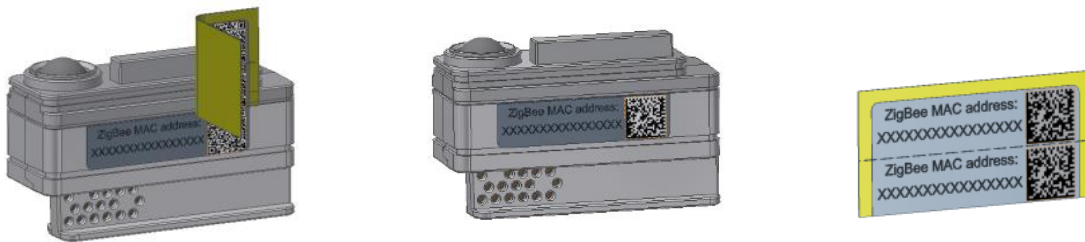
For a network application using a gateway, the labels can be used to identify a luminaire and where it is installed in the building.

• Label 1 - Apply to the luminaire
• Label 2 - Apply to the floor plan
• Label 3 - Remains on the sensor

EasyAir SNS212 MC with multiple Philips Xitanium SR LED drivers (1:N application)
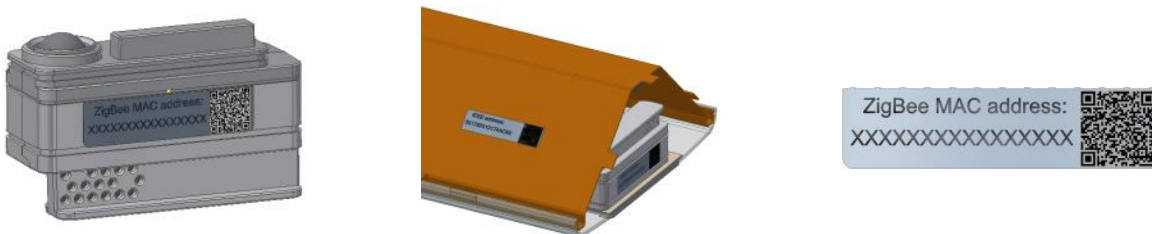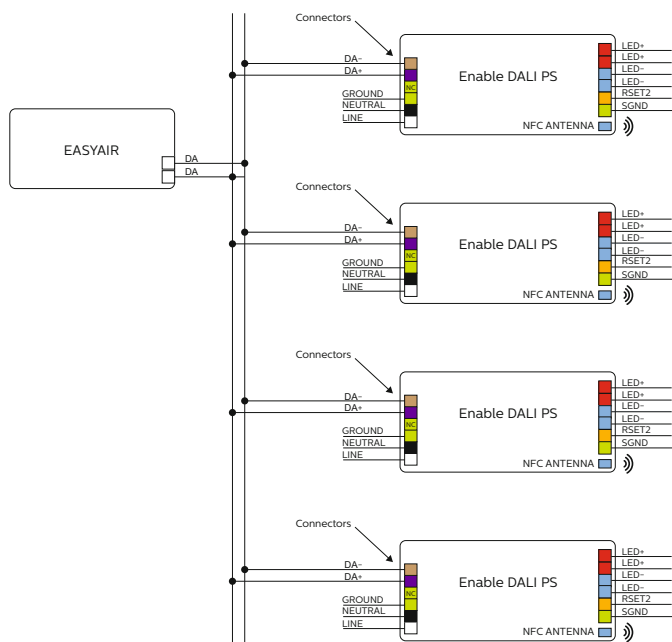

When a group of luminaires is in the same daylight condition and needs to be operated at the same level, it is possible to use one sensor to control multiple luminaires. This can be done in two ways:
(a) Use an SR bridge which can then connect to multiple DALI drivers. For details on SR bridge, please refer to design in guide of SR bridge.
(b) add multiple SR drivers together.

In case EasyAir SNS212 MC is connected to multiple Philips Xitanium SR LED drivers, the number of drivers is limited to 10. Not more than 4 drivers should have DALI power supply enabled. To minimize unnecessary losses, it is recommended to turn on only two DALI power supplies. Each SR driver provides approximately 55mA of current on the DALI bus, and EasyAir SNS212 MC is limited to 250mA.

EasyAir SNS212 MC sends commands to all connected drivers (using broadcast command); it does not have capabilities to address individual drivers. The light commands are sent as a broadcast command, so occupancy-/daylight-based lighting control and task tuning operate the same on all connected drivers. The readout of energy information from the connected drivers will not function. The energy readout of multiple drivers is foreseen in our roadmap.

> ⚠️ **Warning:**
>
> Please note the DALI power supply can only be turned on/off on the Philips Xitanium SR LED driver through the MultiOne tool. For this application, please also make sure all drivers that are connected to the sensor have the same wiring polarity. SR drivers are shipped with the power supply on as default.

Luminaire Production Test

To ensure that a luminaire has been assembled correctly i.e. the wiring of the EasyAir SNS212 MC sensor to Xitanium SR driver is correct; a visible check can be made.
The luminaire on power up dims up to 30% of maximum light output in the 1st second followed by dimming up to 100% in the next second.
This behaviour is only visible in non-commissioned devices i.e. once grouped using Philips MasterConnect app, this behaviour will cease to exist.

FAQ

Can you use a wall dimmer with EasyAir SNS212 MC?

SNS212 MC can be used with a wireless wall dimmer, e.g., Zigbee green power switch. For list of supported switches, please visit our website

How does EasyAir SNS212 MC compare to Philips ActiLume?

Occupancy sensing and daylight harvesting are similar. Form factors are also similar, with the face of the sensor outside the luminaire having the same size. The portion of EasyAir SNS212 MC within the luminaire is slightly deeper and longer to accommodate added functionality. EasyAir SNS212 MC includes granular dimming together with energy reporting and works with Philips Xitanium SR LED drivers to eliminate the cost and complexity of a separate power pack.

Is EasyAir SNS212 MC a DALI sensor?

EasyAir SNS212 MC works with Philips Xitanium SR LED drivers, which have inbuilt power supply. It cannot be used with DALI drivers and therefore, EasyAir SNS212 MC is not a DALI sensor.

Can I use EasyAir SNS212 MC outside a luminaire?

An accessory option called CMP/w is available to enable ceiling mounting. Wiring to the driver must be kept less than 2m.

Can I use one sensor with multiple luminaires?

Yes, and the ceiling mount option is likely utilized in this use case (called 1:N operation as opposed to 1:1). It usually means turning off the SR power supplies in all but two of the SR drivers. See EasyAir SNS212 MC with multiple SR drivers 1:N application section.

Does EasyAir SNS212 MC make sense if I only want to do occupancy sensing?	Yes. Keep "Occupancy Control" enabled in MC App and disable "Daylight Control"
Is EasyAir SNS212 MC "failsafe"?	Unlike traditional occupancy sensors, EasyAir SNS212 MC does not have a mechanical relay. This is a benefit of Philips SR LED drivers, as on/off is done relay-free within the driver. Devices with mechanical relays should be designed so that relay failure results in "lights on." If an SR driver does not see a digital signal from a device for a long period of time (e.g., loose connection, sensor failure), the driver goes to full programmed output.
Does EasyAir SNS212 MC work on 0-10v drivers?	No. EasyAir SNS212 MC works on Philips Xitanium SR LED drivers to enable two-way digital communication directly to the driver and to eliminate the need for other auxiliary devices.

Contact details

Philips EasyAir SNS212 MC

Product information:
www.lighting.philips.co.uk/oem-emea/products/easy-to-integrate-wireless-sensors.html

Or contact your local Philips sales representative.

Disclaimer

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04/2023
Data subject to change