



The Thorlux Smart system uses a passive infra-red (PIR) movement sensor built into each luminaire. Infra-red sensing is a commonly used technology for lighting control, but it is important to consider a few factors in order to get the best performance from the luminaires.

## PRESENCE DETECTION OF THE SENSOR

There are two different sensors available:

For internal use

Standard Smart Sensor – for use up to 8m

High Level Smart Sensor – for use up to 18m

## MOTIONLINE

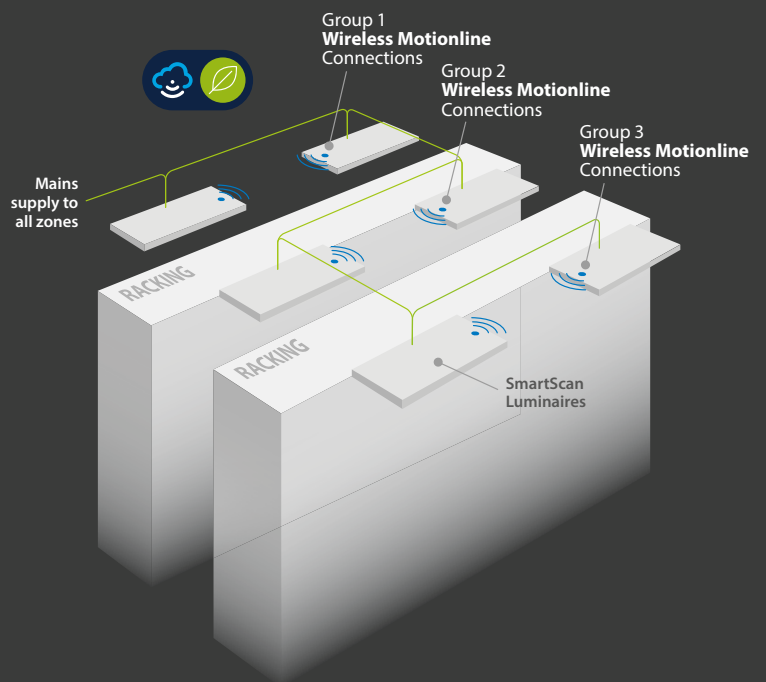
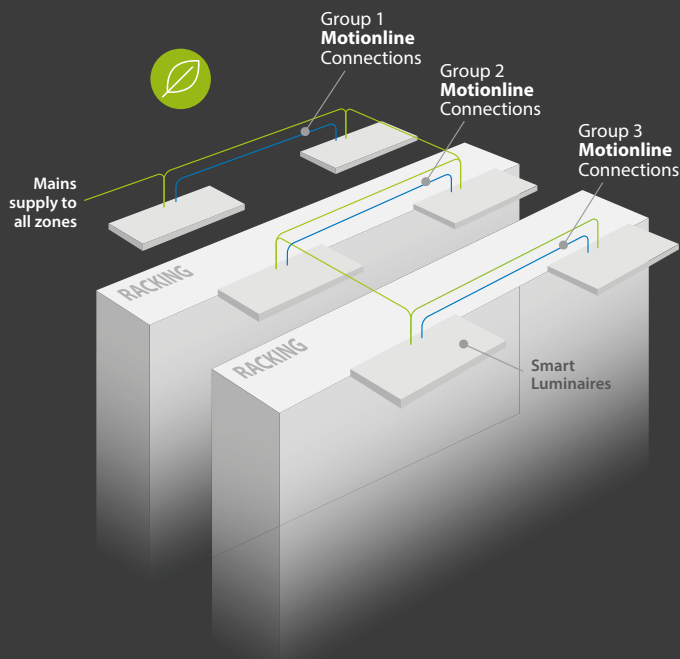
It is strongly recommended Smart luminaires are connected using the “Motionline” two-core low voltage bus. If one luminaire detects movement, a signal is passed to all of the luminaires in the group triggering all luminaires to illuminate. This ensures effective group control and extends presence detection coverage. SmartScan luminaires utilise wireless “mesh” technology to replace the wired Motionline - particularly helpful in retro-fit and external applications.

## MOUNTING HEIGHT

As the mounting height increases, so does the amount of movement needed to trigger the sensor. Hand movement may not be sufficient for sensors mounted higher than 6m therefore the person may need to be walking to be detected.

## POSITIONING OF THE SENSORS

Where possible, Smart luminaires should be positioned in such a way that the detection areas overlap. The Smart system has a sensor in each luminaire ensuring that the optimum detection level is easily achieved using conventional spacing.





# STANDARD SMART SENSOR

## MOUNTING HEIGHTS UP TO 8m

### AMBIENT TEMPERATURE SENSOR

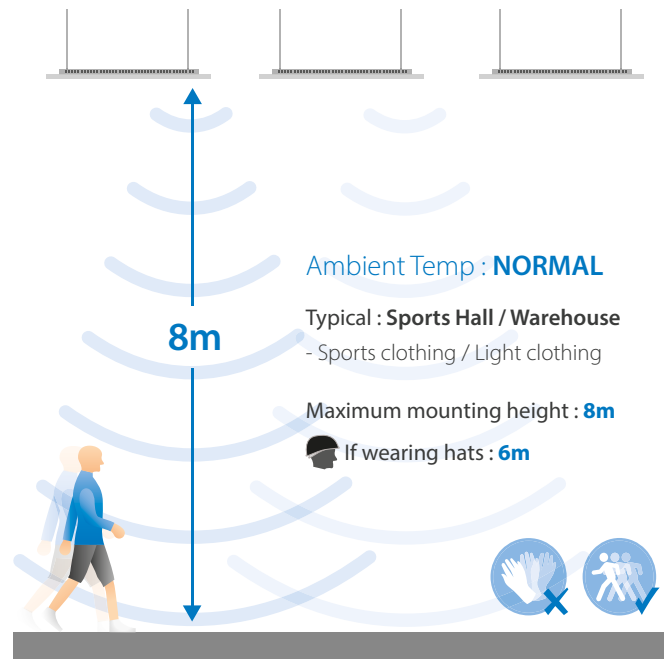
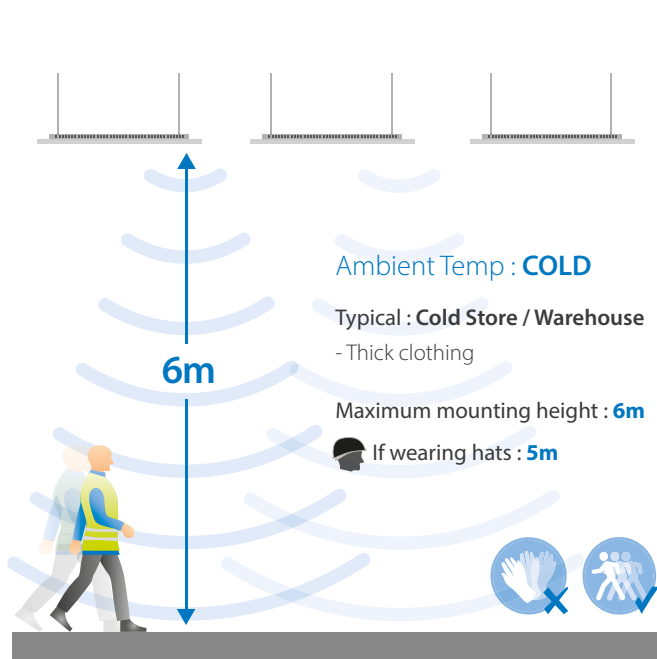
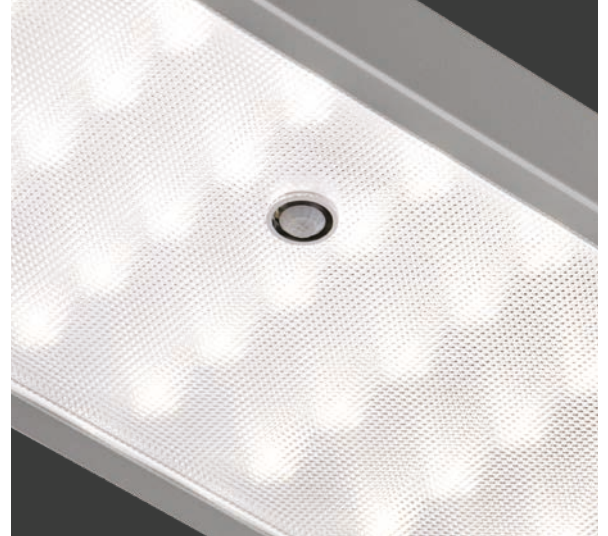
In order for movement to be detected, the PIR sensor requires the moving object to have a temperature differential of at least 4°C from the surrounding area. In a typical indoor application there is sufficient difference between a person, with a typical external skin temperature of 32°C (measured on the head or hands), and the surrounding ambient temperature of 20°C. However, as the ambient temperature rises or falls there are certain factors to consider:

### LOW AMBIENT TEMPERATURE

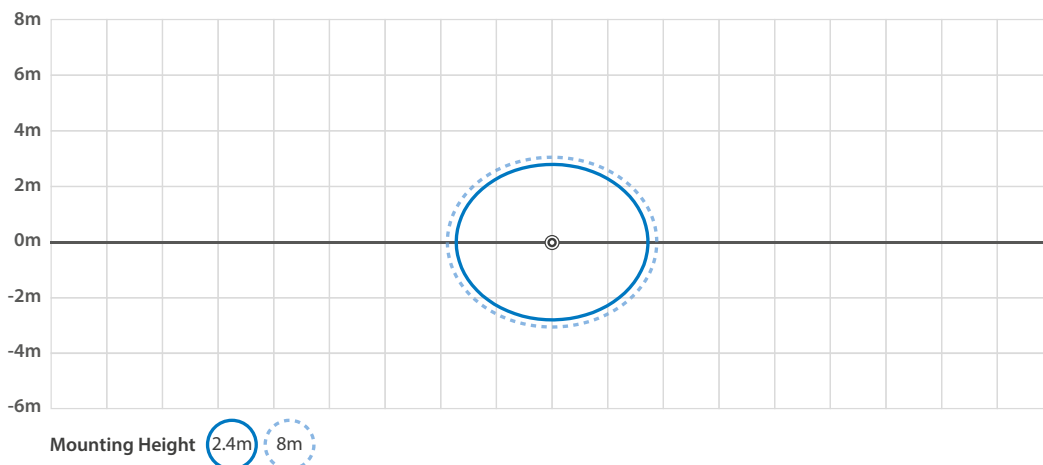
In low temperature applications personnel often wear insulating clothing. This can reduce the thermal image presented to the sensor reducing its effectiveness.

### HIGH AMBIENT TEMPERATURE

In higher ambient temperature applications (>30°C) the sensitivity may be reduced as the differential between ambient and body temperatures is reduced.



### Smart Sensor - Detection Area



# HIGH LEVEL SMART SENSOR

## MOUNTING HEIGHTS UP TO 18m



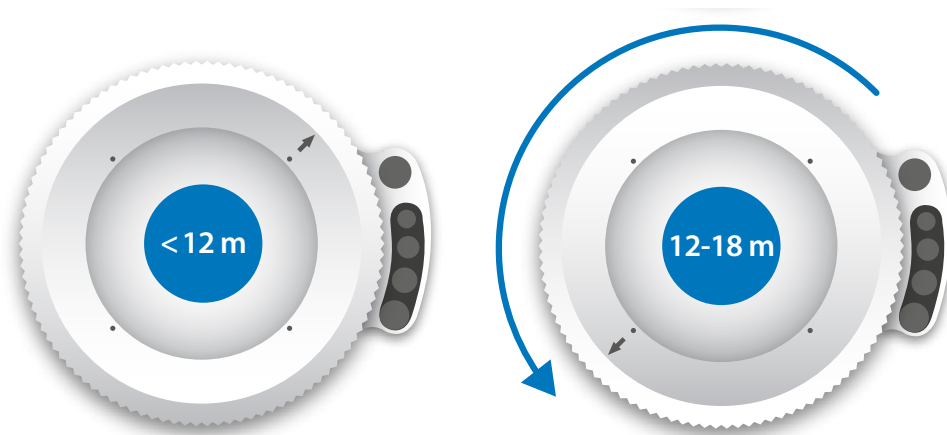
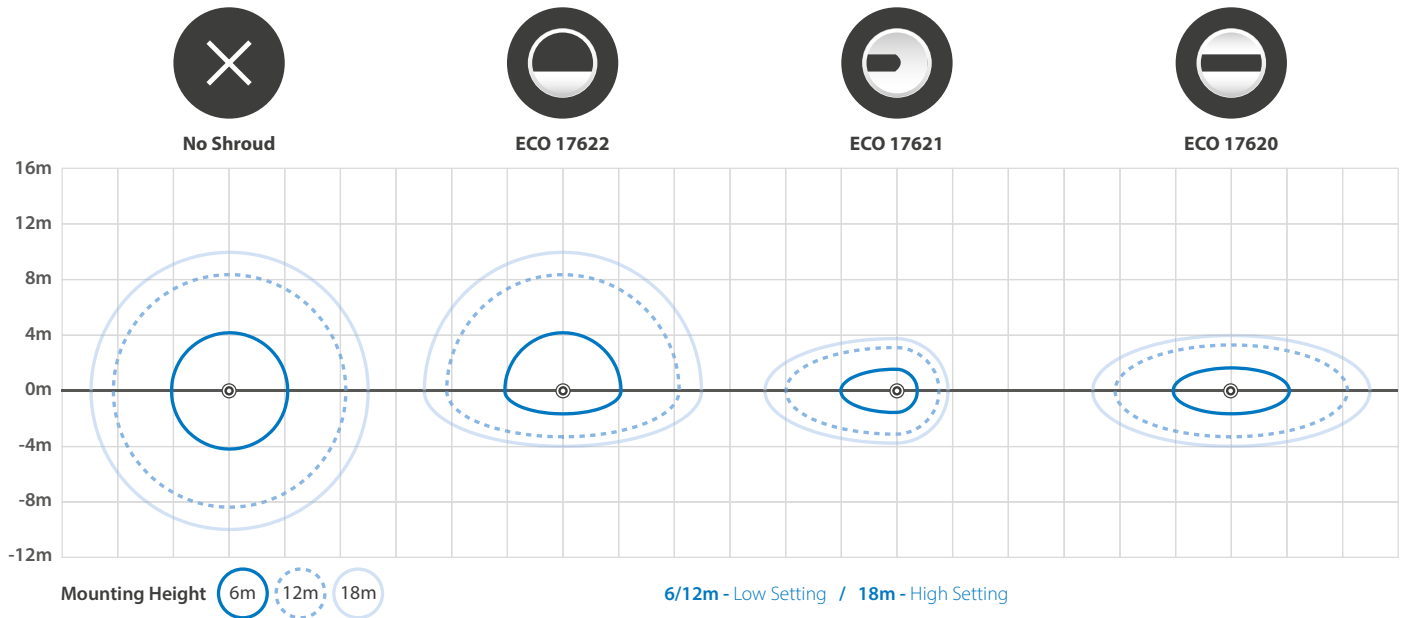
The High Level Smart Sensor is optimised for mounting heights up to 18m. An adjustable lens allows for the detection area to be tuned to suit the application perfectly, with the lens at the "high" setting for all applications above 12m. All Smart settings can be configured from ground level using the Smart Programmer.

For best presence detection it is recommended that luminaires are grouped using Motionline. In retrofit applications SmartScan provides a wireless Motionline signal so removes the need for any additional cabling.

For more information see [www.thorlux.com/smart](http://www.thorlux.com/smart)

Optional shrouds can be fitted to the High Level Smart Sensor to restrict the detection area if required. For example, ECO17620 could be used in racking areas to avoid detecting movement in adjacent aisles.

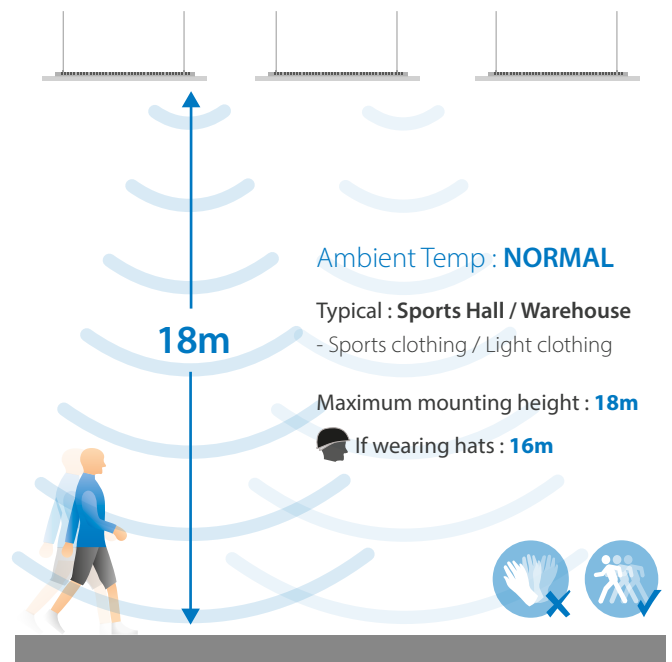
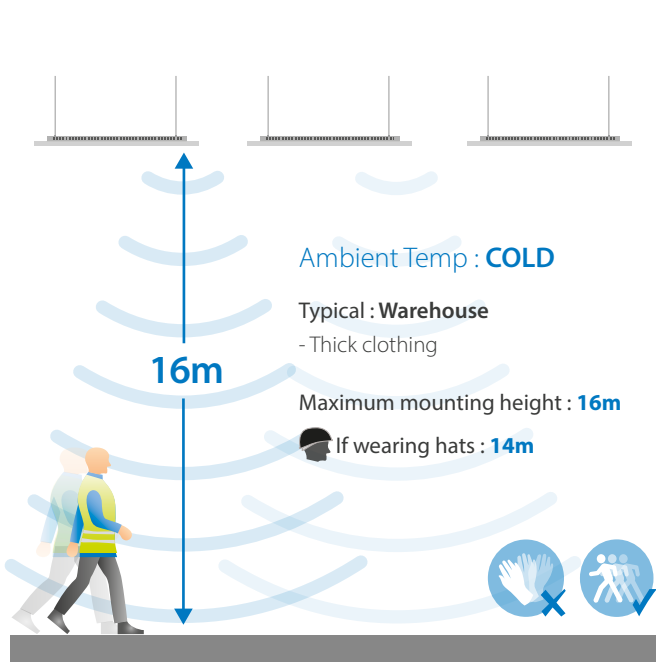
### High Level Smart Sensor - Detection Area





# HIGH LEVEL SMART SENSOR

## MOUNTING HEIGHTS UP TO 18m



# SMART EXTERNAL PRESENCE DETECTION GUIDE



## PRESENCE DETECTION OF THE SENSOR

There are two different sensors available:

Standard Smart External Sensor – for use up to 6m

High Level Smart External Sensor – for use up to 12m

## MOTIONLINE

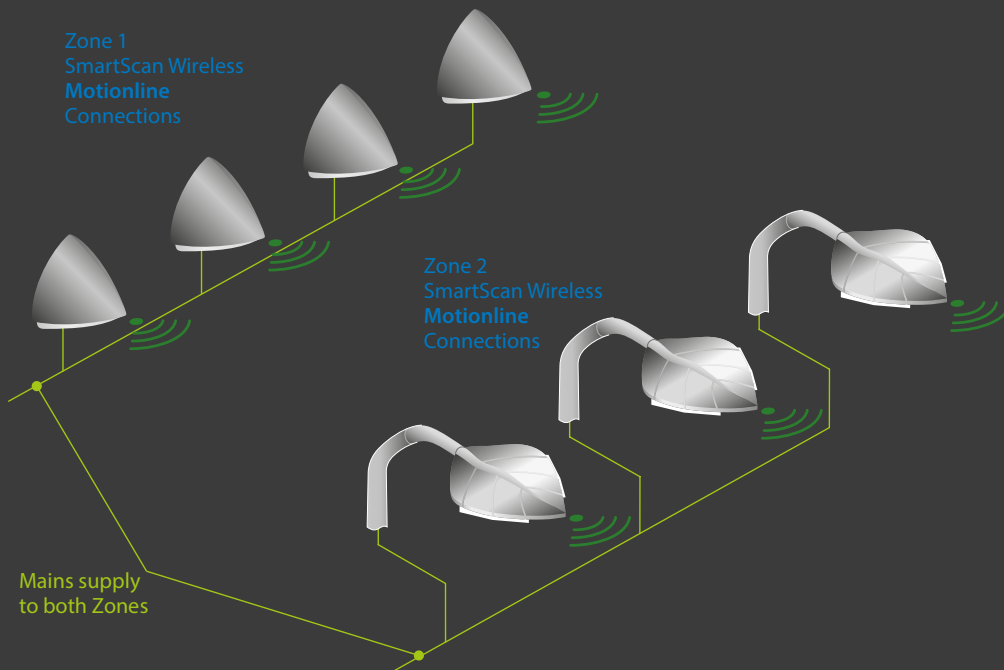
Smart External luminaires utilise a wireless mesh network to form Motionline groups. This ensures effective group control and extends presence detection coverage.

## MOUNTING HEIGHT

As the mounting height increases, so does the amount of movement needed to trigger the sensor. Hand movement may not be sufficient for sensors mounted higher than 6m therefore the person may need to be walking to be detected.

## POSITIONING OF THE SENSORS

Where possible, Smart External luminaires should be positioned in such a way that the detection areas overlap. The Smart External system has a sensor in each luminaire ensuring that the optimum detection level is easily achieved using conventional spacing.





# SMART EXTERNAL SENSOR

## MOUNTING HEIGHTS UP TO 6m



Modern lighting schemes for external spaces are based on minimising light pollution but ensuring that public walkways and roads are well lit. Smart External luminaires have been designed so that the detection area of the sensor is central to the light distribution of the luminaire.

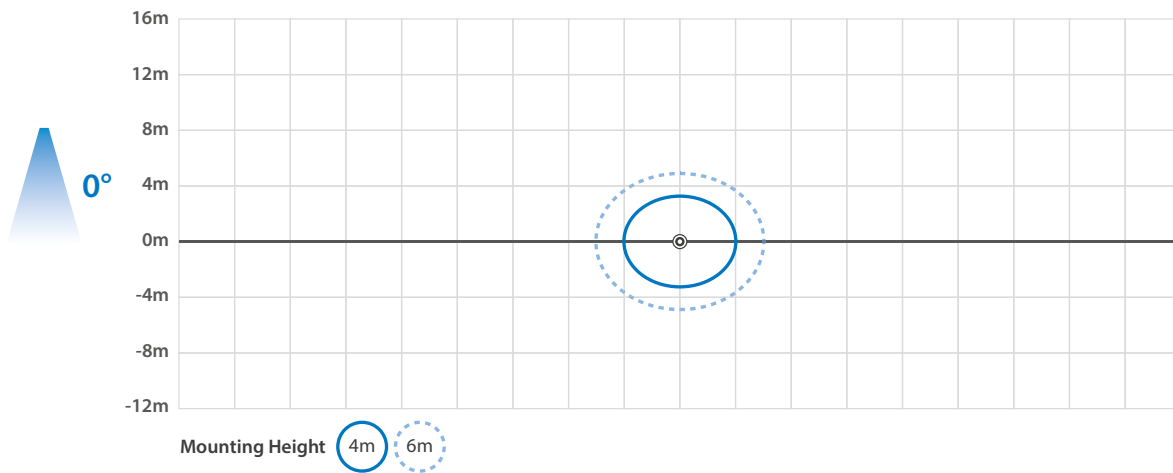
In areas where trees or bushes are present please ensure that any foliage is trimmed back behind the luminaire to ensure optimal movement detection and lighting efficiency.

Smart External uses a passive infra-red (PIR) movement sensor built into each luminaire. Infra-red technology is commonly used for lighting control, but when used externally a number of factors are increasingly important.

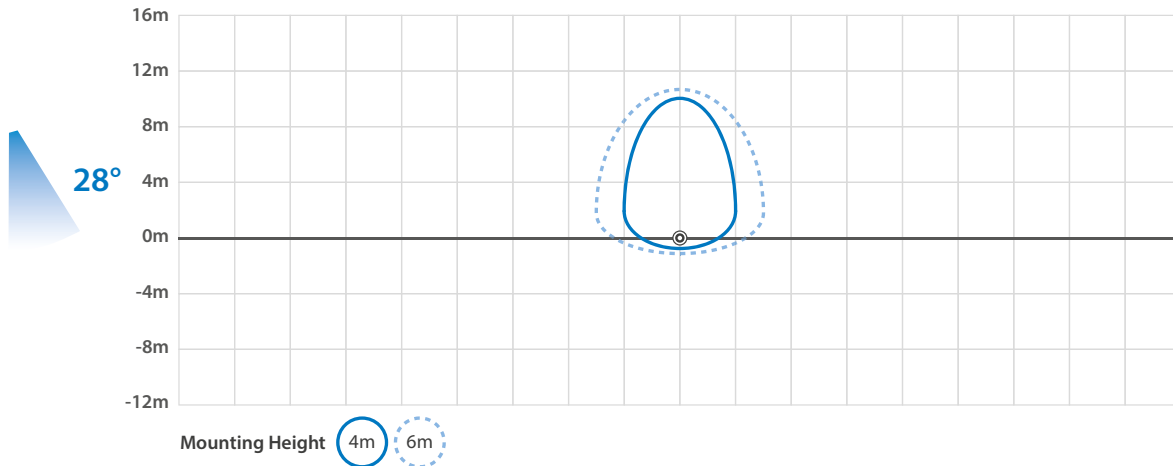
### ANGLE OF THE SENSOR

The majority of Smart External luminaires are wall or column mounted, projecting the light away from the wall or column. The sensor is angled at 28° from the horizontal to focus the presence detection within the lit area, providing little detection coverage behind the column. Some Smart External luminaires are designed for use in canopies and therefore the sensor is directed at 0° towards the floor.

#### SmartScan External Sensor - Detection Area - 0°



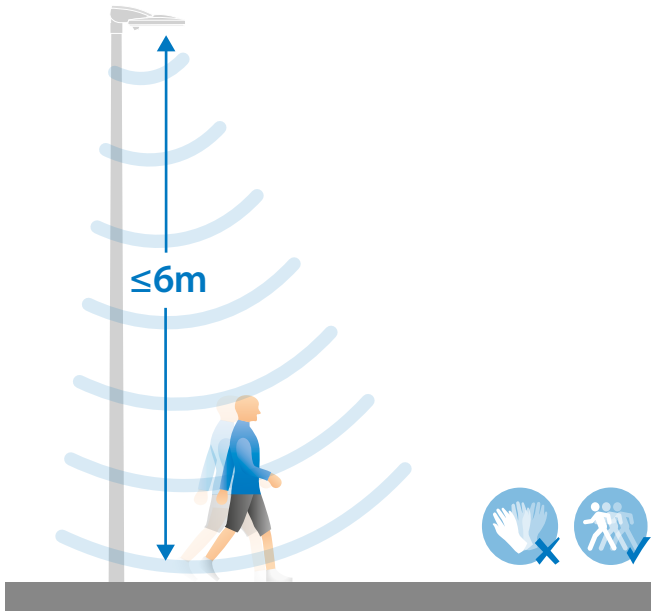
#### SmartScan External Sensor - Detection Area - 28°





# SMART EXTERNAL SENSOR

## MOUNTING HEIGHTS UP TO 6m



### AMBIENT TEMPERATURES

The PIR within the Smart External sensor relies on detecting the heat of a person moving across the detection area. For best reliability the temperature of the person should be at least 4°C different from the background, in this case the floor.

As the ambient temperature drops people wear more layers or coats to keep warm. This insulates the body, therefore a larger movement must be made in order for presence to be detected, or presence may not be detected at the extremities of the detection area.

The amount of time that an individual has been outside can also vary detection sensitivity. Clothing will chill to match the outside temperature. The sensor is more likely to detect a person leaving a building on a cold day than somebody that has been outside for long periods. Therefore they may not be detected until closer to the centre of the detection area.

The detection patterns detailed opposite are based on optimum conditions; the total area may reduce depending on the factors described above.





# HIGH LEVEL SMART EXTERNAL SENSOR

MOUNTING HEIGHTS UP TO 12m



Optional shrouds can be fitted to the sensor to restrict the detection area if required.

## High Level SmartScan External Sensor - Detection Area - 0°



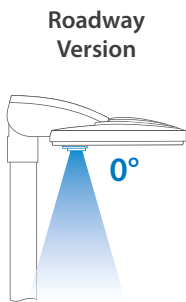
No Shroud



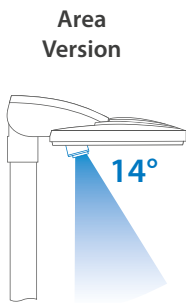
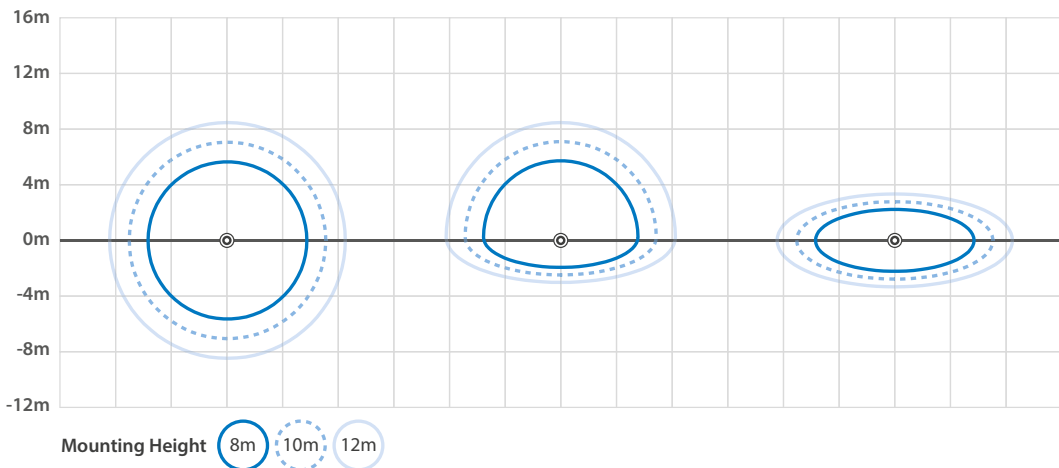
ECO 17622



ECO 17620

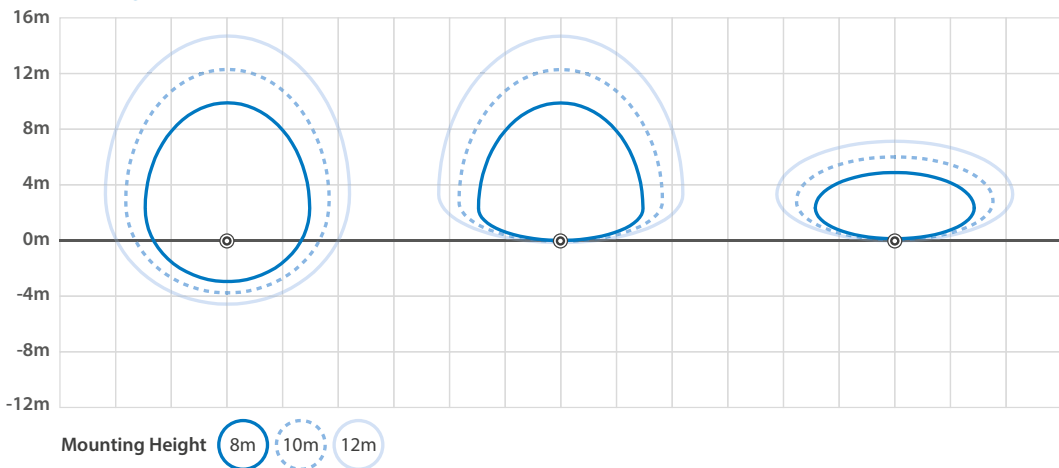


Roadway Version



Area Version

## High Level SmartScan External Sensor - Detection Area - 14°



### NOTE:

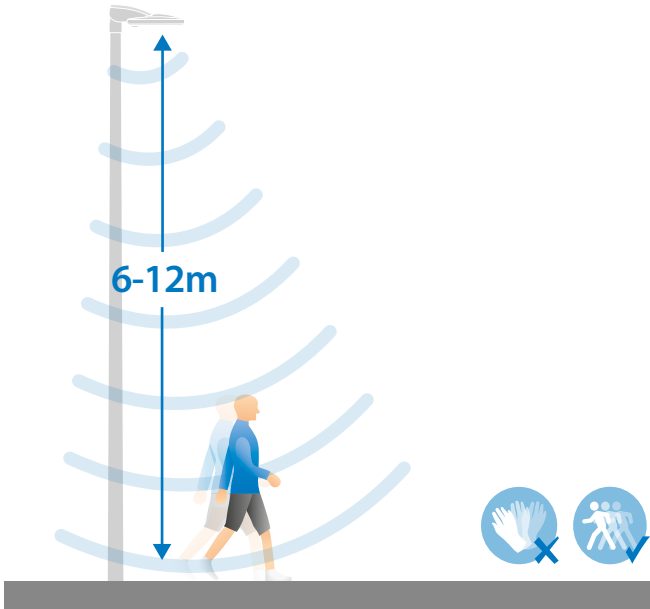
The detection areas above detail maximum values. The criteria described on page 4 is also applicable to the High Level Smart External Sensor.

For best presence detection it is recommended that luminaires are grouped using Motionline. In external and retrofit applications SmartScan Platform 1 provides a wireless Motionline signal so removes the need for any additional cabling. Upgrading to Platform 2 with the addition of a SmartScan Gateway allows users to set operational times of Smart External luminaires.



# HIGH LEVEL SMART EXTERNAL SENSOR

## MOUNTING HEIGHTS UP TO 12m



### HIGH LEVEL SMART EXTERNAL SENSOR MOUNTING HEIGHT

The High Level Smart External Sensor is designed to be used in applications up to 12m.

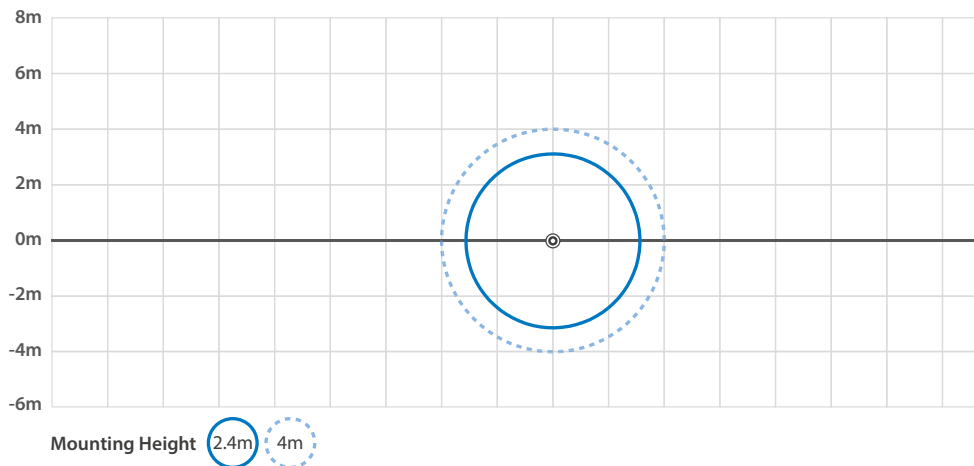


# SMARTSCAN RADAR PRESENCE DETECTION GUIDE



SmartScan Radar uses a 24GHz high frequency sensor to detect movement. This technology benefits from increased sensitivity with fewer detection errors than traditional 5GHz 'microwave' solutions.

## Radar Sensor - Detection Area



## PRESENCE DETECTION OF THE SENSOR

The system can be used in both wall and ceiling mounted applications for internal areas and under canopies for external areas. With seven main and one hundred possible sensitivity settings the system can be commissioned to suit the environment.

## MOTIONLINE

It is strongly recommended that SmartScan luminaires are connected using the "Motionline" technology. If one luminaire detects movement, a signal is passed to all of the luminaires in the group triggering all luminaires to illuminate. This ensures effective group-control and extends presence detection coverage. SmartScan luminaires utilise wireless "mesh" technology to replace the wired Motionline - particularly helpful in retro-fit and external applications.

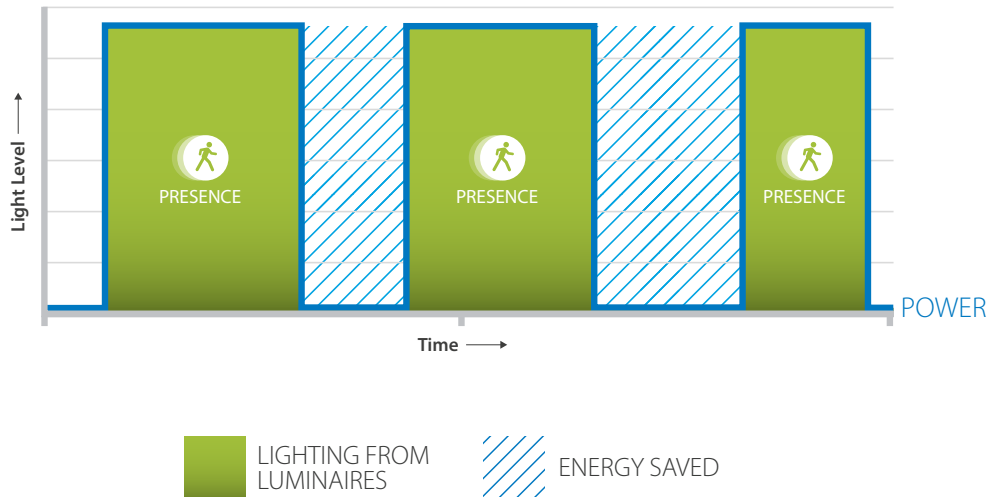
## MOUNTING HEIGHT

Where possible, luminaires should be positioned in such a way that the detection areas overlap. The SmartScan Radar system has a sensor in each luminaire ensuring that the optimum detection level is easily achieved using conventional spacing.



# ECO PRESENCE AND ABSENCE DETECTION

Passive Infra-Red (PIR) sensors are used to detect movement to turn the luminaires on. After a predetermined time of no movement the luminaires will turn off, saving energy.



Some PIRs can be programmed for “absence” mode whereby the luminaires are not initially turned on automatically by movement, but manually by the user with a switch; the PIR will then monitor movement to turn the luminaires off automatically after a pre-determined time.

See product datasheets for detection coverage.