

the **e** senses

e-Sense **Move**

FAGERHULT

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## Luminaire with Build in Microwave Sensor with DALI Function

With a sensor based on microwave technology it is possible to discretely fit the sensor within the luminaire; without affecting the luminaire's design or classification. Fagerhult has a range of luminaires with this technology suitable for numerous applications and requirements. The characteristics of a microwave sensor differs from a standard PIR-sensor. The technology is comparable to that of a radar and offers new possibilities for energy efficient installations.

**Bandwidth:** 868 MHz

**Coding Technology:** KeeLoq

**Number of learning codes/sensor:** 15 pcs

**Max RF-distance between two sensors:** 30 m (open air)

**Programming tool:** Remote control e-Sense Move DALI, article number 86305 (batteries included)

**Distance between sensor and prog-tool:** Max 7 m

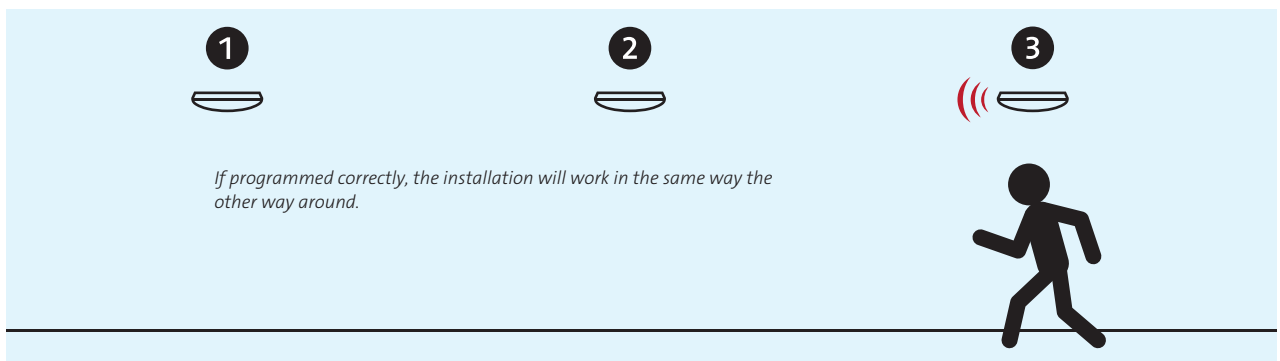
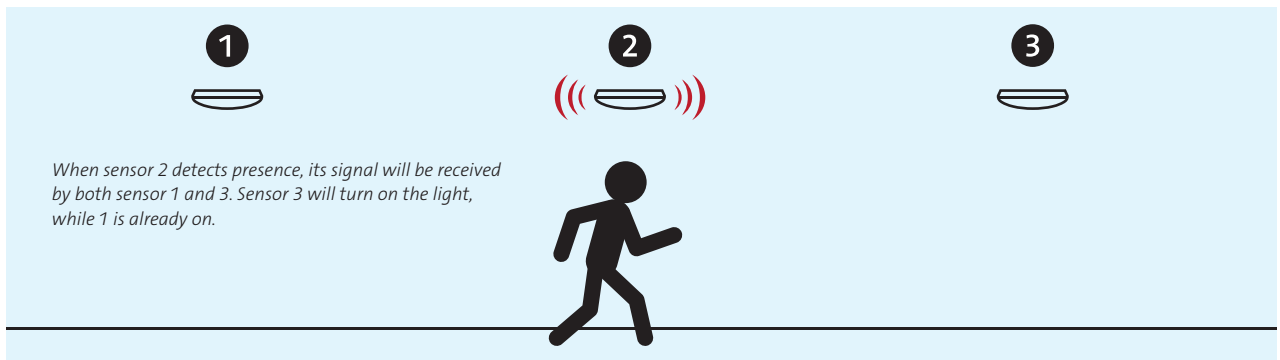
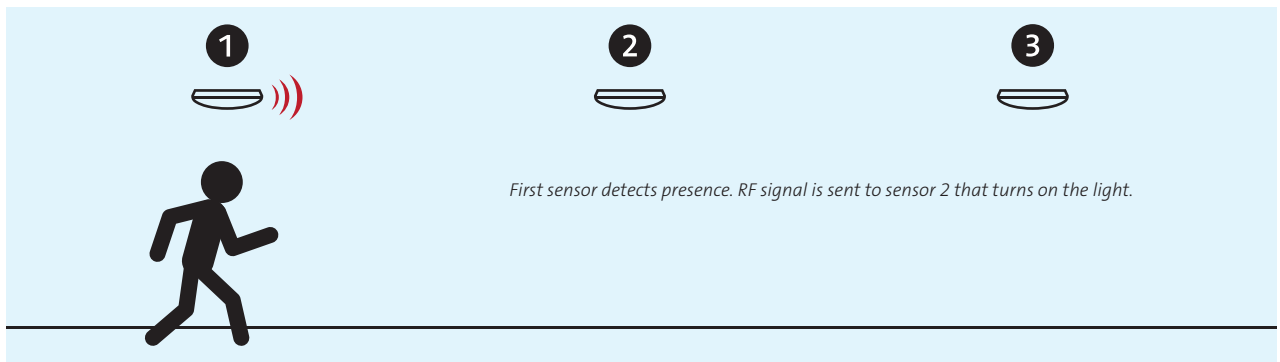
**Load communication protocol:** DALI Broadcast

Luminaires located in the vicinity of telecom antennas where 800 and 900MHz bands are used, communication between luminaires can be blocked, which causes the light to remain constant on. This can happen where luminaires are placed in stairwells on the top floor.

# How the Move Sensor Works

The communication between Move sensors is based on a unique coding that can create flexible installation with special setting for each fixture. No wiring is required between the units as all communication is wireless on the 868 MHz bandwidth.

The unique feature is that a sensor detecting movement is sending the information forward to the next sensor, so light is always on before a person enters that area. This creates a good secure environment without the annoying action of lamps striking too late.



# How to Program Connection Between Move Sensors

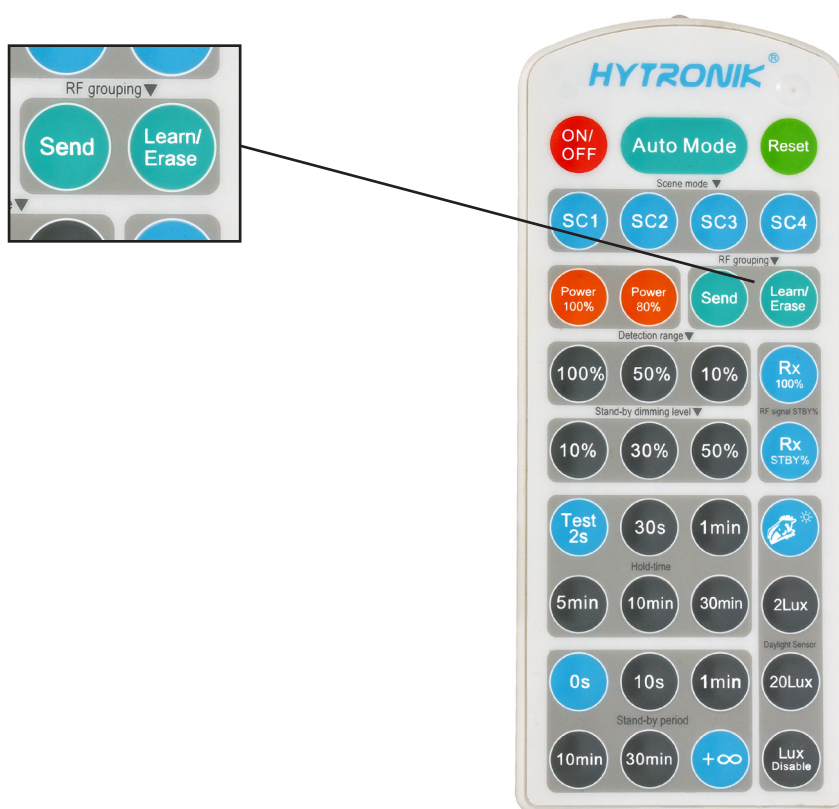
The communication for Move sensors is based on a simple basic “handshake” setup between two or more units.

First, one (or more) sensor is set to LEARN. This will be indicated by a beep from the sensor, one/second.

Now go to the next sensor, whose signal the first one will learn. Press the SEND button. The connection will be indicated by a rapid beeping from the first sensor in LEARN mode. After this, the sensor goes back to slow beeping waiting to see if it should learn another signal. You can now add more sensors/luminaires by following the same principle. If the system is finished, press LEARN until the beeps stops and your system is now closed.

Now do it the other way around so the sensors can communicate in both ways depending on which one is detecting movement first.

On next pages this is explained step by step.

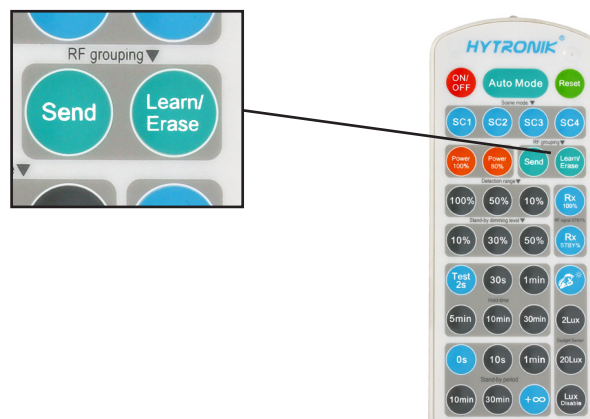


# How to Program Connection Between Move Sensors

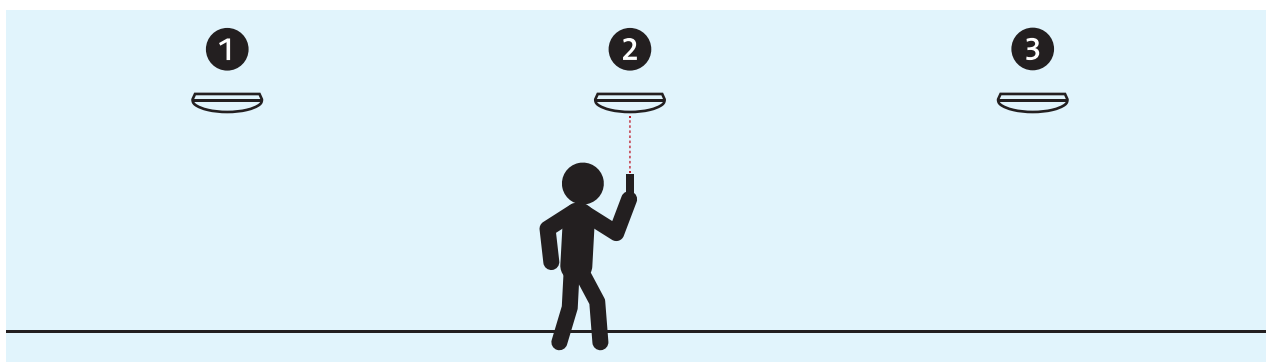
## Sensor 2 will Listen to Sensor 1:

Aim the IR-remote carefully to fixture 2 and press LEARN. The sensor will start to beep every second, prepared for receiving signals from other sensors. The sensor will remain in this mode for 3 minutes if not cancelled manually.

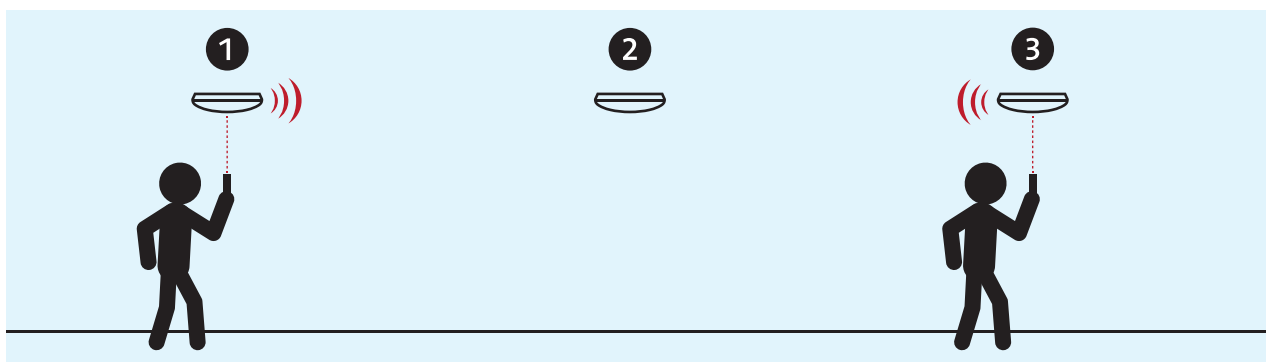
Now aim the IR-remote carefully to fixture 1 and press SEND. Sensor 2 will beep rapidly for 2 seconds to confirm the received signal. Now it is possible to go to sensor 3 and do the same procedure. The result is that sensor 2 will turn on the light by presence from either 1 or 3.



## Learn



## Send



Aim the IR-remote carefully to fixture 1 and 3 and press LEARN. The sensors will start to beep every second, prepared for receiving signals from other sensors. The sensors will remain in this mode for 3 minutes if not cancelled manually.

The diagram illustrates the RF grouping process. A callout box from the 'Send' and 'Learn/Erase' buttons on the remote points to a section of the receiver's interface. This section shows a 'RF grouping' menu with two options: 'Send' and 'Learn/Erase'. The 'Send' button is highlighted in red, indicating it is the active selection for grouping the remote.

The diagram illustrates the three steps of the 'Hand on the Wall' exercise:

- 1**: A stick figure stands with its right arm extended upwards, hand flat against a wall. A red dashed line indicates the vertical alignment of the arm.
- 2**: The stick figure is shown in a side profile, with its right arm extended horizontally to the right, hand flat against the wall. A red dashed line indicates the horizontal alignment of the arm.
- 3**: The stick figure stands with its right arm extended upwards, hand flat against the wall. A red dashed line indicates the vertical alignment of the arm.

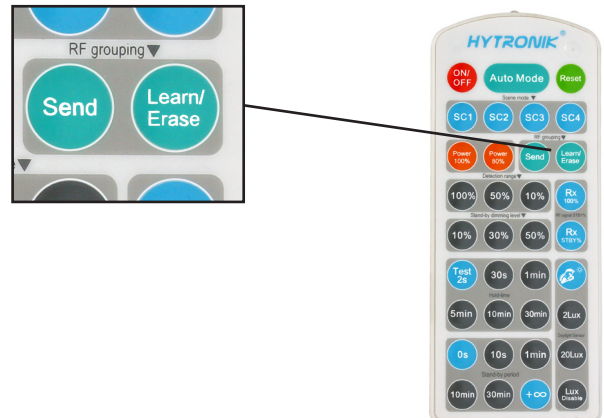
Subject to change without notice.

# How to Erase Connection Between Move Sensors

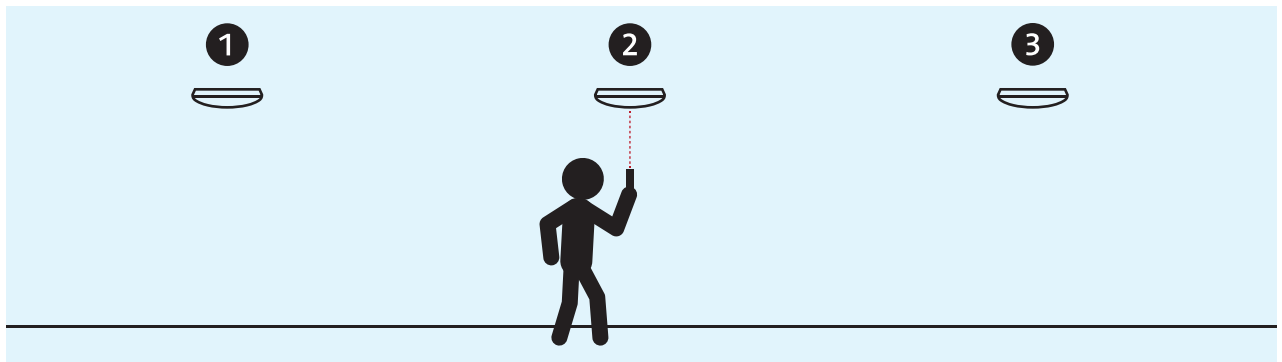
It is possible to erase a sensor from listening to RF-signals from other sensors.

Use the LEARN/ERASE button on the IR-remote control. Aim the remote to the sensor/fixture that shall be excluded from communicating with other sensors. Press LEARN/ERASE button for 10 seconds. During this sequence, the sensor will beep once a second. When the resetting is done, the sensor beeps rapidly to confirm the programming.

**Note!** This Erase function will only stop the RF communication between sensors. It will not affect the setting of any other function.



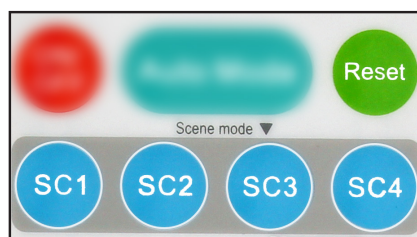
## Learn/Erase





# Pre-set Scenes

By experience, some settings are used very commonly. The selection of 4 pre-sets and Default setting (Reset) can be read on the back of the IR-remote.



	Hold Time	Standby Period	Standby Dimming	Daylight Sensor	RF-Signal Standby %	Detection Range
SC1	1 min	1 min	10 %	Disabled	Standby %	10 %
SC2	5 min	5 min	30 %	Disabled	Standby %	10 %
SC3	10 min	30 min	30 %	Disabled	Standby %	50 %
SC4	30 min	1 hour	50 %	100 lux	100 %	100 %
Reset	1 min	5 min	20 %	Disabled	Standby %	100 %

**Note!** It is always possible to change individual parameters after selecting a Scene. The latest programming will be used. For example: Select SC2. Now it is possible to change the standby dimming level to 10 % if wanted.

## Hold Time

Time after last presence detected. After time has elapsed, light will dim to Standby Dimming level.

## Standby Period

How long light will remain on low level before turning off. The off function can be avoided by selecting +∞ (infinity button).

## Standby Dimming

How bright the light will be during the Standby Period. 10, 30 or 50 % light level can be selected.

## Daylight Sensor

If daylight is brighter than the set value, light will not turn on when presence is detected.

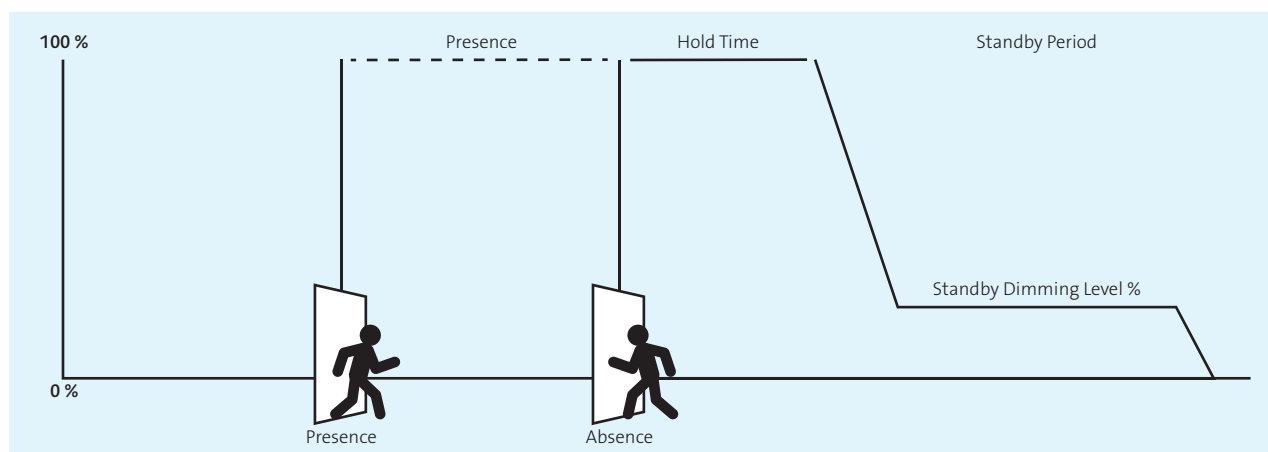
## RF-signal Standby %

When a sensor is detecting presence and sending an RF-signal to other sensors, the receiving sensor can be selected to go to 100 % light, or a standby level. 10, 30 or 50 % can be selected. Select standby level (Rx STBY%) or full level (Rx 100%).

NOTE! On delivery, the default setting is Rx STBY%. When testing, let the luminaires turn off completely to see the full functionality! If you wish 100 % light on RF-signal, push the button Rx 100%.

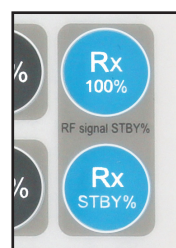
## Detection Range

Depending on height and setting, the detection range can be adjusted approx. between 8 m down to 1,5 m.



# Receiving an Rf-signal

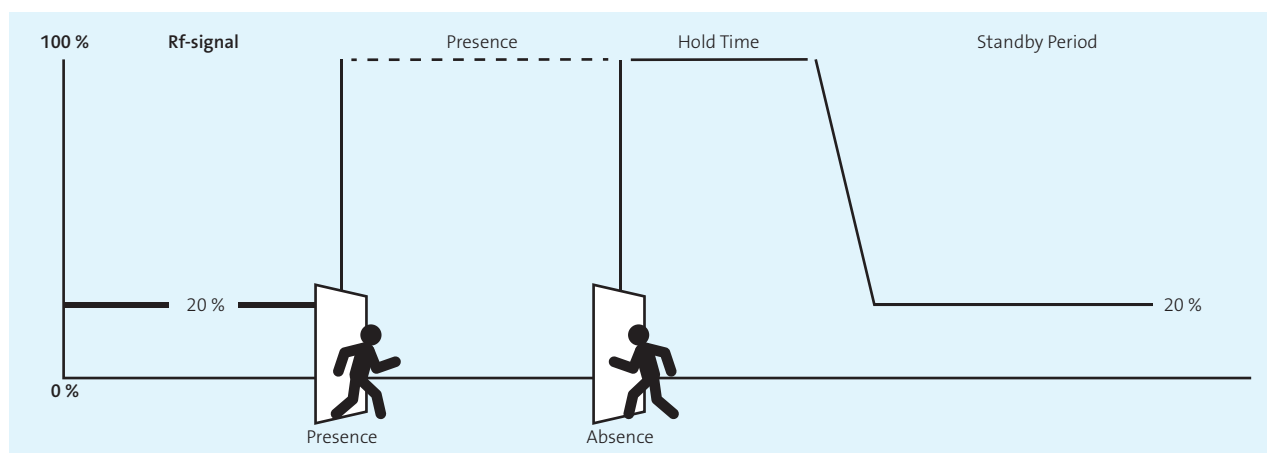
When a sensor is detecting presence, and sends out the information, receiving units can act in two different ways upon the information. Light can go from OFF to 100% (Rx 100%) or to a Standby Dimming Level (Rx STBY%). The Standby Dimming Level will be the same that is used after Hold Time has elapsed.



## Sensor Receiving an RF-signal set to Rx STBY % and Standby Level 20 %

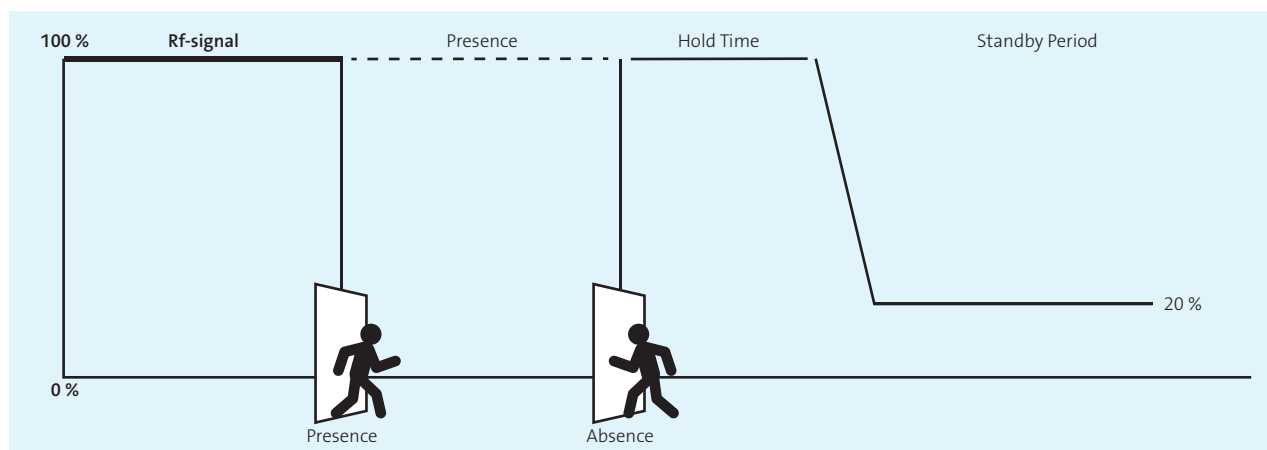
When a signal is received by a sensor, light goes to 20 % and remains there for the Standby Period if nothing more happens. If presence is detected, light will go to 100 %. After absence and Hold Time is elapsed, light will dim to 20 % and then OFF.

NOTE! On delivery, the default setting is Rx STBY%. When testing, let the luminaires turn off completely to see the full functionality! If you wish 100 % light on RF-signal, push the button Rx 100%.



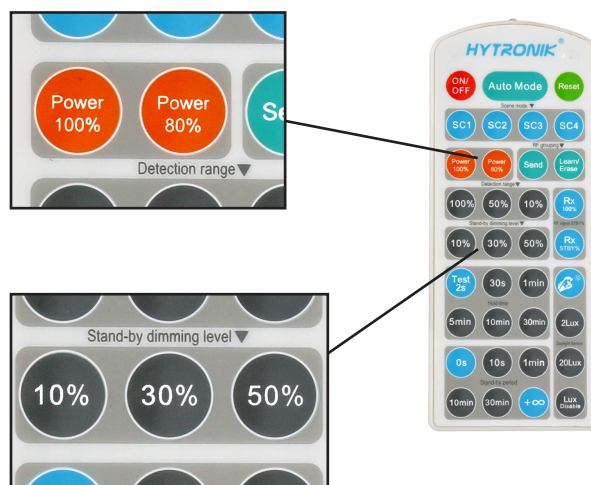
## Sensor Receiving an RF-signal set to Rx 100 % and Standby Level 30 %

When a signal is received by a sensor, light goes to 100% and remains there if nothing more happens. If presence is detected, light will remain at 100 %. After absence and Hold Time is elapsed, light will dim to 30 % and then OFF.



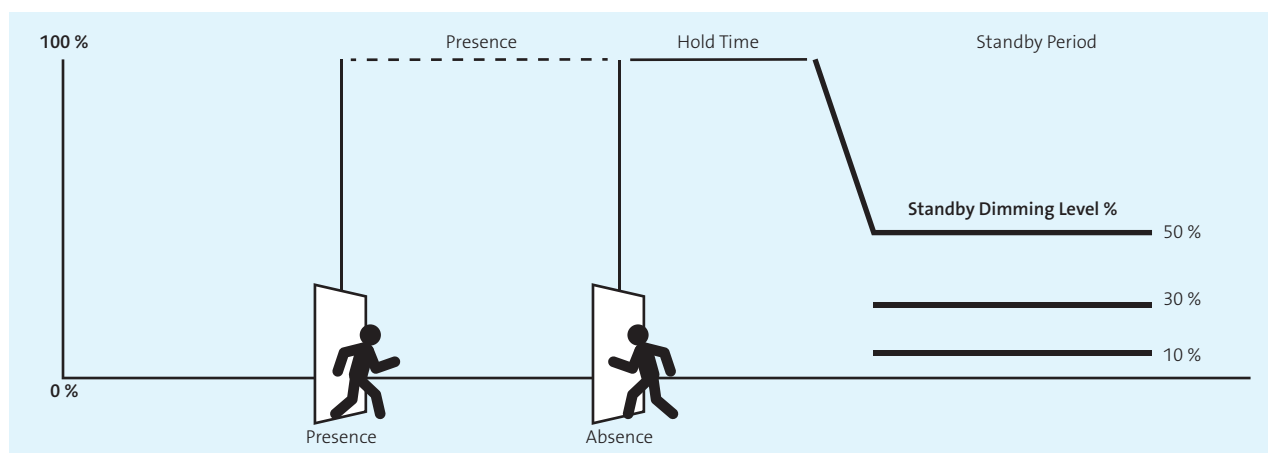
## Reduced Power

Default and normal use will give full light output 100 % at presence. But it is possible to reduce power by 20 %. This can be useful during a light fixtures first years of use, where the light output can be more than the estimated value. Return to 100 % by pressing Power 100 % button. This has to be made manually, no clock or calendar function is used.



## Standby Dimming Level

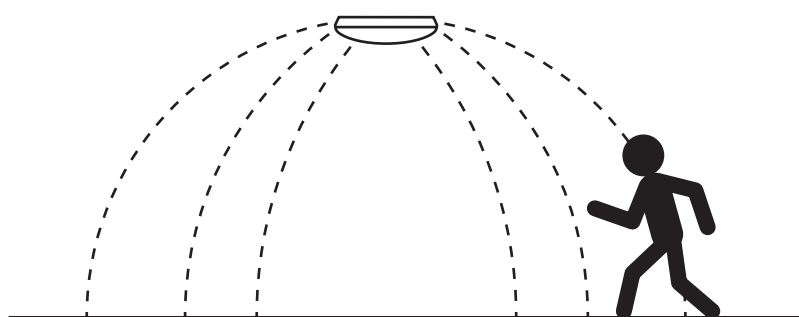
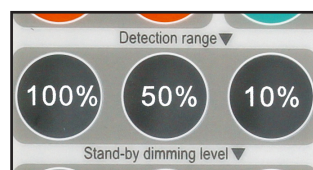
Standby Dimming Level is setting the light output during Standby Period. This means that light can be set to a functional level during absence, with enough light for the surrounding area. More light can be used close to exists, stairwells, lifts etc.



## Detection Range/Sensitivity

The detection area can be adjusted between high, mid and low, described on the remote as 100, 50 or 10 %. If the sensor/fixture is mounted at a height of 3 meters, the area will cover approx. 8 m, 4 m. and 2 m. Detection is always dependent of location of the sensor, speed of the moving object and setting of sensor sensitivity. Use the TEST function to evaluate the current situation.

NOTE! Fast movement towards the sensor will bisect the detection area. Both sensitivity setting, and speed in movement, will affect how light turns on.

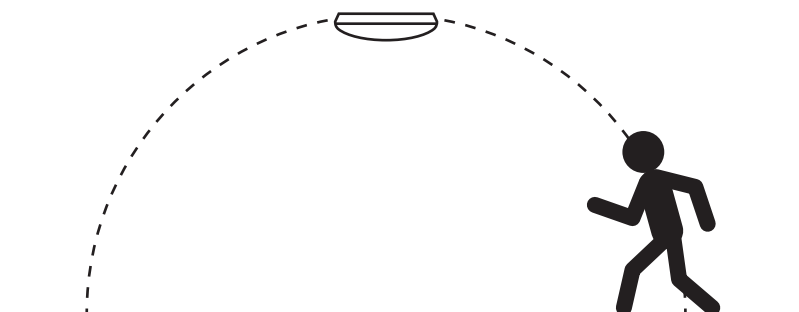


Detection Range. 100–50–10 %

## Test Function

The TEST function is used for checking the sensors detection range. All other functions are temporarily muted. Light will dim down after 2 s. of absence, and go to 100% when presence is detected.

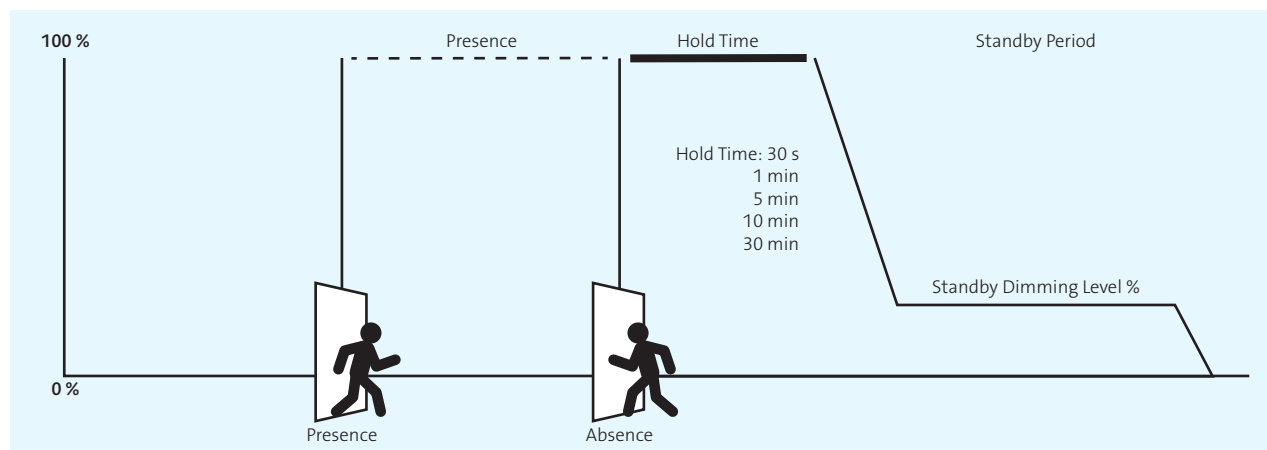
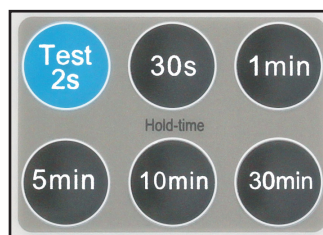
For return to normal mode, select a Scene mode, a Hold Time button, or Reset button.



Detection Range. 100 %

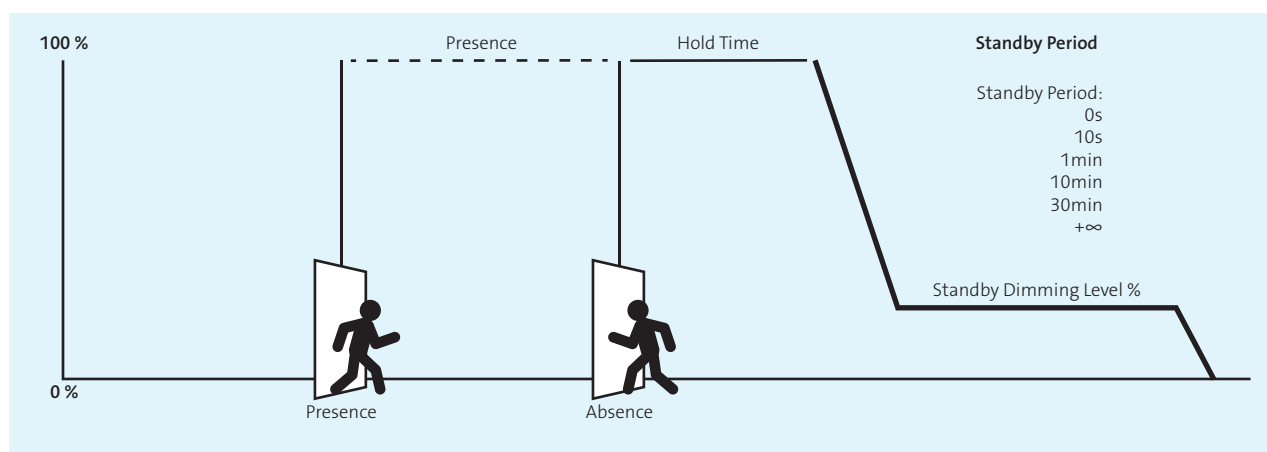
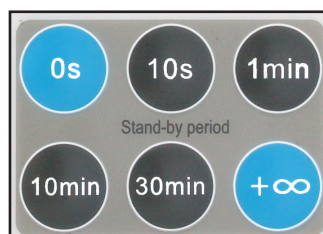
# Hold Time

Hold Time sets the time period that light should remain on 100 % after last presence detection. Depending on the light source, and location, the time can be set to very short (LED's) or longer for fluorescent tubes. A longer time can be used to avoid rapid on/off sequences, which can be irritating. The TEST function is explained earlier in this document.



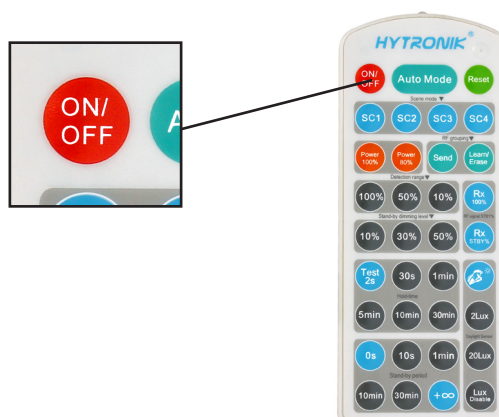
# Standby Period

Standby Period sets the time for how long light should remain ON at Standby Dimming Level. After Hold Time, light can go directly to OFF (0 s), 10 s, 1 min, 10 min, 30 min, or remain ON without turning OFF at all +∞ (infinity button).



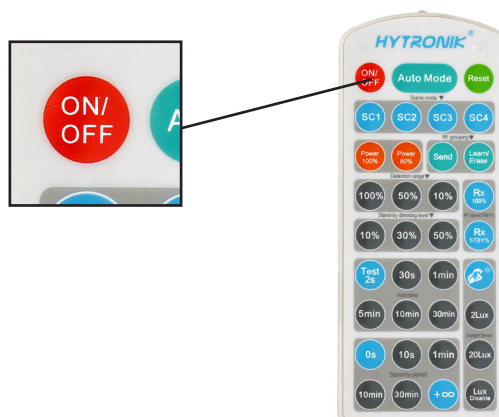
## ON/OFF Function Constant ON

Press once, and light will remain ON until other action is taken. This will leave light constantly ON at 100 %. Presence is muted. To leave this mode, press Auto Mode or RESET button. Auto Mode will make the setting go back to previous programming. Reset will return all settings to default.



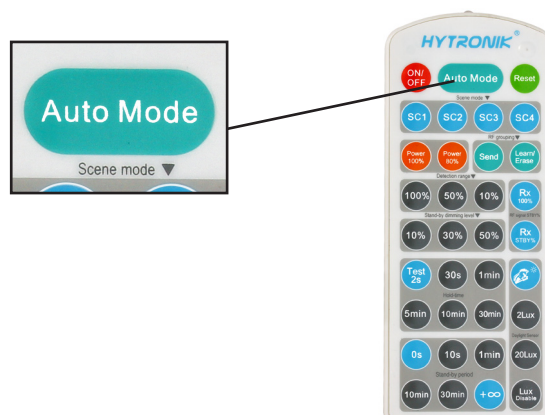
## ON/OFF Function Constant OFF

Press once more, and light will remain OFF until other action is taken. This will leave light constantly in OFF position. Presence is muted. To leave this mode, press Auto Mode or RESET button. Auto Mode will make the setting go back to previous programming. Reset will return all settings to default.



## Auto Mode

Press this button once to leave any state of the ON/OFF function. This will return the sensor to previous settings.



# Daylight Sensor/Lux Threshold

The detection of presence can be muted if there is already sufficient amount of daylight in the area. The settings are Manual, 2 lux, 20 lux and Lux Disable.

## Manual Setting (the “eye” button)

This setting must be done on site at the actual moment when light should mute the sensor.

## ”2 Lux” Threshold

With this level activated, the presence detection of the sensor will only work if the surrounding light level is more or less completely dark. Any light will mute the sensor.

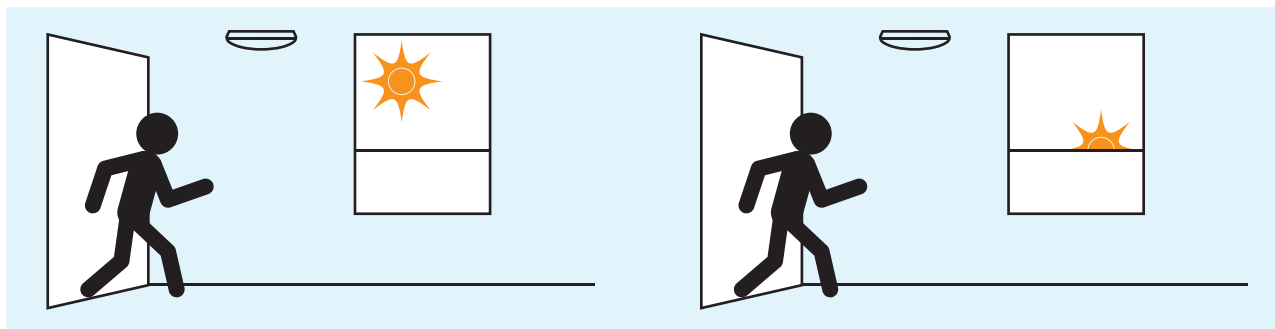
## ”20 Lux” Threshold

With this level activated, the presence detection of the sensor will be muted during daytime. For a more exact dusk or dawn setting, use the manual setting.

## Manual Learning Sequence

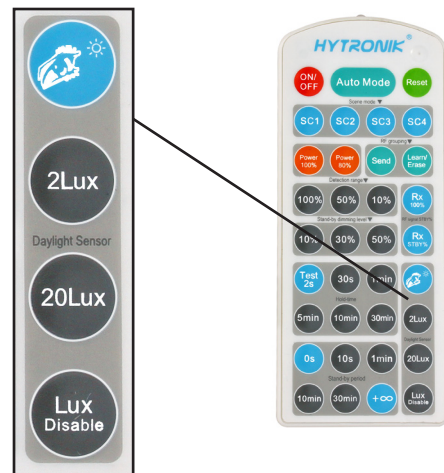
Press the “eye” button. The sequence will start by turning the light off. During this period, the lux sensor will read and memorise the light level. This will then be used as a threshold for when the sensor shall act or be muted when detecting presence. More light than the set level; light will not turn ON. Less light, light will turn ON.

## Threshold Effect



*If surrounding light is HIGHER than the threshold setting. Presence will not turn lights on.*

*If surrounding light is LOWER than the threshold setting. Presence will turn lights on.*



## Lux Disable

This setting lets the sensor work without any effect of surrounding daylight. The light will always turn on when presence is detected.

## Lux Threshold

A Lux Threshold will save energy when there is no need for artificial light. The Lux sensor is reading through the fixture cover when light is off. If the set value of lux is already fulfilled with daylight, the presence detection is muted, and light will remain off. The RF-signal will still be sent out to other sensor that might be under their individual Lux Threshold setting. This will make the system very flexible.



## e-Sense **Move**

Fagerhult develops, manufactures and markets professional lighting systems for public environments. Our operations are run with a constant focus on design, function, flexibility and energy saving solutions.

Fagerhult is part of the Fagerhult Group, one of Europe's leading lighting groups with operations in more than 15 different countries. AB Fagerhult is listed on the NASDAQ OMX Nordic Exchange in Stockholm.

HEAD OFFICE SWEDEN  
Fagerhults Belysning AB  
SE-566 80 Habo, Sweden  
Tel +46 36 10 85 00  
Fax +46 36 10 86 99  
[www.fagerhult.com](http://www.fagerhult.com)  
[www.fagerhult.co.uk](http://www.fagerhult.co.uk)  
[www.fagerhult.ie](http://www.fagerhult.ie)