

HF Sensor with RF Wireless Transmission

HC038V HCD038

Detached Linear Version with Remote Control

HYTRONIK®

Applications

RF wireless occupancy detector with tri-level control suitable for indoor use.

Suitable for building into the fixture:

- Carpark
- Classroom
- Staircase and corridor

Use for retrofit and new luminaire designs/installations



Features

- 24 hour daylight monitoring dawn/dusk sensor
- Special photocell to measure and differentiate natural light from LED light from behind the fixture cover
- Tri-level dimming control based upon occupancy (also known as corridor function)
- Optional 1-10V or DALI dimming control method
- One-key commissioning via programmable remote control
- Fast and simple commissioning/grouping of wireless sensor by the rotary switch
- 5 Year, 50,000hr Warranty

Technical Data

Input Characteristics

Model No.	
Mains voltage	220~240VAC 50/60Hz
Stand-by power	<1W
Load ratings:	
HC038V	400W (capacitive) 800W (resistive)
HCD038	30mA, 16VDC (max. 15 devices)
HC034RF	400W (capacitive) 1200W(resistive)
HC054RF	400W (capacitive) 1200W(resistive)
HC064RF	max. 20 devices, max.40mA
Warming-up	20s

Environment

Operation temperature	Ta: -35°C ~ +70°C
Case temperature (Max.)	Tc: +80°C
IP rating	IP20

Sensor & RF Data

Model No.	SAM8/RC11 SAM11
Sensor principle	High Frequency (microwave)
Operation frequency	5.8GHz +/- 75MHz
Transmission power	<0.2mW
Detection range	Max. (Ø x H) 12m x 6m
Detection angle	30° ~ 150°
RF frequency	868MHz (FSK mode, default)
RF transmission distance	30m indoor, 50m outdoor

Safety and EMC

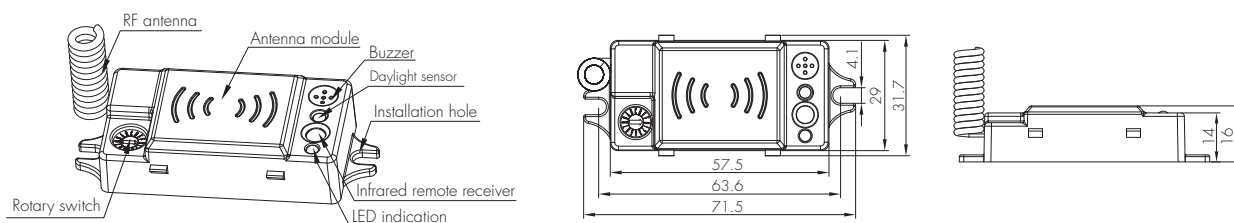
EMC standard (EMC)	EN55015, EN61000
Safety standard (LVD)	EN60669, AS/NZS60669
Radio Equipment (RED)	EN300440, EN301489, EN62479
Certification	Semko, CB, CE, EMC, RED, SAA

CE emc RED SAA CB IP20

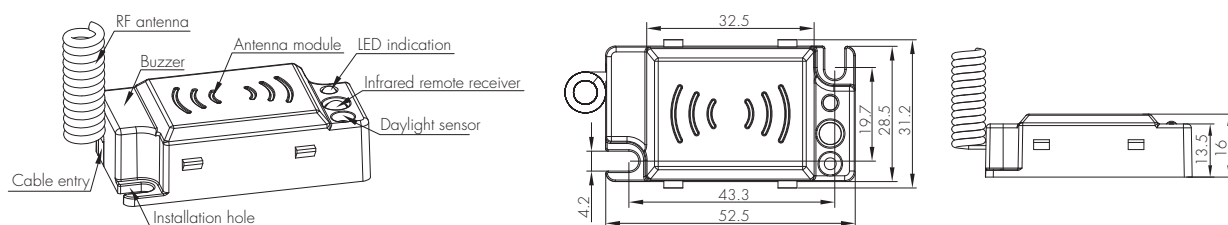
RF transceiver can serve as both master and slave, which consists of two parts, RF sensor antenna and main body.

RF Sensor Antenna

Option ① : SAM11 (RF grouping by rotary switch or remote control)

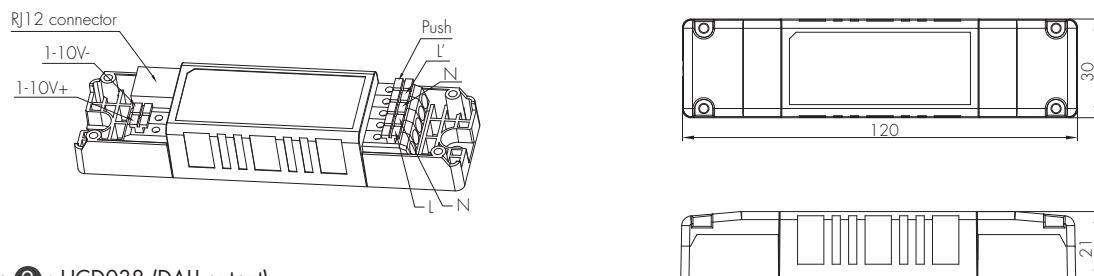


Option ② : SAM8/RC11 (RF grouping by remote control only)

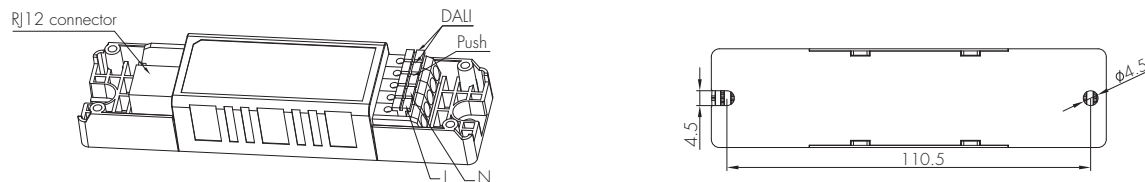


Sensor Main Body

Option ① : HC038V (1-10V output)



Option ② : HCD038 (DALI output)

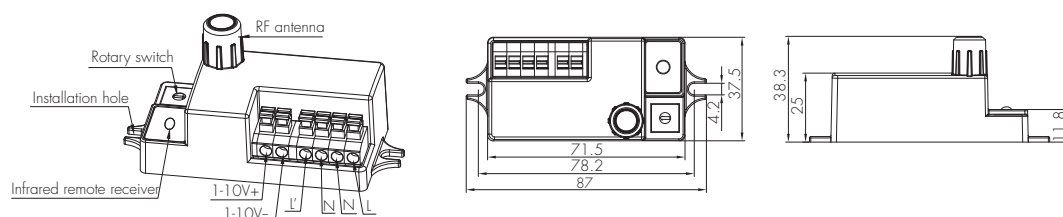


The combination of HC038V/HCD038 + SAM8/SAM11 are designed with sensor antenna separated from the main body, to fit into the narrow space in flat linear luminaires. The main units HC038V (1-10V control) or HCD038 (DALI control) can be hidden behind the PCB board for shadow-free installation.

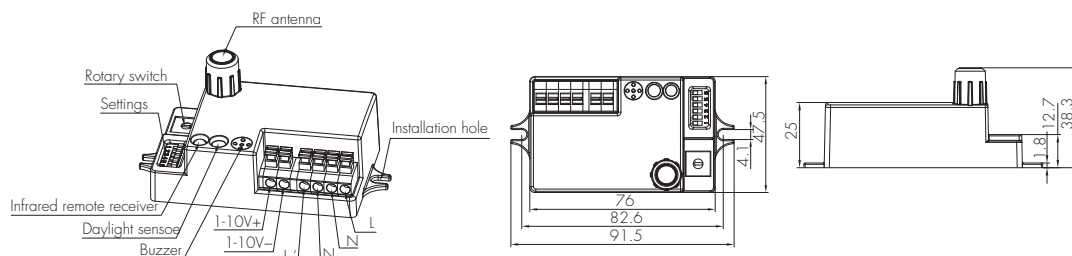
The motion detected by the RF sensor antenna SAM8 or SAM11 will operate all other units programmed on the same group via RF transmission. The transmission can reach 30 meters indoor and 50 meters in open areas. A daylight sensor is also built-in to prevent the light switching on when surrounding natural light is sufficient.

RF receiver serves as slave only, which turns on the light after receiving the RF "ON" signal from the master. Total 3 receivers for different applications:

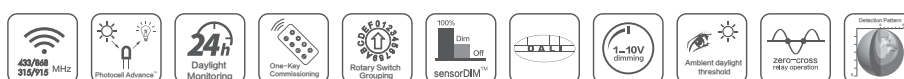
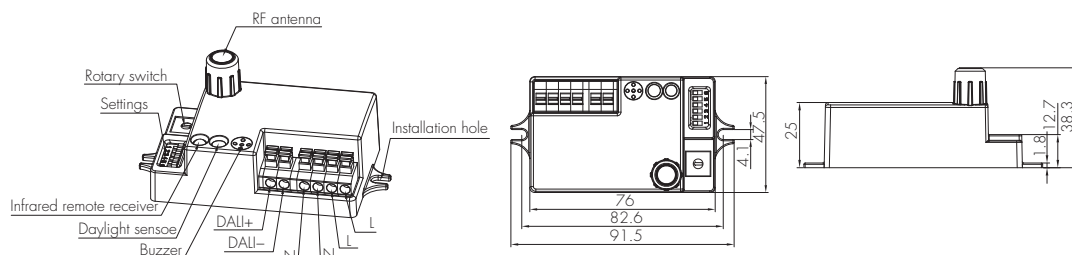
Option ① : HC034RF (1-10V output, RF grouping by rotary switch or remote control)



Option ② : HC054RF (1-10V output with Photocell Advance™)



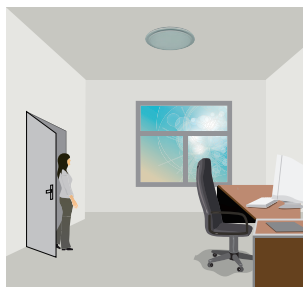
Option ③ : HC064RF (DALI output with Photocell Advance™)



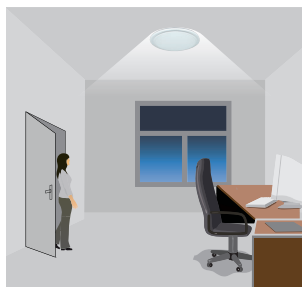
Functions and Features

1 Tri-level Control (Corridor Function)

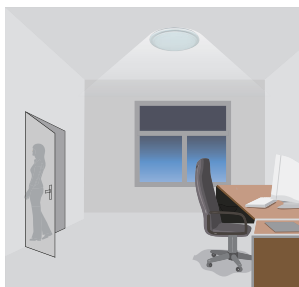
Hytronik builds this function inside the motion sensor to achieve tri-level control, for some areas which require a light change notice before switch-off. The sensor offers 3 levels of light: 100%→dimmed light (natural light is insufficient)→off; and 2 periods of selectable waiting time: motion hold-time and stand-by period; Selectable daylight threshold and freedom of detection area.



With sufficient natural light, the light does not switch on when presence is detected.



With insufficient natural light, the sensor switches on the light automatically when presence is detected.



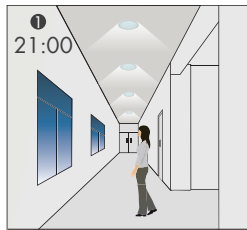
After hold-time, the light dims to stand-by level if the surrounding natural light is below the daylight threshold.



Light switches off automatically after the stand-by period elapses.

2 24h Daylight Monitoring Function (for master only)

Our innovative and patented software enables our antenna with built-in daylight sensor to provide a "smart photocell" function. This function is activated when stand-by period is set to "+∞".



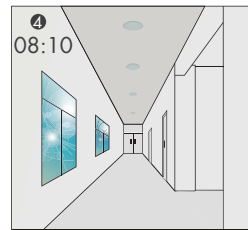
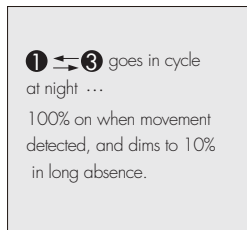
The light switches on at 100% when there is movement detected.



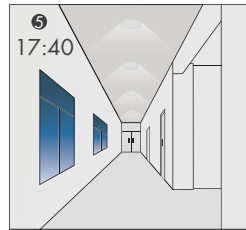
The light dims to stand-by level after the hold-time.



The light remains in dimming level at night.



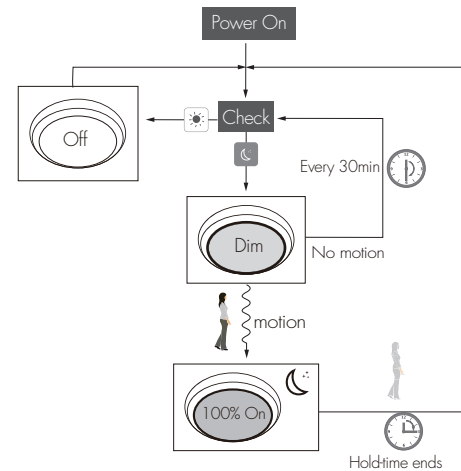
The light turns off completely when natural light lux exceeds daylight threshold pre-set.



The light automatically turns on at 10% when natural light is insufficient (no motion).

Settings on this demonstration:

Hold-time: 10min
Daylight threshold: 50lux
Stand-by dimming level: 10%
Stand-by period: +∞



3 Photocell Advance™ Function (HC054RF & HC064RF)

It's well known that LED lights have a totally different spectrum to natural light. Hytronik uses this principle and comes up with special photocell and sophisticated software algorithm to measure and differentiate natural light from LED light from behind the fixture cover, so that this photocell can ignore internal LED light and only respond to the natural light outside. Our technology has no infringement to the existing patents in the market.

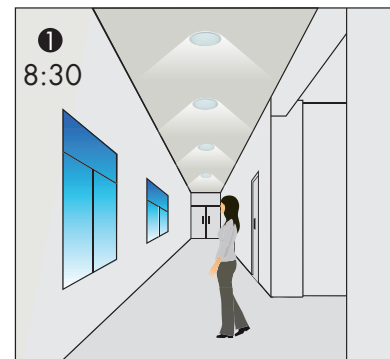
Settings on this demonstration:

Hold-time: 10min

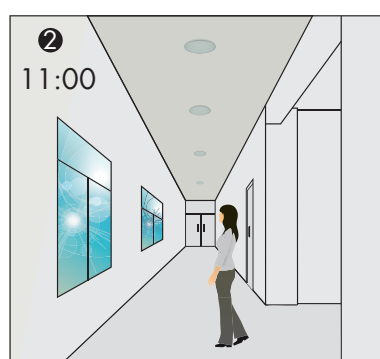
Daylight threshold: 50lux

Stand-by dimming level: 10%

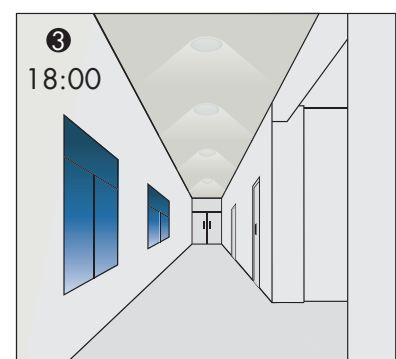
Stand-by period: +∞



With insufficient natural light, the light switches on at 100% when there is motion detected.



The light turns off completely whenever natural light reaches above pre-set daylight threshold, even with presence.



The light turns on at dim level automatically when natural light lux level drops below pre-set daylight threshold (no motion).

4 Loop-in and Loop-out Terminal

Double L N terminal makes it easy for wire loop-in and loop-out, and saves the cost of terminal block and assembly time.

5 Manual Override

This sensor reserves the access of manual override function for end-user to switch on/off, or adjust the brightness by push-switch, which makes the product more user-friendly and offers more options to fit some extra-ordinary demands:

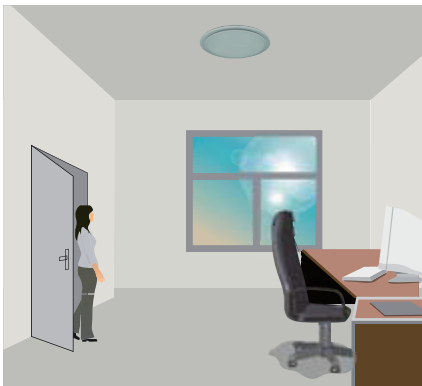
- * Short Push (< 1 s): on/off function;
 - On → Off: the light turns off immediately and cannot be triggered ON by motion until the expiration of pre-set hold-time. After this period, the sensor goes back to normal sensor mode.
 - Off → On: the light turns on and goes to sensor mode, no matter if ambient Lux level exceeds the daylight threshold or not. When manually push on the master via the push switch, it sends out the RF "ON" signal to all slaves in the same group. The slave only turns on the light when ambient light is insufficient.
- * Long Push (> 1 s): adjust the hold-time brightness level between 10% and 100%.

Note: if end-user do not want this manual override function, just leave the "push" terminal unconnected to any wire.

6 Semi-auto Mode (Absence Detection)

It is easy to forget to switch off the light, in office, corridor, even at home. And in many other cases, people do not want to have a sensor to switch on the light automatically, for example, when people just quickly pass-by, there is no need to have the light on. The solution is to apply this "absence detector": motion sensor is employed, but only activated on the manual press of the push switch, the light keeps being ON in the presence, and dims down in the absence, and eventually switches off in the long absence.

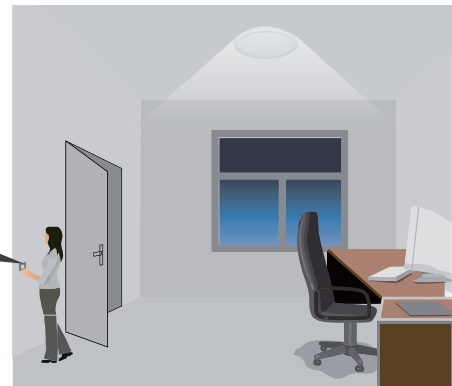
This is a good combination of sensor automation and manual override control, to have the maximum energy saving, and at the same time, to keep efficient and comfortable lighting.



The light does not switch on when there is presence being detected.



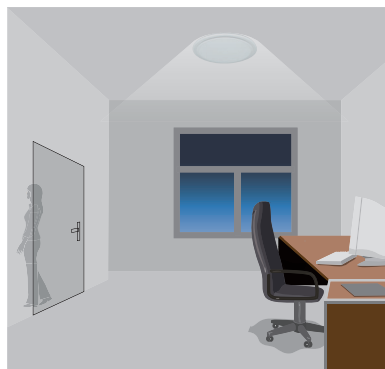
Short push to activate the sensor and switch on the light



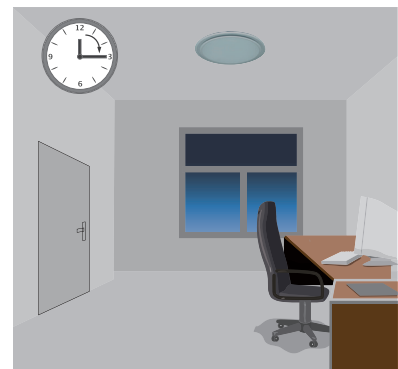
The light turns on full, and the sensor stays in sensor mode.



The light keeps being ON during the presence.



People left, the light dims to stand-by level after the hold-time.

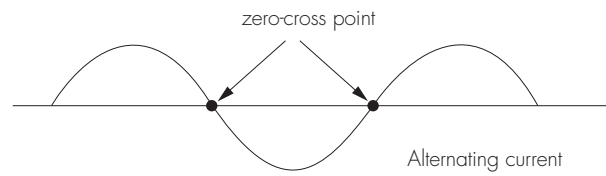


The light switches off automatically after the stand-by period elapses.

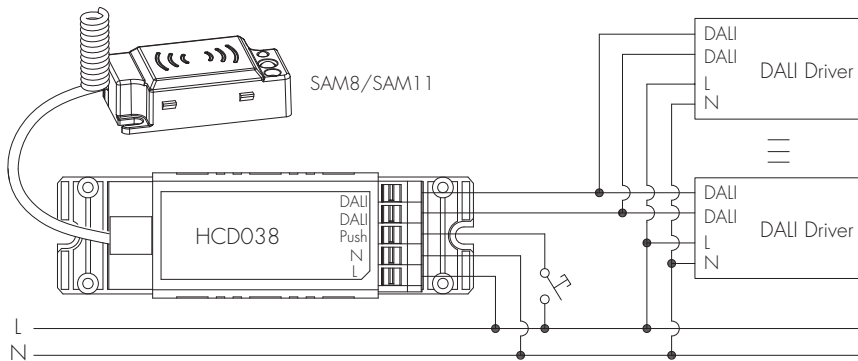
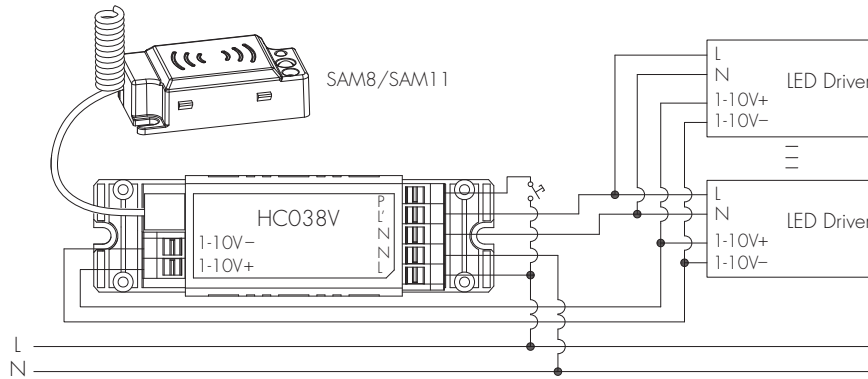
Note: end-user can choose either function 5 or function 6 for application. Default function is manual override.

7 Zero-cross Relay Operation (HC038V)

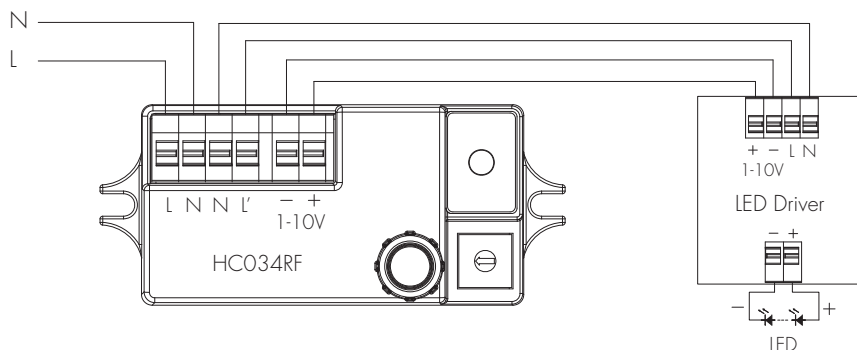
Designed in the software, sensor switches on/off the load right at the zero-cross point, to ensure that the in-rush current is minimised, enabling the maximum lifetime of the relay.



Wiring Diagram

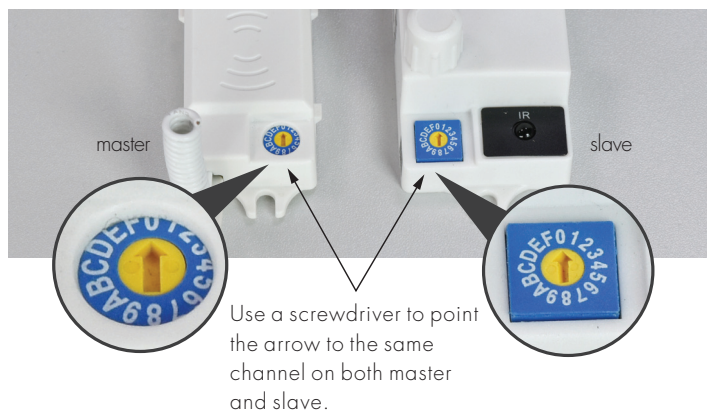


Wiring Diagram



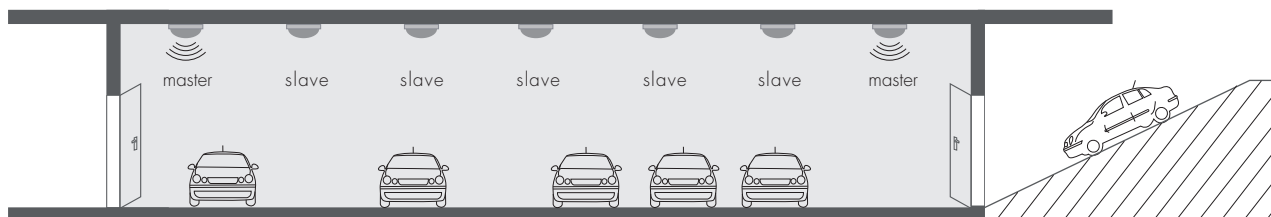
RF Grouping via Rotary Switch

By selecting the same channel on both the transmitter unit (master) and receiving unit (slave), the grouping is automatically completed. 16 channels (maximum 16 groups) are available for both the master & slave unit.

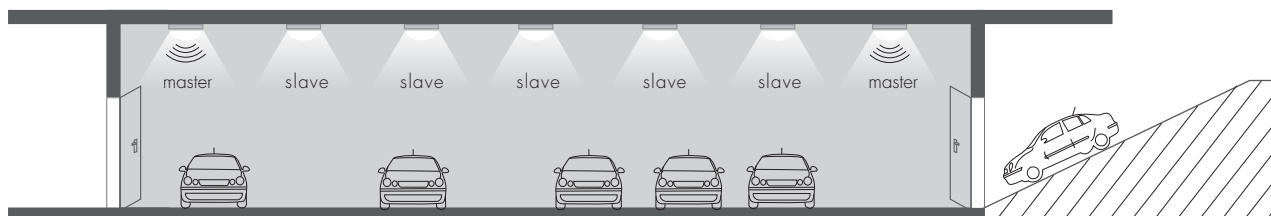


Typical Applications

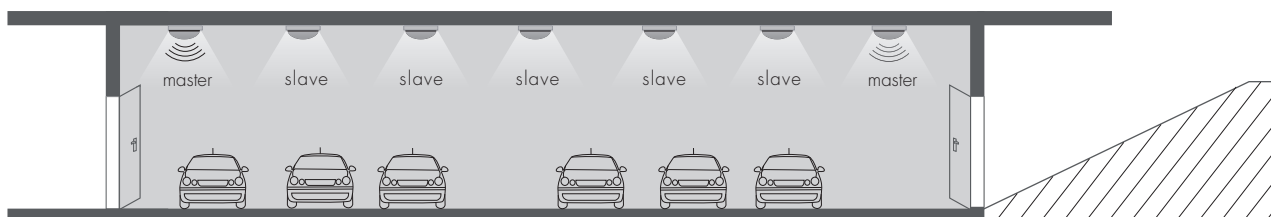
A For carpark (SAM11 with HC038V or HCD038 as master, HC034RF/HC054RF/HC064RF as slave)



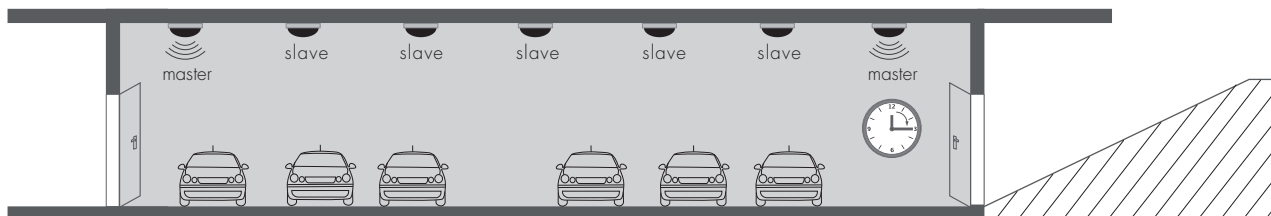
With sufficient natural light, the sensor is not triggered by motion.



With insufficient natural light, the sensor is triggered by motion, the master switches on the light and sends RF ON signal to all slaves.

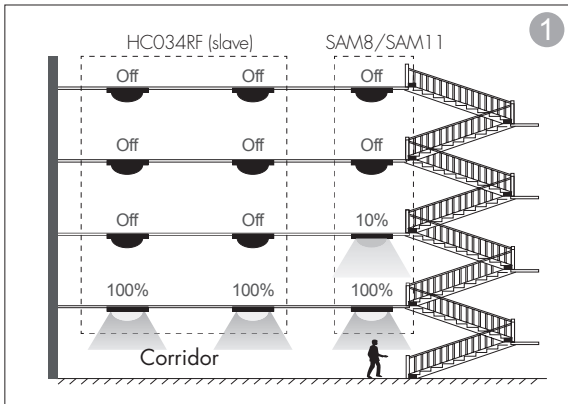


After the hold-time, the whole group of lamps dim to pre-defined dimming level when no movement is detected.

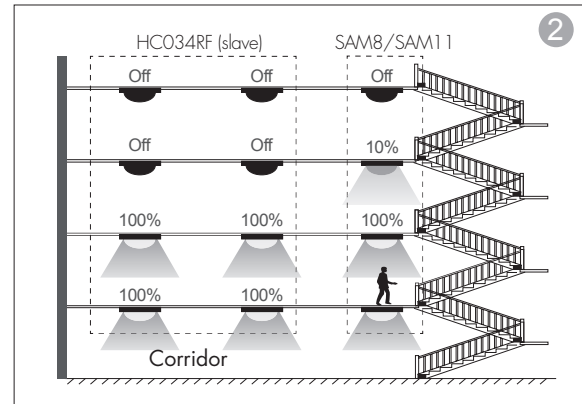


The whole group of lamps switch off automatically after the stand-by period.

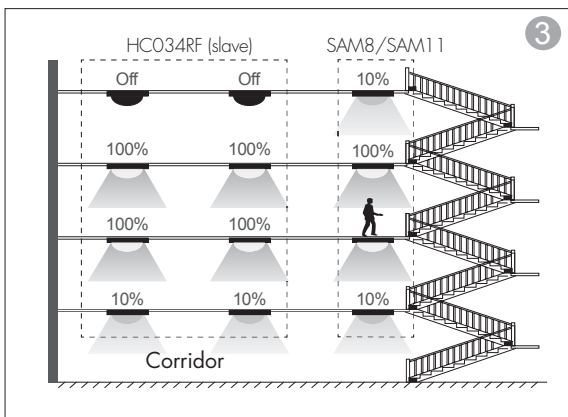
- B For staircase and corridor (SAM8/SAM11 with HC038V/HCD038 as both master and slave in the staircase & HC034RF /HC054RF /HC064RF as slave in the corridor)



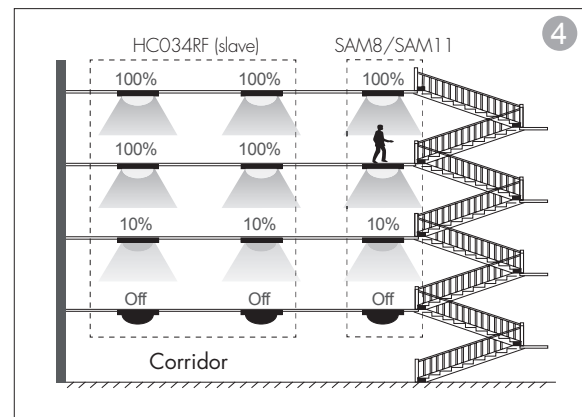
While the 1st sensor detects motion on the 1st floor, it switches the light on at 100% and sends signal to all slave units. All slaves on the 1st floor turn on and the SAM8 or SAM11 on the 2nd floor switches on at stand-by level.



The person walks to the 2nd floor, the 2nd SAM8 or SAM11 switches the light on at 100%. All slaves on the 2nd floor turn the light on and the SAM8 or SAM11 on the 3rd floor switches on at stand-by level.

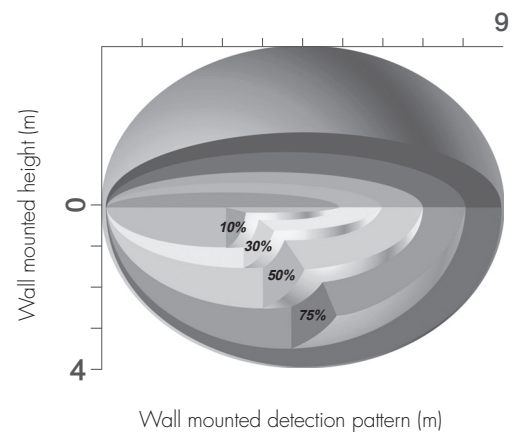
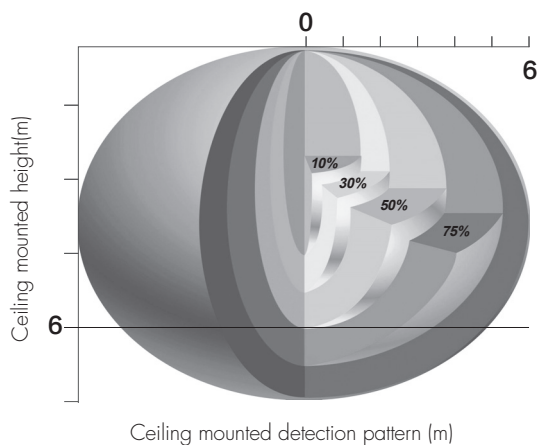


The person walks to the 3rd floor, the 3rd SAM8 or SAM11 switches the light on 100%. All slaves on the 3rd floor turn the light on and the SAM8 or SAM11 on the 4th floor switches on at stand-by level. Meanwhile, the lights on the 1st floor are dimmed to stand-by level after hold-time.



The person walks to the 4th floor, the 4th SAM8 or SAM11 switches the light on at 100%. All slaves on the 4th floor turn the light on. Meanwhile, all sensors on the 1st floor turn the light off after stand-by period, and all lights on the 2nd floor dim to stand-by level after hold-time.

Detection Pattern



Settings (Remote Control HRC-11)



Permanent ON/OFF function

Press button "ON/OFF" to select permanent ON or permanent OFF mode.

* Press button "AUTO", "RESET" to quit this mode.



Reset Settings

Press button "RESET", all settings go back to default settings.



Shift Button

Press button "Shift", the LED on the top left corner will flash to indicate mode selection. All values / settings in RED are valid for 20 seconds.



AUTO mode

Press button "AUTO" to initiate automatic mode. The sensor starts working and all settings remain as before the light is switched ON/OFF.



SEMI-AUTO mode

First press button "Shift" then "SEMI-AUTO" to initiate semi-auto mode. The fixture is manually on by push-switch and automatically off in this mode.



Power output

Press the buttons to select light output at 80% (at initial 10,000 hours) or 100%.

Note: "Sensor off" and "Twilight" functions are disabled.



Brightness +/-

Press the buttons to adjust the light brightness during hold-time.



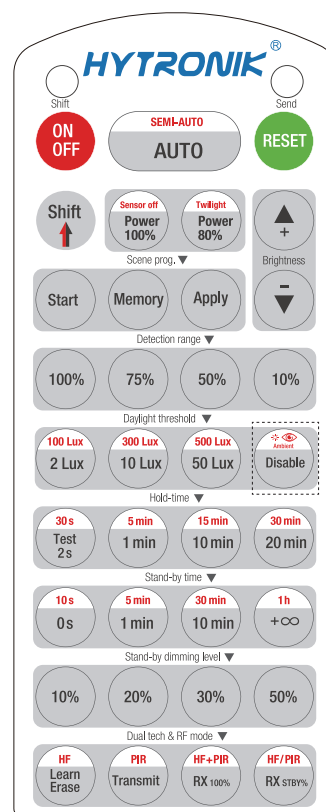
Scene program - 1-key commissioning

1. Press button "Start" to program.
2. Select the buttons in "Detection range", "Daylight threshold", "Hold-time", "Stand-by time", "Stand-by dimming level" to set all parameters.
3. Press button "Memory" to save all the settings programmed in the remote control.
4. Press button "Apply" to set the settings to each sensor unit(s).

For example, to set detection range 100%, daylight threshold Disable, hold-time 5min, stand-by time +∞, stand-by dimming level 30%, the steps should be: Press button "Start", button "100%", "Disable", "Shift", "5min", "Shift", "+∞", "30%", "Memory". By pointing to the sensor unit(s) and pressing "Apply", all settings are passed on the sensor(s).

Detection range (valid for master only)

Press buttons in zone "Detection range" to set detection range at 100% / 75% / 50% / 10%.



HRC-11

Daylight threshold

Press buttons in zone "Daylight threshold" to set daylight sensor at 2Lux / 10Lux / 50Lux / 100Lux / 300Lux / 500Lux / Disable.

Note: 1. To set daylight sensor at 100Lux / 300Lux / 500Lux, press "Shift" button first.
2. These buttons are invalid for HC034RF.

Ambient daylight threshold

1. Press button "Shift", the red LED starts to flash.
2. Press button "Ambient", the surrounding lux level is sampled and set as the new daylight threshold.

Hold-time

Press buttons in zone "hold-time" to set the hold-time at 2s / 30s / 1min / 5min / 10min / 15min / 20min / 30min.

Note: 1. To set hold-time at 30s / 5min / 15min / 30min, press "Shift" button first.

2. 2s is for testing purpose only, stand-by period and daylight sensor settings are disabled in this mode.

*To exit from Test mode, press button "RESET" or any button in "Hold-time".

Stand-by time (corridor function)

Press buttons in zone "stand-by time" to set the stand-by period at 0s / 10s / 1min / 5min / 10min / 30min / 1h / +∞.

Note: "0s" means on/off control; "+∞" means bi-level control, if daylight threshold is disabled or natural light is insufficient, the fixture is 100% on when there is motion detected, and remains at the stand-by dimming level after motion hold-time.

Stand-by dimming level

Press the button in zone "stand-by dimming level" to set the stand-by dimming level at 10% / 20% / 30% / 50%.

Dual tech & RF mode

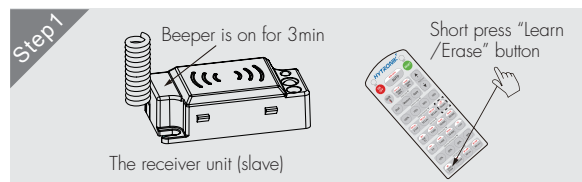
"HF", "PIR", "HF+PIR", "HF/PIR" are disabled.

For RF grouping via remote control, please refer to steps below:

RF grouping by HRC-11

Short press "Learn/Erase" button on RC to activate pairing mode, and the receiver unit starts to beep once every second for 3min.

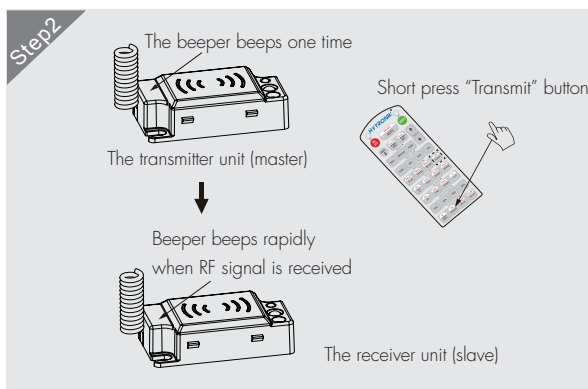
Note: the unit can only pair up to 30 units.



Short press "Transmit" button on RC, the commander unit (master unit) beeps one time to send the transmission signal.
Upon receiving the transmission signal, the receiver unit (slave unit) rapidly beeps 3 times in 1s to indicate the success of pairing. Repeat this step to pair more units.

One more short press on "Learn/Erase" button to the receiver unit to complete the pairing process, the receiver unit will quit the pairing mode.

Note: Press button RX100%, the light on receiver unit is 100% on upon receiving RF on signal; Press "RX STBY%" button, the light(s) goes to preset stand-by dimming level directly.



Erase:
Long press "Learn/Erase" button for 3s to the sensor unit. The beeper beeps rapidly for about 5s. All commands received before are erased.

