

Specification Sheet

ActiLume Wireless DALI gen2 system

The Philips ActiLume Wireless DALI gen2 lighting control system consists of a small, lightweight multisensor LRI1663 and a controller LLC1686, designed for integration into luminaires. It is a plug and play solution for numerous applications for office and industrial areas. Wireless communication is conform the ZigBee Pro standard (IEEE 802.15.4, WPAN).

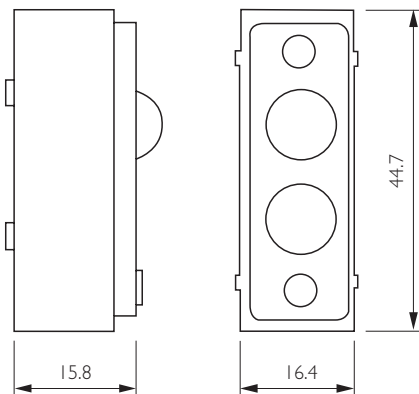
The controller single DALI output can drive maximum 4 loads but the system can be extended by using multiple LLC1686 controllers that again communicate wirelessly. Please note that this is limited communication (exchanging occupancy information). There are 11 predefined modes of operation (5 for Office, 6 for Industry) and 4 free to program available. The system is easy to install and use, not only initially, but also when expansion is required.

LLC1686, LRI1663

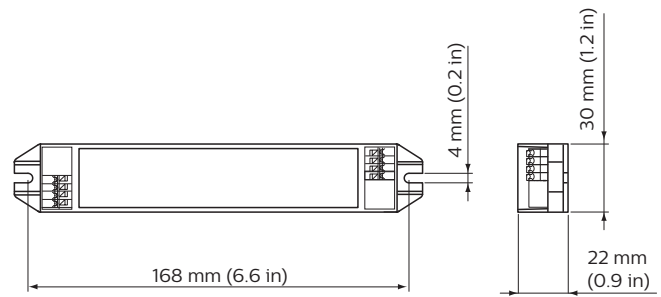
Features and benefits

- Philips ActiLume Wireless DALI gen2 is a DALI based lighting control system designed for maximum comfort and energy savings up to 75%.
- ActiLume Wireless DALI gen2 is a Plug and Play system; no specific lighting control training is needed.
- The ActiLume Wireless DALI gen2 system consists of three state of the art miniature sensors (light, movement and infrared receiver) combined with a controller.
- The light sensor is sensitive for visible radiation (matching the human eye) providing automatic savings with daylight depending regulation, without any visible discomfort for the user.
- The movement detector is very sensitive to human movements and contains a 15 minutes delay timer to provide optimal functionality whilst maximizing energy saving during absence.
- Personal control solutions can be created by connecting a mains rated spring-back switch to the controller or by using an infrared or RF remote control unit.
- The available modes of operation can be selected/ configured with the optionally available IRT9090 extended IR programming tool.
- The ActiLume Wireless DALI gen2 controller has a single DALI output for connecting 4 loads (drivers).
- The system can be combined with the wireless sensors from the OccuSwitch family.
- Communication amongst controllers and between controller(s) and sensor(s) is based on the ZigBee PRO standard (IEEE 802.15.4, WPAN) operating at 2.4GHz radio frequency (RF).
- Lightlevels can be set per mode and vary by default between 400 and 900 lux for office modes and between 200 and 300 lux for industry modes taking the different reflection factors into account over the different applications.

Dimensions



Multisensor LRI1663 dimensions in mm.



Controller LLC1686 dimensions in mm.

Applications

The ActiLume Wireless DALI gen2 system is designed for a broad range of applications, 15 dedicated modes are available, for different office and industry areas.

Plug and Play control regimes

Following functions can be changed independently:

- Power up behavior
- Default lightlevel
- Background level
- Hold time
- Prolong time
- Smart time

They can be changed by means of the IRT9090 and/ or the MultiOne tool and Software.

Commissioning and everyday use tools

The ActiLume Wireless DALI gen2 system can, once it is installed and has been commissioned, work stand alone. For simple commissioning and configuration and/or everyday use there are a number of remotes available.

The tools are listed below:

- IRT8010, IRT8050 and UID8510 simple infrared tools
- IRT8030 infrared tool with extended user functionality
- IRT9090 infrared tool for commissioning / configuration
- UID8410 RF tool (ZigBee protocol) for commissioning and local control

For creating the ZigBee network also dongle (LCN8650) can be used in combination with the MultiOne software.

Specifications

Philips quality

This ensures quality with respect to:

- System supplier
- As manufacturer of lamps, electronic control gear and lighting control equipment, Signify ensures that, from the earliest development stage, optimum performance is maintained.
- International standards
- Philips lighting control equipment complies with all relevant international rules and regulations.

Wireless communication

The Wireless network is based on the ZigBee PRO standard (IEEE 802.15.4, WPAN) which is targeted at radio-frequency (RF) applications and operates at 2.4 GHz. The ZigBee protocol enables fully distributed peer-to-peer communication models. This means no master/slave relationship whereby the application is divided over the devices in the network. Every device knows how it functions within the network. The result is that if one device does not function (removed or defect), the remaining devices keep functioning as intended. The network is based on a mesh network so the devices pass on the received commands. The distance between the devices should not exceed 10 meter. The big advantage of this mesh network is the capability that the network has a self-healing routing meaning automatic route discovery over the mesh network. ZigBee has tolerance for a large number of co-located networks due to use of multiple communication channels and CSMA-CA channel access. The commands do have network security according to AES 128-bits network encryption. The ActiLume Wireless DALI gen2 system and the OccuSwitch Wireless family make use of the same protocol so they can be combined to interact in a seamless way.

Although the ZigBee standard is supported by multiple hardware and software vendors, the ActiLume Wireless DALI gen2 system cannot interact with third party ZigBee devices because its communication is encrypted.

Wireless Scene Remote (UID8410)



The ActiLume Wireless DALI Gen 2 system is a standalone lighting control system but can be manually overruled with the optionally available Wireless Scene Remote UID8410. The remote has the following functions:

- The lights in the room can be switched on and off
- In a room with dimmable lights, the dim level can be set
- Dimming within a zone (area within a room) is also possible
- Scene setting and selection
- Commissioning

Using the remote is confirmed by audible (beep) and visual (controlled lights) feedback. Please note that if for example in a room a scene was selected and the light have been turned off, due to no presence detection, that once presence has been detected the system will go to the normal mode of operation with the appropriate settings.

Detection patterns of the sensors

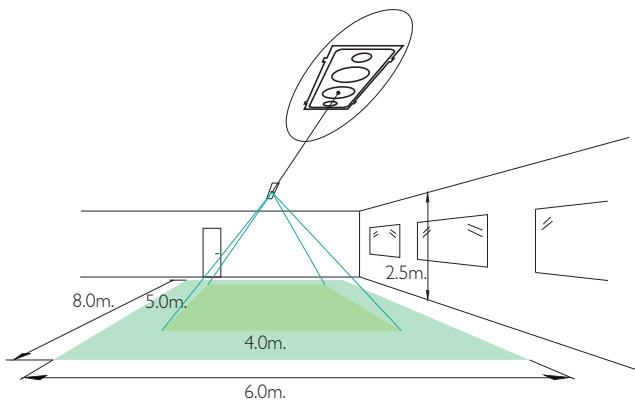
Movement sensor



The detection area for the movement sensor can be roughly divided into two parts:

- 4.0 by 5.0 m. for minor movements (at a desk)
- 6.0 by 8.0 m. for major movements (walking)

Mentioned values are applicable when the sensor is mounted at a height of 2.5 m.



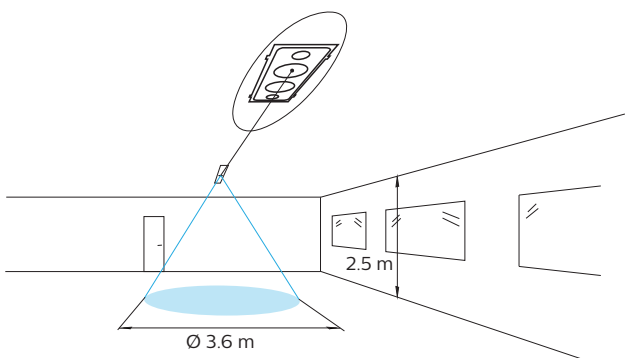
Light sensor



The light sensor measures the total amount of light in circular field of Ø3.6 m. when mounted at a height of 2.5 m. The following aspects should be observed during installation:

- Minimum distance from the window ≥ 0.6 m.
- Prevent light reflections from outside entering the sensor (for example sunlight reflection on a car bonnet) as this will lead to incorrect light regulation.

As a guideline the formula $0.72 \times H$ can be used to calculate the minimum distance between the window and sensor whereby H is the height from the bottom of the window to the ceiling.



Infrared sensor



The infrared sensor (receiver) will react to signals from the IR remote when the signal is transmitted under an angle of up to 55°.

LED indicator



There is an integrated LED indicator in the sensor that will turn red if presence is detected and will turn yellow if no presence is detected.

Multisensor mounting

The sensor has latching rills on the back so it can be mounted easily. There are several methods of mounting available:

- directly onto the lamp by means of an additional clip LCA8002 (TL5) or LCA8003 (TL-D).
 - inside the luminaire housing using the additional clip LCA8005.
- To use this clip a hole needs to be cut according to the dimensions as indicated in figure 1.
- directly inside the luminaire housing whereby a hole needs to be cut (punched) according to figure 2.

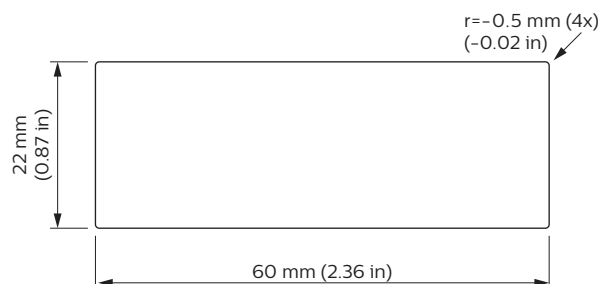


Figure 1: Cutout pattern when using with clip LCA8005

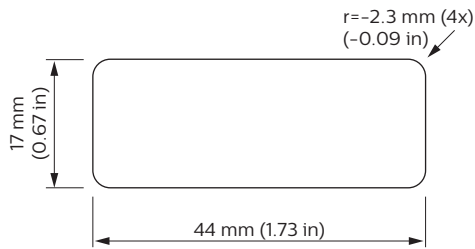


Figure 2: Cutout (punch) pattern when using with cover LCA8006

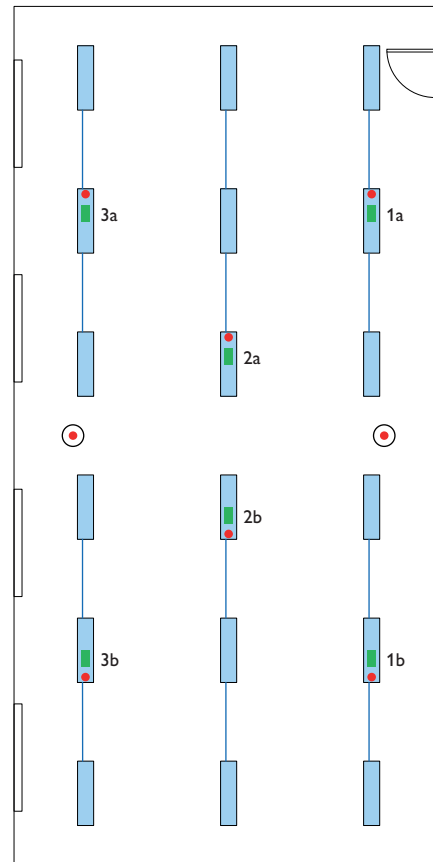
Application example

The application shown is an office area with natural light ingress.

This example is a combination of luminaires fitted with the ActiLume Wireless DALI gen2 system (each connected to two luminaires with DALI connection) combined with two OcuSwitch Wireless multi sensors. This combination provides complete presence detection coverage over the whole area even for minor movements.

As soon as a person enters the office this is detected by the ActiLume Wireless DALI gen2 system (1a), which is closest to the entrance, and the three luminaires will be switched On to the requested light level. Presence information is wireless communicated to the luminaires that are also equipped with the ActiLume Wireless DALI gen2 system (2a and 2b center row), (3a and 3b window row) and to luminaire (1b) and these will be switched On but to the background light level. As the person moves through the area lights will be switched to nominal light level when movement is detected while, after the hold time period has expired area parts will go or stay at background light level. If in the area where presence is detected there is sufficient daylight ingress the Daylight Dependent Regulation (DDR) function will be active.

Once no movement has been detected during the hold time period the luminaires will go to background level and after the prolong time has expired the lights will be switched Off.



Example of ActiLume Wireless DALI gen2 system office configuration

ActiLume Wireless DALI gen2 system connection overview



Note
DALI port 1 and 2 are physically the same connection.

Mode overview

| Mode | Short description |
|---------------------|-------------------------------------|
| Office | |
| 1 | Cell Office Auto On |
| 2 | Open Office Auto on |
| 3 | Cell Office Manual On |
| 4 | Open Office Manual On |
| 5 | Non Working Area Always on |
| Industry | |
| 6 | Max Savings Off when vacant |
| 7 | Comfort Off when Vacant |
| 8 | Max Savings always On |
| 9 | Comfort Off Always On |
| 10 | Non Working Areas Off when vacant |
| 11 | Non working area Manual-on/Auto-off |
| Free for OEM | |
| 12 | Free (copy of mode 1) |
| 13 | Free (copy of mode 1) |
| 14 | Free (copy of mode 1) |
| 15 | Free (copy of mode 1) |
| 16 | Free (copy of mode 1) |

Technical data for installation

Controller LLC1686

| | |
|----------------------------------------------|------------------------------------|
| Mains input ratings | |
| input voltage | 195 to 240 Vac |
| frequency | 50 to 60Hz. |
| Input power (without LRI1663) | ≤ 650 mW (at 230 Vac 50 Hz) |
| Input power (with LRI1663) | ≤ 750 mW (at 230 Vac 50 Hz) |
| Additional required input power | 40 mW (per full DALI load of 2 mA) |
| Environmental conditions operating | |
| ambient temperature range | 20 to 55 °C |
| relative humidity range | 20 to 85% (no condensation) |
| maximum case temperature Tcase | 65 °C |
| Environmental conditions storage | |
| temperature range | -25 to 85 °C |
| relative humidity range | 10 to 95% (no condensation) |
| Connector type mains, Touch and Dim and DALI | WAGO 250 |
| wire size | 0.5 to 1.5 mm ² |
| AWG wire size | 20 to 16 |
| stripping length | 8.5 to 9.5 mm |
| Connector type multisensor port | RJ-10 (4P4C) |
| Dimensions (length, width, height) | 179.5 x 30.0 x 22.1 mm |
| Weight | 70 g |
| Maximum number of ballasts | 4 |
| DALI ports physically | 2 (parallel connected) |

| | |
|-----------------------------------|---------|
| DALI port maximum load | 8 mA |
| DALI port absolute maximum load | ≤ 12 mA |
| Touch and Dim input (mains rated) | 1 |

Note
no external power supply allowed

| | |
|------------------------|-------------------------------------------|
| Wireless Communication | ZigBee PRO standard (IEEE 802.15.4, WPAN) |
| Housing color | White (WH8581) |

Multisensor LRI1663

| | |
|------------------------------------------|---------------------------|
| Viewing angle | |
| light sensor (daylight spectrum) | 72° (circular) |
| movement sensor (passive infra red) | 72° x 85° (rectangular). |
| infra red sensor (RC5 code from remotes) | 110° (circular) |
| Cable length | 1 m |
| Connector type | RJ-10 (4P4C) |
| Extension of cable allowed | Yes (max 5.0 m) |
| Dimensions (length, width, height) | 44.7 x 16.4 x 15.8 mm |
| Weight | 28 grams |
| Housing color | Ultra dark gray (RAL7024) |

Controller and Multisensor

| | |
|-----------------------|------------------------|
| Housing | |
| outer material | polycarbonate UL94 V-0 |
| glow wire test | 850 °C for ≤ 5 s |
| insulation for safety | ≥ 1500 V |

Compliances and approvals

| | |
|------------------------|-----------------------------|
| Emission | |
| RFI 9kHz to 30MHz | EN 55015 |
| RFI 30MHz to 300MHz | EN 55015 |
| Immunity | EN 61547 |
| Safety | EN 61347-1 EN 61374-2-11 |
| Quality standard | ISO 9001 |
| Environmental standard | ISO 14001 |
| Approval marks | CE0682, ENEC |
| Wireless certification | |
| R&TTE EMC | ETSI EN 301 489-1/17 |
| R&TTE Radio | ETSI EN 300 328 |

LLC1686 ActiLume Wireless DALI gen2



The controller for the ActiLume Wireless DALI gen2 system. ActiLume DALI systems are plug and play, DALI-based control system that fulfill the basic needs in areas where maximum energy saving are preferred using the daylight harvesting and presence detection functionality.

LRI1663 ActiLume gen2 multisensor



The multisensor for the ActiLume Wireless DALI gen2 system. Color of the product is ultra dark gray (similar to RAL7024).

LCA8006 Cover for ActiLume multisensor



Cover for the ActiLume multisensor to obtain the same outer dimensions as the ActiLume MicroLuxSense and the ActiLume 1-10V sensor. Color of the product is light gray (similar to RAL7035) or white (RAL9010).

IRT9090 Extended IR Programming Tool



Commissioning / configuration tool for OccuSwitch DALI, OccuSwitch and luminaires with ActiLume. Easy to use and inexpensive tool to adjust the functionality, perform an installation test and/or calibrate lightlevel. Functionality is depending on the product it is used with. Batteries are included.

LCA8001 Ring for ActiLume sensors



Ring around the cover of the ActiLume multisensor + cover, ActiLume luminaire based extension sensor + cover, ActiLume 1-10V sensor or ActiLume MicroLuxSense to fit in the micro-optics of a luminaire. Color of the product is light gray (similar to RAL7035).

LCA8002 ActiLume sensor clip for TL5



Clip to be used for ActiLume multisensor, ActiLume Luminaire based extension sensor, ActiLume 1-10V sensor and the ActiLume MicroLuxSense . With this clip the sensor can be directly clicked on the TL5 lamp.

LCA8003 ActiLume sensor clip for TL-D



Clip to be used for ActiLume multisensor, ActiLume Luminaire based extension sensor, ActiLume 1-10V sensor and the ActiLume MicroLuxSense . With this clip the sensor can be directly clicked on the TL-D lamp.

LCA8005 ActiLume mounting clip for use in luminaire



Clip to be used for ActiLume multisensor, ActiLume Luminaire based extension sensor, ActiLume 1-10V sensor and the ActiLume MicroLuxSense. With this clip the sensor can be mounted in the luminaire housing. Color of the product is light gray (similar to RAL7035) or white (RAL9010).

IRT8010 Hand-held two-key transmitter



Hand-held two-key transmitter , for infrared control of various lighting control systems. ActiLume can also dim the lights (by pressing a button > 0.5 sec). The unit is supplied with batteries. A wall holder is separately available but this transmitter is not designed to be operated from the wall holder. The IR group address section switch is situated in the battery compartment. Color of the product is white (similar to RAL9010).

LRH8010 Wall holder



Wall holder for the IRT8010 hand-held two-key transmitter. Color of the product is white (similar to RAL9010).

IRT8030 Four-preset hand-held transmitter



Four-preset hand-held transmitter, suitable for infrared control of the ActiLume system. It has 4 keys for presets and one key for “all off”. Keys for individual control and preset programming are located under a hinged cover at the bottom of the transmitter. The IR group address selection switch is also situated behind the hinged cover. The unit is supplied complete with wall holder and batteries. Color of the product is white (similar to RAL9010).

IRT8050 Two-key infrared remote control



Two-key infrared remote control transmitter for wall mounting and table-top use. The actual function of the two large keys can be selected with a dip switch in the battery compartment. A dip switch is also used to select the IR group address. Batteries are included and the color of the product is white (similar to RAL9010).

UID8510 ToBeTouched IR



The UID8510 IR user interface panel provides intuitive on/off and dimming functionality. It connects via infrared to the ActiLume system and batteries are included. Color of the product is white (similar to RAL9003).

LRM1763 OSW Multi sensor



The LRM1763 is the multi sensor of the OccuSwitch Wireless family. Generally mounted against the ceiling it has a, more or less, rectangular presence detection pattern of 3.6 x 5.4m for small movements, and 5.4 x 7.2m for large movements when mounted at a height of 2.5m. In addition to presence detection the unit also has a daylight sensor and is provided with a battery for powering.

LRM1765 OSW Corridor sensor



The LRM1765 is the corridor sensor of the OccuSwitch Wireless family. Generally mounted at a height of 2.3m and it has a presence detection pattern of 6.1 x 45.0m and is provided with a battery for powering.

LRM1770 OSW Corner sensor



The LRM1770 is the corner sensor of the OccuSwitch Wireless family. Generally mounted at a height of 2.3m and it has a rectangular presence detection pattern of 10.0 x 10.0m for small movements and 15.0 x 15.0m for large movements and is provided with a battery for powering.

LRM1775 OSW Wall sensor



The LRM1775 is the wall sensor of the OccuSwitch Wireless family. Generally mounted at a height of 2.3m and it has a rectangular presence detection pattern of 10.0 x 10.0m for small movements and 15.0 x 15.0m for large movements and is provided with a battery for powering.

LRH1763 IP65 holder OSW Multi sensor



The LRH1763/00 holder is an IP65 housing suited to be used with the OSW Multi sensor in covered outdoor situations. It is designed to be mounted on the ceiling and the color of the product is light gray (similar to RAL7035).

LRH1765 IP65 holder OSW C-C-W sensors



The LRH1765/00 holder is an IP65 housing suited to be used with the OSW C-C-W sensors in covered outdoor situations. It is designed to be mounted flat against the wall or in a 90° corner between two walls and the color of the product is light gray (similar to RAL7035).

LCN8650 MultiOne interface USB2ZigBee



ZigBee dongle for simple network creation in combination with the MultiOne software.

UID8410 Wireless Scene Remote



Handheld remote for commissioning, scene selection and everyday use of the ActiLume Wireless systems. Actual two way communication is with the Actilume Wireless controller. The remote comes with 3 standard AAA batteries. Color of the product is white.

LRH8020 Wall mount Multi Scene remote



The LRH8020 is the holder for the UID8410 Wireless Scene remote. It comes complete with screws and a wall bracket and the color of the product is white.

Packing data

| Type | Dimensions (mm) | Qty/Box | Material | Weight (Kg) net | gross |
|----------|-----------------|---------|-----------|-----------------|-------|
| LLC | 188 x 188 x 66 | 12 | Ca | 0.840 | 1.000 |
| LRI1663 | 200 x 175 x 110 | 12 | Cardboard | 0.300 | 0.504 |
| IRT9090 | 238 x 46 x 27 | 1 | Cardboard | 0.160 | 0.105 |
| UID8410 | 170 x 110 x 80 | 1 | Cardboard | 0.100 | 0.337 |
| LCA8001 | 216 x 93 x 70 | 100 | Cardboard | 0.155 | 0.221 |
| LCA8002 | 216 x 93 x 70 | 50 | Cardboard | 0.450 | 0.455 |
| LCA8003 | 216 x 93 x 70 | 50 | Cardboard | 0.450 | 0.455 |
| LCA8005 | 220 x 97 x 71 | 50 | Cardboard | 0.780 | 0.810 |
| LCA8006 | 220 x 97 x 71 | 50 | Cardboard | 0.780 | 0.810 |
| LRM1763 | 110 x 60 x 90 | 1 | Cardboard | 0.060 | 0.117 |
| LRM1765 | 110 x 90 x 60 | 1 | Cardboard | 0.063 | 0.155 |
| LRM1770 | 110 x 90 x 60 | 1 | Cardboard | 0.063 | 0.155 |
| LRM1775 | 110 x 90 x 60 | 1 | Cardboard | 0.063 | 0.155 |
| L RH1763 | 460 x 185 x 44 | 4 | Cardboard | 0.710 | 0.830 |
| LRH1765 | 460 x 185 x 65 | 4 | Cardboard | 0.740 | 0.920 |
| LRH8020 | 230 x 195 x 95 | 40 | Cardboard | 0.520 | 0.668 |
| LCN8650 | 88 x 59 x 26 | 1 | Cardboard | 0.026 | 0.041 |

Ordering data

| Type | MOQ | Ordering number | EAN code level 1 | EAN code level 3 | EOC |
|---------------------------------------------|-----|-----------------|------------------|------------------|-----------|
| LLC1686/11 ActiLume Wireless DALI gen2 | 12 | 9137 003 63103 | 8718291 786818 | 8718291 786825 | 786818 00 |
| LRI1663/00 ActiLume gen2 multisensor | 12 | 9137 003 56703 | 8718291 680925 | 8718291 680932 | 680925 00 |
| IRT9090/01 Extended IR programming tool | 1 | 9137 003 59103 | 8718291 747635 | 8718291 747642 | 747635 00 |
| UID8410/10 Wireless Scene Remote (handheld) | 1 | 9137 003 52303 | 8718291 256694 | 8718291 256700 | 256694 00 |
| LCA8001/00 Ring for cover set of 100pce | 1 | 9137 003 38303 | 8727900 882780 | 8727900 882797 | 882780 00 |
| LCA8002/00 ActiLume clip TL5 set 50pce | 1 | 9137 003 40803 | 8727900 952940 | 8727900 952957 | 952940 00 |
| LCA8003/00 ActiLume clip TL-D set 50pce | 1 | 9137 003 40903 | 8727900 952988 | 8727900 952995 | 952988 00 |
| LCA8005/00 ActiLume mounting clip 50pce | 1 | 9137 003 48803 | 8718291 196242 | 8718291 196259 | 196242 00 |
| LCA8005/05 ActiLume mounting clip 50 W | 1 | 9137 003 55103 | 8718291 719632 | 8718291 719649 | 719632 00 |
| LCA8006/00 Cover ActiLume gen2 set 50pce | 1 | 9137 003 55503 | 8718291 653752 | 8718291 653769 | 653752 00 |
| LCA8006/05 Cover ActiLume G2 set 50 W | 1 | 9137 003 58603 | 8718291 719595 | 8718291 719601 | 719595 00 |
| LRM1763/10 OS Wireless Multi sensor | 1 | 9137 003 53003 | 8718291 225751 | 8718291 225768 | 225751 00 |
| LRM1765/10 OS Wireless Corridor sensor | 1 | 9137 003 52003 | 8718291 250654 | 8718291 250661 | 250654 00 |
| LRM1775/10 OS Wireless Wall sensor | 1 | 9137 003 51803 | 8718291 250630 | 8718291 250647 | 250630 00 |
| LRH1763/00 IP65 Holder OSW Multi sensor | 4 | 9137 003 60003 | 8718291 747970 | 8718291 747987 | 747970 00 |
| LRH1765/00 IP65 Holder OSW C-C-W sensor | 4 | 9137 003 60103 | 8718291 748137 | 8718291 748144 | 748137 00 |
| LRH8020/00 Wall mount Multi Scene white | 1 | 9137 136 10314 | 8718291 209409 | 8718291 209416 | 209409 00 |
| LCN8650/10 MultiOne interface USB2ZigBee | 1 | 9137 003 59203 | 8718291 747659 | 8718291 747666 | 747659 00 |

© 2019 Signify Holding. All rights reserved. Specifications are subject to change without notice. No representation or warranty as to the accuracy or completeness of the information included herein is given and any liability for any action in reliance thereon is disclaimed. Philips and the Philips Shield Emblem are registered trademarks of Koninklijke Philips N.V. All other trademarks are owned by Signify Holding or their respective owners.



www.philips.com/lighting