

e-Multisensor 0-10V

Motion detector and light sensor for energy saving applications

Product reference: MS.602000-000



e-Multisensor 0-10V is a ceiling mounting multisensor designed for energy saving indoor applications, which includes a very precise motion sensor for occupancy detection and a light sensor for light level measurement applications.

The product is intended to automatically switch on and off a light or lights depending on occupation on the area and provides a light level with respect to the incident natural light and the artificial light provided by the lamps.

Product description

e-Multisensor 0-10V is a product based on a very precise motion sensor for occupancy detection that provides an ON/OFF signal to indicate when people is moving on its range of application in an indoor area, and is typically used to switch ON and OFF a light or group of lights. On the other hand the product includes a light sensor that measures the light level on the area, and provides its value through an analog output signal for a later process using a Control System.

The ON/OFF signal of the motion detector is an NO/NC potential free contact relay that changes its state when movement detection is sensed, and remains on this state until a pre-defined time expires. The time can be adjusted with a potentiometer on the back side of the product. The switching



ON delay can be adjusted from 1 second to 50 minutes, and the resolution of the scale depends on the position of the potentiometer (see detailed documentation).

The analog signal of the light sensor is a 0-10V standard voltage output, designed to be connected to an analog input system which will use this information to control the light level of the indoor space, in order to adjust the light at the desired level and thus saving as much energy as possible.

The product is designed to be flush mounted on a ceiling of spaces like offices, rooms, corridors, etc. and can be used on different markets like hotels, commercial buildings, office buildings, industry, etc.

Functional description

Motion detector

In stand-by mode, the relay output signal is on its released NC-C position. When movement is detected on the detection area of the sensor, the relay output signal changes its state closing the contact to the NO-C position, during a period of time pre-defined by the potentiometer. After this time the relay changes its state to the released NC-C position. The count resets when a movement is detected by the sensor.

By default the potentiometer position is pre-configured at 1 second.

When supply voltage is applied to the device there is a power-up time of 40 seconds where the relay output signal will remain released NA-C until the motion sensor is stabilized.

Light sensor

The light sensor measures the incident light level within an area defined by the radiant sensitivity pattern of the sensor and provides the information through the 0-10V analog output voltage signal. The output voltage provided is a linear signal respect to the measured light level.

At power up the light sensor output is stable after 100 mSec.

Led indicator

The Led indicator is a red light that blinks each time a movement is detected by the sensor. Once movement is detected the Led goes on and returns to off when movement

detection is finished. The movement detection led indicator can be enabled/disabled using the pushbutton (see Pushbutton section). By default the Led indicator is enabled. When the potentiometer is adjusted the Led indicator blinks indicating a change is detected. Be advised that the Led movement detection blink is not disabled when the potentiometer is adjusted.

Pushbutton

The pushbutton can be used for testing the relay output signal and for enabling/disabling the blink detection:

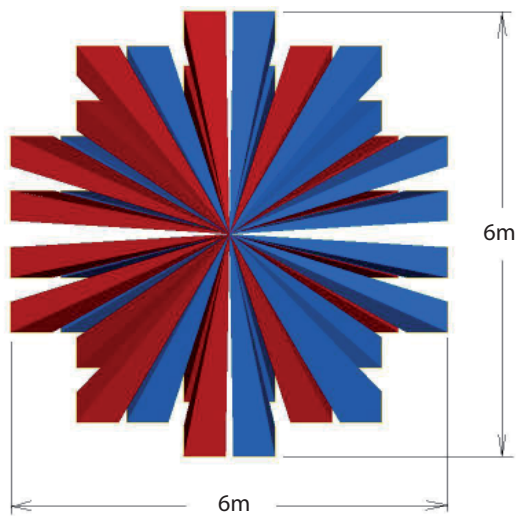
- 1) A short push activates the output relay during 5 seconds. After this time the relay returns to the released NC-C position. When pressing the pushbutton the Led also blinks indicating the pushbutton has pressed and the output goes to active.
- 2) A long push enables/disables the movement detection blink Led function. When pressing the pushbutton, the Led turns ON until the enable/disable function state changes. Then the Led goes OFF and the installer can release the pushbutton.

Potentiometer

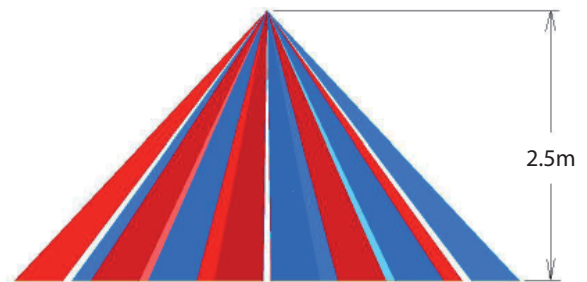
The switching ON time of the relay can be adjusted using a potentiometer on the rear part of the device. Time resolution differs depending on the position of the potentiometer (see Technical Features section).

Motion sensor. Pattern detection diagram

Top View
(installed at 2.5mts ceiling)

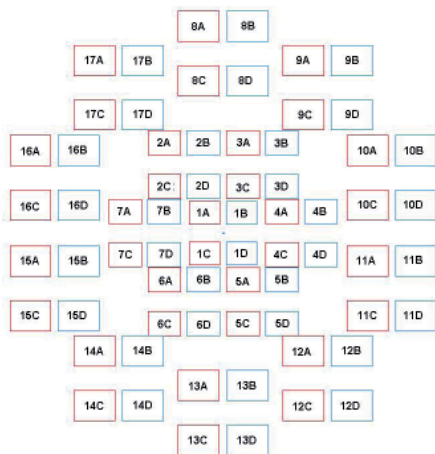


Side View



Motion sensor. Zone detection diagram

Top View

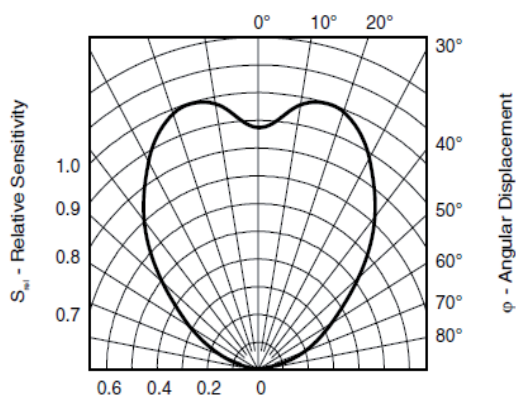


The zone detection diagram shows the radiation pattern of the PIR infrared motion sensor, based on 17 lenses providing a very precise movement detection mechanism, formed by 68 detection zones.

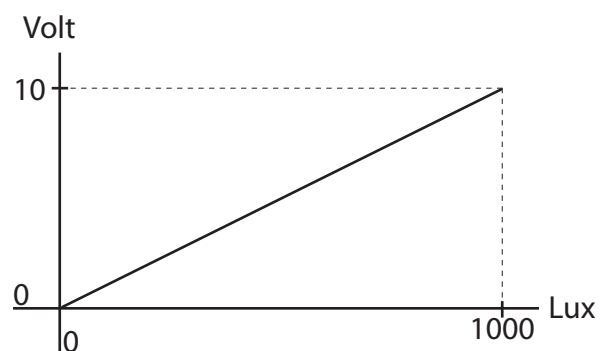
The nominal zone separation between cells is 15 cm and the maximum zone separation is 40 cm (at 2mts distance from the sensor).

Light sensor

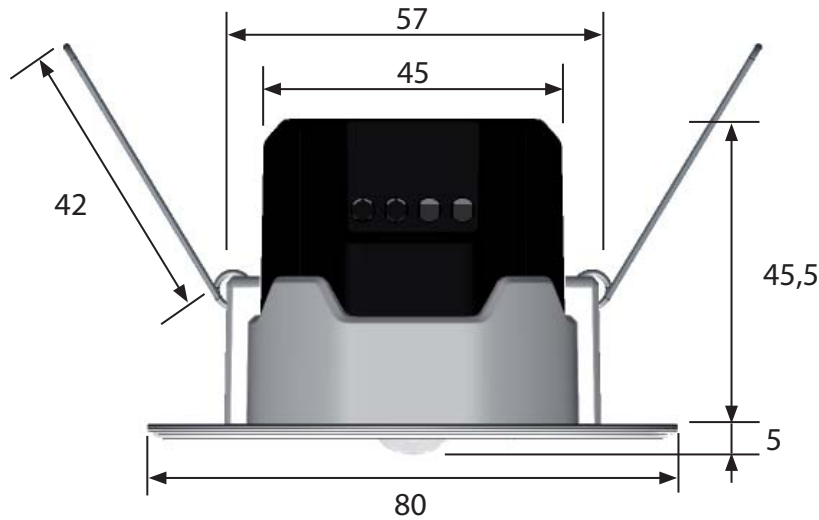
Sensitivity pattern



Output voltage versus measured lux level



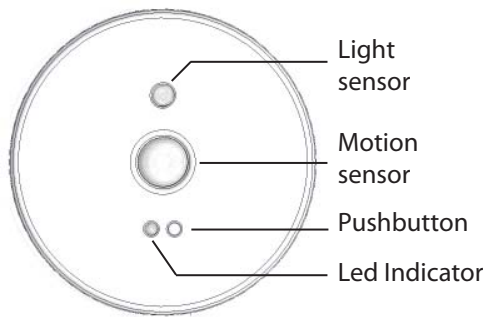
Dimensions



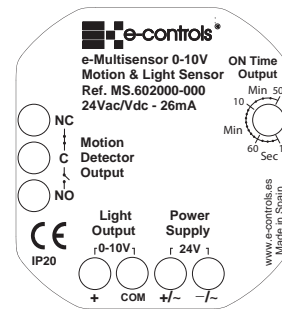
Dimensions in mm

Mechanical description

Front view



Rear view



(*) Drawings not to scale

Mounting instructions

The device has a flush mounting enclosure that must be installed on a suspended ceiling.

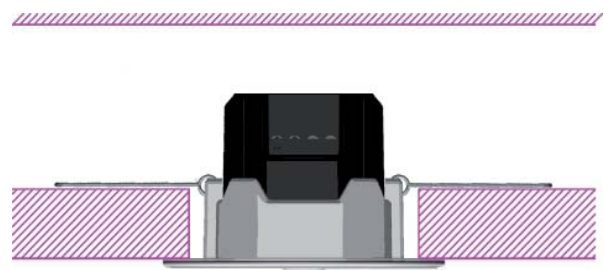
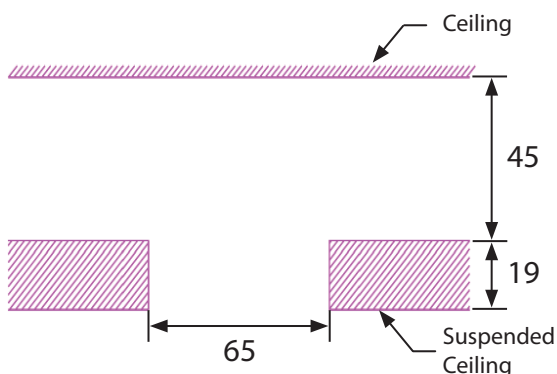
Installation instructions:

- 1) Drill a 65mm diameter hole on the ceiling.
- 2) Connect the wires on the correct terminals:
 - Power supply must be connected to the +/ - terminals. Respect polarity if DC voltage is used.
 - Motion detector output includes NC-C-NO terminals. C is common terminal. NC is Normally closed, NO is normally Open. Connect wiring as needed on the control system
 - Connect light sensor output respecting polarity. + is output voltage signal, COM is reference signal.
- 3) Adjust the ON Time Output potentiometer on back cover, to the desired relay ON time.
- 4) Clip the springs and insert the product into the hole, releasing the springs when placed in (see figure).

- 5) Power up the supply voltage. Check the relay output by short pressing the front Pushbutton. Check the 0-10V analog output by covering the light sensor.

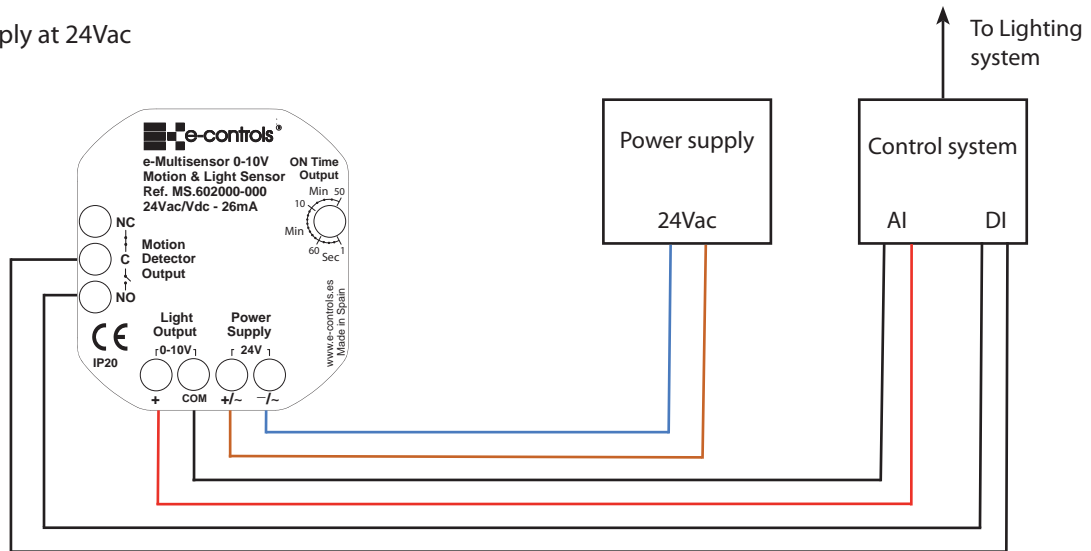
Caution:

- Avoid direct sun radiation over the device.
- Do not install near heat /cool air handling units.
- Disconnect the device from the power supply before mounting or moving the sensor.
- Do not leave cables peeled or turned around the device.
- Do not connect the device with the hands wet.
- Do not open or hole the device.
- Keep the device and cables away from humidity and dust.
- Clean the front cover with a water moistured soft cloth.



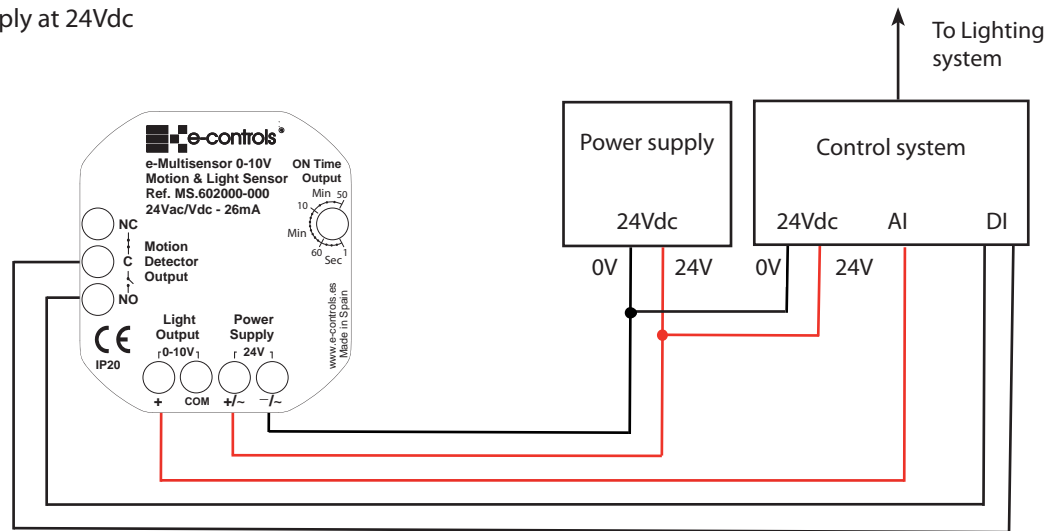
Installation diagram

1- Power supply at 24Vac



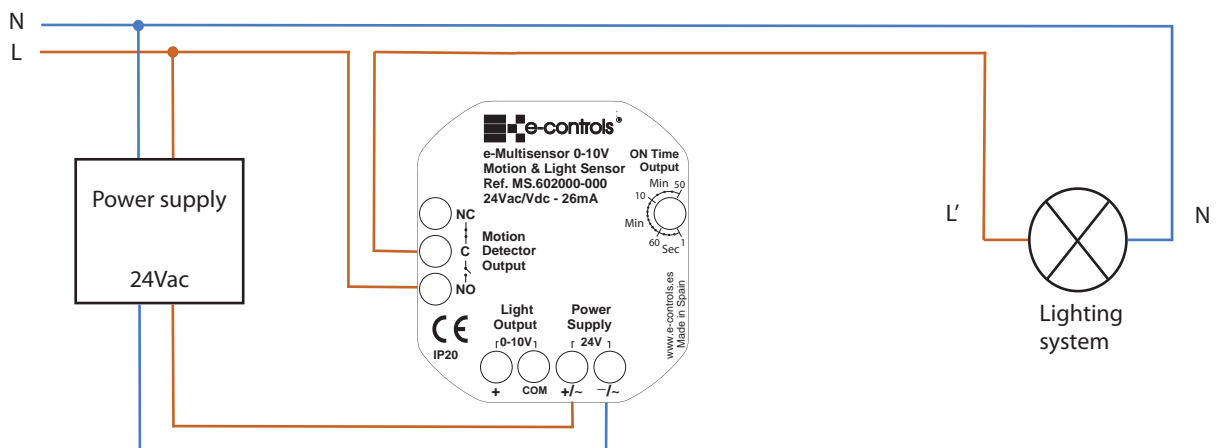
Input signals: AI: Analog input (0-10V)
DI: Digital input (for dry contact signals)

2- Power supply at 24Vdc



Input signals: AI: Analog input (0-10V)
DI: Digital input (for dry contact signals)

3- On/Off direct lighting control (movement detection)



Technical Features

Power Supply

Operating voltage 24Vdc/24Vac - 50-60 Hz
Operating current (nominal) 26 mA

Motion Sensor (EM1)

Technology PIR (Infrared)
Number of pyro elements 4
Number of detection zones 68
Detection angle (X, Y) +/- 50°
Detection range (at 2,5mts from floor) 6 meters (20 ft)
Maximum detection distance 8 meters (26 ft)
Pattern detection See fig. 1
Output signal Relay (see Outputs)

Light Sensor (EL1)

Sensor type Silicon phototransistor with built-in
correction filter for visible radiation
Detection range 5 to 1000 lux
Range of spectral bandwidth 400 to 800 nm
Max. sensitivity wavelength 570nm
Sensitivity pattern See fig. 1
Output signal Analog 0-10V (see Outputs)

Motion sensor Output (SR1)

Output type Relay
Output contacts Potential free

Max. switching voltage 250Vac
Max. current (resistive load at 250Vac) 5 Amp
Switching ON time Adjustable by potentiometer
Terminals NO-C-NC
(Normally Open - Common - Normally Closed)

Light sensor Output (SL1)

Output type Analog
Voltage range 0 to 10V
Load impedance $\geq 1K\Omega$
Voltage/lux diagram See fig. 2
Output signal Linear
Terminals +, COM
(Signal level, Common)

Led indicator (L1)

Color Red
Indication By movement detection
By potentiometer slide
Pressing pushbutton

Pushbutton (P1)

Short push Activates output relay (5 sec)
Long push Enable/Disable motion detector Led

Relay switching time (PT1)

Configuration By potentiometer
Time adjust 1 Sec to 50 min
Adjust resolution From 1 Sec to 60 sec: 1 Sec
From 1 min to 10 min: 5 sec
From 10 min to 50 min: 30 sec

Mechanical installation

Installation Flush mounting on ceiling
Fixation 2 metal springs
Hole diameter 65 mm
Max ceiling thickness 19 mm
Internal height on ceiling 45 mm

Mechanical features

Dimensions 80x50mm (ØxH)
Weight 80 gr
Colour (front) RAL 9016
Enclosure material PP
Terminals Screw type
Wire section 0,5 mm² - 2,5 mm² (14 AWG)

Temperature

Operating 0°C to +50°C (32°F to 104°F)
Storage -20°C to +85°C (-4°F to +185°F)

Humidity (no condensation)

Operating 10% to 90% RH at 50°C
Storage 95% RH at 50°C

Product Family Standards

Automatic electrical controls for household and similar use.
General requirements EN 60730-1

CE Conformity

Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC
Marking CE

Safety

Standards EN 60730-1
IEC Protection Class Class III
Environmental protection level IP20

EMC

Emissions EN 61000-6-3
Immunity EN 61000-6-1

NOTES

- 1) The device is not intended for use as part of a security system detector.
- 2) The product must be installed away of radiated heating areas.

Product reference

e-Multisensor 0-10V, (relay output + analog 0-10V output) Motion Detector and Light Sensor MS.602000-000

Related products

e-Multisensor Lon TP/FT-10, Motion Detector and Light Sensor MS.622000-000
e-Multisensor Lon PowerLine, Motion Detector and Light Sensor MS.512000-000

INS0011508000-1

The packaging of this product is considered as an industrial container, being the receiver a professional
The manufacturer is not responsible for the incorrect installation of the products
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