ekinex

CONTROL YOUR LIVING SPACE

Movement sensor
with 180° detection area

Code: EK-SM2-TP

KNX **CE**

Datasheet STEKSM2TP_EN

KNX bus device for movement and presence detection in interior rooms. It has to be used in KNX installations for control of homes and buildings.

Description

The movement sensor ekinex® EK-SM2-TP is a KNX S-mode device for the detection of movement and presence of people in interior rooms with an detection area of 180°. The device allows a energetically efficient control of the lighting and HVAC installations in residential, office and commercial buildings. The device is provided with 3 passive infrared sensors (PIR) that can be separately activated and allow an optimal 180° detection. The detection area can be extended using further sensors EK-SM2-TP configured as slave devices. The light intensity for the constant brightness regulation is measured by the integrated brightness sensor; the value can be furthermore sent on the bus as a Lux value (2 Byte). The channel dedicated to the HVAC application allows the indipendent control of heating, ventilation and air conditioning devices. The device has an integrated bus communication module and is realised for wall mounting; the metallic support allows the mounting on a round or square wall box with 60 mm distance between the fixing holes. The device is powered by the KNX bus line and requires no auxiliary power supply.

Operation

The movement sensor reacts to the thermal radiation emitted by moving bodies. A person who walks in the detection area automatically activates the lighting. If the sensor no longer detects any movement, the lighting is switched off after the time delay set during the configuration with ETS®. If the standby mode is activated, the lighting remains switched on with a reduced intensity (orientation light function) for the standby time set.

Main characteristics

- Semi-automatic or fully automatic operation
- Detection range 180° (horizontal), 90° (vertical)
- Measuring range from 5 to 2000 Lux
- 3 PIR sensors can be activated individually or in groups
- Sensitivity adjustable (10 levels)
- Brightness sensor with linear output
- High-resolution lens for detection of small movements
- Optical filter integrated

Other characteristics

- Housing in plastic material
- Wall mounting
- Protection degree IP20 (according to EN 60529)
- Classification climatic 3K5 and mechanical 3M2 (according to EN 50491-2)
- Pollution degree 2 (secondo IEC 60664-1)

Technical data

- Rated voltage 24 Vdc (21 - 30 Vdc)
- Power absorption 0,4 W

Environmental conditions

- Operating temperature: - 20 ... + 40°C
- Relative humidity: 95% not condensing

Measurement of brightness

The measurement of the room brightness is carried out by an integrated light sensor with linear output and optical filter set on the profile of the human eye. The photoelectric sensor is able to send a 0 or 1 telegram, which indicates a brightness level lower or higher than a programmed threshold value, independently from the operation mode. The brightness value, measured in Lux, can be transmitted on the bus.

Lighting channel

The lighting channel has two operation modes that can be set in the configuration phase:

- fully automatic
- semi-automatic

The fully automatic mode has 3 states: ready, active and passive. The semi-automatic mode has 2 states: ready and active. The semi-automatic mode does not switch on the lighting after the movement detection, but only after the operation of an external pushbutton.

HVAC channel

The HVAC channel has the same objects and functioning modes of the lighting function; but the movement detection is extended, as it is based on the «long duration» principle. The detection is carried out on several time windows (from 2 to 20) of the same length in each of them at least one movement has to be detected.

Device completing

For the installation and operation the sensor has to be completed with the separate order of:

- a lens with cover (see table below);
- a square plate with 55 x 55 mm window;
- a square frame of the form or flank series.

The metallic support, the fixing screws and the terminal block for the connection to the bus line are included in the delivery.

Accessory	Colour	Code
Lens with cover for movement sensor	Ice white	EK-CLM-GAA
	Intense black	EK-CLM-GAE
	Silver	EK-CLM-GAG

EK-CLM-GAA   EK-CLM-GAE   EK-CLM-GAG
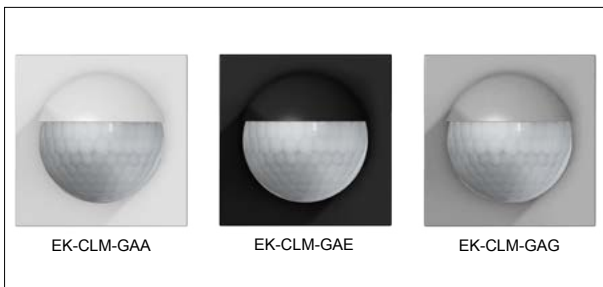
Switching, display and detection elements

The device is equipped with a programming LED and a programming pushbutton, a signalling LED, three PIR sensors, and a brightness sensor.
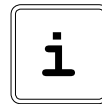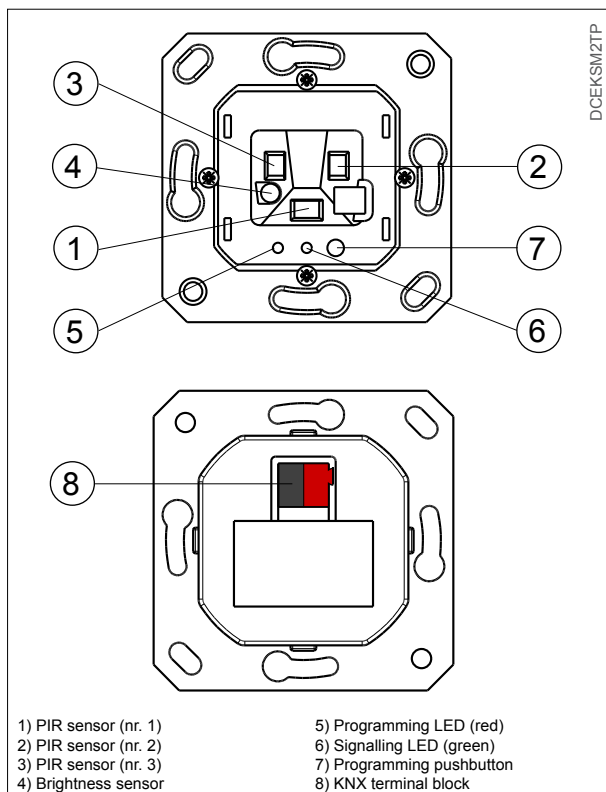
Switching elements

- Pushbutton (7) for switching between the normal and programming operating modes

Signalling elements

- Red LED (5) for indication of the active operating mode (on = programming, off = normal operation)
- Green LED (6) for signalling the movement/presence detection through a blinking

Sensors

- Brightness sensor (4) with linear output for measuring the light intensity in the room (range: 5 ... 2000 Lux)
- Three passive infrared sensors (1, 2, 3) that can be activated individually or in groups. The numbers shown in the figure correspond to the ones used by the application program of the device
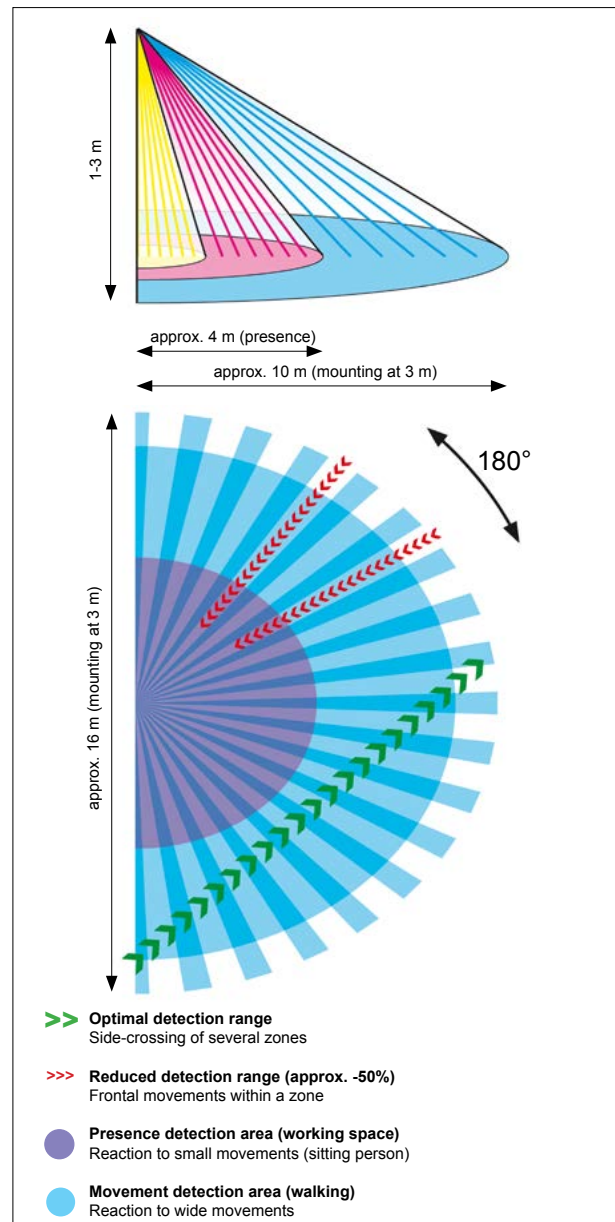

1) PIR sensor (nr. 1)
2) PIR sensor (nr. 2)
3) PIR sensor (nr. 3)
4) Brightness sensor
5) Programming LED (red)
6) Signalling LED (green)
7) Programming pushbutton
8) KNX terminal block

Actual detection range

The actual detection range of the sensor depends on the mounting height. The presence (sitting person, small movements) is detected in a range from 2 to 4 metres, while the movement (person walking through the detection area) is detected in a range from 6 to 10 metres. The optimal range is achieved walking through several portions of the detection area.

Mounting height [m]	Sitting person [m]*	Walking person [m]*
1,0	2	6
1,5	3	7
2,0	4	8
2,5	4	9
3,0	4	10

*) Max. values

1-3 m

approx. 4 m (presence)

approx. 10 m (mounting at 3 m)

180°

approx. 16 m (mounting at 3 m)

>> **Optimal detection range**
Side-crossing of several zones

>>> **Reduced detection range (approx. -50%)**
Frontal movements within a zone

● **Presence detection area (working space)**
Reaction to small movements (sitting person)

● **Movement detection area (walking)**
Reaction to wide movements

Mounting

The device has degree of protection IP20, and is therefore suitable for use in dry interior rooms. The device has to be installed with the metallic support and the screws (included in the delivery) on a wall box with 60 mm distance between fixing holes. Previously connect the bus terminal block to the bus cable (see: "Connection of the KNX bus line") and enter it in its slot on the rear of the device. At this point it is recommended to carry out the commissioning of the device (see "Commissioning") or at least the download of the physical address. Eventually snap the cover with lens on the device.

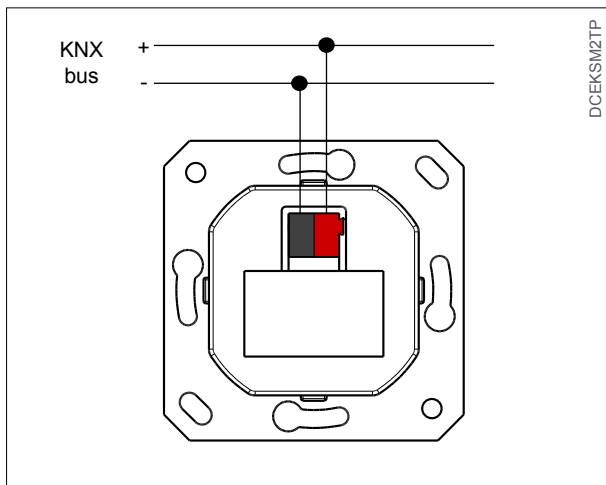## Connection of the KNX bus line

The connection of the KNX bus line is made with the terminal block (8) included in delivery and inserted into the slot of the housing.

Characteristics of the KNX terminal block

- spring clamping of conductors
- 4 seats for conductors for each polarity
- terminal suitable for KNX bus cable with single-wire conductors and diameter between 0.6 and 0.8 mm
- recommended wire stripping approx. 5 mm
- color codification: red = + (positive) bus conductor, black = - (negative) bus conductor

Warning! The electrical connection of the device can be carried out only by qualified personnel. The incorrect installation may result in electric shock or fire. Before making the electrical connections, make sure the power supply has been turned off.

Warning! In order to supply the KNX bus lines use only KNX bus power supplies (e.g. ekinex EK-AB1-TP or EK-AG1-TP). The use of other power supplies can compromise the communication and damage the devices connected to the bus.

Configuration and commissioning

Configuration and commissioning of the device require the use of the ETS® (Engineering Tool Software) program V3 or later releases. These activities must be carried out according to the design of the building automation system done by a qualified planner.
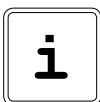
Note. The configuration and commissioning of KNX devices require specialized skills. To acquire these skills, you should attend the workshops at KNX certified training centers.

Configuration

For the configuration of the device parameters the corresponding application program or the whole ekinex® product database must be loaded in the ETS program. For detailed information on configuration options, refer to the application manual of the device available on the website www.ekinex.com.

Code	Application program (## = release)	Communication objects (max nr.)	Group addresses (max nr.)
EK-SM2-TP	APEKSM2TP##.vd4	19	254

Commissioning

For commissioning the device the following activities are required:

- make the electrical connections as described above;
- turn on the bus power supply;
- switch the device operation to the programming mode by pressing the programming pushbutton located on the front side of the housing. In this mode of operation, the programming LED is turned on;
- download into the device the physical address and the configuration with the ETS® program.

At the end of the download the operation of the device automatically returns to normal mode; in this mode the programming LED is turned off. Now the bus device is programmed and ready for use.
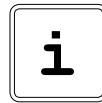
Note. After the connection to the KNX bus it is necessary to wait approximately a minute before the sensore reaches a stable functioning condition.

Troubleshooting

Error	Cause / action
The load does not switch	- the twilight value is too high - check the lighting devices - check the power supply / the protections
The sensor is activated without reason / the light never switches off	- check if in the detection area there are potential causes of unjustified activation, such as presence of pets, heating sources, etc. - check the distance from the lighting devices (heating reflexion or direct influence of the light) - the sensibility of the sensor is too high; reduce the sensibility of the detection area (1...10) with ETS
The light switches on during the daytime	- twilight regulation is set to a too high value; set a lower value with ETS

Dimensions [mm]
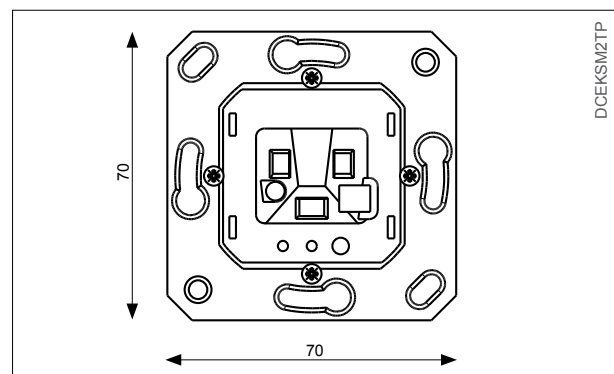
Marks

- KNX
- CE: the device complies with the Low Voltage Directive (2006/95/EC) and the Electromagnetic Compatibility Directive (2004/108/EC). Tests carried out according to EN 50491-5-1:2010, EN 50491-5-2:2010 and EN 50491-5-3:2010.

Maintenance

The device is maintenance-free. To clean use a dry cloth. It must be avoided the use of solvents or other aggressive substances.

Disposal

At the end of its useful life the product described in this datasheet is classified as waste from electronic equipment in accordance with the European Directive 2002/96/EC (WEEE), and cannot be disposed together with the municipal undifferentiated solid waste.

Warning! *Incorrect disposal of this product may cause serious damage to the environment and human health. Please be informed about the correct disposal procedures for waste collecting and processing provided by local authorities.*

Document

This datasheet refers to the release A1.0 of the ekinex® device EK-SM2-TP, and is available for download at www.ekinex.com as a PDF (Portable Data Format) file.

File name	Device release	Updating
STEKSM2TP_EN.pdf	A1.0	03 / 2014

Warnings

- Installation, electrical connection, configuration and commissioning of the device can only be carried out by qualified personnel in compliance with the applicable technical standards and laws of the respective countries
- Opening the housing of the device causes the immediate end of the warranty period
- In case of tampering, the compliance with the essential requirements of the applicable directives, for which the device has been certified, is no longer guaranteed
- ekinex® KNX defective devices must be returned to the manufacturer at the following address: SBS S.p.A. Via Circonvallazione s/n, I-28010 Miasino (NO) Italy

Other information

- This datasheet is aimed at installers, system integrators and planners
- For further information on the product, please contact the ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com
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