

K2150 occupancy detector for controlling the lights of high warehouses, production buildings and areas, car parks, and urban streets

IoT & Smart city
ready



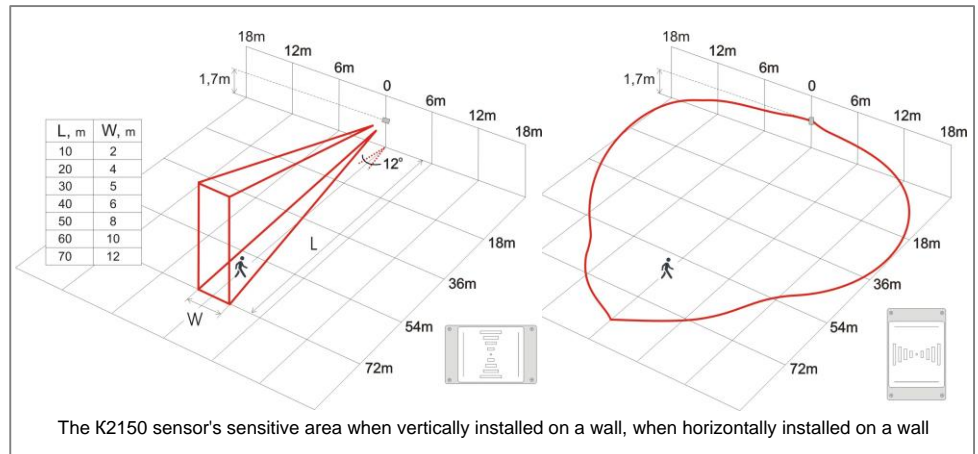
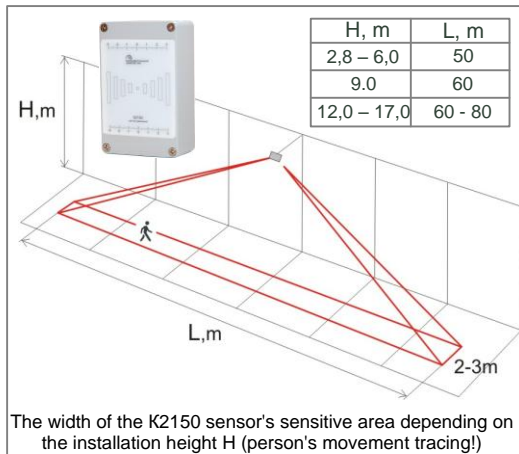
The K2150 occupancy detector for lights control is designed to be installed on a 30-m height ceiling. It can also be installed on a wall, 1.5-2 m from the floor, for controlling the lights of warehouses picking and loading areas, various production areas, car parks, urban streets, squares, and so on, with a large operation zone (at most 160" 40x70 m). The sensor traces the movement of a person or motor vehicles and transmits the control signal to the lighting system.

Energy savings - up to 80%
The payback period < 1 year (for a warehouses)
One of a kind!

K2150 is a three-in-one sensor: One sensor and three outputs:

1. the relay 30A output is for controlling regular lamps (if a movement does not occur, then the lamps are off, if it does, then they are on);
2. the 1-10V output is for adjusting a light flux gradually within 2-100 % (if a movement does not occur, then the lamps operate at the economical mode set by the installer, from 2 % to 100 % of the light flux, if it does, then they gradually, in 2 seconds, switch to the 100 % light flux mode). For your information: at the 5 % light flux mode, the energy consumption of an LED lamp decreases by 12 times, of a luminescent one by 6 times!
3. the special output is for connecting the sensor to a **security alarm** system or to **IP-cameras**. By using this output, the sensor can also be connected to an **automated warehouse control system** for tracing and highlighting bays with a high load (a forklift drives through too often) and underused bays (a forklift drives through seldom) and subsequently optimizing the distribution of items. The sensor may optionally be supplied with: **DALI, KNX, LoRa, Sigfox, NB-IoT...** modules and a long-range radio channel (up to 15 km).

K2150 sensor's sensitive area



How the K2150 sensor works and how it is different from an infrared motion sensor (PIR)

The K2150 sensor's functional principle is based on radiating an electromagnetic field to the surrounding area and registering its changes caused by its reflection from the objects moving in the sensor's sensitive area.

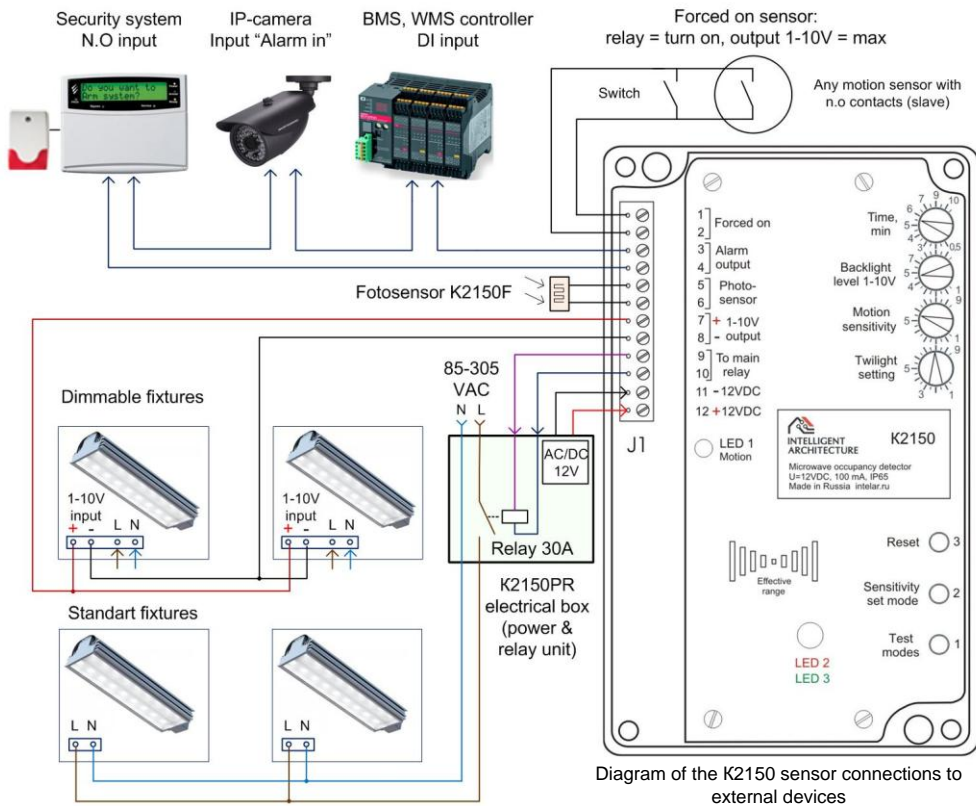
Nowadays, the main competitors are generally German ceiling passive infrared motion sensors with the installation height of 10-12 m and the sensitive area width of about 30 m.

At the same time, infrared motion sensors have a significant drawback, namely, they trace not the movement itself but the difference between the temperatures of the moving object and the surrounding area. That is why infrared motion sensors miss the movement if, for example, the forklift has cooled down to the ambient temperature, and the driver's cabin is covered by plexiglass or the driver is wearing warm coveralls.

The same problem occurs in warehouses in hot weather when the air gets warmed up to 34-36 °C, and the sensors cease to trace a person's movement.

Another feature of infrared sensors is that they trace the movement at certain points of its area, and the distance between those points can amount to several meters; therefore a few of them must be installed for one bay with the turn-off delay of about 10 min, which significantly reduces their effectiveness and pay-off period (the bay is already empty, but the lights will work for 10 more min).

The K2150 sensor does not have these drawbacks. At the place where four infrared motion sensors must be installed, one K2150 sensor with the turn-off delay of about 0.5 min is sufficient because the sensor traces each step of the person, that is, it has a high sensitivity level.



Specifications of the K2150 sensor

The voltage is 12VDC (the 220/12V power supply is in the K2150Px installation box). The sensor's internal consumption is 1.2 W. Two outputs for lights control in the bog-standard sensor:

- 250B 30A relay (in the K2150PR installation box)

- 1-10V output for a light flux control by occupancy within 2-100 %

Special output for connecting the sensor to a security alarm or management system.

Input for the positive engagement of the lamps controlled by the sensor, for example, in case of inventorying a warehouse

Operating temperature is from -30 °C to +65 °C

Degree of enclosure protection is IP65, attachment to a surface (ceiling or wall)

External dimensions are 125x80x40 mm

K2150F external photosensor for adjusting the sensor's operation in buildings with windows or lantern lights on the ceiling (when the quantity of sunlight is sufficient, the sensor won't turn on the lights by movement)

Settings: sensitivity, 0.5-10 min delay timer, light sensitivity, background luminance (for 1-10V output).

Special service mode for setting the sensor to turn off without lights commutation and turn-off delays. Optionally, an external junction box with a 12V, 250 mA power supply and a powerful 30 A (IP65) relay, DALI, KNX, LoRa, Sigfox, NB-IoT modules, and a radio (up to 15 km).

K2150 sensor applications

1. Warehouses with the height from 5 m to 30 m and higher (installation on the ceiling of racking lanes or on the wall of picking zones)
2. Indoor and outdoor car parks (installation on the wall); the wide sensitive area, approximately 40 x 70 m
3. Server rooms and DPCs (the sensitive area width between cabinets is about 70 m at the 2.8-5 m installation height)
4. Any production facilities, including those with thermal radiation sources in which infrared motion sensors will not work (installation on the ceiling or walls)
5. As a traffic intensity control sensor, including transport + pedestrians for the Smart City and Smart Street systems
6. As a motion sensor for controlling street light at parks, squares, and car parks at shopping malls
7. As an intruder detection sensor for guarding a protected area's perimeter and volume, including ones with an additional function of controlling the area lights by movement.

K2150 sensor's cost effectiveness (using the example of a warehouse)

The object is an actual warehouse with the 72x78 m area, 17 m height, and shelf storage of items. The length of the shelves is 68 m. The forklift drives through the bay every 7 min and stays there for about 1 min. 150 W LED lamps without a dimming function, 216 pcs. The number of bays is 18; the number of lamps per bay is 12. The lights duty cycle is 24 hours per day.

Energy consumption without automation is 283,824 kWh per year.

Energy consumption with automation (3 emergency lamps, 9 lamps that get turned off by the sensor) is 97,567 kWh per year.

Savings: 283,824 - 97,567 = 186,257 kWh per year or 186,257 x 0,15 € = 27,938 € per year.

The modernization cost, including the installation cost, is approximately 24,000 €.

The payback period: 24,000/27,938 = **0.8 years**.

If food is stored in the warehouse, that is, the warehouse is artificially cooled, then it is necessary to consider the following. Nowadays, even the best LEDs use only 20 % of the energy for light emission and 80 % for heat generation. Therefore, the 150 W lamp is not only a light source but also a constantly working 120 W heater (150 W x 0.8 = 120 W)!

Thus, the total heat generation of the lamps in such warehouse is 216 pcs. x 0.12 kW = 25.9 kW, and the warehouse cooling system must constantly compensate for this heat generation! Using motion sensors at such facilities will give additional, significant savings, and the pay-off period of the automated light system will be reduced.

We recommend that you install dimming lamps in warehouses and parkings (1-10V protocol). Their price is almost compatible to the price of a standard lamp today! The dimming function will allow to create a light environment comfortable to eyes without abrupt changes in illumination when the automatics operate, to avoid commutation network loads, and to extend the lifetime of the lamps.

Sensor samples are available for order.

OEM is welcome! MOQ - 1000 pcs p/year