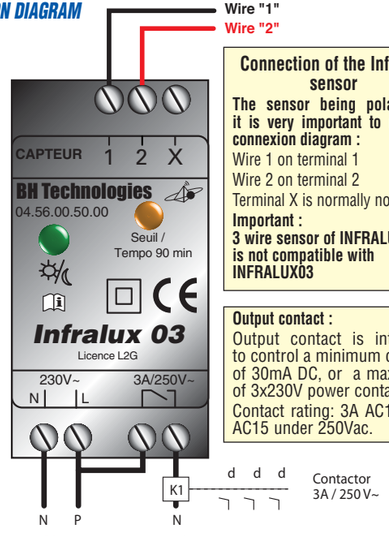
## 2. INSTALLATION

### 2.1. CONNECTION DIAGRAM




**Connection of the Infrared sensor**

**The sensor being polarized ; it is very important to respect connexion diagram :**
Wire 1 on terminal 1
Wire 2 on terminal 2
Terminal X is normally not used.
**Important :**
**3 wire sensor of INFRALUX02 is not compatible with INFRALUX03**

**Output contact :**
Output contact is intended to control a minimum current of 30mA DC, or a maximum of 3x230V power contactors
Contact rating: 3A AC1, 0.8A AC15 under 250Vac.

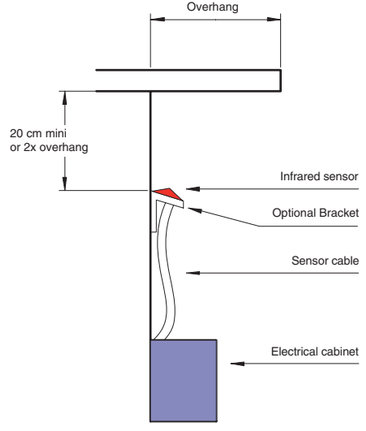
**Extension of sensor cable :** The cable of the sensor can be extended to 25m. Use 2x0.5mm² or 2x.075mm² cable. A bigger cable gauge is not necessary. The connexion of the extension should ideally be soldered and well protected against leakages due to moisture or corrosion. Avoid traditional screw terminals.
Avoid passing the cable near to electromagnetic noise emitting cables, such as power cables to electric motors, light dimmers, etc. Distance to such cables should be 30cm at least.

Sensors with factory pre mounted cable length of 10 and 25m are available.

### 2.2. INSTALLING THE INFRARED SENSOR

**Vertical aiming :**
The Infrared sensor is not sensitive to ambient light generated by street lighting. It can then be aimed at the sky, so that orientation or obstacles become less a problem than with traditional visible light sensors.
As explained above, all sensors will then see the same portion of sky, which will enhance homogeneity of switchings between products.
The sensor is almost not sensitive to dirt, dust or snow, as long as these elements are not accumulating in very thick layers.
One will avoid situations under thick tree foliage, or very humid zones.

For sky aiming against a wall, a special bracket is available.
A typical installation will follow these guidelines :




**Horizontal aiming :**
The Infrared sensor is not sensitive to ambient light generated by street lighting. It can then be aimed at the sky, so that orientation or obstacles become less a problem than with traditional visible light sensors.

**Additional advice :**
With horizontal aiming, one will pay attention not to aim at a source emitting a high level of infrared (incandescent or halogen lamps) coming from shop windows or signs.

## 3. MEMORIZATION OF PARAMETERS

Parameters and programs of INFRALUX03 are stored in a non volatile EEPROM memory. They are permanently saved, even in case of long periods of power off. INFRALUX03 contains no battery.

## 4. BEHAVIOR IN CASE OF POWER INTERUPTION

Power interruptions shorter than 100 ms do not affect the output of INFRALUX03. Longer interruptions at night will force the relay to off state. As soon as power returns to normal, INFRALUX03 immediately positions its output in accordance to the level of infrared light measured.

## 5. GENERAL FEATURES

- Operating voltage : 230 Vac +/- 15%
- Relay contact rating : 3A / 250 Vac
- Relay life, typical : 300 000 switchnigs (AC1, 3A)
  250 000 switchnigs (AC15, 0.8A, cos φ 0,45)
- Power consumption: less than 3VA
- Operating temperature, sensor : -30°C / +60°C
- Operating temperature, electrical device : -30°C / +60°C
- IP Index, sensor : IP 67
- IP rating, electrical device : IP 20
- Humidity max : 90% (non condensing)
- Altitude max : 2000m
- Max Temperature of power cable: 70°C
- Double Isolation : CAT.3
- Pollution degree : III

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# INFRALUX03

### INFRALUX03 comprises two parts :

- The electrical device, mountable on a standard DIN rail
- The polarized Infrared sensor with a 1.50m two wire cable.

### Features :

- Microprocessor based electronic circuit
- 3 pre-programmed switching points, factory preset at 4 lux equivalent
- Forced switch on button with automatic return to “auto” mode after 90 min
- 1 N.O. contact free of potential, 3A/250VAC

### Applications :

Accurate automatic control of electrical installations at sunset and sunrise

*INFRALUX is a trade mark of BH Technologies and a patented product*

BH Technologies

## 1. OPERATING PRINCIPLE

The unique and patented principle of INFRALUX03 is based on the accurate measurement of ambient light **in the near infrared spectrum.**

This is a key differentiator compared with traditional light switches which measure light in the visible spectrum.

The measure in the near infrared spectrum offers 2 major advantages, well adapted to street lighting control:

- **A very accurate detection of sunset and sunrise**

The Sun emits a considerable level of infrared light. On top of heating the atmosphere, this light -especially in the near infrared wavelengths - has the particularity of being absorbed by the water vapour present in the air.

At Sunset, the infrared beams are rapidly absorbed and cannot be diffused by the atmosphere as this is the case for visible light. As a consequence the disappearance of infrared light **is very quick.**

Accurate measurement of Infrared light through a specially filtered silicon photodiode makes detection of switching points very reliable and very much independent of sensor orientation or drift.

The population of INFRALUX03 installed in the same city sees this quick change of infrared light and switches in a very short time interval.

Whereas it is not uncommon to see a difference of 30 to 45 min in switching times in a population of traditional light switches operating in the visible spectrum, a complete population of INFRALUX03 switches in 3 to 6 min. The city lights switch in a very short interval, this reduces contrast between areas. City lights can swith on later and off sooner, allowing significant energy savings.

- **A very high immunity to ambient lights**

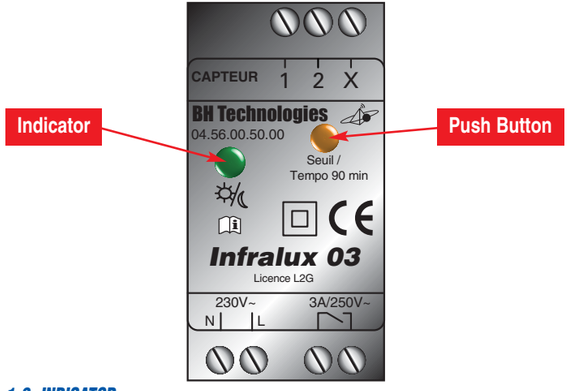
INFRALUX03 is not sensitive to visible light, and especially the light emitted by HID or fluorescent lamps used in street lighting. These lamps have very little emission in the near infrared. The infrared sensor can then be installed with **vertical aiming,** without being affected by the well know light pollution of big cities. The risk of ON/OFF cycling of the sitch almost disappears.

This vertical aiming allows all INFRALUX03 of the same city to see the same part of sky, which reinforces homogeneity of switchings between products

It must also be noticed that INFRALUX03 sensor remains sensitive to light sources containing a high level of infrared, such as incandescent or halogen lights. One will pay attention not to aim at such lamps when installing.

Infralux is NOT sensitive to far infrared emitted by warm or hot material.

### 1.1. PRESENTATION OF THE ELECTRICAL DEVICE




### 1.2. INDICATOR

The bicolour LED is normally **green**. It has several meanings

- Indicates that the unit is powered
- Indicates “day” mode when permanently on
- Indicates “day to night” or night to day” transition when quickly switching (3 per second)
- Indicate “night” mode when slowly switching (1 per second)

### 1.3. ENFORCED ON SWITCHING DURING DAY TIME

A forced switching of output relay, with auto return after 90 min is possible during day time (fixed **green** indicator)

A short push on pushbutton will activate this function. The indicator will turn **red**, and the output relay contact will close.

Another push on the pushbutton will stop on switching. If no push takes place the product will automatically return to “auto” mode after 90 min. This allow a control of the installation and of all lamps without having to return to the cabinet.

For safety reasons, it is not possible to enforce off switching during night time.

### 1.4. SELECTION OF SWITCHING POINT

INFRALUX03 offers 3 preset modes that can be accessed through the same pushbutton.

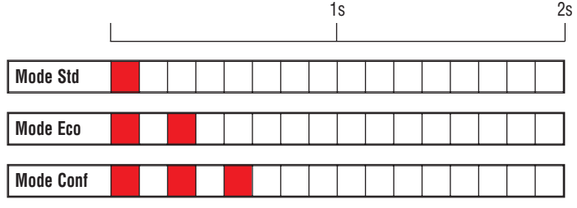
- Mode « Std » : factory preset for normal use in street lighting
- Mode « Eco » : for anticipated switch ON and delayed switch OFF of 5 min around (related to “Std” mode)
- Mode « Conf » : for anticipated switch ON and delayed switch OFF of 8 min around (related to “Std” mode)

To modify switching point push for more than 2 seconds, until the indicators turns to **RED** switching.

- 1 switching in 2 second : « Std » mode
- 2 switching in 2 seconds : « Eco » mode
- 3 switching in 2 seconds : « Conf » mode

A short push on push button will jump to the next mode.

Time diagram of the 3 switching points (modes) :




INFRALUX03 will automatically return to normal operation after a few seconds without activation of the pushbutton.

### 1.5. PROCESSING OF QUICK SPURIOUS LIGHTS (ANTI FOOL MODE)

INFRALUX03 offers advanced processing of spurious lights, such as lightning, passing car lights, attempts to fool the sensor)..

At night, a quick increase of measured infrared level will automatically set INFRALUX03 in “antifool” mode. The output relay remains closed.

The output relay will eventually swith off when the level of infrared has remained high for a period longer than 10 min.

The “antifool” mode is indicated through the permanent changing of coulour of the indicator, from **green** to **red** to **green**, etc.