PIR_L3 sensor operation manual

Description

The PIR_L3 is an infra-passive movement sensor for indoor use. It is used to control LED lamps powered by low voltage (12-24V). Its design makes it fit into a row of LED spot lights. It enables continuous light up and light out in various rise times (PMW regulation). In case of false activations, it is possible to turn on extra resistance using digital filter. It contains additional out OUT2, to enable control of alarm device or other appliances (e.g. ventilation fan). It can measure the intensity of surrounding lighting. The function of the sensor is signalized by inbuilt LED diode. This signalization can be disabled by program. It also serves to program and detect the intensity of surrounding lighting.

Specification

The sensor is set into a spotlight that is 50mm in diameter and 25 mm in depth and that can have various cover designs (polished chrome, opaque chrome, gold, bronze …).
Coverage of the sensor is 5-8 m in 360 degrees.
Voltage: 8-24 VDC, electrical draw 1mA (6 mA when the signal LED is on).
Operating temperature: -20°C to +80°C.
Outs:

OUT1 – N-FET switched ground with the option of PMW regulation, max 24V, 2,5A.
OUT2 – additional out, N-FET switched ground, max 24V, 100mA.

The operational parameters of the switch can be set by a button and the signal LED.
The length of activation of outs can be set from 10s to 160s with 10 second steps.
Measuring of surrounding light intensity can be set in 15 steps, or it can be turned off completely.
Using OUT1 u can set the onset by PMW regulation on the following values.
tab.1.

	1	2	3	4	5	6	7	8
rise time	0 s	0,128 s	1,28 s	1,25 s	2,54 s	5 s	5 s	5 s
fall time	0 s	0,128 s	2,54 s	5 s	5 s	10 s	20 s	30 s

Connection

The sensor is connected using a terminal board:

Red wire – power +12V
Black wire – power ground
Green wire – OUT1 (switches to ground)
Grey wire – OUT2 (switches to ground)

Programming

After removing the top cover (it can be pushed out by a thin object from the back side by the printed circuit) the micro switch is accessible. Connected PIR-L3 sensor can be switched to programming mode by holding the button for approximately 4 seconds. In this mode we can check or modify the set parameters. The transition into programming mode is signalized by ten short flashes of the signal LED. It then starts a sequence of 8 programming parameters shown in tab. 2.

tab. 2

Number	Parameter	Values	Default	
1	Activation time of OUT1	1 – 16	30 s	Value x 10 sec
2	Brightness intensity	1 – 16	8	1 – dark, 15 – bright, 16 - off
3	PWM control of OUT1	1 – 8	3	According to tab. 1
4	Activation time of OUT2	1 – 16	10 s	Value x 10 sec
5	LED signalisation	on / off	on	Detected movement is signaled by LED
6	Additional out OUT2	on / off	off	
7	OUT2 on the end	on / off	off	
8	Digital filter	on / off	off	

Each parameter starts with short flashes. The number of flashes matches the number of parameter (1 to 8). They are followed by longer flashes that signal the value of parameter. In the case of on/off parameter the setting is represented by the state of LED (on – LED on/ off – LED off). If you want to change a value, you can now modify it by pressing the button. In case of parameters 1 to 4, you need to press the button as many times as is the required value setting. Each press of the button is signaled by the LED. When changing parameters 5 to 8 each press of the button changes the state of the setting, which is reflected on the state of the LED. If you do not want to modify a parameter the program will automatically switch to the next parameter after 3 seconds.
If a value was modified, the modified value will be displayed after three seconds (for parameters 1 to 4) and then the next parameter will be displayed.
After the last parameter the programming mode ends with ten short flashes and the sensor switches to standard mode.

Light intensity measurement
To determine the intensity of surrounding light the sensor has a function of measuring the surrounding light intensity. Connected PIR-L3 sensor can be switched to measuring mode by a short press of the button. This starts a sequence of 5 cycles and the sensor then reverts to standard mode. Each cycle starts with two short LED flashes (parameter 2). These are followed by longer flashes that signal the level of intensity of surrounding light that was measured. This way we can measure the intensity of light and set it as a threshold level for activation.
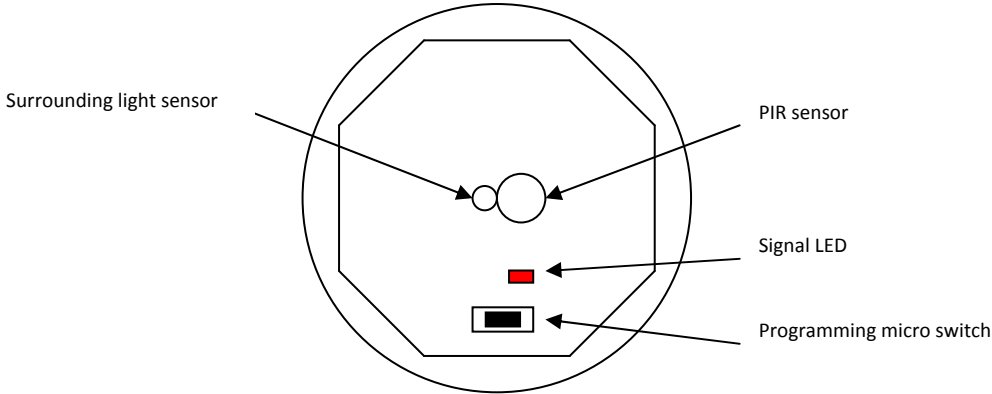
Testing
To test the correct function of the sensor it is recommended to turn on the LED signalization. This signals every move detected by the sensor. In case of false activations (disturbing impulses from power source or thermal fluctuations of environment) it is possible to turn on the digital filter that will reduce their occurrence. However, this will slightly slow the reaction time of the sensor.
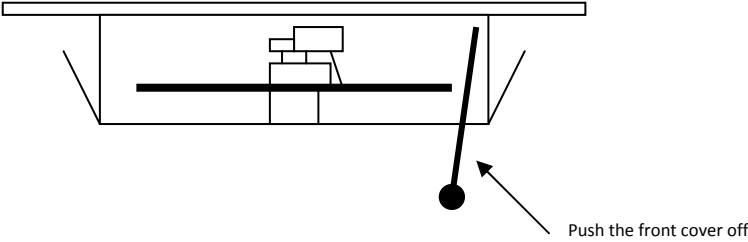When using the PMW regulation you need to use appropriate cables for feed power line. In case of greater loads and longer feed power cables, unwanted bickering can occur on the controlled lamp when it is turning on and off. In case of greater loads it is advisable to use an amplifier. The additional out OUT2 can be used for alarm, ventilation in the bathroom etc.

It can be set at the start or at the end of OUT1 activation interval. If set at the start OUT2 is activated on every move detected by the sensor, regardless of the OUT1 settings. This can be used in cooperation with an alarm – movement signaling. If set at the end, OUT2 is activated after activation time of OUT1 runs out. This can be used to start the ventilation in the bathroom after the lights go out. OUT2 will be automatically deactivated when OUT1 is activated, even if the set time did not elapse.

View of open PIR sensor.

Surrounding light sensor

PIR sensor

Signal LED

Programming micro switch

Side lay-out.

Push the front cover off

Lamp – LED1,5W6

The lamp contains 6 three-chip SAMSUNG LED
Power – 12 V
Consumption – 120 mA
Output – 1,44 W
Luminance – 25 cd
Color – warm white (3200-3800K)

Lamp – LED4W0

The lamp contains 2 high power SAMSUNG LED
Power – 12 V
Consumption – 360 mA
Output – 4,32 W
Luminance – 194 cd
Color – warm white (2600-3200K)

Lamp – LED4W1

The lamp contains 2 high power SAMSUNG LED and one small three-chip LED. The additional LED is independent and can be activated by PIR sensor
Power – 12 V
Consumption – 360 mA + 20 mA
Output – 4,32 W + 0,24 W
Luminance – 194 cd + 4 cd
Color – warm white (2600-3200K)

Schematic LED4W1

J3
Grey   1
+12V low

J1
Red   1
+12V

SLHNNWH629TO   SLSNNWH815TS   SLHNNWH629TO

D1   6   5   4   1   2   3   D2   6   5   4   D3

     3   2   1   4   5   6   3   2   1

R1   R2   R3   R4   R5   R6   R7
39R   39R   39R   100R   39R   39R   39R

J2
Black   1
GND

J4
Brown   1
GND low