

# ERS Eye

## Description

ERS Eye is a sensor for measuring occupancy and the indoor environment. It is enclosed in a room sensor box and is designed to be mounted in the ceiling. ERS Eye is completely wireless and powered by two 3.6V AA lithium batteries. Inside you will find internal sensors for measuring room occupancy (PIR and infrared), temperature, humidity, and light.



## Applications

- Indoor environment measuring
- Smart buildings
- Workplace management
- Workplace statistics
- Facility management
- Room occupancy

## Product features

- LoRaWAN Certified <sup>CM</sup>
- Panasonic Grid-Eye® infrared sensor
- Temperature sensor
- Humidity sensor
- Light sensor
- Motion detection sensor (PIR)
- NFC for configuration
- Configuration over the air
- Discrete and minimalistic design

## Device Specifications

### Mechanical specifications

Weight	60 g excluding batteries / 100 g including batteries
Dimensions	86 x 86 x 28 mm
Enclosure	Plastic, PC/ABS

### Operating conditions

Temperature	0 to 40 °C
Humidity	0 to 85 % RH (non-condensing)

### Device Power Supply

Battery Type	2 x 3.6V AA Lithium Batteries
Expected Battery Life	<5 years (Depending on configurations and environment)

### Device Logging Function

Sampling Interval	Configurable via NFC and downlink configuration
Data Upload Interval	Configurable via NFC and downlink configuration

Radio / Wireless	
Wireless Technology	LoRaWAN® 1.0.3
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN Device Type	Class A/C (configurable) End-device
Supported LoRaWAN® features	OTAA, ABP, ADR, Adaptive Channel Setup
Supportet LoRaWAN® regions	US902 – 928, EU863 – 870, AS923, AU915 – 928, KR920 – 923, RU864, IN865
Link Budget	137 dB (SF7) to 151 dB (SF12)
RF Transmit Power	14 dB / 20 dB (Region specific)

Data types			
Type value	Type	Data size	Comment
0x01	Temperature	2	-3276.5 °C → 3276.5 °C (Value of: 100 → 10.0 °C)
0x02	Humidity	1	0 – 100 %
0x04	Light	2	0 – 65535 Lux
0x05	Motion (PIR)	1	0 – 255 (Number of motion counts)
0x07	VDD (Battery voltage)	2	0 – 65535 mV
0x11	Occupancy	1	0 = Unoccupied / 1 = Pending (Entering or leaving) / 2 = Occupied
0x13	Grid-Eye Room occupancy	65	1 byte ref. 64 byte pixel temp 8x8 (reserved for future use)
0x3D	Debug information	4	Data depends on debug information
0x3E	Sensor settings	n	Sensor setting sent to server at startup (first package). Sent on Port+1.

## Sensors

### Temperature

Resolution: 0.1 °C

Accuracy: ±0.2 °C (See figure 1)

### Humidity

Resolution: 0.1 % RH

Accuracy at 25 °C: ± 2 % RH (See figure 2)

Accuracy of humidity over temperature: See figure 3

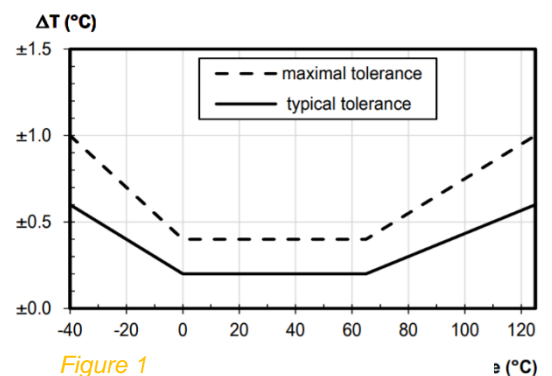


Figure 1

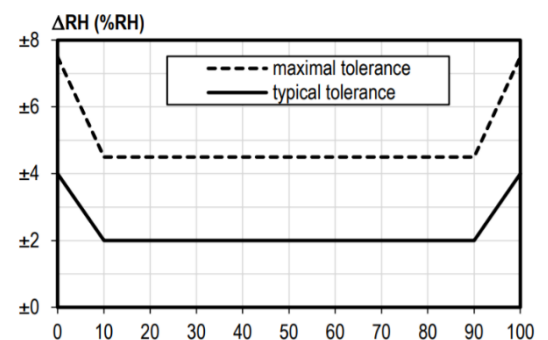


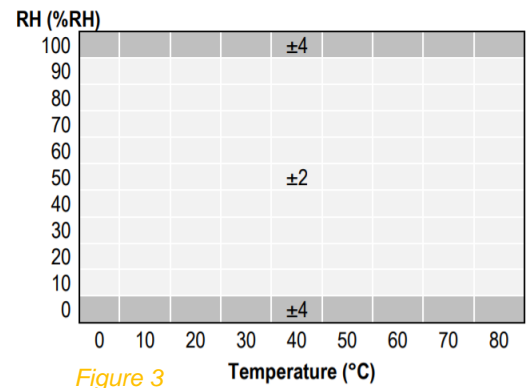
Figure 2

### Light

Range: 4 – 2000 LUX

Resolution: 1 LUX

Accuracy:  $\pm 10$  LUX



### Motion (PIR)

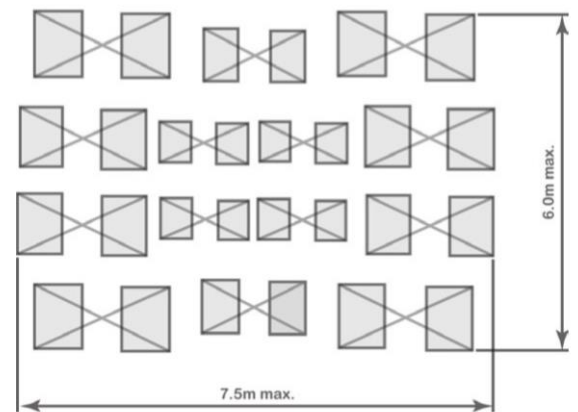
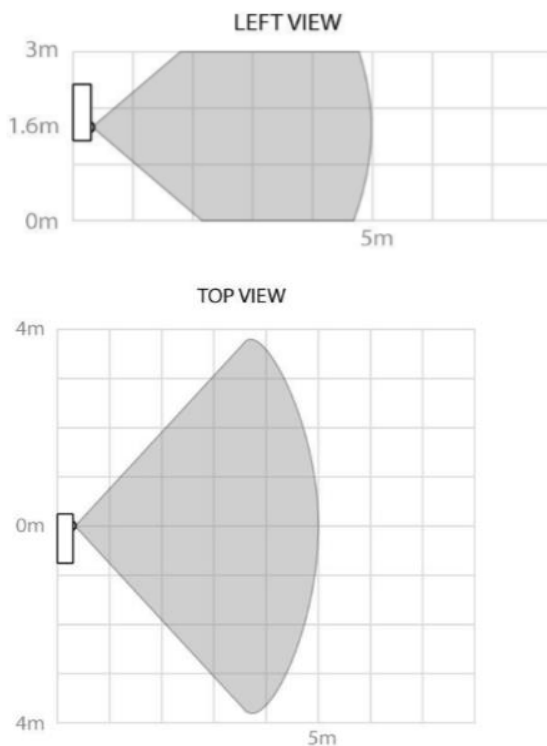


Figure 4 - Detection pattern

### Note:

There is a blanking time of 30 seconds of the PIR triggering after each PIR trig and after each transmission. This is to reduce the risk of self-triggering from internal events that could disturb the high sensitivity PIR circuits.

## Eye Infrared Sensor

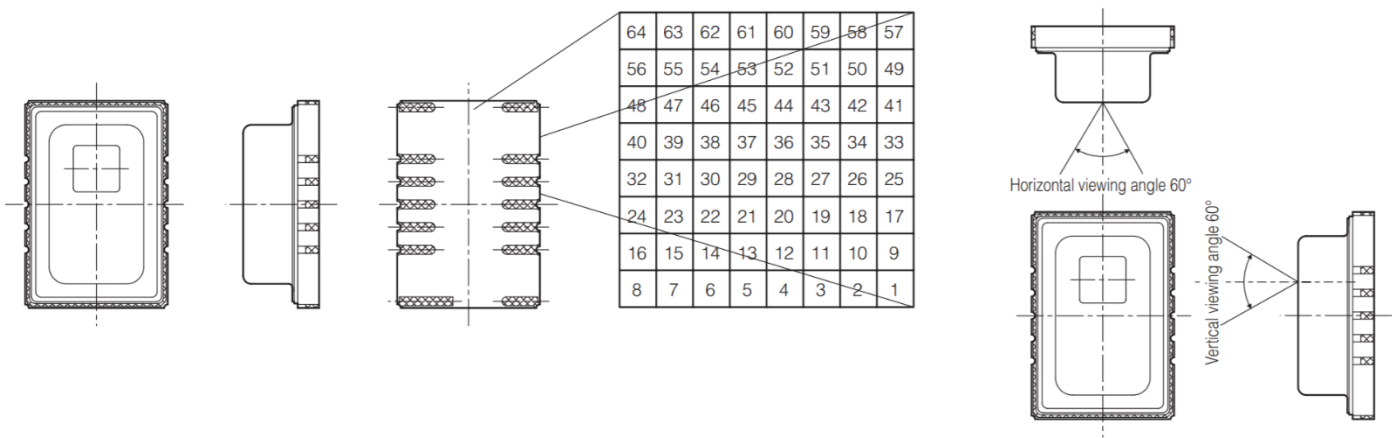
Range of detection: 5 m

Resolution: 0.25 °C

Accuracy:  $\pm 2.5$  °C

Field of View: 60°

ERS Eye have an infrared array sensor with 64 pixels (8x8 matrix). Point the sensor directly towards the desired occupancy detection area.



1. Pixel array from 1 to 64

2. Viewing field