ERS-Eye

LoRaWAN™ wireless Occupancy sensor

ERS-Eye by Elsys

Internal sensors

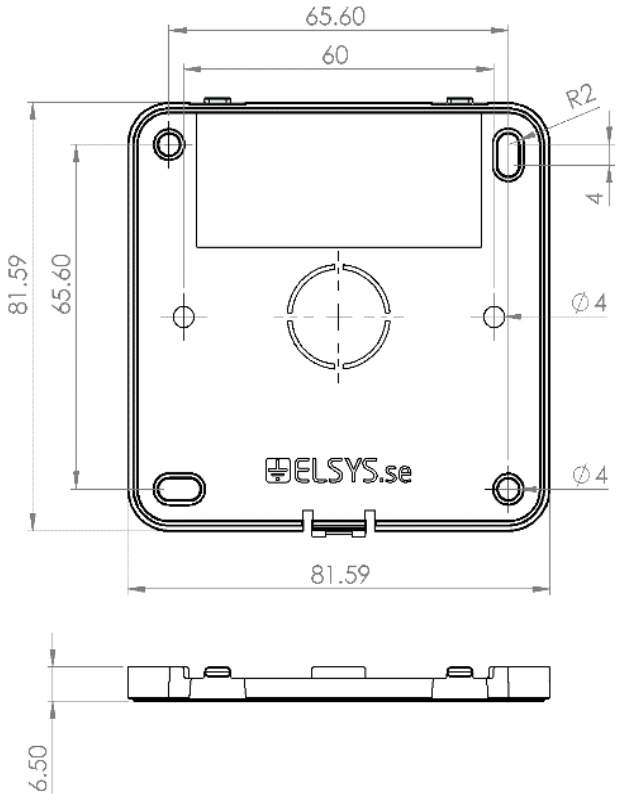
- Eye - Occupancy
- Temperature
- Humidity
- Motion (PIR)
- Light

The ERS-Eye LoRaWAN sensor is a fully self-contained and self-powered Occupancy sensor. Using historic heat pattern comparison alongside PIR movement, it detects on-going occupation with greater accuracy. Suitable for a range of applications across residential care, office occupancy and hotel room occupancy. (LoRaWAN Certified)

Supported channel plans - US902-928, EU863-870, AS923, AU915-928, KR920-923

Supports Over-the-Air-Activation (**OTAA**) or Activation-by-Personalisation (**ABP**). Compatible with all LoRaWAN Network Servers including The Things Network, Orbiwise, Loriot, Wanesy, LoraServer and others. The Elsys sensors adhering to the latest recommendations of operation as promoted by the LoRaWAN alliance. The sensors supporting best practice of Join methods, Adaptive Data Rate, Link Check, retention of RF parameters during sleep and more.

All Elsys sensors are equipped with **NFC** for easy configuration by the Android app "Sensor Settings" available from the Google Play store. Sample rate, data rate, encryption keys, triggers, activation and other advanced features can be simply changed with a single tap of the sensor. Settings may also be updated remotely Over-The-Air from most LoRaWAN Network Servers or through cloud solutions using LNS API's.



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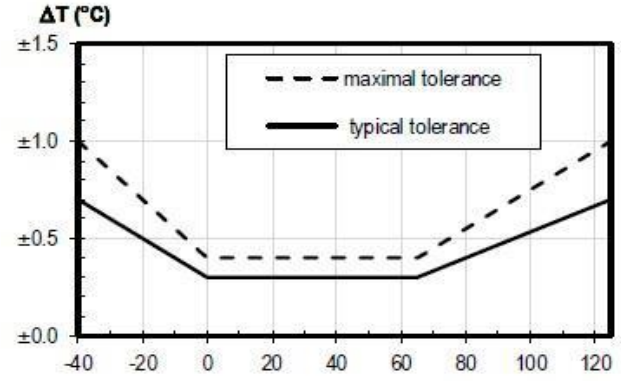
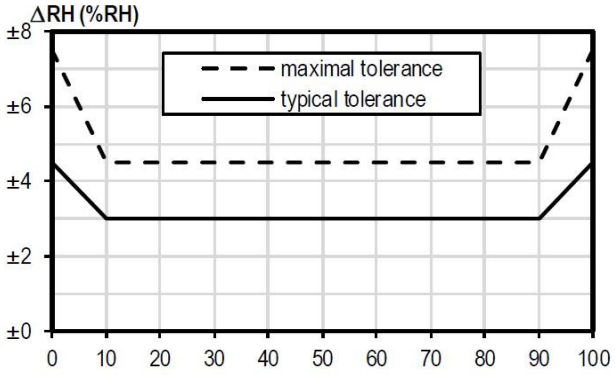
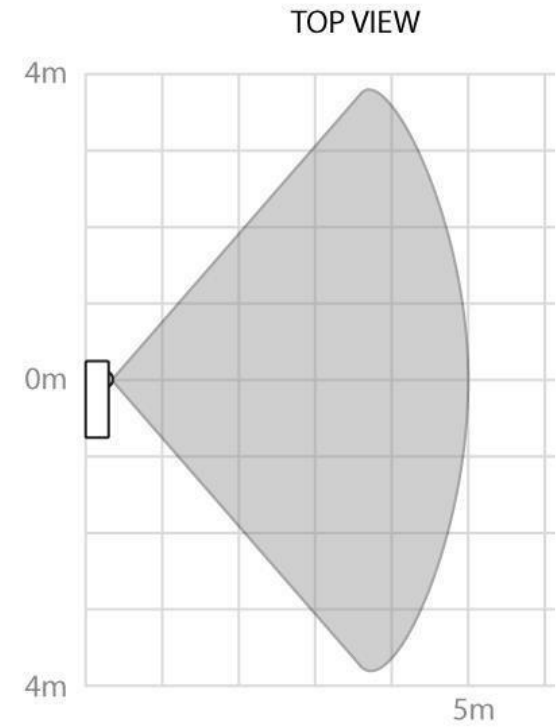
Temperature: Resolution 0.1°C

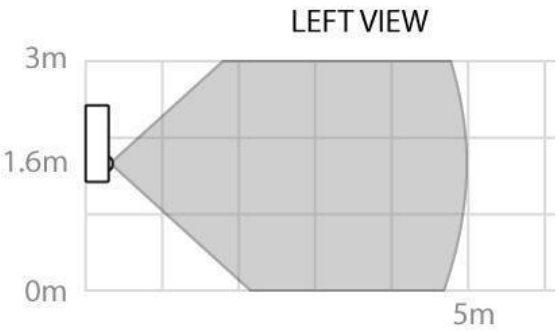


Humidity: Resolution 0.1% RH



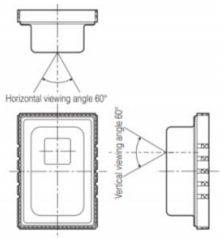
Motion PIR:

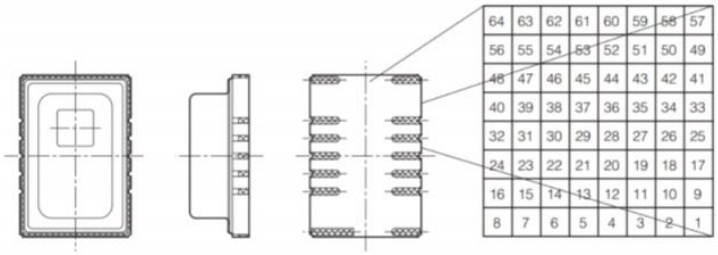




Light: Range: 4-2000 LUX
Resolution: 1 LUX
Accuracy: +- 10 LUX

Eye: Range: 5 m
Resolution: 0.25 °C
Accuracy: ± 2.5 °C
Field of View: 60°





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

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

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ERS-Eye

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

LoRaWAN parameters	
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
Supported 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)

Payload Format

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.

This datasheet is compiled from original publications by Elsys available from the manufacturers website:

- https://elsys.se/public/datasheets/ERS_Eye_datasheet.pdf
- https://elsys.se/public/documents/Declaration-of-conformity-Elsys-LoRa.pdf

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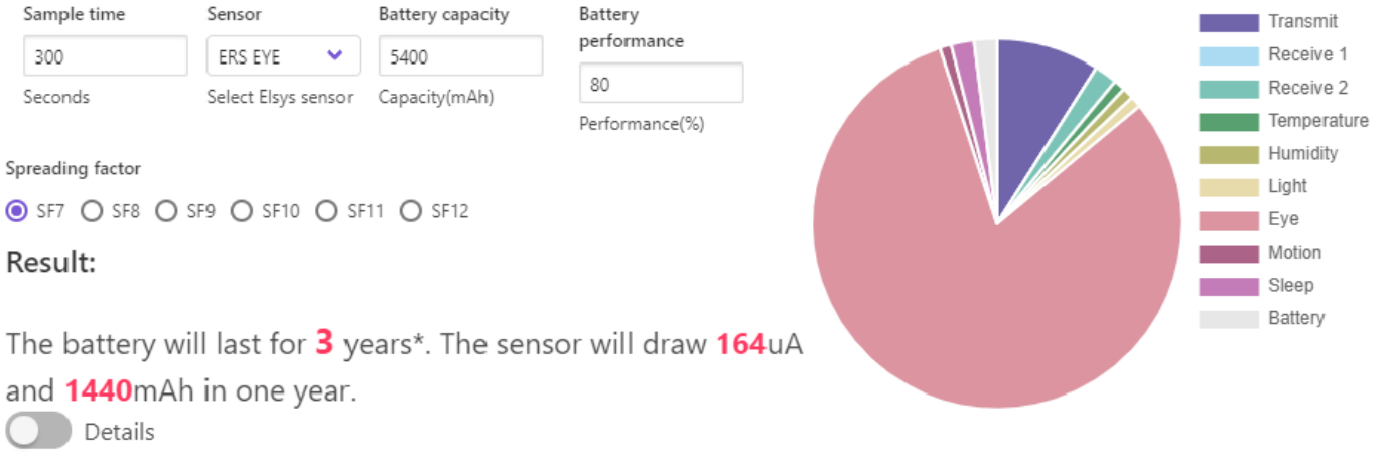
Battery life predictions

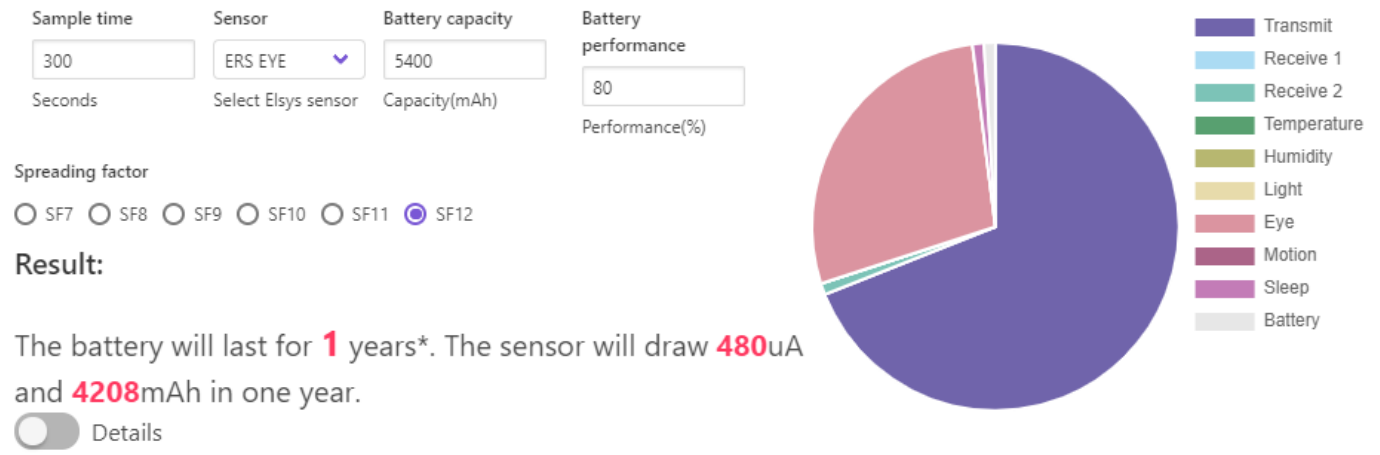
The nature of Radio Frequency (RF) technology including LoRaWAN is that the distances achieved are subject to the configuration, environmental conditions, possible obstacles, topography of the surrounding area and the risk of interference by other devices on the same frequency. LoRaWAN allows for a variance in the transmission speed known as Spread Factor (or Data Rates) which can be dynamically adjusted to achieve the best range while optimising battery use. Over greater distances or through obstacles, a higher Spread Factor may be used which will consume more time on air and therefore greater power. This along with frequency of samples, reducing battery life.

The following guides are provided by the manufacturer as a realistic expectation of battery life performance.

*Sample time of 300 seconds (5minutes) with **Spread Factor 7***



*Sample time of 300 seconds (5minutes) with **Spread Factor 12***



* If enabled, regular triggering of the PIR sensor may further increase battery use and lower battery life expectancy.