ELSYS.se

ERS Sound

LoRaWAN® Wireless Sensor

Description

ERS Sound is an advanced indoor environment sensor. It is enclosed in a room sensor box and is designed to be wall mounted. ERS Sound is completely wireless and powered by two 3.6V AA lithium batteries. Inside you will find internal sensors for measuring sound level, temperature, humidity, light, and motion. The sound module is always on and will detect every sound event.

Applications

- Indoor environment measuring
- Smart buildings
- Workplace management
- Room occupancy
- Sound level control in public spaces, schools, libraries etc.

Product features

- LoRaWAN Certified CM
- Sound sensor / Peak + Average
- Always on – no missed sound events
- dBa filtering
- 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 27 mm
Enclosure	Plastic, PC/ABS

Operating conditions	
Temperature	0 to 50 °C
Humidity	0 to 85 % RH (non-condensing)

Device Logging Function	
Sampling Interval	Configurable via NFC and downlink configuration
Data Upload Interval	Configurable via NFC and downlink configuration

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

Radio / Wireless	
Wireless Technology	LoRaWAN® 1.0.3 rev B
Wireless Security	LoRaWAN® End-to-End encryption (AES-CTR), Data Integrity Protection (AES-CMAC)
LoRaWAN Device Type	Class A/B/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)

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
0x15	Sound	2	Sound data, 1 byte peak / 1 byte average dB
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)

Figure 1

Humidity

Resolution: 0.1 % RH

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

Accuracy of humidity over temperature: See figure 3

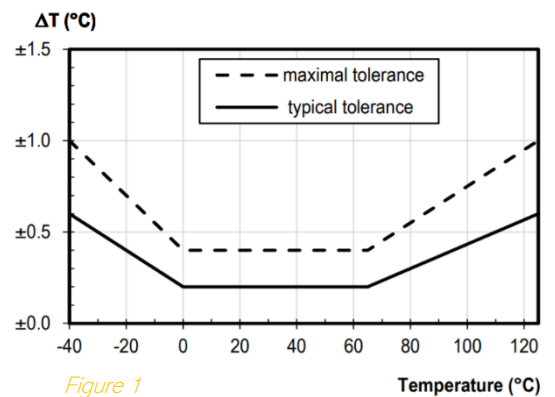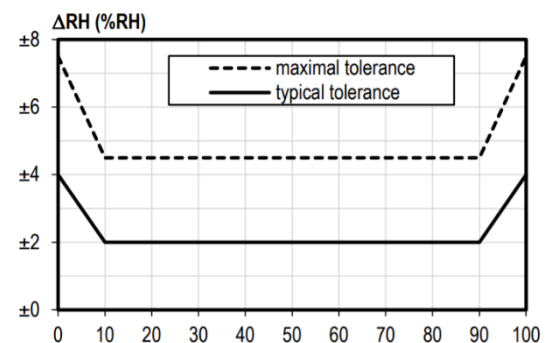*Figure 2*

Light

Range: 4 – 2000 LUX

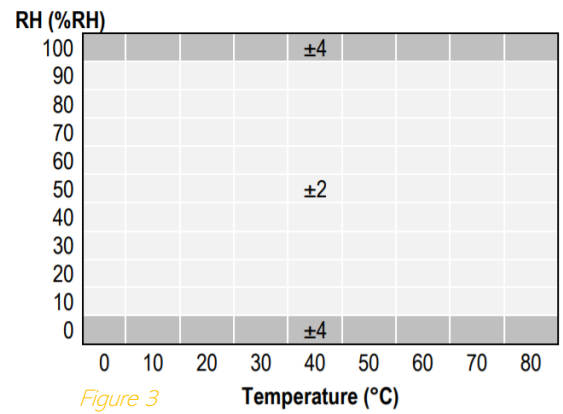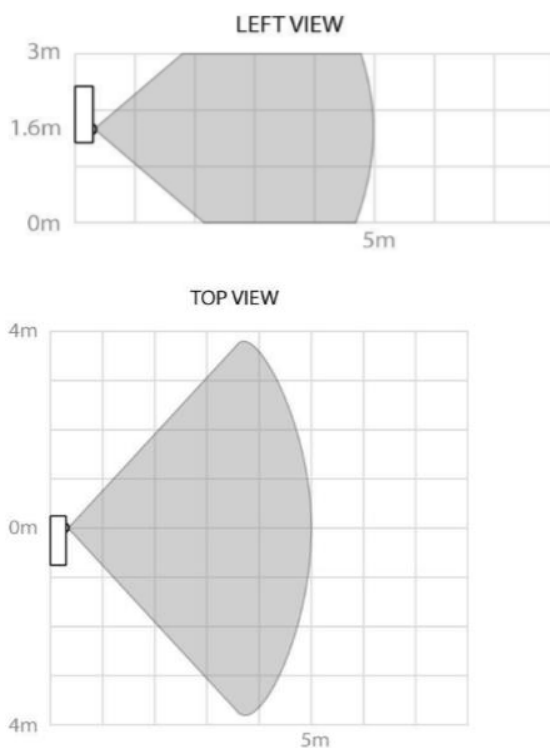Resolution: 1 LUX

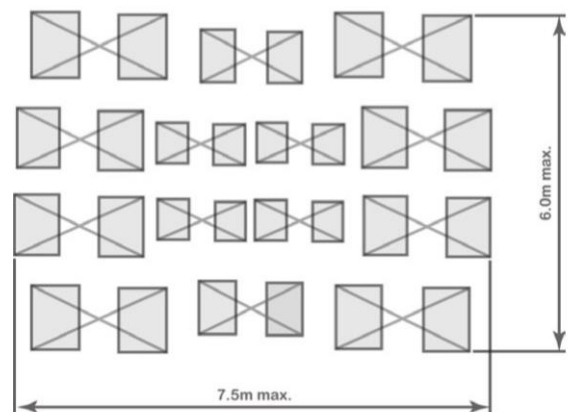Accuracy: ± 10 LUX

Figure 3

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.
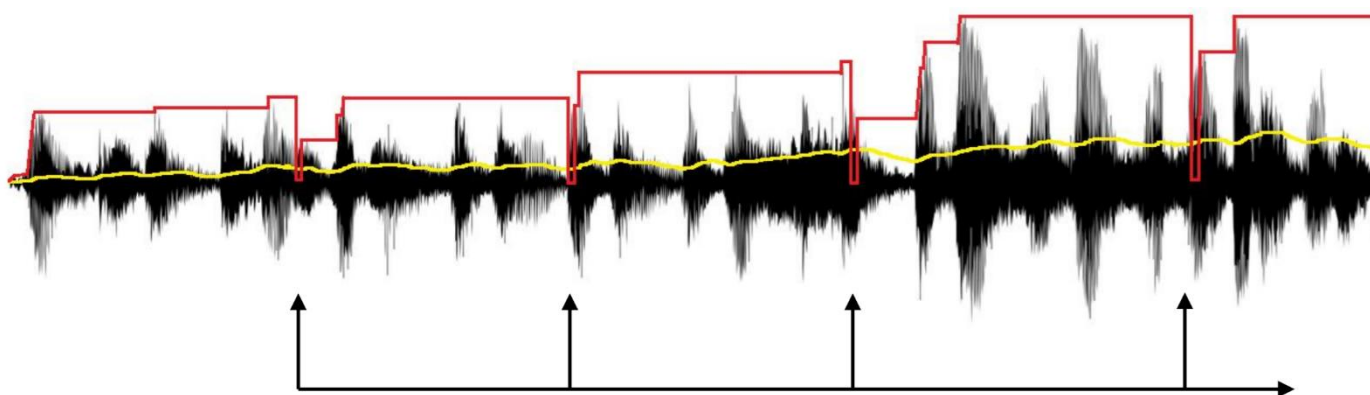
Sound

The sound sensor measures the average and peak sound pressure level with dBa filtering. It wakes and samples both signals every 10s, and does the final calculation before sending the data at the desired send interval. For large orders, sensitivity and filtering can be changed.

Average value range: 35 – 70 dBspl

Peak value range: 65 – 99 dBspl

Sound resolution: 1 dB

Sound accuracy: ±5 dB

10s sample and peak reset. For every send interval,
the ERS Sound calculates total peak and average for all samples.