enerSENSE – Green Building Retrofit

Smart battery-free Building Sensors

We make sensing in buildings powerful, scalable & sustainable

enerSENSE wireless building sensors for measuring occupancy (enerSense IR-Array) and air quality (enerSense CO_2) indoors. Power is supplied by our proprietary indoor photovoltaic technology.

Easy installation without battery replacement. LoRaWAN communication for simple and scalable installations.

Applications

- Workplace management
- Improved building utilization
- Improved energy efficiency
- Facility management
- Green buildings
- Air quality measurement
- Infection prevention

Product Features	enerSENSE Basic	enerSENSE Presence	enerSENSE CO_2
Temperature sensor	•	•	•
Humidity sensor	•	•	•
Motion sensor (PIR)	•	•	•
CO_2 sensor			•
IR-Array sensor		•	
Light sensor	•	•	•
LoRa wireless communication	•	•	•
NFC configuration	•	•	•
Over the air configuration	•	•	•

Powerful without batteries

- Powered by indoor light through Enerthing's proprietary photovoltaic technology
- Smart power management on device and cloud level for reliable and efficient operation
- Superior performance to battery powered sensors

Sustainable by

- Long product lifetime & elimination of maintenance processes
- Reduction of battery- and electronics waste
- Circular product design

ENERTHING GMBH

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enerthing®

Specifications

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	
RF Transmit Power	+14 dBm / +22 dBm (Region specific)	
Link Budget	137 dB (SF7) to 151 dB (SF12)	
Energy Supply		
Photovoltaic module	Energy harvester: Enerthing`s patented robust indoor light photovoltaic technology	
Minimum Illumination conditions	Depending on device settings and environment < 100 lx possible	
Secondary battery (Accumulator)	Storage 700 mAh rechargeable secondary battery (storage size customizable)	
Energy management circuit	Charge- and Power management circuit with reading of battery voltage, PV module voltage and net energy flow	
Energy management software	Energy management incorporated in embedded software on the device and in the cloud	
Sensor Data logging & transmission		
Sampling interval	Configurable via NFC and downlink	
Data transmision interval	Configurable via NFC and downlink	
Sensors	**Feature**	**Range**
CO_2 (enerSENSE CO_2)	measurement range	0 to 5000ppm
	accuracy	+/-45 ppm or +/- 3 %
	sensor type	Near infrared measurement (NDIR)
	calibration	Automatic or via cloud
	measurement interval	optimal settings dependent on light-condition, 15 min, configurable
Temperature	measurement range	-40° C to 85° C 0° C to 65° C full accuracy
	accuracy	+/- 1° C
Humidity	measurement range	10 % to 90 % RH
	accuracy	+/- 3 % @ 20 % to 80 % RH
Pressure	measurement range	300 to 1100 hPa
	accuracy	1,0 hPa @ 0°C to 65° C

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Light	measurement range	0 - 83 k lux
	accuracy	0,01 lx
Device Motion (Acceleration movements)	Full scale range	±2g/±4g/±8g/±16g
	Bandwidth	up to 800 Hz
Motion (PIR)	**Dual Detector with Interrupt function**	
	ADC Output Resolution	14 bit
	Field of view	146°
IR-Array Sensor (enerSENSE Presence)	Range of detection	max. 7 m
	Temperature Range	0° C to 80° C
	Resolution	0.25° C
	accuracy	+/- 2.5 %
	Field of view	60°
Interface & Feedback		
LEDs	RGB	
(Alarm)-Buzzer	Acoustic warning e.g., when measured CO2 level above defined threshold, buzzer pattern customizable	85 dB @10 cm
User-Button		
NFC Interface	For reading and changing device settings	
Mechanical specifications		
Colour	White	
Dimensions	162 mm x 114 mm x 20 mm (H x W x D)	
Protection	IP30	
Enclosure material	PC / ABS	
Weight	140 g	
Operating conditions		
Temperature	0° C to 50° C	
Humidity	0 to 85 % RH (no condensation)	
General		
Storage temperature	-30° C to +70° C	
Lifetime	> 10 years	
Made in Germany		

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High quality data by Smart Power Management

We have implemented a smart power management on the device level as well as on cloud level. While the sensor is designed to provide the performance required in the specific application, more energy provided by better illumination conditions can also be exploited by generating better data in comparison to battery powered devices. This can be more sensor data, higher resolution of said data, higher signal strengths or the ability for more frequent over the air changes of device parameters.

Customization

Applications often result in specific requirements. We are open to customize our solution to your needs – just contact us!

Installation & commissioning

Device installation is usually done on the customer's side with the assistance of our experts. We can provide additional documents for a general overview of the installation and commissioning process. For detailed description of the process, feel free to contact us.

Disposal

According to the European WEEE directive, electrical and electronic equipment must not be disposed with consumers waste. Its components must be recycled or disposed apart from each other. Otherwise contaminative and hazardous substances can pollute our environment.

You as a consumer are committed by law to dispose electrical and electronic devices to the producer, the dealer, or public collecting points at the end of the devices lifetime for free. Particulars are regulated in national right. The symbol on the product, in the user's manual, or at the packaging alludes to these terms. With this kind of waste separation, application and waste disposal of used devices you achieve an important share to environmental protection.

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