PRODUCT SPECIFICATIONS

LoRaWAN™ Sensor Device

MODEL: LS-111P (CO$_2$)

Version: V1.2

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Introduction:

LS-111P is designed to measure Carbon Dioxide (CO_2), Temperature and Humidity by LoRa® long-range and low-power wireless connectivity. It is integrated LoRa® wireless technology, CO_2 sensor knowhow and high-performance MCU solution for various IoT markets usage. With calibrated CO_2 sensor module and compensated Temperature/ Humidity sensor integration, the data is ready for use. It is perfect for monitoring air quality in schools, office buildings, greenhouses, factories, hotels, hospitals, transportation lines and anywhere high levels of carbon dioxide are generated.

Product Features:

- LoRaWAN™ compliant
- High Receiver Sensitivity, Long Range Solution
- Integrated with calibrated CO_2 Sensor
    - Accuracy: ±50 ppm, ±3% of reading
    - Range: 0 ~ 10,000 ppm
- Integrated with Compensated Temp/ RH Sensor
- Wide range DC power-in, 8~24V /or Micro-USB DC power-in, 5V
- Display CO_2 concentration, Temp/ RH
- Alarm LED indicator

Specifications

Wireless

LoRa$^{\circledR}$ Module	LoRa Alliance$^{™}$ certified module LM-130H
Sensitivity	-132 dBm @ 980 bps
Tx Power	Up to 100mW
Standard/ Protocol	Comply with LoRaWAN$^{™}$ protocol
LoRa$^{\circledR}$ Antenna	External Omni Antenna 824 ~ 960 MHz 2 dBi SMA Male connector
Frequency	863 ~ 870 MHz (EU) 902 ~ 928 MHz (US) 920 ~ 928 MHz (ROA)

Sensor Operation

Sensing Element	CO_2: Gold-plated infrared (NDIR) wave-guide technology with Automatic Baseline Correction (ABC) and passive gas diffusion (no moving parts) Temperature & Humidity: CMOS sensor
Response Time	CO_2: < 10 sec. @ 30 cc/min. flow rate < 3 min. diffusion time Temperature: min. 3 sec.；max. 30sec. at τ 63% Humidity: < 8 sec. at τ 63%
Accuracy (at 25℃)	CO_2: ± 50 ppm or ± 3% of reading Temperature: ± 0.5℃ Humidity: ± 5 %RH
Repeatability	CO_2: ± 20 ppm + (± reading * 1%) Temperature: ± 0.3 ℃ Humidity: ± 0.3 %RH
Zero Drift	CO_2: < ± 10 ppm/yr. with Automatic Baseline Correction (ABC) Temperature: < 0.04 ℃/yr Humidity: < 0.5 %RH/yr
Measurement Range*	CO_2: 0 ~ 10,000 ppm Temperature: -40 ~ +125 ℃ Humidity: 0 ~ 85 %RH
Pressure Dependence	CO_2: 1.6% reading per kPa

System Operation

Temperature	-10 ~ +60 ℃
Humidity	0 ~ 85 %RH Non-condensed, 0 to 50℃
Storage Temperature	-20 ~ +70 ℃.

Specifications

Warm-up Time	≤ 1 min. (at full specs ≤ 15 minutes.)
LED Indicator	Orange LED x 1 (by threshold setting, default is 800 ppm)
	Red LED x 1 (by threshold setting, default is 1000 ppm)
Power Supply	DC 8 ~ 24 V or Micro-USB DC 5 V
Power Consumption	TBD
Installation	Wall-mount
Dimension (mm)	Wall-mount: 113.57(H) x 80(W) x 28.79(D) mm
Weight	101 ± 2 g
Case Material	ABS
Accessory	
Standard	LoRa® Antenna (External Omni Antenna) x 1
Optional	Sensor Programmable Cable (Micro USB to UART)