

SenseCAP CO2 Sensor - LoRaWAN US915



SenseCAP Wireless CO2 Sensor - LoRaWAN US915MHz

SKU

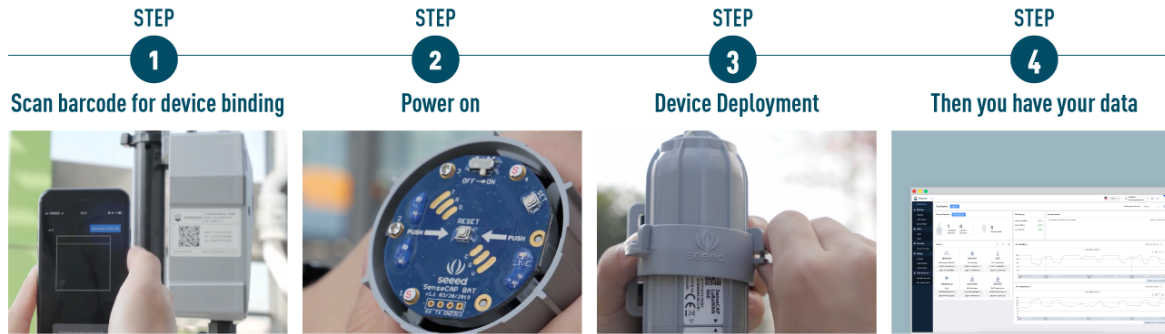
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PRODUCT DETAILS

About SenseCAP

Among the first launch of Seeed industrial IoT (IIoT) product series, **SenseCAP** is focusing on wireless environmental sensing applications: smart agriculture, precision farming, and smart city, to name a few. It consists of hardware products (sensors, data-loggers & gateways, etc.), software services (SenseCAP portal, mobile App, open dashboard), and API for device & data management.

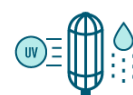
Easy deployment and quick provisioning



Industrial design supports extended operating temperature range



Ultra-wide-distance data transmission and low-power consumption



Suitable for outdoor and harsh environment like with UV, rain, dust



Provides a variety of flexible cloud services with Open API for further development



Certified by CE, FCC, RoHS



Applicable to world-wide market

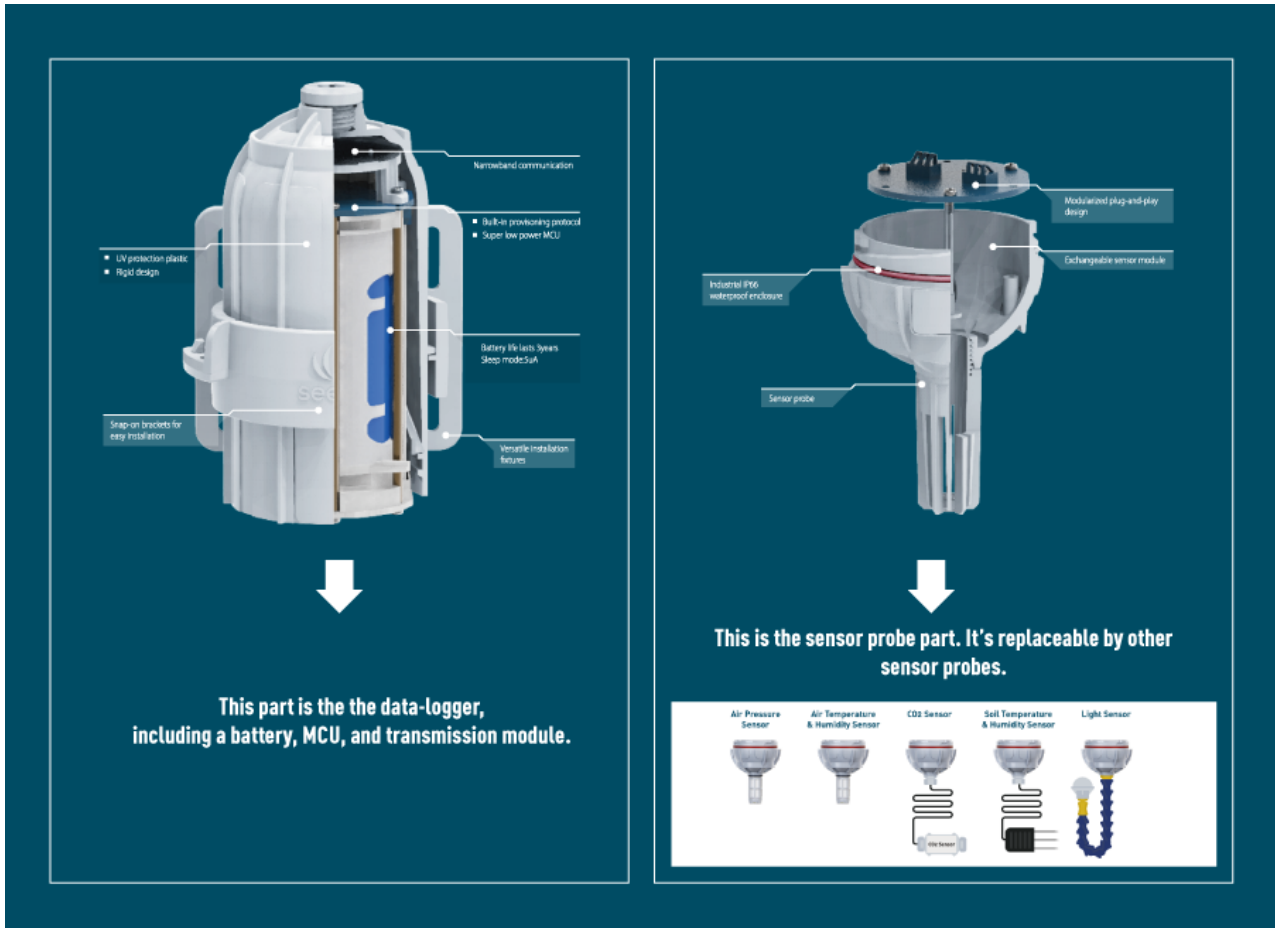
SenseCAP Wireless CO₂ Sensor measures the level of carbon dioxide (CO₂) gas at the range of 0 ~ 40000 ppm in the atmosphere, applicable for both indoor and outdoor environments. It is perfect for monitoring CO₂ ppm in outdoor farms, weather stations, greenhouses, industrial campuses, factories, schools, office buildings, hotels, hospitals, transportation stations, and anywhere data of CO₂ emission is needed.

This device incorporates a built-in LoRa transmitter based on SX1276 for long-range transmission, an NDIR CO₂ sensor, and a custom battery. It is specifically designed and optimized for use cases powering end devices by batteries for years. To minimize the power consumption, the device wakes up, transmits the collected CO₂ data to the gateway, and then goes back to sleep.

Under the best of circumstances, the battery is expected to last for 1.5 years, depending on the data transmission intervals. Please kindly note that the default interval is once per hour. If you'd like to change the data upload interval, please refer to [this document](#).

SenseCAP Sensor Node adopts a modular design, integrating the data logger with the sensor probe, which is replaceable by other SenseCAP sensor probes.

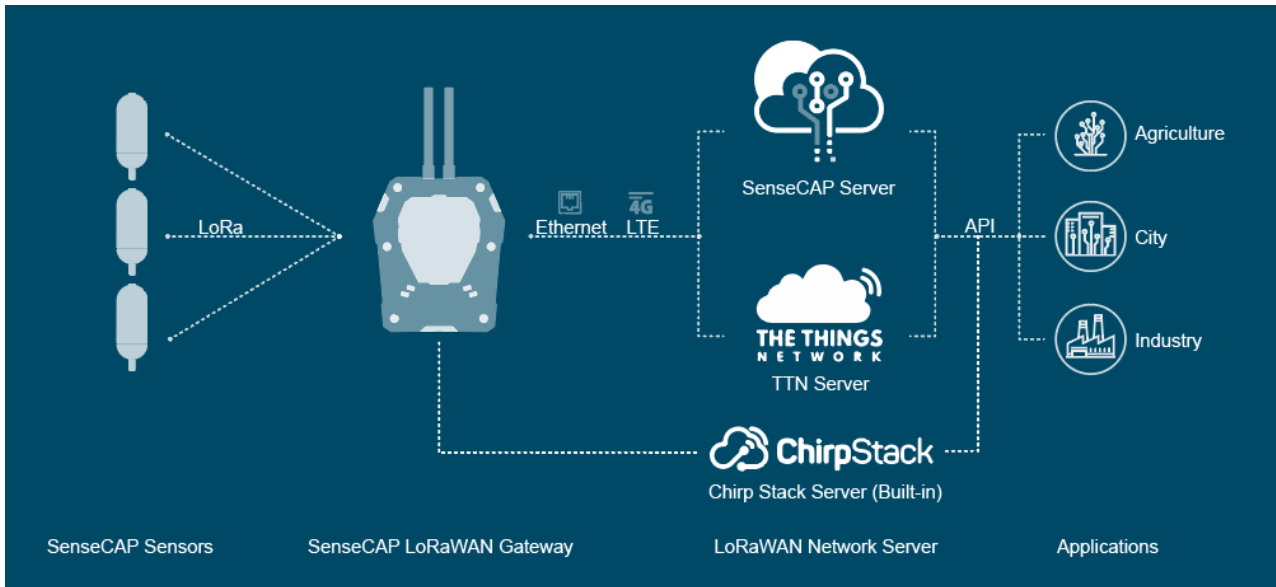
The data logger part is designed with industry standards and equipped with an IP66 waterproof enclosure. To ensure accuracy and sensitivity, we chose the material with the optimal breathable aperture for the sensor probe, which however is not waterproof. Hence, this CO₂ Sensor is applicable only for indoor environments. The product is dustproof, making it ideal for environments such as chicken farms, where there is poultry dust.



SenseCAP Sensor is fully compliant with LoRaWAN specifications and can be used with standard LoRaWAN gateways. Please choose the corresponding gateway according to the sensor frequency. Seeed also provides [SenseCAP LoRaWAN Gateway](#) for you to use with SenseCAP Sensors seamlessly without extra huge workload for provisioning.

System Architecture

SenseCAP Architecture



SenseCAP Sensor + Other LoRaWAN Gateway Architecture



Features

- Support LoRaWAN protocol Class A
- NDIR CO₂ sensor technology
- Dual-channel detection for superior stability
- Ultra-wide-distance transmission: 10km in line of sight scene, 2 km in urban scenes
- Battery life ≥ 1.5 years
- Rapid installation and deployment (see the video below)

Applications



- Smart Agriculture/ Precision Agriculture
- Smart Building and Industrial Control
- Environmental Monitoring
- Other Wireless Sensing Applications

Specifications

CO2

Parameters	Condition	Value
Range	-	0 to 40000 ppm
Accuracy	400 to 10000ppm	$\pm(30 \text{ ppm} + 3 \%MV)$
Resolution	-	1 ppm
Temperature Stability	T = 0 to 50 °C	$\pm 2.5 \text{ ppm}/^{\circ}\text{C}$

Parameters

Product Model	LoRa-S-915-CO2-01
Microcontroller	Ultra-low-power MCU
Support Protocol	Based on LoRaWAN v1.0.2 protocol
LoRa Channel Plan	US915
LoRa Power Output	16 dBm (EIRP)
Sensitivity	-136.5dBm(SF12, BW125KHz)
Current Consumption	5 μA (sleep mode) 120 mA max(active mode)
Communication Distance	2 to 10 km (depending on different antennas and environments)
IP Rating	IP66 (Sensor Node); Indoor (Sensor Probe)

UV Resistance	anti-aging (from rain/sun exposure): UL746C F1
Enclosure Material	PC
Operating Temperature	0 °C to +50 °C
Operating Humidity	0 to 95 %RH
Device Weight	319g
Certification	CE, FCC, RoHS
Battery (Contained in equipment)	
Battery Life	≥ 3 year (upload data once per hour)
Battery Voltage	3.6V
Battery Capacity	19Ah (non-rechargeable)

LoRa Frequency

The device is designed with a fixed LoRa channel, which can not be modified by users. The supported channels are as follows. Please refer to [this document](#) for how to connect this device with a LoRaWAN gateway.

LoRa Channel Plan

Uplink (MHz)	903.9 - SF7BW125 to SF10BW125 904.1 - SF7BW125 to SF10BW125 904.3 - SF7BW125 to SF10BW125 904.5 - SF7BW125 to SF10BW125 904.7 - SF7BW125 to SF10BW125 904.9 - SF7BW125 to SF10BW125 905.1 - SF7BW125 to SF10BW125 905.3 - SF7BW125 to SF10BW125
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Downlink (MHz)	923.3 - SF7BW500 to SF12BW500 923.9 - SF7BW500 to SF12BW500 924.5 - SF7BW500 to SF12BW500 925.1 - SF7BW500 to SF12BW500 925.7 - SF7BW500 to SF12BW500 926.3 - SF7BW500 to SF12BW500 926.9 - SF7BW500 to SF12BW500 927.5 - SF7BW500 to SF12BW500
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Part List



① Sensor



② Bracket



③ M4 Self-drilling Screw



④ M3 Self-drilling Screw

Part List

1	Sensor	x1
2	Bracket	x1
3	M4 Self-drilling Screw	x4
4	M3 Self-drilling Screw	x2

ECCN/HTS

HSCODE 9027100090

USHSCODE 8517709000

UPC