SENSECAP

SenseCAP LoRaWAN Sensor

Product Catalogue

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SENSECAP

About SenseCAP

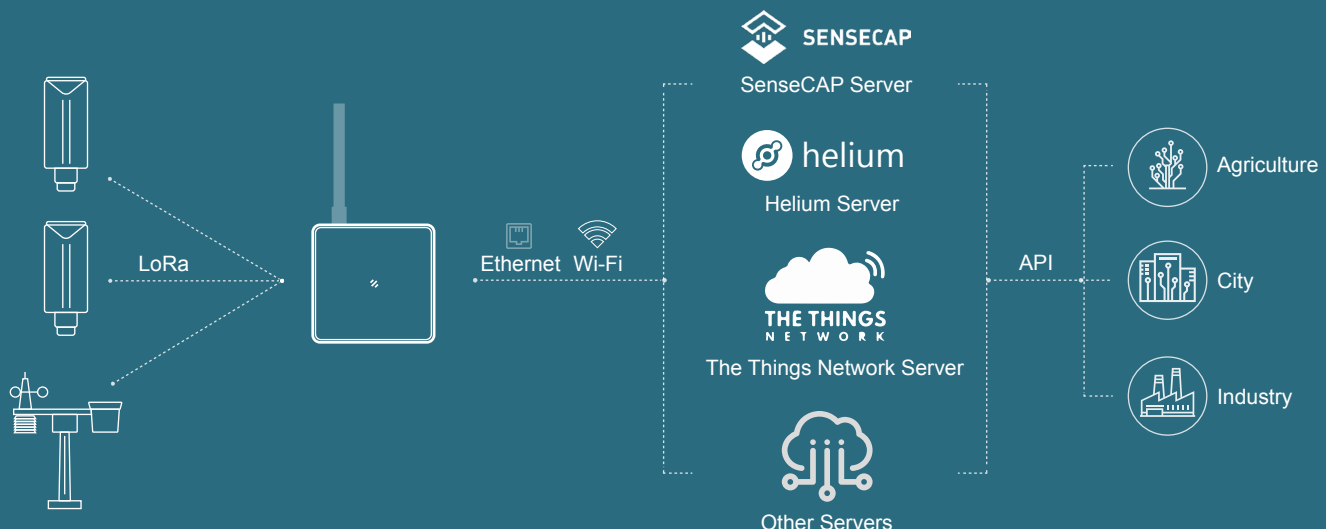
Among the first launch of Seeed IIoT product series, SenseCAP is focusing on wireless environmental sensing applications: smart agriculture, precision farming, and smart city, to name a few. It consists of hardware products (sensors, data-loggers & gateways, etc.), software services (SenseCAP portal,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

About S21XX/A110X Series

The next generation of LoRa sensors, the S21XX/A110X series offers users' industrial long-distance data acquisition via LoRaWAN. This series is suitable for a wide variety of different industries such as smart agriculture, smart buildings and industrial control.

With the IP66 rating, -40 ~ +85C ° operating temperature and built-in 19Ah high-capacity battery, combined with the devices' low power consumption, the series can operate in harsh outdoor environments for up to 10 years with a range of up to 10km. The built-in Bluetooth facilitates setup and greatly reduces large-scale deployment costs. Users can focus on application development with the easy set-up, and start retrieving data in a few steps. Just install the device, bind it using the QR code and configure the network, then data can be viewed from the SenseCAP portal, which supports popular IoT protocols such as HTTP and MQTT.

Architecture



Application

How to Select Gateway and LoRaWAN Network Server

LoRaWAN network coverage is required when using sensors, there are two LoRaWAN network options.

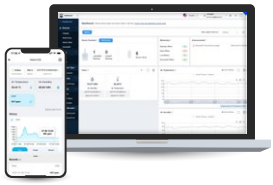
Option 1

Sensors are used out of the box with the Helium network

1. Make sure you are covered by Helium Network.

2. Add Sensor to your account by scanning sensor QR code

3. Get the data from SenseCAP Portal and App



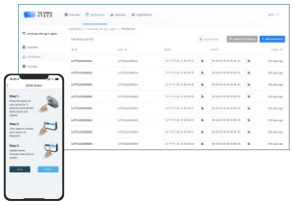
Option 2

Sensors are used with standard LoRaWAN network

1. Deploy gateway and select LoRaWAN Network Server

ChirpStack · THE THINGS NETWORK · LORIOT · SENSECAP

2. Set parameters and get EUI/Key of sensor via SenseCAP App



3. Create a device on the LoRaWAN Server Console

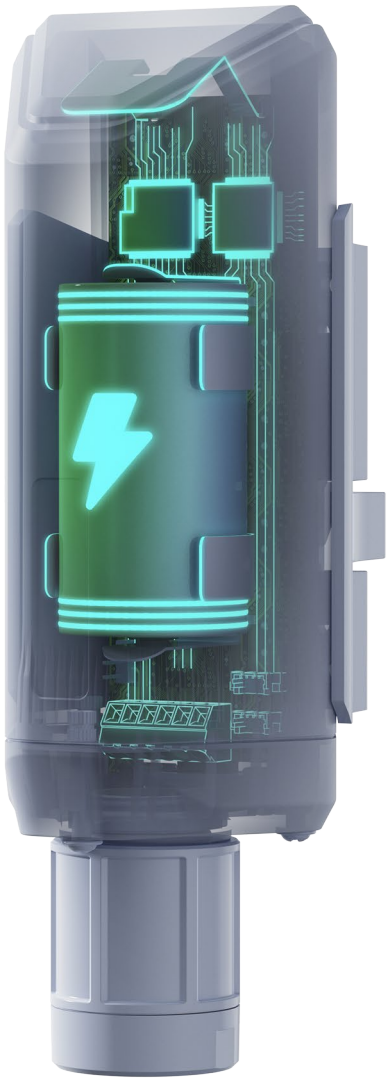
4. Sensors join LoRa network and periodically upload data

* The LoRaWAN® name and the associated logo are licensed by the LoRa Alliance.

Features

High accuracy sensor
Fast response and superior stability

Quick configuration
User–friendly set–up with built–in Bluetooth



Ultra-low power consumption
Battery life of up to 10 years with built–in 19Ah battery

Easy deployment
Easy to mount via brackets

Industrial design
–40 ~ 85℃ operating temperature and IP66 rating

Efficient integration
SenseCAP cloud services with Open API support further development

Weather resistant
Suitable for indoor, outdoor and harsh environments such as high UV exposure, heavy rain, dusty conditions etc.

Multi-platform
Compatible with multiple NS (Helium, TTN) and IoT platforms

SenseCAP S2101

Air Temperature and Humidity Sensor

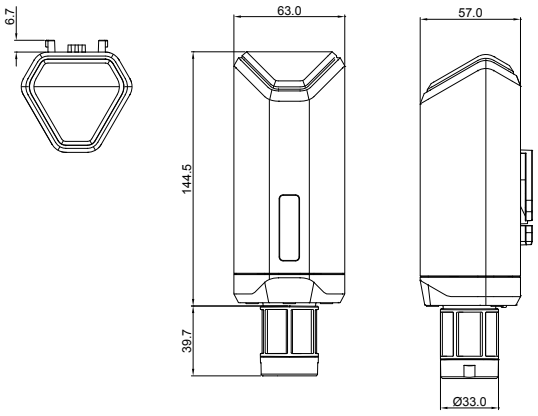
Specifications

Air Temperature	
Range	–40 to +85 ˚C
Accuracy	±0.2 ˚C
Resolution	0.01 ˚C
Long–term Drift	<0.03 ˚C/year
Air Humidity	
Range	0 to 100 %RH
Accuracy	±1.8 %RH
Resolution	0.01 %RH
Long–term Drift	<0.25 %RH/year
General Parameters	
Product Model	S2101
Microcontroller	Wio–E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built–in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 *
Max Transmitted Power	19dBm
Sensitivity	–136dBm@SF12 BW=125KHz
Communication Distance	2 to10km (depending on gateway antenna and environments)
IP Rating	IP66
Operating Temperature	–40 to +85 ˚C
Operating Humidity	0 to 100 %RH (non–condensing)
Device Weight	280g
Certification	CE / FCC / RoHS
Battery (Contained in equipment)	
Battery Life	Up to 10 years**
Battery Capacity	19Ah (non–rechargeable)
Battery Type	Standard D–size SOCI2 Battery

* A device supports different frequencies and can be configured via the Bluetooth App.

** The battery life varies from data upload interval and distance between gateway.

Dimension



SenseCAP S2102

Light Intensity Sensor

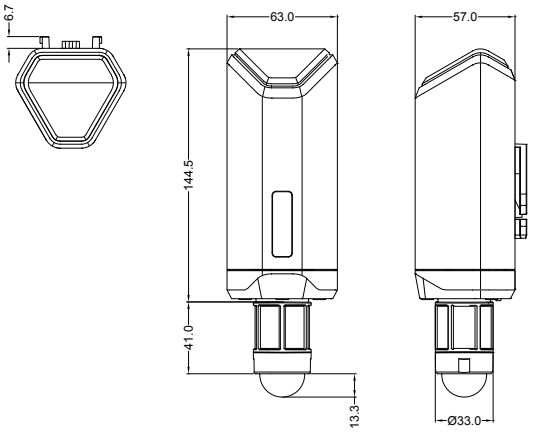
Specifications

Light Intensity	
Range	0 to 160000 Lux
Accuracy	±5%
Resolution	1 Lux
General Parameters	
Product Model	S2102
Microcontroller	Wio–E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built–in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 *
Max Transmitted Power	19dBm
Sensitivity	–136dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments)
IP Rating	IP66
Operating Temperature	–40 to +85 °C
Operating Humidity	0 to 100 %RH (non–condensing)
Device Weight	280g
Certification	CE / FCC / RoHS
Battery (Contained in equipment)	
Battery Life	Up to 10 years**
Battery Capacity	19Ah (non–rechargeable)
Battery Type	Standard D–size SOCl2 Battery

* A device supports different frequencies and can be configured via the Bluetooth App.

** The battery life varies from data upload interval and distance between gateway.

Dimension



SenseCAP S2103

CO2, Temperature, and Humidity Sensor

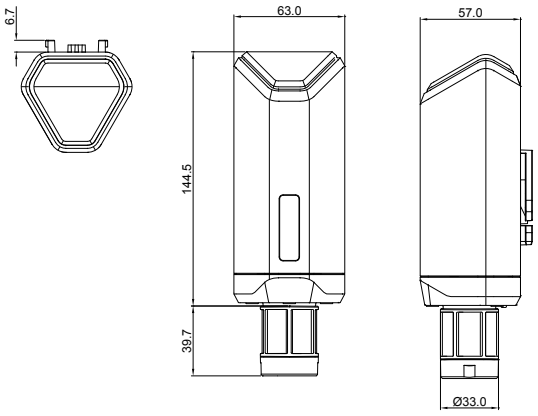
Specifications

CO2	
Range	400 to 10000 ppm
Accuracy	400 to 5000 ppm: ±(30+3%MV)
	5000 to 10000 ppm: ±10%MV
Resolution	1 ppm
Air Temperature	
Range	–40 to +85 °C
Accuracy	±0.2 °C
Resolution	0.01 °C
Long–term Drift	<0.03 °C/year
Air Humidity	
Range	0 to 100 %RH
Accuracy	±1.8 %RH
Resolution	0.01 %RH
Long–term Drift	<0.25 %RH/year
General Parameters	
Product Model	S2103
Microcontroller	Wio–E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built–in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 *
Max Transmitted Power	19dBm
Sensitivity	–136dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments)
IP Rating	IP66
Operating Temperature	0 to 50 °C
Operating Humidity	0 to 90 %RH (non–condensing)
Device Weight	285g
Certification	CE / FCC / RoHS
Battery (Contained in equipment)	
Battery Life	Up to 10 years**
Battery Capacity	19Ah (non–rechargeable)
Battery Type	Standard D–size SOCl2 Battery

* A device supports different frequencies and can be configured via the Bluetooth App.

** The battery life varies from data upload interval and distance between gateway.

Dimension



SenseCAP S2104
Soil Temperature and Moisture Sensor

SenseCAP S2105
Soil Temperature,Moisture and EC Sensor

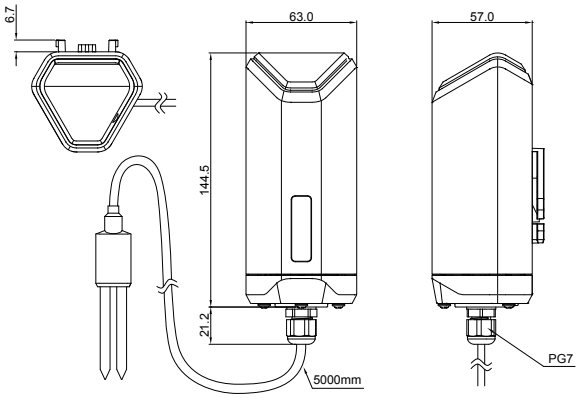
Specifications

Soil Temperature	
Range	–40 to +80 ˚C
Accuracy	0 to 50˚C: ±0.5 ˚C
	–40 to 0, 50 to 80˚C: ±1 ˚C
Resolution	0.1 ˚C
Soil Moisture (VWC–Volumetric Water Content)	
Range	0 to 100% (air – water)
Accuracy	0 to 50%: ±3%
	50 to 100%: ±5%
Resolution	0 to 50%: 0.1%
	50 to 100%: 0.5%
Electrical Conductivity (Only supported in S2105)	
Range	0 to 23 dS/m
Accuracy(0~50˚C)	0 to 5 dS/m: ±5%
	5 to 23 dS/m: ±10%
Resolution	0 to 5 dS/m: 0.01dS/m
	5 to 23 dS/m: 0.1dS/m
General Parameters	
Product Model	S2104/S2105
Microcontroller	Wio–E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built–in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 *
Max Transmitted Power	19dBm
Sensitivity	–136dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments
IP Rating	IP66
Operating Temperature	–40 to +85 ˚C
Operating Humidity	0 to 100 %RH (non–condensing)
Device Weight	405g
Cable Length	5 meters
Certification	CE / FCC / RoHS
Battery (Contained in equipment)	
Battery Life	Up to 10 years**
Battery Capacity	19Ah (non–rechargeable)
Battery Type	Standard D–size SOCl2 Battery

* A device supports different frequencies and can be configured via the Bluetooth App.

** The battery life varies from data upload interval and distance between gateway.

Dimension



SenseCAP S2100

LoRaWAN Data Logger

Specifications

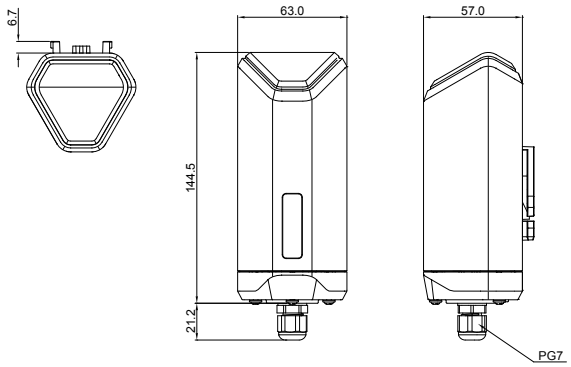
Interface*	
Current Input	4 to 20 mA (2 channel)
Voltage Input	0 to 5 V (2 channel)
RS485	RS485 Modbus-RTU Protocol
General Parameters	
Product Model	SenseCAP S2100
Microcontroller	Wio-E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built-in Bluetooth	App Tool to change parameters and set data conversion algorithm
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 **
Max Transmitted Power	19dBm
Sensitivity	-136dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments)
IP Rating	IP66
Operating Temperature	-40 to +85 ℃
Operating Humidity	0 to 100 %RH (non-condensing)
Device Weight	280g
Certification	CE / FCC / RoHS
Power Supply***	
Sensor Power	3V / 5V, 12V(DC only)
PCBA Power	12V DC or Battery(contained)
Battery Life	Depends on the power consumption of the sensor
Battery Capacity	19Ah (non-rechargeable)
Battery Type	Standard D-size SOCI2 Battery

* Hardware supports all interfaces, but the software supports only one interface type to collect data simultaneously. For example, if the analog interface is selected, the RS485 interface cannot be used at the same time.

** A device supports different frequencies and can be configured via the Bluetooth App.

*** Both external power supply and battery power supply are supported. If 12V is connected to an external power supply, the external power supply is preferred and the battery is used as the backup power supply. The device supports 3V and 5V sensors, which can support the 12V sensor when the PCBA is powered by 12V DC.

Dimension



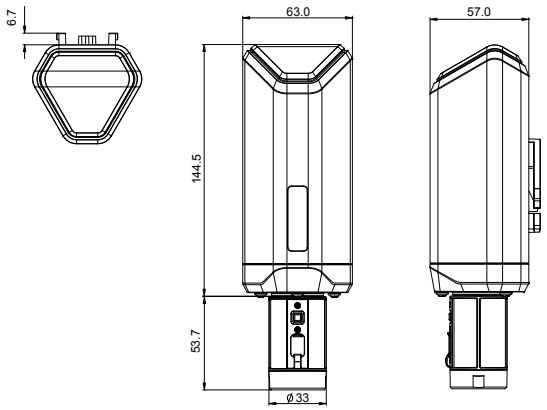
SenseCAP A1101

LoRaWAN Vision AI Sensor

Specifications

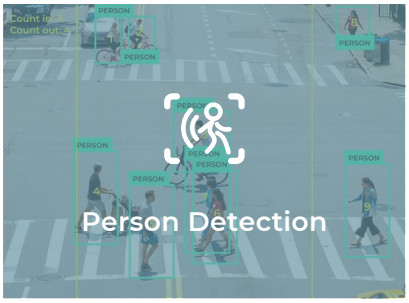
Vision AI	
ML Framework	TensorFlow Lite/PyTorch
AI Hardware Acceleration	400Mhz DSP
Model Resolution	192*192 pixel
Camera	
Field of view	Diagonal 82°
Camera Resolution	30W pixel
General Parameters	
Product Model	A1101
Microcontroller	Wio-E5
Support Protocol	LoRaWAN v1.0.3 Class A
Built-in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864 *
Max Transmitted Power	19dBm
Sensitivity	-136dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments)
IP Rating	IP66
Operating Temperature	-40 to +85 °C
Operating Humidity	0 to 100 %RH (non-condensing)
Device Weight	280g
Certification	CE / FCC / RoHS
Battery (Contained in equipment)	
Battery Life	Varies depending on model and recognition wake frequency
Battery Capacity	19Ah (non-rechargeable)
Battery Type	Standard D-size SOCI2 Battery

Dimension



TinyML+LoRaWAN Perfect Combination

Application



Customizable Vision AI

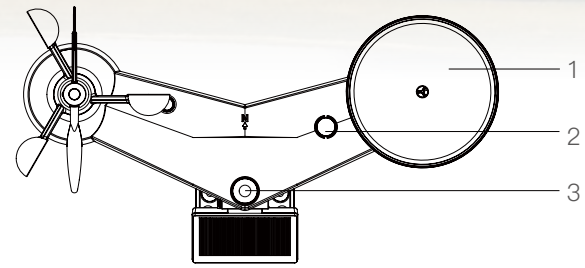
TensorFlow Lite

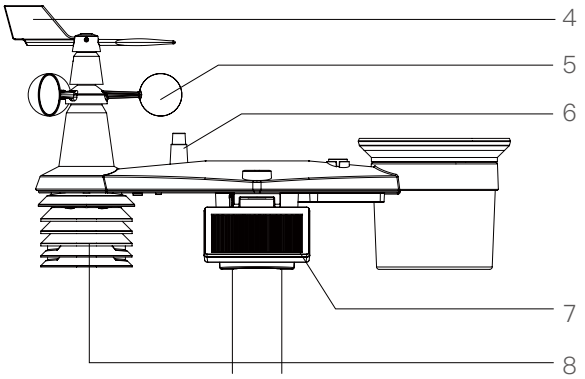
YOLOv5 by

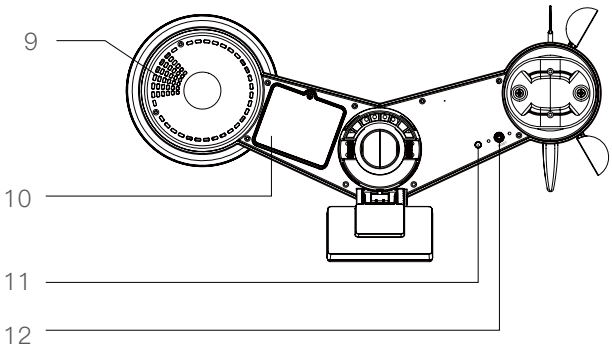
TINY ML

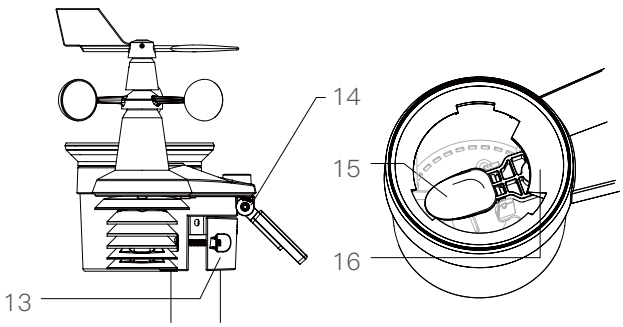
SenseCAP S2120

LoRaWAN 8-in-1 Weather Station





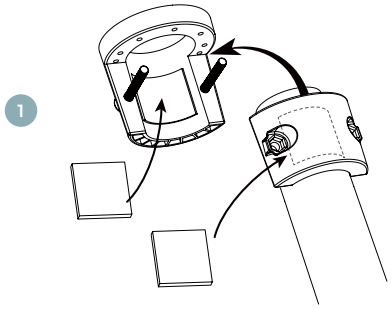


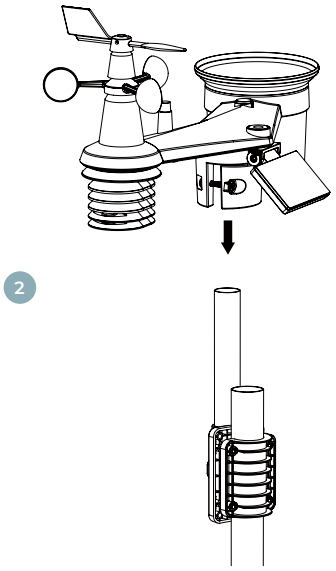


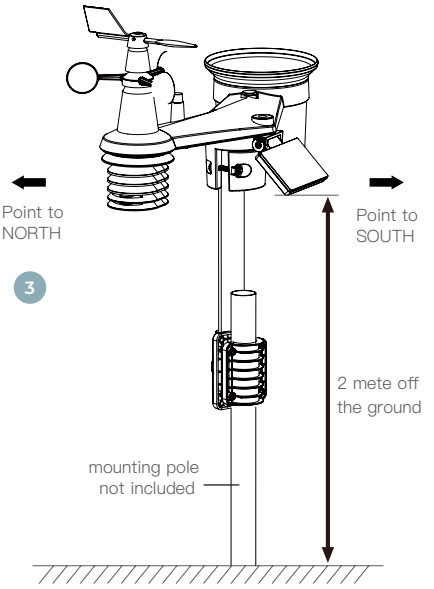
Diagram

1. Rain gauge
2. Balance indicator
3. UV and light Intensity sensor
4. Wind vane
5. Wind cups
6. Antenna
7. Solar panel
8. Radiation shield, temperature and humidity sensor, barometric pressure sensor
9. Drain holes
10. Built–in battery box
11. Red LED indicator
12. Config button
13. Mounting clamp
14. Adjustable hinge of solar panel
15. Tipping bucket

Installation Steps







Specifications

Air Temperature	
Range	–40.0 ~ 80.0 ℃
Accuracy	±0.5℃ (0~80℃); ±0.6℃ (–40~0℃)
Resolution	0.1℃
Air Humidity	
Range	1~99 %RH
Accuracy	±3% (1~90%RH); ±4% (90~99%RH)
Resolution	1%RH
Barometric Pressure	
Range	540 ~ 1100hPa
Accuracy	±5hPa(700~1100hPa); ±8hPa (540 ~ 699hPa)
Resolution	1hPa
Wind Speed	
Range	0~50.0m/s
Accuracy	±0.5m/s(<5m/s); ±10% (> 5m/s)
Resolution	0.1 m/s
Wind Direction	
Range	0~360°
Accuracy	± 8°
Resolution	1°
Light Intensity	
Range	0 ~ 200000 lux
Accuracy	± 5%
Resolution	1lux
UV Index	
Range	0 ~ 16.0
Accuracy	±10%
Resolution	0.1
Rain	
Range	0 ~ 99999.9mm
Accuracy	± 7%
Resolution	0.1mm
General Parameters	
Product Model	S2120
Microcontroller	WM–LR1110

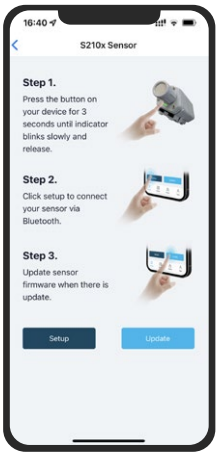
Support Protocol	LoRaWAN v1.0.3 Class A
Built–in Bluetooth	App Tool to change parameters
LoRaWAN Channel Plan	IN865/EU868/US915/AU915/ AS923/KR920/RU864*
GPS	Need to customize
LoRaWAN Max Transmitted Power	21dBm
LoRa Sensitivity	–141dBm@SF12 BW=125KHz
Communication Distance	2 to 10 km (depending on gateway antenna and environments)
Protection grade	Suitable for outdoor scenes
Operating Temperature	–20 to +60 ˚C (Alkaline battery) –40 to +60 ˚C (Lithium battery)
Operating Humidity	0~99%RH
Device Weight	1.5kg
Certification	CE / FCC / RoHS
Power Supply	
Solar Panel	0.5W (When there is sunlight, solar panels will be used first, otherwise batteries will be used)
Battery Type**	AA size, 1.5V batteries (alkaline or non–rechargeable Lithium battery)
Number of Battery	Option1, built–in battery box: 3 * AA battery ; Option2, external battery box: 6 * AA battery
Battery Life	2 years (Solar Panel + 6*AA Battery, 1h/uplink)
External Battery Box	Support 6 * AA 1.5V batteries Cable: 2m IP Rating: IPX6

* A device supports different frequencies and can be configured via the Bluetooth App.

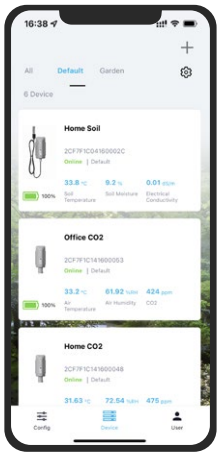
** The battery life varies from data upload interval and distance between gateway.

SenseCAP Mate App

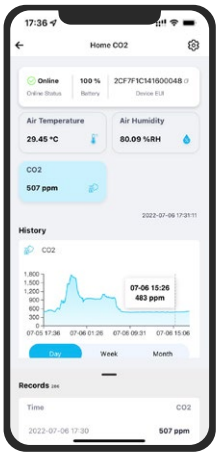
SenseCAP Mate is a standalone Bluetooth configuration tool, which can modify sensor parameters like EUI, key, frequency plan, etc.



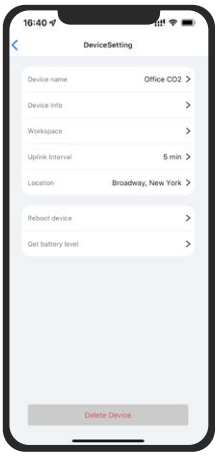
Configure sensor and do OTA



Dashboard for various scene



Real-time data monitoring D/W/M history data review



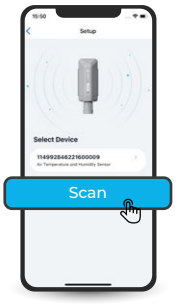
Manage devices remotely

How to Use the Sensor

GET IT ON Google Play

Download on the App Store

1 Download SenseCAP Mate App

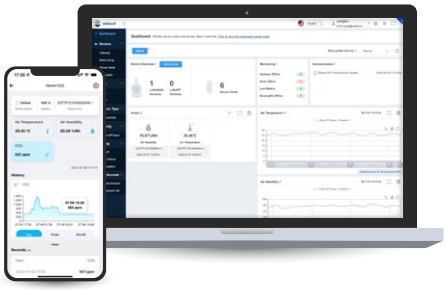


2 Connect App to Sensor via Bluetooth

Set parameters

- Platform and frequency plan
- Uplink interval
- EUI and key

3 Join LoRaWAN network



4 Get the data on LoRaWAN console

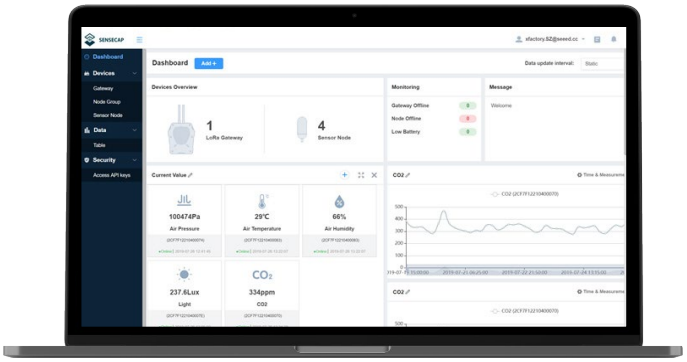
SenseCAP Portal

SenseCAP Portal is a web-based platform which enables

- Device management
- Data management
- API Access Key management

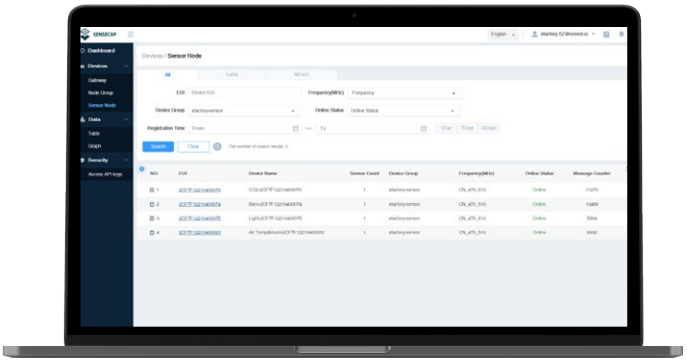
Visit SenseCAP Portal:
https://sensecap.seeed.cc

For more info, please visit:
https://solution.seeedstudio.com



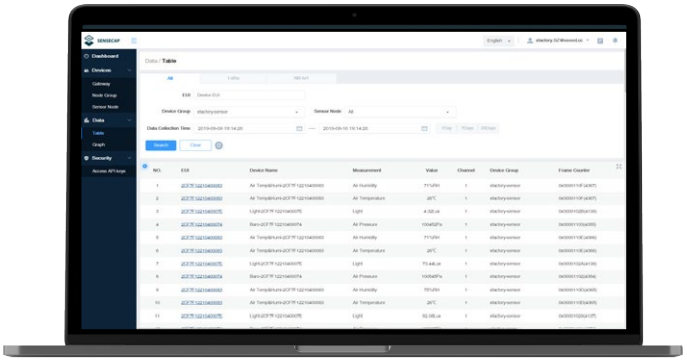
Dashboard

Including Device Overview, Data Upload Interval, Announcement, Scene Data, and Data Chart, etc.



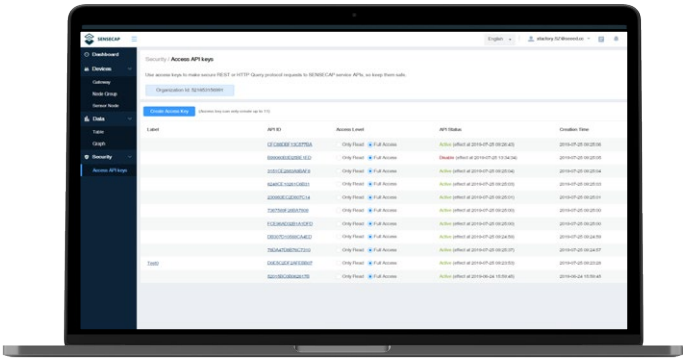
Device Management

Manage SenseCAP devices



Data Management

Manage data, including Data Table and Graph section, providing methods to search for data.



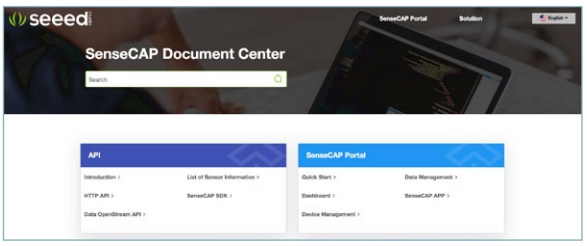
Access Key Management

Manage Access Key (to access API service), including: Key Create, Key Update, and Key Check.

Application Programming Interface (API)

SenseCAP also provides API to support further development.

Please visit this link for more info:
https://sensecap-docs.seeed.cc



SENSECAP

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