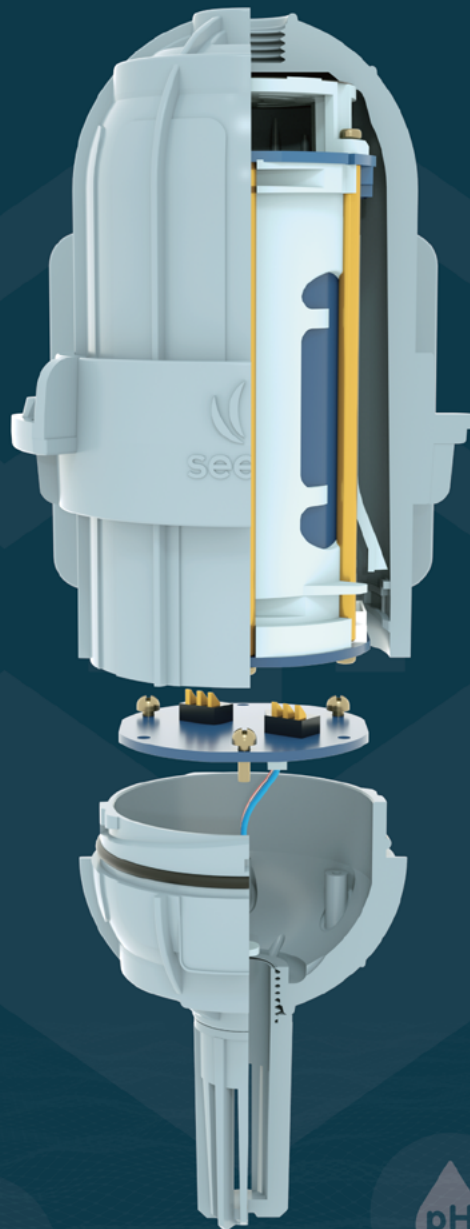




SENSECAP

# LoRaWAN Gateway and Wireless Sensor Catalog

Version: V1.4

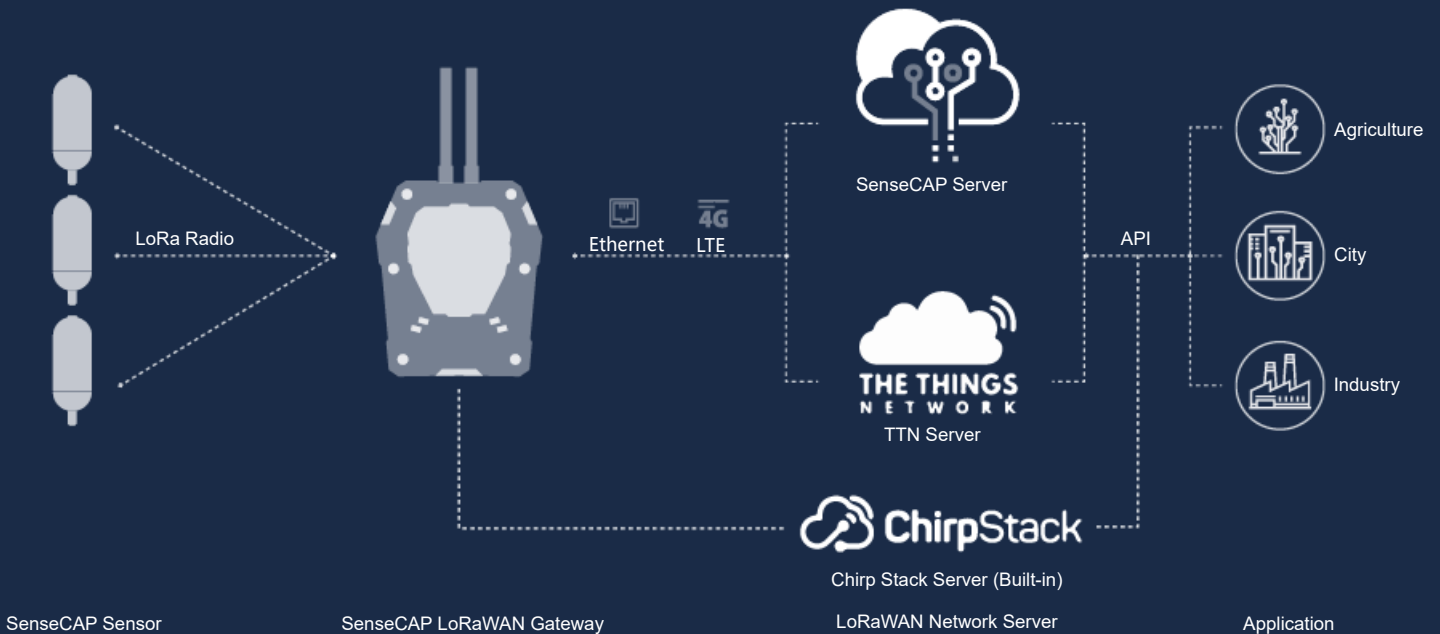


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## System Architecture

### SenseCAP Architecture



### SenseCAP Sensor + Other LoRaWAN Gateway Architecture



# About SenseCAP

SenseCAP is an industrial wireless sensor network that integrates easy-to-deploy hardware and data API services, enabling low-power, long-distance environmental data collection. SenseCAP includes several versions, such as LoRaWAN, SensorHub-2G, etc.

SenseCAP LoRaWAN version products include LoRaWAN Gateways and Sensor Nodes. Based on LoRaWAN protocol, it can realize one-to-many, long-distance networking, and bilateral communication. The LoRaWAN gateway supports Ethernet and 4G. The sensor node is powered by a high-capacity battery that lasts up to 3 years (uploading data once per hour). It also supports hot-swap, making it easy for maintenance and upgrading.

SenseCAP provides an easy-to-use portal. Users can scan the QR code with the App to bind the device with its respective account, manage the devices, and check sensor data on the portal. SenseCAP Portal provides API for users to develop based on the data on the portal further.

## Features of SenseCAP LoRaWAN Gateway

- Support LoRaWAN protocol Class A
- Cortex A8 processor, Linux system, stable and reliable
- Ultra-wide-distance transmission: 10km in line of sight scene, 2 km in the urban scene
- Support multiple ISM bands: CN470, EU868, US915
- Support remote modification of Node collection frequency
- 4G and Ethernet connectivity, suitable for multiple scenes.
- Provides a variety of cloud services and data API interfaces
- Industrial grade protection: IP66 enclosure, suitable for outdoor applications
- Operating temperature -40°C to +70°C



## Features of SenseCAP LoRaWAN Sensors

- Support LoRaWAN protocol Class A
- High reliability and stability
- Ultra-wide-distance transmission: 10km in line of sight scene, 2 km in the urban scene
- Battery life  $\geq 3$  years
- Support remote modification of Node collection frequency
- Support the local modification of EUI, AppKey, AppEui
- Rapid installation and deployment
- IP66 enclosure, suitable for outdoor applications



## Application

- Smart Agriculture
- Smart Cities
- Smart Buildings
- Smart Industry
- Environmental Monitoring
- Other Wireless Sensing Applications



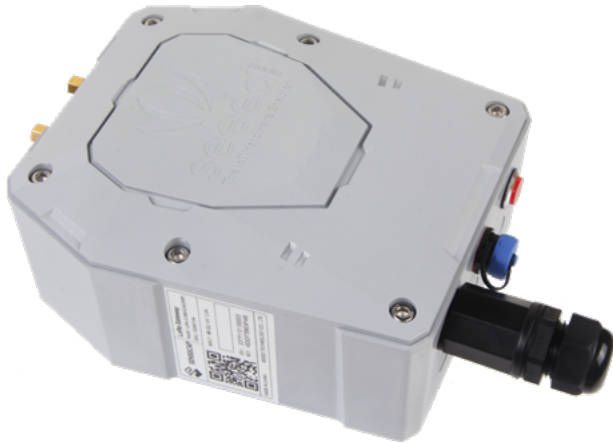
SenseCAP LoRaWAN Gateway can access SenseCAP Server, The Thing Network Server and The ChirpStack open-source LoRaWAN Network Server. However, it can only be used with SenseCAP Sensor.

SenseCAP Sensor can be used not only with the SenseCAP LoRaWAN Gateway but also with other standard LoRaWAN gateways. The Sensor is designed with a fixed LoRa channel, which can not be modified by users. The supported channels are as follows. Please refer to the user manual for how to connect this device with a LoRaWAN gateway.

|          |  |
|----------|--|
| CN470    |  |
| Uplink   | Channels:[80,81,82,83,84,85,86,87]<br>Frequency(MHz): 486.3, 486.5, 486.7, 486.9, 487.1, 487.3, 487.5, 487.7 (SF7BW125 to SF12BW125)   |
| Downlink | Frequency(MHz): 506.7, 506.9, 507.1, 507.3, 507.5, 507.7, 507.9, 508.1 (SF7BW125 to SF12BW125)<br>505.3 -SF12BW125 (RX2 downlink only) |
| EU868    |  |
| Uplink   | Channels: [0,1,2,3,4,5,6,7]<br>Frequency(MHz): 868.1, 868.3, 868.5, 867.1, 867.3, 867.5, 867.7, 867.9 (SF7BW125 to SF12BW125)          |
| Downlink | Multiplexing the frequency points of the 8 uplink channels.<br>869.525MHz -SF9BW125 (RX2 downlink only)                                |
| US915    |  |
| Uplink   | Channels:[8,9,10,11,12,13,14,15]<br>Frequency(MHz): 903.9, 904.1, 904.3, 904.5, 904.7, 904.9, 905.1, 905.3 (SF7BW125 to SF10BW125)     |
| Downlink | Frequency(MHz): 923.3, 923.9, 924.5, 925.1, 925.7, 926.3, 926.9, 927.5 (SF7BW500 to SF12BW500)   |



### SenseCAP Gateway - LoRaWAN



### Specifications

| Product Model      |  |                        |                        |
|--------------------|--|------------------------|------------------------|
| Model              | Region   |                        |                        |
| LoRa-G-470-E/4G    | Asia (China)   |                        |                        |
| LoRa-G-868-E/4G    | European, Africa, Asia (India etc.)  |                        |                        |
| LoRa-G-915-E/4G    | North America, South America, Oceania, Asia (Japan, Korea, Thailand, etc.)   |                        |                        |
| LoRa Parameters    |  |                        |                        |
| Protocol           | Based on LoRaWAN v1.0.2 protocol   |                        |                        |
| Channel Plan       | 470~510MHz   | 863~870MHz             | 902~928MHz             |
| Power Output       | 24dBm  | 25dBm                  | 25dBm                  |
| Sensitivity        | -140dBm<br>(SF12BW125)   | -139dBm<br>(SF12BW125) | -139dBm<br>(SF12BW125) |
| General Parameters |  |                        |                        |
| CPU                | TI AM3358 Cortex-A8 1GHz   |                        |                        |
| System             | Linux Debian   |                        |                        |
| RAM                | DDR3 512MB   |                        |                        |
| Memory             | 8GB eMMC   |                        |                        |
| Ethernet           | 100Mbps FE (RJ-45)   |                        |                        |
| 4G Band            | LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28<br>LTE-TDD: B38/B39/B40/B41<br>WCDMA: B1/B2/B4/B5/B6/B8/B19<br>GSM: 850/900/1800/1900MHz |                        |                        |
| 4G Features        | Support non-CA Cat 4 FDD and TDD<br>LTE-FDD:<br>Max 150Mbps (DL), Max 50Mbps (UL)<br>LTE-TDD:<br>Max 130Mbps (DL), Max 30Mbps (UL)                     |                        |                        |

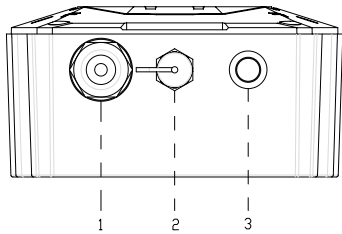
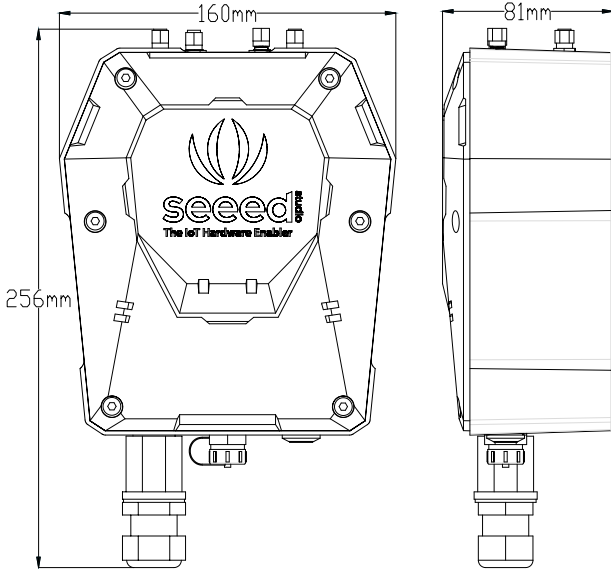
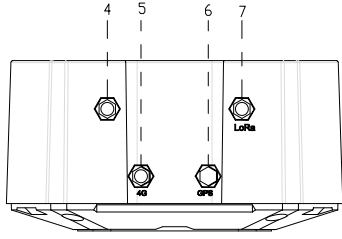
### Introduction

SenseCAP LoRaWAN Gateway(\*) is based on LoRaWAN®(\*\*) protocol, applicable for low-power, long-distance environmental data collection and monitoring in scenarios such as smart agriculture and smart city, etc. As the central device of the LoRa network, the gateway is used for collecting data from different Sensor Nodes and transmit the data to the SenseCAP Portal via 4G or Ethernet cable. Equipped with a high-performance processor and telecom-operator-level LoRa chip, this gateway ensures stable and high performance in a large-scale network. The gateway is designed with an IP66-protection-level enclosure, making it suitable for industrial applications in severe outdoor environments.

| General Parameters    |   |
|-----------------------|---|
| UMTS Features         | Support 3GPP R8 DC-HSDPA, HSPA+, HSDPA, HSUPA and WCDMA<br>DC-HSDPA: Max 42Mbps (DL) HSUPA: Max 5.76Mbps (UL) WCDMA: Max 384Kbps (DL), Max 384Kbps (UL)   |
| LoRa Antenna          | CN470: 0.5dBi gain / Vertical polarization / Omni-directional / SMA-J connector<br>EU868: 2.5dBi gain / Vertical polarization / Omni-directional / SMA-J connector<br>US915: 2.5dBi gain / Vertical polarization / Omni-directional / SMA-J connector |
| 4G Antenna            | 0-4 dBi gain / Linear polarization / Omni-directional / SMA-J connector   |
| LED Indicator         | Indicating network condition (online/offline)   |
| Grounding             | Reserved 1 screw hole for GND   |
| Power Consumption     | 3.6W  |
| Power Supply          | DC 12V/2A   |
| IP Rating             | IP66  |
| UV Resistance         | anti-aging (from rain/sun exposure): UL746C F1  |
| Enclosure Material    | PC  |
| Operating Temperature | -40 °C to +70 °C  |
| Operating Humidity    | 0 to 100 %RH (non-condensing)   |
| Installation Method   | Wall or pole mounting   |
| Device Weight         | 777g  |

## Device Dimensions

## Certification



- 1. Ethernet Port
- 2. Power Connector
- 3. LED
- 4. Reserved
- 5. 4G Antenna Connector
- 6. Reserved
- 7. LoRa Antenna Connector

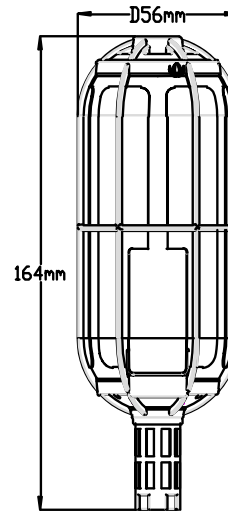
\*\* The LoRaWAN® name and the associated logo are licensed by the LoRa Alliance.

\* SenseCAP LoRaWAN Gateway can access SenseCAP Server, The Thing Network Server and The ChirpStack open-source LoRaWAN Network Server. However, it can only be used with SenseCAP Sensor.





### SenseCAP Wireless Air Temperature and Humidity Sensor - LoRaWAN

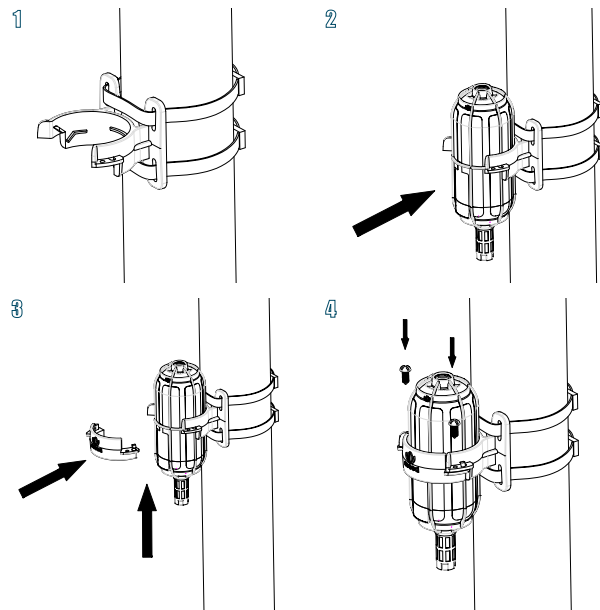


#### Specifications

| Air Temperature        |   |
|------------------------|---|
| Range                  | -40 °C to +85 °C  |
| Accuracy               | ±0.2 °C   |
| Resolution             | 0.1 °C  |
| Drift                  | < 0.03 °C /year   |
| Air Humidity           |   |
| Range                  | 0 to 100 %RH (non-condensing)   |
| Accuracy               | ±1.5 %RH  |
| Resolution             | 1 %RH   |
| Drift                  | < 0.25 %RH/year   |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-TH-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 µA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66 (Sensor Node)<br>IP65 (Sensor Probe)   |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | -40 °C to +85 °C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 236g  |

#### Installation

Please refer to the user manual for more details.

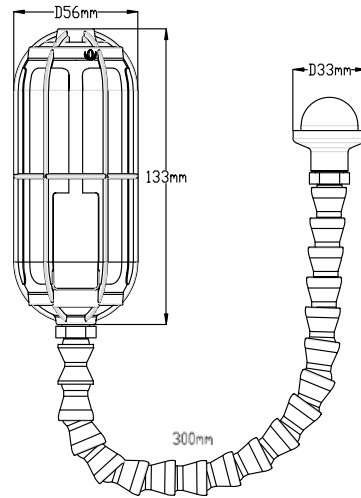


#### Certification





### SenseCAP Wireless Light Intensity Sensor - LoRaWAN

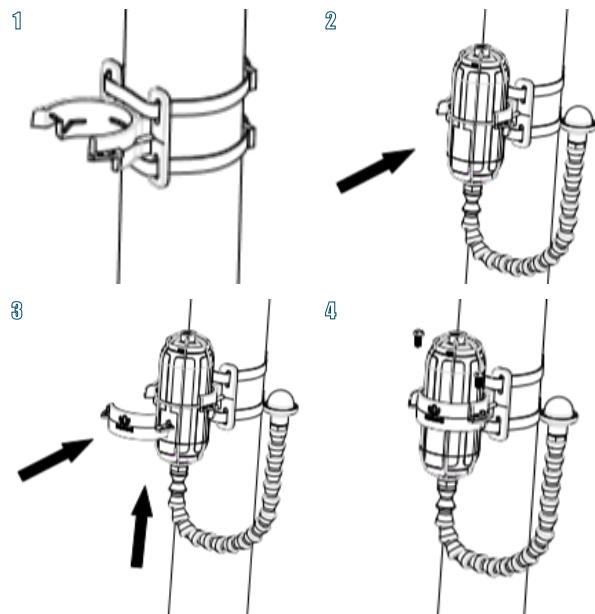


#### Specifications

| Light Intensity        |   |
|------------------------|---|
| Range                  | 0 to 188000 Lux   |
| Sensitivity            | 0.045 Lux/LSB   |
| Resolution             | 0.045 Lux   |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-Light Intensity-01   |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 $\mu$ A (sleep mode)<br>120 mA max(active mode)   |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | $\geq$ 3 year (upload data once per hour)   |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66  |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | -40 $^{\circ}$ C to +85 $^{\circ}$ C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 288g  |

#### Installation

Please refer to the user manual for more details.

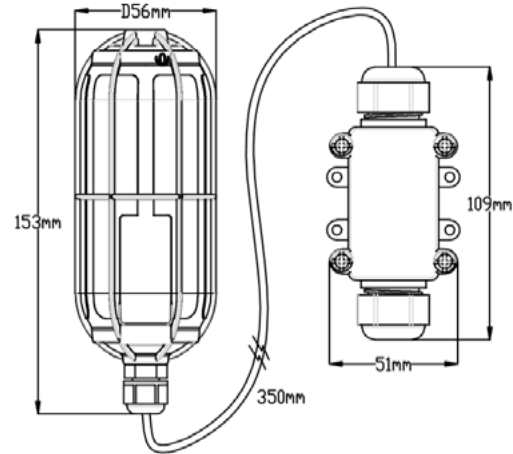


#### Certification





### SenseCAP Wireless CO2 Sensor - LoRaWAN

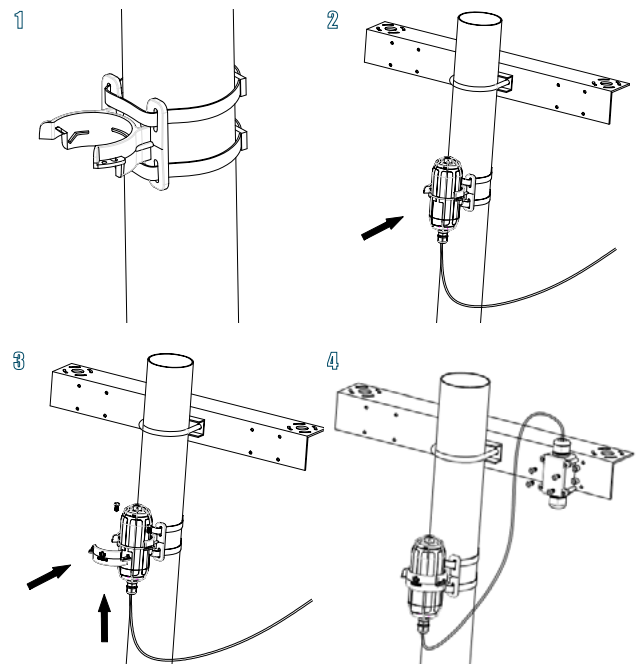


### Specifications

| CO2                    |   |                   |
|------------------------|---|-------------------|
| Parameters             | Condition   | Value             |
| Range                  | -   | 0 to 40000 ppm    |
| Accuracy               | 400 to 10000ppm   | ±(30 ppm + 3 %MV) |
| Resolution             | -   | 1 ppm             |
| Temperature Stability  | T = 0 to 50 °C<br>400 to 10000 ppm                            | ±2.5 ppm / °C     |
| General Parameters     |   |                   |
| Product Model          | LoRa-S-470/868/915-CO2-01                                     |                   |
| Microcontroller        | Ultra-low-power MCU   |                   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol                              |                   |
| LoRa Channel Plan      | CN470 / EU868 / US915   |                   |
| LoRa Power Output      | 16 dBm (EIRP)   |                   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)                               |                   |
|                        | 868MHz: -137.5dBm(SF12, BW125KHz)                             |                   |
|                        | 915MHz: -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) |                   |
| Battery Life           | ≥ 3 year (upload data once per hour)                          |                   |
| Battery Voltage        | 3.6V  |                   |
| Battery Capacity       | 19Ah (Non-rechargeable)                                       |                   |
| IP Rating              | IP66 (Sensor Node)  |                   |
|                        | Indoor (Sensor Probe) *                                       |                   |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1             |                   |
| Enclosure Material     | PC  |                   |
| Operating Temperature  | 0 °C to +50 °C  |                   |
| Operating Humidity     | 0 to 95 %RH   |                   |
| Device Weight          | 319g  |                   |

### Installation

Please refer to the user manual for more details.



### Certification

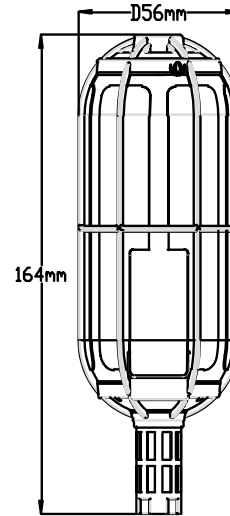


\* The Sensor Probe's membrane is not waterproof !





### SenseCAP Wireless Barometric Pressure Sensor - LoRaWAN

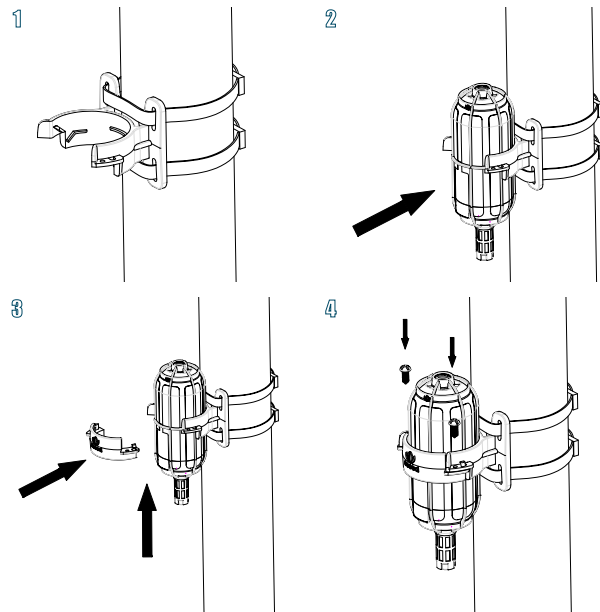


#### Specifications

| Barometric Pressure            |   |               |
|--------------------------------|---|---------------|
| Parameters                     | Condition   | Value         |
| Range                          | -   | 300~1100 hPa  |
| Resolution                     | -   | 1 Pa          |
| Relative Accuracy              | 700 to 900 hPa<br>25 to 40 °C   | ±0.12 hPa     |
| Absolute Accuracy              | 300 to 1100 hPa<br>-20 to 0 °C  | ±1.7 hPa      |
| Absolute Accuracy              | 300 to 1100 hPa<br>0 to 65 °C   | ±1.0 hPa      |
| Temperature Coefficient Offset | 900 hPa<br>25 to 40 °C  | 1.5 Pa/K      |
| Drift                          | -   | ±1.0 hPa/year |
| General Parameters             |   |               |
| Product Model                  | LoRa-S-470/868/915-Baro-01  |               |
| Microcontroller                | Ultra-low-power MCU   |               |
| Support Protocol               | Based on LoRaWAN v1.0.2 protocol  |               |
| LoRa Channel Plan              | CN470 / EU868 / US915   |               |
| LoRa Power Output              | 16 dBm (EIRP)   |               |
| Sensitivity                    | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |               |
| Current Consumption            | 5 μA (sleep mode)<br>120 mA max(active mode)  |               |
| Communication Distance         | 2 to 10 km (depending on different antennas and environments)   |               |
| Battery Life                   | ≥ 3 year (upload data once per hour)  |               |
| Battery Voltage                | 3.6V  |               |
| Battery Capacity               | 19Ah (Non-rechargeable)   |               |
| IP Rating                      | IP66 (Sensor Node)<br>IP65 (Sensor Probe)   |               |
| UV Resistance                  | anti-aging (from rain/sun exposure):<br>UL746C F1   |               |

#### Installation

Please refer to the user manual for more details.



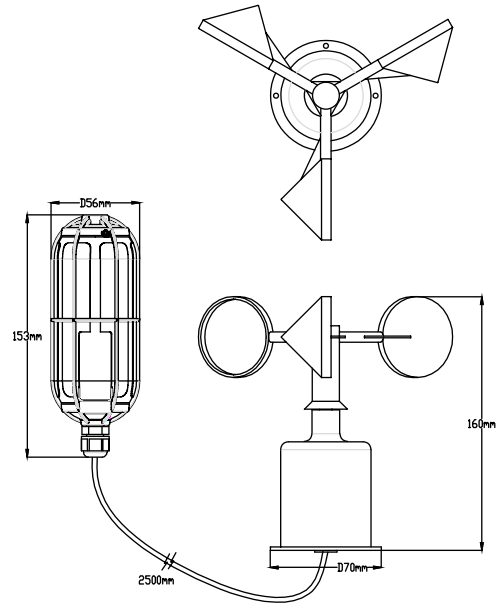
| General Parameters    |  |
|-----------------------|--|
| Enclosure Material    | PC                                       |
| Operating Temperature | -40 to +85 °C (full accuracy: 0 to 65°C) |
| Operating Humidity    | 0 to 100 %RH (non-condensing)            |
| Device Weight         | 237g                                     |

#### Certification





### SenseCAP Wireless Wind Speed Sensor - LoRaWAN

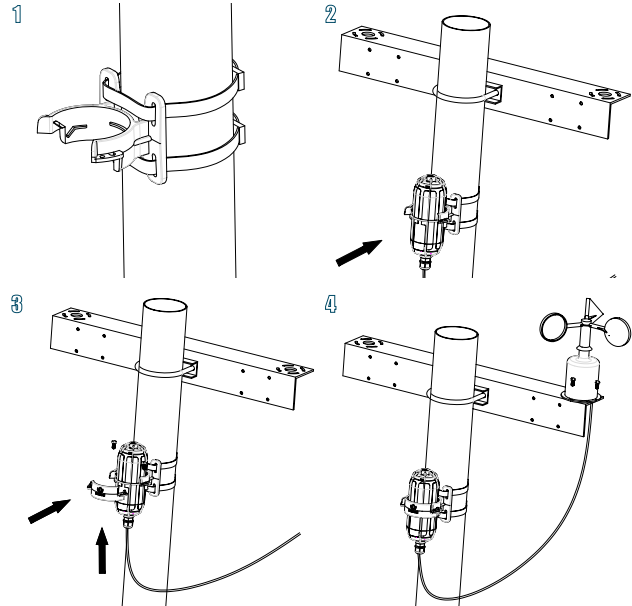


#### Specifications

| Wind Speed             |   |
|------------------------|---|
| Range                  | 0 to 60 m/s   |
| Accuracy               | ±0.3 m/s  |
| Resolution             | 0.1 m/s   |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-Wind Speed-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 µA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66 (Sensor Node)<br>IP45 (Sensor Probe)   |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | -40 °C to +50 °C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 490g  |

#### Installation

Please refer to the user manual for more details.

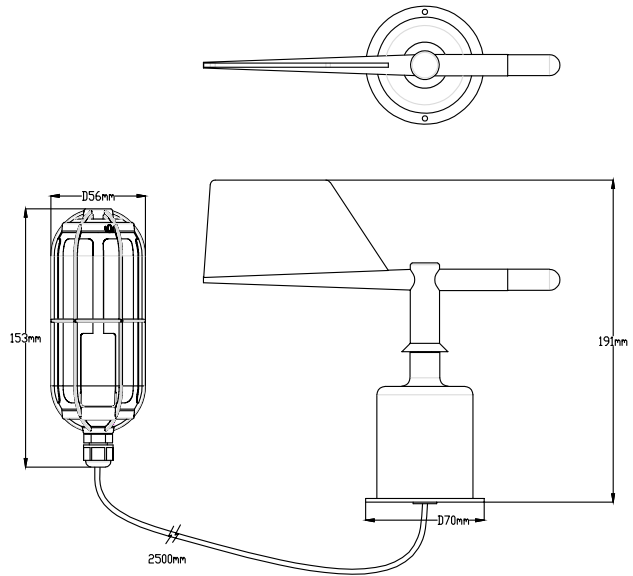


#### Certification





### SenseCAP Wireless Wind Direction Sensor - LoRaWAN

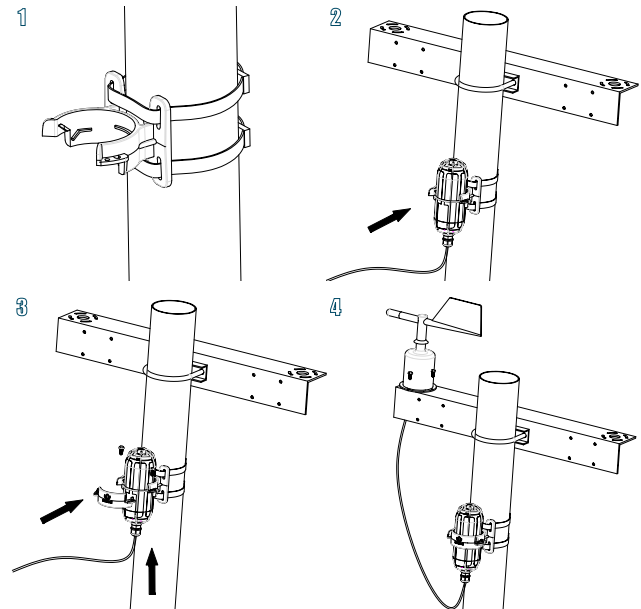


#### Specifications

| Wind Direction         |   |
|------------------------|---|
| Range                  | 0° to 360° (clockwise)  |
| Accuracy               | ±3°   |
| Resolution             | 1°  |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-Wind Direction-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 μA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66 (Sensor Node)<br>IP45 (Sensor Probe)   |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Installation           | Point the slot on the casing to the south   |
| Enclosure Material     | PC  |
| Operating Temperature  | -40 °C to +50 °C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 518g  |

#### Installation

Please refer to the user manual for more details.

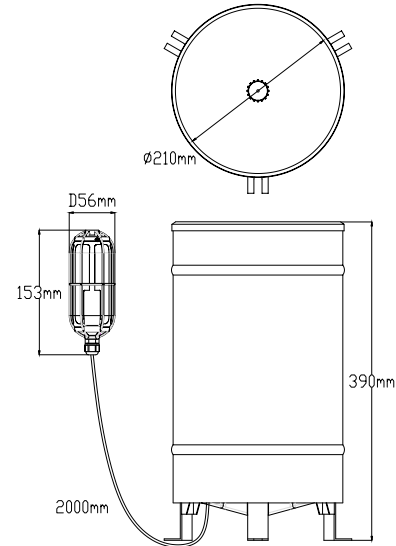


#### Certification





### SenseCAP Wireless Rain Gauge - LoRaWAN

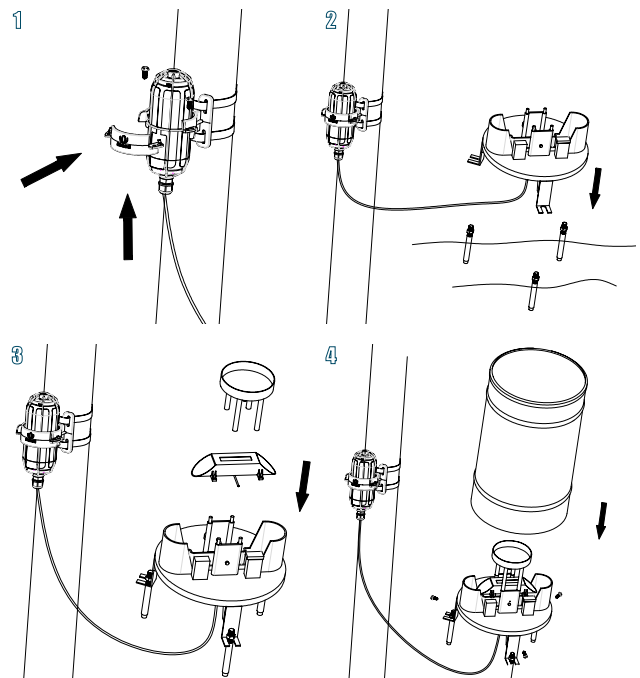


#### Specifications

| Rainfall Volume        |   |
|------------------------|---|
| Range                  | 0~240 mm/hour   |
| Accuracy               | ≤ ±2%   |
| Resolution             | 0.5 mm/hour   |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-Rain-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 μA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66  |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | 0 °C to +50 °C  |
| Operating Humidity     | 0 to 95 %RH   |
| Device Weight          | 2.3kg   |

#### Installation

Please refer to the user manual for more details.

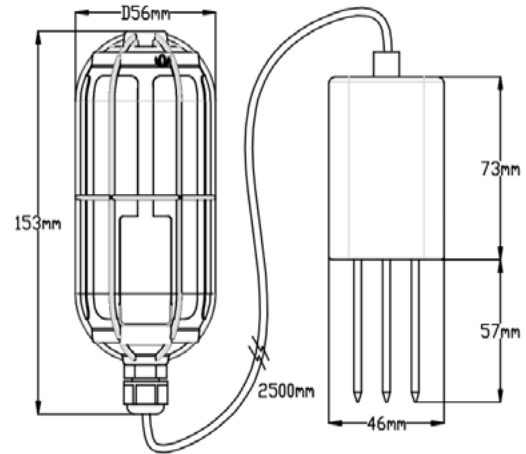


#### Certification





### SenseCAP Wireless Soil Moisture and Temperature Sensor - LoRaWAN



#### Specifications

##### Soil Temperature

|            |                  |
|------------|------------------|
| Range      | -30 °C to +70 °C |
| Accuracy   | ±0.2 °C          |
| Resolution | 0.01 °C          |

##### Soil Moisture

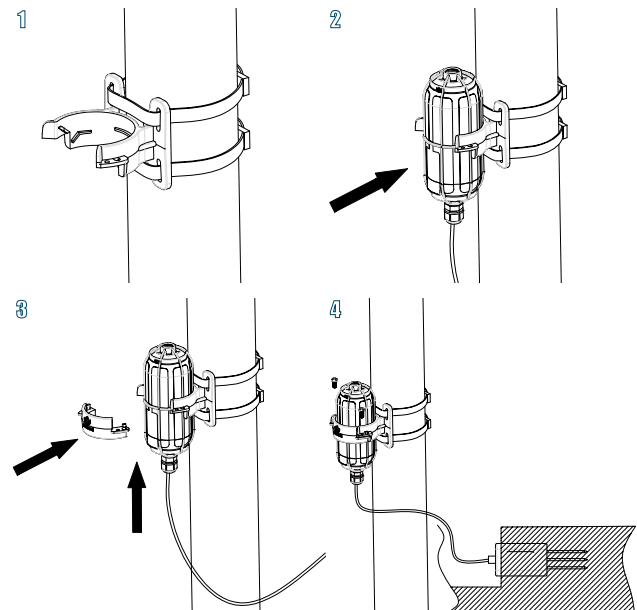
|            |  |
|------------|--|
| Range      | From completely dry to fully saturated (from 0% to 100% of saturation) |
| Accuracy   | ±2% ( 0 to 50 %(m <sup>3</sup> /m <sup>3</sup> ) )                     |
| Resolution | 0.01 %(m <sup>3</sup> /m <sup>3</sup> )                                |

##### General Parameters

|                        |   |
|------------------------|---|
| Product Model          | LoRa-S-470/868/915-Soil MT-01   |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 μA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Measuring Area         | A cylinder area (with the probe as the center, diameter: 7cm, height: 7cm)                                |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66  |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | -30 °C to +70 °C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 415g  |

#### Installation

Please refer to the user manual for more details.



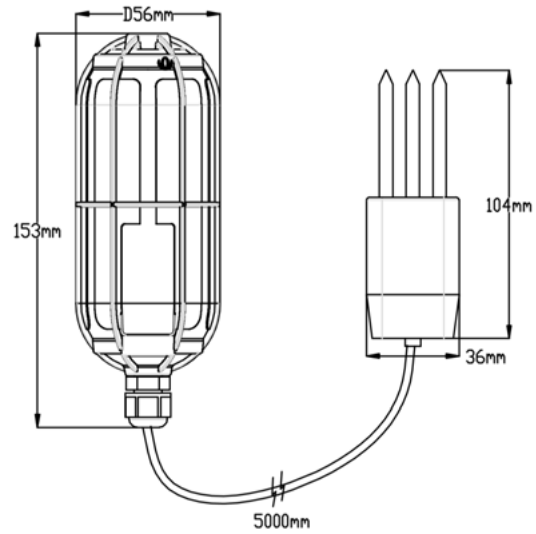
#### Certification







### SenseCAP Wireless Soil Temperature, VWC & EC Sensor - LoRaWAN



#### Specifications

##### Soil Temperature

|            |                  |
|------------|------------------|
| Range      | -40 °C to +60 °C |
| Accuracy   | ±1 °C            |
| Resolution | 0.1 °C           |

##### Soil Volumetric Water Content

|            |  |
|------------|--|
| Range      | From completely dry to fully saturated (from 0% to 100% of saturation) |
| Accuracy   | ±3 %(m³/m³) typical  |
| Resolution | 0.08 %(m³/m³)  |

##### Soil Electrical Conductivity

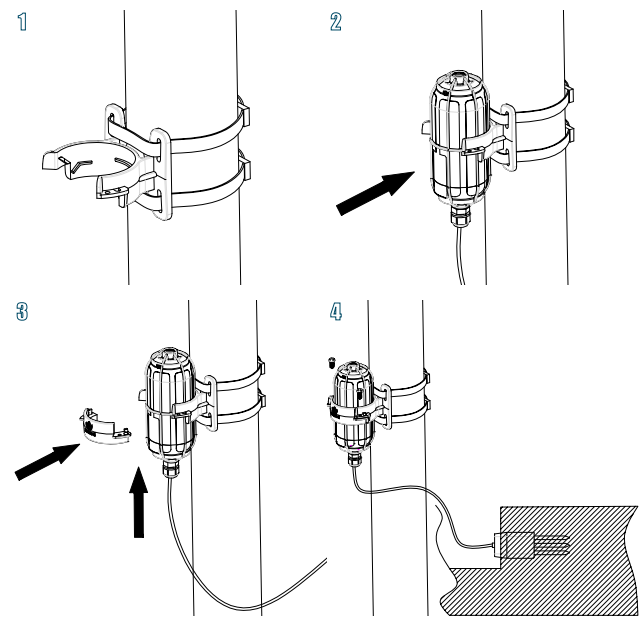
|            |  |
|------------|--|
| Range      | 0 to 23 dS/m (bulk)                                      |
| Accuracy   | ±10% (0~7dS/m), user calibration required from 7~23 dS/m |
| Resolution | 0.01 dS/m (0~7dS/m)<br>0.05 dS/m (7~23dS/m)              |

##### General Parameters

|                        |   |
|------------------------|---|
| Product Model          | LoRa-S-470/868/915-Soil Temp&VWC&EC-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 µA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66  |

#### Installation

Please refer to the user manual for more details.



##### General Parameters

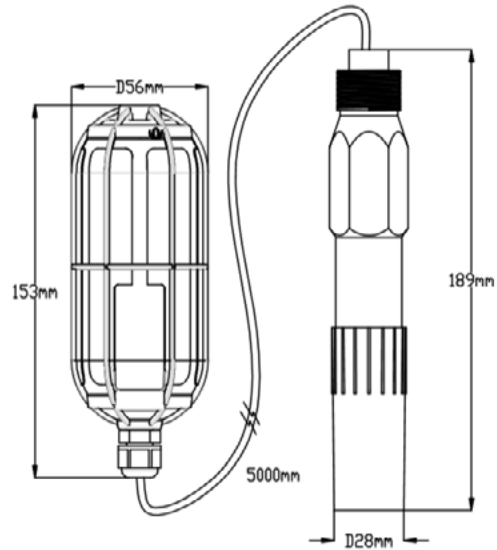
|                       |   |
|-----------------------|---|
| UV Resistance         | anti-aging (from rain/sun exposure):<br>UL746C F1 |
| Enclosure Material    | PC  |
| Operating Temperature | -40 °C to +60 °C                                  |
| Operating Humidity    | 0 to 100 %RH (non-condensing)                     |
| Device Weight         | 385g  |

#### Certification





### SenseCAP Wireless pH Sensor

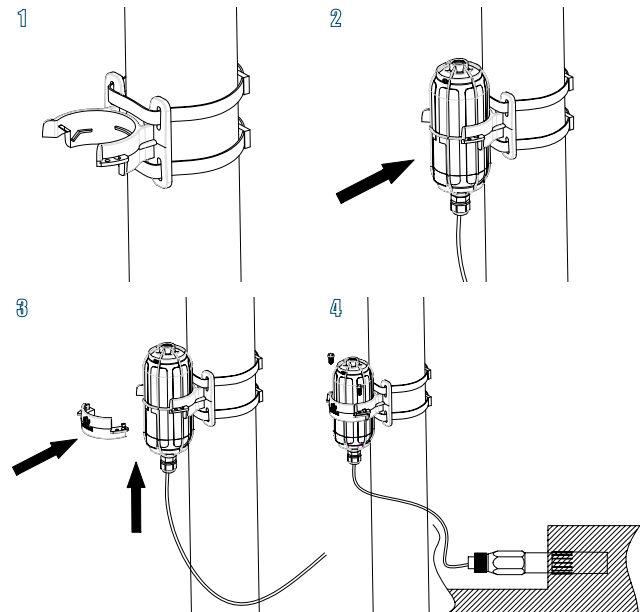


### Specifications

| pH                     |   |
|------------------------|---|
| Range                  | 0~14 pH   |
| Accuracy               | ±0.1 pH   |
| Resolution             | 0.1 pH  |
| General Parameters     |   |
| Product Model          | LoRa-S-470/868/915-pH-01  |
| Microcontroller        | Ultra-low-power MCU   |
| Support Protocol       | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan      | CN470 / EU868 / US915   |
| LoRa Power Output      | 16 dBm (EIRP)   |
| Sensitivity            | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption    | 5 μA (sleep mode)<br>120 mA max(active mode)  |
| Communication Distance | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life           | ≥ 3 year (upload data once per hour)  |
| Battery Voltage        | 3.6V  |
| Battery Capacity       | 19Ah (Non-rechargeable)   |
| IP Rating              | IP66  |
| UV Resistance          | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material     | PC  |
| Operating Temperature  | -20 °C to +50 °C  |
| Operating Humidity     | 0 to 100 %RH (non-condensing)   |
| Device Weight          | 594g  |

### Installation

Please refer to the user manual for more details.

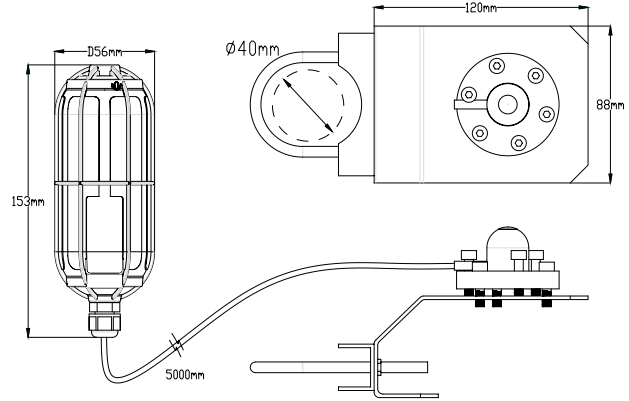


### Certification





### SenseCAP Wireless PAR Sensor - LoRaWAN

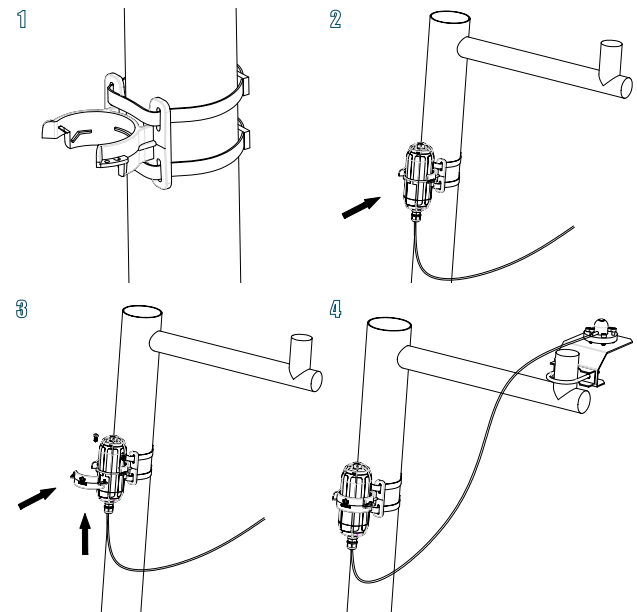


### Specifications

| Photosynthetically Active Radiation |   |
|-------------------------------------|---|
| Range                               | 0 to 2000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ (410 to 655 nm)  |
| Sensitivity                         | 0.2 mV/ $\mu\text{mol m}^{-2} \text{s}^{-1}$  |
| Resolution                          | 1 $\mu\text{mol m}^{-2} \text{s}^{-1}$  |
| Non-stability (Long-term Drift)     | < 2% / year   |
| Measurement Repeatability           | < 1 %   |
| Field of View                       | 180°  |
| General Parameters                  |   |
| Product Model                       | LoRa-S-470/868/915-PAR-01   |
| Microcontroller                     | Ultra-low-power MCU   |
| Support Protocol                    | Based on LoRaWAN v1.0.2 protocol  |
| LoRa Channel Plan                   | CN470 / EU868 / US915   |
| LoRa Power Output                   | 16 dBm (EIRP)   |
| Sensitivity                         | 470MHz: -140dBm(SF12, BW125KHz)<br>868MHz: -137.5dBm(SF12, BW125KHz)<br>915MHz: -136.5dBm(SF12, BW125KHz) |
| Current Consumption                 | 5 $\mu\text{A}$ (sleep mode)<br>120 mA max(active mode)   |
| Communication Distance              | 2 to 10 km (depending on different antennas and environments)   |
| Battery Life                        | $\geq 3$ year (upload data once per hour)   |
| Battery Voltage                     | 3.6V  |
| Battery Capacity                    | 19Ah (Non-rechargeable)   |
| IP Rating                           | IP66  |
| UV Resistance                       | anti-aging (from rain/sun exposure):<br>UL746C F1   |
| Enclosure Material                  | PC  |
| Operating Temperature               | -40 °C to +70 °C  |
| Operating Humidity                  | 0 to 100 %RH (non-condensing)   |
| Device Weight                       | 326g  |

### Installation

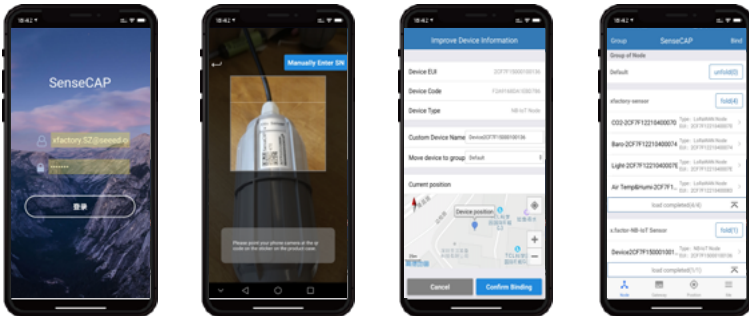
Please refer to the user manual for more details.



### Certification



# SenseCAP Application



SenseCAP App is used to bind devices to your account and check device information.

Download Application:  
For iOS, please search for "SenseCAP" in the App Store and download.

For Android, please download SenseCAP Application from:  
<http://sensecap-app-download.seeed.cn>



iOS



Android

# SenseCAP Portal

SenseCAP Portal is a web-based platform which enables

- Device management
- Data management
- API Access Key management

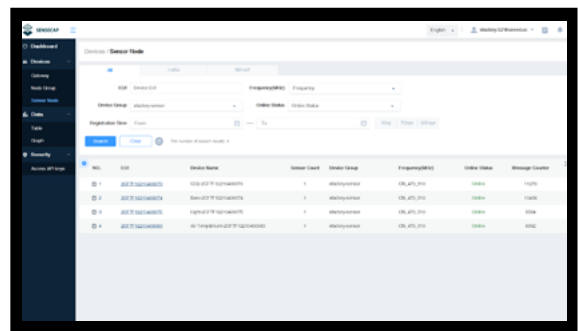
Visit SenseCAP Portal: <https://sensecap.seeed.cc>

For more info, please visit: <https://solution.seeedstudio.com/product/sensecap>



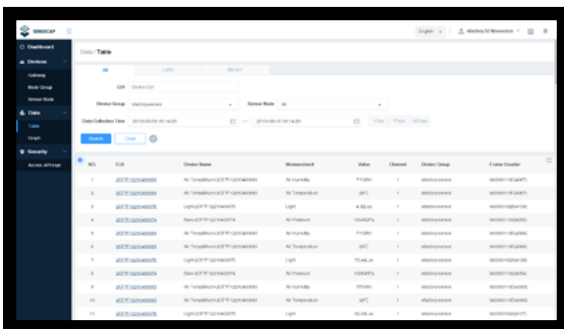
Dashboard

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



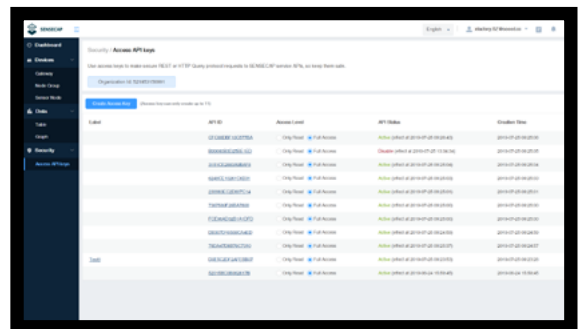
Device Management

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) Instructions

SenseCAP also provides API to support further development.  
Please visit this link for more info: <https://sensecap-docs.seeed.cc>

SenseCAP API Introduction

SenseCAP API is the interface to manage devices and data besides the SenseCAP Web Portal. SenseCAP API consists of HTTP API and Data OpenStream API.

With SenseCAP HTTP API, you can manage your LoRa and NB-IoT devices from your private cloud service, retrieve historical data in raw or segment format.

With Data OpenStream API, you can monitor the measurements from sensors in realtime.

Next - HTTP API  
HTTP API Quickstart

Last updated 11 months ago

WAS THIS PAGE HELPFUL?

# SenseCAP Tools

SenseCAP provides a config tool to modify Sensor parameters like Device EUI, AppKey, data upload interval etc. For more details, please visit <https://github.com/Seeed-Solution/SenseCAP-Node-Configuration-Tool/releases>

SenseCAP Node Configuration Tool

File Edit View Window

Serial Port: COM5 [DISCONNECT]

Device Type: LoRaWAN Device EUI: 2CF7F12010700054

App EUI: 8000000000000006

App Key: 00E1B64631F61009125EBDE00EF861C7

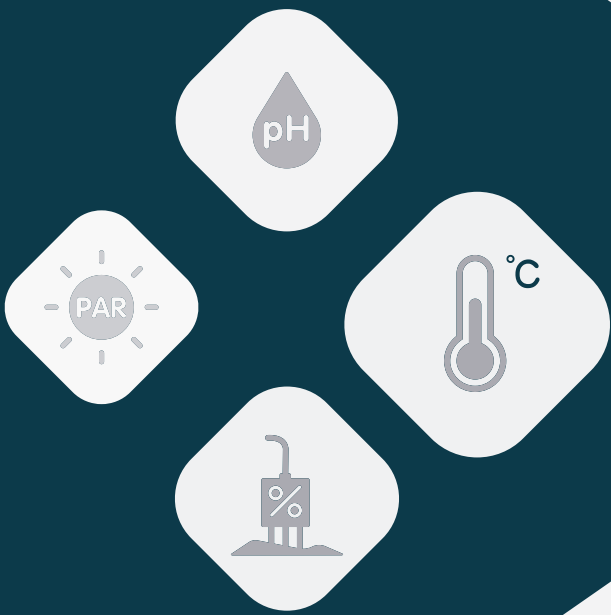
Data Interval: 10 minutes Battery: 100%

Hardware Version: v1.0 Software Version: v3.1

[READ] [WRITE] [UPDATE FW]

```
#-----  
#  
# SENSECAP  
#-----  
# Welcome to SenseCAP console command-line tool  
# You can change the device configuration by commands  
# Command description  
# [r] Read the current device configuration  
# [i] Set the data update interval in minutes  
# [d] Set the Device EUI  
# [a] Set the App EUI  
# [k] Set the App Key  
# [u] Upgrade the firmware  
# [h] Return to console center  
#-----  
# Device Type: LoRaWAN  
# Device EUI: 2CF7F12010700054  
# App EUI: 8000000000000006  
# App Key: 00E1B64631F61009125EBDE00EF861C7  
# Data interval: 10 minutes  
# Battery: 100%  
# Hardware version: v1.0  
# Software firmware: v3.1  
# Please Enter your command with Enter
```





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