



### Soil Temperature and Moisture Sensor



#### Features

- Support LoRaWAN<sup>TM</sup>(\*) protocol Class A
- High reliability and stability
- Ultra-wide-distance transmission: 10km in line of sight scene, 2 km in urban scene
- Battery life  $\geq 3$  years
- Rapid installation and deployment
- IP66 enclosure, suitable for outdoor applications

#### Applications

- Smart Agricultural
- Smart Building and Industrial Control
- Environmental Monitoring
- Other Wireless Sensing Applications

#### Introduction

With a built-in wireless LoRa module, this Soil Temperature and Humidity Sensor transmits the collected soil T&H data to the base station and then to the server. Built on the high-quality German chip, this sensor integrates soil temperature with humidity, featuring high precision, high sensitivity. The measurement results are consistent, hardly affected by soil properties, making it widely applicable in industrial scenarios such as water-saving irrigation, weather station and greenhouse etc. The built-in independent battery can last for 3 years in ultra-low-power-consumption working mode. With the probe made from high-quality German precision platinum resistor and the enclosure made from PC + PBT materials, the sensor features UV radiation proof and erosion-resistance.

#### Specifications

Soil Temperature	
Range	-30 °C to +70 °C
Accuracy	$\pm 0.2$ °C
Resolution	0.01 °C
Soil Moisture	
Range	From completely dry to fully saturated (from 0% to 100% of saturation)
Accuracy	$\pm 2\%$ ( 0 to 50 %(m <sup>3</sup> /m <sup>3</sup> ) )
Resolution	0.01 %(m <sup>3</sup> /m <sup>3</sup> )
Parameters	
Product Model	LoRa-S-470/868/915-Soil MT-01
Microcontroller	Ultra-low-power MCU
Support protocol	Based on LoRaWAN <sup>TM</sup> 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 $\mu$ A (sleep mode) 120 mA (active mode)
Communication Distance	2 to 10 km (depending on different antenna and environment)

Measuring Area	A cylinder area (with the probe as the center, diameter: 7cm, height: 7cm)
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): UL746C F1
Enclosure Material	PC+PBT
Operating Temperature	-30 °C to +70 °C
Operating Humidity	0 to 100 %RH
Device Weight	414g



The device is designed with a fixed LoRa channel, which can not be modified by users. The supported channels are as the follows. Please refer to the user manual for how to connect this device with a LoRaWAN<sup>TM</sup> gateway.

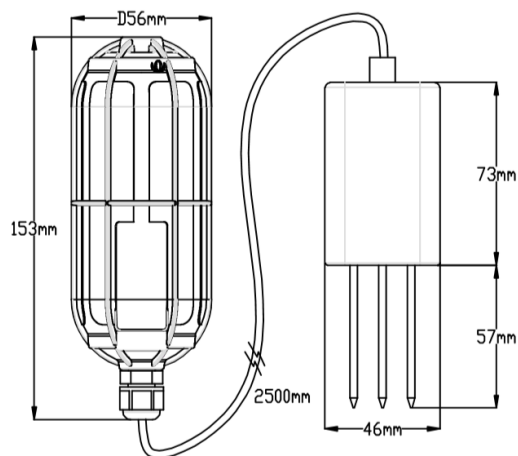
CN470	
Uplink	Channels:[80,81,82,83,84,85,86,87] Frequency(MHz): 486.3, 486.5, 486.7, 486.9, 487.1, 487.3, 487.5, 487.7 (SF7BW125 to SF12BW125)
Downlink	Frequency(MHz): 506.7, 506.9, 507.1, 507.3, 507.5, 507.7, 507.9, 508.1 (SF7BW125 to SF12BW125) 505.3 -SF12BW125 (RX2 downlink only)

# Soil Temperature and Humidity Sensor

EU868	
Uplink	Channels: [0,1,2,3,4,5,6,7] 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. 869.525MHz -SF9BW125 (RX2 downlink only)

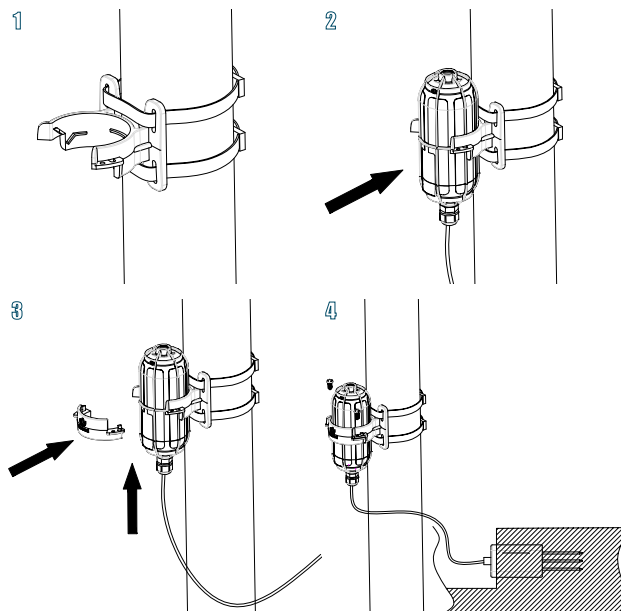
US915	
Uplink	Channels:[8,9,10,11,12,13,14,15] Frequency(MHz): 903.9, 904.1, 904.3, 904.5, 904.7, 904.9, 905.1, 905.3 (SF7BW125 to SF10BW125)
Downlink	Frequency(MHz): 923.3, 923.9, 924.5, 925.1, 925.7, 926.3, 926.9, 927.5 (SF7BW500 to SF12BW500)

## Device Dimensions



## Installation

Please refer to the user manual for more details.



## SenseCAP Series

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. Currently SenseCAP consists of two versions: LoRaWAN™ and NB-IoT. SenseCAP LoRaWAN™ version products include LoRaWAN™ Gateways and Sensor Nodes. NB-IoT version products include Sensor Nodes. They can collect various physical data:



If you'd like to purchase or get more info about SenseCAP, please visit website:

- Website: [solution.seeed.cc](http://solution.seeed.cc)
- Purchase: <https://solution.seeed.cc/product/sensecap>

You can also contact Seeed sales representatives in your local district. The following is the contact information:

- Sales: [iot@seeed.cc](mailto:iot@seeed.cc)
- Phone: +86 755 3653 4305
- Support: [sensecap@seeed.cc](mailto:sensecap@seeed.cc)
- Address: F9, Building G3, TCL International E City, Zhongshanyuan Road, Nanshan District, Shenzhen, China