SENSECAP

An Industrial Wireless Sensor Network Solution

LoRaWAN Soil Temperature & VWC & EC Sensor

Features

- Support LoRaWAN™(*) protocol Class A
- High reliability and stability
- Ultra-wide-distance transmission: 10km in line of sight scene, 2 km in urban scene
- Battery life ≥ 3 years
- Rapid installation and deployment
- IP66 enclosure, suitable for outdoor applications
- Robust epoxy encapsulation to resist corrosive environments

Applications

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

Introduction

This wireless sensor integrates three sensors (soil temperature, volumetric water content, and electrical conductivity) in one device. With a built-in wireless LoRa module, this sensor collects soil temperature, VWC, and EC data, sends to the base station and then to the server. The sensor adopts three different methods in measuring the data of soil temperature, VWC and EC respectively, ensuring high accuracy, making it perfect for industrial application scenarios such as greenhouse. The built-in independent battery can last for 3 years in ultra-low-power-consumption working mode. And the sensor probe is especially processed with PU coating, enabling a long service life.

Specifications

Soil Temperature	
Range	-40 ℃ to +60 ℃
Accuracy	±1 ℃
Resolution	0.1 ℃

Soil Volumetric Water Content	
Range	From completely dry to fully saturated (from 0% to 100% of saturation)
Accuracy	±3 %(m^3/m^3) typical
Resolution	0.08 %(m^3/m^3)

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) 0.05 dS/m (7~23dS/m)

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) 868MHz: -137.5dBm(SF12, BW125KHz) 915MHz: -136.5dBm(SF12, BW125KHz)
Current Consumption	5 μA (sleep mode) 120 mA (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): UL746C F1
Enclosure Material	PC+PBT
Operating Temperature	-40 ℃ to +60 ℃
Operating Humidity	0 to 100 %RH
Device Weight	385g

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™ gateway.

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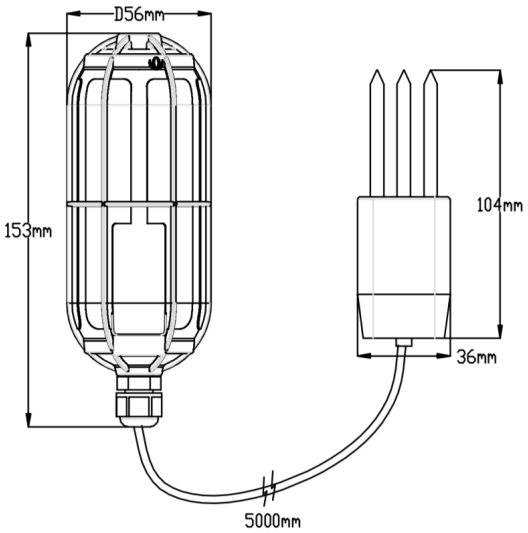
CN470	
Uplink	Channels:[80,81,82,83,84,85,86,87] Frequency(MHz): 486.3, 486.5, 486.7, 486.9, 487.1, 487.3, 487.5, 487.7 (SF7BW125 to SF12BW125)
Downlink	Frequency(MHz): 506.7, 506.9, 507.1, 507.3, 507.5, 507.7, 507.9, 508.1 (SF7BW125 to SF12BW125) 505.3 -SF12BW125 (RX2 downlink only)

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)

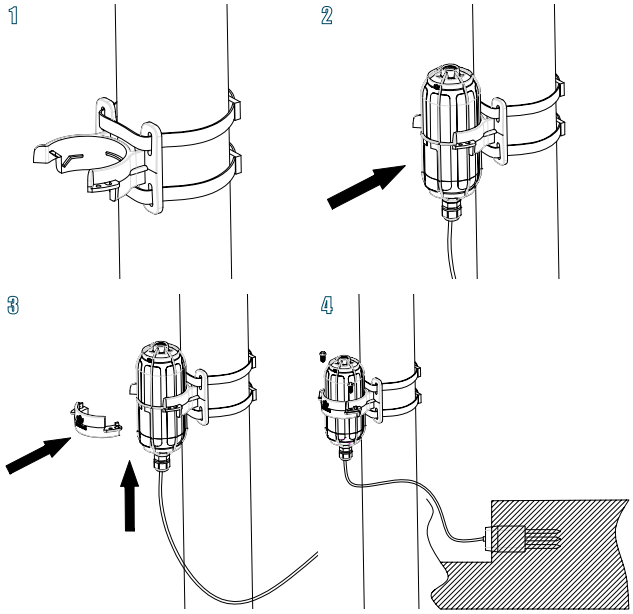
US915	
Uplink	Channels:[8,9,10,11,12,13,14,15] Frequency(MHz): 903.9, 904.1, 904.3, 904.5, 904.7, 904.9, 905.1, 905.3 (SF7BW125 to SF10BW125)
Downlink	Frequency(MHz): 923.3, 923.9, 924.5, 925.1, 925.7, 926.3, 926.9, 927.5 (SF7BW500 to SF12BW500)

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:

Light | Carbon dioxide | Barometric | Soil Moisture | Soil Temperature | Wind Speed | Wind Direction | Air Temperature | Air Humidity

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