AgroSense LoRaWAN® Sensor

Catalogue V1.0

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Contents

About AgroSense

The AgroSense series is a high-precision agricultural sensor product based on the LoRaWAN protocol.

It monitors key agricultural parameters such as soil moisture, air temperature and humidity, and GPS information etc... Designed to use in harsh environments: -40℃ ~ 85℃ operating temperature and IP68-rated enclosure, suitable for outdoor use, high UV exposure, heavy rain, dusty conditions, etc.AgroSense products achieve high reliability and long-distance data transmission , with ultra-low power design significantly lowers user maintenance costs.

By integrating these high-precision sensors, AgroSense provides comprehensive, real-time data support, helping farmers make informed decisions, improve yields and quality, and reduce resource waste.

I. Product Features

- Includes a high precision sensor;
- Can work normally under the temperature of -40℃ ~ 85℃, IP68 waterproof, suitable for outdoor use in harsh conditions, high UV, dusty, heavy rain and other bad weather;
- High stability and reliability, good stability in noisy environments, able to penetrate buildings and obstacles, so it can maintain good communication quality in urban and suburban environments;
- Receive sensitivity -137 dBm , transmit power up to 21dBm . External high-quality antenna, transmission of ultra-long distance, up to 2 kilometers in the city, up to 10 kilometers in the wilderness;
- Provide end-to-end secure communication, including device authentication and network data encryption, to ensure the security of data transmission and prevent data theft and malicious attacks;
- Ultra-low power consumption design, traditional AAA alkaline dry battery can be used for one year;
- Standard LoRaWAN protocol Connects gateways with various LoRaWAN protocols. Support EU868/US915 frequency band selection. 915M band channel Automatic Adaption design, efficient connection and transmission;
- Monitor data and upload real-time data regularly;
- Modify the product parameters through AT commands.

II. Use and Maintenance

- Simple to use, after adding new nodes to the original monitoring system, there is no need to redeploy the network, users only need to bind the product's triad in the server can be used；
- No complicated wiring and installation. Users through the product on both sides of the reserved fixing holes, can be fixed with screws or zip ties, can be used in different places；
- AAA type battery is convenient for users to replace.

Features - AgroSense Series

- **AgroSense__Soil Moisture Sensor**

AgroSense Soil Moisture Sensor measures the soil humility , widely applicable in agricultural environmental sensing scenarios, like fields, agricultural greenhouses, gardens,etc...

Specifications

Soil Moisture	
Range	12-bit ADC
Accuracy	1/4096
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Lead Length	1 .5 meter (custom length available)
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

AgroSense__Air Temperature and Humidity Sensor

Specifications

AgroSense Temperature & Humility Sensor measures temperature and humidity in the air, it widely applicable in agricultural environmental sensing scenarios such as fields, agricultural greenhouses, gardens, etc.

Temperature	
Range	-40°C ~85°C
Accuracy	±0.3°C
Resolution	0.01°C
Humility	
Range	0%-100% RH
Accuracy	±2%
Resolution	0.024% RH
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

AgroSense__Light Intensity Sensor

Specifications

AgroSense Light Intensity Sensor measures the light intensity, it widely applicable in agricultural environmental sensing scenarios such as fields, agricultural greenhouses, gardens, poultry factories, livestock factories, etc.

Light Intensity	
Range	1-65535 LX
Accuracy	1 LX
Resolution	±20%
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Lead Length	1 meter (custom length available)
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm(excluding waterproof connectors and sensor components)
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

AgroSense__RTD PT1000 Temperature Sensor

Specifications

AgroSense Industrial Temperature Sensor measures temperature in the industrial high temperature Environments, it widely applicable in industrial high temperature environments sensing scenarios such as poultry factories, livestock factories, stove, laboratories , etc.

Industrial Temperature	
Range	-60°C ~200°C
	Customizable within the range of -200°C to 800°C according to needs; Not waterproof if the collection range exceeds 300°C
Accuracy	±0.5°C
Resolution	0.1°C
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Lead Length	1 meter (custom length available)
Operating Temperature	-30°C ~70°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm(excluding waterproof connectors and sensor components)
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

- **AgroSense__Barometric Pressure Sensor**

Specifications

AgroSense Barometric Pressure Sensor measures the barometric pressure in the atmosphere, it widely applicable in agricultural environmental sensing scenarios such as fields, agricultural greenhouses, gardens, poultry factories, livestock factories, etc.

Barometric Pressure	
Range	300-1100hPa
Accuracy	1hPa
Resolution	0.01hPa
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

AgroSense__Carbon Dioxide（CO2） Sensor

Specifications

AgroSense Carbon Dioxide（CO2） Sensor measures the carbon dioxide levels in the atmosphere, it widely applicable in agricultural environmental sensing scenarios such as fields, agricultural greenhouses, gardens, poultry factories, livestock factories, etc.

Carbon Dioxide	
Range	400-60000ppm
Accuracy	±20%
Resolution	1ppm
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
Transmit Power	14dBm(868)/20dBm(915)
Receiver Sensitivity	-137dBm @300bps
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 2 years
Battery Type	1x18650 3.7V Li-ion cell battery

- **AgroSense__GPS Tracker PA1010D Sensor**

Specifications

AgroSense GPS Tracker PA1010D Sensor utilizes the small size, high accuracy PA1010D sensor from CD top Technology , makes it suitable for agricultural scenarios such as large ranches.

GNSS	
positioning system	GPS, GLONASS, GALILEO, QZSS, SBAS
positioning parameters	longitude: resolution of 0.0001
	latitude: resolution of 0.0001
	altitude: resolution of 1 meter
positioning accuracy	No assisted positioning:3.0 meters (50% CEP)
	Differential positioning (DGPS, SBAS): 2.5 meters (50% CEP)
	Velocity accuracy: 0.1M/S for no assisted positioning, 0.05M/S for differential positioning
	Time accuracy (1PPS output): ±20 nanoseconds RMS
Device attitude	
detection content	Normal / Tilt
detection logic	Normal: Deviation angle of all axes in XY is <20°
	Tilt: Deviation angle of any one axis in XY is ≥20°
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
MAX Transmit Power	21dBm
Receiver Sensitivity	-137dBm/125kHz SF=12
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 2 years
Battery Type	1x18650 3.7V Li-ion cell battery

- **AgroSense__GPS Tracker NEO_6M Sensor**

Specifications

AgroSense GPS Tracker NEO_6M Sensor utilizes the most commonly used high-performance NEO-6 sensor from **u-blox**.

GNSS	
positioning system	GPS，SBAS，PPP
positioning parameters	longitude：resolution of 0.0001
	latitude：resolution of 0.0001
	altitude：resolution of 4 meter
positioning accuracy	GPS: 2.5 meters
	SBAS: 2.0 meters
	2D horizontal position accuracy < 1 meter 3D horizontal position accuracy < 2 meters
Device attitude	
detection content	Normal / Tilt
detection logic	Normal: Deviation angle of all axes in XY is <20°
	Tilt: Deviation angle of any one axis in XY is ≥20°
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
MAX Transmit Power	21dBm
Receiver Sensitivity	-137dBm/125kHz SF=12
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 2 years
Battery Type	1x18650 3.7V Li-ion cell battery

AgroSense__Water Leak Sensor

Specifications

AgroSense Positioning Water Leak Sensor detects environmental water leaks.

Water leak detection	
Detection types	Various liquids such as water, oil, etc.
Detection modes	Fixed position detection
Lead length	1.0m/ Customizable length
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
MAX Transmit Power	21dBm
Receiver Sensitivity	-137dBm/125kHz SF=12
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

- **AgroSense__None-Position Rope Type Water Leak Sensor**

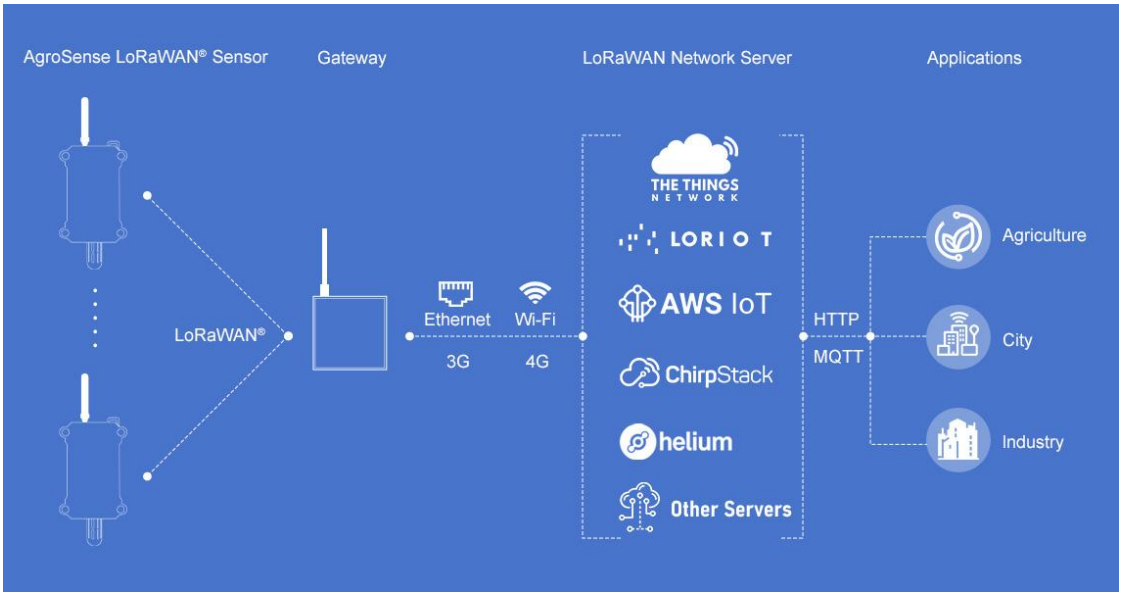
Specifications

AgroSense None-Position Rope Type Water Leak Sensor detects environmental water leaks, can detect the presence of water leaks in a wide range of environments/position.

Water leak detection	
Detection types	Various liquids such as water, oil, etc.
Detection modes	Range detection
Lead length	1.0m / Customizable length
General Parameters	
Communication Protocol	Standard LoRaWAN® protocol
Frequency Band	EU868/US915
MAX Transmit Power	21dBm
Receiver Sensitivity	-137dBm/125kHz SF=12
Network Access/Operating Mode	OTAA Class A
Operating Temperature	-40°C ~85°C
Protection Class	IP68
Dimensions	131 × 62.7 × 27.5 mm
Mounting	Wall Mounting
Battery	
Battery Life	Up to 1 years
Battery Type	2 x AAA 1.5V batteries

How to use:

AgroSense automatically uploads data to LoRaWAN Network Sever through the LoRaWAN gateway once an hour, then You can visualize the data by analyzing it with Applications.



Step1:Battery Installation

Step2：Ensure your gateway works fine，and connect AgroSense LoRaWAN® Sensor to the IoT Server. More detailed usage information can be found on our wiki page: *https://wiki.makerfabs.com/AgroSense_LoRaWAN%C2%AE_Sensor_Instruction_Manual.html*

Environment

A. Disposal of used products and batteries

This product is made of recyclable, high-performance materials and components;

This symbol on the product indicates that the product complies with the European Directive 2012/19/EU.

Please familiarize yourself with local collection mechanisms for electronic and electrical products and rechargeable batteries.

B. Compliance with EMF Standards

This product complies with all applicable standards and regulations regarding exposure to electromagnetic fields.

C. Environmental Information

All unnecessary packaging has been eliminated. Packaging can be easily categorized into three materials: cardboard (boxes), foam (cushioning).

D. Declaration of Conformity

This equipment complies with Part 15 of the Federal Communications Commission (FCC) Rules.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits for uncontrolled environments.

This equipment transmitter may not be co-located or operated with any other antenna or transmitter.

IC Radiation Exposure Statement:

This equipment complies with Canadian radiation exposure limits applicable to uncontrolled environments.

The transmitter of this equipment must not be placed or operated in conjunction with any other antenna or transmitter.

After-sales service

A. Warranty Provisions

1. The warranty period is 1 year from the date of purchase.

2. If the product malfunctions under normal use (in accordance with the instructions and precautions described in the instruction manual, the product body, or the labeling included with the product), it is eligible for free repair service.

3. In the event of a malfunction that requires repair during the warranty period, please go to the store where you purchased the product to have the repair performed with your purchase record.

4. Even within the warranty period, free repair service is not available if any of the following occurs:

1). The product is not under warranty;

2). Failure to present a valid purchase proof

3). Failure or damage caused by improper use of the product, repair or modification not authorized by the Company;

4). Defects and malfunctions caused by rough handling after purchase (including, but not limited to, defects and malfunctions caused by sharp objects, bending, crushing, liquid ingestion, or dropping, etc.

5). Failure or damage caused by fire, natural disasters and other irresistible factors;

6). Unauthorized abnormal maintenance;

B. About after-sale privileges:

When purchasing on the online platform, please submit a valid online purchase certificate.

C. For maintenance and other related information, please contact the seller or the following department.

Company: AgroSense

Reception time: 8: 30-18: 00

E-mail: sales@makerfabs.cc

Tips: Please choose AgroSense official authorized dealers to purchase to ensure product authenticity and after-sales rights!

AgroSense

Website: www.agrosense.cc

Sales: sales@makerfabs.cc

Support: support@makerfabs.com