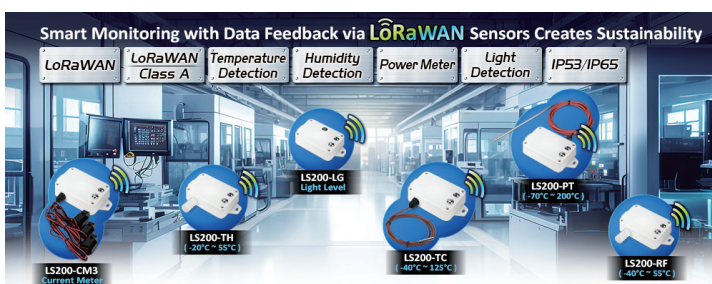# LoRaWAN Sensors

### Build a Smart IoT Environment with Fabulous LoRaWAN Sensors

PLANET LS100 and LS200 LoRaWAN sensor series can be installed in various settings for the comprehensive environmental monitoring and tracking of temperature, humidity, illumination, and ingress and egress, making them the best solutions for outdoor and industrial use. Battery-operated and wire-free, they are easy to install.

The LS200 series includes sensors ideal for cold chain logistics, industrial power monitoring, and maintaining product quality in agriculture and pharmaceuticals. The multi-functional sensor, which comes in one device, supports smart homes and long-term care, offering comprehensive monitoring of temperature, humidity, motion, light, tilt, vibration, door/window status, and glass breakage. The LS100 series offers versatile options for occupancy monitoring, leak detection, and smoke detection. These sensors ensure optimal indoor climates, energy efficiency, security, and maintenance efficiency, making them essential for modern smart environments.



LoRaWAN Sensor Does It All for Smart & Secure Lifestyle



Smart Monitoring with Data Feedback via LoRaWAN Sensors Creates Sustainability

## LS100-WL
- Water Leak Sensor
- IP65 rating
- LoRaWAN™ Class A compatible

## LS100-PIR
- Indoor Occupancy Sensor (Occupancy/Light/Temperature)
- IP30 rating
- LoRaWAN™ Class A compatible

## LS100-DW
- Door and Window Contact Sensor
- IP30 rating
- LoRaWAN™ Class A compatible

## LS200-TH
- Indoor Temperature and Humidity Sensor (-20~55 degrees C)
- IP65 rating
- LoRaWAN™ Class A compatible

## LS200-PT
- Product Temperature Sensor with PT1000 Needle Probe (-70~200 degrees C)
- IP65 rating
- LoRaWAN™ Class A compatible

## LS200-TC
- Machine Temperature Sensor with Thermocouple (-40~125 degrees C)
- IP65 rating
- LoRaWAN™ Class A compatible

## LS200-RF
- Refrigerator Temperature and Humidity Sensor (-40~55 degrees C)
- IP65 rating
- LoRaWAN™ Class A compatible

## LS200-LG
- Light Level Sensor
- IP65 rating
- LoRaWAN™ Class A compatible

## LS200-CM3
- 3-phase Current Meter with Clamp-On CT
- Measure 75A current maximum
- IP53 rating
- LoRaWAN™ Class A compatible

## LoRa and LoRaWAN Wireless Technology

LoRa is a low-power, wide area network (LPWAN) RF modulation technology. It standardizes LPWANs and enables extremely long-range data links. With a range of up to three miles (five kilometers) in urban areas and over 10 miles (15 kilometers) in rural areas (line of sight), LoRa is ideal for creating networks that require long-range or deep in-building communication. A key feature is its ultra-low power requirements, enabling the deployment of battery-operated devices that can last up to several years. Using the open LoRaWAN protocol in a star topology, it's suitable for applications with numerous low-power devices collecting small amounts of data. The LS series is ideal for LoRa-enabled devices in the IoT system.

## LoRaWAN-based Sensor

PLANET LoRaWAN LS100/LS200 series Sensor is fully compatible with standard LoRaWAN gateways like PLANET LCG-300 series, supporting the LoRaWAN class A. It is ideal for large-scale IoT applications, including building automation, smart metering, HVAC systems, agriculture, and more. The sensor facilitates the seamless integration of multiple sensors, making it a perfect choice for retrofitting legacy assets into IoT-enabled systems.

### LS100-SMK

- Smoke Detection
- High Temperature Alarm (>60°C)
- Alarming Bell
- LoRaWAN™ Class A compatible

### LS200-MF8

- Indoor Temperature and Humidity Sensor (-20~55 degrees C)
- PIR Sensor (3m to 5m)
- Light Sensor (1 Lux to 3000 Lux)
- Tilt Sensor (Conversion Angle: 45±5 degrees)
- Vibration Sensor
- Reed Switch Sensor
- Glass Break Sensor (Detection Mode: Piezoelectric buzzer)
- LoRaWAN™ Class A compatible

## Environmental Sensors:

Temperature and Humidity
- **LS200-TH**
  IP65 LoRaWAN Indoor Temperature and Humidity Sensor

Water Leakage
- **LS100-WL**
  IP65 LoRaWAN Water Leak Sensor

Light Detection
- **LS200-LG**
  IP65 LoRaWAN Light Level Sensor

Gas
- **LS200-VOC**
  IP65 LoRaWAN TVOC Sensor
- **LS200-PM25**
  IP30 LoRaWAN PM2.5 Sensor
- **LS100-CO**
  IP20 LoRaWAN CO Detector

Smoke
- **LS100-SMK**
  IP20 LoRaWAN Smoke Detector

Device Sensors:
  Temperature and Humidity Sensing
- **LS200-PT**
  IP65 LoRaWAN Product Temperature Sensor
- **LS200-TC**
  IP65 LoRaWAN Machine Temperature Sensor
- **LS200-RF**
  IP65 LoRaWAN Refrigerator Temperature and Humidity Sensor

Security Monitoring
- **LS100-PIR**
  IP30 LoRaWAN Indoor Occupancy Sensor
- **LS100-DW**
  IP30 LoRaWAN Door and Window Sensor

Power and Current Monitoring
- **LS200-CM3**
  IP53 LoRaWAN 3-phase Current Meter
- **LS200-CM**
  IP53 LoRaWAN 1-phase Current Meter
- **LS250-PLUG**
  IP20 LoRaWAN Power Plug with Power Meter
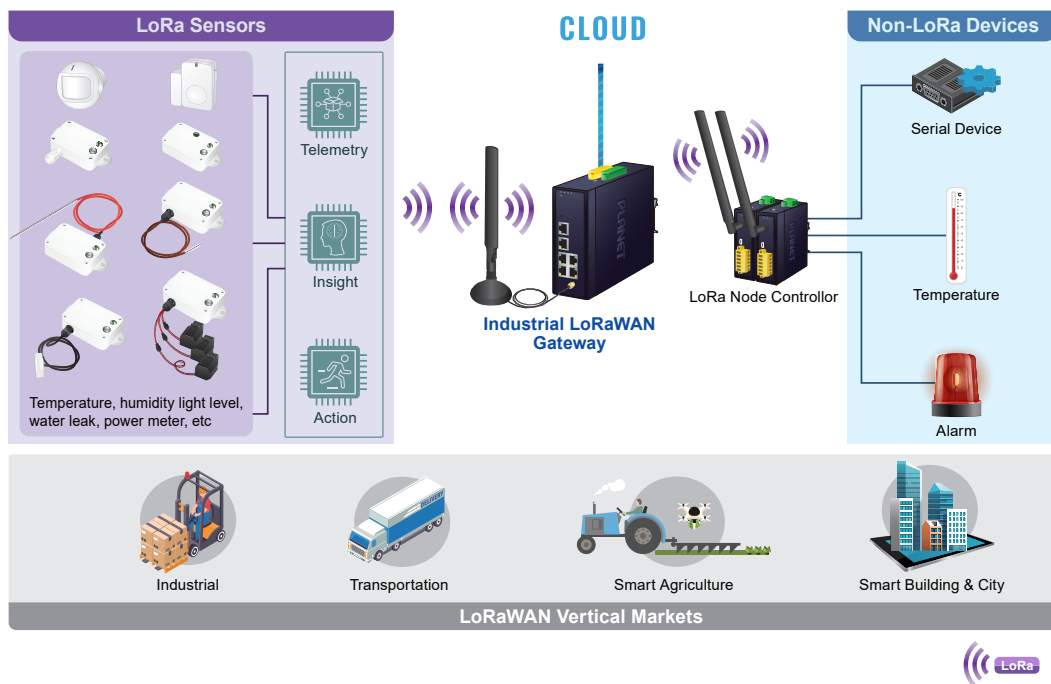
Multi-function
- **LS200-MF8**
  IP30 LoRaWAN Temperature/Humidity/PIR/Tilt/Vibration/Reed Switch/Light/Glass Break Sensor

# Applications

## LoRa Communication Solution

PLANET LoRaWAN LS100/LS200 series Sensor, fully compatible with standard LoRaWAN gateways like PLANET LCG-300 series, supports the LoRaWAN class A. Beyond compatibility, it offers advanced features enhancing IoT applications. With reliable data transmission and low power consumption, it meets diverse IoT demands. In building automation, the sensor enables real-time monitoring and control, optimizing HVAC systems for energy efficiency. In agriculture, it aids precision farming in monitoring soil conditions and livestock well-being. For smart metering, it excels in accurate data acquisition, facilitating energy consumption monitoring and resource management. Its retrofitting capabilities seamlessly integrate various sensors, transforming the existing infrastructure into smart, connected systems. In summary, PLANET LoRaWAN Sensors enrich IoT applications with advanced features, ensuring compatibility and empowering industries for increased efficiency and sustainability in a concise manner.

## LoRa Communication Solution

# Specifications

## ■ LS100 series (1/2)

| Product | LS100-WL | LS100-PIR |
|---|---|---|
| **Wireless Transmission** | | |
| Technology | LoRaWAN | |
| Frequency | EU868: 863–870 MHz<br>US915: 902–928 MHz | |
| TX Power | US915  20dbm<br>AS923  16dbm (optional)<br>AU915  20dbm (optional) | EU868  16dbm<br>KR920  14dbm (optional)<br>IN865  20dbm (optional) |
| Rx Sensitivity | -136dBm (LoRa, Spreading Factor = 12, Bitrate = 293bps)<br>-121dBm (FSK, Frequency Deviation = 5kHz, Bitrate = 1.2kbps) | |
| Work Mode | OTAA/ABP Class A | |
| **Data Interfaces** | | |
| Power Supply | 2x 3.6V ER14505 AA battery in parallel<br>(Battery not included) | |
| Operating Voltage | DC 3.1V~3.65V | DC 3.1V~3.65V |
| Battery Life Time | 5 years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) | |
| Standby Current | 22uA | 110uA |
| Wake-up Current (Typical value) | 7.12mA | 9.78mA |
| Low Battery Threshold | 3.2V | 3.2V |
| **Physical Characteristics** | | |
| Dimensions (L x W x H) | 112 x 88.2 x 32 mm | 78 x 78.8 x 82.2 mm |
| Weight | 141 g | 125.8g |
| Sensor Dimensions (L x W x H) | 38.5 x 11.89 x 13.7mm | - |
| Ingress Protection | IP65 | IP30 |
| Operating Temperature | -20°C to 55°C | |
| Relative Humidity | <90% RH (non condensing) | |
| Storage Temperature | -40 °C ~ 85 °C | |
| **Standards Conformance** | | |
| Regulatory Compliance | CE RED, FCC PART 15B | |

## ■ LS100 series (2/2)

| Product | LS100-DW | LS100-SMK |
|---|---|---|
| **Wireless Transmission** | | |
| Technology | LoRaWAN | |
| Frequency | EU868: 863–870 MHz<br>US915: 902–928 MHz | |
| TX Power | US915  20dbm<br>AS923  16dbm (optional)<br>AU915  20dbm (optional) | EU868  16dbm<br>KR920  14dbm (optional)<br>IN865  20dbm (optional) |
| Rx Sensitivity | -136dBm (LoRa, Spreading Factor = 12, Bitrate = 293bps)<br>-121dBm (FSK, Frequency Deviation = 5kHz, Bitrate = 1.2kbps) | |
| Work Mode | OTAA/ABP Class A | |
| **Data Interfaces** | | |
| Power Supply | 2x 3.0V CR2450 button battery<br>(Battery not included) | 2 x1.5V AAA alkaline batteries<br>(Battery not included) |
| Operating Voltage | DC 2.4V~3V | DC 2.4V~3V |
| Battery Life Time | 3 years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) | 4.7 years<br>(25°C, 60-minutes reports, TX power = 20dBm, SF10) |
| Standby Current | 12uA | 12uA |
| Wake-up Current (Typical value) | 120mA/11mA | 580mA |
| Low Battery Threshold | 2.4V | 2.4V |
| **Physical Characteristics** | | |
| Dimensions (L x W x H) | 57 x 38.05 x 15.2 mm<br>42.5 x 13 x 12 mm (Magnet) | Ø106 x 40.6 mm |
| Weight | 43.8g | 105 g |

| Sensor Measurements | | | Smoke Detection<br>High Temperature Alarm (>60°C)<br>Alarming Bell<br> - 85dBm @ 3 meter |
|---|---|---|---|
| Ingress Protection | IP30 | | IP20 |
| Operating Temperature | -20°C to 55°C | | -10°C to 55°C |
| Relative Humidity | <90% RH (non condensing) | | |
| Storage Temperature | -40 °C ~ 85 °C | | |
| Standards Conformance | | | |
| Regulatory Compliance | CE RED, FCC PART 15B | | |

## ■ LS200 series (1/3)

| Product | LS200-RF | LS200-LG | LS200-CM3 |
|---|---|---|---|
| Wireless Transmission | | | |
| Technology | LoRaWAN | | |
| Frequency | EU868: 863–870 MHz<br>US915: 902–928 MHz | | |
| TX Power | S915   20dbm<br>AS923   16dbm (optional)<br>AU915   20dbm (optional) | EU868   16dbm<br>KR920   14dbm (optional)<br>IN865   20dbm (optional) | |
| Rx Sensitivity | -136dBm (LoRa, Spreading Factor = 12, Bitrate = 293bps)<br>-121dBm (FSK, Frequency Deviation = 5kHz, Bitrate = 1.2kbps) | | |
| Work Mode | OTAA/ABP Class A | | |
| Data Interfaces | | | |
| Power Supply | 2x 3.6V ER14505 AA battery in parallel<br>(Battery not included) | | |
| Operating Voltage | DC 3.1V~3.65V | DC 3.1V~3.65V | DC 3.1V~3.65V |
| Battery Life Time | 5 years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) | | 4.8 Years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) |
| Standby Current | 24uA | 25uA | 34uA |
| Wake-up Current (Typical value) | 6.99mA | 9.94mA | 7.33mA |
| Low Battery Threshold | 3.2V | 3.2V | 3.2V |
| Physical Characteristics | | | |
| Dimensions (L x W x H) | 112 x 65 x 28 mm | 112 x 88.19 x 32 mm | 112 x 88.19 x 32 mm |
| Weight | 141 g | 141 g | 186g |
| Sensor Dimensions | D: Ø16mm*L: 27mm, | - | - |
| Probe Info | - | PT1000 Platinum Thermal | Thermocouple Characteristic |
| Probe Temperature Detection Range | - | -70°C to 200°C | -40°C to 125°C |
| Probe Wire Length | - | 2m | 1m |
| Probe Dimensions | - | 5mm in diameter * 150mm in length, needle probe | - |
| Ingress Protection | IP65 | IP65 | IP65 |
| Operating Temperature | -20°C to 55°C | | |
| Relative Humidity | <90% RH (non condensing) | | |
| Storage Temperature | -40 °C ~ 85 °C | | |
| Standards Conformance | | | |
| Regulatory Compliance | CE RED, FCC PART 15B | TELEC, CB, C TUV US | CE RED, FCC PART 15B |

■ LS200 series (2/3)

| Product | LS200-RF | LS200-LG |
|---|---|---|
| Wireless Transmission | | |
| Technology | LoRaWAN | |
| Frequency | EU868: 863–870 MHz<br>US915: 902–928 MHz | |
| TX Power | US915   20dbm<br>AS923   16dbm (optional)<br>AU915   20dbm (optional) | EU868   16dbm<br>KR920   14dbm (optional)<br>IN865   20dbm (optional) |
| Rx Sensitivity | -136dBm (LoRa, Spreading Factor = 12, Bitrate = 293bps)<br>-121dBm (FSK, Frequency Deviation = 5kHz, Bitrate = 1.2kbps) | |
| Work Mode | OTAA/ABP Class A | |
| Data Interfaces | | |
| Power Supply | 2x 3.6V ER14505 AA battery in parallel<br>(Battery not included) | |
| Operating Voltage | DC 3.1V~3.65V | DC 3.1V~3.65V |
| Battery Life Time | 5 years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) | |
| Standby Current | 20uA | 17uA |
| Wake-up Current (Typical value) | 7.11mA | 7.5mA |
| Low Battery Threshold | 3.2V | 3.2V |
| Physical Characteristics | | |
| Dimensions (L x W x H) | 112 x 65 x 32 mm | 112 x 65 x 32 mm |
| Weight | 141 g | 150g |
| Sensor Measurement Info | Temperature Detection Range:<br>-40°C ~55°C | Illuminance Range:<br>0.01 LUX to 157K LUX |
| Ingress Protection | IP65 | IP65 |
| Operating Temperature | -40°C ~55°C | -20°C to 55°C |
| Relative Humidity | <90% RH (non condensing) | |
| Storage Temperature | -40 °C ~ 85 °C | |
| Standards Conformance | | |
| Regulatory Compliance | CE RED, FCC PART 15B | CE RED, FCC PART 15B |

■ LS200 series (3/3)

| Product | LS200-CM3 | LS200-MF8 |
|---|---|---|
| Wireless Transmission | | |
| Technology | LoRaWAN | |
| Frequency | EU868: 863–870 MHz<br>US915: 902–928 MHz | |
| TX Power | US915   20dbm<br>AS923   16dbm (optional)<br>AU915   20dbm (optional) | EU868   16dbm<br>KR920   14dbm (optional)<br>IN865   20dbm (optional) |
| Rx Sensitivity | -136dBm (LoRa, Spreading Factor = 12, Bitrate = 293bps)<br>-121dBm (FSK, Frequency Deviation = 5kHz, Bitrate = 1.2kbps) | |
| Work Mode | OTAA/ABP Class A | |
| Data Interfaces | | |
| Power Supply | 2x 3.6V ER14505 AA battery in parallel<br>(Battery not included) | 2x 3.0V CR2450 button battery<br>(Battery not included) |
| Operating Voltage | DC 3.1V~3.65V | DC 2.3 ~ 3V |
| Battery Life Time | 5 years<br>(25°C, 15-minute reports, TxPower=20dBm, SF10) | 2.26 years<br>(25°C, 60-minutes reports, TX power = 20dBm, SF10) |
| Standby Current | 25uA | - |
| Wake-up Current (Typical value) | 127mA | - |
| Low Battery Threshold | 3.2V | 3.2V |
| Physical Characteristics | | |
| Dimensions | 112 x 88.19 x 32 mm | 75.5 x 19.4 x 44 mm |
| Weight | 141g | 120 g |
| Sensor Dimensions<br>(L x W x H) | 27.5 x 25 x 42.5 mm | Reed Switch: 46 x 16 x 12.9mm<br>Glass Break Sensor: 36 x 36 x 7.9mm |

| Ingress Protection | 49.6 x 3g | IP30 |
|---|---|---|
| Sensor Measurements | Current Measurement Range: 100mA to 75A<br>Operating Temperature: -40°C to 85°C | **Temperature Sensor Information**<br> - Measurement Range: -20°C to 55°C<br> - Measurement Accuracy: ±1°C<br>**Humidity Sensor Information**<br> - Measurement Range: 0% RH to 100% RH<br> - Measurement Accuracy: ±7%RH<br>**Passive Infrared Sensor Information**<br> - Detectable Angle: 80° horizontally / 55° vertically<br> - Detectable Range: 3m to 5m<br>**Light Sensor Information**<br> - Illumination Measurement Range: 1 Lux to 3000 Lux<br> - Illumination Measurement Accuracy: <15%<br>**Tilt Sensor Information**<br> - Conversion Angle: 45±5 degrees<br> - Contact Resistance: Less than 10 ohms<br> - The Insulation Resistance: Greater than 100 megohms<br> - Operating Temperature: -40°C to 85 °C<br> - Installation Type: Suitable for PCB at vertical state<br>**Vibration Sensor Information**<br> - Model: Ball type omnidirectional signal trigger switch<br> - Voltage: <6V<br> - Current: 2uA to 10mA<br> - Insulation Resistance: >10M Ω<br> - Trigger Rate: 100% (amplitude > 1 mm, frequency > 20 Hz)<br> - Trigger Frequency: >50Hz<br>**Reed Switch Sensor Information**<br> - Minimum Insulation Resistance $10^{10}$ Ω<br> - Maximum Contact Resistance 100m Ω<br> - Maximum Switching Current 0.5A<br>**Glass Break Sensor Information**<br> - Detection Mode: Piezoelectric buzzer<br> - Power Supply: Self-generated voltage chip<br> - Impedance: Normal (NC): 7Ω (max) Alarm (NO): 1MΩ (min)<br> - Sensor Sensing Range: within 2.5M radius<br> - Signal Sensing Time: 1-3 seconds<br> - Loop Voltage: 15VDC (max)<br> - Loop Current: 25mA (max)<br>- Operating Temperature: -10 to 50 °C<br> - Wire Length: 100cm |
| Ingress Protection | IP53 | IP30 |
| Operating Temperature | -20°C to 55°C | -10°C to 50°C |
| Relative Humidity | <90% RH (non condensing) | |
| Storage Temperature | -40 °C ~ 85 °C | |
| Standards Conformance | | |
| Regulatory Compliance | CE RED, FCC PART 15B | CE RED, FCC PART 15B |

## Ordering Information

| | |
|---|---|
| LS100-WL-868M | IP65 LoRaWAN Water Leak Sensor (EU868 Sub 1G) |
| LS100-WL-915M | IP65 LoRaWAN Water Leak Sensor (US915 Sub 1G) |
| LS100-PIR-868M | IP30 LoRaWAN Indoor Occupancy Sensor (Occupancy/Light/Temperature -20~55 degrees C, EU868 Sub 1G) |
| LS100-PIR-915M | IP30 LoRaWAN Indoor Occupancy Sensor (Occupancy/Light/Temperature -20~55 degrees C, US915 Sub 1G) |
| LS100-DW-868M | IP30 LoRaWAN Door and Window Sensor (EU868 Sub 1G) |
| LS100-DW-915M | IP30 LoRaWAN Door and Window Sensor (US915 Sub 1G) |
| LS200-TH-868M | IP65 LoRaWAN Indoor Temperature and Humidity Sensor (-20~55 degrees C, EU868 Sub 1G) |
| LS200-TH-915M | IP65 LoRaWAN Indoor Temperature and Humidity Sensor (-20~55 degrees C, US915 Sub 1G) |
| LS200-PT-868M | IP65 LoRaWAN Product Temperature Sensor (PT1000 Needle Probe -70~200 degrees C, EU868 Sub 1G) |
| LS200-PT-915M | IP65 LoRaWAN Product Temperature Sensor (PT1000 Needle Probe -70~200 degrees C, US915 Sub 1G) |
| LS200-TC-868M | IP65 LoRaWAN Machine Temperature Sensor (Thermocouple -40~125 degrees C, EU868 Sub 1G) |
| LS200-TC-915M | IP65 LoRaWAN Machine Temperature Sensor (Thermocouple -40~125 degrees C, US915 Sub 1G) |
| LS200-RF-868M | IP65 LoRaWAN Refrigerator Temperature and Humidity Sensor (-40~55 degrees C, EU868 Sub 1G) |
| LS200-RF-915M | IP65 LoRaWAN Refrigerator Temperature and Humidity Sensor (-40~55 degrees C, US915 Sub 1G) |
| LS200-LG-868M | IP65 LoRaWAN Light Level Sensor (EU868 Sub 1G) |
| LS200-LG-915M | IP65 LoRaWAN Light Level Sensor (US915 Sub 1G) |
| LS200-CM3-868M | IP53 LoRaWAN 3-phase Current Meter (3 x 75A Clamp-On CT, EU868 Sub 1G) |
| LS200-CM3-915M | IP53 LoRaWAN 3-phase Current Meter (3 x 75A Clamp-On CT, US915 Sub 1G) |
| LS100-SMK-868M | IP20 LoRaWAN Smoke Detector (High-Temperature Alarm, EU868 Sub 1G) |
| LS100-SMK-915M | IP20 LoRaWAN Smoke Detector (High-Temperature Alarm, US915 Sub 1G) |
| LS200-MF8-868M | IP30 LoRaWAN Temperature/Humidity/PIR/Tilt/Vibration/Reed Switch/Light/Glass Break Sensor (-20~55 degrees C, EU868 Sub 1G) |
| LS200-MF8-915M | IP30 LoRaWAN Temperature/Humidity/PIR/Tilt/Vibration/Reed Switch/Light/Glass Break Sensor (-20~55 degrees C, US915 Sub 1G) |

## Related Products

| | |
|---|---|
| LCG-300-NR | Industrial LoRaWAN + 5G NR Cellular Gateway with 5-Port 10/100/1000T |
| LCG-300W | Industrial LoRaWAN Wireless Gateway with 5-Port 10/100/1000T |
| LCG-300 | Industrial LoRaWAN Gateway with 5-Port 10/100/1000T |