**WISE-4610**

# LoRa/LoRaWAN Outdoor Wireless I/O Module

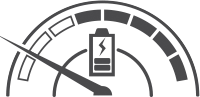


**Features**

* For North America, Europe, and Japan
* Longer communication range
* Better penetration through concrete and steel
* Less interference than 2.4GHz spectrum
* Application-ready I/O combination with IP65 enclosure
* Powered by solar rechargeable battery or 10~50VDC input
* Global Positioning System (GPS) support

# Introduction

LPWAN is a type of wireless telecommunication wide area network designed to allow long range communications at a low data rate among IoT applications, such as sensors operated on a battery. Its benefits is to offer multi-year battery lifetime for sensors/applications to send small amounts of data over long distances a few times per hour suitable for different environments.

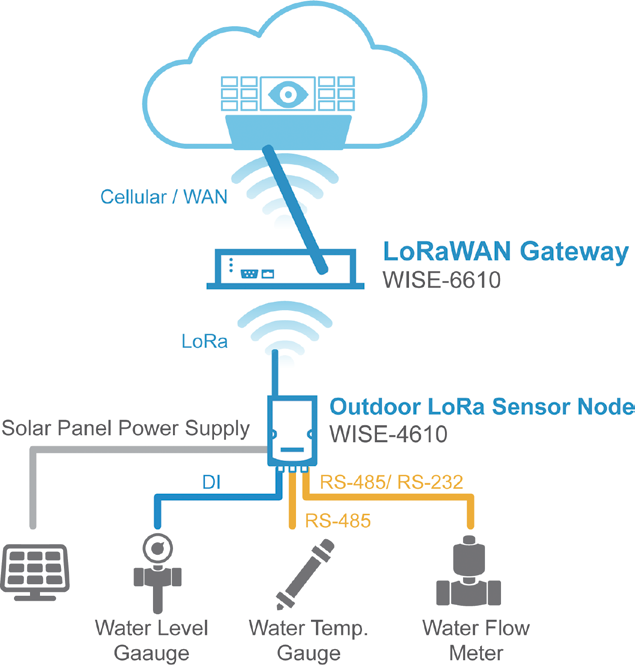
LoRa and LoRaWAN are one of category of LPWAN which belong to the non-cellular LPWAN wireless communication network protocols enables very long range transmissions with low power consumption, operating in the non-licensed spectrum. What is the difference between LoRa and LoraWAN? LoRa (Long Range) is a patented wireless data communication of IoT technology and acquired by Semtech in 2012 which holds the IP for LoRa transmission methodology.

## Star Topology

The LoRaWAN networks in a star topology have gateway relaying the data between the sensor nodes and the network server.

Communication between the sensor nodes and the gateway goes over the wireless channel utilizing the LoRa physical layer, whilst the connection between the gateways and the central server are handled over a backbone IP-based network.

The LoRaWAN end nodes(sensors) typically use Low Power and are battery powered (Class A and Class B). LoRa embedded sensors that run on batteries that lasts from 2–5 years typically. The LoRa sensors can transmit signals over distances from 1km—10km.



**Wireless IoT Sensing Devices**

All product specifications are subject to change without notice. Last updated: 24-Apr-2019

# Common Specification

## Wireless Communication

**Digital Input**

* **Channels** 4
* **Input Type** Dry Contact (Wet Contact by request)
* **Logic Level** 0: Open

# WISE-4610

* **IEEE Standard** IEEE 802.15.4g
* **Frequency Band** EU 863-870 (MHz)
* **Isolation Voltage**



1: Close to DCOM 3,000Vrms

US 902-928 (MHz)

AU (JP) 915-928 (MHz)



**Supports 200Hz Counter Input (16-bit + 1-bit overflow)**

* **Keep/Discard Counter Value when Power-off**



**Spreading Factor** 7~12

* **Outdoor Range** 5km with line of sight (with 2 dBi Antenna)
* **Transmit Power** Up to +18dBm
* **Receiver Sensitivity** Up to -136dBm at SF = 12 / 125KHz
* **Data Rate** 50 kbps at FSK mode EU868

21.9 kbps at SF7 mode US915

5.47 kbps at SF7 mode JP923

* **Topology** Star
* **Function** End Node

**GPS1**

* **GNSS Systems** GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS signals
* **Max. Update Rate** Single GNSS: up to 18 Hz Concurrent GNSS: up to 10 Hz
* **Accuracy** Position: 2.5 m CEP (50% confidence)

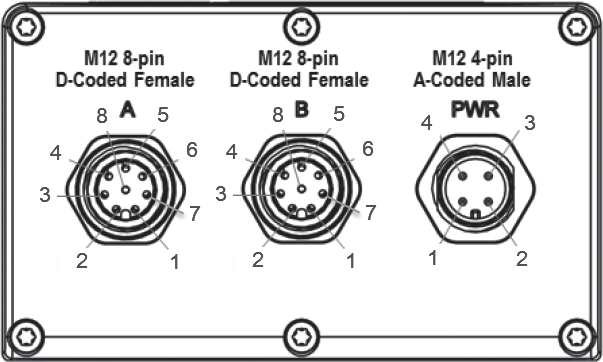
With SBAS: 2.0 m CEP (50% confidence)

* **Acquisition** Cold starts: 57 s Aided starts: 7 s

**Supports 200Hz Frequency Input**

* **Supports Inverted DI Status**

# Pin Assignment



## General

* **Power Input** Built-in 4000mA Lithium rechargeable battery pack2

|  |  |  |  |
| --- | --- | --- | --- |
|  | Model Name | WISE-S614 | WISE-S672 |
| Pin Number |
| A | 1 | DI0 | DI0 |
| 2 | DI1 | DI1 |
| 3 | DI2 | DI2 |
| 4 | DI3 | DI3 |
| 5 | NC | DI4 |
| 6 | NC | DI5 |
| 7 | NC | NC |
| 8 | DI COM | DI COM |
| B | 1 | IA0+ | DATA1- |
| 2 | IA0- | DATA1+ |
| 3 | IA1+ | TX |
| 4 | IA1- | RX |
| 5 | IA2+ | DATA2- |
| 6 | IA2- | DATA2+ |
| 7 | IA3+ | NC |
| 8 | IA3- | GND |
| PWR | 1 | +VS | +VS |
| 2 | -VS | -VS |
| 3 | SP+ | SP+ |
| 4 | SP- |  |

* **Battery Life**
* **Configuration Interface**
* **Connector**
* **LED Indicator**
* **Mounting**

or 10~50VDC external power

6 months (1 hour data update and 1 day GPS update) Micro-B USB

Power: M12 4-pin code-A male x 1 I/O: M12 8-pin code-D female x 2

Status, Error, Tx, Rx, Battery/Signal Level DIN 35 rail, wall, pole, and stack

* **Dimension (W x H x D)** 82 x 122 x 49 mm (without antenna)

## Environment

* **Operating Temperature2** With battery: 0~60°C

Without battery:: -25~70°C

* **Operating Humidity** 5~95% RH

1 No GPS version, can be ordered upon request

2 No battery version, can be ordered upon request

# WISE-S672

## Serial Port

* **Port Number** 2
* **Type** Port 1: RS-485

Port 2: RS-485/232

* **Serial Signal** RS-485: DATA+, DATA- RS-232: Tx, Rx, GND
* **Data Bits** 7, 8
* **Stop Bits** 1, 2
* **Parity** None, Odd, Even

 **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

* **Protection** 15 kV ESD
* **Protocol** Modbus/RTU (Total 32 address)

## Digital Input

* **Channels** 6
* **Input Type** Dry Contact (Wet Contact by request)
* **Logic Level** 0: Open

1: Close to DCOM

* **Isolation Voltage** 3,000Vrms
* **Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
* **Keep/Discard Counter Value when Power-off**
* **Supports 200Hz Frequency Input**
* **Supports Inverted DI Status**

# WISE-S614

## Analog Input

* **Channels** 4
* **Resolution** 16-bit
* **Sampling Rate** 1Hz per channel
* **Accuracy** ±0.1% of FSR (Voltage)

±0.2% of FSR (Current)

 **Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA

* **Input Impedance** > 2M Ω (Voltage)

120 Ω (External resistor for current)

* **Isolation Voltage** 3000Vrms
* **Over Voltage Protection** ±35 VDC
* **Burn-out Detection** Yes (4~20mA only)
* **Supports Data Scaling and Averaging**

# Ordering Information

## Wireless Sensor Node

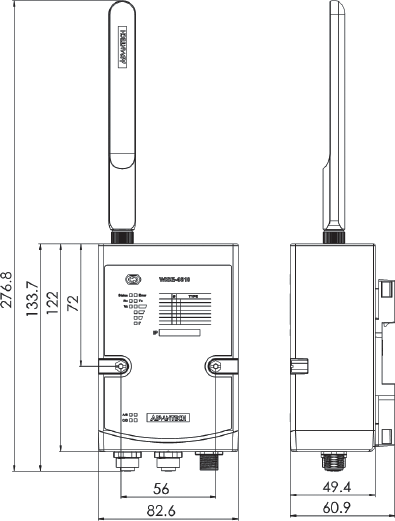
* **WISE-4610-S672NA** LoRa Outdoor WSN with 6DI & 2COM - NA915
* **WISE-4610-S672EA** LoRa Outdoor WSN with 6DI & 2COM - EU868
* **WISE-4610-S672JA** LoRa Outdoor WSN with 6DI & 2COM - JP923
* **WISE-4610-S614NA** LoRa Outdoor WSN with 4AI & 4DI - NA915
* **WISE-4610-S614EA** LoRa Outdoor WSN with 4AI & 4DI - EU868
* **WISE-4610-S614JA** LoRa Outdoor WSN with 4AI & 4DI - JP923

# Accessories

 **1654011516-01** M12 Connector 8P Male

 **1655005903-01** M12 Connector 4P Male

* **1700028162-01** 2M M12 code-A 4-pin female cable for power wiring
* **1700028163-01** 2M M12 code-D 8-pin male cable for I/O wiring
* **PWR-242-AE** DIN Rail Power Supply (2.1A Output Current)
* **PWR-243-AE** Panel Mount Power Supply (3A Output Current)
* **PWR-244-AE** Panel Mount Power Supply (4.2A Output Current)



**Dimensions** Unit: mm

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