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 10~50V_{DC} 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.

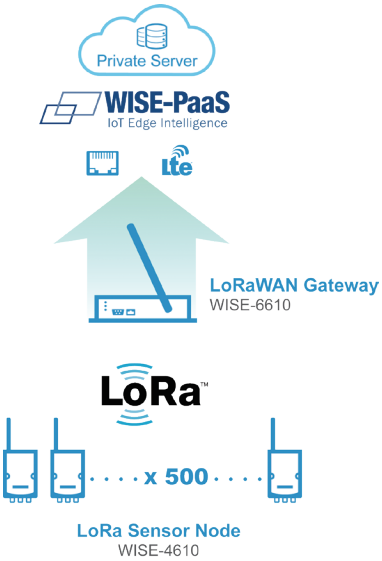
LoRa and LoRaWAN are one of category of LPWAN which belong to the non-cellular LPWAN wireless communication network protocols enables very long range transmissions with low power consumption, operating in the non-licensed spectrum. What is the difference between LoRa and LoraWAN? LoRa (Long Range) is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

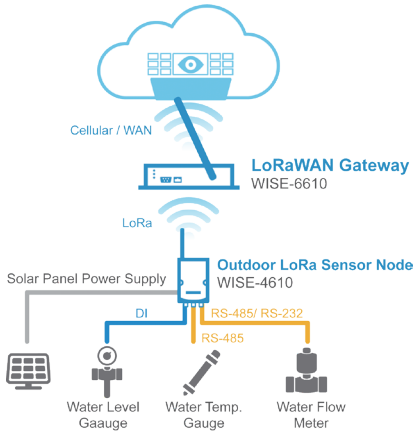
Star Topology

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.





Last updated: 24-Apr-2019

Common Specification

Wireless Communication

- **IEEE Standard** IEEE 802.15.4g
- **Frequency Band** EU 863-870 (MHz)
  US 902-928 (MHz)
  AU (JP) 915-928 (MHz)
- **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

GPS[1]

- **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

General

- **Power Input** Built-in 4000mA Lithium rechargeable battery pack[2]
  or 10~50V_{DC} external power
- **Battery Life** 6 months (1 hour data update and 1 day GPS update)
- **Configuration Interface** Micro-B USB
- **Connector** Power: M12 4-pin code-A male x 1
  I/O: M12 8-pin code-D female x 2
- **LED Indicator** Status, Error, Tx, Rx, Battery/Signal Level
- **Mounting** DIN 35 rail, wall, pole, and stack
- **Dimension (W x H x D)** 82 x 122 x 49 mm (without antenna)

Environment

- **Operating Temperature[2]** 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** 3,000V_{rms}
- **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

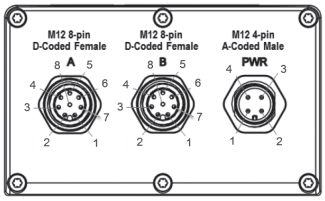
Analog Input

- **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** 3000V_{rms}
- **Over Voltage Protection** ±35 V_{DC}
- **Burn-out Detection** Yes (4~20mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels** 4
- **Input Type** Dry Contact (Wet Contact by request)
- **Logic Level** 0: Open
  1: Close to DCOM
- **Isolation Voltage** 3,000V_{rms}
- **Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports 200Hz Frequency Input**
- **Supports Inverted DI Status**

Pin Assignment



	Model Name / Pin Number	WISE-S614	WISE-S672
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-	

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