WISE-4610

Advanced Industrial LoRa/LoRaWAN Wireless I/O Module

Features

- Private LoRa and LoRaWAN selectable
- 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
- GPS/Galileo/BeiDou/GLONASS 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.

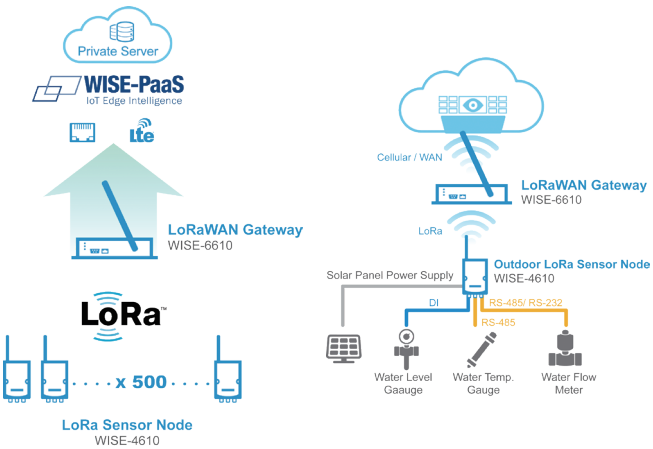
Private LoRa and LoRaWAN are one of category of LPWAN which belong to the non-cellular LPWAN wireless communication network protocols enables very long range transmissions with low power consumption, operating in the non-licensed spectrum.

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 C). 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.



Common Specification

Wireless Communication

- **Standard** LoRaWAN or Private LoRa
- **Private LoRa Frequency Range & Region***
  EU 863-870 (MHz)
  US 902-928 (MHz)
  JP 915-928 (MHz)
- **LoRaWAN Frequency Range & Region***
  EU 868
  NA 915
  JP 923
  AS 923

* Other region can be supported upon request

- **Spreading Factor** 7~12
- **Outdoor Range** 15Km (L.o.S) by pairing with WISE-6610 (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
- **Antenna Type** External

GPS*

- **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
- **Antenna Type** Internal

General

- **Power Input*** Built-in 4000mA Lithium rechargeable battery pack
  10~50V_{DC} external power
  17-21V_{DC} Solar Panel
- **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-A 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*** With battery: 0~60°C
  Without battery:: -25~70°C
- **Operating Humidity** 5~95% RH

* For GPS and battery version, please refer to WISE-4610P series.

Last updated: 15-Jan-2020

WISE-S672 (6DI/1RS-485/1RS-485 or RS-232)

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
- **Logic Level** 0: Open
  1: Close to DCOM
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Inverted DI Status**

WISE-S614 (4AI/4DI)

Analog Input

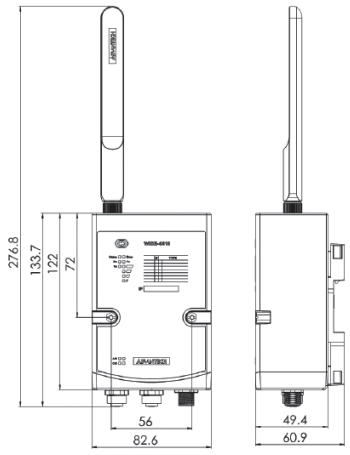
- **Channels** 4
- **Resolution** 16-bit
- **Sampling Rate** 1Hz per channel
- **Accuracy** ±0.1% of FSR (Voltage)
  ±0.2% of FSR (Current)
- **Input Range** ±150mV, ±500mV, ±1 V, ±5V, ±10V, 0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V,
  0 ~ 5V, 0 ~ 10V, 0 ~ 20mA , 4 ~ 20mA , ±20mA
- **Input Impedance** > 2M Ω (Voltage)
  240 Ω (External resistor for current)
- **Over Voltage Protection** ±35 V_{DC}
- **Burn-out Detection** Yes (4~20mA only)
- **Supports Data Scaling and Averaging**

Digital Input

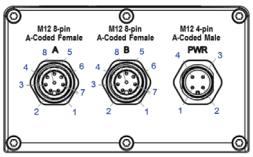
- **Channels** 4
- **Input Type** Dry Contact
- **Logic Level** 0: Open
  1: Close to DCOM
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Inverted DI Status**

Dimensions

Unit: mm



Pin Assignment



	Model Name	M12 Cable	WISE-S672	WISE-S614	WISE-S615	WISE-S617
	Pin Number					
	P/N	4Pin : 1700028162-01 8Pin : 1700028163-01	WISE-S672-A	WISE-S614-A	WISE-S615-A	WISE-S617-A
A	1	White	DI0	DI0	RTD2+	IA0+
	2	Brown	DI1	DI1	RTD2-	IA0-
	3	Green	DI2	DI2	RTD2 COM	+12V_Out0
	4	Yellow	DI3	DI3	NC	+12V_Out_GND
	5	Gray	DI4	NC	RTD3+	IA1+
	6	Pink	DI5	NC	RTD3-	IA1-
	7	Blue	NC	NC	RTD3 COM	+12V_Out1
	8	Red	DI_COM	DI COM	NC	+12V_Out_GND
B	1	White	RS-485 D1-	IA0+	RTD0+	DI0
	2	Brown	RS-485 D1+	IA0-	RTD0-	DI1
	3	Green	RS-232 TX	IA1+	RTD0 COM	DI_COM
	4	Yellow	RS-232 RX	IA1-	NC	DO0
	5	Gray	RS-485 D2-	IA2+	RTD1+	DO_GND
	6	Pink	RS-485 D2+	IA2-	RTD1-	RS-485 D+
	7	Blue	NC	IA3+	RTD1 COM	RS-485 D-
	8	Red	RS-232 GND	IA3-	NC	RS-485 GND
PWR	1	Brown	+VS	+VS	+VS	+VS
	2	White	-VS/ SP-	-VS	-VS	-VS
	3	Blue	SP+	SP+	SP+	SP+
	4	Black	NC	SP-	SP-	SP-

Ordering Information

WISE-4610 Advanced Industrial LoRaWAN Module

- **WISE-4610-NA** Advanced Industrial LoRaWAN Module - NA915
- **WISE-4610-EA** Advanced Industrial LoRaWAN Module - EU868
- **WISE-4610-JA** Advanced Industrial LoRaWAN Module - JP923
- **WISE4610JA2001-T** Advanced Industrial LoRaWAN Module - AS923
- **WISE-4610P-NA** Advanced Industrial LoRaWAN I/O Module w/ GPS & battery - NA915
- **WISE-4610P-EA** Advanced Industrial LoRaWAN I/O Module w/ GPS & battery - EU868
- **WISE-4610P-JA** Advanced Industrial LoRaWAN I/O Module w/ GPS & battery - JP923
- **WISE4610PJA2001-T** Advanced Industrial LoRaWAN I/O Module w/ GPS & battery - AS923

WISE-S600 IP65 I/O Module with M12 Connectors

- **WISE-S614-A** 4AI/4DI
- **WISE-S615-A** 4RTD
- **WISE-S617-A** 2AI/2DI/1DO/1RS-485 w/ 2ch 12V_{DC} power output
- **WISE-S672-A** 6DI/1RS-485/1RS-485 or RS-232

WISE-S600T I/O Module with Terminal Block

- **WISE-S614T-A** 4AI/4DI
- **WISE-S615T-A** 4RTD
- **WISE-S617T-A** 2AI/2DI/1DO/1RS-485 w/ 2ch 12V_{DC} power output

Accessories

- **1654011516-01** M12, A-code, 8 Pin, Male
- **1655005903-01** M12, A-code, 4 Pin, Female
- **1700028162-01** M12, A-code, 4 pin, Female with 1M cable
- **1700028163-01** M12, A-code, 8 Pin, Male with 1M cable
- **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)