

WISE-4610

LoRa/LoRaWAN Outdoor Wireless I/O Module



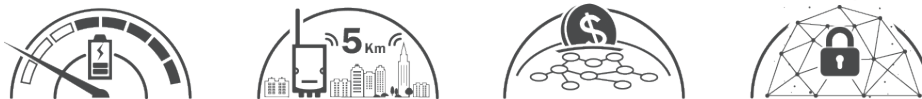
Features

- 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.

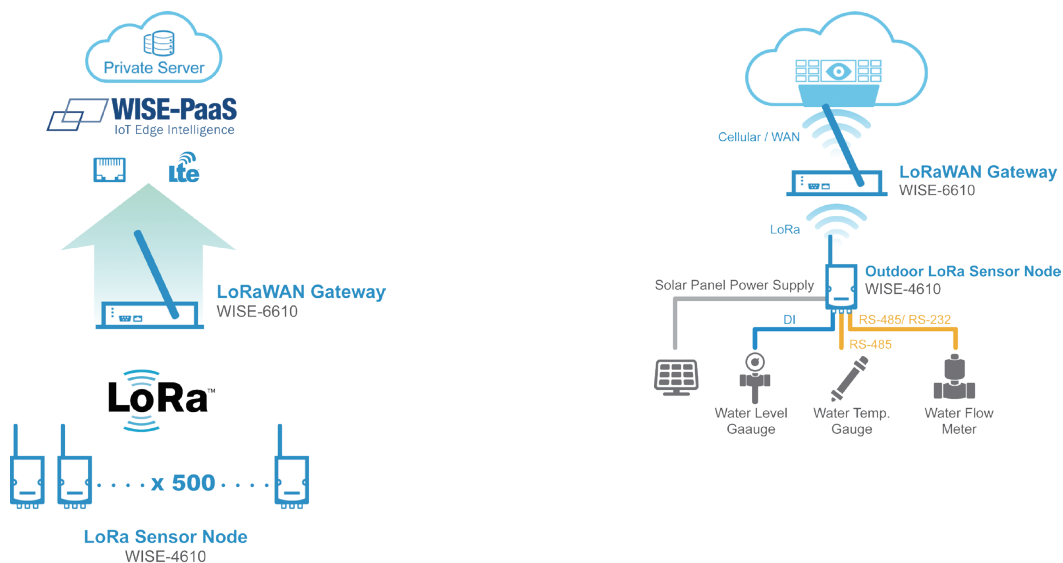


Star Topology

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 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.



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 863-870 (MHz)
 - US 902-928 (MHz)
- * Other region can be supported upon request
- 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

General

- Power Input Built-in 4000mA Lithium rechargeable battery pack²
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 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 (6DI/2COM ports)

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

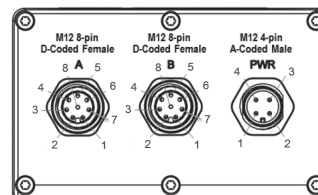
- Channels 4
- Resolution 16-bit
- Sampling Rate 1Hz per channel
- Accuracy ±0.1% of FSR (Voltage)
±0.2% of FSR (Current)
- Input Range ±150mV, ±500mV, ±1 V, ±5V, ±10V, 0 ~ 150mV, 0 ~ 1V,
0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, ±20mA
- Input Impedance > 2M Ω (Voltage)
240 Ω (External resistor for current)
- 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

Pin Assignment



	Model Name	WISE-S614	WISE-S672
	Pin Number		
A	1	DIO	DIO
	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

WISE-4610 Outdoor LoRa/LoRaWAN Module

- WISE-4610-NA LoRa Outdoor WSN - NA915
- WISE-4610-EA LoRa Outdoor WSN - EU868
- WISE-4610-JA LoRa Outdoor WSN - JP923

WISE-S600 I/O Module

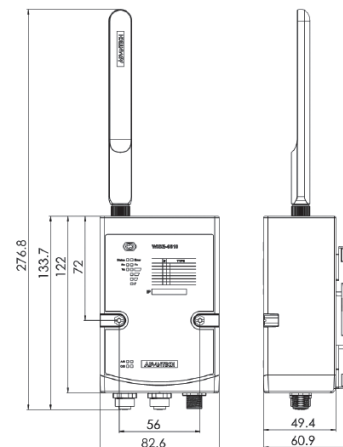
- WISE-S614-A 4AI/4DI
- WISE-S672-A 6DI/2COM Ports

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 female 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



WISE-4000LAN Series

IoT Ethernet I/O Module



Main Features

- IEEE 802.3u 10/100Base-T(X)
- Industrial grade operating temperature -40~70°C
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT
- Supports RESTful web API in JSON format
- Supports local logging with RTC timestamp
- Supports mobile device web configuration in HTML5
- Supports 10~30V_{DC} power with reverse protection

Introduction

The WISE-4000LAN series is a newly designed IoT Ethernet I/O module which supports new RESTful web API for IoT applications. A HTML5 web configure interface enables users to configure WISE modules without the limitation of a platform or operation system. The built-in data logger function logs data with time information, then be retrieved in a bundle. Wide operating temperatures enable the WISE series to be implemented in more IoT data acquisition applications. As well as the new functions, the new mechanical design can let users install the module and doing diagnostics in an easier manner than before.

Specifications

Current Input

- **Channel** WISE-4010LAN: 4 (differential)
- **Resolution** 12-bit
- **Sampling Rate** 10/100 Hz/channel
- **Accuracy** $\pm 0.2\%$ of FSR @ 25°C
- **Input Range** 0~20 mA, 4~20 mA
- **Input Impedance** 120 Ω
- **Burn-out Detection** Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels** WISE-4050LAN: 4
WISE-4060LAN: 4
- **Logic level:** Dry Contact 0: Open
1: Close to DI COM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- **Isolation** 3,000 V_{rms}
- **Supports 32-bit Counter Input Function (Maximum frequency 3kHz)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Frequency Input Function (Maximum frequency 3 kHz)**
- **Supports Inverted DI Status**

Digital Output

- **Channels** WISE-4010LAN: 4
WISE-4050LAN: 4
(Open collector to 30 V, 500 mA max. for resistance load)
- **Isolation** 3,000 V_{rms} (WISE-4050LAN only)
- **Supports 1 kHz Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Relay Output

- **Channels** WISE-4060LAN: 4 (Form A)
- **Contact Rating** 250 V_{AC} @ 5 A
(Resistive Load)
30 V_{DC} @ 3 A
- **Isolation** (b/t coil & contact) 3,000 V_{rms}
- **Relay On Time** 10 ms
- **Relay Off Time** 5 ms
- **Insulation Resistance** 1 G Ω min. @ 500 V_{DC}
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature** -40 ~ 70°C (-40~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

General

- **LAN** IEEE 802.3u 10/100Base-T(X)
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, RoHS
- **Dimensions (W x H x D)** 80 x 98 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V_{DC}
- **Power Consumption** WISE-4010LAN: 1.2 W @ 24 V_{DC}
WISE-4050LAN: 2.2 W @ 24 V_{DC}
WISE-4060LAN: 2.5 W @ 24 V_{DC}

- **Power Reversal Protection**
- **Supports Data Log Function** Up to 10000 samples with timestamp
- **Supports User Defined Modbus Address**
- **Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT**
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4010LAN-B** 4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4050LAN-B** 4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4060LAN-B** 4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module

Selection Table

Model Name	Current Input	Digital Input	Digital Output	Relay Output
WISE-4010LAN	4		4	
WISE-4050LAN		4	4	
WISE-4060LAN		4		4

WISE-4000LAN Series

IoT Ethernet I/O Module



Main Features

- IEEE 802.3u 10/100Base-T(X)
- Industrial grade operating temperature -40~70°C
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT
- Supports RESTful web API in JSON format
- Supports local logging with RTC timestamp
- Supports mobile device web configuration in HTML5
- Supports 10~30V_{DC} power with reverse protection

Introduction

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Specifications

Current Input

- **Channel** WISE-4010LAN: 4 (differential)
- **Resolution** 12-bit
- **Sampling Rate** 10/100 Hz/channel
- **Accuracy** $\pm 0.2\%$ of FSR @ 25°C
- **Input Range** 0~20 mA, 4~20 mA
- **Input Impedance** 120 Ω
- **Burn-out Detection** Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels** WISE-4050LAN: 4
WISE-4060LAN: 4
- **Logic level:** Dry Contact 0: Open
1: Close to DI COM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- **Isolation** 3,000 V_{rms}
- **Supports 32-bit Counter Input Function (Maximum frequency 3kHz)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Frequency Input Function (Maximum frequency 3 kHz)**
- **Supports Inverted DI Status**

Digital Output

- **Channels** WISE-4010LAN: 4
WISE-4050LAN: 4
(Open collector to 30 V, 500 mA max. for resistance load)
- **Isolation** 3,000 V_{rms} (WISE-4050LAN only)
- **Supports 1 kHz Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Relay Output

- **Channels** WISE-4060LAN: 4 (Form A)
- **Contact Rating** 250 V_{AC} @ 5 A
(Resistive Load)
30 V_{DC} @ 3 A
- **Isolation** (b/t coil & contact) 3,000 V_{rms}
- **Relay On Time** 10 ms
- **Relay Off Time** 5 ms
- **Insulation Resistance** 1 G Ω min. @ 500 V_{DC}
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature** -40 ~ 70°C (-40~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

General

- **LAN** IEEE 802.3u 10/100Base-T(X)
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, RoHS
- **Dimensions (W x H x D)** 80 x 98 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V_{DC}
- **Power Consumption** WISE-4010LAN: 1.2 W @ 24 V_{DC}
WISE-4050LAN: 2.2 W @ 24 V_{DC}
WISE-4060LAN: 2.5 W @ 24 V_{DC}

- **Power Reversal Protection**
- **Supports Data Log Function** Up to 10000 samples with timestamp
- **Supports User Defined Modbus Address**
- **Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT**
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4010LAN-B** 4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4050LAN-B** 4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4060LAN-B** 4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module

Selection Table

Model Name	Current Input	Digital Input	Digital Output	Relay Output
WISE-4010LAN	4		4	
WISE-4050LAN		4	4	
WISE-4060LAN		4		4

WISE-4000LAN Series

IoT Ethernet I/O Module



Main Features

- IEEE 802.3u 10/100Base-T(X)
- Industrial grade operating temperature -40~70°C
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT
- Supports RESTful web API in JSON format
- Supports local logging with RTC timestamp
- Supports mobile device web configuration in HTML5
- Supports 10~30V_{DC} power with reverse protection

Introduction

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Specifications

Current Input

- **Channel** WISE-4010LAN: 4 (differential)
- **Resolution** 12-bit
- **Sampling Rate** 10/100 Hz/channel
- **Accuracy** $\pm 0.2\%$ of FSR @ 25°C
- **Input Range** 0~20 mA, 4~20 mA
- **Input Impedance** 120 Ω
- **Burn-out Detection** Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

Digital Input

- **Channels** WISE-4050LAN: 4
WISE-4060LAN: 4
- **Logic level:** Dry Contact 0: Open
1: Close to DI COM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- **Isolation** 3,000 V_{rms}
- **Supports 32-bit Counter Input Function (Maximum frequency 3kHz)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Frequency Input Function (Maximum frequency 3 kHz)**
- **Supports Inverted DI Status**

Digital Output

- **Channels** WISE-4010LAN: 4
WISE-4050LAN: 4
(Open collector to 30 V, 500 mA max. for resistance load)
- **Isolation** 3,000 V_{rms} (WISE-4050LAN only)
- **Supports 1 kHz Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Relay Output

- **Channels** WISE-4060LAN: 4 (Form A)
- **Contact Rating** 250 V_{AC} @ 5 A
(Resistive Load)
30 V_{DC} @ 3 A
- **Isolation** (b/t coil & contact) 3,000 V_{rms}
- **Relay On Time** 10 ms
- **Relay Off Time** 5 ms
- **Insulation Resistance** 1 G Ω min. @ 500 V_{DC}
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

Environment

- **Operating Temperature** -40 ~ 70°C (-40~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

General

- **LAN** IEEE 802.3u 10/100Base-T(X)
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, RoHS
- **Dimensions (W x H x D)** 80 x 98 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V_{DC}
- **Power Consumption** WISE-4010LAN: 1.2 W @ 24 V_{DC}
WISE-4050LAN: 2.2 W @ 24 V_{DC}
WISE-4060LAN: 2.5 W @ 24 V_{DC}

- **Power Reversal Protection**
- **Supports Data Log Function** Up to 10000 samples with timestamp
- **Supports User Defined Modbus Address**
- **Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, MQTT**
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Ordering Information

- **WISE-4010LAN-B** 4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4050LAN-B** 4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4060LAN-B** 4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module

Selection Table

Model Name	Current Input	Digital Input	Digital Output	Relay Output
WISE-4010LAN	4		4	
WISE-4050LAN		4	4	
WISE-4060LAN		4		4

WISE-4012

4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module



Features

- 4-ch universal input and 2-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.



HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

Universal Input

- **Channels** 4
- **Resolution** 16-bit
- **Sampling Rate** Analog Input 10Hz (Total)
Digital Input 2Hz (Per Channel)
- **Accuracy** $\pm 0.1\%$ of FSR (Voltage)
 $\pm 0.2\%$ of FSR (Current)
- **Input Type and Range** Analog Input $\pm 150\text{mV}$, $\pm 500\text{mV}$, $\pm 1\text{V}$, $\pm 5\text{V}$, $\pm 10\text{V}$,
 $0\sim 150\text{mV}$, $0\sim 500\text{mV}$, $0\sim 1\text{V}$, $0\sim 5\text{V}$, $0\sim 10\text{V}$,
 $0\sim 20\text{mA}$, $4\sim 20\text{mA}$, $\pm 20\text{mA}$
Digital Input (Dry Contact) 0: Open, 1: Close
- **Input Impedance** $> 10\text{M}\Omega$ (Voltage)
 120Ω (External resistor for current)
- **Over Voltage Protection** $\pm 35\text{V}_{\text{DC}}$
- **Burn-out Detection** Yes (4~20mA only)
- **Supports Data Scaling and Averaging**

Digital Output

- **Channels** 2
(Open collector to 30 V, 400 mA max.
for resistance load)
- **Isolation** 3,000 V_{rms}
- **Supports 5 kHz Pules Output**
- **Supports High-to-Low and Low-to-High Delay Output**

General

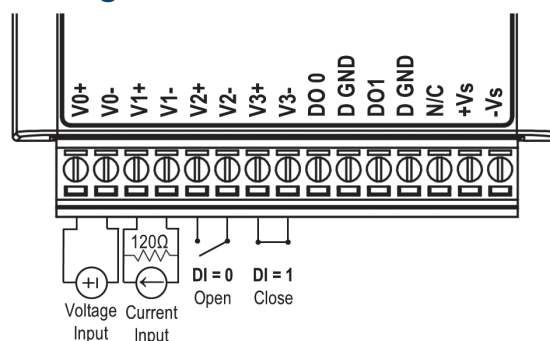
- **WLAN** IEEE 802.11b/g/n 2.4GHz
- **Outdoor Range** 110 m with line of sight
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and
Communication (programmable)
- **Certification** CE, FCC, R&TTE, NCC, SRRC, RoHS, KC
- **Dimensions (W x H x D)** 80 x 148 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V_{DC}
- **Power Consumption** 2.5 W @ 24 V_{DC}
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function** Up to 10000 samples with RTC time stamp
- **Supported Protocols** Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP, MQTT

- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- **Operating Temperature** $-25 \sim 70^{\circ}\text{C}$ ($-13 \sim 158^{\circ}\text{F}$)
- **Storage Temperature** $-40 \sim 85^{\circ}\text{C}$ ($-40 \sim 185^{\circ}\text{F}$)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

Pin Assignment



Ordering Information

- **WISE-4012-AE** 4-ch Universal Input and 2-ch Digital Output IoT
Wireless I/O Module

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- **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

WISE-4050

4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module



Features

- 4-ch digital input and 4-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.



HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

Digital Input

- Channels 4
- Logic Level Dry Contact 0: Open
1: Close to DI COM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- Isolation 3,000 V_{rms}
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

Digital Output

- Channels 4
(Open collector to 30 V, 400 mA max. for resistance load)
- Isolation 3,000 V_{rms}
- Supports 5 kHz Pules Output
- Supports High-to-Low and Low-to-High Delay Output

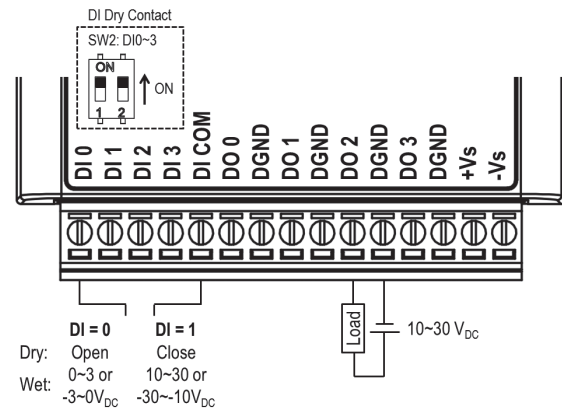
General

- WLAN IEEE 802.11b/g/n 2.4GHz
- Outdoor Range 110 m with line of sight
- Connectors Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, R&TTE, NCC, SRRC, RoHS, KC, ANATEL
- Dimensions (W x H x D) 80 x 148 x 25 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, and stack
- Power Input 10 ~ 30 V_{DC}
- Power Consumption 2.2 W @ 24 V_{DC}
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP, MQTT
- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- Operating Temperature -25 ~ 70°C (-13~158°F)
- Storage Temperature -40 ~ 85°C (-40~185°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

Pin Assignment



Ordering Information

- WISE-4050-B 4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module

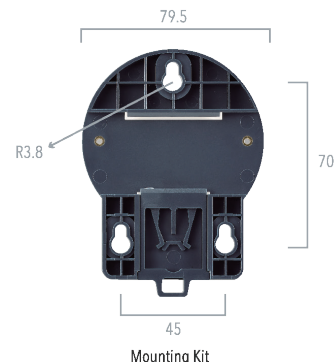
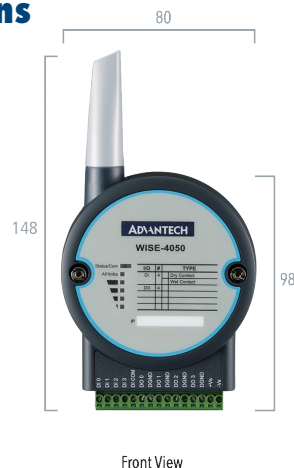
Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- 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

WISE-4051

8-ch Digital Input IoT Wireless I/O Module with RS-485 Port



Features

- 8-ch digital input with 1-port RS-485 for Modbus devices
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4051 is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4051 provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.



Modbus/RTU to Web Service or Modbus/TCP

The RS-485 port of the WISE-4051 supports Modbus, which can be used to poll the data from Modbus/RTU devices, like ADAM-4000, or ADAM-5000/485. Then you can access the data by Modbus or REST from the WISE-4051. The data can also be logged.



RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4051 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4051 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4051 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

Digital Input

- Channels 8
- Logic Level Dry Contact 0: Open
1: Close to DCOM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- Isolation 3,000 V_{rms}
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

Serial Port

- Port Number 1
- Type RS-485
- Serial Signal DATA+, DATA-
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)
- Protection 15 kV ESD
- Protocol Modbus/RTU (Total 32 address by max. 8 instructions)

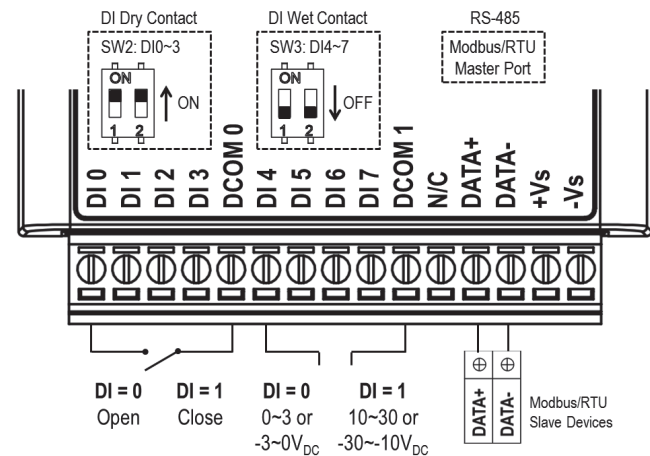
General

- WLAN IEEE 802.11b/g/n 2.4GHz
- Outdoor Range 110 m with line of sight
- Connectors Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, R&TTE, NCC, SRRC, RoHS
- Dimensions (W x H x D) 80 x 148 x 25 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, and stack
- Power Input 10 ~ 30 V_{DC}
- Power Consumption 2.2 W @ 24 V_{DC}
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP, MQTT
- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- Operating Temperature -25 ~ 70°C (-13~158°F)
- Storage Temperature -40 ~ 85°C (-40~185°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

Pin Assignment



Ordering Information

- WISE-4051-B 8-ch Digital Input IoT Wireless I/O Module with RS-485 Port

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- 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

WISE-4060

4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module



Features

- 4-ch digital input and 4-ch relay output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4060 is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4060 provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4000 to be accessed via other Wi-Fi devices directly as an AP.



HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4060 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4060 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4060 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

Digital Input

- Channels 4
- Logic Level Dry Contact 0: Open
1: Close to DI COM
Wet Contact 0: 0 ~ 3 V_{DC}
1: 10 ~ 30 V_{DC} (3 mA min.)
- Isolation 3,000 V_{rms}
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

Relay Output

- Channels 4 (Form A)
- Contact Rating 250 V_{AC} @ 5 A
(Resistive Load)
30 V_{DC} @ 3 A
- Isolation (b/w coil & contacts) 3,000 V_{AC}
- Relay On Time 10 ms
- Relay Off Time 5 ms
- Insulation Resistance 1 GΩ min. @ 500 V_{DC}
- Maximum Switching 60 operations/minute
- Supports Pulse Output
- Supports High-to-Low and Low-to-High Delay Output

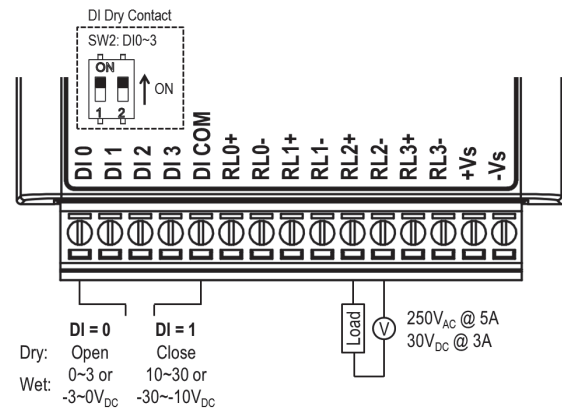
General

- WLAN IEEE 802.11b/g/n 2.4GHz
- Outdoor Range 110 m with line of sight
- Connectors Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, R&TTE, NCC, SRR, RoHS, ANATEL
- Dimensions (W x H x D) 80 x 148 x 25 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, and stack
- Power Input 10 ~ 30 V_{DC}
- Power Consumption 2.5 W @ 24 V_{DC}
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP, MQTT
- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- Operating Temperature -25 ~ 70°C (-13~158°F)
- Storage Temperature -40 ~ 85°C (-40~185°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

Pin Assignment



Ordering Information

- WISE-4060-B 4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module

Selection Table

Model Name	Universal Input	Digital Input	Digital Output	Relay Output	RS-485
WISE-4012	4		2		
WISE-4050		4	4		
WISE-4051		8			1
WISE-4060		4		4	

Accessories

- 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)

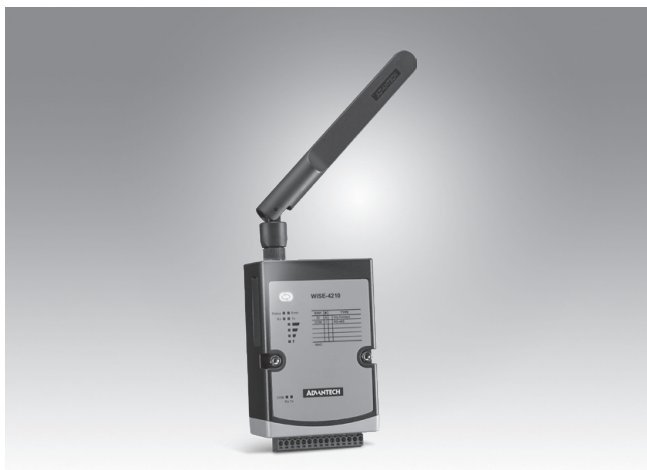
Dimensions



Unit: mm

WISE-4210

Industrial Proprietary LPWAN (SUB-G) Wireless I/O Module



Introduction

LPWAN, created for machine-to-machine (M2M) and Internet of things (IoT) networks, is not a single technology, but a variety of low-power, wide area network technologies. Compared with traditional mobile network, LPWAN is known as lower cost with higher power efficiency. WISE-4210 series is the proprietary LPWAN which provides better connection compare with traditional 2.4G WiFi, WISE-4210 series is helpful of eliminating network interference.

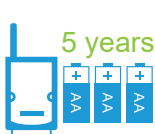
Additionally, WISE-4210 utilize a LPWAN(low-power, wide-area networks) wireless interface, which has a kilometer-long communication distance and battery power. The features of LPWAN make WISE modules ideal solutions for energy and environment monitoring.

Reduced Interference and Extended Communication Range

Compared with Wi-Fi, Bluetooth, Zigbee, or other 2.4GHz wireless interface, a sub-GHz interface can reduce interference at sites. Moreover, Sub-GHz is a type of LPWAN designed for long-range communications. Under the same power consumption, sub-GHz offers a longer communication range with low data rate than other 2.4 GHz technologies.

Powered by a 3.6V AA Lithium Battery

The low power consumption of sub-GHz enables the sensor node to be powered by a battery. With a 3.6V AA Lithium battery, the sensor node can maintain communication at a distance of 5 km for up to 5 years, thereby eliminating the need to recharge or change batteries.



Star Topology

Star topology, also known as star network, is the most common network setup. In star topology, every node connects to a central network device which means WISE-4210-S200 series nodes acts as clients should be connected with WISE-4210-AP. In this configuration, user can organize their own network with 64 nodes paired. Data on a star network pass through WISE-4210-AP before continuing to its destination. WISE-4210-AP with a LAN cable manages and controls most of all functions of the network.

Features

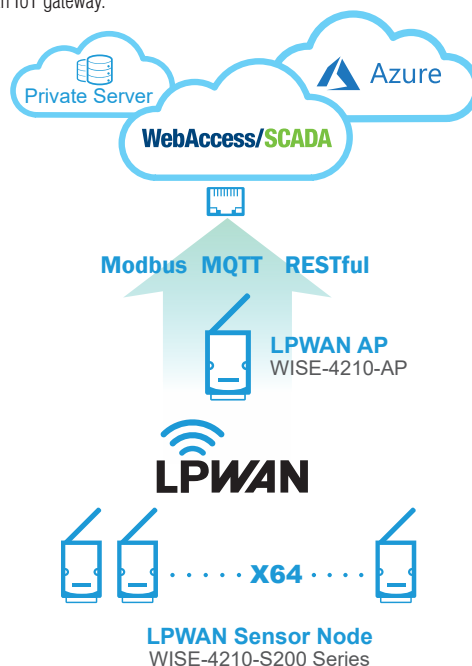
- Proprietary LPWAN with using sub-1GHz wireless frequency
- Battery power for 5 years with 3 x 3.6V AA batteries
- Up to 5 km communication range in open space
- Longer communication range than 2.4GHz
- Better penetration through concrete and steel than 2.4GHz
- Less interference than 2.4GHz spectrum
- Application-ready I/O combination with modularization design

MQTT and RESTful API IoT Protocol Support

IoT Wireless sensor nodes are designed for not only automation applications but also IoT applications that may use MQTT or RESTful web API IoT protocols for cloud integrations.

Azure IoT Hub Support

To provide a complete IoT sensing solution, the WISE-4210 series goes beyond being a wireless communication interface for sensors—it also provides cloud connectivity for additional user applications. With support for HTTPS and integrated APIs for Azure IoT Hub, the WISE-4210 series can automatically push data to the cloud without requiring an IoT gateway.



Common Specification

WISE-4210

- Frequency Band NA915: 923MHz (920.60~924.60), BW: 400kHz
EU868: 868MHz (865.00~869.00), BW: 400kHz
- Antenna Gain 902~928MHz: 1.33 dBi
863~870MHz: 2.19 dBi
- Data Rate 625bps, 50kbps
- Outdoor Range 625bps: 5 km with line of sight
50kbps: 2 km with line of sight
- Topology Star
- Network Capacity 64 clients

General

- Power Input AP: 10 ~ 50 V_{DC}
Sensor Node: 3 x AA, 3.6V Lithium Battery or 10 ~ 50 V_{DC}
- Battery Life 625bps: 5 years with 10 minute update rate @ 25°C with WISE-S251/S231
50kbps: 5 years with 1 minute update rate @ 25°C with WISE-S251/S231
- Configuration Interface AP: LAN port
Sensor Node: Micro-B USB
- LED Indicator Status, Error, Tx, Rx, Battery/Signal Level
- Mounting DIN 35 rail, wall, pole and stack
- Dimension (W x H x D) 70 x 102 x 38 mm
- Certification CE, FCC, IC, NCC, TELEC

Environment

- Operating Temperature -25 ~ 70°C
- Operating Humidity 5 ~ 95% RH
- Storage Temperature -40 ~ 85°C
- Storage Humidity 0 ~ 95% RH

WISE-4210-AP (Access Point)

- Data Rate 625 bps, 2.5k bps, 5k bps, 50k bps,
- Ethernet RJ-45 (for configuration and data query)
- RS-485 Data+, Data- (for query node data)
- Messaging Protocol Modbus/TCP, Modbus/RTU, REST, MQTT
- Application Protocol HTTP, HTTPS, SNMP, DHCP
- Transport Protocol TCP, UDP
- Supports RESTful Web API in JSON format with HTTP protocol
- Supports Web Server in HTML5

WISE-4210-S231 (Built-in Temperature & Humidity Sensor)

Temperature Sensor

- Operating Range -25°C ~ 70°C (-13°F ~ 157.9°F)
- Resolution 0.1 (°C/°F/K)
- Accuracy ±1.0°C (±1.8°F) (vertical installation)

Humidity Sensor

- Operating Range 10 ~ 90% RH
- Resolution 0.1% RH
- Accuracy ±4% RH @ for 0%~50% RH
±6% RH @ 50%~60% RH
±10% RH @ 60%~90% RH

WISE-S214 (4AI/4DI)

Analog Input

- Channels 4
- Resolution 16bits Bipolar
15bits Unipolar
- Sampling Rate 1Hz (per Channel) with 50/60Hz Rejection
(Power Saving Mode)
10Hz (Total) with 50/60Hz Rejection (Normal Mode)
- Accuracy ±0.1% for Voltage Input
±0.2% for Current Input
- Input Range 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, ±150mV, ±500mV, ±1V, ±5V, ±10V,
0~20mA, ±20mA, 4~20mA
- Input Impedance >1MΩ (Voltage)
- Isolated voltage 3kVrms
- Support Data Scaling and Averaging

Digital Input

- Channels 4 (Dry Contact)
- Supports 32-bit counter input function (maximum signal frequency 200Hz)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

WISE-S250 (6DI, 2DO & 1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 3kHz Frequency Input

Digital Output (Sink Type)

- Channels 2
- Output Current 100 mA
At 0 -> 1: 100 us
At 1 -> 0: 100 us
(for Resistive Load)
- Supports Pules Output 5 kHz
- Max. Load Voltage 30V

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 64 addresses by 30 max. instructions)

WISE-S251 (6DI/1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 32-bit counter input function (maximum signal frequency 200Hz)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 32 address by max. 8 instructions)

Ordering Information

WISE-4210 Access Point

- WISE-4210-APNA LPWAN Wireless to Ethernet AP — NA915/EU868

WISE-4210 Node

- WISE-4210-NA Proprietary LPWAN SUB-G Wireless I/O Module — NA915/EU868
- WISE-4210-S231-NA LPWAN IoT WSN Temp & RH Sensor- NA902/EU868

WISE-S200 I/O Module

- WISE-S214-A 4AI/4DI
- WISE-S250-A 6DI, 2DO & 1RS-485
- WISE-S251-A 6DI & 1RS-485

* Power saving is not for downlink mode.

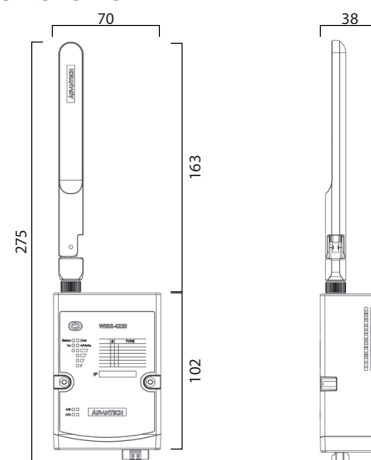
Accessories

- 1760002647-01 Bat.Cylindrical 3.6V/2500mAh AA Li/SOCI2
- 1750008836-01* 863~870MHz Dipole Antenna for WISE-4210
- 1750008837-01* 902~928MHz Dipole Antenna for WISE-4210

* AS923/EU868 version of WISE-4210 needs to order antenna separately

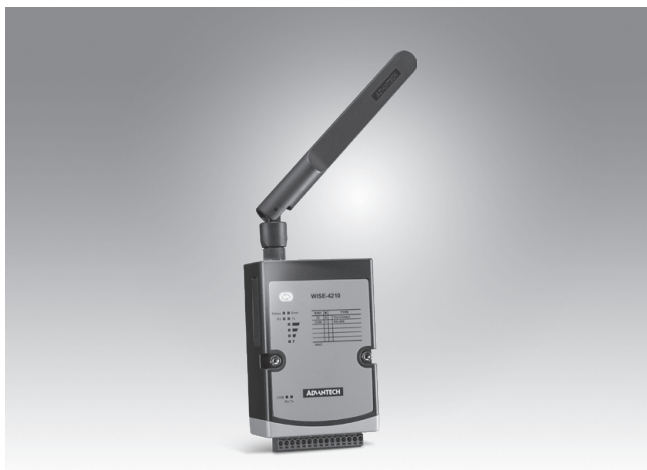
Dimensions

Unit: mm



WISE-4210

Industrial Proprietary LPWAN (SUB-G) Wireless I/O Module



Introduction

LPWAN, created for machine-to-machine (M2M) and Internet of things (IoT) networks, is not a single technology, but a variety of low-power, wide area network technologies. Compared with traditional mobile network, LPWAN is known as lower cost with higher power efficiency. WISE-4210 series is the proprietary LPWAN which provides better connection compare with traditional 2.4G WiFi, WISE-4210 series is helpful of eliminating network interference.

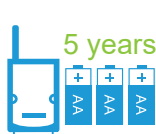
Additionally, WISE-4210 utilize a LPWAN(low-power, wide-area networks) wireless interface, which has a kilometer-long communication distance and battery power. The features of LPWAN make WISE modules ideal solutions for energy and environment monitoring.

Reduced Interference and Extended Communication Range

Compared with Wi-Fi, Bluetooth, Zigbee, or other 2.4GHz wireless interface, a sub-GHz interface can reduce interference at sites. Moreover, Sub-GHz is a type of LPWAN designed for long-range communications. Under the same power consumption, sub-GHz offers a longer communication range with low data rate than other 2.4 GHz technologies.

Powered by a 3.6V AA Lithium Battery

The low power consumption of sub-GHz enables the sensor node to be powered by a battery. With a 3.6V AA Lithium battery, the sensor node can maintain communication at a distance of 5 km for up to 5 years, thereby eliminating the need to recharge or change batteries.



Star Topology

Star topology, also known as star network, is the most common network setup. In star topology, every node connects to a central network device which means WISE-4210-S200 series nodes acts as clients should be connected with WISE-4210-AP. In this configuration, user can organize their own network with 64 nodes paired. Data on a star network pass through WISE-4210-AP before continuing to its destination. WISE-4210-AP with a LAN cable manages and controls most of all functions of the network.

Features

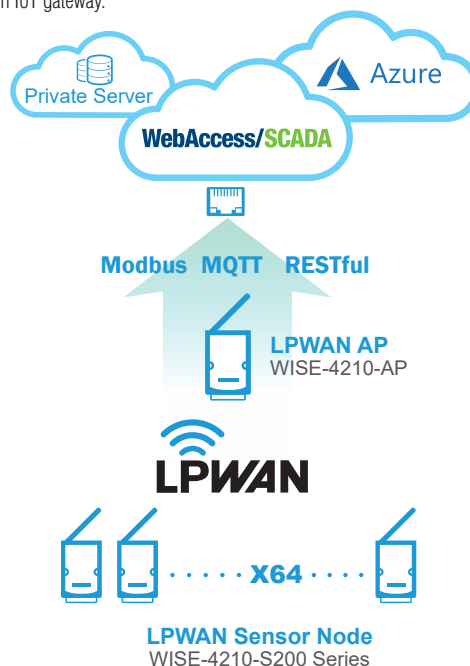
- Proprietary LPWAN with using sub-1GHz wireless frequency
- Battery power for 5 years with 3 x 3.6V AA batteries
- Up to 5 km communication range in open space
- Longer communication range than 2.4GHz
- Better penetration through concrete and steel than 2.4GHz
- Less interference than 2.4GHz spectrum
- Application-ready I/O combination with modularization design

MQTT and RESTful API IoT Protocol Support

IoT Wireless sensor nodes are designed for not only automation applications but also IoT applications that may use MQTT or RESTful web API IoT protocols for cloud integrations.

Azure IoT Hub Support

To provide a complete IoT sensing solution, the WISE-4210 series goes beyond being a wireless communication interface for sensors—it also provides cloud connectivity for additional user applications. With support for HTTPS and integrated APIs for Azure IoT Hub, the WISE-4210 series can automatically push data to the cloud without requiring an IoT gateway.



Common Specification

WISE-4210

- Frequency Band NA915: 923MHz (920.60~924.60), BW: 400kHz
EU868: 868MHz (865.00~869.00), BW: 400kHz
902~928MHz: 1.33 dBi
863~870MHz: 2.19 dBi
- Antenna Gain 625bps, 50kbps
- Data Rate 625bps: 5 km with line of sight
50kbps: 2 km with line of sight
- Outdoor Range Star
- Topology 64 clients
- Network Capacity

General

- Power Input AP: 10 ~ 50 V_{DC}
Sensor Node: 3 x AA, 3.6V Lithium Battery or 10 ~ 50 V_{DC}
625bps: 5 years with 10 minute update rate @ 25°C with WISE-S251/S231
50kbps: 5 years with 1 minute update rate @ 25°C with WISE-S251/S231
- Battery Life AP: LAN port
Sensor Node: Micro-B USB
Status, Error, Tx, Rx, Battery/Signal Level
- Configuration Interface DIN 35 rail, wall, pole and stack
70 x 102 x 38 mm
- LED Indicator CE, FCC, IC, NCC, TELEC
- Mounting
- Dimension (W x H x D)
- Certification

Environment

- Operating Temperature -25 ~ 70°C
- Operating Humidity 5 ~ 95% RH
- Storage Temperature -40 ~ 85°C
- Storage Humidity 0 ~ 95% RH

WISE-4210-AP (Access Point)

- Data Rate 625 bps, 2.5k bps, 5k bps, 50k bps, RJ-45 (for configuration and data query)
- Ethernet Data+, Data- (for query node data)
- RS-485 Modbus/TCP, Modbus/RTU, REST, MQTT
- Messaging Protocol HTTP, HTTPS, SNMP, DHCP
- Application Protocol TCP, UDP
- Transport Protocol
- Supports RESTful Web API in JSON format with HTTP protocol
- Supports Web Server in HTML5

WISE-4210-S231 (Built-in Temperature & Humidity Sensor)

Temperature Sensor

- Operating Range -25°C ~ 70°C (-13°F ~ 157.9°F)
- Resolution 0.1 (°C/°F/K)
- Accuracy ±1.0°C (±1.8°F) (vertical installation)

Humidity Sensor

- Operating Range 10 ~ 90% RH
- Resolution 0.1% RH
- Accuracy ±4% RH @ for 0%~50% RH
±6% RH @ 50%~60% RH
±10% RH @ 60%~90% RH

WISE-S214 (4AI/4DI)

Analog Input

- Channels 4
- Resolution 16bits Bipolar
15bits Unipolar
- Sampling Rate 1Hz (per Channel) with 50/60Hz Rejection (Power Saving Mode)
10Hz (Total) with 50/60Hz Rejection (Normal Mode)
- Accuracy ±0.1% for Voltage Input
±0.2% for Current Input
- Input Range 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, ±150mV, ±500mV, ±1V, ±5V, ±10V,
0~20mA, ±20mA, 4~20mA
- Input Impedance >1MΩ (Voltage)
- Isolated voltage 3kVrms
- Support Data Scaling and Averaging

Digital Input

- Channels 4 (Dry Contact)
- Supports 32-bit counter input function (maximum signal frequency 200Hz)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

WISE-S250 (6DI, 2DO & 1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 3kHz Frequency Input

Digital Output (Sink Type)

- Channels 2
- Output Current 100 mA
At 0 -> 1: 100 us
At 1 -> 0: 100 us
(for Resistive Load)
- Supports Pules Output 5 kHz
- Max. Load Voltage 30V

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 64 addresses by 30 max. instructions)

WISE-S251 (6DI/1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 32-bit counter input function (maximum signal frequency 200Hz)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 32 address by max. 8 instructions)

Ordering Information

WISE-4210 Access Point

- WISE-4210-APNA LPWAN Wireless to Ethernet AP — NA915/EU868

WISE-4210 Node

- WISE-4210-NA Proprietary LPWAN SUB-G Wireless I/O Module — NA915/EU868
- WISE-4210-S231-NA LPWAN IoT WSN Temp & RH Sensor- NA902/EU868

WISE-S200 I/O Module

- WISE-S214-A 4AI/4DI
- WISE-S250-A 6DI, 2DO & 1RS-485
- WISE-S251-A 6DI & 1RS-485

* Power saving is not for downlink mode.

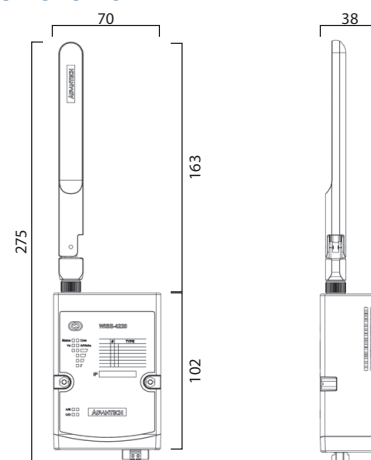
Accessories

- 1760002647-01 Bat.Cylindrical 3.6V/2500mAh AA Li/SOCI2
- 1750008836-01* 863~870MHz Dipole Antenna for WISE-4210
- 1750008837-01* 902~928MHz Dipole Antenna for WISE-4210

* AS923/EU868 version of WISE-4210 needs to order antenna separately

Dimensions

Unit: mm



WISE-4220

Industrial Wi-Fi 2.4G Wireless I/O Module

NEW



Features

- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4220 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O and sensor types, the WISE-4220 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be published to the cloud with security at anytime and anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4220 to be accessed via other Wi-Fi devices directly as an AP.



HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4220 without the limitation of OS/ devices. You can use your mobile phone or tablet to directly configure the WISE-4220.



Data Storage

The WISE-4220 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

General

- WLAN Standard IEEE 802.11b/g/n
- Frequency Band 2.4GHz ISM Band
- Transmit Power 802.11b: 12.0 dBm ±1dBm
802.11g: 15.5 dBm ±1dBm
802.11n: 15.5 dBm ±1dBm
- Antenna Connector: Reverse SMA
Gain (Peak): 2.45 dBi
- Outdoor Range 150m with line of sight
- Connectors Plug-in screw terminal block (power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, IC, NCC, SRR, RCM, VCCI, TELEC (CC3200 listed antenna)
- Dimensions (W x H x D) 70 x 102 x 38 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, stack, and pole
- Power Input 10 ~ 50 V_{DC}
- Power Consumption 1.2 W @ 24 V_{DC}
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, HTTP, and MQTT
- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

Environment

- Operating Temperature -25 ~ 70°C (-13~158°F)
- Storage Temperature -40 ~ 85°C (-40~185°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

WISE-4220-S231 (Built-in Temperature and Humidity Sensor)

Temperature Sensor

- Operating Range -25°C ~ 70°C (-13°F ~ 157.9°F)
- Resolution 0.1 (°C/°F/K)
- Accuracy ±2.0°C (±35.6°F) (vertical installation)

Humidity Sensor

- Operating Range 10 ~ 90% RH
- Resolution 0.1% RH
- Accuracy ±4% RH @ 0%-50% RH
±10% RH @ 50%-60% RH
±13% RH @ 60%-90% RH

WISE-S214 (4AI/4DI)

Analog Input

- Channels 4
- Resolution 16bits Bipolar; 15bits Unipolar
- Sampling Rate 10Hz (Total) with 50/60Hz Rejection
- Accuracy ±0.1% for Voltage Input; ±0.2% for Current Input
- Input Range 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, ±150mV, ±500mV, ±1V, ±5V, ±10V, 0~20mA, ±20mA, 4~20mA
- Input Impedance >1MΩ (Voltage)
240 Ω (External resistor for current)
- Support Data Scaling and Averaging

Digital Input

- Channels 4 (Dry Contact)
- Supports 200Hz Counter Input (32-bit + 1-bit overflow)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

WISE-S250 (6DI, 2DO & 1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 3kHz Frequency Input

Digital Output (Sink Type)

- Channel 2
- Output Current 100 mA
- At 0 -> 1: 100 us
- At 1 -> 0: 100 us (for Resistive Load)
- Supports Pules Output 5 kHz
- Max. Load Voltage 30V

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 32 addresses by 8 max. instructions)

WISE-S251 (6DI/1RS-485)

Digital Input

- Channels 6 (Dry Contact)
- Supports 200Hz Counter Input (32-bit + 1-bit overflow)
- Supports keep/discard counter value on power-off
- Support inverted digital input status

Serial Port

- Port Number 1
- Type RS-485
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate (bps) 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protocol Modbus/RTU (Total 32 address by max. 8 instructions)

Ordering Information

Wi-Fi 2.4G Wireless I/O Module

- WISE-4220-A Wi-Fi 2.4G Wireless I/O Module
- WISE-4220-S231-A Wi-Fi 2.4G Wireless Module with Temperature and Humidity Sensor

WISE-S200 I/O Module

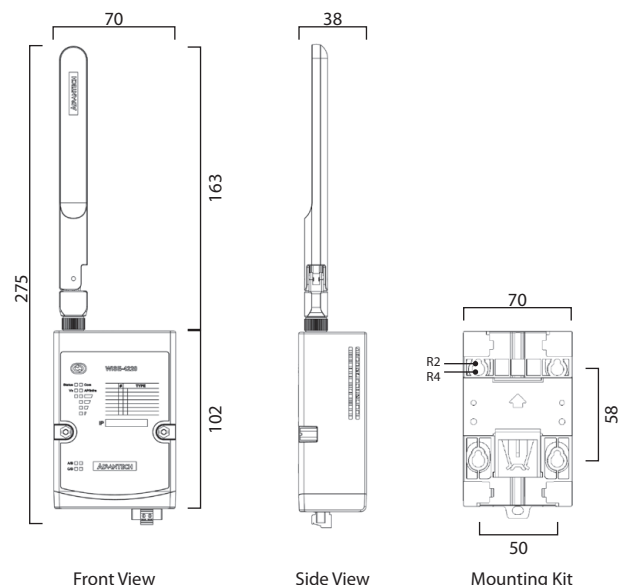
- WISE-S214-A 4AI/4DI
- WISE-S250-A 6DI, 2DO & 1RS-485
- WISE-S251-A 6DI & 1RS-485

Accessories

- 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



WISE-4220

Industrial Wi-Fi 2.4G Wireless I/O Module

NEW



Features

- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

Introduction

The WISE-4220 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O and sensor types, the WISE-4220 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be published to the cloud with security at anytime and anywhere.

Features

IEEE 802.11 b/g/n 2.4GHz Wi-Fi with AP Mode

The Wi-Fi interface is easily integrated with wired or wireless Ethernet devices, users only need to add a wireless router or AP to extend existing Ethernet network to wireless. The limited AP mode enables the WISE-4220 to be accessed via other Wi-Fi devices directly as an AP.



HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4220 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4220.



Data Storage

The WISE-4220 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



Specifications

General

- **WLAN Standard** IEEE 802.11b/g/n
- **Frequency Band** 2.4GHz ISM Band
- **Transmit Power** 802.11b: 12.0 dBm \pm 1dBm
802.11g: 15.5 dBm \pm 1dBm
802.11n: 15.5 dBm \pm 1dBm
- **Antenna** Connector: Reverse SMA
Gain (Peak): 2.45 dBi
- **Outdoor Range** 150m with line of sight
- **Connectors** Plug-in screw terminal block (power)
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, IC, NCC, SRRC, RCM, VCCI, TELEC (CC3200 listed antenna)
- **Dimensions (W x H x D)** 70 x 102 x 38 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, stack, and pole
- **Power Input** 10 ~ 50 V_{DC}
- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**
- **Supports Data Log Function** Up to 10000 samples with RTC time stamp
- **Supported Protocols** Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

Environment

- **Operating Temperature** -25 ~ 70°C (-13~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

WISE-4220-S231 (Built-in Temperature and Humidity Sensor)

Temperature Sensor

- **Operating Range** -25°C ~ 70°C (-13°F ~ 157.9°F)
- **Resolution** 0.1 (°C/°F/K)
- **Accuracy** \pm 2.0°C (\pm 35.6°F) (vertical installation)

Humidity Sensor

- **Operating Range** 10 ~ 90% RH
- **Resolution** 0.1% RH
- **Accuracy** \pm 4% RH @ 0%-50% RH
 \pm 10% RH @ 50%-60% RH
 \pm 13% RH @ 60%-90% RH

WISE-S214 (4AI/4DI)

Analog Input

- **Channels** 4
- **Resolution** 16bits Bipolar; 15bits Unipolar
- **Sampling Rate** 10Hz (Total) with 50/60Hz Rejection
- **Accuracy** \pm 0.1% for Voltage Input; \pm 0.2% for Current Input
- **Input Range** 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, \pm 150mV, \pm 500mV, \pm 1V, \pm 5V, \pm 10V, 0~20mA, \pm 20mA, 4~20mA
- **Input Impedance** $>$ 1M Ω (Voltage)
240 Ω (External resistor for current)
- **Support Data** Scaling and Averaging

Digital Input

- **Channels** 4 (Dry Contact)
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Supports keep/discard counter value on power-off**
- **Support inverted digital input status**

WISE-S250 (6DI, 2DO & 1RS-485)

Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 3kHz Frequency Input**

Digital Output (Sink Type)

- **Channel** 2
- **Output Current** 100 mA
At 0 \rightarrow 1: 100 us
At 1 \rightarrow 0: 100 us
(for Resistive Load)
- **Supports Pules Output** 5 kHz
- **Max. Load Voltage** 30V

Serial Port

- **Port Number** 1
- **Type** RS-485
- **Data Bits** 7, 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU (Total 32 addresses by 8 max. instructions)

WISE-S251 (6DI/1RS-485)

Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Supports keep/discard counter value on power-off**
- **Support inverted digital input status**

Serial Port

- **Port Number** 1
- **Type** RS-485
- **Data Bits** 7, 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU (Total 32 address by max. 8 instructions)

Ordering Information

Wi-Fi 2.4G Wireless I/O Module

- **WISE-4220-A** Wi-Fi 2.4G Wireless I/O Module
- **WISE-4220-S231-A** Wi-Fi 2.4G Wireless Module with Temperature and Humidity Sensor

WISE-S200 I/O Module

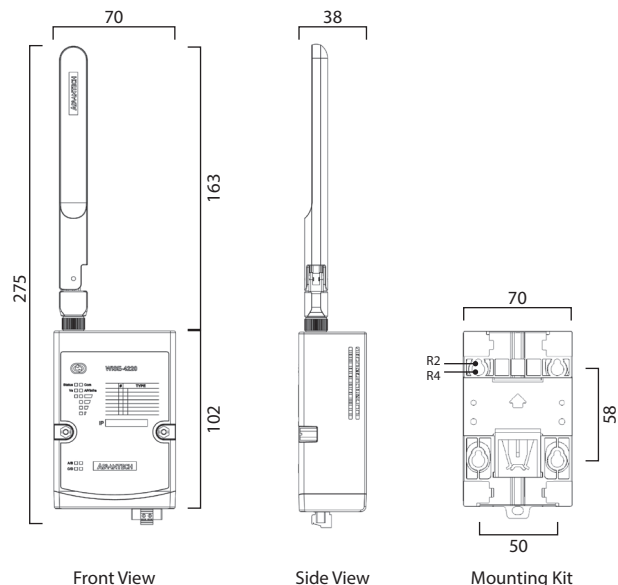
- **WISE-S214-A** 4AI/4DI
- **WISE-S250-A** 6DI, 2DO & 1RS-485
- **WISE-S251-A** 6DI & 1RS-485

Accessories

- **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



WISE-4250AS

Industrial Wi-Fi 2.4G/5G Wireless I/O Module driving with Azure Sphere

Preliminary



Features

- 2.4GHz/5GHz Wi-Fi reducing the wiring cost during big data acquisition
- IEEE 802.11 a/b/g/n with dual band 1T1R support
- Build-in security subsystem with its own dedicated Cortex-M4F core for secure boot and secure system operation
- Secure Over The Air (OTA) updates infrastructure
- Robust application deployment
- Reliable System software updates

Introduction

The WISE-4250AS series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O and sensor types, the WISE-4250AS series is programmable to provide data pre-scaling, data logic, and data logger functions. The device is powered by Microsoft with Azure Sphere inside.

Azure Sphere is an end-to-end solution for securing MCU powered devices, from silicon partners, with built-in Microsoft security technology provide connectivity and a dependable hardware root of trust. The Azure Sphere Security Service renews device security in several ways.

Secure Over The Air (OTA) updates infrastructure

- Cloud infrastructure can deliver updates to Azure Sphere devices around the world

Robust application deployment and updates

- Customer written applications are signed, deployed and updated by the customer using the Azure Sphere cloud.
- Attestation authorizes only genuine software to execute on device.

Reliable System software updates

- Microsoft automatically manages updating device software to help ensure secure device operation.
- Updates are delivered privately to device creators first to test updates

How Does WISE-4250AS Work

Advantech offer the high adaptability interchangeable I/O module and sensors as well as the I/O configuration and SDK by each model. Users can follow the examples to compile their own codes for the device to ensure all compatibility and functionality of the hardware device.

Following is that end users or system integrator claim the device to their Azure Sphere tenant by developing the integrated application based on Advantech device and Microsoft software stack. Please take note that claiming is a one-time operation that you cannot undo even if the device is sold or transferred to another person or organization. A device can be claimed only once. Once claimed, the device is permanently associated with the Azure Sphere tenant.

One of the features of the WISE-4250AS is its advanced end-to-end IoT security with Microsoft Visual Studio IDE for not only accelerated application software development and debugging but also provide the application development by function.

Specifications

WISE-4250AS (WiFi IoT Modular I/O)

Wireless Specification

- **WLAN Standard** IEEE 802.11a/b/g/n
- **Frequency Band** 2.4GHz/5GHz ISM Band
- **Transmit Power** 802.11a: 13dBm Typ.
802.11b: 15dBm Typ.
802.11g: 15dBm Typ.
802.11n(2.4GHz): 15dBm Typ.
802.11n(5GHz): 13dBm Typ.
- **Antenna** Chip antenna with 2.2dBi peak gain
- **Certification** FCC, CE
- **Dimensions (W x H x D)** 70 x 102 x 38 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, stack, and pole

General Specification

- **Power Input** 10 ~ 50 V_{DC}
- **Power Consumption** 3W @24V_{DC}
- **Power Reversal Protection**
- **Supports User Defined Modbus Address**

Environment

- **Operating Temperature** -25 ~ 70°C (-13~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 5 ~ 95% RH (non-condensing)

WISE-4250AS-S231 (Built-in Temperature and Humidity Sensor)

Temperature Sensor

- **Operating Range** -25°C ~ 70°C (-13°F ~ 157.9°F)
- **Resolution** 0.1 (°C/°F/K)
- **Accuracy (Typ.)** ±2.0°C (±35.6°F) (vertical installation)

Humidity Sensor

- **Operating Range** 10 ~ 90% RH
- **Resolution** 0.1% RH
- **Accuracy (Typ.)** ±4% RH @ 10%~50% RH
±6% RH @ 50%~60% RH
±10% RH @ 60%~90% RH

WISE-S214 (4AI/4DI)

Analog Input

- **Channels** 4
- **Resolution** 16bits Bipolar; 15bits Unipolar
- **Sampling Rate** 10Hz (Total) with 50/60Hz Rejection
- **Accuracy** ±0.1% for Voltage Input; ±0.2% for Current Input
- **Input Range** 0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, ±150mV, ±500mV, ±1V, ±5V, ±10V, 0~20mA, ±20mA, 4~20mA
- **Input Impedance** >1MΩ (Voltage); 240 Ω (External resistor for current)
- **Support Data** Scaling and Averaging

Digital Input

- **Channels** 4 (Dry Contact)
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Support inverted digital input status**

WISE-S250 (6DI, 2DO & 1RS-485)

Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 3kHz Frequency Input**

Digital Output (Sink Type)

- **Channel** 2
- **Output Current** 100 mA
At 0 -> 1: 100 us
At 1 -> 0: 100 us (for Resistive Load)
- **Supports Pules Output** 5 kHz
- **Max. Load Voltage** 30V

Serial Port

- **Port Number** 1
- **Type** RS-485
- **Data Bits** 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU (Total 32 addresses by 8 max. instructions)

WISE-S251 (6DI/1RS-485)

Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Support inverted digital input status**

Serial Port

- **Port Number** 1
- **Type** RS-485
- **Data Bits** 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU (Total 32 address by max. 8 instructions)

Ordering Information

Wi-Fi 2.4G/5G Wireless I/O Module

- **WISE-4250AS-A** 2.4G/5G WiFi IoT Wireless Modular I/O
- **WISE-4250AS-S231-A** 2.4G/5G WiFi IoT Wireless Modular I/O with Temperature & Humidity Sensor

WISE-S200 Modular I/O for WISE-4200 Series

- **WISE-S214-A** 4AI/4DI
- **WISE-S250-A** 6DI, 2DO & 1RS-485
- **WISE-S251-A** 6DI & 1RS-485

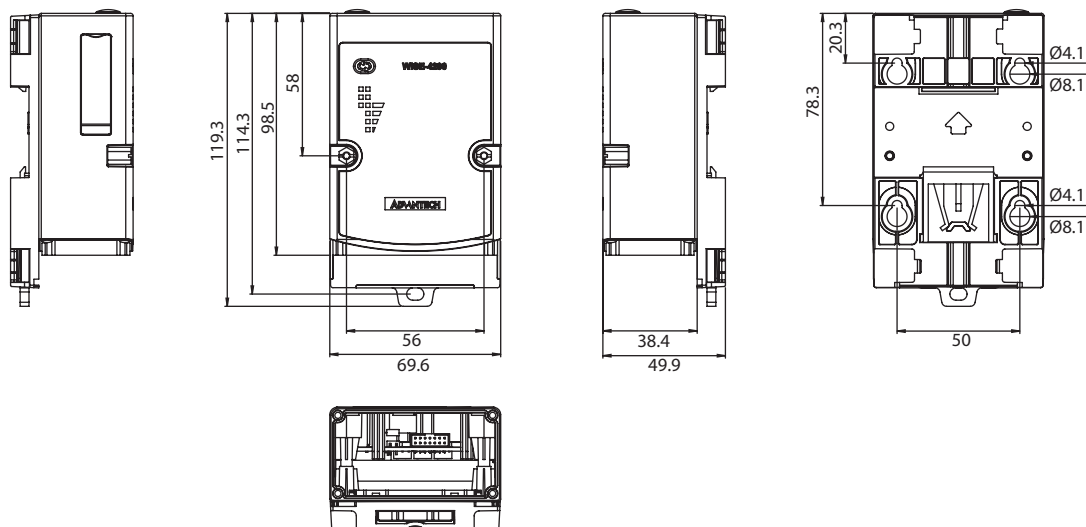
Accessories

- **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)

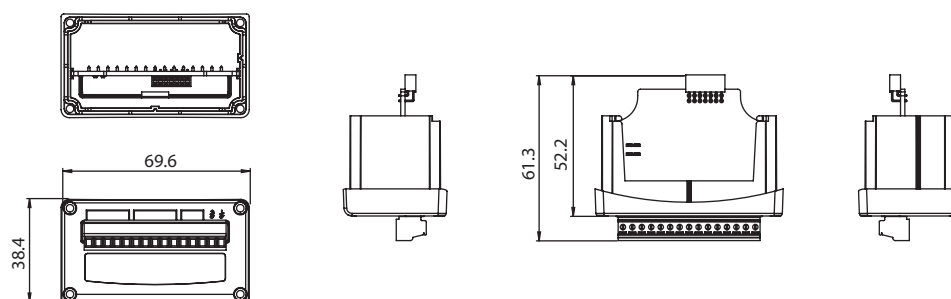
Dimensions

Unit: mm

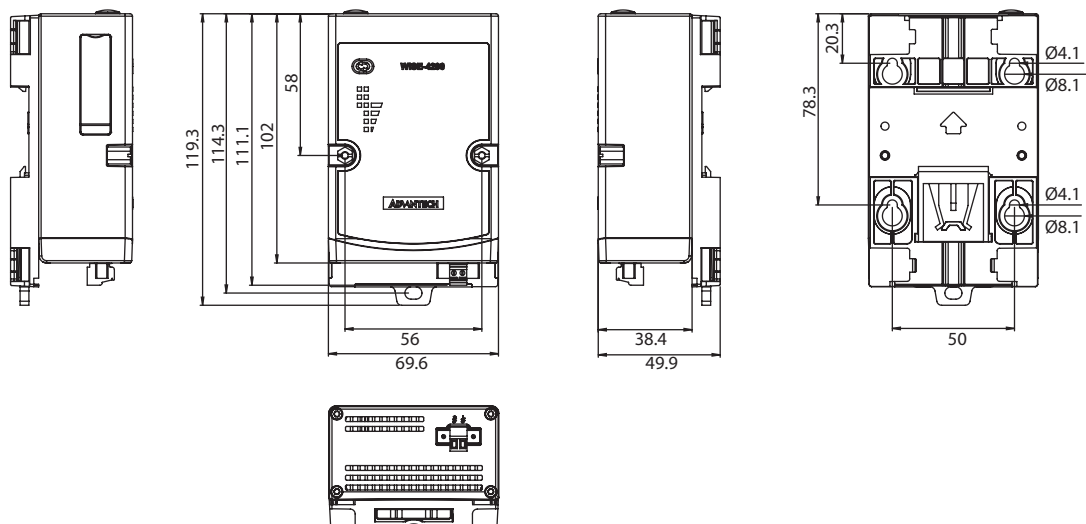
WISE-4250AS



WISE-S200 I/O



WISE-4250AS-S231



WISE-4671

Advanced Industrial Cat. NB1/ Cat. M1 Wireless I/O Module

NEW



Introduction

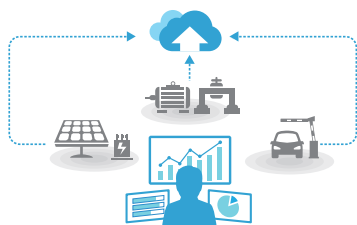
NB-IoT and LTE Cat M1 are new wireless technologies included in the 5G evolution of cellular technology standards defined by the 3rd Generation Partnership Project (3GPP). NB-IoT and LTE Cat M1 feature low power consumption and utilize LTE networks based on licensed spectrum bands. These technologies are optimized for connectivity to machines, assets and sensors in order to enable IoT applications such as smart cities, smart agriculture and remote asset management.

WISE-4671 series is a cellular based IoT wireless sensor node compliant with LTE Cat. NB1 and Cat. M1 with external for flexible installation. In addition to offering various I/O types, WISE-4671 series provides a data logger and direct cloud connectivity so that data can be published to the cloud by messaging protocol such as MQTT, CoAP, LwM2M with secure socket supported.

Features

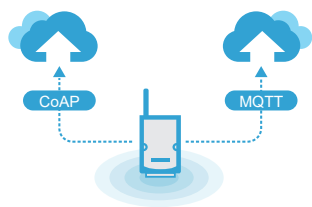
Automatic Connection with Cloud

By utilizing leading IoT messaging protocols such as MQTT and CoAP, WISE-4671 series easily integrates with popular cloud services, reducing setup complexity and accelerating implementation.



Open Connectivity for Cloud and System

WISE-4671 series support CoAP and MQTT communication protocols while continually integrating mainstream cloud services to simplify the complexity of data integration.

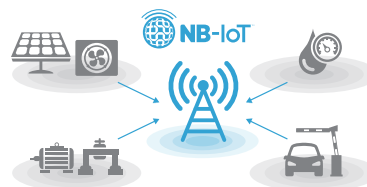


Features

- Global coverage of Cat. NB1 and Cat. M1 frequency bands
- Application-ready I/O combination with optional IP65 I/O
- Wide voltage power input with 10 ~ 50V_{DC}
- Data buffered function with time stamp prevents data loss
- Fast and easy deployment to reduce operation cost
- Supports direct cloud service for IoT integration
- Support MQTT, CoAP & LwM2M protocol
- GPS/Galileo/BeiDou/GLONASS support

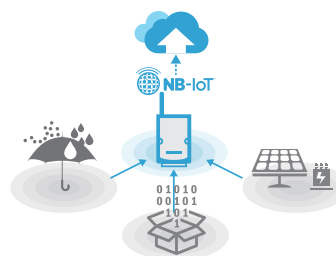
Legacy and Existing Devices to NB-IoT/LTE-M

WISE-4671 series offer digital I/O, 4~20-mA analog and RS-232/485 interfaces for various applications, quickly providing NB-IoT/LTE-M network functions to existing devices and assets.



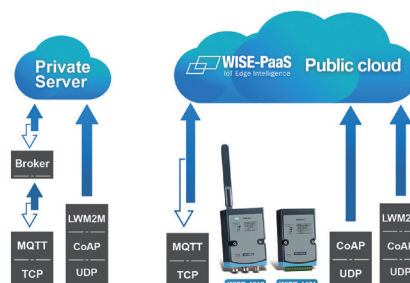
Upgrade Legacy Equipment through Cloud Management

WISE-4671 series NB-IoT/LTE-M sensor nodes are suitable for data collection from widely distributed assets. No complicated programming, setup, or registration are required for a fast introduction into IoT applications such as smart cities, smart water/electricity meters, and remote facility management.



Device to Cloud System Architecture

WISE-4671 series wireless sensor nodes support the open communication protocols MQTT, CoAP, and LwM2M. Users can transmit data to specific public cloud services or existing private cloud platforms by publish/subscribe or push.



Specification

Wireless Communication

- **3GPP Standards** R.13, Cat. NB1/ Cat. M1
- **Frequency Band** B2, B3, B4, B8, B12, B13, B20, B28
- **Antenna Type** External

GPS

- **GNSS Systems** GPS, GLONASS, Galileo, BeiDou and QZSS signals
- **Max. Update Rate** Every 15 seconds
- **Accuracy** Position: 2.5 m Typ.
- **Acquisition** Cold starts: 31s Typ.
- **Antenna Type** Internal

General

- **Power Input**
 - Built-in 4100mAh Lithium rechargeable battery pack 10~50V_{DC}
 - external power
 - 17-21V_{DC} Solar Panel
- **Power Consumption**
 - Non-battery Charging: 1.4W @ 12V_{DC}
 - When Battery Charging: 11W @ 24V_{DC}
- **Configuration Interface** Micro-B USB
- **SIM** 4FF/Nano SIM
- **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, Signal Level, Battery Level
- **Mounting** DIN 35 rail, wall, and pole
- **Dimension (W x H x D)** 82 x 122 x 49 mm (without antenna)
- **Certification** CE, FCC, PTCRB, AT&T, Verizon

Operating Temperature

- **With rechargeable battery** 0 ~ 60 °C (32 ~ 140 °F)
- **Without battery** -25 ~ 70 °C (-13 ~ 158 °F)

Storage Temperature

- **With rechargeable battery** -20 ~ 60 °C (-4 ~ 140 °F)
- **Without battery** -40 ~ 85 °C (-40 ~ 185 °F)
- **Operating Humidity** 5 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

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)
- **Isolation Voltage** 2000 V_{DC}
- **Common Mode Voltage** 350 V_{DC}
- **Drift**
 - Unipolar ±100ppm
 - Bipolar ±50ppm
- **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 DI COM
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Inverted DI Status**

WISE-S615 (4 RTD)

Analog Input

- **Channels** 4 differential
- **Input Connections** 2, 3-wire
- **Input Impedance** 10 M Ω
- **Resolution** 15 bits
- **Sampling Rate** 1 Sample/s (MAX)
- **RTD Types and Temperature Ranges**
 - Pt 100 RTD**
 - RTD 100 (a = 0.00385) -200°C to 600°C
 - RTD 100 (a = 0.00392) -200°C to 600°C
 - Pt 1000 RTD**
 - Pt -40°C to 160°C
- **Accuracy** ±0.1% FSR
- **CMR @ 50/60 Hz** 90 dB
- **NMR @ 50/60 Hz** 60 dB
- **Span Drift** ± 25 ppm/°C

WISE-S617 (2AI/2DI/1DO/1RS-485)

Digital Input

- **Channel** 2
- **Logic Level**
 - 0: Open
 - 1: Close to DI COM
- **Non-isolation**
- **Supports 32-bit counter input function** (maximum signal frequency: 200 Hz)
- **Supports keep/discard counter value when power OFF**
- **Supports frequency input function** (maximum signal frequency: 200 Hz)
- **Supports inverted digital input status**

Analog Input

- **Channels** 2
- **Resolution** 16 bit
- **Sampling Rate** 1 Hz per channel
- **Accuracy**
 - ±0.1% of FSR (Voltage)
 - ±0.2% of FSR (Current)
- **Input Range**
 - ±1 V, ±5V, ±10V, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, ±20mA
- **Input Impedance**
 - > 2M Ω (Voltage)
 - 120 Ω (External Resistor for Current)
- **Isolation Voltage** 2000 V_{RMS}
- **Common Mode Voltage** 350 V_{DC}
- **Drift**
 - Unipolar ±100ppm
 - Bipolar ±50ppm
- **Burn-Out Detection** Yes (4 ~ 20mA only)
- **Supports data scaling and averaging**

Digital Output

- **Channel** 1 (Sink Type)
- **Non-isolation**
- **Output Current** 100mA

COM Port

- **Port Type** RS-485
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Data Bits** 7, 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Flow Control** Auto flow control
- **Signals** DATA+ and DATA-
- **Protection** 15 kV ESD
- **Supported Protocols** Modbus/RTU (Up to 32 addresses with a maximum of 8 instructions)

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

- **Port Number** 2
- **Type** COM1: RS-485
COM1: RS-485/232
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 DI COM
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Inverted DI Status**

Ordering Information**Advanced Industrial Cat. NB1/Cat. M1 Module**

- **WISE-4671-UA** Advanced Industrial Cat. NB1/ Cat. M1 Wireless Module

WISE-S600 IP65 I/O Module with M12 Connectors

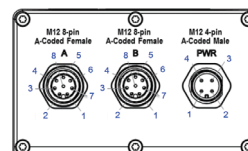
- **WISE-S614-A** 4AI/4DI
- **WISE-S615-A** 4RTD
- **WISE-S617-A** 2AI/2DI/1DO/1RS-485 w/ 2ch 12V_{DC} power output
- **WISE-S672-A** 6DI/1RS-485/1RS-485 or RS-232

WISE-S600T I/O Module with Terminal Block

- **WISE-S614T-A** 4AI/4DI
- **WISE-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)

Pin Assignment

Model Name	M12 Cable	WISE-S614	WISE-S615	WISE-S617	WISE-S672
Pin Number	4Pin : 1700028162-01 8Pin : 1700028163-01				
P/N		WISE-S614-A	WISE-S615-A	WISE-S617-A	WISE-S672-A
A	1 White	DI0	RTD2+	AI0+	DI0
	2 Brown	DI1	RTD2-	AI0-	DI1
	3 Green	DI2	RTD2 COM	+12V Out0	DI2
	4 Yellow	DI3	NC	+12V Out GND	DI3
	5 Gray	NC	RTD3+	AI1+	DI4
	6 Pink	NC	RTD3-	AI1-	DI5
	7 Blue	NC	RTD3 COM	+12V Out1	NC
	8 Red	DI COM	NC	+12V Out GND	DI COM
B	1 White	AI0+	RTD0+	DI0	RS-485 D1-
	2 Brown	AI0-	RTD0-	DI1	RS-485 D1+
	3 Green	AI1+	RTD0 COM	DI COM	RS-232 TX
	4 Yellow	AI1-	NC	DO0	RS-232 RX
	5 Gray	AI2+	RTD1+	DO GND	RS-485 D2-
	6 Pink	AI2-	RTD1-	RS-485 D+	RS-485 D2+
	7 Blue	AI3+	RTD1 COM	RS-485 D-	NC
	8 Red	AI3-	NC	RS-485 GND	RS-232 GND
PWR	1 Brown	+VS	+VS	+VS	+VS
	2 White	-VS	-VS	-VS	-VS/ SP-
	3 Blue	SP+	SP+	SP+	SP+
	4 Black	SP-	SP-	SP-	NC

Dimensions

Unit: mm

