WISE-4250

Wi-Fi 2.4/5 GHz 802.11 a/b/g/n/ac I/O and Sensor Module

NEW

Features

- Wi-Fi Dual band 2.4/5 GHz up to 802.11 a/b/g/n/ac
- Supports interchangeable I/O and Sensor module
- Supports the smart roaming function
- Supports MQTT, Modbus/TCP, SNTP, TCP/IP, HTTPS, RESTful, UDP, and DHCP protocols
- Supports the WPA3 /TLS1.3 encryption protocol
- UDP-based AES-128 encrypted wireless P2P (Peer-to-Peer) function
- Easy configuration via web UI with mobile devices and PC
- 10000+ data logger with SNTP/RTC time synchronization and WDT (Watchdog Timer) auto connection recovery
- Supports Dropbox, WebAccess, iSensing MQTT, IFTTT, Azure, AWS, Azure MQTT, Line messaging API, and other cloud services
- Supports SNMP network monitoring. User can remotely monitor, manage, and control network devices

Introduction

The WISE-4250 series is an Ethernet-based wireless IoT device that is compatible with various I/O and sensors. It is integrated with IoT data acquisition, processing, and publishing functions and can communicate with different WISE devices via the P2P function. Wireless watchdog timer, smart roaming, timestamped data logger, and data recovery functions can enhance connection quality and mitigate the risk of data loss. Data and connections can also be protected via the WPA3/TLS1.3 encryption protocol. It can be accessed via PC and mobile devices and data can be published to diverse types of clouds.

Features

IEEE 802.11 a/b/g/n/ac 2.4/5GHz 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-4250 to be accessed via other Wi-Fi devices directly as an AP.

Smart Roaming

This function help WISE-4250 series communicate and connect to surrounding AP much more flexibly and effectively to prevent long disconnection idle time and setup more stable network. 802.11 k/v/r are also supported to help on better signal strength management in advance and faster connection time.
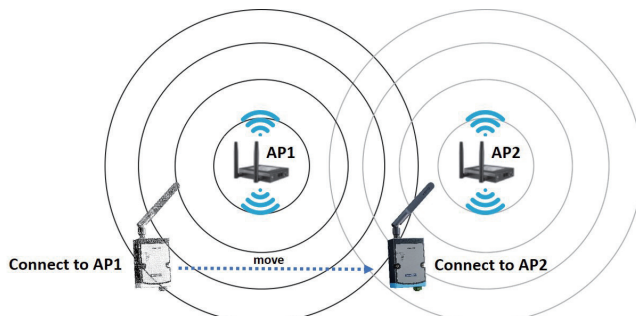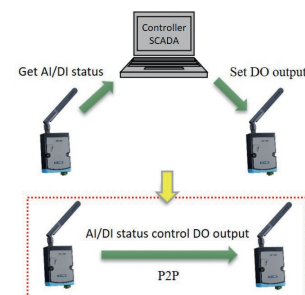

Data Logger and Recovery

The WISE-4250 can log 10000+ data with timestamp and system log normally or if there's any wireless dis-connection gap. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function. This function helps no missing data and help tracking complete data.

Peer to Peer (P2P)

This function allows modules to send signals to each other remotely (up to 16 devices). These signals can be sent periodically or triggered by a change in status (e.g., an AI/DI input change triggering a DO output). It supports two modes: a basic mode for a single target module/channel and an advanced mode for multiple target modules/channels.

By utilizing P2P technology, modules can communicate directly, effectively reducing latency and improving response time. Furthermore, data transmission uses the UDP protocol and can be encrypted with AES-128 to ensure communication security.

Security Features

☐ X.509 Certificate

Digital Certificate

☐ WPA2 & WPA3 Personal/Enterprise

Protect Wi-Fi networks from attacks
- WPA3 uses a longer 192-bit key, further enhancing security.

☐ TLS1.3 encryption

Cryptographic Protocol
- Secures data transmission between clients and the server
- Supports **EAP-PEAP** and **EAP-TLS** security types

☐ AES-128 encrypted

- UDP based AES-128 (advanced encryption standard) encrypted wireless **P2P** (Peer to Peer) function

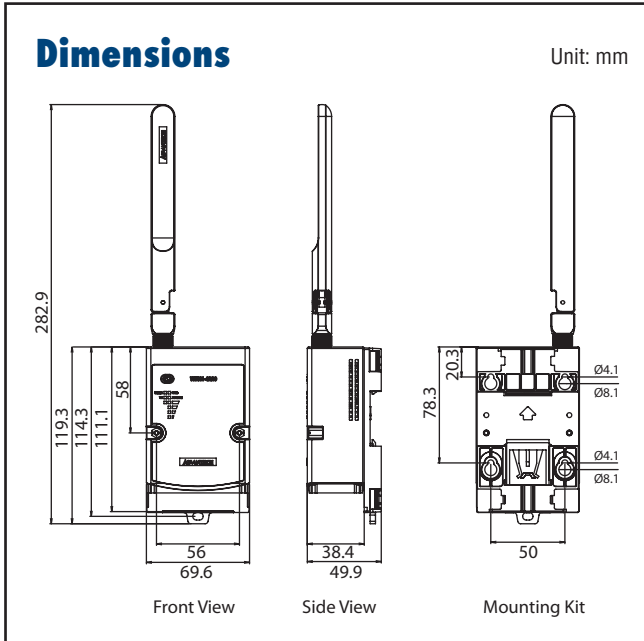## HTML5 Web Configuration Interface

All the configuration interfaces are applied in web service, and the web pages are based on HTML5, so users can configure the WISE-4250 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4250.

RESTful Web Service with Security Socket

WISE-4250 also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4250 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4250 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).

Data Storage with RTC Time Stamp

Public and Private Cloud Connectivity

Dimensions

Unit: mm

Front View

Side View

Mounting Kit

Specifications

General

- **WLAN Standard** IEEE 802.11a/b/g/n/ac
- **Modulation** 802.11b : CCK(11, 5.5Mbps), DQPSK(2Mbps), BPSK(1Mbps)
  802.11a/g/n/ac : OFDM
- **Transmit Power** 2.4 GHz
  802.11b: 16.0 dBm ±2dBm
  802.11g: 14.0 dBm ±2dBm
  802.11n: 12.0 dBm ±2dBm
  5 GHz
  802.11a: 13.0 dBm ±2dBm
  802.11n: 10.0 dBm ±2dBm
  802.11ac: 8.0 dBm ±2dBm
- **Wireless Security** X.509 (TLS1.2/1.3), WPA2/WPA3 Personal and Enterprise
- **Antenna** Connector: RP-SMA
  Gain (Peak): 2.4G 3.64 dBi / 5G 5.65 dBi
- **Connectors** Plug-in-and-play I/O and sensor modules
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, IC, TELEC
- **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** 1.6W @ 24 V_{DC}
- **RTC Accuracy** ±2 second/day
- **Cloud** Dropbox, WebAccess, iSensing MQTT, IFTTT, Azure, AWS, Azure MQTT, Line messaging API
- **Support wireless P2P (Peer to Peer) with AES-128 encryption and UDP protocol**
- **Support MQTT data recovery function**
- **Support smart roaming function and 802.11k/v/r**
- **Supports User Defined Modbus Address**
- **Power Reversal Protection**
- **Supports Data Log** 10000+ samples with SNTP/RTC sync time stamp
- **Supported Protocols** Modbus/TCP, TCP/IP, SNMP V2, SNTP, UDP, DHCP, HTTP, HTTPS, and MQTT
- **Supports RESTful API Client/Server 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** 10 ~ 85% RH (non-condensing)
- **Storage Humidity** 0 ~ 60% RH (non-condensing)

Supported I/O module

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 (current)
- **Support Data**   Max/min, Scaling and Averaging
- **Burn-out Detection Yes (4~20mA only)**
- **Switch Label**
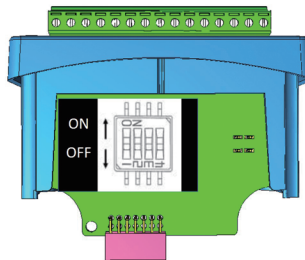
DI Switch	Status	Condition
SW1 (Vo0)	ON	Current Input
	OFF	Voltage Input
SW2 (Vo1)	ON	Current Input
	OFF	Voltage Input
SW3 (Vo2)	ON	Current Input
	OFF	Voltage Input
SW4 (Vo3)	ON	Current Input
	OFF	Voltage Input

Digital Input

- **Channels**   4 Dry Contact (Wet Contact by request for customization)
- **Logic Level**   0: Open 1: Close to DI COM
- **Compatibility**   3.3V/TTL
- **Channel Mode**   DI (Logic status), Counter, Low to High Latch, High to Low Latch, Frequency
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Supports keep/discard counter value on power-off**
- **Support inverted digital input status**
- **Support configuration by each channel**
- **Support digital filter (min 0.1ms)**
- **Support high-to-low and low-to-high latch**

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

Digital Input

- **Channels**   6 Dry Contact (Wet Contact by request for customization)
- **Logic Level**   0: Open 1: Close to DI COM
- **Compatibility**   3.3V/TTL
- **Channel Mode**   DI (Logic status, Counter, Low to High Latch, High to Low Latch, Frequency
- **Supports 3kHz Frequency Input**
- **Supports 3kHz Counter Input (32-bit + 1-bit overflow)**
- **Supports keep/discard counter value on power-off**
- **Support inverted digital input status**
- **Support configuration by each channel**
- **Support digital filter (min 0.1ms)**
- **Support high-to-low and low-to-high latch**

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
- **Support pulse high/low width and duty cycle adjustment**
- **Support high to low and low to high delay time setup**

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 64 addresses by 30 max. instructions)
- **Support Server response timeout and Delay between Polls setting**

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

Digital Input

- **Channels**   6 Dry Contact (Wet Contact by request for customization)
- **Logic Level**   0: Open 1: Close to DI COM
- **Compatibility**   3.3V/TTL
- **Channel Mode**   DI (Logic status), Counter, Low to High Latch, High to Low Latch, Frequency
- **Supports 200Hz Counter Input (32-bit + 1-bit overflow)**
- **Supports keep/discard counter value on power-off**
- **Support inverted digital input status**
- **Support configuration by each channel**
- **Support digital filter (min 0.1ms)**
- **Support high-to-low and low-to-high latch**

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 64 addresses by 30 max. instructions)
- **Support Server response timeout and Delay between Polls setting**

WISE-S252 (12DI/12DO)

Digital Input

- **Channels**   12
- **Logic Level**   – Dry Contact 0: Open
   1: Close to DCOM
                          – Wet Contact 0: -5~5 V_{DC}
                                         1: -17~-30 V_{DC} or 17~30 V_{DC} (2 mA min.)
- **Input Voltage**   50 V_{DC} max
- **Isolation**   3,000 Vrms
- **Channel Mode**   DI (Logic status), Counter, Low to High Latch, High to Low Latch, Frequency

- Supports 1kHz Counter Input (32-bit + 1-bit overflow)
- Supports keep/discard counter value on power-off
- Support inverted digital input status
- Support digital filter (min 0.1ms)
- Support high-to-low and low-to-high latch
- Contact Type Label (Dry/Wet)
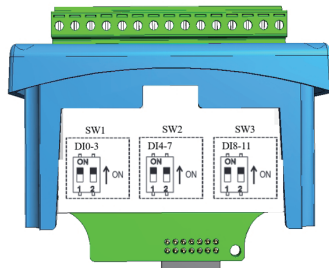
| DI Switch	Status	Condition
SW1-1	ON	DI 0-3 Dry Contact
SW1-2	OFF	DI 0-3 Wet Contact
SW2-1	ON	DI 4-7 Dry Contact
SW2-2	OFF	DI 4-7 Wet Contact
SW3-1	ON	DI 8-11 Dry Contact
SW3-2	OFF	DI 8-11 Wet Contact

- I/O Label
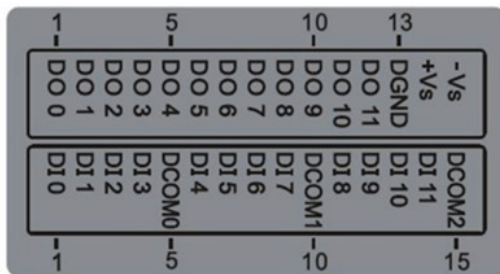
Digital Output (Sink Type)

- **Channel**   12
- **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
- **Support pulse high/low width and duty cycle adjustment**
- **Support high to low and low to high delay time setup**

WISE-S232 (Temperature & Humidity Sensor)

Dimensions

265 mm
132 mm
51 mm
69.6 mm
18.5 mm

WISE-4250-S232   WISE-S232
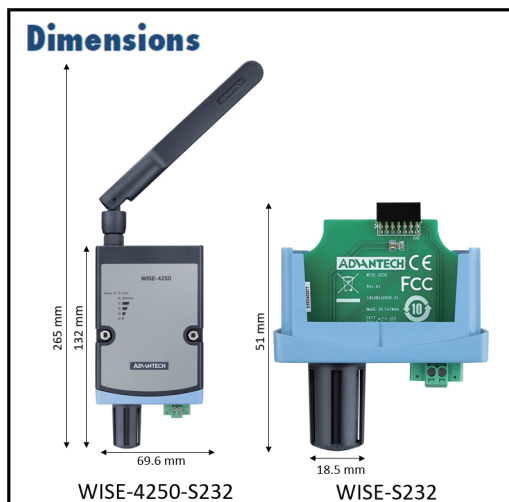
Temperature

- **Operating Range**   -25°C ~ 70°C (77°F ~ 158°F)
- **Update Rate**   Min. 1 second (with WISE-4250)
- **Resolution**   0.01 (°C)
- **Accuracy**   ±1°C (at 25°C)
- **Response time**   2 seconds (at 25°C and 1m/s airflow)
- **Long Term Drift**   <0.04°C/year

Humidity

- **Operating Range**   0 ~ 100% RH (Recommended 20~80% RH)
- **Update Rate**   Min. 1 second (with WISE-4250)
- **Resolution**   0.01% RH
- **Accuracy**   ±4% RH (at 25°C) @ 0%~90% RH
                         ±5% RH (at 25°C) @ 90%~100% RH
- **Response time**   6 seconds (at 25°C and 1m/s airflow)
- **Long Term Drift**   <0.5%RH/year

* Default value of measurement interval is 15 seconds, user can set in the configuration page.
* Users can independently procure and replace accessories (cap and ePTFE membrane) to enhance protection in harsher environments.

Ordering Information

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

- **WISE-4250-A**   Wi-Fi 5 2.4/5GHz Wireless I/O Module

WISE I/O Module

- **WISE-S214-A**   4AI/4DI
- **WISE-S250-A**   6DI, 2DO & 1RS-485
- **WISE-S251-A**   6DI & 1RS-485
- **WISE-S252-A**   12DI (support dry/wet contact) & 12DO
- **WISE-S200/S400**   can be customized based on requirement
- **WISE-S232**   Temperature & Humidity Sensor

Accessories

- **96PSD-A30W24-DS**   DIN Rail Power Supply (1.25A Output Current)
- **BB-RPS-V2-WR2-US**   Power Supply, 12V/1A, US plug
- **BB-RPS-V2-WR2-EU**   Power Supply, 12V/1A, EU plug
- **1750008648-01**   2.4/5GHz External Dipole Antenna, Peak Gain: 2.4G 3.64 dBi / 5G 5.65 dBi
- **1750008767-01**   Magnetic Antenna Extend Cable Base 150cm
- **1760000897-11**   RTC Battery 3V/200 mAh with Cable Connector
- **EKI-6333AC-2G**   IEEE 802.11 a/b/g/n/ac Concurrent Dual-Band Wi-Fi AP/Client