WISE-4250

Dual-Band Wi-Fi 5 Industrial IoT Wireless I/O Module

Features

- Supports IEEE 802.11ac (2.4/5GHz) to reduce interference and ensure stable high-speed transmission
- Supports interchangeable antenna, I/O and Sensor module
- Supports 802.11k/v/r for seamless switching between Access Points (APs), ensuring zero data loss for mobile applications like AGVs
- Secures data with WPA3, TLS 1.3 encryption, and X.509 certificates. Includes IP Access Control (Whitelisting) for enhanced network protection
- Decentralized P2P Enables direct device-to-device control. Input events on one module can instantly trigger outputs on another without a central controller
- Supports Dropbox, WebAccess, iSensing MQTT, IFTTT, Azure, AWS, Azure MQTT, Line messaging API, and other cloud services

Introduction

The WISE-4250 series is a robust wireless IoT solution designed for industrial applications. Featuring dual-band Wi-Fi (2.4/5GHz) and an interchangeable modular design, it integrates data acquisition, processing, and publishing into a single device. With built-in support for MQTT, RESTful APIs, and decentralized P2P communication, the WISE-4250 enables rapid deployment without complex programming. To ensure mission-critical reliability, it features smart roaming (802.11k/v/r) and enterprise-grade security (WPA3/TLS 1.3), making it ideal for AGV, facility monitoring, and machine automation.

Features

Robust & Versatile Hardware Architecture

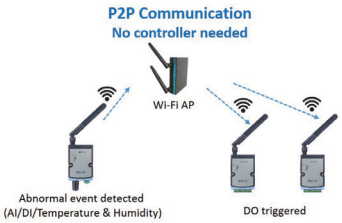
Engineered for harsh environments, the WISE-4250 combines dual-band Wi-Fi 5 connectivity with interchangeable I/O modules. It features a wide 10~50 VDC power input , flexible DIN-rail/wall/pole mounting , and a built-in data logger (10,000+ samples), delivering all-in-one industrial reliability in a compact form factor

Peer to Peer (P2P)

WISE-4250 supports Peer-to-Peer communication for direct device-to-device control without relying on SCADA or PLC systems, enabling real-time, decentralized, and low- latency responses.

Up to 16 modules can be linked. Signals can be sent periodically or triggered by input status changes (e.g., DI/AI input triggering DO output).

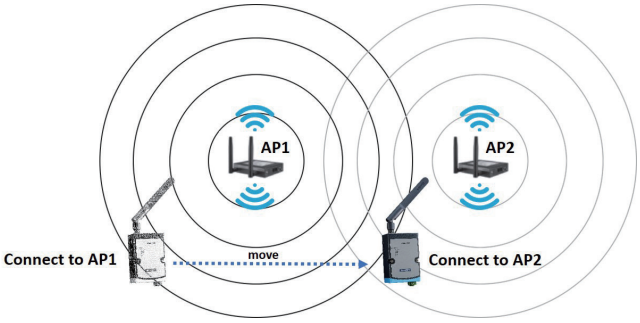
Communication uses UDP and supports AES-128 encryption for enhanced security.



Smart Roaming

Smart roaming allows WISE-4250 to dynamically connect to the most optimal access point.

With 802.11k/v/r support, the device significantly reduces connection downtime and ensures reliable wireless coverage in roaming environments.



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

Last updated: 27-Nov-2025

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, NBTC, RCM
- **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
- **Reliability Test** IEC60068-2-64 Vibration broadband random test
  Package Drop Test
- **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(S), 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

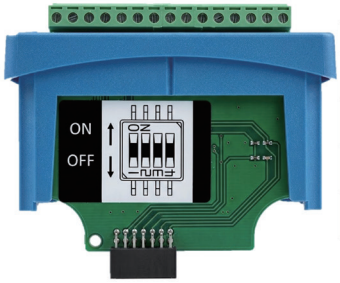
- **Operating Temperature** -25 ~ 70°C (-13~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 10 ~ 85% RH (non-condensing)
- **Storage Humidity** 0 ~ 60% RH (non-condensing)

Supported I/O module

WISE-4250-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
- **Supports Burn-out Detection (4~20mA only), prevent failures and downtime**
- **Supports High/Low value Alarm modes**
- **Supports Latch and Momentary Alarm Modes**
- **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
- **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-4250-S250 (6DI, 2DO& 1RS-485)

Digital Input

- **Channels** 6 Dry Contact
- **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**
- **Supports Fail Safe Value (FSV) function, ensures system safety by automatically setting outputs to a predefined state upon communication failure, maximizing safety and preventing unexpected behavior**

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 Supports up to 64 addresses with a maximum of 30 Rules (instructions)
- **Support Server response timeout and Delay between Polls setting**
- **Supports quick setting with Advantech's sensor, reduce the complexity of setting.**

WISE-4250-S251 (6DI/1RS-485)

Digital Input

- **Channels** 6 Dry Contact
- **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**

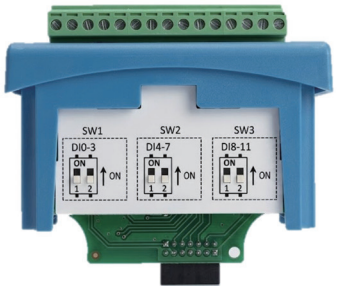
Serial Port

- **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 Supports up to 64 addresses with a maximum of 30 Rules (instructions)
- **Support Server response timeout and Delay between Polls setting**
- **Supports quick setting with Advantech's sensor, reduce the complexity of setting.**

WISE-4250-S252 (12DI/12DO)

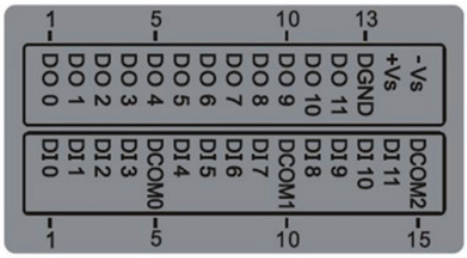
Digital Input

- **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** 30 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**



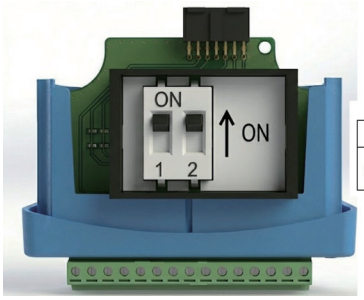
Digital Output (Sink Type)

- **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**
- **Supports Fail Safe Value (FSV) function, ensures system safety by automatically setting outputs to a predefined state upon communication failure, maximizing safety and preventing unexpected behavior**

WISE-4250-S260 (4DI/4Relay Output)

Digital Input

- **Channels** 4
- **Logic Level** – Dry Contact 0: Open
  1: Close to DCOM
  – Wet Contact 0: -5~5 V_{DC}
  1: -15~-30 V_{DC} or 15~30 V_{DC} (2 mA min.)
- **Input Voltage** 50 V_{DC} max
- **Isolation** 3,000 V_{DC}
- **Channel Mode** -Logic Status
  -Event Counter (32-bit + overflow)
  -Frequency Input
  -Latch Mode (Rising/Falling Edge)
- **Supports 1kHz Counter Input (32-bit + 1-bit overflow)**
- **Keep Last Value: Ensures counter retains data even after power loss**
- **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&SW2	ON	DI 0-3 Dry Contact
	OFF	DI 0-3 Wet Contact

Relay Output

- **Channels** 4 (Form A)
- **Contact Rating** 250 V_{AC} @ 5 A
  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 VDC
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

WISE-4250-S232 (Temperature & Humidity Sensor with a protection filter)

Temperature

- **Operating Range** -25°C ~ 70°C (-13°F ~ 158°F)
- **Update Rate** Min. 1 second, Max. 24 hours
- **Resolution** 0.01 (°C)
- **Accuracy** ±0.2°C at 25°C (Based on built-in SHT41-AD1F sensor)
- **Response time ($\tau_{63\%}$)** 2 seconds
- **Long Term Drift** <0.04°C/year

Humidity

- **Operating Range** 0 ~ 100% RH
- **Update Rate** Min. 1 second, Max. 24 hours
- **Resolution** 0.01% RH
- **Accuracy** ±1.8% RH at 25°C (Based on built-in SHT41-AD1F sensor)
- **Response time ($\tau_{63\%}$)** 4 seconds
- **Long Term Drift** <0.5%RH/year

* Default value of measurement interval is 15 seconds, user can set in the configuration page.
* The white PTFE filter membrane is pre-installed in the black cap. For environments with high oil mist or dust levels, install the filter membrane as needed.
* $\tau_{63\%}$: Time for achieving 63% of a temperature or humidity step function, measured at 25 °C and 1 m/s airflow.

Dimensions

Ordering Information

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

- **WISE-4250-A** Wi-Fi 5 (2.4/5 GHz) Wireless I/O Module
- **WISE-4250-S232** WISE-4250 with Temperature & Humidity Sensor
- **WISE-4250-S214** WISE-4250 with 4AI+4DI
- **WISE-4250-S250** WISE-4250 with 6DI+2DO+RS-485
- **WISE-4250-S251** WISE-4250 with 6DI+RS-485
- **WISE-4250-S252** WISE-4250 with 12DI+12DO
- **WISE-4250-S260** WISE-4250 with 4DI+4Relay Output

I/O board	Analog Input	Digital Input	Digital Output	RS-485	Relay Output
WISE-4250-S214	4 (Current/Voltage)	4 (Dry Contact)			
WISE-4250-S250		6 (Dry Contact)	2 (Sink Type)	1	
WISE-4250-S251		6 (Dry Contact)		1	
WISE-4250-S252		12 (Dry/Wet Contact)	12 (Sink Type)		
WISE-4250-S260		4 (Dry/Wet Contact)			4 (Form A)

WISE-4250-S232	Temperature and Humidity sensor with a protection filter

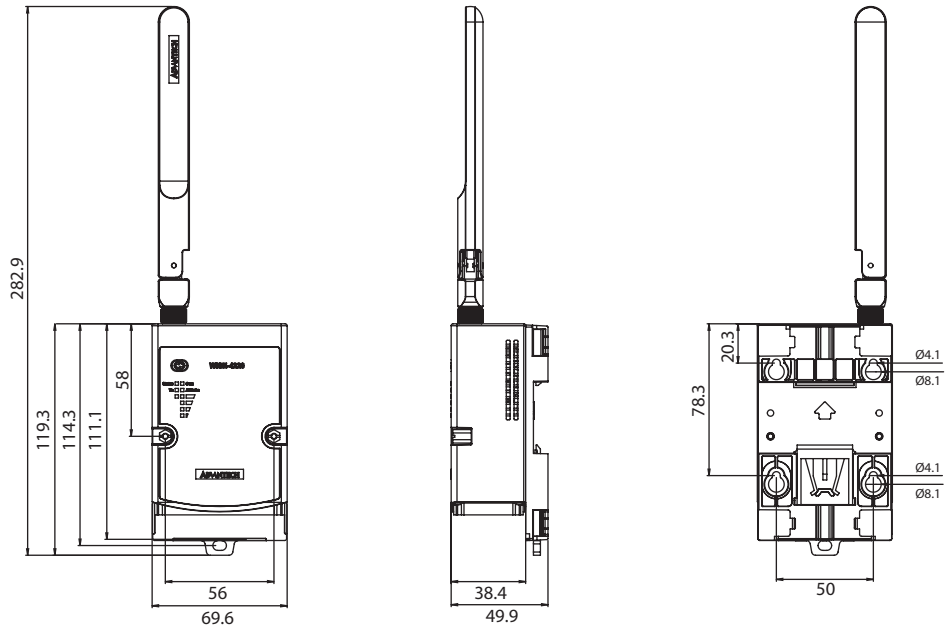
Accessories

- **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
- **BB-RPS-V2-WR2-UK** Power Supply, 12V/1A, UK plug
- **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
- **WISES2142401-T** Wet Contact 4AI/4DI I/O Module

* WISE-4250 doesn't needs to order antenna separately

Dimensions

Unit: mm



Front View Side View Mounting Kit