

# Wireless IoT Sensing Solutions

Modularized and Ready-to-Use Solutions  
High Adaptability for IoT Sensing

Vertrieb durch



**AMC – Analytik & Messtechnik GmbH Chemnitz**

Heinrich-Lorenz-Str. 55 Tel.: +49/371/38388-0  
09120 Chemnitz Fax: +49/371/38388-99  
E-Mail: info@amc-systeme.de Web: www.amc-systeme.de

- / IoT Sensing Applications
- / LPWAN and Wireless Ethernet IoT Architecture
- / IoT Technology
- / Product Highlights
- / Selection Guide



**ADVANTECH**

*Enabling an Intelligent Planet*



ADVANTECH *iAutomation*

Premier Partner

# Jump Start to **IoT Solution**...

Data acquisition has played a key role throughout the IoT era. Increasingly more devices are being interconnected and wireless applications have become the preferred network solution.

As a leading provider of IoT solutions, Advantech continues to develop a wide range of wireless sensing devices for various application fields in order to offer customers the latest solutions to complete their IoT application systems.

Be **WISE**,  
Make Sense,  
Boost Your **IoT**



Factory Environment



Machine Room



Food & Beverage Product Line



Warehouse



Data Center



## IoT Sensing Simply but Complex

### Is Wireless Transmission Reliable?

The WISE-4000 addresses concerns over low-quality wireless networks by utilizing local data storage to store data in the node, ensuring zero data loss when connections are weak or even broken.

### Will IoT Complicate System Architecture?

To send data from devices to the cloud or widely deployed aggregate devices, one might be afraid that an IoT system would become overly complex. However, with WISE-4000's cloud access ability, data can be transmitted directly to the cloud without the need for a gateway.

### How to Connect Data to the Cloud?

In IoT, the purpose of data acquisition is to connect data to the cloud in order to improve managerial efficiency. The WISE-4000 provides a wireless communication interface, IoT protocols, and pre-integrated major cloud service connectivity to facilitate connecting data to the cloud.



Water Treatment



Agriculture



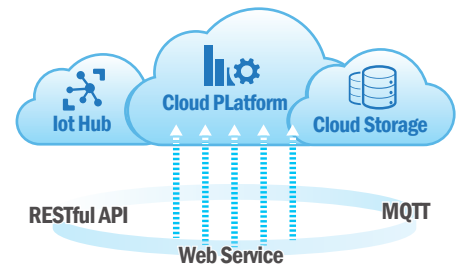
Renewable Energy

# Overcome Barriers to Connectivity with IoT and Big Data Technology

As the primary source of big data, data sensing plays a key role in the realization of IoT systems. To obtain different types of data for different IoT applications, conventional automation architecture and basic data acquisition alone are no longer sufficient, which is why Advantech has developed the WISE-4000 wireless sensor node (WSN). Based on the latest IoT concepts and technology, the WISE-4000 is a cloud-ready data sensing and communication tool that can help you realize your IoT system.

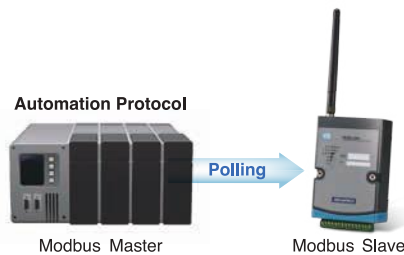
## Cloud Integration

To provide complete IoT sensing solution, the WISE-4000 series goes beyond providing a wireless communication interface for sensors—it also provides cloud connectivity for additional user applications. With support for IoT protocols such as REST and MQTT, the WISE-4000 series can communicate with cloud services or other web services via secure web sockets. The WISE-4000 series comes with pre-integrated APIs for major cloud service providers (e.g., Dropbox) and IoT cloud services (e.g., Azure IoT Hub) and provides support for both private cloud platforms (e.g., private file servers or databases) and ERP/MES systems.



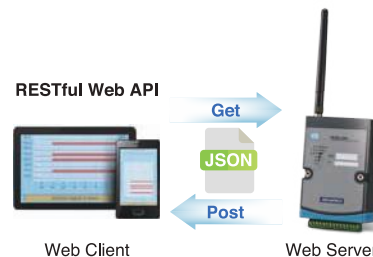
## Modbus

Modbus is an automation protocol widely used in PLC communication and SCADA systems. It adopts master-slave system architecture, in which the master polls individual slave devices to determine their status. In such systems, slaves do not send messages unless they have been polled.



## RESTful

The REST communication approach can take advantage of not having to leverage much bandwidth while transmitting data. With RESTful web API in JSON format, data can be easily integrated to IoT services and optimized for use over the Internet. Additionally, REST support HTTPS or TLS, which improve security while publishing or retrieving data between devices and the cloud. Furthermore, it also enables end devices to publish data actively.



3 Questions x 3 Minutes,  
Determine which product is right for you!



What's the first consideration  
of your IoT application?



More information

High-Volume,  
Real-Time Data

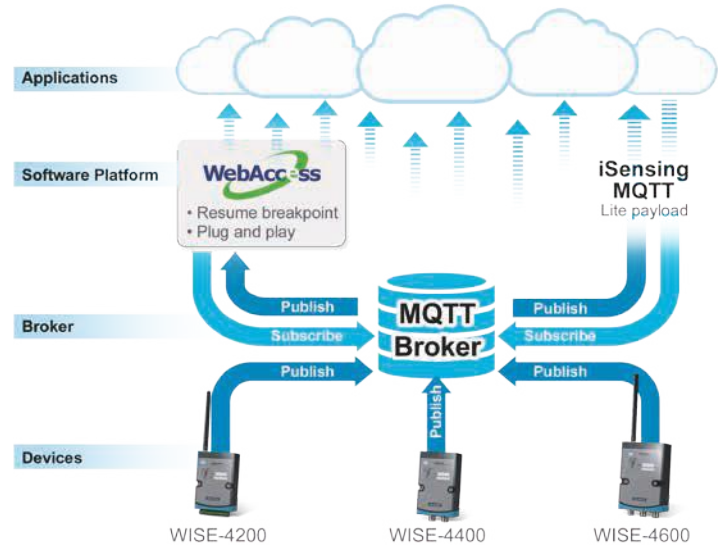
Limited Power Supply

Environmental  
Conditions

## MQTT Protocol

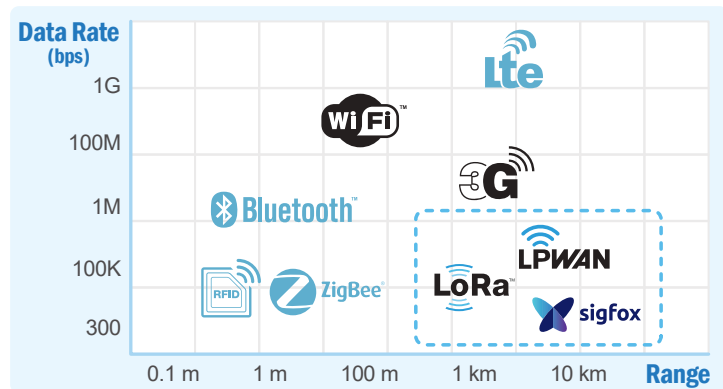
WISE-4000 series leverages MQTT—a publish/subscribe messaging protocol for constrained IoT devices in low-bandwidth, high-latency, or unreliable networks—to communicate directly with the cloud or ERP/MES systems without a gateway or converter.

With this device-to-cloud architecture, lite payload, and low bandwidth, the WISE-4000 is the ideal solution for high-volume data collection applications because it can simplify the communication and hardware complexity of IoT systems.



## Wireless Communication

Advancements in IoT have led to the development of many wireless technologies that can be implemented in various hardware products. The WISE-4000 utilizes Wi-Fi, 3G, and LPWAN to meet specific wireless communication requirements.



Are devices deployed over a wide area?

YES

Is the power supply limited?

YES

WISE-4470 p.10

NO

WISE-4670 p.12

NO

WISE-4220 p.8

High-volume, real-time data

YES

WISE-4670 p.12

NO

Is GPS required?

YES

WISE-4610 p.12

NO

WISE-4210 p.8

High-volume, real-time data

YES

Is GPS required?

YES

WISE-4670 p.12

NO

WISE-4470 p.10

NO

Are devices deployed outdoors?

YES

WISE-4610 p.12

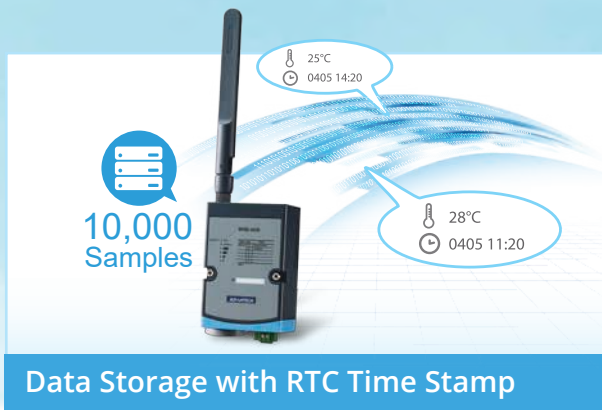
NO

WISE-4410 p.10

# The First Consideration: Wireless IoT Architecture

## Wireless Ethernet Architecture

Wireless Ethernet is the simplest interface for IoT applications. It can be easily integrated with existing data or web servers. The WISE-4220 supports Wi-Fi for organizing wireless networks with access points that can be extended to WANs via a cellular router. Moreover, the WISE-4470 and WISE-4670 provide direct support for cellular interfaces for distributed data acquisition. With MQTT and RESTful web services, the WISE-4000 series can connect to cloud services without the need for individual IP addresses.

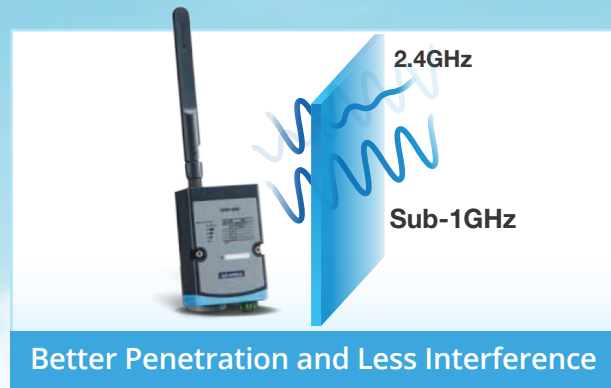


## Wireless Ethernet Architecture



## Low-Power Wide-Area Network (LPWAN) Architecture

LPWAN technology, including LoRa, SigFox, and NB-IoT, is suitable for applications requiring low-volume, long-range data transmission while maintaining a long battery life, minimal cost, and low levels of interference. The WISE-4000 series provides both standard LPWAN and LoRa devices to meet different long-range sensing requirements. For the WISE-4210, WISE-4410, and WISE-4610 LPWAN end nodes, Advantech also provides LPWAN access points and LoRa gateways, enabling users can easily build up an LPWAN and LoRa network.



### LPWAN Architecture



# WISE-4200

## Industrial IoT Wireless Sensor Node

The WISE-4200 series comprises sensor-integrated WSNs that offer modularized sensor and I/O interface configuration options. With this series, data can be easily collected via a single node without additional development or assembly. WISE-4200 nodes are suitable for environmental monitoring and management applications in factories, pipelines, data centers, and warehouses.



### Built-In Sensor and I/O

Combination of I/O and sensors makes it a ready-to-use node for various applications.

### Battery-Powered

Utilizing LPWAN technology means that the WISE-4210 can be powered by 3.6-V AA lithium battery.



### Flexible Mounting

DIN-Rail, wall and pole mounting enable fitting in any installation environment.

### IoT Protocols

MQTT and RESTful web API in JSON format for IoT or cloud service integration.





## WISE-4210

### LPWAN Industrial IoT Wireless Sensor Node

The WISE-4210 utilizes LPWAN technology to provide modularized nodes that can transmit data over long distances without interference.

With low power consumption and wide area communication features, this solution can provide coverage up to 5 km.



Sub-1-GHz LPWAN with 5-km line-of-sight communication



3 x 3.6-V AA lithium batteries for a 5-year lifetime



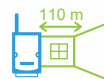
Easy to organize LPWAN data access via wireless access points

## WISE-4220

### WLAN Industrial IoT Wireless Sensor Node

Adopting Wi-Fi technology, the WISE-4220 is a modularized node that can be easily integrated into existing networks.

With the high compatibility and universality of Wi-Fi technology, this solution requires no extra infrastructure cost or implementation effort.



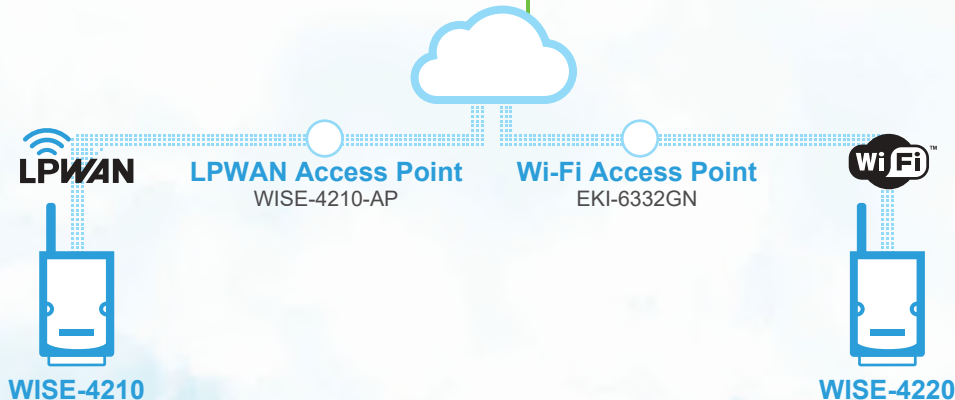
2.4-GHz IEEE 802.11b/g/n WLAN for 110-m line-of-sight communication



Local logging of 10,000 samples with RTC time stamp and SNTP time synchronization



Access point mode with an HTML5 webpage for direct access and device configuration via mobile devices



# WISE-4400

## IP65-Rated IoT Wireless Sensor Node

The WISE-4400 features a built-in antenna that provides enhanced connectivity for flexible installation. Moreover, the IP65 rating ensures protection against dust, oil, and water, ensuring stable data collection and transmission in harsh industrial environments or CNC processing plants requiring frequent cleaning due to oil and dust accumulation.



### Internal Antenna

Saves installation space and prevents damage while maintaining communication quality.



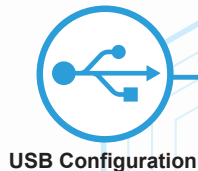
Internal Antenna

### IP65 Housing and M12 Connector

Resists dust, dirt, and oil in harsh environments, thereby reducing maintenance.



IP65-Rated



USB Configuration



Data Storage  
WISE-4470



10 ~ 50V Wide  
Input Voltage

### USB Configuration Port

USB port for quick configuration during installation and maintenance.



M12 Connector

### Flexible Mounting

DIN rails and wall/pole mounting enable fitting in any installation environment.




## WISE-4410


### LPWAN IP65-Rated IoT Wireless Sensor Node

Leveraging LPWAN technology, the WISE-4410 node has an IP65-rated housing and can transmit data over long distances without interference.

With superior penetration and low degradation, signals can penetrate concrete and steel buildings, making this solution ideal for high-density environments.

 Sub-1-GHz LPWAN with 5-km line-of-sight communication

 Superior penetration, low interference  
2.4 GHz  
Sub-1 GHz


 Easy to organize LPWAN data access via wireless access points

## WISE-4470

### 3G IP65-Rated IoT Wireless Sensor Node

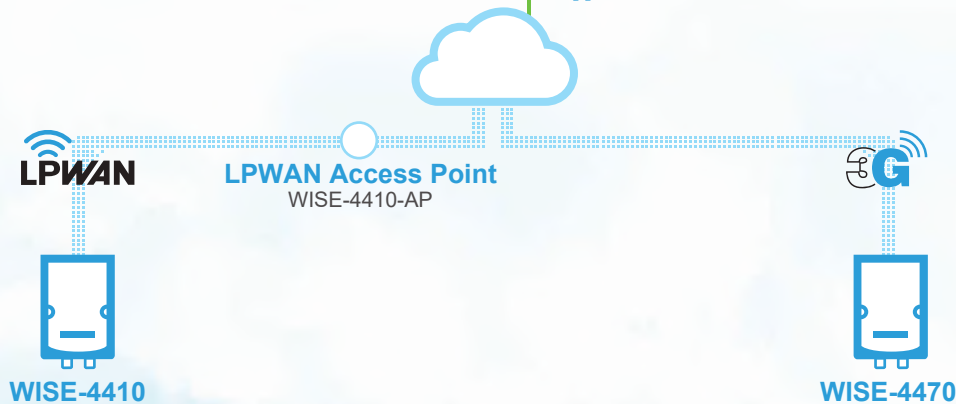
The WISE-4470 node utilizes cellular networks and comes with an IP65-rated housing that can transmit data across networks requiring high bandwidth.

With faster data speeds, real-time data can be transmitted from widely distributed remote sites to the control center for immediate action.

 MQTT and RESTful web API with SSL in JSON format for IoT or cloud service integration

 SMS control support

 Local logging of 10,000 samples to prevent data loss



# WISE-4600

## Outdoor IoT Wireless Sensor Node

The WISE-4600 series are solar-powered and designed for wide-area outdoor applications. In addition to a solar rechargeable battery, the WISE-4600 nodes support a wide input power voltage and come with optional GPS for locating and tracking functions, ensuring sustainable operation in outdoor applications such as water treatment, renewable energy, and agriculture.



### Location Tracking

Optional GPS for obtaining location information in wide-area applications.



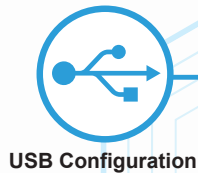
GPS Location Tracking

### IP65, Anti-UV Housing and M12 Connector

Protection against water and dust penetration and UV resistant.



IP65-Rated



USB Configuration



Data Storage  
WISE-4670



Solar Rechargeable Battery

### Flexible Mounting

DIN-Rail, wall and pole mounting enable fitting in any installation environment.



M12 Connector

### Continuous Power Supply

Solar rechargeable battery and external power source ensure continuous power in outdoor areas.





## WISE-4610

### LoRa Outdoor IoT Wireless Sensor Node

The WISE-4610 adopts LoRa technology, providing outdoor nodes that consume little power when transmitting data over long distances. This means that it can be powered by a solar rechargeable battery, enabling continuous data acquisition.

 LoRa LPWAN with 5-km line-of-sight communication


 Superior penetration, low interference

 Easy to organize LoRa network data access


## WISE-4670

### 3G Outdoor IoT Wireless Sensor Node

The WISE-4670 utilizes cellular technology, thus providing outdoor nodes that can transmit data from remote site over long distances. With its high transfer speed, real-time data from outdoor environments can be transmitted back to the control center for immediate action.

 MQTT and RESTful web API with SSL in JSON format for IoT or cloud service integration

 SMS control support

 Local logging of 10,000 samples to prevent data loss



# Selection Guide

## Wi-Fi Node



## LoRa Node



Model Name	WISE-4220-S231	WISE-4220-S215	WISE-4220-S217	WISE-4610-S672	WISE-4610-S614	
<b>Description</b>	Wireless IoT WSN with Temperature/Humidity Sensors	Wireless IoT WSN with 4-ch RTD or Digital Input	Wireless IoT WSN with 8-ch Analog Input	LoRaWAN WSN with 2 Serial Port	LoRaWAN WSN with 4-ch Analog Input	
<b>Wireless Interface</b>	<b>Function</b>	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	
	<b>IEEE Standard</b>	IEEE 802.11b/g/n			IEEE 802.15.4g	
	<b>Frequency Band</b>	2.4 GHz			433 MHz or 868, 915 MHz	
	<b>Mode / Topology</b>	Infrastructure, Limited AP			Star	
	<b>Outdoor Range</b>	110 m (line of sight)			5,000 m (line of sight)	
<b>Network</b>	<b>GPS</b>	-			Optional	
	<b>Interface</b>	WLAN			Micro-B USB	Micro-B USB
	<b>Protocol</b>	Modbus/TCP, REST, MQTT			-	-
<b>Analog / Sensor Input</b>	<b>Channel</b>	Built-in sensors	4-ch	8-ch	-	4-ch
	<b>Input Type</b>	Temperature, humidity	2, 3-wire Pt RTD	V, A	-	V, A
	<b>Input Range</b>	-25 ~ 70°C 0% ~ 90% RH	Pt-100: -200~200°C Pt-1000: -40~160°C	0~10 V, 0~20 mA, 4~20 mA	-	0~10 V, 0~20 mA, 4~20 mA
<b>Digital Input / Output</b>	<b>Channel</b>	-	4-ch dry contact digital input shared with RTD	-	6-ch dry contact digital input	4-ch dry contact digital input (2-ch digital output)
<b>Serial Port</b>	<b>Port Number</b>	-	-	-	1 RS-485 1 RS-232/485	-
<b>Power Input</b>	<b>Battery Power</b>	-			Solar rechargeable battery	
	<b>External Power</b>	10 ~ 50 V <sub>DC</sub>			10 ~ 50 V <sub>DC</sub>	

## Cellular Node



Model Name	WISE-4470-S250	WISE-4470-S412	WISE-4470-S472	WISE-4670-S672	WISE-4670-S614	
<b>Description</b>	3G WSN with 1-port RS-485 and DIO	IP65 3G WSN with 4-ch Analog Input	IP65 3G WSN with 2 Serial Port	Outdoor 3G WSN with 2 Serial Port	Outdoor 3G WSN with 4-ch Analog Input	
<b>Wireless Interface</b>	<b>Function</b>	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	
	<b>IEEE Standard</b>	GSM/GPRS/HSPA			GSM/GPRS/HSPA	
	<b>Frequency Band</b>	UMTS/HSPA: 1/8 (900/2100MHz) GSM/GPRS/EDGE: 850/900/1800/1900MHz			UMTS/HSPA: 1/8(2100/900MHz) GSM/GPRS/EDGE: 2/3/5/8(1900/1800/850/900MHz)	
	<b>Outdoor Range</b>	-			-	
	<b>GPS</b>	-			Optional	
<b>Network</b>	<b>Interface</b>	Micro-B USB	Micro-B USB	Micro-B USB	Micro-B USB	Micro-B USB
	<b>Protocol</b>	Modbus/TCP, REST, MQTT	Modbus/TCP, REST, MQTT	Modbus/TCP, REST, MQTT	Modbus/TCP, REST, MQTT	Modbus/TCP, REST, MQTT
<b>Analog / Sensor Input</b>	<b>Channel</b>	-	4-ch	-	-	4-ch
	<b>Input Type</b>	-	V, A	-	-	V, A
	<b>Input Range</b>	-	0~10 V, 0~20 mA, 4~20 mA	-	-	0~10 V, 0~20 mA, 4~20 mA
<b>Digital Input / Output</b>	<b>Channel</b>	6-ch dry contact digital input 2-ch sink-type digital output	4-ch dry contact digital input shared with analog input	-	6-ch dry contact digital input	4-ch dry contact digital input (2-ch digital output)
<b>Serial Port</b>	<b>Port Number</b>	1 RS-485 for Modbus/RTU	-	1 RS-485 1 RS-232/485	1 RS-485 1 RS-232/485	-
<b>Power Input</b>	<b>Battery Power</b>	-			Solar rechargeable battery	
	<b>External Power</b>	10 ~ 30 V <sub>DC</sub>			10 ~ 50 V <sub>DC</sub>	

### LPWAN Node



Model Name		WISE-4210-AP	WISE-4210-S231	WISE-4210-S250	WISE-4210-S215	WISE-4210-S217
Description		LPWAN Wireless to Ethernet AP	LPWAN WSN with Temperature/Humidity Sensors	LPWAN WSN with 1-port RS-485 and DIO	LPWAN WSN with 4-ch RTD or Digital Input	LPWAN WSN with 8-ch Analog Input
Wireless Interface	Function	Wireless Access Point	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node
	IEEE Standard	IEEE 802.15.4g				
	Frequency Band	433 MHz or 868, 915 MHz				
	Mode / Topology	Star				
	Outdoor Range	5,000 m (line of sight)				
Network	Interface	RJ-45	Micro-B USB	Micro-B USB	Micro-B USB	Micro-B USB
	Protocol	Modbus/TCP, REST, MQTT	-	-	-	-
Analog / Sensor Input	Channel	-	Built-in sensors		4-ch	8-ch
	Input Type	-	Temperature, humidity		2, 3-wire Pt RTD	V, A
	Input Range	-	-25 ~ 70°C 0% ~ 90% RH		Pt-100: -200~200°C Pt-1000: -40~160°C	0~10 V, 0~20 mA, 4~20 mA
Digital Input / Output	Channel	-	-	6-ch dry contact digital input 2-ch sink-type digital output	4-ch dry contact digital input shared with RTD	-
Serial Port	Port Number	-	-	1 RS-485 for Modbus/RTU	-	-
Power Input	Battery Power	For power backup 3 x 3.6-V AA lithium battery				
	External Power	10 ~ 30 V <sub>DC</sub>				

### LPWAN Node



Model Name		WISE-4410-AP	WISE-4410-S415	WISE-4410-S412	WISE-4410-S472	PCM-24S1S1
Description		IP65 LPWAN Wireless to Ethernet AP	IP65 LPWAN WSN with 4-ch RTD Input	IP65 LPWAN WSN with 4-ch Analog Input	IP65 LPWAN WSN with 2 Serial Port	LPWAN Wireless iDoor AP
Wireless Interface	Function	Wireless Access Point	Wireless Sensor Node	Wireless Sensor Node	Wireless Sensor Node	Wireless access point
	IEEE Standard	IEEE 802.15.4g				
	Frequency Band	433 MHz or 868, 915 MHz				
	Topology	Star				
	Outdoor Range	1,000 m (line of sight)				
Network	Interface	RJ-45 / Micro-B USB	Micro-B USB	Micro-B USB	Micro-B USB	mPCIe
	Protocol	Modbus/TCP, REST, MQTT	-	-	-	Modbus/TCP, REST, MQTT
Analog / Sensor Input	Channel	-	4-ch	4-ch	-	-
	Input Type	-	2, 3-wire Pt RTD	V, A	-	-
	Input Range	-	Pt-100: -200~200°C Pt-1000: -40~160°C	0~10 V, 0~20 mA, 4~20 mA	-	-
Digital Input / Output	Channel	-	4-ch dry contact digital input shared with RTD	4-ch dry contact digital input shared with analog input	-	-
Serial Port	Port Number	-	-	-	1 RS-485 1 RS-232/485	-
Power Input	Battery Power	3 x 3.6-V AA lithium battery for power backup				
	External Power	10 ~ 30 V <sub>DC</sub>				