Wireless IoT Sensing Devices

**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

**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. Compare 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 2.4GHz 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 interfae, 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.

**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**
  - NA315: 923MHz (900-924.0z), BW: 4kHz
  - EU868: 868MHz (868.00-869.00), BW: 4kHz
- **Antenna Gain**
  - 902-928MHz: 3.3 dB
  - 863-870MHz: 2.19 dB
- **Data Rate**
  - 625bps, 1000bps
  - 625bps: 5 km with line of sight
- **Outdoor Range**
  - 5000m: 2 km with line of sight
- **Topologies**
  - Star
- **Network Capacity**
  - 64 clients

**General**
- **Power Input**
  - AP: 10 - 50 V AC
- **Battery Life**
  - Sensor Node: 3 x AA, 3.6 V Lithium Battery
  - 10 years with 1 minute update rate @ 25°C
- **Configuration Interface**
  - AP-LAN port
- **LED Indicator**
  - Status, Error, Tx, Rx
- **Mounting**
  - DIN 35 rail, wall, pole and stack
- **Dimensions**
  - (W x H x D)
  - 70 x 102 x 38 mm

**WISE-4210-AP (Access Point)**
- **Data Rate**
  - 625 bps, 2.5 kbps, 5 kbps, 56 kbps
- **Ethernet**
  - RJ-45 (for configuration and data query)
- **RS-485**
  - Data: 500 kbps (for query node data)
- **Messaging Protocol**
  - Modbus/TCP, Modbus/RTU, REST, MQTT
- **Supports RESTful Web API in JSON format**
- **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**: 0 ~ 95% RH
  - **Resolution**: 0.1% RH
  - **Accuracy**: ±4% RH @ 0% ~ 95% RH

**WISE-S214 (4AA/4DI)**
- **Channels**: 4
- **Resolution**: 16 bits Bipolar
  - 16 bits Unipolar
- **Sampling Rate**
  - 1 Hz (for each channel) with 50/60Hz Rejection
- **Accuracy**
  - ±0.1% for Voltage Input
  - ±0.2% for Current Input
- **Input Range**
  - 4–20mA, 0–30mV, 0–1V, 0–5V, 0–10V, ±150mV, ±50mV, ±1V, ±5V, ±10V, ±20mA, ±50mA, ±20mA
- **Input Impedance**
  - 1MΩ (Voltage)
  - 300Ω (Current)
- **Support Data Scaling and Averaging**

**WISE-S250 (6DI, 2DO & 1RS-485)**
- **Channels**: 6 (Dry Contact)
- **Supports** 3kHz Frequency Input

**Digital Output (Sink Type)**
- **Channels**: 2
- **Output Current**
  - 100 mA
  - At 0 ~ 1, 100 mA
  - At 1 ~ 5, 150 mA
- **Supports Poles Output**
  - 5 V
  - 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

**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

**Ordering Information**

**WISE-4210 Access Point**
- **WISE-4210-APRA**: LPWAN Wireless to Ethernet AP – NA315/EU868
- **WISE-4210-APUA**: LPWAN Wireless to Ethernet AP – NA433

**WISE-4210 Node**
- **WISE-4210-NA**: Proprietary LPWAN SUB-G Wireless I/O Module – NA315/EU868
- **WISE-4210-UA**: Proprietary LPWAN SUB-G Wireless I/O Module – NA433
- **WISE-4210-S231-NA**: LPWAN IoT WSN Temp & RH Sensor - NA902/EU868
- **WISE-4210-S231-UA**: LPWAN IoT WSN Temp & RH Sensor - NA433

**WISE-S200 I/O Module**
- **WISE-S214-A**: 4AA/1DI
- **WISE-S220-A**: 6DI, 2DO & 1RS-485
- **WISE-S221-A**: 6DI & 1RS-485

* Power saving is not for downlink mode.

**Accessories**

- **1760002647-01**: Bat Cylindrical 3.6V/250mAh AA Li/SOCl2
- **1750008836-01**: 6DI & 1RS-485
- **1750008837-01**: 6DI, 2DO & 1RS-485

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