Cloud Integration Architecture of LoRaWAN

About LoRaWAN

Advantech LoRaWAN solutions provide a device-to-cloud solution by simply sending collected data through the LoRa gateway to the cloud. With Edgelink inside the gateway, it also helps users simply plug-and-play without worrying about data parsing processes.

WISE-2410 Vibration Sensor

WISE-2410 is a LoRaWAN wireless vibration sensor integrated with ARM Cortex-M4 Processor, LoRa transceiver, 3-axis accelerometer and temperature sensor. Battery life cycle is 2 years with IP66 enclosure.

- Built-in 3-axis accelerometer and temperature sensor
- Computing total 8 vibration characteristic values on board
- Compliant with ISO 10816
- IP66 with battery-powered, no wiring installation needed
- Easy setting with user friendly interfaces on WISE Studio
- Support wide temperature -20 ~ 85 °C
LAN/4G LTE

WISE-6610 LoRaWAN Gateway

The WISE-6610 plays a key role in connecting sensor devices to the cloud. With network service providers like “The Things Network” or WISE-PaaS EdgeLink, the WISE-6610 utilizes data collection to perform intelligent Internet of Things applications.

- LoRaWAN protocol for closed and public system applications
- Redundancy-enhanced functions for continuous data transmission
- Enhanced memory for hosting custom software applications
- Low power consumption for solar and battery power applications
- Ethernet and I/O for connecting a wide array of field assets with DIN rail or wall mounting
- RED compliance

WISE-4610 I/O Module

WISE-4610 features a wireless sensor node based on LoRa network technologies targeting outdoor applications. Not only does it provide wireless communication coverage of 5 kilometers, it also has a long battery life due to the low power consumption of the LoRa network.

- Support LoRaWAN wireless frequency with external detachable antenna
- Application-ready I/O combination with optional M12 connectors, IP65
- Wide voltage power input with 10 ~ 50VDC
- Longer communication range
- Better penetration through concrete and steel
Factory Industrial IoT

The point of IIoT (Industrial Internet of Thing) is to deploy many types of sensors in a factory to collect vast quantities of information and send the corresponding data to the control center. Users can not only set the threshold for the system but also get in-time alerts to ensure safety control and maximize productivity. The primary benefit of using the Advantech WISE-4610 outdoor LoRa/LoRaWAN I/O node and WISE-2410 vibration sensor in a factory is that users do not need to worry about signal penetration issues and/or tangled and complex wiring. Using vibration, humidity and temperature to monitor warehouses and storage environments through the control center offers an efficient alternative to the traditional one-by-one inspection. With WISE-2410 vibration sensor and other sensors paired with a WISE-4610 analog input I/O board, alerts can be triggered when the pressure levels (water pressure, oil pressure, gas pressure...) are abnormal. This increases safety and improves production quality by controlling the material usage in the manufacturing process.

- Higher Penetration
- Lower Power Consumption
- No Wiring Needed
- Increase Productivity
- Enhance Factory Safety
- Control Factory Resource Usage
- Automatic Alerts

Smart Agriculture

The architecture of the Advantech LoRaWAN solution in smart agriculture connects WISE-2410 vibration sensor and other sensors with the WISE-4610 outdoor LoRa/LoRaWAN I/O node. They further send data through a WISE-610 LoRaWAN gateway to the cloud. In this use case, the application collects temperature, humidity, vibration and soil PH data to better understand the environmental situation. WISE-4610 is designed with an IP65 enclosure and M12 connectors to offer an optimal fit for outdoor applications. WISE-2410 is a LoRaWAN wireless vibration sensor integrated with ARM Cortex-M4 Processor, LoRa transceiver, 3-axis accelerometer and temperature sensor. The WISE-6610 is a high-performance LoRaWAN gateway with reliable connectivity options for industrial environments and LoRaWAN protocol support for building LoRaWAN private and public networks.

- Flexibility of deployment without worrying about signal coverage
- No monthly payment by using LoRa network
- Solar powered or solar rechargeable battery to make the device more independent
- Allows farmers to minimize resources such as water and fertilizers
- Upgraded data collection process helps with wireless monitoring and control
- Cost effective
### WISE-2410 Series
(LoRaWAN Intelligent Vibration Sensor)

<table>
<thead>
<tr>
<th></th>
<th>WISE-2410-NB</th>
<th>WISE-2410-EB</th>
<th>WISE-2410-BT0</th>
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<tbody>
<tr>
<td><strong>Frequency Range</strong></td>
<td>US 932–923 MHz</td>
<td>EU 863–870 MHz</td>
<td>RU 864-921 MHz / AU 915-923 MHz / TW 920-923 MHz / AS 915-924 MHz / TH 924-925 MHz / JP 924-925 MHz</td>
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<tr>
<td><strong>Amplitude Range</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3-axis Accelerometer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freq. Range</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sampling Rate</td>
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</tr>
<tr>
<td>Temperature Sensor</td>
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</tr>
<tr>
<td>Range</td>
<td></td>
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</tr>
<tr>
<td><strong>Dimension (H x D)</strong></td>
<td>34.7 x 48.3 mm</td>
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<tr>
<td>Battery type</td>
<td>2 x 3.6 V AA lithium battery</td>
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</tr>
<tr>
<td>Operating Temperature</td>
<td>0°C ~ 70°C (depends on battery spec)</td>
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</tr>
<tr>
<td>IP Rate</td>
<td></td>
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<td>IP65</td>
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### WISE-4610 Series
(Advanced Industrial LoRaWAN I/O Module)

<table>
<thead>
<tr>
<th></th>
<th>WISE-4610-NA</th>
<th>WISE-4610-EA</th>
<th>WISE-4610-JA</th>
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<tbody>
<tr>
<td><strong>Model Name</strong></td>
<td>WISE-4610-NA</td>
<td>WISE-4610-EA</td>
<td>WISE-4610-JA</td>
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<tr>
<td><strong>Frequency Range</strong></td>
<td>US 902–923 MHz</td>
<td>EU 863–870 MHz</td>
<td>AS 923–923.5 MHz</td>
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<tr>
<td><strong>Function</strong></td>
<td>Wireless Bond</td>
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<tr>
<td><strong>Positioning</strong></td>
<td>GPS / Galileo / Beidou / GLONASS</td>
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<tr>
<td><strong>Power Input</strong></td>
<td>4000 Lithium Rechargeable Battery &amp; Solar Panel</td>
<td></td>
<td></td>
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<tr>
<td><strong>Configuration Interface</strong></td>
<td>Micro-USB</td>
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### WISE-6610 Series
(LoRaWAN Gateway)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Model Name</strong></td>
<td>WISE-6610-A500</td>
<td>WISE-6610-E100</td>
<td>WISE-6610-E500</td>
<td>WISE-6610-N100</td>
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<td>WISE-6610-A100</td>
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<td><strong>Wireless Communication</strong></td>
<td>LoRaWAN</td>
<td>LoRaWAN</td>
<td>LoRaWAN</td>
<td>LoRaWAN</td>
<td>LoRaWAN</td>
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<tr>
<td><strong>Frequency</strong></td>
<td>923 MHz</td>
<td>868 MHz</td>
<td>868 MHz</td>
<td>915 MHz</td>
<td>915 MHz</td>
<td>923 MHz</td>
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<tr>
<td><strong>Support Node</strong></td>
<td>500</td>
<td>160</td>
<td>500</td>
<td>100</td>
<td>500</td>
<td>100</td>
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<tr>
<td><strong>Antenna Number</strong></td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
<td>-40 ~ 75°C (-40 ~ 167°F)</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>Wall</td>
<td>Wall</td>
<td>Wall</td>
<td>Wall</td>
<td>Wall</td>
<td>Wall</td>
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<tr>
<td><strong>Power Input</strong></td>
<td>9 ~ 38 VDC</td>
<td>9 ~ 38 VDC</td>
<td>9 ~ 38 VDC</td>
<td>9 ~ 38 VDC</td>
<td>9 ~ 38 VDC</td>
<td>9 ~ 38 VDC</td>
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<tr>
<td><strong>Power Connector</strong></td>
<td>4-way Molex mini-FL connector</td>
<td>4-way Molex mini-FL connector</td>
<td>4-way Molex mini-FL connector</td>
<td>4-way Molex mini-FL connector</td>
<td>4-way Molex mini-FL connector</td>
<td>4-way Molex mini-FL connector</td>
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<tr>
<td><strong>Power Consumption</strong></td>
<td>4W</td>
<td>4W</td>
<td>4W</td>
<td>4W</td>
<td>4W</td>
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</tr>
</tbody>
</table>
### Worldwide Offices

#### Asia Pacific

**China**
- **Toll Free**: 800-777-111
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- **Ottawa**: 1-815-433-5100
- **Chicago**: 1-888-676-9668
- **Boston**: 1-800-866-6008

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- **São Paulo**: 55-11-5592-5367

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- **Mexico City**: 52-55-6275-2777
- **Guadalajara**: 52-33-3169-7670

#### Middle East and Africa

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- 072-2410527

**Turkey**
- 90-212-222-0422
- **Turkey-Bursa**: 90-224-413-3134

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