

## 7

## Remote I/O & Wireless Sensing Modules

7-2 Wireless IoT Sensing Devices: WISE-4000, WISE-2000

7-30 Ethernet I/O Modules: ADAM-6000

7-45 RS-485 I/O Modules: ADAM-4000



# Wireless IoT Sensing Devices

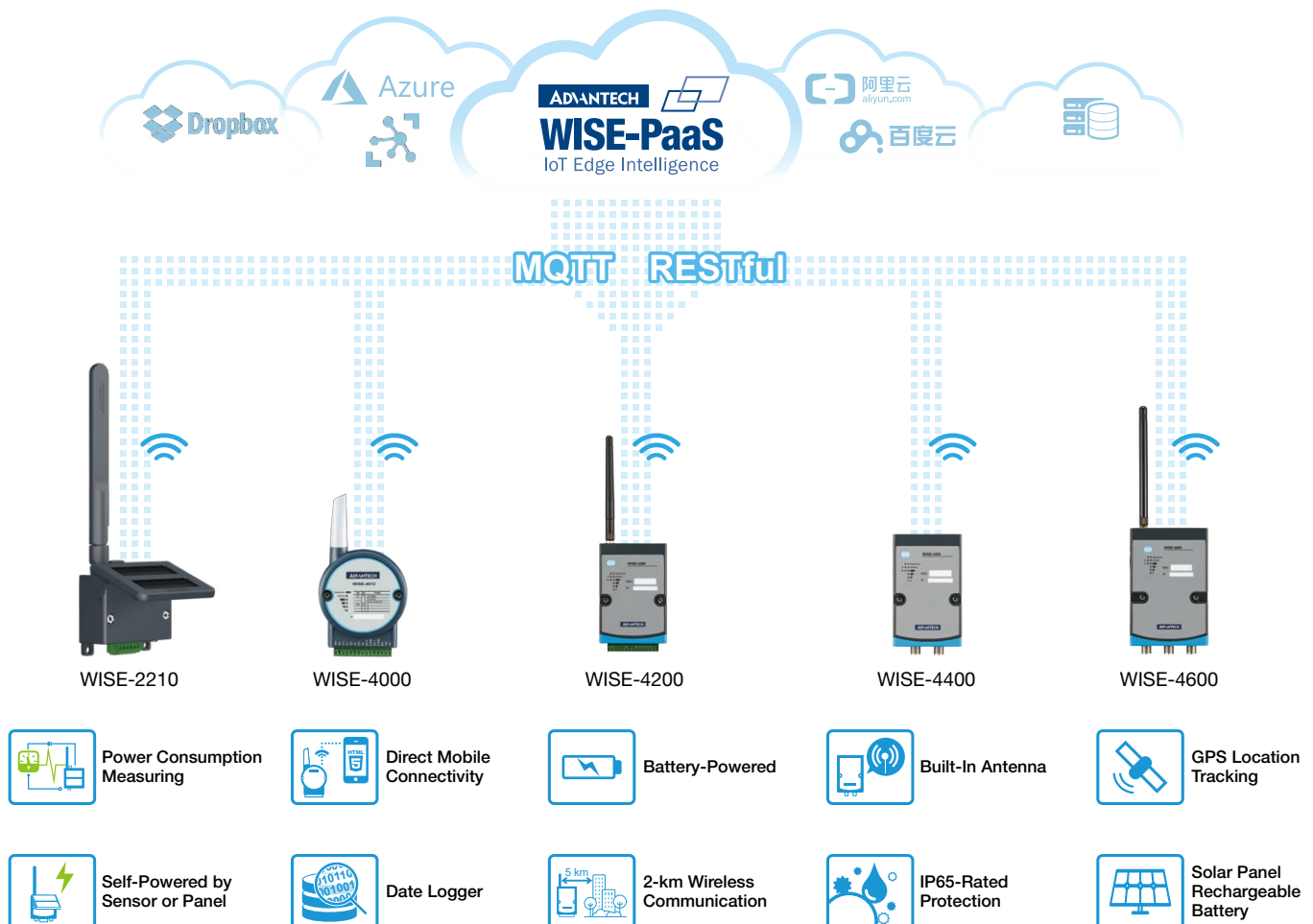
## Overview

Coinciding with the development of wireless and cloud technologies, remote management is now distributed across wider areas due to the availability of cloud services. To shorten the gap between the edge and the cloud, Advantech has launched wireless sensing devices that can directly pass data from the edge to different cloud platforms via MQTT and RESTful APIs.

For wide area communication, WISE-4000 I/O modules and sensor nodes have been designed with LPWAN, LoRa, NB-IoT/eMTC, 3G/LTE, and IP65-rated features, making them highly suitable for outdoor applications. WISE-2000 sensor devices are all-in-one devices designed for specific applications, whereas WISE-6000 devices are ready-to-use M2M edge devices for machine status monitoring in the field of remote management.

To realize a complete IoT sensing solution, the WISE-4000 series goes beyond merely providing a wireless communication interface for sensors—it also provides cloud connectivity for additional user applications. With support for IoT protocols such as MQTT and RESTful API, 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.

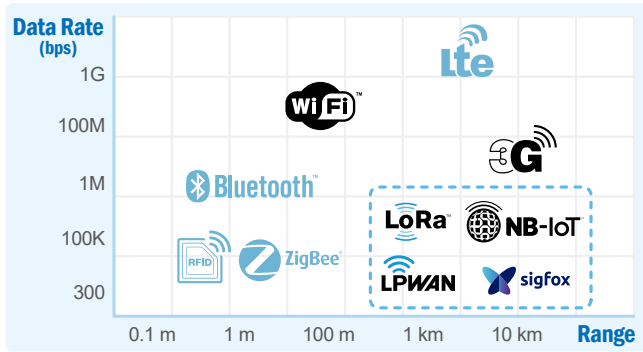
## Wireless Sensor and Sensing Devices



## Wireless Communication

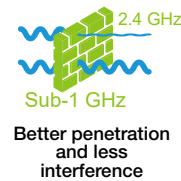
### Wireless Technology

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



### Low-Power Wide-Area Network (LPWAN, Sub-1 GHz)

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, eMTC/NB-IoT, and LoRa devices to meet different long-range sensing requirements. For the WISE-4210 and WISE-4610 end nodes, Advantech also provides LPWAN access points or LoRa gateways, enabling users to easily build up an LPWAN or LoRa network.



## Wireless RFID Gateway and Edge Device



- 4-port UHF RFID read/write function
- Node-RED programmable for data read, write, filter, and transfer
- Application-ready function block
- Ethernet/Wi-Fi interface for uplink

- Supports more than 100 PLC drivers by WISE-PaaS/EdgeLink
- Built-in digital I/O, analog I/O, and RS-485 for machine status monitoring
- Wi-Fi, 3G, NB-IoT with mini PCIe communication
- Intelligent logic control with Node-RED
- ePaper for local visualization and web service support for remote management

# IoT Wireless I/O Modules



| Model              |                                | WISE-4012E                                              | WISE-4012                                                                               | WISE-4050                                                        | WISE-4060                                                      | WISE-4051                                                       |
|--------------------|--------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------|
| Description        |                                | 6-ch IoT wireless I/O module for IoT developers         | 4-ch universal input + 2-ch digital output IoT wireless I/O module                      | 4-ch digital input + 4-ch digital output IoT wireless I/O module | 4-ch digital input + 4-ch relay output IoT wireless I/O module | 8-ch digital input IoT wireless I/O module with 1 x RS-485 port |
| Wireless Interface | IEEE Standard                  | IEEE 802.11b/g/n                                        | IEEE 802.11b/g/n                                                                        | IEEE 802.11b/g/n                                                 | IEEE 802.11b/g/n                                               | IEEE 802.11b/g/n                                                |
|                    | Frequency Band                 | 2.4 GHz                                                 | 2.4 GHz                                                                                 | 2.4 GHz                                                          | 2.4 GHz                                                        | 2.4 GHz                                                         |
|                    | Outdoor Range                  | 110 m (L.O.S.)                                          | 110 m (L.O.S.)                                                                          | 110 m (L.O.S.)                                                   | 110 m (L.O.S.)                                                 | 110 m (L.O.S.)                                                  |
|                    | Network Mode                   | Infrastructure, Limited AP                              | Infrastructure, Limited AP                                                              | Infrastructure, Limited AP                                       | Infrastructure, Limited AP                                     | Infrastructure, Limited AP                                      |
|                    | Security                       | WPA2 Personal and Enterprise                            | WPA2 Personal and Enterprise                                                            | WPA2 Personal and Enterprise                                     | WPA2 Personal and Enterprise                                   | WPA2 Personal and Enterprise                                    |
|                    | Antenna Connector              | Reverse SMA                                             | Reverse SMA                                                                             | Reverse SMA                                                      | Reverse SMA                                                    | Reverse SMA                                                     |
| Analog Input       | Channel                        | 2-ch (differential)                                     | 4-ch                                                                                    | -                                                                | -                                                              | -                                                               |
|                    | Input Type                     | V                                                       | V, A, Dry contact DI                                                                    | -                                                                | -                                                              | -                                                               |
|                    | Voltage Range                  | 0 ~ 10 V                                                | ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, 0 ~ 150 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V | -                                                                | -                                                              | -                                                               |
|                    | Current Range                  | -                                                       | 0 ~ 20, 4 ~ 20, ±20 mA                                                                  | -                                                                | -                                                              | -                                                               |
|                    | Resolution                     | 12-bit                                                  | 16-bit                                                                                  | -                                                                | -                                                              | -                                                               |
|                    | Sampling Rate                  | 10 Hz (total)                                           | 10 Hz (total)                                                                           | -                                                                | -                                                              | -                                                               |
|                    | Accuracy                       | ±0.1 V <sub>DC</sub>                                    | Voltage: ±0.1% of FSR<br>Current: ±0.2% of FSR                                          | -                                                                | -                                                              | -                                                               |
|                    | Burnout Detection              | -                                                       | ✓ (4 ~ 20 mA only)                                                                      | -                                                                | -                                                              | -                                                               |
|                    | Isolation                      | -                                                       | 3,000 V <sub>rms</sub>                                                                  | -                                                                | -                                                              | -                                                               |
|                    | Channel                        | 2-ch dry contact                                        | Shared with analog input                                                                | 4-ch dry contact or wet contact                                  | 4-ch dry contact or wet contact                                | 8-ch dry contact or wet contact                                 |
| Digital Input      | Counter Input                  | 3 kHz                                                   | 2 Hz                                                                                    | 3 kHz                                                            | 3 kHz                                                          | 3 kHz                                                           |
|                    | Frequency Input                | 0.1 ~ 3 kHz                                             | 0.1 ~ 2 Hz                                                                              | 0.1 ~ 3 kHz                                                      | 0.1 ~ 3 kHz                                                    | 0.1 ~ 3 kHz                                                     |
|                    | Isolation                      | -                                                       | 3,000 V <sub>rms</sub>                                                                  | 3,000 V <sub>rms</sub>                                           | 3,000 V <sub>rms</sub>                                         | 3,000 V <sub>rms</sub>                                          |
|                    | Channel                        | 2-ch relay                                              | 2-ch (sink-type)                                                                        | 4-ch (sink-type)                                                 | 4-ch power relay                                               | -                                                               |
| Digital Output     | Output Rating (Resistive Load) | 120 V <sub>AC</sub> @ 0.5 A<br>30 V <sub>DC</sub> @ 1 A | Open collector to 30 V <sub>DC</sub> , 400 mA max.                                      |                                                                  | 250 V <sub>AC</sub> @ 5 A<br>30 V <sub>DC</sub> @ 3 A          | -                                                               |
|                    | Pulse Output                   | 60 operations/min                                       | 5 kHz                                                                                   | 5 kHz                                                            | 60 operations/min                                              | -                                                               |
|                    | Isolation                      | 1,500 V <sub>rms</sub>                                  | 3,000 V <sub>rms</sub>                                                                  | 3,000 V <sub>rms</sub>                                           | 3,000 V <sub>AC</sub>                                          | -                                                               |
|                    | Port Number                    | -                                                       | -                                                                                       | -                                                                | -                                                              | 1                                                               |
| Serial Port        | Type                           | -                                                       | -                                                                                       | -                                                                | -                                                              | RS-485                                                          |
|                    | Data Bits                      | -                                                       | -                                                                                       | -                                                                | -                                                              | 7, 8                                                            |
|                    | Stop Bits                      | -                                                       | -                                                                                       | -                                                                | -                                                              | 1, 2                                                            |
|                    | Parity                         | -                                                       | -                                                                                       | -                                                                | -                                                              | None, odd, even                                                 |
| General            | LED Indicators                 | Status, communication, network mode, quality            | Status, communication, network mode, quality                                            | Status, communication, network mode, quality                     | Status, communication, network mode, quality                   | Status, communication, network mode, quality, serial Tx, Rx     |
|                    | Real-Time Clock                | ✓                                                       | ✓ (with battery backup)                                                                 | ✓ (with battery backup)                                          | ✓ (with battery backup)                                        | ✓ (with battery backup)                                         |
|                    | Connectors                     | I/O: Terminal block<br>Power: Micro-B USB               | Plug-in screw terminal block (I/O and power)                                            | Plug-in screw terminal block (I/O and power)                     | Plug-in screw terminal block (I/O and power)                   | Plug-in screw terminal block (I/O and power)                    |
|                    | Dimensions                     | 80 x 148 x 25 mm (W x H x D)                            |                                                                                         |                                                                  |                                                                |                                                                 |
| Environment        | Operating Temperature          | -25 ~ 70°C (-13 ~ 158°F)                                |                                                                                         |                                                                  |                                                                |                                                                 |
|                    | Storage Temperature            | -40 ~ 85°C (-40 ~ 185°F)                                |                                                                                         |                                                                  |                                                                |                                                                 |
|                    | Operating Humidity             | 20 ~ 95% RH (non-condensing)                            |                                                                                         |                                                                  |                                                                |                                                                 |
|                    | Storage Humidity               | 0 ~ 95% RH (non-condensing)                             |                                                                                         |                                                                  |                                                                |                                                                 |
| Power              | Input Range                    | Micro USB 5 V <sub>DC</sub>                             | 10 ~ 30 V <sub>DC</sub>                                                                 | 10 ~ 30 V <sub>DC</sub>                                          | 10 ~ 30 V <sub>DC</sub>                                        | 10 ~ 30 V <sub>DC</sub>                                         |
|                    | Protection                     | -                                                       | Power reversal protection                                                               | Power reversal protection                                        | Power reversal protection                                      | Power reversal protection                                       |
|                    | Power Consumption              | 1.5 W @ 5 V <sub>DC</sub>                               | 2.5 W @ 24 V <sub>DC</sub>                                                              | 2.2 W @ 24 V <sub>DC</sub>                                       | 2.5 W @ 24 V <sub>DC</sub>                                     | 2.2 W @ 24 V <sub>DC</sub>                                      |

# WISE-4012E

## 6-ch Input/Output IoT Wireless I/O Module for IoT Developers



ANATEL
 CE
 FC
 R&TTE
 SRRC

### Introduction

The Advantech WISE IoT Developer Kit is a complete hardware & software solution to help users develop IoT applications and simulate their projects in the simplest way. The WISE IoT Developer Kit provides everything you need to get going: a WISE-4012E 6-ch universal input or output wireless Ethernet I/O module, and developer kit including: WebAccess 8.0 with open interfaces for intelligent application developer, extension board for simulating sensor status, a micro USB cable for power input, and a screwdriver for wiring. The WISE-4012E has an integrated Wi-Fi interface with AP mode and web configuration which can be accessed by mobile device directly. Data can be logged in the I/O module and then automatically pushed to the file-based cloud.

### Product Concept: Data A-P-P



Data  
Acquisition



Data  
Processing



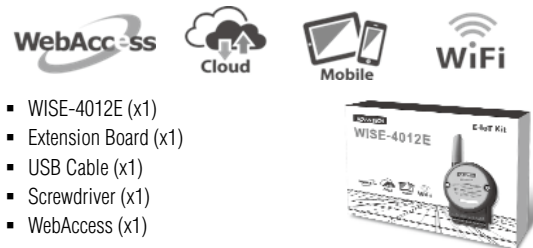
Data  
Publishing

### Features

- 2.4 GHz IEEE 802.11b/g/n WLAN
- 2-ch 0 ~ 10V Input, 2-ch DI, and 2-ch Relay Output
- Includes WebAccess with demo project for developer
- Includes extension board for simulating sensor status
- Includes micro USB cable for power input
- Supports Modbus/TCP with RESTful web service
- Supports wireless client and server mode that can be accessed directly without AP or router
- Supports mobile device web configuration with HTML5 without the platform limitation
- Supports file-based cloud storage and local logging with time stamp



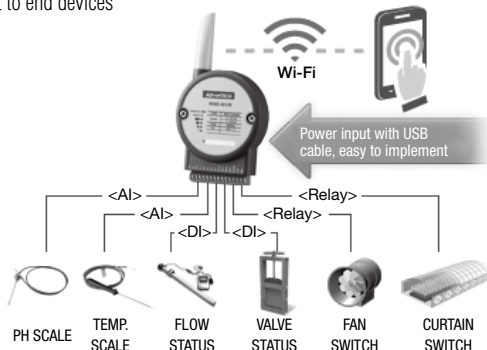
### IoT Developer Kit



- WISE-4012E (x1)
- Extension Board (x1)
- USB Cable (x1)
- Screwdriver (x1)
- WebAccess (x1)

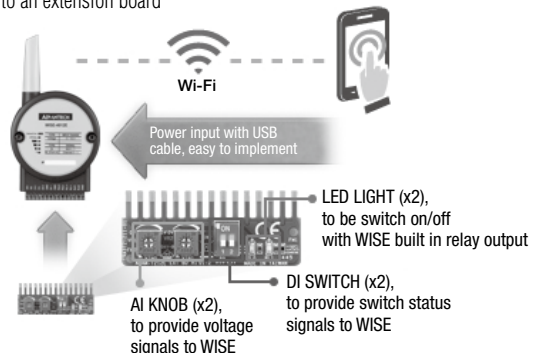
### Application Scenario 1

Connect to end devices



### Application Scenario 2

Connect to an extension board



- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

## Specifications

### Voltage Input

|                        |                      |
|------------------------|----------------------|
| ▪ Channel              | 2                    |
| ▪ Resolution           | 12-bit               |
| ▪ Sampling Rate        | 10 Hz (Total)        |
| ▪ Accuracy             | ±0.1 V <sub>DC</sub> |
| ▪ Input Type and Range | 0 ~ 10 V             |
| ▪ Input Impedance      | 100 kΩ               |

### Digital Input

|                                                          |                                        |
|----------------------------------------------------------|----------------------------------------|
| ▪ Channels                                               | 2                                      |
| ▪ Logic level                                            | Dry Contact 0: Open<br>1: Close to GND |
| ▪ Supports 3 kHz Counter Input (32-bit + 1-bit overflow) |                                        |
| ▪ Keep/Discard Counter Value when Power-off              |                                        |
| ▪ Supports 3 kHz Frequency Input                         |                                        |
| ▪ Supports Inverted DI Status                            |                                        |

### Relay Output

|                                                     |                                                         |
|-----------------------------------------------------|---------------------------------------------------------|
| ▪ Channels                                          | 2 (Form A)                                              |
| ▪ Contact Rating (Resistive Load)                   | 120 V <sub>AC</sub> @ 0.5 A<br>30 V <sub>DC</sub> @ 1 A |
| ▪ Isolation (b/w coil & contacts)                   | 1,500 V <sub>rms</sub>                                  |
| ▪ Relay On Time                                     | 10 ms                                                   |
| ▪ Relay Off Time                                    | 7 ms                                                    |
| ▪ Insulation Resistance                             | 1 GΩ min. @ 500 V <sub>DC</sub>                         |
| ▪ Maximum Switching                                 | 60 operations/minute                                    |
| ▪ Supports Pulse Output                             |                                                         |
| ▪ Supports High-to-Low and Low-to-High Delay Output |                                                         |

### Environment

|                         |                              |
|-------------------------|------------------------------|
| ▪ Operating Temperature | -25 ~ 70°C (-13 ~ 158°F)     |
| ▪ Storage Temperature   | -40 ~ 85°C (-40 ~ 185°F)     |
| ▪ Operating Humidity    | 20 ~ 95% RH (non-condensing) |
| ▪ Storage Humidity      | 0 ~ 95% RH (non-condensing)  |

### General

|                                                                |                                                      |
|----------------------------------------------------------------|------------------------------------------------------|
| ▪ WLAN                                                         | IEEE 802.11b/g/n 2.4GHz                              |
| ▪ Connectors                                                   | Plug-in screw terminal block (I/O)                   |
| ▪ Watchdog Timer                                               | System (1.6 second) and Communication (programmable) |
| ▪ Certification                                                | CE, FCC, R&TTE, NCC, SRRC, RoHS, ANATEL              |
| ▪ Dimensions (W x H x D)                                       | 80 x 139 x 25 mm                                     |
| ▪ Enclosure                                                    | PC                                                   |
| ▪ Power Input                                                  | Micro-B USB 5 V <sub>DC</sub>                        |
| ▪ Power Consumption                                            | 1.5 W @ 5 V <sub>DC</sub>                            |
| ▪ Supports User Defined Modbus Address                         |                                                      |
| ▪ Supports Data Log Function                                   | Up to 10,000 samples with time stamp                 |
| ▪ Supported Protocols                                          | Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP              |
| ▪ Supports RESTful Web API in JSON format                      |                                                      |
| ▪ Supports Web Server in HTML5 with JavaScript & CSS3          |                                                      |
| ▪ Supports System Configuration Backup and User Access Control |                                                      |

## Ordering Information

|                    |                                             |
|--------------------|---------------------------------------------|
| ▪ WISE-4012E-AE-WA | WISE-4012E IoT Developer Kit with WebAccess |
|--------------------|---------------------------------------------|

## Advantech WebAccess 8.0

### WebAccess Cloud Architecture

WebAccess is a 100% web based HMI and SCADA software with private cloud software architecture. WebAccess can provide large equipment vendors, SIs, and Enterprises access to and manipulation of centralized data to configure, change/update, or monitor their equipment, projects, and systems all over the world using a standard web browser. Also, all the engineering works, such as: database configuration, graphics drawing and system management and the troubleshooting can be operated remotely. This can significantly increase the efficiency of maintenance operations and reduce maintenance costs.

### Business Intelligence Dashboard

WebAccess 8.0 provides an HTML5 based Dashboard as the next generation of WebAccess HMI. System integrators can use Dashboard Editor to create the customized information page by using analysis charts and diagrams which are called widgets. Ample widgets have been included in the built-in widget library, such as trends, bars, alarm summary, maps...etc. After the dashboard screens have been created, end user can view the data by Dashboard Viewer in different platforms, like Explorer, Safari, Chrome, and Firefox for a seamless viewing experience across PCs, Macs, tablets and smartphones.

### Open Interfaces

WebAccess has three interfaces for different uses. First, WebAccess provides a Web Service interface for partners to integrate WebAccess data into APPs or application system. Second, a pluggable widget interface has been opened for programmer to develop their widget and run on WebAccess Dashboard. Last, WebAccess API, a DLL interface for programmer to access WebAccess platform and develop Windows applications. With these interfaces, WebAccess can act as an IoT platform for partners to develop IoT applications in various vertical markets.

### Google Maps and GPS Tracking Integration

WebAccess integrates real-time data on each geographical site with Google Maps and GPS location tracking. For remote monitoring, users can intuitively view the current energy consumption on each building, production rate on each field or traffic flow on the highway together with alarm status. By right-clicking on Google Maps or entering the coordinate of the target, users can create a marker for the target and associate the real-time data of three sites with a display label. Furthermore, this function also integrates with GPS modules to track the location of the marker in Google Maps and allows it to be used in vehicle systems.

### Ample Driver Support

WebAccess supports hundreds of devices. In addition to Advantech I/Os and controllers, WebAccess also supports all major PLCs, controllers and I/Os, like Allen Bradley, Siemens, LonWorks, Mitsubishi, Beckhoff, Yokogawa etc. WebAccess can easily integrate all devices in one SCADA. All of these device drivers are integrated into WebAccess and free of charge. For a complete list of WebAccess drivers, refer to [webaccess.advantech.com](http://webaccess.advantech.com).

### Distributed SCADA Architecture with Central Database Server

SCADA nodes run independent of any other node. Each SCADA node communicates to automation equipment using communication drivers supplied with Advantech WebAccess. The Project Node is a centralized database server of configuration data. A copy of the database and graphics of all SCADA nodes is kept on the Project Node. The historical data is also stored in the database in project node.

### Open Data Connectivity

Advantech WebAccess exchanges online data with 3rd party software in real-time by supporting OPC UA/DA, DDE, Modbus and BACnet Server/Client. It supports SQL, Oracle, MySQL, and MS Access for offline data sharing.

### Software Requirements

|                    |                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| ▪ Operating System | Windows XP (SCADA Node Only), Windows 7 SP1, Windows 8 Professional, Windows Server 2008 R2 or later                                   |
| ▪ Hardware         | Intel Atom or Celeron. Dual Core processors or higher recommended<br>2GB RAM minimum, more recommended<br>30GB or more free disk space |

# WISE-4012

## 4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions



### Features

- 4-ch universal input and 2-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

### Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with I/O data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

### Features

#### IEEE 802.11 b/g/n 2.4GHz 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-4000 to be accessed via other Wi-Fi devices directly as an AP.



#### 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-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



#### RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



#### Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



#### Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



## Specifications

### Universal Input

- Channels: 4
- Resolution: 16-bit
- Sampling Rate: Analog Input 10Hz (Total)  
Digital Input 2Hz (Per Channel)
- Accuracy:  $\pm 0.1\%$  of FSR (Voltage)  
 $\pm 0.2\%$  of FSR (Current)
- Input Type and Range: Analog Input  $\pm 150\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 5\text{V}$ ,  $\pm 10\text{V}$ ,  
 $0\sim 150\text{mV}$ ,  $0\sim 500\text{mV}$ ,  $0\sim 1\text{V}$ ,  $0\sim 5\text{V}$ ,  $0\sim 10\text{V}$ ,  
 $0\sim 20\text{mA}$ ,  $4\sim 20\text{mA}$ ,  $\pm 20\text{mA}$   
Digital Input (Dry Contact) 0: Open, 1: Close
- Input Impedance:  $> 10\text{M}\Omega$  (Voltage)  
 $120\Omega$  (External resistor for current)
- Over Voltage Protection:  $\pm 35\text{V}_{\text{DC}}$
- Burn-out Detection: Yes (4~20mA only)
- Supports Data Scaling and Averaging

### Digital Output

- Channels: 2  
(Open collector to 30 V, 400 mA max.  
for resistance load)
- Isolation: 3,000  $\text{V}_{\text{rms}}$
- Supports 5 kHz Pules Output
- Supports High-to-Low and Low-to-High Delay Output

### General

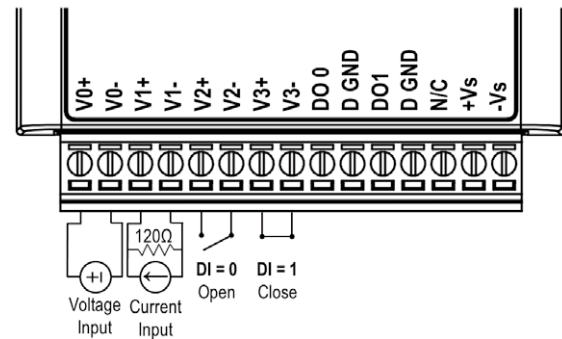
- WLAN: IEEE 802.11b/g/n 2.4GHz
- Outdoor Range: 110 m with line of sight
- Connectors: Plug-in screw terminal block (I/O and power)
- Watchdog Timer: System (1.6 second) and  
Communication (programmable)
- Certification: CE, FCC, R&TTE, NCC, SRRC, RoHS, KC
- Dimensions (W x H x D): 80 x 148 x 25 mm
- Enclosure: PC
- Mounting: DIN 35 rail, wall, and stack
- Power Input: 10 ~ 30  $\text{V}_{\text{DC}}$
- Power Consumption: 2.5 W @ 24  $\text{V}_{\text{DC}}$
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function: Up to 10000 samples with RTC time stamp
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP

- Supports RESTful Web API in JSON format
- Supports Web Server in HTML5 with JavaScript & CSS3
- Supports System Configuration Backup and User Access Control

### Environment

- Operating Temperature:  $-25 \sim 70^{\circ}\text{C}$  ( $-13 \sim 158^{\circ}\text{F}$ )
- Storage Temperature:  $-40 \sim 85^{\circ}\text{C}$  ( $-40 \sim 185^{\circ}\text{F}$ )
- Operating Humidity: 20 ~ 95% RH (non-condensing)
- Storage Humidity: 0 ~ 95% RH (non-condensing)

## Pin Assignment



## Ordering Information

- WISE-4012-AE: 4-ch Universal Input and 2-ch Digital Output IoT  
Wireless I/O Module

### Selection Table

| Model Name | Universal Input | Digital Input | Digital Output | Relay Output | RS-485 |
|------------|-----------------|---------------|----------------|--------------|--------|
| WISE-4012  | 4               |               | 2              |              |        |
| WISE-4050  |                 | 4             | 4              |              |        |
| WISE-4051  |                 | 8             |                |              | 1      |
| WISE-4060  |                 | 4             |                | 4            |        |

### Accessories

- PWR-242-AE: DIN-rail Power Supply (2.1A Output Current)
- PWR-243-AE: Panel Mount Power Supply (3A Output Current)
- PWR-244-AE: Panel Mount Power Supply (4.2A Output Current)

## Dimensions



Unit: mm

# WISE-4050

## 4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module



### Introduction

The WISE-4000 series is an Ethernet-based wireless IoT device, integrated with I/O data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4000 series provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

### Features

#### IEEE 802.11 b/g/n 2.4GHz 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-4000 to be accessed via other Wi-Fi devices directly as an AP.



#### 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-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



### Features

- 4-ch digital input and 4-ch digital output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

#### RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4000 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4000 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4000 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



#### Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



#### Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



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- 8 Industrial I/O and Video Solutions

## Specifications

### Digital Input

- Channels 4
- Logic Level
  - Dry Contact 0: Open
  - 1: Close to DI COM
  - Wet Contact 0: 0 ~ 3 V<sub>DC</sub>
  - 1: 10 ~ 30 V<sub>DC</sub> (3 mA min.)
- Isolation 3,000 V<sub>rms</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Digital Output

- Channels 4
  - (Open collector to 30 V, 400 mA max. for resistance load)
- Isolation 3,000 V<sub>rms</sub>
- Supports 5 kHz Pules Output
- Supports High-to-Low and Low-to-High Delay Output

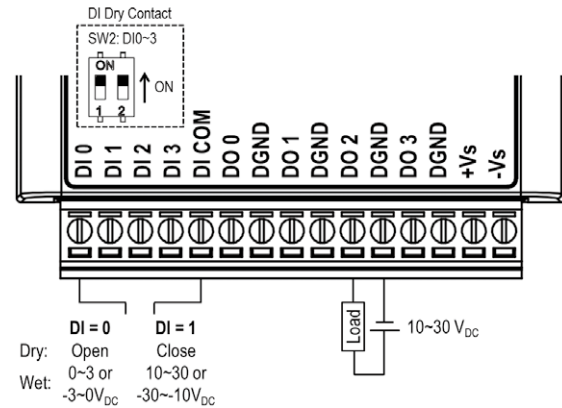
### General

- WLAN IEEE 802.11b/g/n 2.4GHz
- Outdoor Range 110 m with line of sight
- Connectors Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, R&TTE, NCC, SRRC, RoHS, KC, ANATEL
- Dimensions (W x H x D) 80 x 148 x 25 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, and stack
- Power Input 10 ~ 30 V<sub>DC</sub>
- Power Consumption 2.2 W @ 24 V<sub>DC</sub>
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- Supports RESTful Web API 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 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

## Pin Assignment



## Ordering Information

- WISE-4050-AE 4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module

### Selection Table

| Model Name | Universal Input | Digital Input | Digital Output | Relay Output | RS-485 |
|------------|-----------------|---------------|----------------|--------------|--------|
| WISE-4012  | 4               |               | 2              |              |        |
| WISE-4050  |                 | 4             | 4              |              |        |
| WISE-4051  |                 | 8             |                |              | 1      |
| WISE-4060  |                 | 4             |                | 4            |        |

### Accessories

- PWR-242-AE DIN-rail Power Supply (2.1A Output Current)
- PWR-243-AE Panel Mount Power Supply (3A Output Current)
- PWR-244-AE Panel Mount Power Supply (4.2A Output Current)

## Dimensions



# WISE-4060

## 4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module



### Introduction

The WISE-4060 is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4060 provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

### Features

#### IEEE 802.11 b/g/n 2.4GHz 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-4000 to be accessed via other Wi-Fi devices directly as an AP.



#### 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-4000 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4000.



### Features

- 4-ch digital input and 4-ch relay output
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

#### RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4060 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4060 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4060 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



#### Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



#### Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



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## Specifications

### Digital Input

- Channels: 4
- Logic Level: Dry Contact 0: Open  
1: Close to DI COM  
Wet Contact 0: 0 ~ 3 V<sub>DC</sub>  
1: 10 ~ 30 V<sub>DC</sub> (3 mA min.)
- Isolation: 3,000 V<sub>rms</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Relay Output

- Channels: 4 (Form A)
- Contact Rating: 250 V<sub>AC</sub> @ 5 A  
(Resistive Load) 30 V<sub>DC</sub> @ 3 A
- Isolation (b/w coil & contacts): 3,000 V<sub>AC</sub>
- Relay On Time: 10 ms
- Relay Off Time: 5 ms
- Insulation Resistance: 1 GΩ min. @ 500 V<sub>DC</sub>
- Maximum Switching: 60 operations/minute
- Supports Pulse Output
- Supports High-to-Low and Low-to-High Delay Output

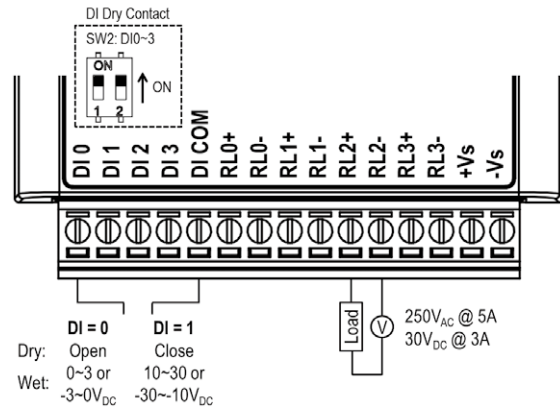
### General

- WLAN: IEEE 802.11b/g/n 2.4GHz
- Outdoor Range: 110 m with line of sight
- Connectors: Plug-in screw terminal block (I/O and power)
- Watchdog Timer: System (1.6 second) and Communication (programmable)
- Certification: CE, FCC, R&TTE, NCC, SRRC, RoHS, ANATEL
- Dimensions (W x H x D): 80 x 148 x 25 mm
- Enclosure: PC
- Mounting: DIN 35 rail, wall, and stack
- Power Input: 10 ~ 30 V<sub>DC</sub>
- Power Consumption: 2.5 W @ 24 V<sub>DC</sub>
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function: Up to 10000 samples with RTC time stamp
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- Supports RESTful Web API 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: 20 ~ 95% RH (non-condensing)
- Storage Humidity: 0 ~ 95% RH (non-condensing)

## Pin Assignment



## Ordering Information

- WISE-4060-AE: 4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module

### Selection Table

| Model Name | Universal Input | Digital Input | Digital Output | Relay Output | RS-485 |
|------------|-----------------|---------------|----------------|--------------|--------|
| WISE-4012  | 4               |               | 2              |              |        |
| WISE-4050  |                 | 4             | 4              |              |        |
| WISE-4051  |                 | 8             |                |              | 1      |
| WISE-4060  |                 | 4             |                | 4            |        |

### Accessories

- PWR-242-AE: DIN-rail Power Supply (2.1A Output Current)
- PWR-243-AE: Panel Mount Power Supply (3A Output Current)
- PWR-244-AE: Panel Mount Power Supply (4.2A Output Current)

## Dimensions



# WISE-4051

## 8-ch Digital Input IoT Wireless I/O Module with RS-485 Port



CE FCC R&TTE SRRC

### Introduction

The WISE-4051 is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O types, the WISE-4051 provides data pre-scaling, data logic, and data logger functions. Data can be accessed via mobile devices and be securely published to the cloud anytime from anywhere.

### Features

#### IEEE 802.11 b/g/n 2.4GHz 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-4000 to be accessed via other Wi-Fi devices directly as an AP.



#### Modbus/RTU to Web Service or Modbus/TCP

The RS-485 port of the WISE-4051 supports Modbus, which can be used to poll the data from Modbus/RTU devices, like ADAM-4000, or ADAM-5000/485. Then you can access the data by Modbus or REST from the WISE-4051. The data can also be logged.



### Features

- 8-ch digital input with 1-port RS-485 for Modbus devices
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

#### RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4051 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4051 when the I/O status is changed. The I/O status can be retrieved over the web using JSON. The WISE-4051 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



#### Data Storage

The WISE-4000 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



#### Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



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## Specifications

### Digital Input

- Channels 8
- Logic Level
  - Dry Contact 0: Open  
1: Close to DCOM
  - Wet Contact 0: 0 ~ 3 V<sub>DC</sub>  
1: 10 ~ 30 V<sub>DC</sub> (3 mA min.)
- Isolation 3,000 V<sub>rms</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Serial Port

- Port Number 1
- Type RS-485
- Serial Signal DATA+, DATA-
- Data Bits 7, 8
- Stop Bits 1, 2
- Parity None, Odd, Even
- Baud Rate 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)
- Protection 15 kV ESD
- Protocol Modbus/RTU (Total 32 address by max. 8 instructions)

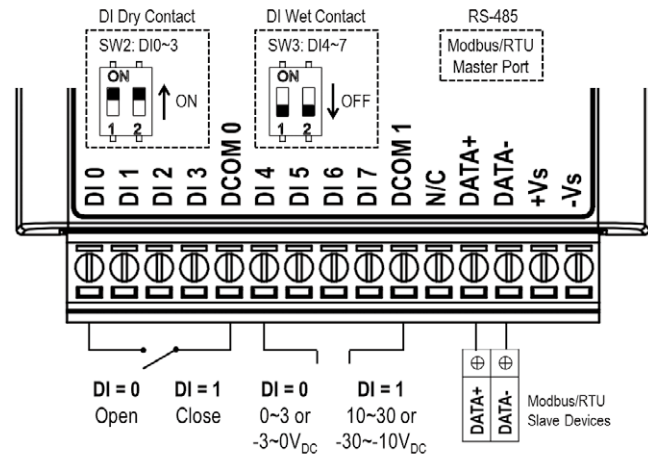
### General

- WLAN IEEE 802.11b/g/n 2.4GHz
- Outdoor Range 110 m with line of sight
- Connectors Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Certification CE, FCC, R&TTE, NCC, SRRC, RoHS
- Dimensions (W x H x D) 80 x 148 x 25 mm
- Enclosure PC
- Mounting DIN 35 rail, wall, and stack
- Power Input 10 ~ 30 V<sub>DC</sub>
- Power Consumption 2.2 W @ 24 V<sub>DC</sub>
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function Up to 10000 samples with RTC time stamp
- Supported Protocols Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- Supports RESTful Web API 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 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

## Pin Assignment



## Ordering Information

- WISE-4051-AE 8-ch Digital Input IoT Wireless I/O Module with RS-485 Port

### Selection Table

| Model Name | Universal Input | Digital Input | Digital Output | Relay Output | RS-485 |
|------------|-----------------|---------------|----------------|--------------|--------|
| WISE-4012  | 4               |               | 2              |              |        |
| WISE-4050  |                 | 4             | 4              |              |        |
| WISE-4051  |                 | 8             |                |              | 1      |
| WISE-4060  |                 | 4             |                | 4            |        |

### Accessories

- PWR-242-AE DIN-rail Power Supply (2.1A Output Current)
- PWR-243-AE Panel Mount Power Supply (3A Output Current)
- PWR-244-AE Panel Mount Power Supply (4.2A Output Current)

## Dimensions



# IoT Ethernet I/O Modules



| Model Name            |                 | WISE-4010/LAN                                                    | WISE-4050/LAN                                                    | WISE-4060/LAN                                                  |
|-----------------------|-----------------|------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------|
| Description           |                 | 4-ch current input + 4-ch digital output IoT Ethernet I/O module | 4-ch digital input + 4-ch digital output IoT Ethernet I/O module | 4-ch digital input + 4-ch relay output IoT Ethernet I/O module |
| Analog I/O            | Channels        | 4                                                                | -                                                                | -                                                              |
|                       | Resolution      | 12-bit                                                           | -                                                                | -                                                              |
|                       | Accuracy        | ±0.2% of FSR                                                     | -                                                                | -                                                              |
|                       | Sampling Rate   | 10/100 Hz per channel                                            | -                                                                | -                                                              |
|                       | Current Input   | 0 ~ 20, 4 ~ 20 mA                                                | -                                                                | -                                                              |
| Digital I/O           | Input Channels  | -                                                                | 4                                                                | 4                                                              |
|                       | Output Channels | 4                                                                | 4                                                                | 4 (from a power relay)                                         |
|                       | Counter Input   | -                                                                | 3 kHz                                                            | 3 kHz                                                          |
|                       | Frequency Input | -                                                                | 3 kHz                                                            | 3 kHz                                                          |
|                       | Pulses Output   | 1 kHz                                                            | 1 kHz                                                            | 1 kHz                                                          |
| Isolation Protection  |                 | -                                                                | 3,000 V <sub>rms</sub>                                           | 3,000 V <sub>rms</sub>                                         |
| LED Indicators        |                 | Status, Comm                                                     |                                                                  |                                                                |
| Power Requirement     |                 | 10 ~ 30 V <sub>DC</sub> (24 V <sub>DC</sub> Standard)            |                                                                  |                                                                |
| Power Consumption     |                 | 1.2 W @ 24 V <sub>DC</sub>                                       | 2.2 W @ 24 V <sub>DC</sub>                                       | 2.5 W @ 24 V <sub>DC</sub>                                     |
| Operating Temperature |                 | -40 ~ 70°C (-40~158°F)                                           |                                                                  |                                                                |
| Storage Temperature   |                 | -40 ~ 85°C (-40~185°F)                                           |                                                                  |                                                                |
| Operating Humidity    |                 | 20 ~ 95% RH (non-condensing)                                     |                                                                  |                                                                |
| Storage Humidity      |                 | 0 ~ 95% RH (non-condensing)                                      |                                                                  |                                                                |

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# WISE-4000/LAN Series

## IoT Ethernet I/O Module



### Features

- IEEE 802.3u 10/100Base-T(X)
- Industrial grade operating temperature -40~70°C
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, HTTP
- Supports RESTful web API in JSON format
- Supports local logging with RTC time stamp
- Supports mobile device web configuration in HTML5
- Supports 10~30V<sub>DC</sub> power with reverse protection

### Introduction

The WISE-4000/LAN series is a newly designed IoT Ethernet I/O module which supports new RESTful web API for IoT applications. A HTML5 web configured interface enables users to configure WISE modules without the limitation of a platform or operating system. The built-in data logger function logs data with time information. Wide operating temperatures enable the WISE series to be implemented in more IoT data acquisition applications. As well as these functions, the new mechanical design allows users to install the module and perform diagnostics easier than before.

### Specifications

#### Current Input

- **Channel** WISE-4010/LAN: 4 (differential)
- **Resolution** 12-bit
- **Sampling Rate** 10/100 Hz/channel
- **Accuracy** ±0.2% of FSR @ 25°C
- **Input Range** 0~20 mA, 4~20 mA
- **Input Impedance** 120 Ω
- **Burn-out Detection** Yes (4~20 mA only)
- **Supports Data Scaling and Averaging**

#### Digital Input

- **Channels** WISE-4050/LAN: 4  
WISE-4060/LAN: 4
- **Logic level:** Dry Contact 0: Open  
1: Close to DI COM  
Wet Contact 0: 0 ~ 3 V<sub>DC</sub>  
1: 10 ~ 30 V<sub>DC</sub> (3 mA min.)
- **Isolation** 3,000 V<sub>rms</sub>
- **Supports 32-bit Counter Input Function (Maximum frequency 3kHz)**
- **Keep/Discard Counter Value when Power-off**
- **Supports Frequency Input Function (Maximum frequency 3 kHz)**
- **Supports Inverted DI Status**

#### Digital Output

- **Channels** WISE-4010/LAN: 4  
WISE-4050/LAN: 4  
(Open collector to 30 V, 500 mA max. for resistance load)
- **Isolation** 3,000 V<sub>rms</sub> (WISE-4050/LAN only)
- **Supports 1 kHz Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

#### Relay Output

- **Channels** WISE-4060/LAN: 4 (Form A)
- **Contact Rating** 250 V<sub>AC</sub> @ 5 A  
(Resistive Load) 30 V<sub>DC</sub> @ 3 A
- **Isolation** (b/t coil & contact) 3,000 V<sub>rms</sub>
- **Relay On Time** 10 ms
- **Relay Off Time** 5 ms
- **Insulation Resistance** 1 GΩ min. @ 500 V<sub>DC</sub>
- **Maximum Switching** 60 operations/minute
- **Supports Pulse Output**
- **Supports High-to-Low and Low-to-High Delay Output**

#### Environment

- **Operating Temperature** -40 ~ 70°C (-40~158°F)
- **Storage Temperature** -40 ~ 85°C (-40~185°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

#### General

- **LAN** IEEE 802.3u 10/100Base-T(X)
- **Connectors** Plug-in screw terminal block (I/O and power)
- **Watchdog Timer** System (1.6 second) and Communication (programmable)
- **Certification** CE, FCC, RoHS
- **Dimensions (W x H x D)** 80 x 98 x 25 mm
- **Enclosure** PC
- **Mounting** DIN 35 rail, wall, and stack
- **Power Input** 10 ~ 30 V<sub>DC</sub>
- **Power Consumption** WISE-4010/LAN: 1.2 W @ 24 V<sub>DC</sub>  
WISE-4050/LAN: 2.2 W @ 24 V<sub>DC</sub>  
WISE-4060/LAN: 2.5 W @ 24 V<sub>DC</sub>
- **Power Reversal Protection**
- **Supports Data Log Function** Up to 10000 samples with time stamp
- **Supports User Defined Modbus Address**
- **Supported Protocols** Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- **Supports RESTful Web API in JSON format**
- **Supports Web Server in HTML5 with JavaScript & CSS3**
- **Supports System Configuration Backup and User Access Control**

### Ordering Information

- **WISE-4010/LAN** 4-ch Current Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4050/LAN** 4-ch Digital Input and 4-ch Digital Output IoT Ethernet I/O Module
- **WISE-4060/LAN** 4-ch Digital Input and 4-ch Relay Output IoT Ethernet I/O Module

#### Selection Table

| Model Name    | Current Input | Digital Input | Digital Output | Relay Output |
|---------------|---------------|---------------|----------------|--------------|
| WISE-4010/LAN | 4             |               | 4              |              |
| WISE-4050/LAN |               | 4             | 4              |              |
| WISE-4060/LAN |               | 4             |                | 4            |

# IoT Wireless Sensor Nodes



| Wireless               |                 | Wi-Fi                                              |                                           |                                          | LoRa                                  |                                   |
|------------------------|-----------------|----------------------------------------------------|-------------------------------------------|------------------------------------------|---------------------------------------|-----------------------------------|
| Model Name             |                 | WISE-4220-S231                                     | WISE-4220-S214                            | WISE-4220-S215                           | WISE-4610-S672                        | WISE-4610-S614                    |
| Description            |                 | Wireless IoT WSN with Temperature/Humidity Sensors | Wireless IoT WSN with 4-ch AI and 4-ch DI | Wireless IoT WSN with 4-ch RTD           | LoRa WSN with 2 Serial Port & 6-ch DI | LoRa WSN with 4-ch AI and 4-ch DI |
| Wireless Interface     | Function        | Wireless Sensor Node                               | Wireless Sensor Node                      | Wireless Sensor Node                     | Wireless Sensor Node                  | Wireless Sensor Node              |
|                        | IEEE Standard   | IEEE 802.11b/g/n                                   |                                           |                                          | IEEE 802.15.4g LoRa Modulation        |                                   |
|                        | Frequency Band  | 2.4GHz                                             |                                           |                                          | NA915, EU868, JP925, CN470            |                                   |
|                        | Mode / Topology | Infrastructure, Limited AP                         |                                           |                                          | Star                                  |                                   |
|                        | Outdoor Range   | 110m (L.O.S.)                                      |                                           |                                          | 5000m (L.O.S.)                        |                                   |
| Network                | GNSS            | -                                                  |                                           |                                          | GPS/GLONASS/BeiDou                    |                                   |
|                        | Interface       | WLAN                                               |                                           |                                          | Micro-B USB                           |                                   |
|                        | Protocol        | Modbus/TCP, REST, MQTT, Azure                      |                                           |                                          | -                                     | -                                 |
| Analog / Sensor Input  | Channel         | Built-in Sensors                                   | 4-ch                                      | 4-ch                                     | -                                     | 4-ch                              |
|                        | Input Type      | Temperature, Humidity                              | V, A                                      | 2, 3-wire Pt RTD                         | -                                     | V, A                              |
|                        | Input Range     | -25 ~ 70°C<br>0 ~ 90% RH                           | 0~10V, 0~20mA,<br>4~20mA                  | Pt-100: -200~200°C<br>Pt-1000: -40~160°C | -                                     | 0~10V, 0~20mA,<br>4~20mA          |
| Digital Input / Output | Channel         | -                                                  | 4-ch Dry Contact DI                       | -                                        | 6-ch Dry Contact DI                   | 4-ch Dry Contact DI               |
| Serial Port            | Port Number     | -                                                  | -                                         | -                                        | 1-port RS-485<br>1-port RS-232/485    | -                                 |
|                        | Battery Power   | Solar Rechargeable Battery                         |                                           |                                          |                                       |                                   |
| Power Input            | External Power  | 10 ~ 50 V <sub>DC</sub>                            |                                           |                                          |                                       |                                   |



| Wireless               |                | Cellular                                                                     |                          |                                    |                                                                             |                                         |
|------------------------|----------------|------------------------------------------------------------------------------|--------------------------|------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------|
| Model Name             |                | WISE-4470-S250                                                               | WISE-4470-S414           | WISE-4470-S472                     | WISE-4670-S672                                                              | WISE-4670-S614                          |
| Description            |                | 3G WSN with 1-port RS-485 and DIO                                            | IP65 3G WSN with 4-ch AI | IP65 3G WSN with 2 Serial Port     | Outdoor 3G WSN with 2 Serial Port & 6-ch DI                                 | Outdoor 3G WSN with 4-ch AI and 4-ch DI |
| Wireless Interface     | Function       | Wireless Sensor Node                                                         | Wireless Sensor Node     | Wireless Sensor Node               | Wireless Sensor Node                                                        | Wireless Sensor Node                    |
|                        | IEEE Standard  | GSM/GPRS/HSPA                                                                |                          |                                    |                                                                             |                                         |
|                        | Frequency Band | UMTS/HSPA: 1/8 (900/2100MHz)<br>GSM/GPRS/EDGE: 2/3/5/8(1900/1800/850/900MHz) |                          |                                    | UMTS/HSPA: 1/8(2100/900MHz)<br>GSM/GPRS/EDGE: 2/3/5/8(1900/1800/850/900MHz) |                                         |
|                        | Outdoor Range  | -                                                                            |                          |                                    |                                                                             |                                         |
|                        | GNSS           | -                                                                            |                          |                                    |                                                                             |                                         |
| Network                | Configuration  | Micro-B USB                                                                  |                          |                                    |                                                                             |                                         |
|                        | Protocol       | REST, MQTT, Azure                                                            |                          |                                    | REST, MQTT, Azure                                                           |                                         |
| Analog / Sensor Input  | Channel        | -                                                                            | 4-ch                     | -                                  | -                                                                           | 4-ch                                    |
|                        | Input Type     | -                                                                            | V, A                     | -                                  | -                                                                           | V, A                                    |
|                        | Input Range    | -                                                                            | 0~10V, 0~20mA, 4~20mA    |                                    | -                                                                           | 0~10V, 0~20mA, 4~20mA                   |
| Digital Input / Output | Channel        | 6-ch Dry Contact DI<br>2-ch Sink-type DO                                     | -                        | -                                  | 6-ch Dry Contact DI                                                         | 4-ch Dry Contact DI                     |
| Serial Port            | Port Number    | 1-port RS-485 for Modbus/RTU                                                 | -                        | 1-port RS-485<br>1-port RS-232/485 | 1-port RS-485<br>1-port RS-232/485                                          | -                                       |
| Power Input            | Battery Power  | Solar Rechargeable Battery                                                   |                          |                                    |                                                                             |                                         |
|                        | External Power | 10 ~ 50 V <sub>DC</sub>                                                      |                          |                                    |                                                                             |                                         |

# IoT Wireless Sensor Nodes



| Wireless               |                | LPWAN                              |                                              |                                          |                                    |                                          |
|------------------------|----------------|------------------------------------|----------------------------------------------|------------------------------------------|------------------------------------|------------------------------------------|
| Model Name             |                | WISE-4210-AP                       | WISE-4210-S231                               | WISE-4210-S251                           | WISE-4210-S214                     | WISE-4210-S215                           |
| Description            |                | LPWAN Wireless to Ethernet AP      | LPWAN WSN with Temperature/Humidity Sensors  | LPWAN WSN with 1-port RS-485 and 6-ch DI | LPWAN WSN with 4-ch AI and 4-ch DI | LPWAN WSN with 4-ch RTD                  |
| Wireless Interface     | Function       | Wireless Access Point              | Wireless Sensor Node                         | Wireless Sensor Node                     | Wireless Sensor Node               | Wireless Sensor Node                     |
|                        | IEEE Standard  | IEEE 802.15.4g FSK/GFSK Modulation |                                              |                                          |                                    |                                          |
|                        | Frequency Band | 433, 868, or 923 MHz               |                                              |                                          |                                    |                                          |
|                        | Topology       | Star                               |                                              |                                          |                                    |                                          |
|                        | Outdoor Range  | 2000m (L.O.S.)                     |                                              |                                          |                                    |                                          |
| Network                | Configuration  | RJ-45                              | Micro-B USB                                  |                                          |                                    |                                          |
|                        | Protocol       | Modbus/TCP, REST, MQTT, Azure      | -                                            | -                                        | -                                  | -                                        |
| Analog / Sensor Input  | Channel        | -                                  | Built-in Sensors                             | -                                        | 4-ch                               | 4-ch                                     |
|                        | Input Type     | -                                  | Temperature, Humidity                        | -                                        | V, A                               | 2, 3-wire Pt RTD                         |
|                        | Input Range    | -                                  | -25°C ~ 70°C<br>0 ~ 90% RH                   | -                                        | 0~10V, 0~20mA, 4~20mA              | Pt-100: -200~200°C<br>Pt-1000: -40~160°C |
| Digital Input / Output | Channel        | -                                  | -                                            | 6-ch Dry Contact DI                      | 4-ch Dry Contact DI                | -                                        |
| Serial Port            | Port Number    | -                                  | -                                            | 1-port RS-485 for Modbus/RTU             | -                                  | -                                        |
| Power Input            | Battery Power  | -                                  | 3 x AA, 3.6V V <sub>DC</sub> Lithium Battery |                                          |                                    |                                          |
|                        | External Power | 10 ~ 50 V <sub>DC</sub>            | 10 ~ 50 V <sub>DC</sub>                      |                                          |                                    |                                          |



| Wireless                 |                | eMTC / NB-IoT                              |                                          |                                            |                                          | LPWAN                     |
|--------------------------|----------------|--------------------------------------------|------------------------------------------|--------------------------------------------|------------------------------------------|---------------------------|
| Model Name               |                | WISE-4471-S250                             | WISE-4471-S214                           | WISE-4671-S672                             | WISE-4671-S614                           | PCM-24S1S1                |
| Description              |                | eMTC/NB-IoT WSN with 1-port RS-485 and DIO | eMTC/NB-IoT WSN with 4-ch AI and 4-ch DI | Outdoor eMTC/NB-IoT WSN with 2 Serial Port | Outdoor eMTC/NB-IoT WSN with 4-AI & 4-DI | LPWAN Wireless iDoor AP   |
| Wireless Interface       | Function       | Wireless Sensor Node                       | Wireless Sensor Node                     | Wireless Sensor Node                       | Wireless Sensor Node                     | Wireless Access Point     |
|                          | IEEE Standard  | R13 LTE Cat M1 / NB1                       |                                          |                                            |                                          | IEEE 802.15.4g            |
|                          | Frequency Band | 2, 3, 4, 5, 8, 12, 13, 20, 28              |                                          |                                            |                                          | 433, 868, or 923 MHz      |
|                          | Topology       | Star                                       |                                          |                                            |                                          |                           |
|                          | Outdoor Range  | -                                          |                                          |                                            |                                          | 2000m (L.O.S.)            |
|                          | GPS            | Option                                     |                                          |                                            |                                          | -                         |
| Network                  | Interface      | Micro-B USB                                | Micro-B USB                              | Micro-B USB                                | Micro-B USB                              | mPCIe                     |
|                          | Protocol       | UDP, CoAP<br>REST, MQTT                    | UDP, CoAP<br>REST, MQTT                  | UDP, CoAP<br>REST, MQTT                    | UDP, CoAP<br>REST, MQTT                  | Modbus/TCP,<br>REST, MQTT |
| Analog /<br>Sensor Input | Channel        | -                                          | 4-ch                                     | -                                          | 4-ch                                     | -                         |
|                          | Input Type     | -                                          | V, A                                     | -                                          | V, A                                     | -                         |
|                          | Input Range    | -                                          | 0~10V, 0~20mA,<br>4~20mA                 | -                                          | 0~10V, 0~20mA,<br>4~20mA                 | -                         |
| Digital Input / Output   | Channel        | 6-ch Dry Contact DI<br>2-ch Sink-type DO   | 4-ch Dry Contact DI                      | 6-ch Dry Contact DI                        | 4-ch Dry Contact DI                      | -                         |
| Serial Port              | Port Number    | 1-port RS-485 for Modbus/RTU               | -                                        | 1-port RS-485<br>1-port RS-232/485         | -                                        | -                         |
| Power Input              | Battery Power  | Solar Rechargeable Battery                 |                                          |                                            |                                          | -                         |
|                          | External Power | 10 ~ 50 V <sub>DC</sub>                    |                                          |                                            |                                          | -                         |

# WISE-4220-S231

## Wi-Fi IoT WSN with Temperature and Humidity Sensors

**NEW**



### Introduction

The WISE-4220 series is an Ethernet-based wireless IoT device, integrated with IoT data acquisition, processing, and publishing functions. As well as various I/O and sensor types, the WISE-4220 series provides data pre-scaling, data logic, and data logger functions. These data can be accessed via mobile devices and be published to the cloud with security at anytime and anywhere.

### Features

#### IEEE 802.11 b/g/n 2.4GHz 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-4220 to be accessed via other Wi-Fi devices directly as an AP.



#### 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-4220 without the limitation of OS/devices. You can use your mobile phone or tablet to directly configure the WISE-4220.



### Features

- Built-in temperature and humidity sensors
- 2.4GHz Wi-Fi reducing the wiring cost during big data acquisition
- Easily extend the existing network by adding APs, and share existing Ethernet software
- Configured by mobile devices directly without installing any software or Apps
- Zero data loss using the log function with RTC time stamp
- Data can be automatically pushed to Dropbox or computer
- Supports RESTful web API in JSON format for IoT integration

#### RESTful Web Service with Security Socket

As well as supporting Modbus/TCP, the WISE-4220 series also supports IoT communication protocol, RESTful web service. Data can be polled or even be pushed automatically from the WISE-4220 when the I/O status is changed. The I/O status can be retrieved by internet media types like JSON. The WISE-4220 also supports HTTPS which has security that can be used in a Wide Area Network (WAN).



#### Data Storage

The WISE-4220 can log up to 10,000 samples of data with a time stamp. The I/O data can be logged periodically, and also when the I/O status changes. Once the memory is full, users can choose to overwrite the old data to ring log or just stop the log function.



#### Cloud Storage

Data logger can push the data to file-based cloud services like Dropbox using pre-configured criteria. With RESTful API, the data can also be pushed to a private cloud server in the format of JSON. Users can setup their private cloud server using the provided RESTful API and their own platform.



- 1 Software and Industry Solutions
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- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

## WISE-4220-S231

### Specifications

#### 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: 10 ~ 90% RH
- Resolution: 0.1% RH
- Accuracy: ±4% for 0%~50% RH  
±6% for 50%~60% RH  
±10% for 60%~90% RH

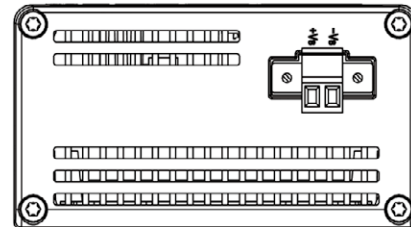
#### General

- WLAN: IEEE 802.11b/g/n 2.4GHz
- Outdoor Range: 150m with line of sight
- Connectors: Plug-in screw terminal block (power)
- Watchdog Timer: System (1.6 second) and Communication (programmable)
- Certification: CE, FCC, IC, RED, NCC, SRRC, RCM, VCCI, TELEC (CC3200 listed antenna)
- 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<sub>DC</sub>
- Power Consumption: 1.2 W @ 24 V<sub>DC</sub>
- Power Reversal Protection
- Supports User Defined Modbus Address
- Supports Data Log Function: Up to 10000 samples with RTC time stamp
- Supported Protocols: Modbus/TCP, TCP/IP, UDP, DHCP, and HTTP
- Supports RESTful Web API 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: 20 ~ 95% RH (non-condensing)
- Storage Humidity: 0 ~ 95% RH (non-condensing)

### Pin Assignment



### Ordering Information

- WISE-4220-S231A: IoT WSN with Temperature and Humidity Sensors

#### Selection Table

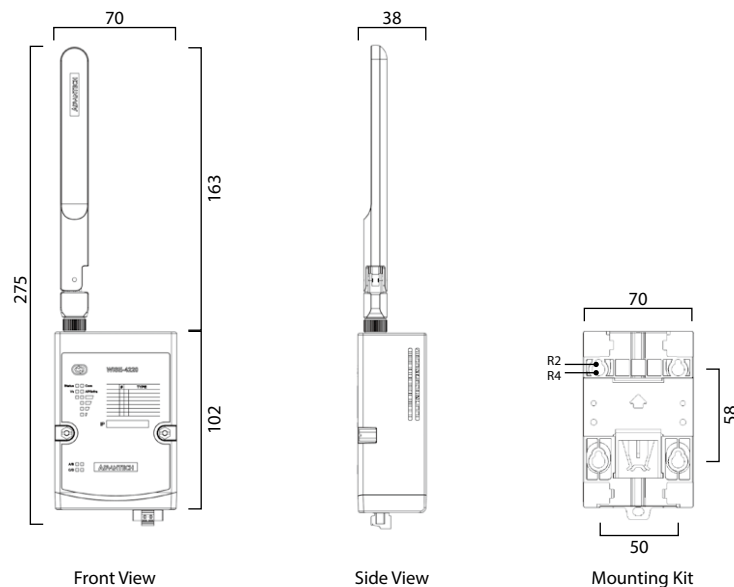
| Model Name     | Analog Input | Digital Input | Digital Output | Relay Output | RS-485 | Built-in Sensor  |
|----------------|--------------|---------------|----------------|--------------|--------|------------------|
| WISE-4012      | 4            |               | 2              |              |        |                  |
| WISE-4050      |              | 4             | 4              |              |        |                  |
| WISE-4051      |              | 8             |                |              | 1      |                  |
| WISE-4060      |              | 4             |                | 4            |        |                  |
| WISE-4220-S231 |              |               |                |              |        | Temp. & Humidity |

#### Accessories

- PWR-242-AE: DIN-rail Power Supply (2.1A Output Current)
- PWR-243-AE: Panel Mount Power Supply (3A Output Current)
- PWR-244-AE: Panel Mount Power Supply (4.2A Output Current)

### Dimensions

Unit: mm



# WISE-4210

## LPWAN IoT Wireless Sensor Node

**Preliminary**



### 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

### Common Specification

#### Wireless Communication

- IEEE Standard** 625bps: IEEE 802.15.4g FSK Modulation  
50kbps: IEEE 802.15.4g GFSK Modulation
- Frequency Band** 923MHz (920.60~924.60), BW: 400kHz  
868MHz (865.00~869.00), BW: 400kHz  
433MHz (433.05~434.55), BW: 300kHz
- Data Rate** 625bps, 50kbps
- Outdoor Range** 625bps: 5 km with line of sight (with 2 dBi antenna)  
50kbps: 2 km with line of sight (with 2 dBi antenna)
- Topology** Star
- Network Capacity** 64 clients

#### General

- Power Input** AP: 10 ~ 50 V<sub>DC</sub>  
Sensor Node: 3 x AA, 3.6V Lithium Battery or 10 ~ 50 V<sub>DC</sub>
- Battery Life** 625bps: 5 years with 10 minute update rate  
50kbps: 5 years with 1 minute update rate
- Configuration Interface** AP: LAN port  
Sensor Node: Micro-B USB
- LED Indicator** Status, Error, Tx, Rx, Battery/Signal Level
- Mounting** DIN 35 rail, wall, and stack
- Dimension (W x H x D)** 70 x 102 x 38 mm

#### Environment

- Operating Temperature** -25 ~ 70°C
- Operating Humidity** 5 ~ 95% RH
- Storage Temperature** -40 ~ 85°C
- Storage Humidity** 0 ~ 95% RH

### WISE-4210-AP

#### General

- Ethernet** RJ-45 (for configuration and data query)
- RS-485** Data+, Data- (for query node data)
- Messaging Protocol** Modbus/TCP, Modbus/RTU, REST, MQTT
- Application Protocol** HTTP, HTTPS, SNMP, DHCP
- Transport Protocol** TCP, UDP
- Supports RESTful Web API in JSON format**
- Supports Web Server in HTML5**

### WISE-4210-S231

#### 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** 10 ~ 90% RH
- Resolution** 0.1% RH
- Accuracy** ±4% for 0%~50% RH  
±6% for 50%~60% RH  
±10% for 60%~90% RH

### WISE-4210-S214

#### Analog Input

- Channels** 4
- Resolution** 16-bit
- Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA

#### Digital Input

- Channels** 4 (Dry Contact)

### WISE-4210-S251

#### Digital Input

- Channels** 6 (Dry Contact)

#### 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
- Protocol** Modbus/RTU (Total 32 address by max. 8 instructions)

### WISE-4210-S215 (Preliminary)

#### RTD Input

- Channels** 4
- Input Type** 2, 3-wire Pt RTD or digital input
- Temperature Range** Pt-100: -200 ~ 200°C  
Pt-1000: -40 ~ 160°C
- Accuracy** ±0.1% or better

### Ordering Information

#### Wireless Access Point

- WISE-4210-APNA\*** LPWAN Wireless to Ethernet AP – AS923/EU868
- WISE-4210-APUA** LPWAN Wireless to Ethernet AP – UN433

#### Wireless Sensor Node

- WISE-4210-S231NA\*** LPWAN WSN with Temp/RH Sensors – AS923/EU868
- WISE-4210-S251NA\*** LPWAN WSN with 6DI and RS-485 – AS923/EU868
- WISE-4210-S214NA\*** LPWAN WSN with 4AI and 4DI – AS923/EU868
- WISE-4210-S215NA\*** LPWAN WSN with 4-ch RTD – AS923/EU868
- WISE-4210-S231UA** LPWAN WSN with Temp/RH Sensors – UN433
- WISE-4210-S251UA** LPWAN WSN with 6DI and RS-485 – UN433
- WISE-4210-S214UA** LPWAN WSN with 4AI and 4DI – UN433
- WISE-4210-S215UA** LPWAN WSN with 4-ch RTD – UN433

#### Accessories

- 1750008836-01** 863-870MHz Dipole Antenna for WISE-4210
- 1750008837-01** 902-928MHz Dipole Antenna for WISE-4210

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

# WISE-4470

## 3G IP65 IoT Wireless Sensor Node

### Preliminary



### Features

- Application-ready I/O combination with optional IP65 I/O
- Global coverage of 3G frequency bands from 800 to 2100MHz
- Supports multiple cellular technologies including GSM, GPRS & HSPA
- Fast and easy deployment to reduce operation cost
- Supports RESTful web API in JSON format for IoT integration
- Data buffered function with RTC reducing data lost

## Common Specification

### Wireless Communication

- **3GPP Standards** GSM/GPRS/HSPA
- **Frequency Band** GSM/GPRS/EDGE: 850, 900, 1800, 1900MHz  
UMTS/HSPA: 900, 2100MHz
- **Antenna Type** Internal

### General

- **Power Input** 10~50V<sub>DC</sub> external power
- **Configuration Interface** Micro-B USB
- **Connector**  
WISE-4470-S2xx: Plug-in screw terminal block (I/O and power)  
WISE-4470-S4xx: M12 4-pin code-A male x 1 (Power)  
M12 8-pin code-D female x 1 (I/O)
- **LED Indicator** Status, Error, Tx, Rx, Signal Level
- **Mounting** DIN 35 rail, wall, pole, and stack
- **Dimension (W x H x D)** 69 x 112 x 38 mm

### Environment

- **Operating Temperature** -25 ~ 70°C
- **Storage Temperature** -40 ~ 85°C
- **Operating Humidity** 20 ~ 95% RH
- **Storage Humidity** 0 ~ 95% RH

## WISE-4470-S250

### Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 3kHz Frequency Input**

### Digital Output

- **Channels** 2

### 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
- **Protocol** Modbus/RTU  
(Total 32 addresses by 8 max. instructions)

## WISE-4470-S214/S414

### Analog Input

- **Channels** S214: 4  
S414: 4
- **Resolution** 16-bit
- **Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA

### Digital Input

- **Channels** S214: 4 (Dry Contact)
- **Supports 3kHz Frequency Input**

## WISE-4470-S215

### RTD Input

- **Channels** 4
- **Input Type** 2, 3-wire Pt RTD or digital input
- **Temperature Range** Pt-100: -200~200°C  
Pt-1000: -40~160°C
- **Accuracy** ±0.1% or better

## WISE-4470-S472

### Serial Port

- **Port Number** 2
- **Type** Port1: RS-485  
Port2: RS-485/RS-232
- **Data Bits** 7, 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU  
(Total 32 addresses by 8 max. instructions)

## Ordering Information

### Wireless Sensor Node

- **WISE-4470-S250CA** 3G IoT WSN with 6DI, 2DO, and RS-485
- **WISE-4470-S214CA** 3G IoT WSN with 4AI and 4DI
- **WISE-4470-S215CA** 3G IoT WSN with 4-ch RTD
- **WISE-4470-S414CA** 3G IP65 IoT WSN with 4-ch Analog Input
- **WISE-4470-S472CA** 3G IP65 IoT WSN with 2 serial ports

# WISE-4471

## NB-IoT / eMTC IoT Wireless Sensor Node

**Preliminary**



### Features

- Global coverage of NB-IoT and eMTC frequency bands
- Application-ready I/O combination with optional IP65 I/O
- Wide voltage power input with 10~50V<sub>DC</sub>
- Data buffered function with RTC reducing data lost
- Fast and easy deployment to reduce operation cost
- Supports direct cloud service for IoT integration
- Support MQTT and CoAP protocols

### Common Specification

#### Wireless Communication

- **3GPP Standards** R13 LTE Cat M1 / NB1
- **Frequency Band** 1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28 (and band 39 in M1-only)
- **Antenna Type** Internal

#### General

- **Power Input** 10~50V<sub>DC</sub> external power
- **Configuration Interface** Micro-B USB
- **Connector**
  - WISE-4471-S2xx: Plug-in screw terminal block (I/O and power)
  - WISE-4471-S4xx: M12 4-pin code-A male x 1 (Power) M12 8-pin code-D female x 1 (I/O)
- **LED Indicator** Status, Error, Tx, Rx, Signal Level
- **Mounting** DIN 35 rail, wall, pole, and stack
- **Dimension (W x H x D)** 69 x 112 x 38 mm

#### Environment

- **Operating Temperature** -20 ~ 65°C
- **Storage Temperature** -40 ~ 85°C
- **Operating Humidity** 20 ~ 95% RH
- **Storage Humidity** 0 ~ 95% RH

### WISE-4471-S250

#### Digital Input

- **Channels** 6 (Dry Contact)
- **Supports 3kHz Frequency Input**

#### Digital Output

- **Channels** 2

#### 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
- **Protocol** Modbus/RTU (Total 32 addresses by 8 max. instructions)

### WISE-4471-S214/S414

#### Analog Input

- **Channels** S214: 4 S414: 4
- **Resolution** 16-bit
- **Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA

#### Digital Input

- **Channels** S214: 4
- **Supports 3kHz Frequency Input**

### WISE-4471-S215

#### RTD Input

- **Channels** 4
- **Input Type** 2, 3-wire Pt RTD or digital input
- **Temperature Range** Pt-100: -200~200°C Pt-1000: -40~160°C
- **Accuracy** ±0.1% or better

### WISE-4471-S472

#### Serial Port

- **Port Number** 2
- **Type** Port1: RS-485 Port2: RS-485/RS-232
- **Data Bits** 7, 8
- **Stop Bits** 1, 2
- **Parity** None, Odd, Even
- **Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- **Protocol** Modbus/RTU (Total 32 addresses by 8 max. instructions)

### Ordering Information

#### Wireless Sensor Node

- **WISE-4471-S250UA** NB-IoT/eMTC IoT WSN with 6DI, 2DO, and RS-485
- **WISE-4471-S214UA** NB-IoT/eMTC IoT WSN with 4AI and 4DI
- **WISE-4471-S215UA** NB-IoT/eMTC IoT WSN with 4-ch RTD
- **WISE-4471-S414UA** NB-IoT/eMTC IP65 IoT WSN with 4-ch Analog Input
- **WISE-4471-S472UA** NB-IoT/eMTC IP65 IoT WSN with 2 serial ports

1

Software and Industry Solutions

2

Industrial Server

3

Intelligent System

4

Intelligent HMI and Monitors

5

Automation Computers and Controllers

6

Industrial Communication

7

Remote I/O & Wireless Sensing Modules

8

Industrial I/O and Video Solutions

# WISE-4610

## LoRa Outdoor Wireless Sensor Node

### Preliminary



### Features

- For North America, Europe, Japan, and China
- 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 IP65 housing
- Powered by solar rechargeable battery or 10–50V<sub>DC</sub> input
- Global Positioning System (GPS) support

## Common Specification

### Wireless Communication

- IEEE Standard** IEEE 802.15.4g
- Frequency Band** 868.1–896.5MHz for Europe (Proprietary LoRa)  
903.0–927.5MHz for North America (Proprietary LoRa)  
920.6–923.4MHz for Japan (Proprietary LoRa)  
470.3–509.7MHz for China (Proprietary LoRa)
- Spreading Factor** 7–12
- Outdoor Range** 5km with line of sight (with 2 dBi Antenna)
- Transmit Power** Up to +18dBm
- Receiver Sensitivity** Up to -136dBm at SF = 12 / 125KHz
- Data Rate** 50 kbps at FSK mode EU868  
21.9 kbps at SF7 mode US915  
5.47 kbps at SF7 mode JP923
- Topology** Star
- Function** End Node

### GPS<sup>1</sup>

- GNSS Systems** GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1I
- Update Rates** Single GNSS: up to 18 Hz  
2 Concurrent GNSS: up to 10 Hz
- SBAS (L1 C/A)** WAAS, EGNOS, MSAS, GAGAN
- Accuracy** Position: 2.5 m CEP (50% confidence)  
With SBAS: 2.0 m CEP (50% confidence)
- Acquisition Time** Cold starts: 26 s

### General

- Power Input** Built-in 4000mA Lithium rechargeable battery pack<sup>2</sup> or 10–50V<sub>DC</sub> external power
- Battery Life** 6 months (1 hour data update and 1 day GPS update)
- Configuration Interface** Micro-B USB
- Connector** Power: M12 4-pin code-A male x 1  
I/O: M12 8-pin code-D female x 2
- LED Indicator** Status, Error, Tx, Rx, Battery/Signal Level
- Mounting** DIN 35 rail, wall, pole, and stack
- Dimension (W x H x D)** 82 x 122 x 49 mm (without antenna)

### Environment

- Operating Temperature<sup>2</sup>** 0–60°C  
No Battery Version: -20–70°C
- Operating Humidity** 5–95% RH

<sup>1</sup> No GPS version, can be order by request

<sup>2</sup> No battery version, can be order by request

## WISE-4610-S672

### Serial Port

- Port Number** 2
- Type** Port 1: RS-485  
Port 2: RS-485/232
- Serial Signal** RS-485: DATA+, DATA-  
RS-232: Tx, Rx, GND
- Data Bits** 7, 8
- Stop Bits** 1, 2
- Parity** None, Odd, Even
- Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protection** 15 kV ESD
- Protocol** Modbus/RTU (Total 8 address)

### Digital Input

- Channels** 6
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Isolation Voltage** 3,000V<sub>rms</sub>
- Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 200Hz Frequency Input**
- Supports Inverted DI Status**

## WISE-4610-S614

### Analog Input

- Channels** 4
- Resolution** 16-bit
- Sampling Rate** 1Hz per channel
- Accuracy** ±0.1% of FSR (Voltage)  
±0.2% of FSR (Current)
- Input Range** ±5V, ±10V, 0–5V, 0–10V, 0–20mA, 4–20mA, ±20mA
- Input Impedance** > 2M Ω (Voltage)  
120 Ω (External resistor for current)
- Isolation Voltage** 3000V<sub>rms</sub>
- Over Voltage Protection** ±35 V<sub>DC</sub>
- Burn-out Detection** Yes (4–20mA only)
- Supports Data Scaling and Averaging**

### Digital Input

- Channels** 4
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Isolation Voltage** 3,000V<sub>rms</sub>
- Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 200Hz Frequency Input**
- Supports Inverted DI Status**

## Ordering Information

### Wireless Sensor Node

- WISE-4610-S672NA** LoRa Outdoor WSN with 6DI & 2COM - NA915
- WISE-4610-S672EA** LoRa Outdoor WSN with 6DI & 2COM - EU868
- WISE-4610-S672JA** LoRa Outdoor WSN with 6DI & 2COM - JP923
- WISE-4610-S672CA** LoRa Outdoor WSN with 6DI & 2COM - CN470
- WISE-4610-S614NA** LoRa Outdoor WSN with 4AI & 4DI - NA915
- WISE-4610-S614EA** LoRa Outdoor WSN with 4AI & 4DI - EU868
- WISE-4610-S614JA** LoRa Outdoor WSN with 4AI & 4DI - JP923
- WISE-4610-S614CA** LoRa Outdoor WSN with 4AI & 4DI - CN470

### Private LoRa Network Gateway

- WISE-3610ILS-51A1N** Private LoRa Network IoT Gateway - NA915
- WISE-3610ILS-51A1E** Private LoRa Network IoT Gateway - EU868
- WISE-3610ILS-51A1J** Private LoRa Network IoT Gateway - JP923
- WISE-3610ILS-51A1C** Private LoRa Network IoT Gateway - CN470

# WISE-4670

## 3G IoT Outdoor Wireless Sensor Node

Preliminary



### Features

- Global coverage of frequency bands from 800 to 2100MHz
- Multiple cellular technologies including UMTS, HSPA, GSM & GPRS
- Application-ready I/O combination with IP65 housing
- Global Positioning System (GPS) support
- Fast and easy deployment to reduce operation cost
- Supports RESTful web API in JSON format for IoT integration
- Data buffered function with RTC reducing data lost

### Common Specification

#### Wireless Communication

- 3GPP Standards** GSM/GPRS/HSPA
- Frequency Band** GSM/GPRS/EDGE: 850, 900, 1800, 1900MHz  
UMTS/HSPA: 900, 2100MHz
- Transmit Power** Up to +32dBm
- Antenna Type** External

#### GPS<sup>1</sup>

- Support System** GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1L
- Update Rates** Single GNSS: up to 18 Hz  
2 Concurrent GNSS: up to 10 Hz  
WAAS, EGNOS, MSAS, GAGAN
- SBAS (L1 C/A)** Position: 2.5 m CEP (50% confidence)
- Accuracy** With SBAS: 2.0 m CEP (50% confidence)
- Acquisition Time** Cold starts: 26 s

#### General

- Power Input** Built-in 4000mA Lithium rechargeable battery pack<sup>2</sup> or 10~50V<sub>DC</sub> external power
- Configuration Interface** Micro-B USB
- Connector** Power: M12 4-pin code-A male x 1  
I/O: M12 8-pin code-D female x 2
- LED Indicator** Status, Error, Tx, Rx, Battery/Signal Level
- Mounting** DIN 35 rail, wall, pole, and stack
- Dimension (W x H x D)** 82 x 122 x 49 mm

#### Environment

- Operating Temperature<sup>2</sup>** 0 ~ 60°C  
No Battery Version: -20 ~ 70°C
- Operating Humidity** 5~95% RH

<sup>1</sup> No GPS version can be order by request

<sup>2</sup> No Battery version can be order by request

### WISE-4670-S672

#### Serial Port

- Port Number** 2
- Type** Port 1: RS-485  
Port 2: RS-485/232
- Serial Signal** RS-485: DATA+, DATA-  
RS-232: Tx, Rx, GND
- Data Bits** 7, 8
- Stop Bits** 1, 2
- Parity** None, Odd, Even
- Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protection** 15 kV ESD
- Protocol** Modbus/RTU (total 8 address)

#### Digital Input

- Channels** 6
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 200Hz Frequency Input**
- Supports Inverted DI Status**

### WISE-4670-S614

#### Analog Input

- Channels** 4
- Resolution** 16-bit
- Sampling Rate** 1Hz per channel
- Accuracy** ±0.1% of FSR (Voltage)  
±0.2% of FSR (Current)
- Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA
- Input Impedance** > 2M $\Omega$  (Voltage)  
120 $\Omega$  (External resistor for current)
- Isolation Voltage** 3000V<sub>RMS</sub>
- Burn-out Detection** Yes (4~20mA only)
- Supports Data Scaling and Averaging**

#### Digital Input

- Channels** 4
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Supports 200Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 200Hz Frequency Input**
- Supports Inverted DI Status**

### Ordering Information

#### Wireless Sensor Node (with GPS & Battery)

- WISE-4670-S672CA** 3G Outdoor IoT WSN with 6DI & 2COM
- WISE-4670-S614CA** 3G Outdoor IoT WSN with 4AI & 4DI

1

Software and Industry Solutions

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Intelligent HMI and Monitors

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Automation Computers and Controllers

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Industrial Communication

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Remote I/O & Wireless Sensing Modules

8

Industrial I/O and Video Solutions

# WISE-4671

## NB-IoT / eMTC Outdoor IoT Wireless Sensor Node

### Preliminary



### Features

- Global coverage of NB-IoT and eMTC
- Application-ready I/O combination with IP65 housing
- Powered by solar rechargeable battery or 10~50V<sub>DC</sub> input
- Global Positioning System (GPS) support
- Data buffered function with RTC reducing data lost
- Support MQTT and CoAP protocols

### Common Specification

#### Wireless Communication

- 3GPP Standard** Rel.13 LTE Cat. NB1/Cat. M1
- Frequency Band** 1, 2, 3, 4, 5, 8, 12, 13, 17, 18, 19, 20, 25, 26, 28 (and band 39 in M1-only)
- Antenna Type** External

#### GPS<sup>1</sup>

- Support System** GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1L
- Update Rates** Single GNSS: up to 18 Hz  
2 Concurrent GNSS: up to 10 Hz
- SBAS (L1 C/A)** WAAS, EGNOS, MSAS, GAGAN
- Accuracy** Position: 2.5 m CEP (50% confidence)  
With SBAS: 2.0 m CEP (50% confidence)
- Acquisition Time** Cold starts: 26 s

#### General

- Power Input** Built-in 4000mA Lithium rechargeable battery pack<sup>2</sup> or 10~50V<sub>DC</sub> external power
- Battery Life<sup>2</sup>** 6 months (1 hour data update and 1 day GPS update)
- Configuration Interface** Micro-B USB
- Connector** Power: M12 4-pin code-A male x 1  
I/O: M12 8-pin code-D female x 2  
Status, Error, Tx, Rx, Battery/Signal Level
- LED Indicator** DIN 35 rail, wall, pole, and stack
- Mounting** DIN 35 rail, wall, pole, and stack
- Dimension (W x H x D)** 82 x 122 x 49 mm

#### Environment

- Operating Temperature<sup>2</sup>** 0~60°C  
No Battery Version: -20~65°C
- Operating Humidity** 5~95% RH

<sup>1</sup> No GPS version, can be order by request  
<sup>2</sup> No battery version, can be order by request

### WISE-4671-S672

#### Serial Port

- Port Number** 2
- Type** Port 1: RS-485  
Port 2: RS-485/232
- Serial Signal** RS-485: DATA+, DATA-  
RS-232: Tx, Rx, GND
- Data Bits** 7, 8
- Stop Bits** 1, 2
- Parity** None, Odd, Even
- Baud Rate (bps)** 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- Protection** 15 kV ESD
- Protocol** Modbus/RTU (Total 8 address)

#### Digital Input

- Channels** 6
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Supports 100Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 100Hz Frequency Input**
- Supports Inverted DI Status**

### WISE-4671-S614

#### Analog Input

- Channels** 4
- Resolution** 16-bit
- Sampling Rate** 1Hz per channel
- Accuracy** ±0.1% of FSR (Voltage)  
±0.2% of FSR (Current)
- Input Range** ±5V, ±10V, 0~5V, 0~10V, 0~20mA, 4~20mA, ±20mA
- Input Impedance** > 2M  $\Omega$  (Voltage)  
120  $\Omega$  (External resistor for current)
- Isolation Voltage** 3000Vrms
- Burn-out Detection** Yes (4~20mA only)
- Supports Data Scaling and Averaging**

#### Digital Input

- Channels** 4
- Input Type** Dry Contact (Wet Contact by request)
- Logic Level** 0: Open  
1: Close to DCOM
- Supports 100Hz Counter Input (16-bit + 1-bit overflow)**
- Keep/Discard Counter Value when Power-off**
- Supports 100Hz Frequency Input**
- Supports Inverted DI Status**

### Ordering Information

#### Wireless Sensor Node

- WISE-4671-S672UA** NB-IoT/eMTC Outdoor Wireless Sensor Node with 6-ch DI & 2-port RS-485
- WISE-4671-S614UA** NB-IoT/eMTC Outdoor Wireless Sensor Node with 4-ch DI & 4-ch AI

# IoT Wireless Sensor Devices

Preliminary



Preliminary



| Model Name         |                                | WISE-2210                                                 | WISE-2834                                                |
|--------------------|--------------------------------|-----------------------------------------------------------|----------------------------------------------------------|
| Description        |                                | 3-ch CT input self-powered wireless sensor node           | 4-ch digital I/O Ethernet/Wi-Fi intelligent RFID gateway |
| Wireless Interface | Function                       | Wireless sensor device                                    | RFID sensor                                              |
|                    | Communication Standard         | IEEE 802.15.4g                                            | IEEE 802.15.4g and EPC Global Class 1 Gen 2              |
|                    | Frequency Band                 | 868, 923 MHz                                              | 860 ~ 928 MHz                                            |
|                    | Outdoor Range                  | 1000m (L.O.S.)                                            | 10m (L.O.S.)                                             |
|                    | Topology                       | Star                                                      | -                                                        |
|                    | Security                       | WPA2 Personal and Enterprise of AP                        | WPA2 Personal and Enterprise                             |
|                    | Antenna Connector              | Reverse SMA                                               | RFID: Reverse TNC<br>Wi-Fi: Reverse SMA                  |
| CT Input           | Channel                        | 3-ch                                                      | -                                                        |
|                    | Input Type                     | V                                                         | -                                                        |
|                    | Voltage Range                  | 1 ~ 5 V                                                   | -                                                        |
|                    | Current Range                  | 200 mA (max.)                                             | -                                                        |
|                    | Resolution                     | 12-bit                                                    | -                                                        |
|                    | Sampling Rate                  | 10 Hz (total)                                             | -                                                        |
|                    | Accuracy                       | Voltage: $\pm 1\%$ of FSR                                 | -                                                        |
| Digital Input      | Channel                        | -                                                         | 2-ch dry contact<br>2-ch wet contact                     |
|                    | Counter Input                  | -                                                         | 3 kHz                                                    |
|                    | Frequency Input                | -                                                         | 0.1 ~ 3 kHz                                              |
|                    | Isolation                      | -                                                         | 2,000 V <sub>rms</sub>                                   |
| Digital Output     | Channel                        | -                                                         | 4-ch (sink-type)                                         |
|                    | Output Rating (Resistive Load) | -                                                         | Open collector to 50 V, 400 mA max.                      |
|                    | Pulse Output                   | -                                                         | 5 kHz                                                    |
|                    | Isolation                      | -                                                         | 2,000 V <sub>rms</sub>                                   |
| Serial Port        | Port Number                    | -                                                         | 1                                                        |
|                    | Type                           | -                                                         | RS-485                                                   |
| General            | LED Indicators                 | COM, USB                                                  | Status, communication, network mode, signal quality      |
|                    | Real-Time Clock                | -                                                         | ✓                                                        |
|                    | Connectors                     | I/O: Plug-in screw terminal block<br>Power: Micro USB     | Terminal block (I/O and RS485)                           |
|                    | Dimensions                     | 71 x 72.7 x 29.8 mm (W x H x D)                           | 190 x 120 x 30.2 mm (W x H x D)                          |
| Environment        | Operating Temperature          | -25 ~ 70°C (-13 ~ 158°F)                                  | -25 ~ 70°C (-13 ~ 158°F)                                 |
|                    | Storage Temperature            | -40 ~ 85°C (-40 ~ 185°F)                                  | -40 ~ 85°C (-40 ~ 185°F)                                 |
|                    | Operating Humidity             | 20 ~ 95% RH (non-condensing)                              | 20 ~ 95% RH (non-condensing)                             |
|                    | Storage Humidity               | 0 ~ 95% RH (non-condensing)                               | 0 ~ 95% RH (non-condensing)                              |
| Power              | Input Range                    | Micro USB: 5 V <sub>DC</sub><br>CT: 1 ~ 5 V <sub>DC</sub> | 10 ~ 30 V <sub>DC</sub>                                  |
|                    | Protection                     | -                                                         | Power reversal protection                                |
|                    | Power Consumption              | 0.1 mW @ 3.3 V <sub>DC</sub>                              | 5 W @ 24 V <sub>DC</sub>                                 |

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

# WISE-2210

## LPWAN Self-Powered Wireless Sensor Node

### Preliminary



### Features

- Wireless and self-powered design reduce installation cost
- Energy harvesting from sensors or photovoltaic panel
- Proprietary LPWAN with using sub-1GHz wireless frequency
- Longer communication range than 2.4GHz
- Better penetration through concrete and steel than 2.4GHz
- Less interference than 2.4GHz spectrum
- RESTful Web API supported by access point (AP)

### Common Specification

#### Wireless Communication

- IEEE Standard** IEEE 802.15.4g
- Frequency Band** 923MHz (920.60~924.60), BW: 400kHz  
868MHz (865.00~869.00), BW: 400kHz
- Data Rate** 2.5kbps
- Outdoor Range** 2000m with line of sight (with external antenna)  
100m with line of sight (with internal antenna)
- Configuration Interface** AP: LAN Port  
Sensor Node: Micro-B USB
- Topology** Star
- Network Capacity** 1 AP for 64 Nodes

#### Environment

- Operating Temperature** -25°C ~70°C
- Operating Humidity** 5~95% RH
- Storage Temperature** -40°C ~ 85°C
- Storage Humidity** 0~95% RH

### CT Sensor Node

#### General

- Power Input** USB: 5V<sub>DC</sub>  
CT: 1~5V<sub>DC</sub>
- Recharge Time** 1V: 10mins @ 1k ohm  
5V: 5s @ 1k ohm
- LED Indicator** Comm, USB
- Mounting DIN** 35 rail, wall, pole and stack
- Connector** 3 Channel CT Input
- Dimension(W x H x D)** 71 x 72 x 30 mm  
77 x 72 x 41 mm (with photovoltaic panel)

### Temperature and Humidity Sensors

#### Temperature Sensor

- Operating Range** -25°C ~ 70°C (-4°F ~ 157.9°F)
- Resolution** 0.1 (°C/°F/K)
- Accuracy** ±1.0°C (±1.8°F) (vertical installation)

#### Humidity Sensor

- Operating Range** 10 ~ 90% RH
- Resolution** 0.1% RH
- Accuracy** ±4% RH @ 0~50% RH  
±6% RH @ 50~60% RH  
±10% RH @ 60~90% RH

### Photovoltaic Panel Specification

- Peak Power** 378uW
- Peak Voltage** 0.925V
- Peak Current** 408uA
- Panel Daily Provide Power:**

| Lux    | mW   |
|--------|------|
| 300    | 0.23 |
| 500    | 0.40 |
| 1,000  | 0.81 |
| 1,500  | 1.49 |
| 3,000  | 2.13 |
| 6,000  | 2.94 |
| 10,000 | 3.75 |

### Wireless Access Point

- Power Input** 10 ~ 50 V<sub>DC</sub>
- Ethernet** RJ-45 (for configuration and data query)
- RS-485** Data+, Data- (for query node data)
- Mounting** DIN 35 rail, wall, and pole
- Messaging Protocol** Modbus/RTU, Modbus/TCP, REST
- Dimension (W x H x D)** 70 x 102 x 38 mm

### Ordering Information

#### Wireless Access Point

- WISE-4210-APNA\*** LPWAN IoT Wireless to Ethernet AP - AS923/EU868

#### Wireless Sensor Node

- WISE-2210A-CNA\*** LPWAN Self-Powered Sensor Node for CT - AS923/EU868
- WISE-2210A-THPNA\*** LPWAN Self-Powered Sensor Node with Temperature & Humidity sensor and Photovoltaic Panel - AS923/EU868
- WISE-2210-CNA** LPWAN Self-Powered Sensor Node for CT with internal antenna - AS923
- WISE-2210-THPA** LPWAN Self-Powered Sensor Node with Temperature & Humidity sensor, Photovoltaic Panel and internal antenna - AS923

#### Accessories

- 1750008836-01** 863~870MHz Dipole Antenna for EU868
- 1750008837-01** 902~928MHz Dipole Antenna for AS923

\* External antenna need to order separately

# WISE-2834

## Intelligent RFID Gateway

Preliminary



### Features

- Intelligent RFID Gateway
- Support Ethernet and WiFi data communication
- Intelligent NodeRed function reducing coding effort
- Data read, filter, transfer could be configured automatically
- Linux operation system and provide web dashboard for RFID setting
- Data log function and cloud connectivity
- Flexible mounting methods suitable for different environment

### Common Specification

#### General

- **RFID Standard** EPC Global Class 1 Gen. 2 (ISO18000-6C)
- **Frequency Band** FCC 902-928 MHz (American)  
ETSI 865.6-867.6 MHz (EU)  
NCC 922-928 MHz (Taiwan)
- **RFID Power Output** Available to adjust from +10 ~ +31.5dBm
- **Max Receive Sensitivity** -82dBm
- **Antenna Number** 4 port antennas
- **Antenna Connector** 4 RP-TNC

#### System Hardware

- **Power Input** 10~30V<sub>DC</sub>
- **Dimension** 190x120x30.2 mm
- **CPU** ARM Cortex-A8, 400MHz
- **Storage** NAND Flash 512MB for system
- **Memory** DDR3L 512MB
- **SD Slot** 1 x Micro SD card
- **Mounting** DIN 35 rail, Wall, and Pole
- **Watch Dog Timer** System & Power Monitor
- **Real Time Clock** Time Accuracy to Second
- **Programming** Node-RED, Linux OS

#### Environment

- **Operating Temperature** -25°C~70°C
- **Operating Humidity** 20~95% RH
- **Storage Temperature** -40°C~ 85°C
- **Storage Humidity** 0~95% RH

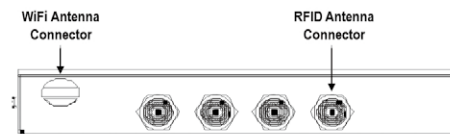
#### I/O Interface

- **Ethernet** 1 x 10/100 Based-T RJ-45
- **Serial Port** 1 x RS-232/RS485: 50 ~ 115.2 kbps
- **USB Port** 1 x USB2.0 High Speed (Up to 480Mbps)
- **Digital Input** 4 Dry/Wet Contact
- **Digital Output** 4 Sink Type

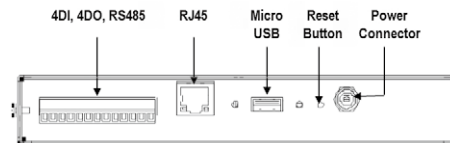
#### Wireless Communication

- **Interface** 1 x Mini-PCIE (Half-Size)
- **Type** WiFi

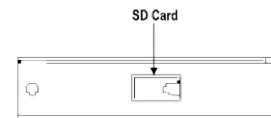
### TOP I/O View



### Bottom I/O View



### Side I/O View



### Ordering Information

#### Wireless Access Point

- **WISE-2834-A** Ethernet intelligent RFID gateway

#### Optional Accessories

- **96PD-RYUW131** Half-size mini card, supports 802.11bgn
- **96PSA-A60W12W6** ADP A/D 100-240V 60W 12V C14 LOCKABLE DC PLUG
- **1700000596-11** Power Cable China Plug 1.8M
- **1702002600** Power Cable US Plug 1.8M
- **1702002605** Power Cable EU Plug 1.8M
- **1702031802** Power Cable UK Plug 1.8M

# ADAM-6000 and ADAM-6200 Series

## Intelligent Ethernet I/O Modules

### Transition and Vision for Remote DAQ Devices

IT and network infrastructure have become established technologies. In the future, there will be many potentially key elements such as artificial intelligence, energy-efficiency, cloud computing, cyber-security, and mobile communication technologies being progressively leveraged in automation markets. We believe that these will also contribute to ideal remote data acquisition devices in IoT world.

To fulfill the transition requirements and future applications, Advantech has developed the ADAM-6000/6200 series of Ethernet I/O modules, comprising analog I/O, digital I/O, and relay modules. ADAM-6000/6200 series modules possess a multitude of advanced features that can cope with changes in hardware design and user expectations regarding useful software functions for applications in the field. With a new design and strong capabilities, ADAM-6000/6200 series modules can provide a well-integrated I/O solution for Ethernet control systems.



### Major Functionality Comparison

|                              |            | ADAM-6000 | ADAM-6200 |
|------------------------------|------------|-----------|-----------|
| Daisy-chain with auto-bypass |            | -         | ✓         |
| GCL                          |            | ✓         | ✓         |
| Peer-to-peer                 |            | ✓         | ✓         |
| Web server (HTML5)           |            | ✓         | ✓         |
| Configuration backup         |            | ✓         | ✓         |
| Access control               |            | ✓         | ✓         |
| Protocol Support             | Modbus/TCP | ✓         | ✓         |
|                              | MQTT       | ✓         | ✓         |
|                              | SNMP       | ✓         | ✓         |
|                              | RESTful    | ✓         | ✓         |

### Flexible Deployment with Daisy Chain Networking and Auto-Bypass Protection

ADAM-6200 modules have built-in Ethernet switches to allow daisy chain connections in an Ethernet network, making it easier to deploy, saving on wiring costs, and helping to improve scalability. The two Ethernet ports are fully compliant with IEEE 802.3u 10/100 Mbps via standard RJ-45 connectors.

Although the daisy chain topology brings cost-saving benefits for users, it still comes with the risk that once any device in the chain suffers a power outage, it will cause the disconnection of all devices data stream.

#### Auto-Bypass Protection

To prevent this critical issue from happening, Advantech has refined the hardware design of ADAM-6200 modules so that they can rapidly recover the network connection within approximately 2.5 s, thereby greatly minimizing any potential damage.



### Remote Monitoring and Control with Smart Portable Devices

At the early stage of automation, it was difficult to access or obtain online equipment data when conducting on-site inspections. Mostly, the only possible way to do this was by communicating with engineers on the factory floor or in a central control room where the SCADA program was running. With these factors considered, on-site inspections and debugging were invariably arduous tasks that took considerable effort to complete.

Overcoming this, the ADAM-6200 series of modules integrates HTML5, allowing users to remotely monitor the status of all online modules without bridging a SCADA system. These modules also allow users to perform basic I/O configuration on any built-in HMI device such as a smartphone or digital pad via the Internet. Moreover, users can further develop extended applications based on the default HTML5 file embedded in the module.

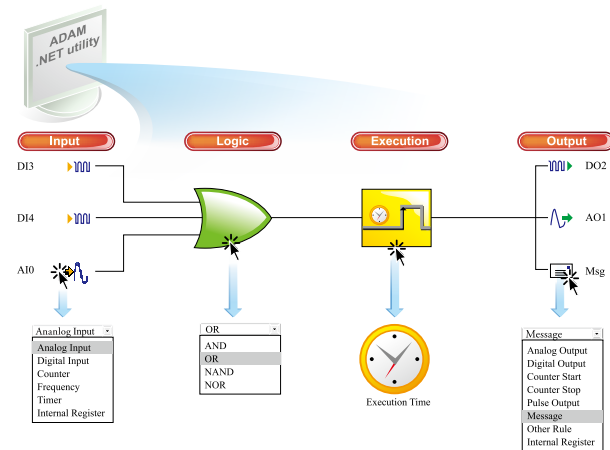
With its enhanced syntax structure and integration of rich web technologies such as CSS and JavaScript, the now widely used markup language HTML5 has enhanced the design of web content. This is particularly beneficial for ADAM module users because it allows them to implement more web services and APIs and to develop more interactive applications for configuring and monitoring their hardware.



## ADAM-6000 GCL is the Simplest Logic Ethernet I/O

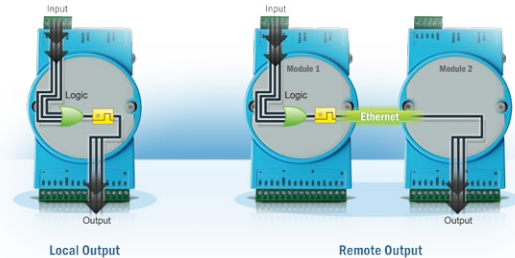
### What is GCL?

Graphic Condition Logic (GCL) gives controllability to Ethernet I/O modules. Users can define control logic rules using the graphic configuration environment in ADAM series modules and download defined logic rules to ADAM-6000/6200 Ethernet I/O modules. The modules will then execute the logic rules automatically, just like a standalone controller. For each Ethernet I/O module, 16 logic rules can be defined. In the configuration environment of Adasm/Apax .NET Utility, four graphic icons show the four stages of one logic rule, referring to the input, logic, execution, and output stages (refer to the image below). Users can simply click on each icon and a dialog window will appear to configure each stage. After completing all configurations, users can simply click a button to download the defined logic rules to their module.



### Supports Both Local and Remote Output

When users define the destination of the output stage (e.g., digital output, analog output, counter, and pulse output), the target module can be set as either the local module or another remote module, thus giving the ability to develop complex logic rules.



### Fast Execution Time

Advantech GCL features the shortest logic rule execution time on the market. When a local output is selected (i.e., the input and output channels are on the same module), the processing time (including an hardware input delay time, logic rule, execution time, and hardware output delay time) is <1 ms. When a remote output is selected (i.e., the input and output channels are on different modules), the total processing time (including processing and communication time) is <3 ms.

### Sending Messages

In GCL, you can define customized message. When the specified conditions are met, the message, module IP, and I/O status will be sent to the PC or device you define.

## What Benefits Do Peer-to-Peer Modules Provide?

### What is Peer-to-Peer?

Unlike client /server mode, peer-to-peer mode enabled modules to actively update their input channel status to a specific output channel. For this, a pair of modules is used: one input module and one output module. Users can define the mapping between them and the input value of one module will be transferred to the output channel of the other module.

### No Controller Required

For Ethernet I/O modules without peer-to-peer functionality, a controller is needed to read data from the input module and then send the data to the output module. With peer-to-peer solutions, the controller can be removed since data will be automatically transferred. This not only simplifies the process but also helps save on system hardware costs.

### No Programming Required

To utilize peer-to-peer modules, the only thing required is to configure the settings using Adam/Apax .NET Utility. Because no additional programming effort is needed, this greatly reduces system development time.

### Fast Response Time

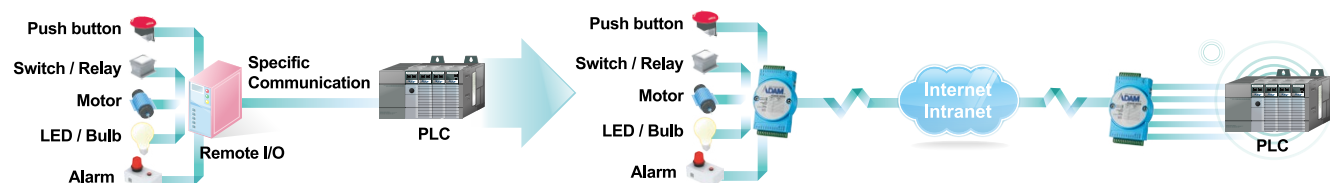
Advantech peer-to-peer modules offer the best execution times on the market; specifically, the execution time to transfer data from input to output is <1.2 ms.

### Advanced Security

When peer-to-peer modules are employed, it is critical that they not be controlled by unauthorized computers or devices. ADAM-6000 series peer-to-peer modules allow users to decide which IP or MAC address has control authority. This can make ensure that output modules are controlled only by their paired input modules.

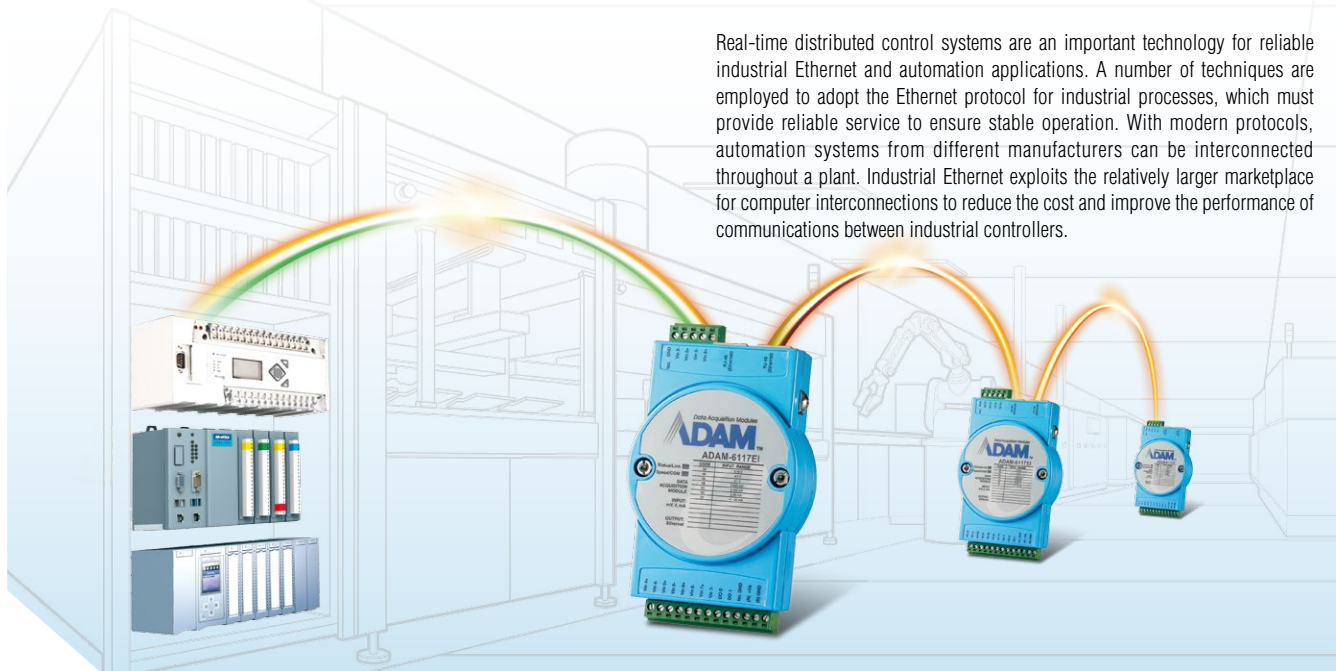
### Simple and Flexible System Wiring

Long-distance wiring can introduce difficulties into any project. For some automation applications, if the PLC and the sensors are far away, a remote I/O module needs to be located near the sensors and a proprietary communication network needs to connect the PLC and the remote I/O module. However, with this setup, communication will be severely limited. Moreover, networks provided by PLC manufacturers are rarely open networks. Peer-to-peer modules can replace limited and closed networks with no limitations since they leverage the most open and flexible Ethernet networks.



# ADAM-6100 Series

## EtherNet/IP and Profinet I/O Modules



Real-time distributed control systems are an important technology for reliable industrial Ethernet and automation applications. A number of techniques are employed to adopt the Ethernet protocol for industrial processes, which must provide reliable service to ensure stable operation. With modern protocols, automation systems from different manufacturers can be interconnected throughout a plant. Industrial Ethernet exploits the relatively larger marketplace for computer interconnections to reduce the cost and improve the performance of communications between industrial controllers.

### Real-Time Systems

A real-time system is one in which the correctness of a result depends not only on precise calculations but also on accurate timing. In computing, "real time" refers to a time frame that is very brief, to the point that it is virtually instantaneous. When a computer processes data in real time, it reads and handles data as it is received, producing results without any delay. A non-real-time computer process does not have a deadline. Such processes can be considered non-real-time—even if fast results are the preferred outcome. A real-time system, on the other hand, is expected to respond not just quickly, but also within a predictable period of time. In automation control systems, real-time technology provides multiple advantages, such as improved safety, quality, and efficiency. To build a real-time distributed control system, it is critical to establish reliable real-time communication among the controllers; accordingly, there is now increasing interest in the use of Ethernet protocols as the link-layer protocol, such as EtherNet/IP, PROFINET, EtherCAT, Ethernet PowerLink, SERCOS III.

### EtherNet/IP

EtherNet/IP was developed in the late 1990s by Rockwell Automation for use in process control and other industrial automation applications, ensuring multi-vendor system interoperability. EtherNet/IP is a lot like standard office Ethernet, using the same TCP/IP messaging but with a new application layer added where data are arranged. This is known as object-orientated organization, which allows ordinary office Ethernet to become a markedly more versatile system. Today, EtherNet/IP is commonly used in industrial automation applications such as water processing, manufacturing, and utilities.

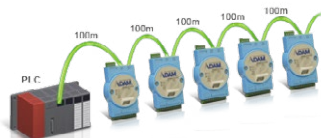
### Profinet

PROFINET, the standard for industrial networking in automation, connects devices, systems, and cells to facilitate manufacturing that is faster, safer, less costly, and of higher quality. As it is fully compatible with office Ethernet, it can be easily integrated with existing systems and equipment while bringing enhanced features such as real-time performance and control as well as monitoring functions. Additionally, PROFINET features highly scalable architectures, remote access and maintenance of field devices over the network, and lower production/quality data monitoring costs.

### Feature Highlights

#### Daisy Chain Connections

ADAM-6100 modules have two built-in Ethernet switches to allow daisy chain connections in an Ethernet network, making it easier to deploy while improving scalability and resistance against interference commonly found in factory settings.



#### 2,500 V<sub>DC</sub> Isolation Protection

With triple isolation, including power supply, I/O, and Ethernet communication, ADAM-6100 series modules ensure that I/O data are controlled correctly while preventing devices from breaking down.

#### Ethernet-Based Configuration Tool

Adam/Apax .NET Utility comes bundled with each ADAM-6100 module. With this utility, users can configure, set, and test ADAM-6100 modules via Ethernet.



#### Multiple Mounting Options

Advantech provides various mounting methods to fit the varying needs of different projects in the field. ADAM-6100 series modules support DIN rail mounting, wall mounting, and piggybacking.

# ADAM-6000 Series Selection Guide



| Spec.                     |                         | Model | ADAM-6015             | ADAM-6017                                                                                           | ADAM-6018                        | ADAM-6022                                             | ADAM-6024                                             |
|---------------------------|-------------------------|-------|-----------------------|-----------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Interface                 |                         |       | 10/100 Mbps Ethernet  |                                                                                                     |                                  |                                                       |                                                       |
| Peer-to-Peer <sup>1</sup> |                         |       |                       | ✓                                                                                                   |                                  | -                                                     | Receiver Only <sup>2</sup>                            |
| GCL <sup>1</sup>          |                         |       |                       | ✓                                                                                                   |                                  | -                                                     | Receiver Only <sup>2</sup>                            |
| Resolution                |                         |       |                       | 16 bit                                                                                              |                                  | 16-bit for analog inputs<br>12-bit for analog outputs | 16-bit for analog inputs<br>12-bit for analog outputs |
| Analog Input              | Channels                |       | 7                     | 8                                                                                                   | 8                                | 6                                                     | 6                                                     |
|                           | Sampling Rate           |       | 10 Hz                 |                                                                                                     |                                  |                                                       |                                                       |
|                           | Voltage Input           |       | -                     | ±150 mV, ±500 mV,<br>±1 V, ±5 V, ±10 V,<br>0 ~ 150 mV, 0 ~ 500<br>mV, 0 ~ 1 V, 0 ~ 5 V,<br>0 ~ 10 V | -                                | ±10 V                                                 | ±10 V                                                 |
|                           | Current Input           |       | -                     | 0 ~ 20, 4 ~ 20, ±20 mA                                                                              | -                                | 0 ~ 20, 4 ~ 20 mA                                     | 0 ~ 20, 4 ~ 20 mA                                     |
|                           | Direct Sensor Input     |       | Pt, Balco, and Ni RTD | -                                                                                                   | J, K, T, E, R, S, B thermocouple | -                                                     | -                                                     |
|                           | Burnout Detection       |       | ✓                     | ✓ (4 ~ 20mA only)                                                                                   | ✓                                | -                                                     | -                                                     |
|                           | Math. Functions         |       | Max. Min. Avg.        | Max. Min. Avg.                                                                                      | Max. Min. Avg.                   | -                                                     | -                                                     |
| Analog Output             | Channels                |       | -                     | -                                                                                                   | -                                | 2                                                     | 2                                                     |
|                           | Current Output          |       | -                     | -                                                                                                   | -                                | 0 ~ 20, 4 ~ 20 mA @<br>15 V <sub>DC</sub>             | 0 ~ 20, 4 ~ 20 mA @<br>15 V <sub>DC</sub>             |
|                           | Voltage Output          |       | -                     | -                                                                                                   | -                                | 0 ~ 10 V <sub>DC</sub> @ 30 mA                        | 0 ~ 10 V <sub>DC</sub> @ 30 mA                        |
| Digital I/O               | Input Channels          |       | -                     | -                                                                                                   | -                                | 2                                                     | 2                                                     |
|                           | Output Channels         |       | -                     | 2 (sink)                                                                                            | 8 (sink)                         | 2 (sink)                                              | 2 (sink)                                              |
|                           | Extra Counter Channels  |       | -                     | -                                                                                                   | -                                | -                                                     | -                                                     |
|                           | Counter Input           |       | -                     | -                                                                                                   | -                                | -                                                     | -                                                     |
|                           | Frequency Input         |       | -                     | -                                                                                                   | -                                | -                                                     | -                                                     |
|                           | Pulse Output            |       | -                     | -                                                                                                   | -                                | -                                                     | -                                                     |
|                           | High/Low Alarm Settings |       | ✓                     | ✓                                                                                                   | ✓                                | -                                                     | -                                                     |
| Isolation Protection      |                         |       | 2,000 V <sub>DC</sub> |                                                                                                     |                                  |                                                       |                                                       |
| Remark                    |                         |       | -                     | -                                                                                                   | -                                | Built-in dual loop PID control algorithm              | -                                                     |



| Spec.                     |                         | Model | ADAM-6050             | ADAM-6051 | ADAM-6052  | ADAM-6060  | ADAM-6066        |
|---------------------------|-------------------------|-------|-----------------------|-----------|------------|------------|------------------|
| Interface                 |                         |       | 10/100 Mbps Ethernet  |           |            |            |                  |
| Peer-to-Peer <sup>1</sup> |                         |       | ✓                     | ✓         | ✓          | ✓          | ✓                |
| GCL <sup>1</sup>          |                         |       | ✓                     | ✓         | ✓          | ✓          | ✓                |
| Digital I/O               | Input Channels          |       | 12                    | 12        | 8          | 6          | 6                |
|                           | Output Channels         |       | 6 (sink)              | 2 (sink)  | 8 (source) | 6-ch relay | 6-ch power relay |
|                           | Extra Counter Channels  |       | -                     | 2         | -          | -          | -                |
|                           | Counter Input           |       | 3 kHz                 | 4.5 kHz   | 3 kHz      | 3 kHz      | 3 kHz            |
|                           | Frequency Input         |       | 3 kHz                 | 4.5 kHz   | 3 kHz      | 3 kHz      | 3 kHz            |
|                           | Pulse Output            |       | ✓                     | ✓         | ✓          | ✓          | ✓                |
|                           | High/Low Alarm Settings |       | -                     | -         | -          | -          | -                |
| Isolation Protection      |                         |       | 2,000 V <sub>DC</sub> |           |            |            |                  |

# ADAM-6200 Series Selection Guide



| Model                     |                     | ADAM-6217                                                      | ADAM-6224                   | ADAM-6250                              | ADAM-6251         | ADAM-6256          | ADAM-6260                                           | ADAM-6266                    |
|---------------------------|---------------------|----------------------------------------------------------------|-----------------------------|----------------------------------------|-------------------|--------------------|-----------------------------------------------------|------------------------------|
| Interface                 |                     | 10/100Mbps Ethernet                                            |                             |                                        |                   |                    |                                                     |                              |
| Peer-to-Peer <sup>1</sup> |                     | ✓                                                              | Receiver Only <sup>2</sup>  | ✓                                      | ✓                 | ✓                  | ✓                                                   | ✓                            |
| GCL <sup>1</sup>          |                     | ✓                                                              | ✓                           | ✓                                      | ✓                 | ✓                  | ✓                                                   | ✓                            |
| Analog Input              | Channels            | 8                                                              | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Input Impedance     | >10MΩ (voltage)<br>120Ω (current)                              | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Voltage Input       | ±150 mV,<br>±500 mV, ±1 V,<br>±5 V, ±10 V                      | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Current Input       | 0 ~ 20, 4 ~ 20,<br>±20 mA                                      | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Sampling Rate       | 10 Hz                                                          | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Direct Sensor Input | -                                                              | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Burnout Detection   | ✓ (4 ~ 20 mA)                                                  | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Resolution          | 16-bit                                                         | -                           | -                                      | -                 | -                  | -                                                   | -                            |
| Analog Output             | Accuracy            | ±0.1% of FSR (voltage) @ 25°C<br>±0.2% of FSR (current) @ 25°C | -                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Channels            | -                                                              | 4                           | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Voltage Output      | -                                                              | 0 ~ 5, 0 ~ 10, ±5,<br>±10 V | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Current Output      | -                                                              | 0 ~ 20,<br>4 ~ 20 mA        | -                                      | -                 | -                  | -                                                   | -                            |
| Digital I/O               | Resolution          | -                                                              | 12-bit                      | -                                      | -                 | -                  | -                                                   | -                            |
|                           | Input Channels      | -                                                              | 4 (dry contact only)        | 8                                      | 16                | -                  | -                                                   | 4                            |
|                           | Output Channels     | -                                                              | -                           | 7 (sink)                               | -                 | 16 (sink)          | -                                                   | -                            |
|                           | Relay Output        | -                                                              | -                           | -                                      | -                 | -                  | 6 (5 Form C + 1 Form A)                             | 4 (Form C)                   |
|                           | Contact Rating      | -                                                              | -                           | -                                      | -                 | -                  | 250 V <sub>AC</sub> @ 5A<br>30 V <sub>DC</sub> @ 5A |                              |
|                           | Counter Input       | -                                                              | -                           | 3 kHz                                  | 3 kHz             | -                  | -                                                   | 3 kHz                        |
|                           | Frequency Input     | -                                                              | -                           | 3 kHz                                  | 3 kHz             | -                  | -                                                   | 3 kHz                        |
|                           | Pulse Output        | -                                                              | -                           | 5 kHz                                  | -                 | 5 kHz              | 5 kHz                                               | 5 kHz                        |
| LED Indicator             | LED Indicator       | -                                                              | -                           | 8 digital outputs,<br>7 digital inputs | 16 digital inputs | 16 digital outputs | 6 relay                                             | 4 digital inputs,<br>4 relay |
|                           | Power Consumption   | 3.5 W                                                          | 6 W                         | 3 W                                    | 2.7 W             | 3.2 W              | 4.5 W                                               | 4.2 W                        |
| Isolation Voltage         |                     | 2,500 V <sub>DC</sub>                                          |                             |                                        |                   |                    |                                                     |                              |
| Watchdog Timer            |                     | System (1.6 s)<br>Communication (programmable)                 |                             |                                        |                   |                    |                                                     |                              |
| Communication Protocol    |                     | Modbus TCP, TCP/IP, UDP, HTTP, DHCP, MQTT, SNMP                |                             |                                        |                   |                    |                                                     |                              |
| Power Requirements        |                     | 10 ~ 30 V <sub>DC</sub> (24 V <sub>DC</sub> standard)          |                             |                                        |                   |                    |                                                     |                              |
| Operating Temperature     |                     | -10 ~ 70°C (14 ~ 158°F)                                        |                             |                                        |                   |                    |                                                     |                              |
| Storage Temperature       |                     | -20 ~ 80°C (-4 ~ 176°F)                                        |                             |                                        |                   |                    |                                                     |                              |
| Operating Humidity        |                     | 20 ~ 95% RH (non-condensing)                                   |                             |                                        |                   |                    |                                                     |                              |
| Storage Humidity          |                     | 0 ~ 95% RH (non-condensing)                                    |                             |                                        |                   |                    |                                                     |                              |

Note 1: Peer-to-peer and GCL cannot be run simultaneously; only one feature can be enabled at a time.

Note 2: The ADAM-6224 can only act as a receiver and generate analog output when peer-to-peer or GCL mode is used.

# ADAM-6100 Series Selection Guide



| Model                |                     | ADAM-6117                                                                   | ADAM-6150             | ADAM-6151             | ADAM-6156             | ADAM-6160             |
|----------------------|---------------------|-----------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Interface            |                     | 10/100 Mbps Ethernet                                                        |                       |                       |                       |                       |
| Support Protocol     |                     | ADAM-6100EI: EtherNet/IP<br>ADAM-6100PN: Profinet                           |                       |                       |                       |                       |
| Analog Input         | Resolution          | 16-bit                                                                      | -                     | -                     | -                     | -                     |
|                      | Channels            | 8                                                                           | -                     | -                     | -                     | -                     |
|                      | Sampling Rate       | 10 Hz                                                                       | -                     | -                     | -                     | -                     |
|                      | Voltage Input       | ±150 mV<br>±500 mV<br>±1 V<br>±5 V<br>±10 V                                 | -                     | -                     | -                     | -                     |
|                      | Current Input       | 0 ~ 20, 4 ~ 20, ±20 mA                                                      | -                     | -                     | -                     | -                     |
|                      | Direct Sensor Input | -                                                                           | -                     | -                     | -                     | -                     |
| Analog Output        | Resolution          | -                                                                           | -                     | -                     | -                     | -                     |
|                      | Channels            | -                                                                           | -                     | -                     | -                     | -                     |
|                      | Current Output      | -                                                                           | -                     | -                     | -                     | -                     |
|                      | Voltage Output      | -                                                                           | -                     | -                     | -                     | -                     |
| Digital I/O          | Input Channels      | -                                                                           | 8                     | 16                    | -                     | -                     |
|                      | Output Channels     | -                                                                           | 7                     | -                     | 16                    | 6-ch power relay      |
| Isolation Protection |                     | 2,500 V <sub>DC</sub>                                                       | 2,500 V <sub>DC</sub> | 2,500 V <sub>DC</sub> | 2,500 V <sub>DC</sub> | 2,500 V <sub>DC</sub> |
| Connectors           |                     | 2 x RJ-45 LAN (daisy chain)<br>Plug-in screw terminal block (I/O and power) |                       |                       |                       |                       |

1  
Software and Industry  
Solutions

2  
Industrial Server

3  
Intelligent System

4  
Intelligent HMI and  
Monitors

5  
Automation Computers  
and Controllers

6  
Industrial  
Communication

7  
Remote I/O & Wireless  
Sensing Modules

8  
Industrial I/O and  
Video Solutions

# ADAM-6015 ADAM-6017 ADAM-6018



7-ch Isolated RTD Input Modbus TCP Module  
8-ch Isolated Analog Input Modbus TCP Module  
with 2-ch DO  
8-ch Isolated Thermocouple Input Modbus TCP  
Module with 8-ch DO



ADAM-6015



ADAM-6017



ADAM-6018



## Specifications

### Analog Input

- **Channels** 7 (differential)
- **Input Impedance** > 10 MΩ
- **Input Connections** 2 or 3 wire
- **Input Type** Pt, Balco and Ni RTD
- **RTD Types and Temperature Ranges**
  - Pt 100 -50°C ~ 150°C
  - 0°C ~ 100°C
  - 0°C ~ 200°C
  - 0°C ~ 400°C
  - 200°C ~ 200°C
  - Pt 1000 -40°C ~ 160°C
  - Supports both IEC 60751 ITS90 (0.0385 W/W/°C) and JIS C 1604 (0.0392 W/W/°C)
  - Balco 500 -30°C ~ 120°C
  - Ni 518 -80°C ~ 100°C
  - 0°C ~ 100°C
- **Accuracy** ±0.1 % or better
  - High speed mode ±0.5% or better
- **Span Drift** ±25 ppm/°C
- **Zero Drift** ±6 μV/°C
- **Resolution** 16-bit
- **Sampling Rate**
  - 10 sample/ second (total)
  - High speed mode: 1K sample/second (total)
  - CMR @ 50/60 HZ 90dB
  - NMR @ 50/60 HZ 60dB
  - \* high speed mode does not support CMR/NMR
- **Wire Burnout Detection**

## Ordering Information

- **ADAM-6015** 7-ch Isolated RTD Input Modbus TCP Module

## Specifications

### Analog Input

- **Channels** 8 (differential)
  - **Input Impedance** > 10 MΩ (voltage)  
120 Ω (current)
  - **Input Type** mV, V, mA
  - **Input Range**
    - ±150mV, ±500mV, ±1 V,
    - ±5V, ±10V, 0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V,
    - 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, ±20mA
  - **Accuracy**
    - ±0.1% (voltage)
    - ±0.2% (current)
  - **Span Drift** ±25 ppm/°C
  - **Zero Drift** ±6 μV/°C
  - **Resolution** 16-bit
  - **Sampling Rate**
    - 10 or 100 sample/ second (total)
    - CMR @ 50/60 HZ 90dB
    - NMR @ 50/60 HZ 67dB
  - **Common-Mode Voltage** 350V<sub>DC</sub>
- ### Digital Output
- **Channels** 2, open collector to 30 V, 100 mA max. load
  - **Power Dissipation** 300 mW for each module
  - **Output Delay**
    - On: 100μs
    - Off: 150μs

## Ordering Information

- **ADAM-6017** 8-ch Isolated AI with 2-ch DO Modbus TCP Module

## Specifications

### Analog Input

- **Channels** 8 (differential)
  - **Input Impedance** > 10 MΩ
  - **Input Type** Thermocouple
  - **Thermocouple Type and Range:**

|          |              |          |               |
|----------|--------------|----------|---------------|
| <b>J</b> | 0 ~ 760°C    | <b>R</b> | 500 ~ 1,750°C |
| <b>K</b> | 0 ~ 1,370°C  | <b>S</b> | 500 ~ 1,750°C |
| <b>T</b> | -100 ~ 400°C | <b>B</b> | 500 ~ 1,800°C |
| <b>E</b> | 0 ~ 1,000°C  |          |               |
  - **Accuracy** ±0.1%
  - **Span Drift** ±25 ppm/°C
  - **Zero Drift** ±6 μV/°C
  - **Resolution** 16-bit
  - **Sampling Rate**
    - 10 sample/ second (total)
    - CMR @ 50/60 HZ 90dB
    - NMR @ 50/60 HZ 60dB
  - **Wire Burnout Detection**
- ### Digital Output
- **Channels** 8, open collector to 30 V, 100 mA max. load
  - **Power Dissipation** 300 mW for each module

## Ordering Information

- **ADAM-6018** 8-ch Isolated Thermocouple Input Modbus TCP Module w/ 8-ch DO

## Common Specifications

### General

- **LAN** 10/100Base-T(X)
- **Power Consumption**
  - 2.5 W @ 24 V<sub>DC</sub> (ADAM-6015)
  - 2.7 W @ 24 V<sub>DC</sub> (ADAM-6017)
  - 2 W @ 24 V<sub>DC</sub> (ADAM-6018)
- **Connectors** 1 x RJ-45 (LAN), Plug-in screw terminal block (I/O and power)
- **Watchdog** System (1.6 second) and Communication (programmable)

- **Power Input** 10 ~ 30 V<sub>DC</sub>
- **Supports Peer-to-Peer**
- **Supports GCL**
- **Supports Modbus/TCP, TCP/IP, UDP, HTTP and MQTT (ADAM-6017) Protocols**

### Protection

- **Over Voltage Protection** ±35 V<sub>DC</sub>
- **Isolation Protection** 2,000 V<sub>DC</sub>
- **Built-in TVS/ESD Protection**
- **Power Reversal Protection**

### Environment

- **Operating Temperature**
  - 10 ~ 70°C (14 ~ 158°F)
  - 40 ~ 70°C (-40~158°F) (ADAM-6017-D)
- **Storage Temperature**
  - 20 ~ 80°C (-4 ~ 176°F)
  - 40 ~ 80°C (-40~176°F) (ADAM-6017-D)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

# ADAM-6022 ADAM-6024

## Ethernet-based Dual-loop PID Controller 12-ch Isolated Universal Input/Output Modbus TCP Module

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions



ADAM-6022

FCC CE RoHS

### Specifications

#### General

- Loop Number 2 (3 AI, 1 AO, 1 DI, 1 DO for each control loop)

#### Analog Input

- Channels 6 (differential)
- Input Range  $\pm 10 V_{DC}$ , 0 ~ 20 mA, 4 ~ 20 mA

#### Analog Output

- Channels 2
- Output Type V, mA
- Output Range 0 ~ 10  $V_{DC}$ , 4 ~ 20 mA, 0 ~ 20 mA

#### Digital Input

- Channels 2
- Dry Contact Logic level 0: close to GND  
Logic level 1: open
- Wet Contact Logic level 0: 0 ~ 3  $V_{DC}$   
Logic level 1: 10 ~ 30  $V_{DC}$

#### Digital Output

- Channels 2, open collector to 30 V, 100 mA max. load
- Power Dissipation 300 mW for each module

### Ordering Information

- ADAM-6022 Ethernet-based Dual-loop PID Controller



ADAM-6024

FCC CE RoHS

### Specifications

#### Analog Input

- Channels 6 (differential)
- Input Range  $\pm 10 V_{DC}$ , 0 ~ 20 mA, 4 ~ 20 mA

#### Analog Output

- Channels 2
- Output Type V, mA
- Output Range 0 ~ 10  $V_{DC}$ , 4 ~ 20 mA, 0 ~ 20 mA

#### Digital Input

- Channels 2
- Dry Contact Logic level 0: close to GND  
Logic level 1: open
- Wet Contact Logic level 0: 0 ~ 3  $V_{DC}$   
Logic level 1: 10 ~ 30  $V_{DC}$

#### Digital Output

- Channels 2, open collector to 30 V, 100 mA max. load
- Power Dissipation 300 mW for each module

#### Supports

- Peer-to-Peer (Receiver only)
- GCL (Receiver only)

### Ordering Information

- ADAM-6024 12-ch Isolated Universal I/O Modbus TCP Module

### Common Specifications

#### General

- LAN 10/100Base-T(X)
- Power Consumption 4 W @ 24  $V_{DC}$
- Connectors 1 x RJ-45 (LAN), Plug-in screw terminal block (I/O and power)
- Watchdog System (1.6 second) and Communication (programmable)
- Power Input 10 ~ 30  $V_{DC}$
- Supports Modbus/TCP, TCP/IP, UDP and HTTP Protocols

#### Analog Input

- Input Impedance 20 M $\Omega$
- Accuracy  $\pm 0.1\%$  of FSR
- Resolution 16-bit
- Sampling Rate 10 sample/second
- CMR @ 50/60 Hz 90 dB
- NMR @ 50/60 Hz 60 dB
- Span Drift  $\pm 25$  ppm/ $^{\circ}$  C
- Zero Drift  $\pm 6$   $\mu$ V/ $^{\circ}$  C

#### Analog Output

- Accuracy  $\pm 0.1\%$  of FSR
- Resolution 12-bit
- Drift  $\pm 50$  ppm/ $^{\circ}$  C
- Current Load Resistor Max. 500 $\Omega$
- Voltage Load Resistor Min. 1K  $\Omega$

#### Protection

- Isolation Protection 2,000  $V_{DC}$
- Built-in TVS/ESD Protection
- Over Voltage Protection  $\pm 35 V_{DC}$
- Power Reversal Protection

#### Environment

- Operating Temperature -10 ~ 50 $^{\circ}$  C  
(14 ~ 122 $^{\circ}$  F)
- Storage Temperature -20 ~ 80 $^{\circ}$  C  
(-4 ~ 176 $^{\circ}$  F)
- Operating Humidity 20 ~ 95% RH  
(non-condensing)
- Storage Humidity 0 ~ 95% RH  
(non-condensing)

# ADAM-6050 ADAM-6051 ADAM-6052



**18-ch Isolated Digital I/O Modbus TCP Module**  
**14-ch Isolated Digital I/O Modbus TCP**  
**Module with 2-ch Counter**  
**16-ch Source-type Isolated Digital I/O**  
**Modbus TCP Module**



ADAM-6050

FCC CE RoHS COMPLIANT 2002/95/EC



ADAM-6051

FCC CE RoHS COMPLIANT 2002/95/EC



ADAM-6052

FCC CE RoHS COMPLIANT 2002/95/EC

## Specifications

### Digital Input

- Channels 12
- Dry Contact Logic level 0: close to GND  
Logic level 1: open
- Wet Contact Logic level 0: 0 ~ 3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Digital Output

- Channels 6 (sink type), open collector to 30 V, 100 mA maximum load
- Supports 5 kHz Pulse Output
- Supports High-to-Low and Low-to-High Delay Output

## Ordering Information

- ADAM-6050 18-ch Isolated DI/O Modbus TCP Module

## Specifications

### Digital Input

- Channels 12
- Dry Contact Logic level 0: close to GND  
Logic level 1: open
- Wet Contact Logic level 0: 0 ~ 3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Counter Input

- Channels 2
- Mode Counter, Frequency
- Keep/Discard Counter Value when Power-off 4,294,967,295 (32-bit + 1-bit overflow)
- Maximum Count
- Input Frequency Frequency Mode: 0.2 ~ 4500 Hz  
Counter Mode: 0 ~ 4.5 kHz

### Digital Output

- Channels 2 (sink type), open collector to 30 V, 100 mA maximum load
- Supports 5 kHz Pulse Output
- Supports High-to-Low and Low-to-High Delay Output

## Ordering Information

- ADAM-6051 16-ch Isolated DI/O with Counter Modbus TCP Module

## Specifications

### Digital Input

- Channels 8
- Dry Contact Logic level 0: Open  
Logic level 1: Close to Ground
- Wet Contact Logic level 0: 0 ~ 3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Digital Output

- Channels 8 (Source Type)
- Voltage Range 10 ~ 35 V<sub>DC</sub>
- Current 1 A (per channel)
- Supports 5 kHz Pulse Output
- Supports High-to-Low and Low-to-High Delay Output
- Supports Over Current Protection

## Ordering Information

- ADAM-6052 16-ch Source-type Isolated DI/O Modbus TCP Module

## Common Specifications

### General

- LAN 10/100Base-T(X)
- Power Consumption 2 W @ 24 V<sub>DC</sub>
- Connectors 1 x RJ-45 (LAN), Plug-in screw terminal block (I/O and power)
- Watchdog System (1.6 second) and Communication (programmable)

- Power Input 10 ~ 30 V<sub>DC</sub>
- Supports Peer-to-Peer, GCL
- Supports User Defined Modbus Address
- Supports Modbus/TCP, TCP/IP, UDP, DHCP, SNMP, HTTP and MQTT Protocol

### Protection

- Power Reversal Protection
- Isolation Protection 2,000 V<sub>DC</sub>

### Environment

- Operating Temperature -20 ~ 70°C (-4 ~ 158°F)  
D version -40 ~ 70°C (-40 ~ 158°F)
- Storage Temperature -30 ~ 80°C (-22 ~ 176°F)  
D version -40 ~ 80°C (-40 ~ 176°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

# ADAM-6060 ADAM-6066

6-ch Digital Input and 6-ch Relay  
Modbus TCP Module

6-ch Digital Input and 6-ch Power Relay  
Modbus TCP Module



ADAM-6060

ADAM-6066



## Specifications

### General

- LAN 10/100Base-T(X)
- Power Consumption 2 W @ 24 V<sub>DC</sub> (ADAM-6060)  
2.5 W @ 24 V<sub>DC</sub> (ADAM-6066)
- Connectors 1 x RJ-45 (LAN), Plug-in screw terminal block (I/O and power)
- Watchdog Timer System (1.6 second) and Communication (programmable)
- Power Input 10 ~ 30 V<sub>DC</sub>
- Supports Peer-to-Peer
- Supports GCL
- Supports Modbus/TCP, TCP/IP, UDP, DHCP, SNMP, HTTP and MQTT Protocol

### Digital Input

- Channels 6
- Dry Contact Logic level 0: close to GND  
Logic level 1: open
- Wet Contact Logic level 0: 3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub>
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Keep/Discard Counter Value when Power-off
- Supports 3 kHz Frequency Input
- Supports Inverted DI Status

### Relay Output (Form A)

- Channels 6
- Contact Rating (Resistive) ADAM-6060: 120 V<sub>AC</sub> @ 0.5 A  
30 V<sub>DC</sub> @ 1 A  
ADAM-6066: 250 V<sub>AC</sub> @ 5 A  
30 V<sub>DC</sub> @ 3 A
- Breakdown Voltage 500 V<sub>AC</sub> (50/60 Hz)
- Relay On Time 7 ms
- Relay Off Time 3 ms
- Total Switching Time 10 ms
- Insulation Resistance 1 GΩ min. at 500 V<sub>DC</sub>
- Maximum Switching Rate (at rated load) 20 operations/minute
- Supports Pulse Output

### Protection

- Isolation Voltage 2,000 V<sub>DC</sub>
- Power Reversal Protection

### Environment

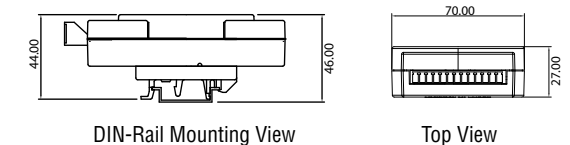
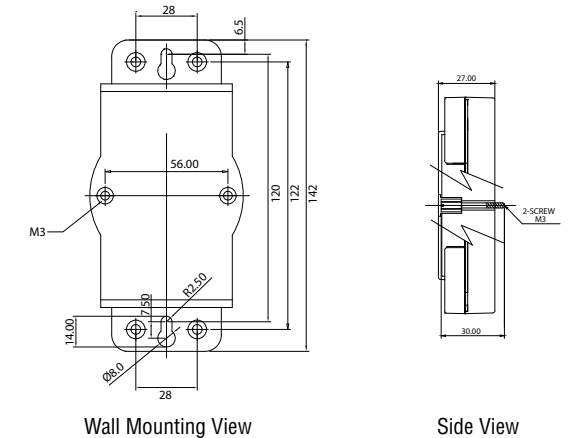
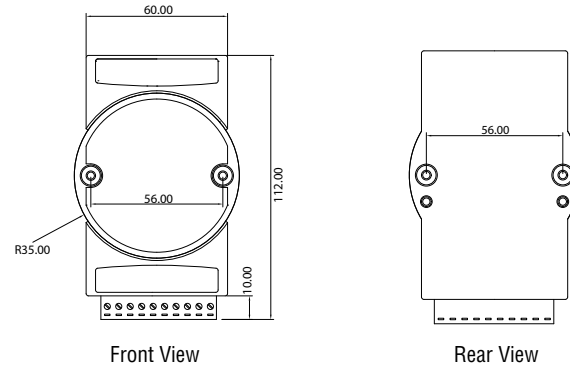
- Operating Temperature -10 ~ 70°C (14 ~ 158°F)  
-40 ~ 70°C (-40 ~ 158°F) for D version
- Storage Temperature -20 ~ 80°C (-4 ~ 176°F)  
-40 ~ 80°C (-40 ~ 176°F) for D version
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

## Ordering Information

- ADAM-6060 6-ch DI and 6-ch Relay Modbus TCP Module
- ADAM-6066 6-ch DI and 6-ch Power Relay Modbus TCP Module

## ADAM-6000 Series Dimensions

Unit: mm



## ADAM-6000 Series Common Specifications

### General

- Dimensions (W x H x D) 70 x 120 x 30 mm
- Enclosure ABS+PC
- Mounting DIN 35 rail, stack, wall

# ADAM-6217

# ADAM-6224

## 8-ch Isolated Analog Input Modbus TCP Module

## 4-ch Isolated Analog Output Modbus TCP Module



ADAM-6217



### Specifications

#### Analog Input

- Channels: 8 (differential)
- Input Impedance: > 10 MW (voltage)  
120 W (current)
- Input Type: mV, V, mA
- Input Range:  $\pm 150$  mV,  $\pm 500$  mV,  $\pm 1$  V,  $\pm 5$  V,  $\pm 10$  V, 0 ~ 20 mA, 4 ~ 20 mA,  $\pm 20$  mA
- Span Drift:  $\pm 30$  ppm/ $^{\circ}$ C
- Zero Drift:  $\pm 6$   $\mu$ V/ $^{\circ}$ C
- Resolution: 16-bit
- Accuracy:  $\pm 0.1\%$  of FSR (Voltage) at 25 $^{\circ}$ C  
 $\pm 0.2\%$  of FSR (Current) at 25 $^{\circ}$ C
- Sampling Rate: 10 sample/second (total)
- CMR @ 50/60 Hz: 92 dB
- NMR @ 50/60 Hz: 67 dB
- Common Mode: 200 V<sub>DC</sub>

### Ordering Information

- ADAM-6217: 8-ch Isolated Analog Input Modbus TCP Module



ADAM-6224



### Specifications

#### Analog Output

- Channels: 4
- Output Impedance: 2.1  $\Omega$
- Output Settling Time: 20  $\mu$ s
- Driving Load: Voltage: 2k $\Omega$   
Current: 500  $\Omega$
- Programmable Output Slope: 0.125 ~ 128 mA/sec  
0.0625 ~ 64 V/sec
- Output Type: V, mA
- Output Range: 0 ~ 5 V, 0 ~ 10 V,  $\pm 5$  V,  $\pm 10$  V, 0 ~ 20 mA, 4 ~ 20 mA
- Accuracy:  $\pm 0.3\%$  of FSR (Voltage) at 25 $^{\circ}$ C  
 $\pm 0.5\%$  of FSR (Current) at 25 $^{\circ}$ C
- Resolution: 12-bit
- Current Load Resistor: 0 ~ 500  $\Omega$
- Drift:  $\pm 50$  ppm/ $^{\circ}$ C

#### Digital Input

- Channels: 4 (Dry Contact only)
- Dry Contact: Logic 0: Open  
Logic 1: Closed to DGND

- Support DI Filter
- Support Inverted DI Status
- Support Trigger to Startup or Safety Value

### Ordering Information

- ADAM-6224: 4-ch Isolated Analog Output Modbus TCP Module

### Common Specifications

#### General

- Ethernet: 2-port 10/100 Base-TX (for Daisy Chain)
- Protocol: Modbus/TCP, TCP/IP, UDP, HTTP, DHCP
- Connector: Plug-in 5P/15P screw terminal blocks
- Power Input: 10 ~ 30 V<sub>DC</sub> (24 V<sub>DC</sub> standard)
- Watchdog Timer: System (1.6 seconds)  
Communication (Programmable)
- Dimensions: 70 x 122 x 27 mm
- Protection: Built-in TVS/ESD protection  
Power Reversal protection  
Over Voltage protection:  $\pm 35$  V<sub>DC</sub>  
Isolation protection: 2500 V<sub>DC</sub>
- Power Consumption: ADAM-6217: 3.5W @ 24 V<sub>DC</sub>  
ADAM-6224: 6W @ 24 V<sub>DC</sub>

#### Features

- Daisy chain connection with auto-bypass protection
- Remote monitoring and control with smart phone/pad
- Group configuration capability for multiple module setup
- Flexible user-defined Modbus address
- Intelligent control ability by Peer-to-Peer and GCL function
- Multiple protocol support: Modbus TCP, TCP/IP, UDP, HTTP, DHCP, SNMP (ADAM-6217-B), MQTT (ADAM-6217-B)
- Web language support: XML, HTML 5, Java Script
- System configuration backup
- User Access Control

#### Environment

- Operating Temperature: -10 ~ 70 $^{\circ}$ C (14 ~ 158 $^{\circ}$ F) ADAM-6224  
-40 ~ 70 $^{\circ}$ C (-40 ~ 158 $^{\circ}$ F) ADAM-6217-B
- Storage Temperature: -20 ~ 80 $^{\circ}$ C (-4 ~ 176 $^{\circ}$ F) -40 ~ 80 $^{\circ}$ C (-40 ~ 176 $^{\circ}$ F) for ADAM-6217-B
- Operating Humidity: 20 ~ 95% RH (non-condensing)
- Storage Humidity: 0 ~ 95% RH (non-condensing)

# ADAM-6250 ADAM-6251 ADAM-6256

15-ch Isolated Digital I/O Modbus TCP Module  
16-ch Isolated Digital Input Modbus TCP Module  
16-ch Isolated Digital Output Modbus TCP Module



ADAM-6250



ADAM-6251



ADAM-6256



## Specifications

### Digital Input

- Channels ADAM-6250: 8  
ADAM-6251: 16
- Dry Contact Logic 0: Open  
Logic 1: Closed to DGND
- Wet Contact Logic 0: 0 ~ 3 V<sub>DC</sub> or 0 ~ -3 V<sub>DC</sub>  
Logic 1: 10 ~ 30 V<sub>DC</sub> or -10 ~ -30 V<sub>DC</sub>  
(Dry/Wet Contact decided by Switch)
- Input Impedance 5.2 k $\Omega$  (Wet Contact)
- Transition Time 0.2 ms
- Frequency Input Range 0.1 ~ 3 kHz
- Counter Input 3 kHz (32 bit + 1 bit overflow)
- Keep/Discard Counter Value when power off
- Supports Inverted DI Status

### Digital Output

- Channels ADAM-6250: 7 (Sink Type)  
ADAM-6256: 16 (Sink Type)
- Output Voltage Range 10 ~ 30 V<sub>DC</sub>
- Normal Output Current 100 mA (per channel)
- Pulse Output Up to 5 kHz
- Delay Output High-to-Low and Low-to-High

## Ordering Information

- ADAM-6250 15-ch Isolated Digital I/O Modbus TCP Module
- ADAM-6251 16-ch Isolated Digital Input Modbus TCP Module
- ADAM-6256 16-ch Isolated Digital Output Modbus TCP Module

## Common Specifications

### General

- Ethernet 2-port 10/100 Base-TX (for Daisy Chain)
- LED Indication ADAM-6250: 8 DI + 7 DO  
ADAM-6251: 16 DI  
ADAM-6256: 16 DO
- Protocol Modbus/TCP, TCP/IP, UDP, HTTP, DHCP, MQTT, SNMP
- Connector Plug-in 5P/15P screw terminal blocks
- Power Input 10 ~ 30 V<sub>DC</sub> (24 V<sub>DC</sub> standard)
- Watchdog Timer System (1.6 seconds)  
Communication (Programmable)
- Dimensions 70 x 122 x 27 mm
- Protection Built-in TVS/ESD protection  
Power Reversal protection  
Over Voltage protection: +/- 35V<sub>DC</sub>  
Isolation protection: 2500 V<sub>DC</sub>
- Power Consumption ADAM-6250: 3 W @ 24 V<sub>DC</sub>  
ADAM-6251: 2.7 W @ 24 V<sub>DC</sub>  
ADAM-6256: 3.2 W @ 24 V<sub>DC</sub>

### Features

- Daisy chain connection with auto-bypass protection
- Remote monitoring and control with smart phone/pad
- Group configuration capability for multiple module setup
- DI/O LED Indication
- Flexible user-defined Modbus address.
- Intelligent control ability by Peer-to-Peer and GCL function
- Multiple protocol support: Modbus/TCP, TCP/IP, UDP, HTTP, DHCP, MQTT, SNMP
- Web language support: XML, HTML 5, Java Script
- System configuration backup
- User Access Control

### Environment

- Operating Temperature -10 ~ 70°C (14 ~ 158°F)  
-40 ~ 70°C (-40~158°F) (B version)
- Storage Temperature -20 ~ 80°C (-4 ~ 176°F)  
-40 ~ 80°C (-40~176°F) (B version)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

# ADAM-6260 ADAM-6266

## 6-ch Relay Output Modbus TCP Module 4-ch Relay Output Modbus TCP Module with 4-ch DI



ADAM-6260



ADAM-6266



## Specifications

### Relay Output

- Channels ADAM-6260: 5 Form C and 1 Form A  
ADAM-6266: 4 Form C
- Contact Rating (Resistive) 250 V<sub>AC</sub> @ 5A  
30 V<sub>DC</sub> @ 5A
- Max. Switching Voltage 400 V<sub>AC</sub>  
300 V<sub>DC</sub>
- Breakdown Voltage 500 V<sub>AC</sub> (50/60Hz)
- Max. Breakdown Capacity 1250 VA
- Frequency of Operation 360 operations/hour with load  
72,000 operations/hour without load
- Set/Reset Time 8 ms/8 ms
- Mechanical Endurance > 15 x 10<sup>6</sup> operations
- Isolation between Contact 1000 V<sub>rms</sub>
- Insulation Resistance > 10 GΩ @ 500 V<sub>DC</sub>

### Digital Input

- Channels ADAM-6266: 4
- Dry Contact Logic 0: Open  
Logic 1: Closed to DI COM
- Wet Contact Logic 0: 0 ~ 3 V<sub>DC</sub> or 0 ~ -3 V<sub>DC</sub>  
Logic 1: 10 ~ 30 V<sub>DC</sub> or -10 ~ -30 V<sub>DC</sub>  
(Dry/Wet Contact decided by Switch)
- Input Impedance 5.2 kΩ (Wet Contact)
- Transition Time 0.2 ms
- Frequency Input Range 0.1 ~ 3kHz
- Counter Input 3kHz (32 bit + 1 bit overflow)
- Keep/Discard Counter Value when power off
- Supports Inverted DI Status

## Ordering Information

- ADAM-6260 6-ch Relay Output Modbus TCP Module
- ADAM-6266 4-ch Relay Output Modbus TCP Module with 4-ch DI

## Common Specifications

### General

- Ethernet 2-port 10/100 Base-TX (for Daisy Chain)
- LED Indication ADAM-6260: 6 RL  
ADAM-6266: 4 RL + 4 DI
- Protocol Modbus/TCP, TCP/IP, UDP, HTTP, DHCP, SNMP, MQTT
- Connector Plug-in 5P/15P screw terminal blocks
- Power Input 10 ~ 30 V<sub>DC</sub> (24 V<sub>DC</sub> standard)
- Watchdog Timer System (1.6 seconds)  
Communication (Programmable)
- Dimensions 70 x 122 x 27 mm
- Protection Built-in TVS/ESD protection  
Power Reversal protection  
Over Voltage protection: +/- 35V<sub>DC</sub>  
Isolation protection: 2500 V<sub>DC</sub>
- Power Consumption ADAM-6260: 4.5 W @ 24 V<sub>DC</sub>  
ADAM-6266: 4.2 W @ 24 V<sub>DC</sub>

### Features

- Daisy chain connection with auto-bypass protection
- Remote monitoring and control with smart phone/pad
- Group configuration capability for multiple module setup
- DI/O LED Indication
- Flexible user-defined Modbus address.
- Intelligent control ability by Peer-to-Peer and GCL function
- Multiple protocol support: Modbus/TCP, TCP/IP, UDP, HTTP, DHCP, SNMP, MQTT
- Web language support: XML, HTML 5, Java Script
- System configuration backup
- User Access Control

### Environment

- Operating Temperature -10 ~ 70°C (14 ~ 158°F)  
-40 ~ 70°C (-40~158°F) (B version)
- Storage Temperature -20 ~ 80°C (-4 ~ 176°F)  
-40 ~ 80°C (-40~176°F) (B version)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

# ADAM-6117

# ADAM-6160

## 8-ch Isolated Analog Input Real-time Ethernet Module

## 6-ch Relay Real-time Ethernet Module

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions



ADAM-6117

FCC CE RoHS

### Specifications

#### Analog Input

- **Channels** 8 (differential)
- **Input Impedance** > 10 MΩ (voltage)  
120 Ω (current)
- **Input Type** mV, V, mA
- **Input Range** ±150 mV, ±500 mV, ±1 V  
±5 V, ±10 V, 0 ~ 20 mA,  
4 ~ 20 mA, ±20 mA
- **Span Drift** ± 30 ppm/°C
- **Zero Drift** ± 6 μV/°C
- **Resolution** 16-bit
- **Accuracy** ± 0.1% of FSR (Current) at 25°C  
± 0.2% of FSR (Current) at 25°C
- **Sampling Rate** 10 sample/second (total)
- **CMR @ 50/60 Hz** 92 dB
- **NMR @ 50/60 Hz** 67 dB
- **High Common Mode** 200 V<sub>DC</sub>

### Ordering Information

- **ADAM-6117E1** 8-ch Isolated AI EtherNet/IP Module



ADAM-6160

FCC CE RoHS

### Specifications

#### Relay Output

- **Channels** 5 Form C and 1 Form A
- **Contact Rating (Resistive)** 250 V<sub>AC</sub> @ 5A  
30 V<sub>DC</sub> @ 5A
- **Max. Switching Voltage** 400 V<sub>AC</sub>  
300 V<sub>DC</sub>
- **Breakdown Voltage** 500 V<sub>AC</sub> (50/60Hz)
- **Max. Breakdown Capacity** 1250 VA
- **Frequency of Operation** 360 operations/hour with load  
72,000 operations/hour without load
- **Set/Reset Time** 8 ms/8 ms
- **Mechanical Endurance** > 15 x 10<sup>6</sup> operations
- **Isolation between Contact** 1000 V<sub>rms</sub>
- **Insulation Resistance** > 10 GΩ @ 500 V<sub>DC</sub>

### Ordering Information

- **ADAM-6160E1** 6-ch Relay EtherNet/IP Module

### Common Specifications

#### General

- **LAN** 10/100Base-T(X)
- **Power Consumption** ADAM-6117: 3.5 W @ 24 V<sub>DC</sub>  
ADAM-6160: 4.5 W @ 24 V<sub>DC</sub>
- **Connectors** 2 x RJ-45 LAN (Daisy Chain)  
Plug-in screw terminal block (I/O and power)
- **Watchdog** System (1.6 second)
- **Power Input** 10 ~ 30 V<sub>DC</sub>

#### Protection

- **Isolation Protection** 2,500 V<sub>DC</sub>
- **Built in TVS/ESD Protection**
- **Power Reversal Protection**

#### Environment

- **Operating Temperature** -10 ~ 70°C (14 ~ 158°F)
- **Storage Temperature** -20 ~ 80°C (-4 ~ 176°F)
- **Operating Humidity** 20 ~ 95% RH (non-condensing)
- **Storage Humidity** 0 ~ 95% RH (non-condensing)

# ADAM-6150

## ADAM-6151/6156

15-ch Isolated Digital I/O Real-time Ethernet Module

16-ch Isolated Digital Input/ Digital Output Real-time Ethernet Module



ADAM-6150

FCC CE RoHS

### Specifications

#### Digital Input

- Channels 8
- Dry Contact Logic level 0: open  
Logic level 1: close to DGND
- Wet Contact Logic level 0: 0 ~ 3 V<sub>DC</sub> or 0 ~ -3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub> or -10 ~ -30 V<sub>DC</sub>  
(Dry/Wet Contact decided by switch)
- Input Impedance 5.2 kΩ (Wet Contact)
- Transition Time From logic level 0 to 1: 0.2 ms  
From logic level 1 to 0: 0.2 ms

#### Digital Output

- Channels 7
- Output Voltage Range 8 ~ 35 V<sub>DC</sub>
- Normal Output Current 100 mA (per channel)

### Ordering Information

- ADAM-6150EI 15-ch Isolated DI/O EtherNet/IP Module



ADAM-6151/6156

FCC CE RoHS

### Specifications

#### Digital Input (ADAM-6151)

- Channels 16
- Dry Contact Logic level 0: open  
Logic level 1: close to DGND
- Wet Contact Logic level 0: 0 ~ 3 V<sub>DC</sub> or 0 ~ -3 V<sub>DC</sub>  
Logic level 1: 10 ~ 30 V<sub>DC</sub> or -10 ~ -30 V<sub>DC</sub>  
(Dry/Wet Contact decided by switch)
- Input Impedance 5.2 kΩ (Wet Contact)
- Transition Time From logic level 0 to 1: 0.2 ms  
From logic level 1 to 0: 0.2 ms

#### Digital Output (ADAM-6156)

- Channels 16
- Output Voltage Range 8 ~ 35 V<sub>DC</sub>
- Normal Output Current 100 mA (per channel)

### Ordering Information

- ADAM-6151EI 16-ch Isolated DI EtherNet/IP Module
- ADAM-6156EI 16-ch Isolated DO EtherNet/IP Module

### Common Specifications

#### General

- LAN 10/100Base-T(X)
- Power Consumption ADAM-6150: 3 W @ 24 V<sub>DC</sub>  
ADAM-6151: 2.7 W @ 24 V<sub>DC</sub>  
ADAM-6156: 3.2 W @ 24 V<sub>DC</sub>
- Connectors 2 x RJ-45 LAN, (Daisy Chain)  
Plug-in screw terminal block (I/O and power)
- Watchdog System (1.6 second)
- Power Input 10 ~ 30 V<sub>DC</sub>

#### Protection

- Over Voltage Protection ±35 V<sub>DC</sub>
- Isolation Protection 2,500 V<sub>DC</sub>
- Power Reversal Protection

#### Environment

- Operating Temperature -10 ~ 70°C (14 ~ 158°F)
- Storage Temperature -20 ~ 80°C (-4 ~ 176°F)
- Operating Humidity 20 ~ 95% RH (non-condensing)
- Storage Humidity 0 ~ 95% RH (non-condensing)

# ADAM-4000 Series

## Introduction

ADAM-4000 series modules are compact, versatile sensor-to-computer interface units designed specifically for reliable operation in harsh environments. Their built-in microprocessors are encased in rugged industrial grade plastic and independently provide intelligent signal conditioning, analog I/O, digital I/O, data display, and RS-485 communication. The ADAM-4000 series can be categorized into three groups: controllers, communication modules, and I/O modules.



- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

## Applications

- Remote data acquisition
- Process monitoring
- Industrial process control
- Energy management
- Supervisory control
- Security systems
- Laboratory automation
- Building automation
- Product testing
- Direct digital control
- Relay control

## General Features

### Modbus Communication Protocol

Since Modbus is one of the most widely used communication standards in the world, Advantech has applied it as the major communication protocol for eAutomation product development. The new generation of ADAM-4000 modules now also supports Modbus/RTU as the remote data transmission protocol. Featuring Modbus-support capacity, the new ADAM-4000 series have become universal remote I/O modules that can operate with any Modbus system. HMI servers or controllers can read/write data via standard Modbus commands instead of complex ASCII code.

### Watchdog Timer

A watchdog timer supervisory function will automatically reset the ADAM-4000 series modules if required, which reduces the need for maintenance. It also contributes a high level of reliability to the system.

### Modular Industrial Design

You can easily mount modules on a DIN rail, panel, or piggyback them on top of each other. Signal connections can be formed through plug-in screw-terminal blocks, ensuring simple installation, modification, and maintenance.

## I/O Module Features

### Easy Plug-In System Integration

With the ADAM-4000's Modbus I/O and built-in Modbus/RTU protocol, any controller using the Modbus/RTU standard can be integrated as part of an ADAM-4000 control system. Any Modbus Ethernet data gateway can upgrade these I/O modules up to the Modbus/TCP Ethernet layer. Most HMI software is bundled with a Modbus driver and can access the ADAM-4000 I/O directly. Moreover, Advantech provides Modbus OPC Server and Modbus/TCP OPC Server as data exchange interfaces between the ADAM-4000 Modbus I/O and any Windows applications.

## Communication Module Features

### Fiber Converter

The ADAM-4541 and ADAM-4542+ have been designed specifically for transmitting data over long distances without noise interference. The ADAM-4541 is a multi-mode converter that carries signals from fiber optics to RS-232/422/485. It offers a transmission distance of up to 2,500 m with total immunity against electromagnetic noise. The ADAM-4542+ is a single-mode converter that carries signals from fiber optics to RS-232/422/485. It offers an incredible transmission distance of up to 15 km, also with total immunity against electromagnetic noise.

### USB Converter

The ADAM-4561 and ADAM-4562 are one-port isolated USB to RS-232/422/485 converters. The ADAM-4561 can convert USB to RS-232/422/485 with a plug-in terminal, and its major features are the capability to use 9-wire RS-232 and to draw power from a USB port. With 9-wire RS-232 capability, this converter meets the requirements of PLCs, modems, and controller equipment. The ADAM-4562 is a USB-to-serial converter that supports Plug & Play and hot-swapping, which simplifies the configuration process while allowing the module to draw power via USB, thus making it no longer necessary to have an external power supply.

# ADAM-4100 Series

## Robust Remote Data Acquisition and Control Modules Overview



### Applications

- Wide operating temperature:  $-40 \sim 85^{\circ}\text{C}$
- Higher Noise Immunity  
ESD (IEC 61000-4-2) 8KV  
EFT (IEC 61000-4-4) 4KV  
Surge (IEC 61000-4-5) 4KV
- Wide power input:  $10 \sim 48 \text{ V}_{\text{DC}}$
- Support modbus/RTU
- Multiple interface :RS-485, Micro USB

### Introduction

The robust ADAM-4000 family includes ADAM-4100 series modules, the ADAM-4510I, and the ADAM-4520I modules. The ADAM-4100 series comprises compact, versatile sensor-to-computer interface units designed for reliable operation in harsh environments. Their built-in microprocessors, encased in rugged industrial-grade PC plastic, independently provide intelligent signal conditioning, analog I/O, digital I/O, LED data display, and an address mode with a user-friendly design for convenient address reading. The ADAM-4510I and ADAM-4520I modules are robust industrial-grade communication modules.

### Designed for Harsh Industrial Environments

#### ADAM-4100 Module with LED Display

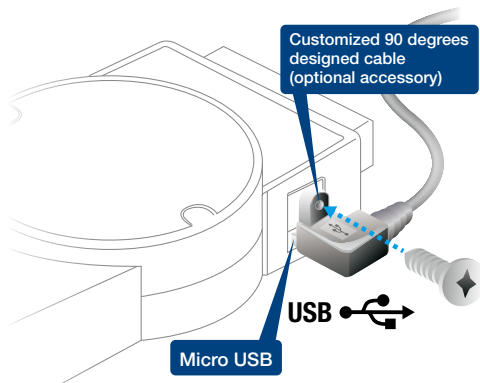
ADAM-4100 series modules have an LED display that lets you monitor the channel status. For the ADAM-4117 and ADAM-4118, the LED will be lit when the related channel is active; for the ADAM-4150 and ADAM-4168, the LED will be lit when the related channel value is high. ADAM-4100 series modules have two operating modes: initial and normal. In contrast to old modules that require additional wiring to set the mode, this can be done using a switch with ADAM-4100 modules, making it very convenient to configure. When set to initial mode, the LED display represents the node address of the module. Additionally, in systems where multiple ADAM-4100 series modules are used, you can locate individual modules using Adam/Apax .NET Utility and the LED display on the module. All of these functions are very helpful for diagnosing ADAM-4100 series systems.

#### Online Firmware Updates

ADAM-4100 series modules have a user-friendly and convenient design that allows for firmware updates via a local network or the Internet. You can easily update to the latest firmware using Adam/Apax .NET Utility on the host PC. This saves time and ensures that the module always runs with the latest functional enhancements.

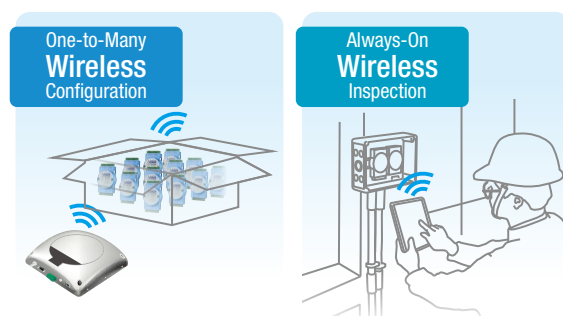
### Micro USB interface

USB has become common interface in IoT devices, and it is easy to be accessed via PC. To expand the accessibility of ADAM-4100 series modules, in addition to an RS-485 serial port, the B version of these modules also has a micro USB interface that supplies power and a communication interface. Users have the option to use the RS-485 and USB ports concurrently or independently, depending on their application. The ADAM-4100 micro USB interface can be adapted to standard micro USB cable. Advantech also offers a 90° cable (optional) with a locking screw mechanism to further enhance the connection stability.



### Access ADAM by Passive RFID

There is a trend in current IoT applications where increasingly more data are needed. Consequently, the demand for I/O modules is increasing. Users are pursuing efficient ways to set up and manage the modules. Thus, how to deploy I/O modules quickly and trace related usage information to avoid downtime have become key requirements in IoT applications. To fulfill these needs, ADAM-4100 series modules (B version) implement a passive internal RFID tag. This remarkable feature means that module information such as the model name, device ID, I/O value, firmware version, alarm events, and serial number are stored in the RFID tag. In contrast to typical RFID tags that contain fixed data, the RFID tag information in ADAM modules can be dynamically updated, which means that the RFID tag will reflect the latest ADAM module information. This innovative design makes ADAM modules more flexible for IoT applications.



# I/O Module Selection Guide

## Analog Input



| Model             |                                   | ADAM-4015             | ADAM-4017+                                  | ADAM-4018+                       | ADAM-4019+                                            |
|-------------------|-----------------------------------|-----------------------|---------------------------------------------|----------------------------------|-------------------------------------------------------|
| Resolution        |                                   |                       |                                             | 16 bit                           |                                                       |
| Analog Input      | Channels                          | 6 differential        | 8 differential                              | 8 differential                   | 8 differential                                        |
|                   | Sampling Rate                     | 10 Hz                 |                                             | 10 Hz                            | 10 Hz                                                 |
|                   | Voltage Input                     | -                     | ±150 mV<br>±500 mV<br>±1 V<br>±5 V<br>±10 V | -                                | ±100 mV<br>±500 mV<br>±1 V<br>±2.5 V<br>±5 V<br>±10 V |
|                   | Current Input                     | -                     | 4 ~ 20, ±20 mA                              | 4 ~ 20, ±20 mA                   | 4 ~ 20, ±20 mA                                        |
|                   | Direct Sensor Input               | RTD                   | -                                           | J, K, T, E, R, S, B thermocouple | J, K, T, E, R, S, B thermocouple                      |
|                   | Burnout Detection                 | ✓                     | -                                           | ✓                                | ✓ (4 ~ 20 mA and all T/C)                             |
|                   | Channel Independent Configuration | ✓                     | ✓                                           | ✓                                | ✓                                                     |
| Isolation Voltage |                                   | 3,000 V <sub>DC</sub> |                                             | 3,000 V <sub>DC</sub>            | 3,000 V <sub>DC</sub>                                 |
| Watchdog Timer    |                                   | ✓ (system and comm.)  | ✓ (system and comm.)                        | ✓ (system and comm.)             | ✓ (system and comm.)                                  |
| Modbus Support *  |                                   | ✓                     | ✓                                           | ✓                                | ✓                                                     |

\*All ADAM-4000 I/O modules support ASCII commands

## Analog Output

## Digital Input/Output



| Model                 |                 | ADAM-4021             | ADAM-4024             | ADAM-4050  | ADAM-4051             | ADAM-4052              |
|-----------------------|-----------------|-----------------------|-----------------------|------------|-----------------------|------------------------|
| Resolution            |                 | 12 bit                | 12 bit                | -          | -                     | -                      |
| Analog Output         | Channels        | 1                     | 4                     | -          | -                     | -                      |
|                       | Voltage Output  | 0 ~ 10 V              | ±10 V                 | -          | -                     | -                      |
|                       | Current Output  | 0 ~ 20, 4 ~ 20 mA     | 0 ~ 20, 4 ~ 20 mA     | -          | -                     | -                      |
| Digital I/O           | Input Channels  | -                     | 4                     | 7          | 16                    | 8                      |
|                       | Output Channels | -                     | -                     | 8          | -                     | -                      |
|                       | Alarm Settings  | -                     | ✓                     | -          | -                     | -                      |
| Isolation Voltage     |                 | 3,000 V <sub>DC</sub> | 3,000 V <sub>DC</sub> | -          | 2,500 V <sub>DC</sub> | 5,000 V <sub>RMS</sub> |
| Digital LED Indicator |                 | -                     | -                     | -          | Yes                   | -                      |
| Watchdog Timer        |                 | ✓ (system)            | ✓ (system and comm.)  | ✓ (system) | ✓ (system and comm.)  | ✓ (system)             |
| Safety Setting        |                 | -                     | ✓                     | -          | -                     | -                      |
| Modbus Support *      |                 | -                     | ✓                     | -          | ✓                     | -                      |

\*All ADAM-4000 I/O modules support ASCII commands

# I/O Module Selection Guide

## Digital Input/Output

## Relay Output

## Counter



| Model                 |                                   | ADAM-4053  | ADAM-4055             | ADAM-4056S/<br>4056SO | ADAM-4060  | ADAM-4068            | ADAM-4069            | ADAM-4080              |
|-----------------------|-----------------------------------|------------|-----------------------|-----------------------|------------|----------------------|----------------------|------------------------|
| Resolution            |                                   | -          | -                     | -                     | -          | -                    | -                    | -                      |
| Analog Input          | Channels                          | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Sampling Rate                     | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Voltage Input                     | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Current Input                     | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Direct Sensor Input               | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Burnout Detection                 | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Channel Independent Configuration | -          | -                     | -                     | -          | -                    | -                    | -                      |
| Analog Output         | Channels                          | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Voltage Output                    | -          | -                     | -                     | -          | -                    | -                    | -                      |
|                       | Current Output                    | -          | -                     | -                     | -          | -                    | -                    | -                      |
| Digital I/O           | Input Channels                    | 16         | 8                     | -                     | -          | -                    | -                    | -                      |
|                       | Output Channels                   | -          | 8                     | 12                    | 4-ch relay | 8-ch relay           | 8-ch power relay     | 2                      |
|                       | Alarm Settings                    | -          | -                     | -                     | -          | -                    | -                    | Yes                    |
| Counter (32-bit)      | Channels                          | -          | -                     | -                     | -          | -                    | -                    | 2                      |
|                       | Input Frequency                   | -          | -                     | -                     | -          | -                    | -                    | 50 kHz                 |
| Isolation Voltage     |                                   | -          | 2,500 V <sub>DC</sub> | 5,000 V <sub>DC</sub> | -          | -                    | -                    | 2,500 V <sub>RMS</sub> |
| Digital LED Indicator |                                   | -          | ✓                     | ✓                     | -          | ✓                    | -                    | -                      |
| Watchdog Timer        |                                   | ✓ (system) | ✓ (system and comm.)  | ✓ (system and comm.)  | ✓ (system) | ✓ (system and comm.) | ✓ (system and comm.) | ✓ (system)             |
| Safety Setting        |                                   | -          | ✓                     | -                     | ✓          | ✓                    | ✓                    | -                      |
| Modbus Support *      |                                   | -          | ✓                     | ✓                     | -          | ✓                    | ✓                    | supported in E version |

\*All ADAM-4000 I/O modules support ASCII commands

# Communication and Controller Module Selection Guide

## Repeaters



| Model                 | ADAM-4510<br>ADAM-4510S                           |
|-----------------------|---------------------------------------------------|
| Network               | RS-422<br>RS-485                                  |
| Comm. Protocol        | -                                                 |
| Comm. Speed (bps)     | Serial: From 1,200 to 115.2K                      |
| Comm. Distance        | Serial: 1.2 km                                    |
| Interface Connectors  | RS-422/485: plug-in screw terminal                |
| LED Indicators        | Communication and power                           |
| Data Flow Control     | -                                                 |
| Watchdog Timer        | -                                                 |
| Isolation Voltage     | ADAM-4510: -<br>ADAM-4510S: 3,000 V <sub>DC</sub> |
| Special Features      | -                                                 |
| Built-In I/O          | -                                                 |
| Power Requirements    | 10 ~ 30 V <sub>DC</sub>                           |
| Operating Temperature | -10 ~ 70°C (14 ~ 158°F)                           |
| Operating Humidity    | 5 ~ 95% RH                                        |
| Power Consumption     | 1.4 W @ 24 V <sub>DC</sub>                        |

## Converters



| Model                 | ADAM-4520                                                | ADAM-4521                                                | ADAM-4541<br>ADAM-4542+                                                                                 | ADAM-4561<br>ADAM-4562                                                                                                   |
|-----------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Network               | RS-232 to RS-422/485                                     |                                                          | Fiber optic to RS-232/422/485                                                                           | USB to RS-232/485/422                                                                                                    |
| Comm. Protocol        | -                                                        |                                                          |                                                                                                         |                                                                                                                          |
| Comm. Speed (bps)     | Serial: From 1,200 to 115.2K                             |                                                          |                                                                                                         |                                                                                                                          |
| Comm. Distance        | Serial: 1.2 km                                           | Serial: 1.2 km                                           | ADAM-4541: 2.5 km<br>ADAM-4542+: 15 km                                                                  | Serial: 1.2 km                                                                                                           |
| Interface Connectors  | RS-232: female DB9<br>RS-422/485: plug-in screw terminal | RS-232: female DB9<br>RS-422/485: plug-in screw terminal | RS-232/422/485: plug-in screw terminal<br>Fiber:<br>ADAM-4541: ST connector<br>ADAM-4542+: SC connector | USB: type A client connector<br>Serial: ADAM-4561:<br>plug-in screw terminal (RS-232/422/485)<br>ADAM-4562: DB9 (RS-232) |
| LED Indicators        | Communication and power                                  |                                                          |                                                                                                         |                                                                                                                          |
| Data Flow Control     | -                                                        | ✓                                                        | -                                                                                                       | ✓                                                                                                                        |
| Watchdog Timer        | -                                                        | ✓                                                        | -                                                                                                       | ✓                                                                                                                        |
| Isolation Voltage     | 3,000 V <sub>DC</sub>                                    | 1,000 V <sub>DC</sub>                                    | -                                                                                                       | ADAM-4561: 3,000 V <sub>DC</sub><br>ADAM-4562: 2,500 V <sub>DC</sub>                                                     |
| Power Requirements    | 10 ~ 30 V <sub>DC</sub>                                  |                                                          |                                                                                                         |                                                                                                                          |
| Operating Temperature | -10 ~ 70°C (14 ~ 158°F)                                  |                                                          |                                                                                                         |                                                                                                                          |
| Operating Humidity    | 5 ~ 95% RH                                               |                                                          |                                                                                                         |                                                                                                                          |
| Power Consumption     | 1.2 W @ 24 V <sub>DC</sub>                               | 1 W @ 24 V <sub>DC</sub>                                 | ADAM-4541: 1.5 W @ 24 V <sub>DC</sub><br>ADAM-4542+: 3 W @ 24 V <sub>DC</sub>                           | ADAM-4561: 1.5 W @ 5 V <sub>DC</sub><br>ADAM-4562: 1.1 W @ 5 V <sub>DC</sub>                                             |

# Robust RS-485 I/O Module Selection Guide



| Model                  |                                   | ADAM-4117                                                                                                                                          | ADAM-4118                           | ADAM-4150                  | ADAM-4168                  |
|------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------|----------------------------|
| Resolution             |                                   | 16 bit                                                                                                                                             |                                     | -                          | -                          |
| Analog Input           | Channels                          | 8 differential                                                                                                                                     |                                     | -                          | -                          |
|                        | Sampling Rate                     | 10/100 Hz (total)                                                                                                                                  |                                     | -                          | -                          |
|                        | Voltage Input                     | 0 ~ 150 mV, 0 ~ 500 mV,<br>0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V,<br>0 ~ 15 V, $\pm 150$ mV,<br>$\pm 500$ mV, $\pm 1$ V, $\pm 5$ V,<br>$\pm 10$ V, $\pm 15$ V |                                     | -                          | -                          |
|                        | Current Input                     | 0 ~ 20, 4 ~ 20, $\pm 20$ mA                                                                                                                        | 4 ~ 20, $\pm 20$ mA                 | -                          | -                          |
|                        | Direct Sensor Input               | -                                                                                                                                                  | J, K, T, E, R, S, B<br>Thermocouple | -                          | -                          |
|                        | Burnout Detection                 | ✓ (mA)                                                                                                                                             | ✓ (mA and All T/C)                  | -                          | -                          |
|                        | Channel Independent Configuration | ✓                                                                                                                                                  | ✓                                   | -                          | -                          |
| Digital I/O            | Input Channels                    | -                                                                                                                                                  | -                                   | 7                          | -                          |
|                        | Output Channels                   | -                                                                                                                                                  | -                                   | 8                          | 8-ch relay                 |
| Counter                | Channels                          | -                                                                                                                                                  | -                                   | 7                          | -                          |
|                        | Input Frequency                   | -                                                                                                                                                  | -                                   | 3 kHz                      | -                          |
| Isolation Voltage      |                                   | 3,000 V <sub>DC</sub>                                                                                                                              |                                     |                            |                            |
| Digital LED Indicator  |                                   | Communication and Power                                                                                                                            |                                     |                            |                            |
| Watchdog Timer         |                                   | Yes (System & Communication)                                                                                                                       |                                     |                            |                            |
| Safety Setting         |                                   | -                                                                                                                                                  | -                                   | ✓                          | ✓                          |
| Communication Protocol |                                   | ASCII Command/Modbus                                                                                                                               |                                     |                            |                            |
| Power Requirements     |                                   | 10 ~ 48 V <sub>DC</sub>                                                                                                                            |                                     |                            |                            |
| Operating Temperature  |                                   | -40 ~ 85°C (-40 ~ 185°F)                                                                                                                           |                                     |                            |                            |
| Storage Temperature    |                                   | -40 ~ 85°C (-40 ~ 185°F)                                                                                                                           |                                     |                            |                            |
| Operating Humidity     |                                   | 5 ~ 95% RH                                                                                                                                         |                                     |                            |                            |
| Power Consumption      |                                   | 1.2 W @ 24 V <sub>DC</sub>                                                                                                                         | 0.5 W @ 24 V <sub>DC</sub>          | 0.7 W @ 24 V <sub>DC</sub> | 1.8 W @ 24 V <sub>DC</sub> |
| Page                   |                                   | 16-18                                                                                                                                              |                                     | 16-19                      |                            |



| Model                     | ADAM-4510I                         | ADAM-4520I                                               |
|---------------------------|------------------------------------|----------------------------------------------------------|
| Network                   | RS-422/485                         | RS-232 to RS-422/485                                     |
| Communication Speed (bps) | From 1,200 to 115.2k               |                                                          |
| Communication Distance    | Serial: 1.2 km                     |                                                          |
| Interface Connectors      | RS-422/485: plug-in screw terminal | RS-232: female DB9<br>RS-422/485: plug-in screw terminal |
| Digital LED Indicators    | Communication and Power            |                                                          |
| Auto Data Flow Control    | ✓                                  |                                                          |
| Isolation Voltage         | 3,000 V <sub>DC</sub>              |                                                          |
| Power Requirements        | 10 ~ 48 V <sub>DC</sub>            |                                                          |
| Operating Temperature     | -40 ~ 85°C (-40 ~ 185°F)           |                                                          |
| Storage Temperature       | -40 ~ 85°C (-40 ~ 185°F)           |                                                          |
| Operating Humidity        | 5 ~ 95%                            |                                                          |
| Power Consumption         | 1.4 W @ 24 V <sub>DC</sub>         | 1.2 W @ 24 V <sub>DC</sub>                               |
| Page                      | 16-18                              |                                                          |

# ADAM-4017+ ADAM-4018+ ADAM-4019+

8-ch Analog Input Module with Modbus

8-ch Thermocouple Input Module with Modbus

8-ch Universal Analog Input Module with Modbus



ADAM-4017+

FCC CE RoHS UL



ADAM-4018+

FCC CE RoHS UL



ADAM-4019+

FCC CE RoHS UL

## Specifications

### General

- Power Consumption 1.2 W @ 24 V<sub>DC</sub>
- Watchdog Timer System (1.6 second) & Communication
- Supported Protocols ASCII command and Modbus/RTU

### Analog Input

- Channels 8 differential
- Channel Independent Configuration Yes
- Input Impedance Voltage: 20 MΩ  
Current: 120 Ω
- Input Type mV, V, mA
- Input Range ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 4 ~ 20 mA

## Specifications

### General

- Power Consumption 0.8 W @ 24 V<sub>DC</sub>
- Watchdog Timer System (1.6 second) & Communication
- Supported Protocols ASCII command and Modbus/RTU

### Analog Input

- Channels 8 differential
- Channel Independent Configuration Yes
- Input Impedance Voltage: 20 MΩ  
Current: 120 Ω
- Input Type Thermocouple, mA
- Input Range ±20 mA, 4 ~ 20 mA
- T/C Types and Temperature Ranges

|   |              |   |               |
|---|--------------|---|---------------|
| J | 0 ~ 760°C    | R | 500 ~ 1,750°C |
| K | 0 ~ 1,370°C  | S | 500 ~ 1,750°C |
| T | -100 ~ 400°C | B | 500 ~ 1,800°C |
| E | 0 ~ 1,000°C  |   |               |

- Burnout Detection All T/C

## Specifications

### General

- Power Consumption 1.0 W @ 24 V<sub>DC</sub>
- Watchdog Timer System (1.6 second) & Communication
- Supported Protocols ASCII command and Modbus/RTU

### Analog Input

- Channels 8 differential channels for individual input type
- Channel Independent Configuration Yes
- Input Impedance Voltage: 20 MΩ  
Current: 120 Ω
- Input Type T/C, mV, V, mA
- Input Range ±1 V, ±2.5 V, ±5 V, ±10 V, ±100 mV, ±500 mV, ±20 mA, 4 ~ 20 mA

- T/C Types and Temperature Ranges

|   |              |   |               |
|---|--------------|---|---------------|
| J | 0 ~ 760°C    | R | 500 ~ 1,750°C |
| K | 0 ~ 1,370°C  | S | 500 ~ 1,750°C |
| T | -100 ~ 400°C | B | 500 ~ 1,800°C |
| E | 0 ~ 1,000°C  |   |               |

- Burnout Detection 4 ~ 20 mA & all T/C

## Common Specifications

### General

- Power Input Unregulated 10 ~ 30 V<sub>DC</sub>
- Connectors 2 x plug-in terminal block (#14 ~ 22 AWG)

### Analog Input

- Accuracy Voltage mode: ±0.1% or better  
Current mode: ±0.2% or better
- Resolution 16-bit
- Sampling Rate 10 sample/second (total)
- Isolation Voltage 3,000 V<sub>DC</sub>

- Overvoltage Protection ±35 V<sub>DC</sub>
- CMR @ 50/60 Hz 120 dB
- NMR @ 50/60 Hz 100 dB
- Span Drift ±25 ppm/°C (Typical)
- Zero Drift ±6 μV/°C
- Built-in TVS/ESD Protection

### Environment

- Operating Humidity 5 ~ 95% RH
- Operating Temperature -10 ~ 70°C (14 ~ 158°F)
- Storage Temperature -25 ~ 85°C (-13 ~ 185°F)

## Ordering Information

- ADAM-4017+ 8-ch Analog Input Module with Modbus
- ADAM-4018+ 8-ch Thermocouple Input Module w/Modbus
- ADAM-4019+ 8-ch Universal Analog Input Module w/Modbus

# ADAM-4021 ADAM-4015 ADAM-4024

## 1-ch Analog Output Module

## 6-ch RTD Module with Modbus

## 4-ch Analog Output Module with Modbus



ADAM-4021



ADAM-4015



ADAM-4024



### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Power Consumption** 1.4 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second)
- Supported Protocols** ASCII command

#### Analog Output

- Channels** 1
- Output Impedance** 0.5 Ω
- Output Range** 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 10 V
- Output Type** mA, V
- Accuracy** ±0.1% of FSR for current output  
±0.2% of FSR for voltage output
- Current Load Resistor** 0 to 500 Ω (source)
- Resolution** 12-bit
- Isolation Voltage** 3,000 V<sub>DC</sub>
- Programmable Output Slope** 0.125 ~ 128 mA/sec.  
0.0625 ~ 64.0 V/sec.
- Readback Accuracy** ±1% of FSR
- Span Temperature Coefficient** ±25 ppm/°C
- Zero Drift** Voltage output: ±30 μV/°C  
Current output: ±0.2 μA/°C

### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- Power Consumption** 1.2 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 s) & Communication
- Supported Protocols** ASCII command and Modbus/RTU
- Burnout Detection** Yes

#### Analog Input

- Channels** 6 differential
- Input Connections** 2, 3-wire
- Input Impedance** 10 MΩ
- Input Type** Pt, Balco and Ni RTD
- RTD Types and Temperature Ranges**
  - Pt 100 RTD:**
    - Pt -50°C to 150°C
    - Pt 0°C to 100°C
    - Pt 0°C to 200°C
    - Pt 0°C to 400°C
    - Pt -200°C to 200°C
  - IEC RTD 100 ohms (α = 0.00385)
  - JIS RTD 100 ohms (α = 0.00392)
  - Pt 1000 RTD**
    - Pt -40°C to 160°C
  - Balco 500 RTD**
    - 30°C to 120°C
  - Ni 50 RTD**
    - Ni -80°C to 100°C
  - Ni 508 RTD**
    - Ni 0°C to 100°C
  - BA1**
    - 200°C to 600°C
- Accuracy** ±0.1% (Typical)
- CMR @ 50/60 Hz** 120 dB
- Span Drift** ±25 ppm/°C
- Zero Drift** ±3 μV/°C

### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- Power Consumption** 3 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second) & Communication
- Supported Protocols** ASCII command and Modbus/RTU

#### Analog Output

- Channels** 4
- Output Impedance** 0.5 Ω
- Output Range** 0 ~ 20 mA, 4 ~ 20 mA, ±10 V
- Output Type** mA, V (Differential)
- Accuracy** ±0.1 % of FSR for current output  
±0.1 % of FSR for voltage output
- Current Load Resistor** Max. 500 Ω (source)
- Voltage Load Resistor** Min. 1K Ω
- Resolution** 12-bit
- Isolation Voltage** 3,000 V<sub>DC</sub>
- Programmable Output Slope** 0.125 ~ 128 mA/sec.  
0.0625 ~ 64.0 V/sec.
- Span Temperature Coefficient** ±25 ppm/°C
- Zero Drift** Voltage output: ±30 μV/°C  
Current output: ±0.2 μA/°C

#### Digital Input

- Channels** 4
- Input Level** Logic level 0: 1 V max.  
Logic level 1: 10 ~ 30 V<sub>DC</sub>
- Isolation Voltage** 3,000 V<sub>DC</sub>

### Common Specifications

#### General

- Power Input** Unregulated 10 ~ 30 V<sub>DC</sub>

#### Environment

- Operating Humidity** 5 ~ 95% RH
- Operating Temperature** -10 ~ 70°C (14 ~ 185°F)
- Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)

### Ordering Information

- ADAM-4021** 1-ch Analog Output Module
- ADAM-4015** 6-ch RTD Module with Modbus
- ADAM-4024** 4-ch Analog Output Module with Modbus

# ADAM-4050 ADAM-4051 ADAM-4052



## 15-ch Digital I/O Module

## 16-ch Isolated Digital Input Module with Modbus

## 8-ch Isolated Digital Input Module



ADAM-4050



ADAM-4051



ADAM-4052



### Specifications

#### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 0.4 W @ 24 V<sub>DC</sub>
- **Watchdog Timer** System (1.6 second)
- **Supported Protocols** ASCII command

#### Digital Input

- **Channels** 7
- **Input Level** Logic level 0: 1 V max.  
Logic level 1: 3.5 ~ 30 V  
Pull up current: 0.5 mA,  
10 kΩ resistor to 5 V

#### Digital Output

- **Channels** 8  
open collector to 30 V,  
30 mA max. load
- **Power Dissipation** 300 mW

### Specifications

#### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- **Power Consumption** 1 W @ 24 V<sub>DC</sub>
- **Watchdog Timer** System (1.6 second)
- **Supported Protocols** ASCII command and  
Modbus/RTU

#### LED Indicators

Yes

#### Digital Input

- **Channels** 16
- **Input Voltage** 50 V max
- **Input Level**  
Dry contact: Logic level 0: open  
Logic level 1: close to  
GND  
Wet contact: Logic level 0: 3 V max  
Logic level 1: 10 ~ 50 V  
(Note: Digital Input levels 0 and 1 can be inverted)
- **Isolation Voltage** 2,500 V<sub>DC</sub>
- **Input Resistance** 5.2 kΩ
- **Overvoltage Protection** 70 V<sub>DC</sub>

### Specifications

#### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 0.4 W @ 24 V<sub>DC</sub>
- **Watchdog Timer** System (1.6 second)
- **Supported Protocols** ASCII command

#### Digital Input

- **Channels** 8  
(6 fully independent  
isolated channels, 2  
isolated channels with  
common ground)
- **Input Level** Logic level 0: 1 V max.  
Logic level 1: 3 ~ 30 V
- **Isolation Voltage** 5,000 V<sub>RMS</sub>
- **Input Resistance** 3 kΩ

- 1 Software and Industry Solutions
- 2 Industrial Server
- 3 Intelligent System
- 4 Intelligent HMI and Monitors
- 5 Automation Computers and Controllers
- 6 Industrial Communication
- 7 Remote I/O & Wireless Sensing Modules
- 8 Industrial I/O and Video Solutions

### Common Specifications

#### General

- **Power Input** Unregulated 10 ~ 30 V<sub>DC</sub>

#### Environment

- **Operating Humidity** 5 ~ 95% RH
- **Operating Temperature** -10 ~ 70°C (14 ~ 158°F)
- **Storage Temperature** -25 ~ 85°C  
(-13 ~ 185°F)

### Ordering Information

- **ADAM-4050** 15-ch Digital I/O Module
- **ADAM-4051** 16-ch Isolated Digital Input Module with Modbus
- **ADAM-4052** 8-ch Isolated Digital Input Module

# ADAM-4055 ADAM-4056S/4056SO ADAM-4080

16-ch Isolated Digital I/O Module with Modbus  
 12-ch Sink/Source Type Isolated Digital Output Modules with Modbus  
 2-ch Counter/Frequency Module



ADAM-4055



ADAM-4056S/4056SO



ADAM-4080



## Specifications

### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- Power Consumption** 1 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second) & Communication
- Supported Protocols** ASCII command and Modbus/RTU
- Isolation Voltage** 2,500 V<sub>DC</sub>
- LED Indicators** Yes

### Digital Input

- Channels** 8
- Input Level**
  - Dry Contact: Logic level 0: open
  - Logic level 1: close to GND
  - Wet Contact: Logic level 0: 3 V max.
  - Logic level 1: 10 ~ 50 V
- Overvoltage Protection** 70 V<sub>DC</sub>

### Digital Output

- Channels** 8, open collector to 40 V (200 mA max. load)
- Power Dissipation** Channel: 1 W max.
- Total: 2.2 W (8 Channels)

## Common Specifications

### General

- Power Input** Unregulated 10 ~ 30 V<sub>DC</sub>

### Environment

- Operating Humidity** 5 ~ 95% RH
- Operating Temperature** -10 ~ 70°C (14 ~ 158°F)
- Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)

## Specifications

### General

- Connectors** 2 x Plug-in terminal blocks (#14 ~ 22 AWG)
- Watchdog Timer** System (1.6 second) & Communication
- Support Protocol** ASCII command and Modbus/RTU
- Isolation Voltage** 5000 V<sub>DC</sub>
- LED Indicators** Yes

### ADAM-4056S

- Digital Output Channels** 12
- Open collector to 40V (200mA max. load)
- Power Dissipation** Channel: 1 W max
- Total: 4 W (12 Channels)
- Digital Output Type** Sink

### ADAM-4056SO

- Digital Output Channels** 12
- VCC: 10 ~ 35 V<sub>DC</sub>
- Current: 1A (per channel)
- Digital Output Type** Source
- Over Current Detection and Protection**

## Ordering Information

- ADAM-4055** 16-ch Isolated Digital I/O Module with Modbus
- ADAM-4056S** 12-ch Sink Type Isolated Digital Output Module with Modbus
- ADAM-4056SO** 12-ch Source Type Isolated Digital Output Module with Modbus
- ADAM-4080** 2-ch Counter/Frequency Modules

## Specifications

### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Power Consumption** 2.0 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second)
- Supported Protocols** ASCII command modbus/RTU (E version)

### Counter Input

- Channels** 2 independent counters (32-bit + 1-bit overflow)
- Input Frequency** 50 kHz max.
- Input Pulse Width** >10 μs.
- Input Mode** Isolated or non-isolated
- Isolated Input Level** Logic level 0: 1 V max.
- Logic level 1: 3.5 ~ 30 V
- Isolation Voltage** 2,500 V<sub>RMS</sub>
- Non-isolated Input Level** Programmable threshold:
- Logic level 0: 0.8 Vmax.
- Logic level 1: 2.4 ~ 5.0 V
- Maximum Count** 4,294,967,295 (32-bit)
- Preset Type** Absolute or relative
- Programmable Digital Noise Filter** 2 μs ~ 65 ms
- Alarm** Alarm comparators on each counter
- Frequency Measurement Range** 5 Hz ~ 50 kHz
- Programmable Built-in Gate Time** 1 or 0.1 second

### Digital Output

- Channels** 2, open collector to 30 V, 30 mA max. load
- Power Dissipation** 300 mW for each channel

# ADAM-4060 ADAM-4068 ADAM-4069

## 4-ch Relay Output Module

## 8-ch Relay Output Module with Modbus

## 8-ch Power Relay Output Module with Modbus



ADAM-4060



ADAM-4068



ADAM-4069



### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Power Consumption** 0.8 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second)
- Supported Protocols** ASCII command

#### Relay Output

- Breakdown Voltage** 500 V<sub>AC</sub> (50/60 Hz)
- Channels** 2 x Form A  
2 x Form C
- Contact Rating (Resistive)** 0.6 A @ 125 V<sub>AC</sub>  
0.3 A @ 250 V<sub>AC</sub>  
2 A @ 30 V<sub>DC</sub>  
0.6 A @ 110 V<sub>DC</sub>
- Initial Insulation Resistance** 1 GΩ min. at 500 V<sub>DC</sub>
- Relay off Time (Typical)** 2 ms
- Relay on Time (Typical)** 3 ms
- Maximum Operating Speed** 20 operations/min (at related load)

### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- Power Consumption** 0.6 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second) & Communication
- Supported Protocols** ASCII command and Modbus/RTU

#### Relay Output

- Breakdown Voltage** 500 V<sub>AC</sub> (50/60 Hz)
- Channels** 4 x Form A  
4 x Form C
- Contact Rating (Resistive)** 0.5 A @ 120 V<sub>AC</sub>  
0.25 A @ 240 V<sub>AC</sub>  
1 A @ 30 V<sub>DC</sub>  
0.3 A @ 110 V<sub>DC</sub>
- Initial Insulation Resistance** 1 GΩ min. at 500 V<sub>DC</sub>
- Relay off Time (Typical)** 4 ms
- Relay on Time (Typical)** 3 ms
- Maximum Operating Speed** 50 operations/min (at related load)

### Specifications

#### General

- Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- Power Consumption** 2.2 W @ 24 V<sub>DC</sub>
- Watchdog Timer** System (1.6 second) & Communication
- Supported Protocols** ASCII command and Modbus/RTU

#### Relay Output

- Breakdown Voltage** 1,000 V<sub>AC</sub> (50/60 Hz)
- Channels** 4 x Form A  
4 x Form C
- Contact Rating (Resistive)** 5 A @ 250 V<sub>AC</sub>  
5 A @ 30 V<sub>DC</sub>
- Initial Insulation Resistance** 1 GΩ min. at 500 V<sub>DC</sub>
- Relay off Time (Typical)** 5.6 ms
- Relay on Time (Typical)** 5 ms
- Maximum Operating Speed** 6 operations/min (at related load)

### Common Specifications

#### General

- Power Input** Unregulated 10 ~ 30 V<sub>DC</sub>

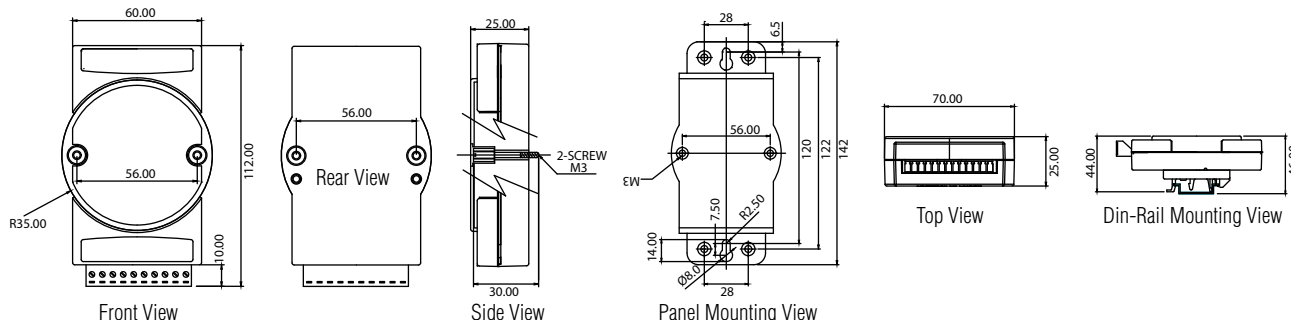
#### Environment

- Operating Humidity** 5 ~ 95% RH
- Operating Temperature** -10 ~ 70°C (14 ~ 158°F)
- Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)

### Ordering Information

- ADAM-4060-DE** 4-ch Relay Output Module
- ADAM-4068-BE** 8-ch Relay Output Module with Modbus
- ADAM-4069-AE** 8-ch Power Relay Output Module with Modbus

### Dimensions



# ADAM-4510/S ADAM-4520 ADAM-4521



RS-422/485 Repeater

Isolated RS-232 to RS-422/485 Converter

Addressable RS-422/485 to RS-232 Converter



ADAM-4510/4510S



ADAM-4520



ADAM-4521



## Specifications

### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG) (RS-422/485)
- **Isolation Voltage** 3,000 V<sub>DC</sub> (ADAM-4510S)
- **Power Consumption** 1.4 W @ 24 V<sub>DC</sub>

### Serial Communications

- **Input** RS-485 (2-wire) or RS-422 (4-wire)
- **Output** RS-485 (2-wire) or RS-422 (4-wire)
- **Speed Modes (bps)** 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)

## Specifications

### General

- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-422/485)  
1 x DB9-F (RS-232)
- **Isolation Voltage** 3,000 V<sub>DC</sub>
- **Power Consumption** 1.2 W @ 24 V<sub>DC</sub>

### Serial Communications

- **Input** RS-232 (DB9)
- **Output** RS-485 (2-wire) or RS-422 (4-wire)
- **Speed Modes (bps)** 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)

## Specifications

### General

- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-422/485)  
1 x DB9-F (RS-232)
- **Isolation Voltage** 1,000 V<sub>DC</sub>
- **Power Consumption** 1.0 W @ 24 V<sub>DC</sub>
- **Built-in microprocessor and watchdog timer**

### Serial Communications

- **Input** RS-485 (2-wire) or RS-422 (4-wire)
- **Output** RS-232 (DB9)
- **Speed Modes (bps)** 300, 600, 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k (software configurable)
- **RS-232 and 485 can be set to different baudrates**
- **RS-485 surge protection and automatic RS-485 data flow control**
- **Software configurable to either addressable or non-addressable mode**

## Common Specifications

### General

- **Power Input** Unregulated 10 ~ 30 V<sub>DC</sub> w/ power reversal protection

### Environment

- **Operating Humidity** 5 ~ 95% RH
- **Operating Temperature** -10 ~ 70°C (14 ~ 158°F)
- **Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)

## Ordering Information

- **ADAM-4510** RS-422/485 Repeater
- **ADAM-4510S** Isolated RS-422/485 Repeater
- **ADAM-4520** Isolated RS-232 to RS-422/485 Converter
- **ADAM-4521** Addressable RS-422/485 to RS-232 Converter

# ADAM-4541 ADAM-4542+ ADAM-4561/4562

**Multi-mode Fiber Optic to RS-232/422/485 Converter**  
**Single-mode Fiber Optic to RS-232/422/485 Converter**  
**1-port Isolated USB to RS-232/422/485 Converter**



ADAM-4541



ADAM-4542+



ADAM-4561/4562



## Specifications

### General

- Power Input** Unregulated 10 ~ 30 V<sub>DC</sub>
- Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-232/422/485)  
2 x ST fiber connector
- Power Consumption** 1.5 W @ 24 V<sub>DC</sub>
- Operation Modes** Support Point-to-Point, and Ring (half-duplex)

### Fiber Optic Communications

- Optical Power Budget (Attenuation)** 15 dB (measured with 62.5/125 μm)
- Transmission Distance** 2.5 km
- Transmission Mode** Multi mode (Send and Receive)
- Wavelength** 820 nm

### Serial Communications

- Communication Mode** Asynchronous
- Speed Modes (bps)** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6k, 115.2 k and RS-232/422 mode (switchable)
- Transmission Mode** Full/half duplex, bidirectional

## Specifications

### General

- Power Input** Unregulated 12 ~ 24 V<sub>DC</sub>
- Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-232/422/485)  
1 x SC fiber connector
- Power Consumption** 3 W @ 24 V<sub>DC</sub>
- Operation Modes** Support Point-to-Point, Redundant and Ring (half-duplex)

### Fiber Optic Communications

- Optical Power Budget (Attenuation)** 15 dB
- Transmission Distance** 15 km
- Transmission Mode** Single mode (Send and Receive)
- Wavelength** 1310 nm

### Serial Communications

- Communication Mode** Asynchronous
- Speed Modes (bps)\*** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, 230.4 k, 460.8 k, 921.6 k and RS-232/422 mode (switchable)
- Transmission Modes** Full/half duplex, bidirectional

\* The highest speed for RS-232 mode is 115.2 kbps

## Common Specifications

### Environment

- Operating Humidity** 5 ~ 95% RH
- Operating Temperature** ADAM-4541/4542+: -10 ~ 70°C (14 ~ 158°F)  
ADAM-4561/4562: -10 ~ 70°C (14 ~ 158°F)
- Storage Temperature** -25 ~ 85°C (-13 ~ 185°F)

## Specifications

### General

- Connectors** Network: USB-type A connector (type A to type B cable provided)  
Serial:  
ADAM-4561 1 x plug-in terminal (#14 ~ 22 AWG) (3-wire RS-232/422/485)  
ADAM-4562 1 x DB-9 serial connectors (9-wire RS-232)
- Isolation Voltage**  
ADAM-4561: 3,000 V<sub>DC</sub>  
ADAM-4562: 2,500 V<sub>DC</sub>
- Power Consumption**  
ADAM-4561: 1.5 W @ 5 V  
ADAM-4562: 1.1 W @ 5 V
- Driver Support**  
ADAM-4561/4562: Windows 2000/XP/Vista/7/8 (32&64-bit)
- USB Specification Compliance**  
ADAM-4561: USB 2.0  
ADAM-4562: USB 2.0

### Serial Communications

- Speed Modes (bps)**  
ADAM-4561: 600 bps to 115.2 kbps  
ADAM-4562: 75 bps to 115.2 kbps
- Transmission Modes** Full/half duplex, bidirectional

## Ordering Information

- ADAM-4541** Multi-mode Fiber to RS-232/422/485 Converter
- ADAM-4542+** Single-mode Fiber to RS-232/422/485 Converter
- ADAM-4561** 1-port Isolated USB to RS-232/422/485 Converter
- ADAM-4562** 1-port Isolated USB to RS-232 Converter

1 Software and Industry Solutions  
2 Industrial Server  
3 Intelligent System  
4 Intelligent HMI and Monitors  
5 Automation Computers and Controllers  
6 Industrial Communication  
7 Remote I/O & Wireless Sensing Modules  
8 Industrial I/O and Video Solutions

# ADAM-4510I ADAM-4520I ADAM-4117



Robust RS-422/485 Repeater

Robust RS-232 to RS-422/485 Converter

Robust 8-ch Analog Input Module with Modbus



ADAM-4510I



ADAM-4520I



ADAM-4117



## Specifications

### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 1.4 W @ 24 V<sub>DC</sub>

### Communications

- **Input** RS-485 (2-wire) or RS-422 (4-wire)
- **Output** RS-485 (2-wire) or RS-422 (4-wire)
- **Speed Modes (bps)** 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)
- **Supports Auto Baud-Rate**
- **Provide RS-485 to RS-422 Convert Ability**

## Specifications

### General

- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-422/485) 1 x DB9-F (RS-232)
- **Power Consumption** 1.2 W @ 24 V<sub>DC</sub>

### Communications

- **Input** RS-232 (DB9)
- **Output** RS-485 (2-wire) or RS-422 (4-wire)
- **Speed Modes (bps)** 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)
- **Supports Auto Baud-Rate**

## Specifications

### General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Watchdog Timer** System (1.6 second) & Communication
- **Supported Protocols** ASCII Command and Modbus/RTU
- **Power Consumption** 1.2 W @ 24 V<sub>DC</sub>
- **Interface (B version)** RS-485, micro USB

### Analog Input

- **Channels** 8 differential and independent configuration channels
- **Input Impedance** Voltage: 800 K $\Omega$  Current: 120  $\Omega$
- **Input Type** mV, V (supports unipolar and bipolar), mA
- **Input Range** 0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V, 0 ~ 15V,  $\pm 150$  mV,  $\pm 500$  mV,  $\pm 1V$ ,  $\pm 5$  V,  $\pm 10$  V,  $\pm 15V$ ,  $\pm 20$  mA, 0 ~ 20 mA, 4 ~ 20mA
- **Accuracy** Voltage mode :  $\pm 0.1\%$  or better Current mode :  $\pm 0.2\%$  or better
- **Resolution** 16-bit
- **Sampling Rate** 10/100 samples/sec (selected by utility)
- **CMR @ 50/60 Hz** 92 dB
- **NMR @ 50/60 Hz** 60 dB
- **Over Voltage Protection**  $\pm 60$  V<sub>DC</sub>
- **High Common Mode** 200 V<sub>DC</sub>
- **Span Drift**  $\pm 25$  ppm/ $^{\circ}$ C (Typical)
- **Zero Drift**  $\pm 6\mu$ V/ $^{\circ}$ C
- **Built-in TVS/ESD Protection**

## Common Specifications

### General

- **Power Input** Unregulated 10 ~ 48 V<sub>DC</sub> w/power reversal protection
- **Isolation Voltage** 3,000 V<sub>DC</sub>

### Environment

- **Operating Humidity** 5 ~ 95% RH
- **Operating Temperature** - 40 ~ 85 $^{\circ}$ C (-40 ~ 185 $^{\circ}$ F)
- **Storage Temperature** - 40 ~ 85 $^{\circ}$ C (-40 ~ 185 $^{\circ}$ F)
- **Supports Noise Rejection**

## Ordering Information

- **ADAM-4510I** Robust RS-422/485 Repeater
- **ADAM-4520I** Robust RS-232 to RS-422/485 Converter
- **ADAM-4117** Robust 8-ch Analog Input Module with Modbus

# ADAM-4118 ADAM-4150 ADAM-4168

Robust 8-ch Thermocouple Input Module with Modbus

Robust 15-ch Digital I/O Module with Modbus

Robust 8-ch Relay Output Module with Modbus



ADAM-4118



ADAM-4150



ADAM-4168



## Specifications

### General

- Power Consumption 0.5W @ 24 V<sub>DC</sub>

### Analog Input

- Channels 8 differential and independent configuration channels
- Input Impedance Voltage: 20 M $\Omega$   
Current: 120  $\Omega$
- Input Type T/C, mV, V, mA
- Input Range Thermocouple

|   |              |   |               |
|---|--------------|---|---------------|
| J | 0 ~ 760°C    | R | 500 ~ 1,750°C |
| K | 0 ~ 1,370°C  | S | 500 ~ 1,750°C |
| T | -100 ~ 400°C | B | 500 ~ 1,800°C |
| E | 0 ~ 1,000°C  |   |               |

- Voltage mode  $\pm 15$  mV,  $\pm 50$  mV,  $\pm 100$  mV,  $\pm 500$  mV,  $\pm 1$  V,  $\pm 2.5$  V
- Current mode  $\pm 20$  mA, 4 ~ 20 mA
- Accuracy Voltage mode:  $\pm 0.1\%$  or better  
Current mode:  $\pm 0.2\%$  or better
- Resolution 16-bit
- Sampling Rate 10/100 samples/sec (selected by Utility)
- CMR @ 50/60 Hz 92 dB
- NMR @ 50/60 Hz 60 dB
- Overvoltage Protection  $\pm 60$  V<sub>DC</sub>
- High Common Mode 200 V<sub>DC</sub>
- Span Drift  $\pm 25$  ppm/°C (Typical)
- Zero Drift  $\pm 6\mu$ V/°C
- Built-in TVS/ESD Protection
- Burnout Detection

## Specifications

### General

- Power Consumption 0.7 W @ 24 V<sub>DC</sub>

### Digital Input

- Channels 7
- Input Level Dry contact: Logic level 0: Close to GND  
Logic level 1: Open  
Wet contact: Logic level 0: 3 V max  
Logic level 1: 10 ~ 30 V  
(Note: The Digital Input Level 0 and 1 status can be inverted)
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Supports 3 kHz Frequency Input
- Supports Invert DI Status
- Over Voltage Protection 40 V<sub>DC</sub>

### Digital Output

- Channels 8, open collector to 40 V (0.8A max. load)
- Power Dissipation 1W load max
- RON Maximum 150 m $\Omega$
- Supports 1 kHz Pulse Output
- Supports High-to-Low Delay Output
- Supports Low-to-High Delay Output

## Specifications

### General

- Power Consumption 1.8 W @ 24 V<sub>DC</sub>

### Relay Output

- Output Channels 8 Form A
- Contact Rating (Resistive) 0.5 A @ 120 V<sub>AC</sub>  
0.25 A @ 240 V<sub>AC</sub>  
1 A @ 30 V<sub>DC</sub>  
0.3 A @ 110 V<sub>DC</sub>
- Breakdown Voltage 750 V<sub>AC</sub> (50/60 Hz)
- Initial Insulation Resistance 1 G  $\Omega$  min. @ 500 V<sub>DC</sub>
- Relay Response Time (Typical) On: 3ms  
Off: 1ms
- Total Switching Time 10 ms
- Supports 100 Hz pulse output
- Maximum Operating Speed 50 operations/min (at related load)

## Common Specifications

### General

- Power Input Unregulated 10 ~ 48 V<sub>DC</sub>
- Watchdog Timer System (1.6 second) & Communication
- Connector 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Isolation Voltage 3,000 V<sub>DC</sub>
- Interface (B version) RS-485, micro USB
- Supported Protocols ASCII Command and Modbus/RTU

### Environment

- Operating Humidity 5 ~ 95% RH
- Operating Temperature -40 ~ 85°C (-40 ~ 185°F)
- Storage Temperature -40 ~ 85°C (-40 ~ 185°F)

## Ordering Information

- ADAM-4118 Robust 8-ch Thermocouple Input Module w/ Modbus
- ADAM-4150 Robust 15-ch Digital I/O Module with Modbus
- ADAM-4168 Robust 8-ch Relay Output Module with Modbus