15 Remote I/O, Wireless I/O and Sensors

Vertrieb durch AMC

AMC – Analytik & Messtechnik GmbH Chemnitz

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

Ethernet I/O Modules: ADAM-6000/6200/6300

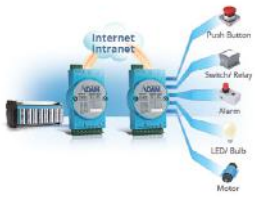
Introduction

Advantech's ADAM-6000/6200/6300 Ethernet I/O modules are easily integrated so they can remotely monitor and control devices more flexibly.

Feature Highlights

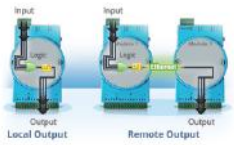
Simple and intuitive logic control

Advantech's ADAM-6000/6200 Peer-to-Peer (P2P) and Graphic Condition Logic (GCL) modules can perform as standalone products for measurement, control, and automation.



Peer-to-Peer(P2P) connection

- Easy channel mapping from different I/O modules without extra programming effort or additional controllers.
- Utilizes Peer-to-Peer modules, just configure settings through ADAM.NET utility.

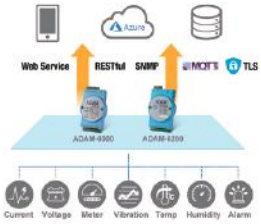


Graphic condition logic (GCL)

- GCL function is built-in ADAM-6000 and ADAM-6200 modules for users to easily set up logic rules in any application.
- User defined logic rules through graphical configuration environment in ADAM.NET utility.
- No additional controllers or programming is needed.

Communication with IoT protocols

The ADAM-6000/6200 series supports multiple protocols for IoT applications: MQTT, SNMP, Restful APIs, and Modbus, which are very flexible and can be easily integrated with Microsoft Azure, Database, Network and SCADA systems.



Cloud

- Supports Azure IoT Hub

MQTT

- Actively publish MQTT messages with user defined intervals.
- Shortens downtime with alarm event notification.
- Privacy assured with the TLS (Transport Layer Security).
- User defined topic to integrate existing systems.

SNMP

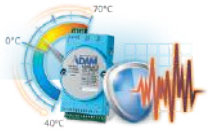
- Simple way to monitor I/O data on NMS (Network Management System).
- SNMP trap to notify alarm events.
- Reduces implementation cost with ADAM MIB (Management Information Base) file.

Communication interface

Flexible deployment with daisy chain networking and auto-bypass protection

ADAM-6200/6300 series supports daisy chain connectivity that offers flexible cabling and space saving capabilities. With Ethernet auto-bypass function supported to prevent accidental power failures if one of the modules unexpectedly shuts down.

Industrial design / isolation & wide-operating temp.



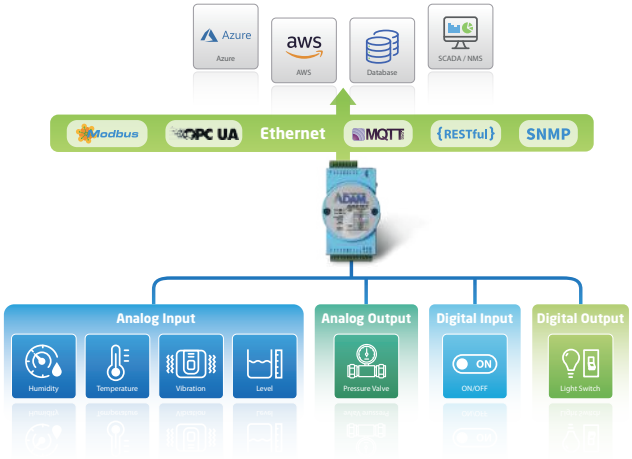
ADAM-6000/6200/6300 series has a rugged design.

- Supports isolation protection to avoid system damage from high-energy noise.
- Supports operating temperatures of between -40 ~70°C and can perform in most harsh environments.

ADAM-6000/6200/6300 Series Comparison

Series Name		ADAM-6000 Series	ADAM-6200 Series	ADAM-6300 Series
Daisy-chain Connectivity		–	✓	✓
Protocols	MQTT	✓	✓	–
	SNMP	✓	✓	–
	Modbus	✓	✓	✓
	RESTful	✓	✓	–
	OPC UA	–	–	✓

Application Structure



Ethernet I/O Modules: ADAM-6000/6200





Model		ADAM-6015	ADAM-6017	ADAM-6018+	ADAM-6022	ADAM-6024
Interface		1x RJ-45 LAN port, 10/100 Mbps Ethernet				
Peer-to-Peer[1]			✓		–	Receiver Only[2]
GCL[1]			✓		–	Receiver Only[2]
Resolution			16 bit		16-bit for analog inputs 12-bit for analog outputs	16-bit for analog inputs 12-bit for analog outputs
Analog Input	Channels	7	8	8	6	6
	Sampling Rate	10 Hz	10/100 Hz	10 Hz	10 Hz	10 Hz
	Voltage Input	–	±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	–	±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 @ 15 V_{DC}	0 ~ 20, 4 ~ 20 mA @ 15 V_{DC}
	Voltage Output	–	–	–	0 ~ 10 V_{DC} @ 30 mA	0 ~ 10 V_{DC} @ 30 mA
Digital I/O	Input Channels	–	–	–	2	2
	Output Channels	-	2 (sink)	8 (sink)	2 (sink)	2 (sink)
	High/Low Alarm Settings	✓	✓	✓	–	–
Isolation Protection			2,000 V_{DC}		2,000 V_{DC}[3]	2,000 V_{DC}[3]
Remark		–	–	–	Built-in dual loop PID control algorithm	–
Protocols		D version :Modbus TCP, RESTful, MQTT, SNMP,ASCII			Modbus TCP	D version: Modbus TCP,RESTful, MQTT, SNMP,ASCII
Certificate		C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	CE, FCC	C1D2, UL, CE, FCC





Model		ADAM-6050	ADAM-6051	ADAM-6052	ADAM-6060	ADAM-6066
Interface		1x RJ-45 LAN port, 10/100 Mbps Ethernet				
Peer-to-Peer[1]		✓	✓	✓	✓	✓
GCL[1]		✓	✓	✓	✓	✓
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_{DC}				
Protocols		D version: Modbus TCP,RESTful, MQTT, SNMP,ASCII				
Certificate		C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

✓: supported, – : not supported, △ : optional

Ethernet I/O Modules: ADAM-6000/6200

Model		ADAM-6217	ADAM-6224	ADAM-6250	ADAM-6251	ADAM-6256	ADAM-6260	ADAM-6266
Interface		2x RJ-45 LAN port (Daisy-chain), 10/100 Mbps Ethernet						
Peer-to-Peer[1]		✓	Receiver Only[2]	✓	✓	✓	✓	✓
GCL[1]		✓	✓	✓	✓	✓	✓	✓
Analog Input	Channels	8	–	–	–	–	–	–
	Input Impedance	>10MΩ (voltage) 120Ω (current)	–	–	–	–	–	–
	Voltage Input	±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 Input	0 ~ 20, 4 ~ 20, ±20 mA	–	–	–	–	–	–
	Sampling Rate	10 Hz	–	–	–	–	–	–
	Burnout Detection	✓ (4 ~ 20 mA)	–	–	–	–	–	–
	Resolution	16-bit	–	–	–	–	–	–
	Accuracy	±0.1% of FSR (voltage) @ 25°C ±0.2% of FSR (current) @ 25°C	–	–	–	–	–	–
Analog Output	Channels	–	4	–	–	–	–	–
	Voltage Output	–	0 ~ 5, 0 ~ 10, ±5, ±10 V	–	–	–	–	–
	Current Output	–	0 ~ 20, 4 ~ 20 mA	–	–	–	–	–
	Resolution	–	12-bit	–	–	–	–	–
Digital I/O	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_{AC} @ 5A 30 V_{DC} @ 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	–	–	8 digital outputs, 7 digital inputs	16 digital inputs	16 digital outputs	6 relay	4 digital inputs, 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_{DC}						
Watchdog Timer		System (1.6 s) Communication (programmable)						
Communication Protocol		Modbus TCP, RESTful, MQTT, SNMP, ASCII						
Power Requirements		10 ~ 30 V_{DC} (24 V_{DC} standard)						
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)						
Certification		CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL	CE, FCC, UL

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.
✓: supported, – : not supported, △ : optional

OPC UA Ethernet I/O Modules: ADAM-6300

Model		ADAM-6317	ADAM-6350	ADAM-6360D	ADAM-6366	ADAM-6315	ADAM-6318	ADAM-6324
Description		IoT OPC UA Ethernet I/O - Analog Input Module	IoT OPC UA Ethernet I/O - Digital I/O Module	IoT OPC UA Ethernet I/O - SSR Relay Output Module	IoT OPC UA Ethernet I/O - Relay Output Module	IoT OPC UA Ethernet I/O - RTD Input Module	IoT OPC UA Ethernet I/O - T/C Input Module	IoT OPC UA Ethernet I/O - Analog Output Module
General	Power Input	10 ~ 30 V_{DC}						
	LAN Port	2 x RJ-45 10/100 Mbps						
	Connectors	2 x RJ-45 (LAN), Plug-in screw terminal block (I/O and power)						
	Watchdog	System and Communication						
	Protocol	OPC UA, Modbus/TCP						
Protection	Isolation	2500 V_{DC}						
	Power Reversal Protection	Yes						
OPC UA	Max Monitored Items	600 (including all sessions)						
	Max Sessions	4 (including security or non-security session)						
	Max Subscriptions per Session	1						
	Support security/ certificate management	Yes						
Modbus/TCP Connections		4						
Environment	Operating Temperature	-25° C ~ 70° C (-13 ~ 158°F)						
LED Indicator		Status, Error, Link, Active						
Analog Input	Channels	8	–	–	–	8	7	–
	Voltage Input	0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V, ±150 mV, ±500 mV, ±1V, ±5 V, ±10 V,	–	–	–	RTD: Pt 100, Pt 1000, Balco 500, Ni 518	Thermocouple: J, K, T, E, R, S, B	–
	Current Input	0 ~ 20 mA, 4 ~ 20mA, ± 20mA	–	–	–	–	–	–
	Sampling Rate	10/100 Hz (total)	–	–	–	10 Hz (total)	10 Hz (total)	–
	Burn-out Detection	Yes (4~20 mA)	–	–	–	Yes	Yes	–
	Resolution	16-bit	–	–	–	16-bit	16-bit	–
Digital Input	Digital Input Channels	11	18	14	18	10	10	11
	Counter Input	3 kHz (DI5~DI10)	3 kHz (DI12~DI17)	3 kHz (DI8~DI13)	3 kHz (DI12~DI17)	3 kHz (DI4~DI9)	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)
	Frequency Input	3 kHz (DI5~DI10)	3 kHz (DI12~DI17)	3 kHz (DI8~DI13)	3 kHz (DI12~DI17)	3 kHz (DI4~DI9)	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)
Digital Output	Digital Output Channels	10	18	6	6	10	13	12
	Relay Output Channels	–	–	8 SSR (Form A)	6 (Form A)	–	–	–
	Contact Rating	–	–	1 A @25°C @ 30 V_{DC} 0.7A @70°C @30 V_{DC}	0.25A@ 25°C @ 250V_{AC} 2A@ 25°C@ 30V_{DC}	–	–	–
	Pulse Output	3 kHz (DO4~DO9)	3 kHz (DO12~DO17)	3 kHz (DO0~DO5)	3 kHz (DO0~DO5)	3 kHz (DO4~DO9)	3 kHz (DO7~DO12)	3 kHz (DO6~DO11)
Analog Output	Channels	–	–	–	–	–	–	4
	Type	–	–	–	–	–	–	0 ~ 5 V, 0 ~ 10 V, ± 5 V, ± 10 V, 0 ~ 20 mA, 4 ~ 20 mA

✓: supported, – : not supported, △ : optional

RS-485 I/O Modules: ADAM-4000/4100

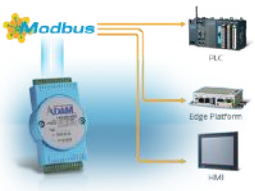
Introduction

The ADAM-4000/ 4100 series feature rugged industrial-grade cases which are specially designed for reliable operation in harsh environments. Built-in microprocessors independently provide intelligent signal conditioning, analog I/O, digital I/O, data display, and RS-485 communication through Modbus protocols.

Feature Highlights

The most used protocol for industrial automation development

The new ADAM-4000/ 4100 modules feature Modbus/RTU remote data transmission protocol.



Standardized protocol

- One of the most widely used standard communication protocols for eAutomation development

Centralized control

- Universal remote I/O modules operate the system via Modbus

Easy integration

- We provide sample code and commands for user programming

Non-stop monitoring with watchdog timer and protection

For stable and constant performance, ADAM-4000/ 4100 features a Watchdog Timer and maximum protection to ensure the highest level of system reliability.

Noise protection

- Data accuracy assured by enhanced ESD / EFT / Surge Protection

Module stability ensured

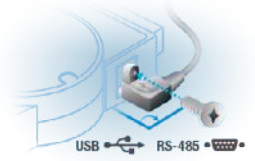
- Once a problem is detected, the Watchdog Timer automatically recovers the system

Save on maintenance costs

- The Watchdog Timer enhances system stability and reduces maintenance costs

Various interfaces to meet your needs

Integration with embedded systems or PLC systems via USB or RS-485



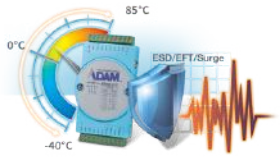
Friendly L-shaped cable design*

- Optional 90 degree input micro USB to a Type-A USB cable with locking mechanism.

Micro USB interface*

- New ADAM-4100 series can be powered and transmit data via micro USB interface

Robust design for industrial IoT applications

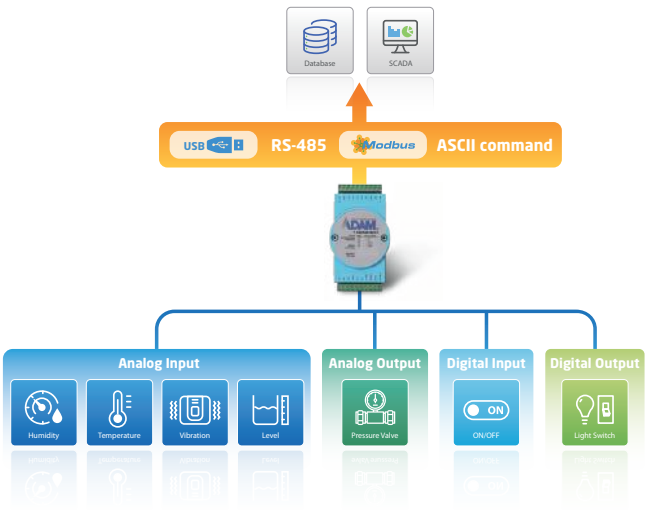


- Level-4 ESD/EFT/ surge & isolation protection
- Wide operating temperature support, up to -40°C ~ +85°C
- Wide power input range, up to 10 ~ 48 V_{DC}

ADAM-4000/4100 Series Comparison

Series Name		ADAM-4000 Series	ADAM-4100 Series
Operation Temperature		-10 ~ 70°C	-40 ~ 85°C
Power Input		10 ~ 30V_{DC}	10 ~ 48V_{DC}
ESD		8KV Air, 4KV contact	8KV Air, 6KV contact
EFT		2KV	4KV
Surge		0.5KV	4KV
Communication Interface	RS-485	✓	✓
	USB	–	✓

Application Structure



RS-485 I/O Modules: ADAM-4000/4100

Analog Input





Model		ADAM-4015	ADAM-4017	ADAM-4017+	ADAM-4018+	ADAM-4019+
Resolution		16 bit				
Analog Input	Channels	6 differential	8 differential	8 differential	8 differential	8 differential
	Sampling Rate	10 Hz			10 Hz	10 Hz
	Voltage Input	–	0 ~ 150 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 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, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V	–	0 ~ 100 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V, ±100 mV, ±500 mV, ±1 V, ±5 V, ±10 V
	Current Input	–	0 ~ 20, ±20 mA	0 ~ 20, 4 ~ 20, ±20 mA	4 ~ 20, ±20 mA	0 ~ 20, 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_{DC}				
Watchdog Timer		✓ (system and comm.)	–	✓ (system and comm.)	✓ (system and comm.)	✓ (system and comm.)
Modbus Support *		✓	–	✓	✓	✓
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

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

Analog Output


Model		ADAM-4021	ADAM-4024
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
	Output Channels	–	–
	Alarm Settings	–	✓
Isolation Voltage		3,000 V_{DC}	3,000 V_{DC}
Digital LED Indicator		–	–
Watchdog Timer		✓ (system)	✓ (system and comm.)
Safety Setting		–	✓
Modbus Support *		supported after F version	✓
Certification		UL, CE, FCC	UL, CE, FCC

Digital Input/Output



Model	ADAM-4050	ADAM-4051	ADAM-4052
Resolution	–	–	–
Channels	–	–	–
Voltage Output	–	–	–
Current Output	–	–	–
Input Channels	7	16	8
Output Channels	8	–	–
Alarm Settings	–	–	–
Isolation Voltage	–	2,500 V_{DC}	5,000 V_{RMS}
Digital LED Indicator	–	Yes	-
Watchdog Timer	✓ (system)	✓ (system and comm.)	✓ (system)
Safety Setting	–	–	–
Modbus Support *	supported after E version	✓	–
Certification	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

*All ADAM-4000 I/O modules support ASCII commands
✓: supported, – : not supported, △ : optional

RS-485 I/O Modules: ADAM-4000/4100

Digital Input/Output

Relay Output

Counter







Model		ADAM-4053	ADAM-4055	ADAM-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_{DC}	5,000 V_{DC}	–	–	–	2,500 V_{RMS}
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 after E version	✓	✓	supported after E version	✓	✓	supported in E version
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

***All ADAM-4000 I/O modules support ASCII commands**
✓: supported, – : not supported, △ : optional

RS-485 I/O Modules: ADAM-4000/4100





Model		ADAM-4115	ADAM-4117	ADAM-4118	ADAM-4150	ADAM-4168
Resolution		16 bits	16 bits		–	–
Analog Input	Channels	6	8 differential		–	–
	Sampling Rate	10/100 Hz (Total)	10/100 Hz (total)		–	–
	Voltage Input	-	0 ~ 150 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 15 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±15V	0 ~ 15 mV, 0~ 50 mV, 0 ~ 100 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 2.5 V, ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	–	–
	Current Input		0 ~ 20, 4 ~ 20, ±20 mA	0 ~ 20, 4 ~ 20, ±20 mA	–	–
	Direct Sensor Input	Pt100,Pt1000,Ni 50, Ni 508	-	J, K, T, E, R, S, B 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_{DC}				
Digital LED Indicator		Communication and power				
Watchdog Timer		Yes (system & communication)				
Safety Setting		✓	–	–	✓	✓
Communication Protocol		ASCII command/Modbus				
Power Requirements		10 ~ 48 V_{DC}				
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_{DC}	1.2 W @ 24 V_{DC}	0.5 W @ 24 V_{DC}	0.7 W @ 24 V_{DC}	1.8 W @ 24 V_{DC}
Communication Interface		RS-485, Micro USB				
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

✓: supported, – : not supported, △ : optional

Wireless I/O & Sensors

Overview

Designed to be a complete IoT sensing solution, the WISE-4000 series goes beyond merely providing wireless communication for sensors—it also provides cloud connectivity for additional user applications. With support for IoT protocols such as MQTT, the WISE-4000 series can communicate with cloud services or other web services via secure web sockets. For wide area communication, WISE-4000 I/O modules and sensor nodes have been designed with LPWAN, LoRa, NB-IoT/LTE-M, 4G/LTE, and IP65-rated features, making them highly suitable for many kinds of industrial application. WISE-2000 sensor devices are all-in-one devices designed for specific applications and domain focused scenarios.

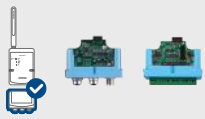
IoT wireless I/O module and sensor node with modularized high adaptability design

Low Power Wide Area Networks (LPWAN) are created for Machine-to-Machine (M2M) and Internet of Things (IoT) networks. They are not a single technology, but rather a variety of low-power, wide area network technologies. Compared with a traditional mobile network, LPWANs are known for offering low power efficiency and longer range transmission. To shorten the gap between field site data and the cloud, WISE-4000 series provides wireless I/O and sensor modules that can get and pass data directly to the cloud by utilizing a variety wireless communication technologies.

For more domain focussed applications, WISE-2000 series offers a wireless and sensing all-in-one solution to simplify and accelerate the implementation of IoT applications. Industrial BB-WSx wireless edge sensor starter kits and nodes create a low power, dynamic and scalable mesh network that does not disrupt existing networks. Starter kits provide Node-RED dashboards and Advantech WISE-PaaS cloud connectivity.

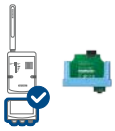
LoRaWAN I/O Modules

LoRaWAN

Category	Industrial LoRa/LoRaWAN Wireless Module			Industrial LoRa/LoRaWAN Wireless Module			Industrial LoRa/LoRaWAN Wireless Module
Model	WISE-4610P-NA	WISE-4610P-EA	WISE-4610P-JA	WISE-4610-NA	WISE-4610-EA	WISE-4610-JA	WISE-2200-MNA WISE-2200-MEA
Frequency Range	US 902~923 MHz	EU 863~870 MHz	AS 923~923.5 MHz	US 902~923 MHz	EU 863~870 MHz	AS 923~923.5 MHz	EU 863-870 (MHz) / RU 864-870 (MHz) US 902-928 (MHz) / AU 915-928 (MHz) AS 919-924 (MHz) / TH 920-925 (MHz) JP 920-928 (MHz)
Function	Wireless board			Wireless board			Wireless board
Positioning	GPS/Galileo/BeiDou/GLONASS			–			–
Power Input	4100 mAh Lithium rechargeable battery			–			–
	10~50V$_{DC}$ external power			10~50V$_{DC}$ external power			5-50V$_{DC}$
	17~21V$_{DC}$ solar panel			17~21V$_{DC}$ solar panel			–
Configuration Interface	Micro-B USB			Micro-B USB			Micro-B USB
I/O Module							–
Model	WISE-S614-A	WISE-S614T-A	WISE-S615-A	WISE-S615T-A	WISE-S617-A	WISE-S617T-A	WISE-S672-A	WISE-S600 / WISE-S600T	WISE-S100-A	–
Spec	4AI&4DI (M12)	4AI&4DI (terminal block)	4RTD (M12)	4RTD (terminal block)	2AI, 2DI, 1 DO & 1 RS-485 with 12V power output (M12)	2AI, 2DI, 1 DO & 1 RS-485 with 12V power output (M12)	6DI, 1 RS-485 & 1 RS-485/ 232	Customization upon request *MOQ required	Stack light monitoring sensor	1 RS-485
WISE-4610 Optional	1654011516-01 M12, A-code, 8-pin, male 1655005903-01 M12, A-code, 4-pin, female 1700028162-01 M12, A-code, 4-pin, female with 1m cable 1700028163-01 M12, A-code, 8-pin, male with 1m cable									–

WiFi I/O Modules

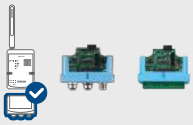
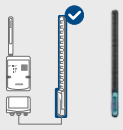
Wi-Fi

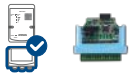
Category	WiFi 2.4G Wireless Module					Built-in Temperature & Humidity Sensor*	Dual-band WiFi 2.4G/5G Wireless Module			Built-in Temperature & Humidity Sensor*
Model	WISE-4220-A					WISE-4220-S231A	WISE-4250AS-A			WISE-4250AS-S231-A
Standard	802.11 b/g/n						802.11 a/b/g/n			
Frequency	2.4GHz						2.4GHz/5GHz			
Function	Wireless board						Wireless board			
Power Input	10~50V$_{DC}$ external power						10~50V$_{DC}$ external power			
Configuration Interface	Micro-B USB						Micro-B USB			
Outdoor Range (LOS)	100m						–			
I/O Module						*Modularization does not effect WISE-4220-S231 series				*Modularization does not effect WISE-4250AS-S231 series
Model	WISE-S214-A	WISE-S250-A	WISE-S251-A	WISE-S200-A	WISE-S100-A		WISE-S214-A	WISE-S250-A	WISE-S251-A	
Spec	4AI&4DI	6DI, 2DO&1RS-485	6DI &1RS-485	Stack light monitoring sensor	Customization upon request *MOQ required		4AI&4DI	6DI, 2DO & 1RS-485	6DI & 1RS-485	

✓: supported, – : not supported, △ : optional

Wireless I/O & Sensors

NB-IoT/LTE-M I/O Modules

Category	Advanced Industrial Cat.NB1/Cat.M1 Wireless Module								
Model	☞ WISE-4671-UA								
Standard	3GPP release13								
Band	B2,3,4,5,8,12,13,20,28								
SIM Type	Nano SIM/4FF								
Function	Wireless board								
Positioning	GPS/Galileo/BeiDou/GLONASS								
Power Input	4100 mAh Lithium Rechargeable Battery 10~50V_{DC} External Power 17~21 V_{DC} Solar Panel								
Configuration Interface	Micro-B USB								
I/O Module									
Model	WISE-S614-A	WISE-S614T-A	WISE-S615-A	WISE-S615T-A	WISE-S617-A	WISE-S617T-A	WISE-S672-A	WISE-S600/ WISE-S600T	WISE-S100-A
Spec	4AI & 4DI (M12)	4AI & 4DI (Terminal Block)	4RTD (M12)	4RTD (Terminal Block)	2AI,2DI, 1DO & 1RS-485 (M12)	2AI,2DI, 1DO & 1RS-485 (Terminal Block)	6DI, 1RS-485 & 1RS-485/232	Upon Customization Request *MOQ required	Stack Light Monitoring Sensor
WISE-4671 Optional	1654011516-01 M12, A-code, 8-pin, male 1655005903-01 M12, A-code, 4-pin, female 1700028162-01 M12, A-code, 4-pin, female with 1m cable 1700028163-01 M12, A-code, 8-pin, male with 1m cable								

Category	Industrial Cat.NB1/Cat.M1 Wireless Module					
Model	☞ WISE-4471-UA					
Standard	3GPP release 13					
Band	B2,3,4,5,8,12,13,20,28					
SIM Type	Micro SIM/3FF					
Function	Wireless board					
Power Input	10~50V_{DC} external power					
Configuration Interface	Micro-B USB					
I/O Module						
Model	WISE-S214-A	WISE-S250-A	WISE-S251-A	WISE-S472-A	WISE-S200-A	WISE-S100-A
Spec	4AI & 4DI	6DI, 2DO & 1RS-485	6DI &1RS-485	1DI, 1RS-485 & 1RS-485 or 1RS-232	Customization upon request *MOQ required	Stack light monitoring sensor

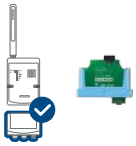
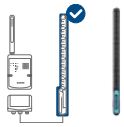
✓: supported, – : not supported, △ : optional

Proprietary LPWAN I/O Modules

SUB-G LPWAN Proprietary




Category	Proprietary LPWAN(SUB-G) Wireless Module		Proprietary LPWAN(SUB-G) Built-in Temperature & Humidity Sensor*	Propriety LPWAN (SUB-G) Wireless CT Node	Propriety LPWAN (SUB-G) Wireless Analog Input Modules
Function	AP	Node/Wireless Board	Sensor Node	Self-Powered Node	
Model	☞ WISE-4210AP-NA	☞ WISE-4210-NA	☞ WISE-4210-S231NA	☞ WISE-2210-NA	☞ WISE-2211-NA
Frequency	868MHz/ 923MHz	868MHz/ 923MHz	868MHz/ 923MHz	868MHz/ 923MHz	868MHz/ 923MHz
Standard	IEEE 802.15.4g FSK/GFSK modulation				
Data Rate	625 bps, 2.5k bps, 5k bps, 50k bps	625 bps, 50k bps		625 bps, 2.5k bps, 5k bps, 50k bps	
Power Input	10~50V_{DC} external power			Self powered	
Configuration Interface	Micro-B USB				
Network Capacity	64 clients				
Outdoor Range (LOS)	5KM@625bps				

I/O Module					
					
Model	WISE-S214-A	WISE-S250-A	WISE-S251-A	WISE-S200-A	WISE-S100-A
Spec	4AI&4DI	6DI, 2DO & 1RS-485	6DI &1RS-485	Customization upon request *MOQ required	Stack light monitoring sensor

*Modularization doesn't effect WISE-4210-S231 and WISE-221x series

** WISE-S250 does not support power saving mode
✓: supported, – : not supported, △ : optional

Wireless I/O & Sensors

LoRaWAN Smart Vibration Sensor

Category		LoRaWAN Smart Vibration Sensor	Explosion Proof LoRaWAN Smart Vibration Sensor
Model		WISE-2410-NB WISE-2410-EB	WISE-2410X-E21NA WISE-2410X-A02NA WISE-2410X-A02EA
Wireless Communication	Topology	Star (LoRaWAN)	
	Frequency Band	EU 863-870 (MHz) / RU 864-870 (MHz) US 902-928 (MHz) / AU 915-928 (MHz) AS 919-924 (MHz) / TH 920-925 (MHz) JP 920-928 (MHz)	
	Spreading Factor	7~12	
	Transmit Power	Up to +18dBm	
	Data Rate	50 kbps at FSK mode EU868;21.9 kbps at SF7 mode US915;5.47 kbps at SF7 mode JP923	
Vibration Sensor	Axis	X-Y-Z	
	Frequency Range	10~1000Hz	
	Amplitude Range	±2/4/8/16g	
	Output Data Rate	6600Hz	
	Noise (MAX. TA = 25°C. 0g)	±40mg	
Temperature Sensor	Operating Range	-20°C ~ 85°C (USB powered); -20°C ~ 70°C (Battery powered)	-20°C ~ 85°C (USB powered); 0°C ~ 70°C (Battery powered)
	Resolution	12 bit	
	Accuracy	±2.0°C (±35.6°F) (vertical installation)	
Mechanical	Enclosure	IP66	IP65
	Mounting	Mounting stud; curved surface magnet; adhesives	
	Dimension (L x W x H)	42 x 40.2 x 84.7 mm	42 x 63.5 x 84.7 mm
General	Power Input	3.6V AA battery *2pcs (not included)	WISE-2410X-E21NA: 3.6V AA battery *1pcs (not included) WISE-2410X-A02NA/WISE-2410X-A02EA: 3.6V AA battery *2pcs (not included)
	Configuration Interface	Micro-B USB	
	Temperature (Operating)	-20°C ~ 85°C (USB powered); -20°C ~ 70°C (Battery powered)	-20°C ~ 85°C (USB powered); 0°C ~ 70°C (Battery powered)
	Temperature (Storage)	-25°C ~ 90°C	
	Humidity (Operating)	10% ~ 95% RH	
	Humidity (Storage)	5% ~ 95% RH	

✓: supported, – : not supported, △ : optional

Intelligent RFID Gateway

Model		WISE-2834-CA
Wireless Communication	RFID Standard	EPC Global Class 1 Gen. 2 (ISO18000-6C)
	Frequency Band	US 902.75MHz - 927.25MHz; EU 865.7MHz - 867.5MHz; TW 922.25MHz - 927.75MHz
	Transmit Power	Available to adjust from +10dBm ~ +31.5dBm
	Receiver Sensitivity	-82dBm
	Antenna Connector	4 RP-TNC
General	Chipset	ARM Cotex-A8, 300MHz for system; ARM Cortex-M0 32-Bit 32MHz for I/O
	Memory	512MB DDR3L
	Storage	NAND Flash 512MB
	OS Support	Linux 3.12
	LED Indicators	Status, Serial (Tx, Rx), Wi-Fi communication, RFID channel on/off, Wi-Fi signal strength
	Power Input	10V ~ 30V DC; Power Consumption: 3W (TYP.), 15W (Max.)
	Slot	1 x Micro SD card
	USB	1 x USB2.0 High Speed (Up to 480Mbps)
	Communication Speed	1 x 10/100 Based-T RJ-45; 1 x RS-485: 50 ~ 115.2 kbps
	Digital Input	4 dry/wet contact
	Digital Output	4 sink type
	Configuration Tool	WISE studio
	Dimensions (L x W x H)	190mm x 120mm x 30.2mm
Mechanical	Mounting	DIN 35 rail, wall, pole
Operating System	Temperature (Operating)	-25°C ~ 50°C
	Temperature (Storage)	20% ~ 95% RH
	Humidity (Operating)	-40°C ~ 85°C
	Humidity (Storage)	0% ~ 95% RH

Wireless IoT Sensing Devices: Wzzard™ Mesh Sensor Nodes – for Industrial Application Sensors

BB-WSD2x industrial series

Model	☞ BB-WSD2C21150	☞ BB-WSD2C06010	☞ BB-WSD2C31010	☞ BB-WSD2M06010	☞ BB-WSD2M31010	☞ BB-WSD2M3101P2K	☞ BB-WSD2M3101R100
Description	Industrial cooler, HVAC node	Industrial digital input node	Industrial power monitor node	Industrial digital input node	Industrial power monitor node	Industrial power monitor node	Industrial power monitor node
Wireless Technology	Low power 802.15.4e, SmartMesh IP (to SmartSwarn 342 gateway) via MQTT protocol						
Connector	Conduit (UL Type 3 outdoor approved) 12.7mm (0.5 in)	Conduit (UL Type 3 outdoor approved) 12.7mm (0.5 in)	Conduit (UL Type 3 outdoor approved) 12.7mm (0.5 in)	M12	M12	M12	M12
Includes	2 AI, 1 DI, 1 DO, 2 Thermocouples, 2 Thermistors, internal temperature, antenna, cable	6 DI, internal temperature, antenna, cable	3 AI, 1 DI, internal temperature, antenna, cable	6 DI, internal temperature, antenna, cable	3 AI, 1 DI, internal temperature, antenna, cable	2 AI, Vbat measurement, 1 DI, internal temperature, Switched Vbat Power Out (2 sec.), antenna, cable	12 AI, Vref measurement, 1 DI, internal temperature, Switched 3.3V Power Out (100 ms), antenna, cable
External Antenna (included)	RP-SMA, Omni-directional, 3.8 dBi, 2.4 GHz						
Power	Internal Power: (2) 3.6V 2400 mAH Lithium Thionyl Chloride AA Batteries Battery Life: >5 years – based on 1 min. sensor sampling and reporting external input voltage: 10-30 V_{DC} @ 40mA peak						
Sensor Power Out	Switched Vbat: Battery Power – Turned on at time of measurement (20 mA max.) Switched Vref: 3.3V (± 0.1%) – Turned on at time of measurement (20 mA max.)						
Sensors	Analog Input (0 -10 VDC, 0 - 20 mA, 4 - 20 mA) Digital Input (0 - 48 V_{DC}) Digital Input Frequency 1-1K Hz (accuracy ± 1 Hz) Digital input counter integrated temperature Thermocouple (J, K, N, R, S, T, B, E) Digital output, sinking, up to 100mA @ 30V_{DC}						
Wireless Security	Device authentication, 128-bit, AES-based wncryption with multiple keys, message integrity check (MIC), synchronized key changeovers, customized key rotation						
Temperature	-40 to +80 °C (operating)						
Enclosure	IP67 rated fiber reinforced polyester PBT						
Mounting Option	(4) Mounting ears, M5 (#10) screws (UL approved option)						
Mounting Option	Magnetic Mounting (via internal enclosure magnet) Pull Force 2.13 kg (4.7 lb) Note: Magnetic mounting models not rated for UL installations.						
Certifications	UL C1/D2, CE, FCC, EN62479 (lower power), shock, vibration	UL C1/D2, CE, FCC, EN62479 (lower power), shock, vibration	UL C1/D2, CE, FCC, EN62479 (lower power), shock, vibration	CE, FCC, EN62479 (lower power), shock, vibration	CE, FCC, EN62479 (lower power), shock, vibration	CE, FCC, EN62479 (lower power), shock, vibration	CE, FCC, EN62479 (lower power), shock, vibration
UL Listed C1/D2 Conditions	Yes. Indoor / Outdoor, w/ mounting ear installation	(pending)	Yes. Indoor / Outdoor, w/ mounting ear installation	No (M12 connector not UL)	No (M12 connector not UL)	No (M12 connector not UL)	No (M12 connector not UL)
	WIDE	WIDE	WIDE	WIDE	WIDE	WIDE	WIDE

ADVANTECH iAutomation Premier Partner

Wireless IoT Sensing Devices: Wzzard™ Mesh Starter Kits – for Industrial & Commercial Applications

BB-WSK-xxx-2 kit series




Model	BB-WSK-CBM-2	BB-WSK-HAC-2	BB-WSK-REF-2	BB-WSK-NRG-2
Description	Condition-based monitoring starter kit	Energy starter kit	Refrigeration monitoring starter kit	HVAC/Compressor / fan monitoring starter kit
Product Sensor & Format	Industrial low-power wireless sensing – temperature, vibration	Industrial low-power wireless sensing – current, differential temperature	Commercial low-power wireless sensing – temperature, humidity, current, door	Industrial low-power wireless sensing – current
Contents - Bundled Kits Include:	Wzzard Node, sensors & cables, gateway with cloud license and Node-RED starter flow with web server			

NOTE: Starter kits include everything to get started.

Wireless IoT Sensing Devices: Wzzard™ Mesh Sensor Nodes – for Commercial Application Sensors

BB-BB-WCD1Hx commercial series


Model	☞ BB-WCD1H2102H	☞ BB-WCD1H3001HP100
Description	HVAC/cooler node for temperature & humidity sensing	AI, vBAT Out temperatue & humidity sensing node
Wireless Technology	Low power 802.15.4e, 2.4GHz SmartMesh IP (to SmartSwarn 342 gateway) via MQTT protocol	
Physical Connector	Molex 6-pin MicroClasp	
Sensors (industry standard type)	(2) Analog Inputs (1) DI (1) Thermistor	(3) AI
Integrated Sensors (within node)	(1) Temperature (1) Humidity	(1) Temperature (1) Humidity
Antenna	Internal, included.	
Power	Internal: 3.6V 1650 mAH Lithium Thionyl Chloride 2/3 AA battery. Battery Life: 5-year battery life, based on 1 minute sensor sampling interval	
Power Backup	–	vBat Out operating mode
LED Indication	Network Connectivity, Node Status	
Wireless Security	Device authentication, 128-bit, AES-based wncryption with multiple keys, Message Integrity Check (MIC), Synchronized key changeovers, Customized key rotation	
Installation	Indoor	
Operating Temperature	-20 to +70 °C (-4 to +158 °F)	
Mounting	Mounting bracket (included) VHB adhesive strip (included) Zip tie (ties not included)	
Certifications	UL C1/D2, CE, FCC, Industry Canada (RSS210), shock, vibration, drop	
UL Listed C1/D2 Conditions	UL C1/D2 rating is voided when using non UL-specified batteries. Do not mix old and new batteries	

✓: supported, –: not supported, △: optional