16 Remote I/O, Wireless I/O & Sensors

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

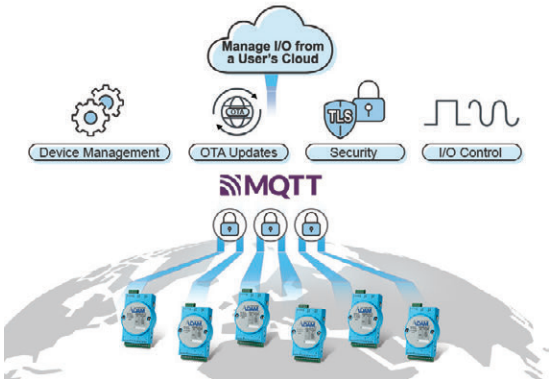
Introduction

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

Secured Cloud I/O

Innovative ADAM-6000/6200 Secured Cloud I/O offers device management, OTA updates, security and device monitoring functions in IoT era and help user easily manage widespread assets across diverse applications



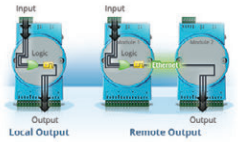
- **Device Management:** UUID, networking setting, I/O channel configuration
- **OTA Updates:** firmware, certificate and configuration mass deployment
- **Security:** TLS, X.509 certificate, cipher suites, IP whitelisting, protocol disabled
- **I/O Control:** digital I/O on/off, analog I/O read/write, I/O value periodically updated, alarm notificatio

Simple and Intuitive Logic Control

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.

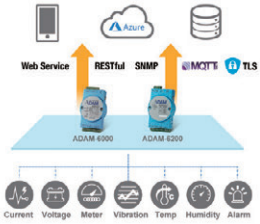
Easy Deployment and Robust Communication

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.

Rich 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

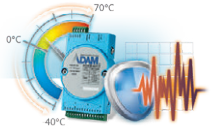
MQTT

- 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.

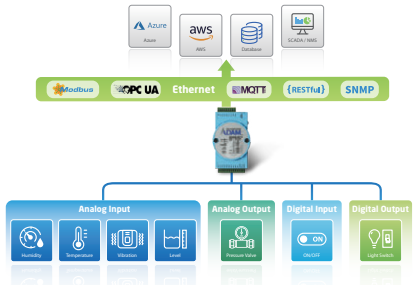
Industrial Grade with Isolation & Wide-operating Temperature



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.

Application Structure



ADAM-6000/6200/6300 Series Comparison

Series Name		ADAM-6000 Series	ADAM-6200 Series	ADAM-6300 Series
Daisy-chain Connectivity		–	✓	✓
Protocol	MQTT	✓	✓	–
	SNMP	✓	✓	–
	Modbus	✓	✓	✓
	RESTful	✓	✓	–
	OPC UA	–	–	✓
	Cloud I/O	✓	✓	(By request)

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 mA, 4~20 mA, ±20 mA	–	0~20 mA, 4~20 mA	0~20 mA, 4~20 mA
	Direct Sensor Input	Pt, Balco, and Ni RTD	–	J, K, T, E, R, S, B thermocouple	–	–
	Burn-out 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}	2,000 V_{DC}
Remark		–	–	–	Built-in dual loop PID control algorithm	–
Protocol		D version: Modbus TCP, RESTful, MQTT, SNMP, ASCII			Modbus TCP	D version: Modbus TCP, RESTful, MQTT, SNMP, ASCII
Certification		CID2, UL, CE, FCC	CID2, UL, CE, FCC	UL, CE, FCC	CE, FCC	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}				
Protocol		D version: Modbus TCP, RESTful, MQTT, SNMP, ASCII				
Certification		CID2, UL, CE, FCC	UL, CE, FCC	CID2, 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	–	–	–	–	–	–
	Current Input	0~20 mA, 4~20 mA ±20 mA	–	–	–	–	–	–
	Sampling Rate	10 Hz	–	–	–	–	–	–
	Burn-out 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 V, 0~10 V, ±5 V, ±10 V	–	–	–	–	–
	Current Output	–	0~20 mA, 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	–	–	–	–	–	1 x Form A, 5 x Form C	4 x 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 Indicators	–	–	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		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

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-6315	ADAM-6317	ADAM-6318	ADAM-6324	ADAM-6350	ADAM-6360D	ADAM-6366
Description		IoT OPC UA Ethernet I/O - RTD Input Module	IoT OPC UA Ethernet I/O - Analog Input Module	IoT OPC UA Ethernet I/O - T/C Input Module	IoT OPC UA Ethernet I/O - Analog Output 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
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	✓						
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	✓						
Modbus TCP Connections		4						
Environment	Operating Temperature	-25° ~ 70°C (-13 ~ 158°F)						
LED Indicator		Status, Error, Link, Active						
Analog Input	Channels	8	8	7	–	–	–	–
	Voltage Input	RTD: Pt 100, Pt 1000, Balco 500, Ni 518	0~150mV, 0~500mV, 0~1V, 0~5V, 0~10V, ±150 mV, ±500 mV, ±1V, ±5 V, ±10 V	Thermocouple: J, K, T, E, R, S, B	–	–	–	–
	Current Input	–	0 ~ 20 mA, 4 ~ 20 mA, ± 20 mA	–	–	–	–	–
	Sampling Rate	10 Hz (total)	10/100 Hz (total)	10 Hz (total)	–	–	–	–
	Burn-out Detection	✓	✓ (4~20 mA)	✓	–	–	–	–
	Resolution	16-bit	16-bit	16-bit	–	–	–	–
Digital Input	Digital Input Channels	10	11	10	11	18	14	18
	Counter Input	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)	3 kHz (DI12~DI17)	3 kHz (DI8~DI13)	3 kHz (DI12~DI17)
	Frequency Input	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)	3 kHz (DI4~DI9)	3 kHz (DI5~DI10)	3 kHz (DI12~DI17)	3 kHz (DI8~DI13)	3 kHz (DI12~DI17)
Digital Output	Digital Output Channels	10	10	13	12	18	6	6
	Relay Output Channels	–	–	–	–	–	8 x Form A (SSR)	6 x Form A
	Contact Rating	–	–	–	–	–	1 A @25°C @ 30 V_{DC} 0.7A @70°C @30 V_{DC}	250 V_{AC} @ 0.25 A, 30 V_{DC} @ 2 A
	Pulse Output	3 kHz (DO4~DO9)	3 kHz (DO4~DO9)	3 kHz (DO7~DO12)	3 kHz (DO6~DO11)	3 kHz (DO12~DO17)	3 kHz (DO0~DO5)	3 kHz (DO0~DO5)
Analog Output	Channels	–	–	–	4	–	–	–
	Type	–	–	–	0~5 V, 0~10 V, ± 5 V, ± 10 V, 0~20 mA, 4~20 mA	–	–	–
Certification		CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC	CE, FCC

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

Modular I/O Systems: ADAM-5000




Model		☞ ADAM-5000/485	☞ ADAM-5000E	☞ ADAM-5000L/TCP	☞ ADAM-5000/TCP
CPU		80188	80188	RISC CPU	
RAM		–	–	4 MB	
Flash ROM (User AP)		–	–	512 KB	
Flash Memory (Data Storage)		–	–	–	
Flash Disk		–	–	–	
OS		–	–	Real-time OS	
Timer BIOS		–	–	–	
Real-time Clock		–	–	–	
Watchdog Timer		✓			
I/O Slots		4	8	4	8
Power Consumption		3 W		4.0 W	5.0 W
Isolation	Communication	2,500 V_{DC}	3,000 V_{DC}	RS-485: 1,500 V_{DC}	
	Communication Power	3,000 V_{DC}			
	I/O Module	3,000 V_{DC}			
Diagnosis	Status Display	Power, CPU, Communication		Power, CPU, Error Diagnostic, Communication	
	Self Test	Yes, while ON			
	Software Diagnosis	✓			
Communication	Interface	RS-232/485 (2-wire)		Ethernet	
	Speed (bps)	1,200, 2,400, 4,800, 9,600, 19.2 K, 38.4 K, 57.6 K, 115.2 K		10 M, 100 M	
	Max. Distance	4,000 feet (1.2 km)		100 m without repeater	
	Data Format	Advantech protocol: N, 8, 1 Modbus protocol: N, 8, 1 N, 8, 2 E, 8, 1 O, 8, 1	Advantech protocol: N, 8, 1 Modbus protocol: N, 8, 1 N, 8, 2 E, 8, 1	TCP/IP	
	Max. Nodes	128		Depend on IP address	
	Protocol	ADAM-5000/485 & ADAM-5000E: ASCII, Modbus RTU		Modbus TCP, Modbus RTU	
	Remote I/O	–	–	20 nodes Modbus devices	
	Power Requirements	+10~+30 V_{DC}			
Environment	Operating Temperature	-10 ~ 70°C (14 ~ 158°F)			
	Storage Temperature	-25 ~ 85°C (-13 ~ 185°F)			
	Operating Humidity	5~95% RH (non-condensing)			
Dimension (W x H x D)		231 x 110 x 75 mm	355 x 110 x 75 mm	231 x 110 x 75 mm	355 x 110 x 75 mm

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

Modular I/O Systems: ADAM-5000

Analog Input/Output Modules





Model		ADAM-5013	ADAM-5017	ADAM-5017P	ADAM-5017H ADAM-5017UH	ADAM-5018
Analog Input	Resolution	16-bit	16-bit	16-bit	12-bit	16-bit
	Input Channel	3	8	8	8	7
	Sampling Rate	10 (total*)	10 (total*)	10 (total*)	ADAM-5017H: 100 (total)** ADAM-5017UH: 200K (total)**	10 (total*)
	Voltage Input	–	±150 mV, ±500 mV ±1 V, ±5 V, ±10 V	±150 mV, ±500 mV ±15V, ±10V, ±5 V, ±1 V 0~150mV, 0~500mV 0~1V, 0~5V, 0~10V 0~15V	±10 V, 0~10 V	±15 mV, ±50 mV ±100 mV, ±500 mV ±1 V, ±2.5 V
	Current Input	–	±20 mA	±20 mA, 4~20mA	0 ~ 20 mA, 4~20 mA	±20 mA
	Direct Sensor Input	Pt or Ni RTD	–	–	–	J, K, T, E, R, S, B
Isolation		3,000 V_{DC}	3,000 V_{DC}	3,000 V_{DC}	3,000 V_{DC}	3,000 V_{DC}

*Sampling rate value depends on used channel number.
Example: Using 5 channels on ADAM-5017, sampling rate for each used channel will be 10/5 = 2 samples/second.
**The sampling rate varies with the controller.





Model		ADAM-5018P	ADAM-5024	ADAM-5050	ADAM-5051 ADAM-5051D ADAM-5051S	ADAM-5052
Analog Input	Resolution	16-bit	–	–	–	–
	Input Channel	7	–	–	–	–
	Sampling Rate	10 (total*)	–	–	–	–
	Voltage Input	±15 mV, ±50 mV ±100 mV, ±500 mV ±1 V, ±2.5 V	–	–	–	–
	Current Input	4~20 mA	–	–	–	–
	Direct Sensor Input	J, K, T, E, R, S, B	–	–	–	–
Analog Output	Output Channels	–	4	–	–	–
	Resolution	–	12-bit	–	–	–
	Voltage Output	–	0~10 V	–	–	–
	Current Output	–	0~20 mA 4~20 mA	–	–	–
Digital Input and Digital Output	Digital Input Channels	–	–	16 DI/O (bit-wise selectable)	16 (ADAM-5051) 16w/LED (5051D/5051S)	8
	Digital Output Channels	–	–		–	–
Isolation		3,000 V_{DC}	3,000 V_{DC}	–	2,500 V_{DC} (5051S)	5,000 Vrms

*Sampling rate value depends on used channel number.
Example: Using 6 channels on ADAM-5017, sampling rate for each used channel will be 12/6 = 2 samples/second.
✓: supported, – : not supported, △ : optional

Modular I/O Systems: ADAM-5000

Digital Input/Output Modules



Model		☞ ADAM-5055S	☞ ADAM-5056D	☞ ADAM-5056S ☞ ADAM-5056SO
Digital Input and Digital Output	Digital Input Channels	8 with LED	–	–
	Digital Output Channels	8 with LED	16 with LED	16 with LED
Isolation		2,500 V_{DC}	–	2,500 V_{DC}




Model		☞ ADAM-5069	☞ ADAM-5080	☞ ADAM-5081	☞ ADAM-5091
Digital Input and Digital Output	Digital Input Channels	–	–	–	–
	Digital Output Channels	8 power relay (form A)	–	–	–
Counter (32-bit)	Channels	–	4	4/8	–
	Input Frequency	–	0.3~1000 Hz max. (frequency mode) 5000 Hz max. (counter mode)	5 Hz~1 MHz max. (frequency mode) 1 MHz max. (counter mode)	–
	Mode	–	Frequency, Up/Down Counter, Bi-direction Counter	Frequency, Counter (Up/Down, Bi-direction, Up, A/B Phase)	–
Communication	Channels	–	–	–	4
	Type	–	–	–	RS-232/422/485
Isolation		–	1,000 Vrms	2,500 V_{DC}	–

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

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

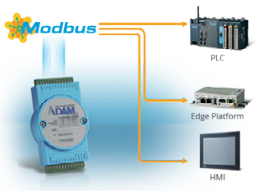
Introduction

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

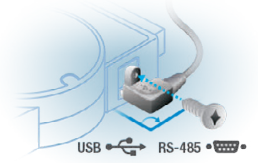
- Once a problem is detected, the Watchdog Timer automatically recovers the system

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



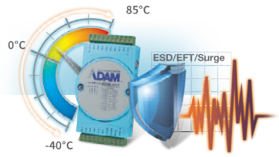
Friendly L-shaped cable design*

- 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



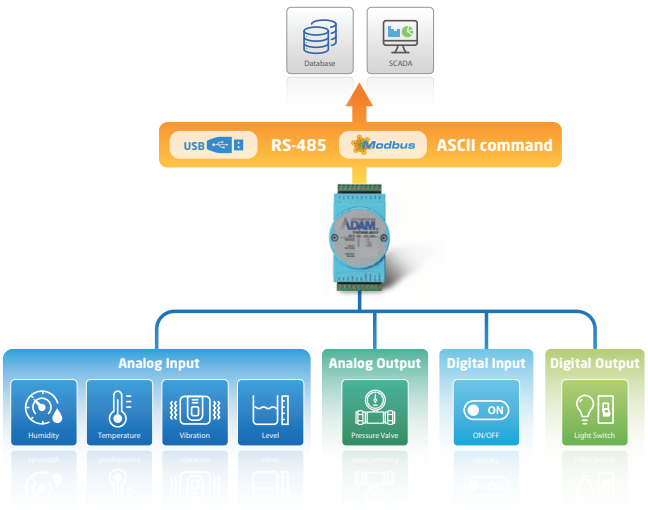
ADAM-4100 Series

- Level-4 ESD/EFT/ surge & isolation protection
- Wide operating temperature support, up to -40 ~ 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 mA, ±20 mA	0~20 mA, 4~20 mA, ±20 mA	4~20 mA, ±20 mA	0~20 mA, 4~20 mA, ±20 mA
	Direct Sensor Input	RTD	–	–	J, K, T, E, R, S, B thermocouple	J, K, T, E, R, S, B thermocouple
	Burn-out 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



ADAM-4050	ADAM-4051	ADAM-4052
–	–	–
–	–	–
–	–	–
–	–	–
7	16	8
8	–	–
–	–	–
–	2,500 V_{DC}	5,000 Vrms
–	✓	–
✓ (system)	✓ (system and comm.)	✓ (system)
–	–	–
Supported after E version	✓	–
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	–	–	–	–	–	–	–
	Burn-out 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	–	–	–	–	–	–	✓
Counter (32-bit)	Channels	–	–	–	–	–	–	2
	Input Frequency	–	–	–	–	–	–	50 kHz
Isolation Voltage		–	2,500 V_{DC}	5,000 V_{DC}	–	–	–	2,500 Vrms
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 after 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-bit	16-bit		–	–
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	–	–
	Burn-out 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		✓	–	–	✓	✓
Protocol		ASCII, Modbus RTU				
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 (non-condensing)				
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

IP67 Machine Mount I/O Modules: ADAM-200

Feature Highlights

IP67-rated zinc housing is very rugged and resistant to vibration, dust, oil, and water

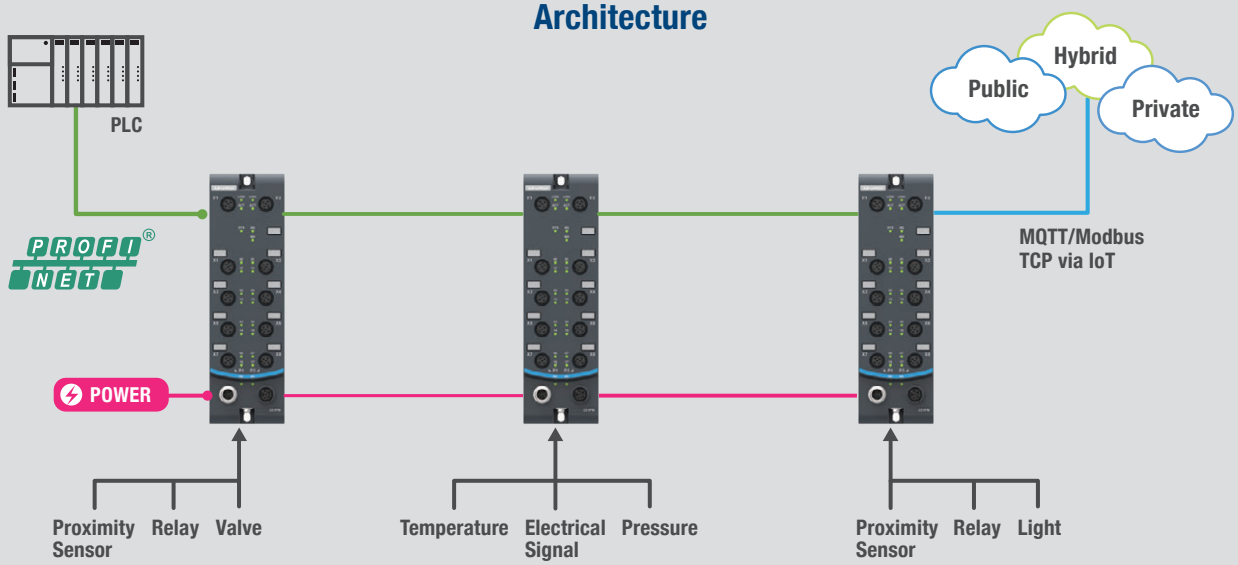
UL CID2 certification for harsh industrial environments

Class I Division II

M12 plug-and-play connectors reduce installation time and wiring efforts

Wide operating temperature range: -40 ~ 60°C EMC protection: ESD±8kV; EFT±2kV; Surge±1kV

Architecture



ADAM-200PN Series Selection Guide

	ADAM-217PN	ADAM-219PN	ADAM-250PN
Digital Input / Output	–	–	16DIO
Analog Input / Output	6AI+2AIO	–	–
RTD/Thermocouple (TC)	–	8x AI/RTD/TC	–
Protocol	PROFINET, MQTT, Modbus TCP, SNMP		
PROFINET Functions	RT mode, I&M data, MRP, Shared device, Fast Start Up (FSU)		
Connectors	8 x M12 A-coded, 2 x D-coded, 2 x L-coded		
General	Diagnostic functions for I/O and power Wide operating temperature -40 °C ~ 60 °C; EMC protection: ESD ±8 kV; EFT ±2 kV; Surge ±1 kV		

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, LoRaWAN, NB-IoT/LTE-M, 4G/LTE, and IP65-rated features, making them highly suitable for many kinds of industrial application. EVA-2000 and WISE-2000 LoRaWAN smart sensor devices are all-in-one devices designed for specific applications and domain focused scenarios.

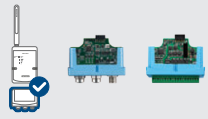
IoT wireless I/O module and sensor node with modularized high adaptability design

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 focused applications, EVA-2000 and WISE-2000 series offer a wireless and sensing all-in-one solution to simplify and accelerate the implementation of IoT applications.

Industrial Wireless I/O & Sensors

LoRaWAN I/O Modules

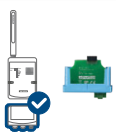
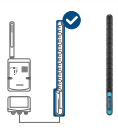
LoRaWAN

Category	Industrial LoRa/LoRaWAN Wireless Module				Industrial LoRa/LoRaWAN Wireless Module			Industrial LoRaWAN Wireless Module	Industrial LoRaWAN Node
Model	☞ WISE-4610P				☞ WISE-4610			☞ WISE-2200-M	☞ BB-WSW
Frequency Range	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)								EU 863-870 (MHz) US 902-928 (MHz) AS 919-924 (MHz)
Function	Wireless board				Wireless board			Wireless I/O Module	Wireless I/O Module
Positioning	GPS/Galileo/BeiDou/GLONASS				–			–	–
Power Input	4100 mAh Lithium rechargeable battery 10~50 V_{DC} external power 17~21 V_{DC} solar panel				– 10~50 V_{DC} external power 17~21 V_{DC} solar panel			– 5~50 V_{DC} –	9~36 V_{DC} / 2*3.6V AA Batteries
Configuration Interface	Micro-B USB				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	–	–
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 (terminal block)	6DI, 1 RS-485 & 1 RS-485/ 232	1 RS-485	2AI, 2DI, 1DO
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							–	

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

Wi-Fi I/O Modules

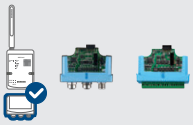
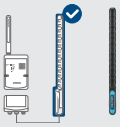
Wi-Fi

Category	Dual-band Wi-Fi 2.4/5G Wireless Module			
Model	☞ WISE-4250			
Standard	802.11 a/b/g/n/ac			
Frequency	2.4/5GHz			
Function	Wireless board			
Power Input	10~50 V_{DC} external power			
Configuration Interface	–			
Antenna Gain	(Peak) 2.4G 3.64 dBi / 5G 5.65 dBi			
I/O Module				
Model	☞ WISE-S214-A	☞ WISE-S250-A	☞ WISE-S251-A	☞ WISE-S100-A
Spec	4AI&4DI	6DI, 2DO&1RS-485	6DI &1RS-485	Stack Light Monitoring Sensor

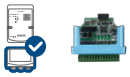
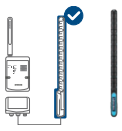
✓ : supported, – : not supported, △ : optional

Industrial Wireless I/O & Sensors

NB-IoT/LTE-M I/O Modules

Category	Advanced Industrial Cat.NB1/Cat.M1 Wireless Module								
Model	☞ WISE-4671								
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 10~50 V_{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								

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

Category	Industrial Cat.NB1/Cat.M1 Wireless Module				
Model	☞ WISE-4471				
Standard	3GPP release 13				
Band	B2,3,4,5,8,12,13,20,28				
SIM Type	Micro SIM/3FF				
Function	Wireless board				
Power Input	10~50 V_{DC} external power				
Configuration Interface	Micro-B USB				
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

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

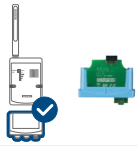
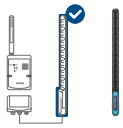
Industrial Wireless I/O & Sensors

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	☞ WISE-4210	☞ WISE-4210-S231	☞ WISE-2210	☞ WISE-2211
Frequency	868/923MHz	868/923MHz	868/923MHz	868/923MHz	868/923MHz
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

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

Industrial Wireless I/O & Sensors

Wi-Fi All-In-One I/O





Model Name		WISE-4012E	WISE-4012	WISE-4050	WISE-4060	WISE-4051
Description		6-ch Input/Output IoT Wireless I/O Module for IoT Developer	4-ch Universal Input and 2-ch Digital Output IoT Wireless I/O Module	4-ch Digital Input and 4-ch Digital Output IoT Wireless I/O Module	4-ch Digital Input and 4-ch Relay Output IoT Wireless I/O Module	8-ch Digital Input IoT Wireless I/O Module with 1-port RS-485
Wireless Network	IEEE Standard	IEEE 802.11b/g/n				
	Frequency Band	2.4GHz				
	Outdoor Range	110m (L.O.S.)				
Analog Input	Channel	2-ch (Differential)	4-ch	–	–	–
	Input Type	V	V, A, Dry contact DI	–	–	–
	Voltage Range	0~10V	±5V, ±V, 0~5V, 0~10V	–	–	–
	Current Range	–	±0~20mA, 4~20mA	–	–	–
	Resolution	12-bit	16-bit	–	–	–
	Sampling Rate	10 Hz (Total)	10 Hz (Total)	–	–	–
	Accuracy	±0.1 V_{DC}	Voltage: ±0.1% of FSR Current: ±0.2% of FSR	–	–	–
	Burn-out Detection	–	Yes (4~20 mA only)	–	–	–
	Isolation	–	3,000 Vrms	–	–	–
Digital Input	Channel	2-ch Dry Contact	Shared with AI	4-ch	4-ch	8-ch
	Counter Input	3kHz	2Hz	3kHz	3kHz	3kHz
	Frequency Input	0.1~3 kHz	0.1~2 kHz	0.1~3 kHz	0.1~3 kHz	0.1~3 kHz
	Isolation	–	3,000 Vrms	3,000 Vrms	3,000 Vrms	3,000 Vrms
Digital Output	Channel	2-ch Relay	2-ch (Sink Type)	4-ch (Sink Type)	4-ch Power Relay	–
	Output Rating (Resistive Load)	120 V_{AC} @ 0.5 A 30V_{DC} @ 1 A	Open collector to 30 V_{DC}, 400mA max.		250 V_{AC} @ 5 A 30 V_{DC} @ 3 A	–
	Pulse Output	60 operations/minute	5 kHz	5 kHz	60 operations/minute	–
	Isolation	1,500 Vrms	3,000 Vrms	3,000 Vrms	3,000 Vrms	–
Serial Port	Port Number	–				1 (RS-485)
General	Real-time Clock	✓	Yes, with battery backup	Yes, with battery backup	Yes, with battery backup	Yes, with battery backup
	Dimension (W x H x D)	80 x 148 x 25 mm				
Environment	Operating Temperature	-25 ~ 70°C (-13 ~ 158°F)				
	Operating Humidity	20~95% RH (non-condensing)				
Power	Input Range	Micro USB 5 V_{DC}	10~30 V_{DC}	10~30 V_{DC}	10~30 V_{DC}	10~30 V_{DC}
	Protection	–	Power Reversal Protection	Power Reversal Protection	Power Reversal Protection	Power Reversal Protection
	Power Consumption	1.5 W @ 5 V_{DC}	2.5 W @ 24 V_{DC}	2.2 W @ 24 V_{DC}	2.5 W @ 24 V_{DC}	2.2 W @ 24 V_{DC}

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

Industrial Wireless I/O & Sensors

RS-485 Smart Vibration Sensors

Model		WISE-2460P	WISE-2460
Communication	Interface	RS-485	
	protocol	Modbus/RTU	
Vibration Sensor	Axis	Z	
	Frequency Range	5-8,000Hz	1-10,000Hz
	Amplitude Range	±50 g	
	Output Data Rate	16384Hz	32000Hz
	Accuracy	1-4000Hz (5%); 4001~8000Hz (35%)	1-4000Hz (5%); 4001~10000Hz (35%)
	Noise	25 μg/√Hz in ±50 g range	
Mechanical	Enclosure	IP68	
	Mounting	Mounting stud; curved surface magnet base; metal base with epoxy	
	Dimension (W x H x D)	58.4 x 36.7 x 40 mm	
General	Power input	10~30 V_{DC}	
	Configuration Interface	RS-485	
	Operating Temperature	-20 ~ 105°C (-4 ~ 221°F)	
	Storage Temperature	-25 ~ 120°C (-13 ~ 248°F)	
	Operating Humidity	10~95% RH	
	Storage Humidity	5~95% RH	

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

LoRaWAN Smart Vibration Sensors

Category		LoRaWAN Smart Vibration Sensor	Explosion Proof LoRaWAN Smart Vibration Sensor
Model		WISE-2410	WISE-2410X
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	±2/4/8/16 g	
	Output Data Rate	6600Hz	
	Noise (MAX. TA = 25°C. 0g)	±40 mg	
Temperature Sensor	Operating Range	-20 ~ 85°C (-4 ~ 185°F) (USB powered); -20 ~ 70°C (-4 ~ 158°F) (Battery powered)	0 ~ 70°C (32 ~ 158°F) (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/ WISE-2410X-C12NA: 3.6V AA battery *2pcs (not included)
	Configuration Interface	Micro-B USB	
	Operating Temperature	-20 ~ 85°C (-4 ~ 185°F) (USB powered); -20 ~ 70°C (-4 ~ 158°F) (Battery powered)	0 ~ 70°C (32 ~ 158°F) (Battery powered)
	Storage Temperature	-25 ~ 90°C (-13 ~ 194°F)	
	Operating Humidity	10~95% RH	
	Storage Humidity	5~95% RH	

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

Industrial Wireless I/O & Sensors

LoRaWAN Smart Sensors




Model		☞ EVA-2210	☞ EVA-2310	☞ EVA-2311	☞ EVA-2510
Description		3-Phase Current Meter with 3 x 75A Clamp-On CT	LoRaWAN Temperature and Humidity Sensor	LoRaWAN Temperature PT1000 Round Head Probe Sensor	LoRaWAN Wireless Water Leakage Sensor
Wireless Communication	Topology	Star (LoRaWAN)			
	Frequency Band	EU 863-870 (MHz) / US 902-928 (MHz) / AU 915-928 (MHz) /AS 919-924 (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			
Sensor	Type	Current Transformer	Temperature & humidity	PT1000	Leakage detector
	Quantity	3			
	Spec	100mA to 75A (<±1%@300mA to 75A)			
Mechanical	Mounting	Magnetic; Wall; Pole mount			
	Dimension (L x W x H)	112 x 51 x 71.5 mm			
General	Power Input	2 x 3.6V AA batteries (not included)			
	Configuration Interface	Via downlink commands			
	Operating Temperature	-20 ~ 55°C (-4 ~ 131°F)			
	Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)			
	Operating Humidity	0~90% RH			
	Storage Humidity	0~90% RH			

✓ : supported, - : not supported, △ : optional

Wireless LoRaWAN Gateway

Model Name		☞ WISE-6610-B
Description		LoRaWAN Gateway support up to 500 nodes with 868/915/923MHz
Specifications	Mobile Wireless	LoRaWAN
	Communication Interface	LoRaWAN
	Operating Temperature	-40 ~ 75°C (-40 ~ 167°F)
	Power Input	10~30 V_{DC}
	Dimension (W x H x D)	150 x 37.5 x 83 mm
	Weight	500 g

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