

RS-485 I/O Modules

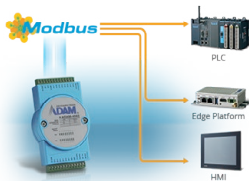
Introduction

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 to operate the system via Modbus

Easy integration

- Provides the sample code and command for users to program

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

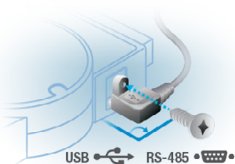
- Once a problem is detected, the Watchdog Timer automatically recovers the system

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*

- Users can optionally order the 90 degree micro USB to a Type-A USB cable with a locking mechanism to provide a stable connection.

Micro USB interface*

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

* Only featured on the B version of ADAM-4100 series selected models.

Efficient management

Now, you can access ADAM-4100 modules (B version) by passive RFID for more efficient management.



Quickly obtain module status

- Quickly retrieve module information (I/O value, alarm event, and etc.) via the RFID interface.

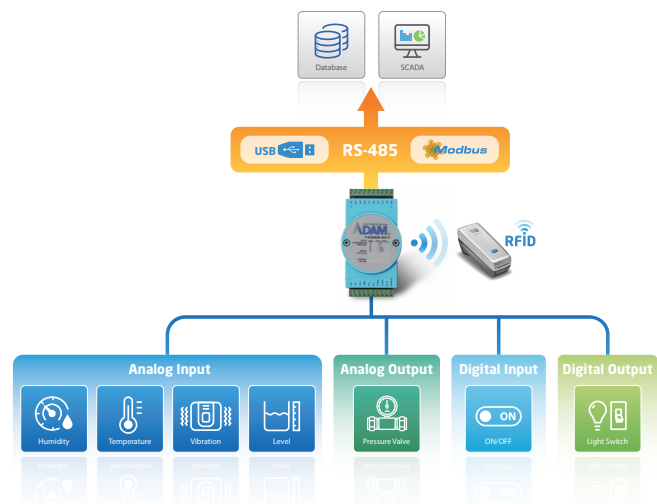
Easy maintenance

- Recorded RFID tag information (model name, serial number, user defined information, etc.) makes module field maintenance easy.

ADAM-4000/4100 Series Comparison

		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	-	✓
	Passive RFID	-	✓

Application Structure



RS-485 I/O Modules

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 ±500 mV ±1 V ±5 V ±10 V	-	±100 mV ±500 mV ±1 V ±2.5 V ±5 V ±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 _{DC}		3,000 V _{DC}	3,000 V _{DC}
Watchdog Timer		✓ (system and comm.)	✓ (system and comm.)	✓ (system and comm.)	✓ (system and comm.)
Modbus Support *		✓	✓	✓	✓
Certification		C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC

*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 _{DC}	3,000 V _{DC}	-	2,500 V _{DC}	5,000 V _{RMS}
Digital LED Indicator		-	-	-	Yes	-
Watchdog Timer		✓ (system)	✓ (system and comm.)	✓ (system)	✓ (system and comm.)	✓ (system)
Safety Setting		-	✓	-	-	-
Modbus Support *		-	✓	-	✓	-
Certification		CE, FCC	C1D2, UL, CE, FCC	UL, CE, FCC	C1D2, UL, CE, FCC	UL, CE, FCC

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Digital Input/Output

Relay Output

Counter



Model		ADAM-4053	ADAM-4055	ADAM-4056S 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 in E version
Certification		UL, CE, FCC	CE, FCC	ADAM-4056SO: C1D2, UL, CE, FCC ADAM-4056S: CE, FCC	CE, FCC	CE, FCC	UL, CE, FCC	CE, FCC

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

1
IoT Software Solutions

2
Edge AI and SKY Servers

3
Intelligent Systems

4
Machine Vision Solutions

5
Intelligent HMI and Monitors

6
Automation Computers

7
DAQ and Communication Gateways

8
Industrial Communication

9
Remote I/O, Wireless Sensing Modules and Converters

10
Intelligent Motion Control Solutions

11
EtherCAT Solutions and Automation Controllers

12
Industrial I/O Solutions

13
Intelligent Transportation Platforms

14
Utility and Energy Solutions

RS-485 I/O Modules



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, ± 15 V		± 15 mV, ± 50 mV, ± 100 mV, ± 500 mV, ± 1 V, ± 2.5 V	-
	Current Input		0 ~ 20, 4 ~ 20, ± 20 mA	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		CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	C1D2, UL, CE, FCC	UL, CE, FCC