RS-485 I/O Modules: ADAM-4000

To view all of Advantech's IoT Ethernet I/O Modules, please visit www.advantech.com/products.

Vertrieb durch **AMC**

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ADAM-4000 Series

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

Introduction

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

General Features

RS-485

The ADAM-4000 series of modules use the EIA RS-485 communication protocol, the industry's most widely used bi-directional, balanced transmission line standard. The EIA RS-485 was specifically developed for industrial applications. It lets ADAM-4000 modules transmit and receive data at high rates over long distances. All modules use optical isolators to prevent ground loop problems and reduce damages caused by power surges.

Modbus Communication Protocol

Since Modbus is one of the most popular communication standards in the world, Advantech has applied it as the major communication protocol for eAutomation product development. The new-generation ADAM-4000 modules now also support the Modbus/RTU protocol as the remote data transmission mechanism. Featuring the Modbus-support capacity, the new ADAM-4000 series becomes universal remote I/O modules, which work with any Modbus systems. The HMI server or controller can read/write data via standard Modbus command 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 provides great reliability to the system.

Flexible Networking

ADAM-4000 series modules need just two wires to communicate with their controlling host computer over a multidrop RS-485 network. Their ASCII-based command/response protocol ensures compatibility with virtually any computer system.

Modular Industrial Design

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

Controller Features

Alternative Standalone Control Solution

A standalone control solution is made possible when the ADAM-4000 series modules are controlled by the ADAM-4501 or ADAM-4502 PC-based communication controller. The ADAM-4501 and ADAM-4502 allow users to download an application (written in a high-level programming language) into its Flash ROM. This allows customization for your applications.

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I/O Module Features

Remotely Programmable Input Ranges

The ADAM-4000 series modules stand out because of their ability to accommodate multiple types and ranges of analog input. The type and range can be remotely selected by issuing commands from a host computer. One type of module satisfies many different tasks, which greatly simplifies design and maintenance. A single kind of module can handle the measurement needs of a whole plant. Since all modules are remotely configured by the host computer, physical adjustments are unnecessary.

Easy Plug-in System Integration

With 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

Ethernet

ADAM-4570 and ADAM-4571 are designed for the connection between serial devices (RS-232/422/485) and Ethernet. With ADAM-4570 or ADAM-4571, you can use graphical control software to monitor and control I/O modules. With existing devices, you can connect to an Ethernet network with the benefits of enhanced host performance and convenience.

Fiber Optics

If users need to transmit over long distances without noise interference, ADAM-4541 and ADAM-4542+ are designed for this task. The ADAM-4541 is a multi-mode converter, which carries signals from fiber optics to RS-232/422/485. It offers a transmission distance of up to 2,500 m with a total immunity to electromagnetic noise. The ADAM-4542+ is a single-mode converter, which carries signals from fiber to optics to RS-232/422/485. It offers a transmission distance of up to 15 km with total immunity to electromagnetic noise.

USB Communications

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

ADAM-4000 Remote Data Acquisition and Control System
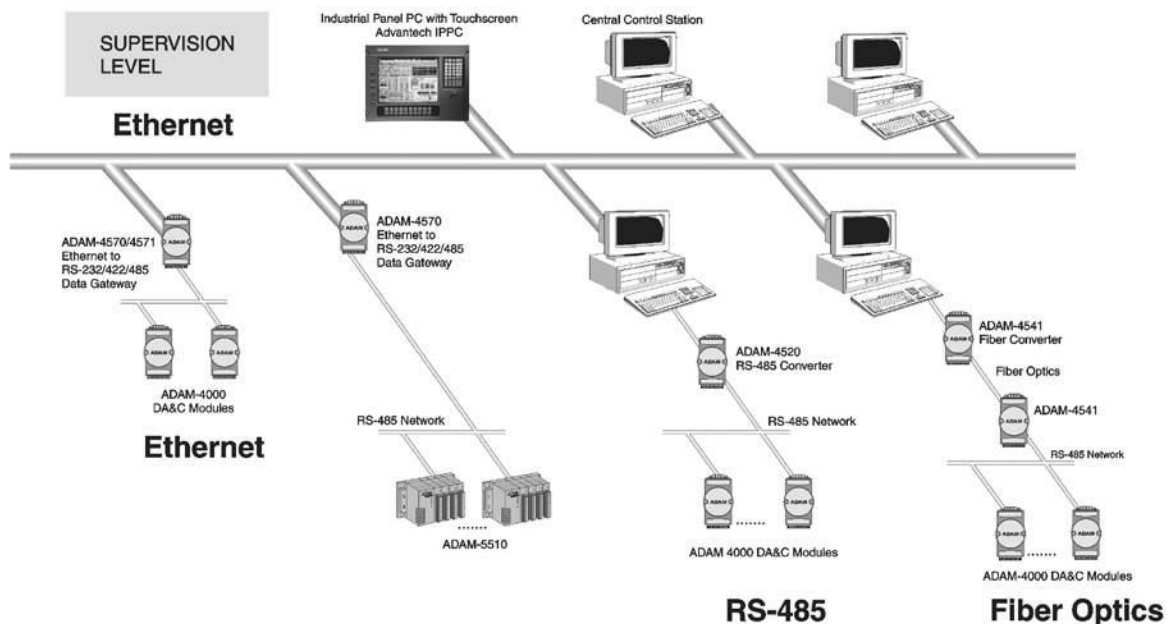
Communication and Controller Module Selection Guide

Controllers

Repeaters

Model	ADAM-4022T	ADAM-4510 ADAM-4510S
Network	RS-485	RS-422 RS-485
Comm. Protocol	ASCII Command/ Modbus	-
Comm. Speed (bps)	Serial: From 1,200 to 115.2 k	Serial: From 1,200 to 115.2 k
Comm. Distance	Serial: 1.2 km	Serial: 1.2 km
Interface Connectors	RS-485: plug-in screw terminal	RS-422/485: plug-in screw terminal
LED Indicators	Power	Communication & Power
Data Flow Control	Yes	-
Watchdog Timer	Yes	-
Isolation Voltage	3,000 V_{DC}	ADAM-4510: - ADAM-4510S: 3,000 V_{DC}
Special Features	PID Control	-
Built-in I/O	-	-
Power Requirements	10 ~ 30 V_{DC}	10 ~ 30 V_{DC}
Operating Temperature	-10 ~ 70°C (14 ~ 158°F)	-10 ~ 70°C (14 ~ 158°F)
Operating Humidity	5 ~ 95% RH	5 ~ 95% RH
Power Consumption	4 W @ 24 V_{DC}	1.4 W @ 24 V_{DC}
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Converters

Model	ADAM-4520	ADAM-4521	ADAM-4541 ADAM-4542+	ADAM-4561 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 115.2 k			
Comm. Distance	Serial: 1.2 km	Serial: 1.2 km	ADAM-4541: 2.5 km ADAM-4542+: 15 km	Serial: 1.2 km
Interface Connectors	RS-232: female DB9 RS-422/485: plug-in screw terminal	RS-232: female DB9 RS-422/485: plug-in screw terminal	RS-232/422/485: plug-in screw terminal Fiber: ADAM-4541: ST connector ADAM-4542+: SC connector	USB: type A client connector Serial: ADAM-4561: plug-in screw terminal (RS-232/422/485) ADAM-4562: DB9 (RS-232)
LED Indicators	Communication & Power			
Data Flow Control	-	Yes	-	Yes
Watchdog Timer	-	Yes	-	Yes
Isolation Voltage	3,000 V_{DC}	1,000 V_{DC}	-	ADAM-4561: 3,000 V_{DC} ADAM-4562: 2,500 V_{DC}
Power Requirements	10 ~ 30 V_{DC}			
Operating Temperature	-10 ~ 70°C (14 ~ 158°F)			
Operating Humidity	5 ~ 95% RH			
Power Consumption	1.2 W @ 24 V_{DC}	1 W @ 24 V_{DC}	ADAM-4541: 1.5 W @ 24 V_{DC} ADAM-4542+: 3 W @ 24 V_{DC}	ADAM-4561: 1.5 W @ 5 V_{DC} ADAM-4562: 1.1 W @ 5 V_{DC}
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I/O Module Selection Guide

Analog Input

1 WebAccess+ Solution
2 Intelligent Motion Control and Machine Vision
3 Power & Energy Automation
4 Industrial Operator Panels
5 Thin-Client Terminals
6 High-Performance Control Panels
7 Control Cabinet PCs
8 Industrial IoT Gateways
9 Industrial monitors
10 iDoor Technology Modules
11 Panel PCs
12 Control IPCs
13 Remote DA&C Systems
14 Wireless IoT Sensing Devices
15 Ethernet I/O Modules
16 RS-485 I/O Modules
17 Industrial Ethernet Solutions
18 IP Gateway and Serial Device Servers
19 iNetworking

Model			ADAM-4012	ADAM-4013	ADAM-4015	ADAM-4017+
Resolution			16 bit			
Analog Input	Channels		1 differential	1 differential	6 differential	8 differential
	Sampling Rate		10 Hz			
	Voltage Input		±150 mV ±500 mV ±1 V ±5 V ±10 V	-	-	±150 mV ±500 mV ±1 V ±5 V ±10 V
	Current Input		±20 mA	-	-	4 ~ 20 mA ±20 mA
	Direct Sensor Input		-	RTD	RTD	-
	Burn-out Detection		-	-	Yes	-
	Channel Independent Configuration		-	-	Yes	Yes
Analog Output	Channels		-	-	-	-
	Voltage Output		-	-	-	-
	Current Output		-	-	-	-
Digital Input/Output	Input Channels		1	-	-	-
	Output Channels		2	-	-	-
	Alarm Settings		Yes	-	-	-
Counter (32-bit)	Channels		-	-	-	-
	Input Frequency		-	-	-	-
Isolation Voltage			3,000 V_{DC}			
Digital LED Indicator			-			
Watchdog Timer			Yes (System)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)
Safety Setting			-			
Modbus Support *			-	-	Yes	Yes
Page			16-8	16-8	16-8	16-9

*: All ADAM-4000 I/O Modules support ASCII Commands

I/O Module Selection Guide

Analog Input   Analog Output   Digital Input/Output

	Model	ADAM-4018+	ADAM-4019+	ADAM-4021	ADAM-4024	ADAM-4050	ADAM-4051
	Resolution	16 bit		12 bit	12 bit	-	-
Analog Input	Channels	8 differential	8 differential	-	-	-	-
	Sampling Rate	10 Hz	10 Hz	-	-	-	-
	Voltage Input	-	± 100 mV ± 500 mV ± 1 V ± 2.5 V ± 5 V ± 10 V	-	-	-	-
	Current Input	4 ~ 20 mA ±20 mA	4 ~ 20 mA ±20 mA	-	-	-	-
	Direct Sensor Input	J, K, T, E, R, S, B Thermocouple	J, K, T, E, R, S, B Thermocouple	-	-	-	-
	Burn-out Detection	Yes	Yes (4 ~ 20 mA & All T/C)	-	-	-	-
	Channel Independent Configuration	Yes	Yes	-	-	-	-
Analog Output	Channels	-	-	1	4	-	-
	Voltage Output	-	-	0 ~ 10 V	±10 V	-	-
	Current Output	-	-	0 ~ 20 mA 4 ~ 20 mA	0 ~ 20 mA 4 ~ 20 mA	-	-
Digital Input/ Output	Input Channels	-	-	-	4	7	16
	Output Channels	-	-	-	-	8	-
	Alarm Settings	-	-	-	Yes	-	-
Counter (32-bit)	Channels	-	-	-	-	-	-
	Input Frequency	-	-	-	-	-	-
	Isolation Voltage	3,000 V$_{DC}$	3,000 V$_{DC}$	3,000 V$_{DC}$	3,000 V$_{DC}$	-	2,500 V$_{DC}$
	Digital LED Indicator	-	-	-	-	-	Yes
	Watchdog Timer	Yes (System & Comm.)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)
	Safety Setting	-	-	-	Yes	-	-
	Modbus Support *	Yes	Yes	-	Yes	-	Yes
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*: All ADAM-4000 I/O Modules support ASCII Commands

Relay Output | Counter

	ADAM-4052	ADAM-4053	ADAM-4055	ADAM-4056S/4056SO	ADAM-4060	ADAM-4068	ADAM-4069	ADAM-4080
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	8	16	8	-	-	-	-	-
	-	-	8	12	4-ch relay	8-ch relay	8-ch power relay	2
	-	-	-	-	-	-	-	Yes
	-	-	-	-	-	-	-	2
	-	-	-	-	-	-	-	50 kHz
	5,000 V_{RMS}	-	2,500 V_{DC}	5,000 V_{DC}	-	-	-	2,500 V_{RMS}
	-	-	Yes	Yes	-	Yes	-	-
	Yes (System)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)	Yes (System)
	-	-	Yes	-	Yes	Yes	Yes	-
	-	-	Yes	Yes	-	Yes	Yes	-
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ADAM-4012
ADAM-4013
ADAM-4015

1-ch Analog Input Module

1-ch RTD Input Module

6-ch RTD Module with Modbus

ADAM-4012	ADAM-4013	ADAM-4015

Specifications

General

- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Supported Protocols** ASCII command
- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG)

Analog Input

- **Channels** 1
- **Input Impedance** Voltage: 20 MΩ
  Current: 125 Ω (Added by user)
- **Input Type** mV, V or mA
- **Input Range** ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V and ±20 mA
- **Accuracy** Voltage mode: ±0.1% or better
  Current mode: ±0.2% or better
- **Span Drift** ±25 ppm/°C
- **Zero Drift** ±6 µV/°C

Digital Input

- **Channels** 1
  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
- **Event Counter** Max. input freq.: 50 Hz
  Min. input pulse width: 1 msec.

Digital Output

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

Specifications

General

- **Power Consumption** 0.7 W @ 24 V_{DC}
- **Supported Protocols** ASCII command
- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG)

Analog Input

- **Channels** 1
- **Input Connections** 2 or 3-wire
- **Input Impedance** 2 MΩ
- **Input Type** Pt or Ni RTD
- **RTD Types and Temperature Ranges**
  IEC RTD 100 ohms

Pt	-100°C	to	+100°C	a = 0.00385
Pt	0°C	to	+100°C	a = 0.00385
Pt	0°C	to	+200°C	a = 0.00385
Pt	0°C	to	+600°C	a = 0.00385

  JIS RTD 100 ohms

Pt	-100°C	to	+100°C	a = 0.003916
Pt	0°C	to	+100°C	a = 0.003916
Pt	0°C	to	+200°C	a = 0.003916
Pt	0°C	to	+600°C	a = 0.003916

  Ni RTD

Ni	-80°C	to	+100°C
Ni	0°C	to	+100°C

- **Accuracy** ±0.1% or better
- **Span Drift** ±25 ppm/°C
- **Zero Drift** ±3 µV/°C
- **CMR @ 50/60 Hz** 150 dB

Specifications

General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 28 AWG)
- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 s) & Communication
- **Supported Protocols** ASCII command and Modbus/RTU
- **Burn-out 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 (a = 0.00385)
  JIS RTD 100 ohms (a = 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

Common Specifications

General

- **Power Input** Unregulated 10 ~ 30 V_{DC}
- **Connectors** 1 x plug-in terminal block (#14 ~ 22 AWG)
- **Watchdog Timer** System (1.6 second)

Analog Input

- **Resolution** 16-bit
- **Sampling Rate** 10 sample/second (total)

- **NMR @ 50/60 Hz** 100 dB
- **Isolation Voltage** 3,000 V_{DC}

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-4012** 1-ch Analog Input Module
- **ADAM-4013** 1-ch RTD Input Module
- **ADAM-4015** 6-ch RTD Module with Modbus

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 COMPLIANT 2002/95/EC c UL us LISTED E180881 I.T.E.

ADAM-4018+ FCC CE RoHS COMPLIANT 2002/95/EC c UL us LISTED E180881 I.T.E.

ADAM-4019+ FCC CE RoHS COMPLIANT 2002/95/EC c UL us LISTED E180881 I.T.E.

Specifications

General

- **Power Consumption** 1.2 W @ 24 V$_{DC}$
- **Watchdog Timer** System (1.6 second) & Communication
- **Supported Protocols** ASCII command and Modbus/RTU

Analog Input

- **Channels** 8 differential
- **Channel Independent** Yes **Configuration**
- **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$_{DC}$
- **Watchdog Timer** System (1.6 second) & Communication
- **Supported Protocols** ASCII command and Modbus/RTU

Analog Input

- **Channels** 8 differential
- **Channel Independent** Yes **Configuration**
- **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		

- **Burn-out Detection** All T/C

Specifications

General

- **Power Consumption** 1.0 W @ 24 V$_{DC}$
- **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** Yes **Configuration**
- **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		

- **Burn-out Detection** 4 ~ 20 mA & all T/C

Common Specifications

General

- **Power Input** Unregulated 10 ~ 30 V$_{DC}$
- **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$_{DC}$

- **Overvoltage Protection** ±35 V$_{DC}$
- **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

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ADAM-4021
ADAM-4022T
ADAM-4024

1-ch Analog Output Module

2-ch Serial Based Dual Loop PID Controller with Modbus

4-ch Analog Output Module with Modbus

| ADAM-4021 | ADAM-4022T | ADAM-4024 |

Specifications (ADAM-4021)

General

▪ **Connectors**	2 x plug-in terminal blocks (#14 ~ 22 AWG)
▪ **Power Consumption**	1.4 W @ 24 V_{DC}
▪ **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_{DC}
▪ **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

Common Specifications

General

▪ **Power Input**	Unregulated 10 ~ 30 V_{DC}

Environment

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

Specifications (ADAM-4022T)

General

▪ **Connectors**	2 x plug-in terminal blocks (#14 ~ 28 AWG)
▪ **Power Consumption**	4 W @ 24 V_{DC}
▪ **Watchdog Timer**	System (1.6 second)
▪ **Supported Protocols**	ASCII command and Modbus/RTU

Analog Input (Only AI0 and AI2 are the PID input)

▪ **Channels**	4
▪ **Input Type**	mA, V, Thermistor, RTD
▪ **Input Range**	0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 10 V
▪ **Thermistor Type and Temperature Ranges**	
Thermistor 3 K (NTC):	0 ~ 100°C
Thermistor 10 K (NTC):	0 ~ 100°C
▪ **RTD Type and Temperature Ranges** **Pt 100 RTD**	
Pt 0 ~ 100°C	Pt -100 ~ 100°C
Pt 0 ~ 600°C	Pt 0 ~ 200°C
IEC RTD 100 ohms (a = 0.00385)	
JIS RTD 100 ohms (a = 0.00392)	
Pt 1000 RTD	Pt -40 ~ 160°C
▪ **Resolution**	16-bit
▪ **Sampling Rate**	10 sample/second
▪ **Isolation Voltage**	3,000 V_{DC}

Analog Output

▪ **Channels**	2
▪ **Output Range**	0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 10 V
▪ **Output Type**	mA, V
▪ **Resolution**	12-bit
▪ **Isolation Voltage**	3,000 V_{DC}

Digital Input

▪ **Channels**	2
▪ **Dry Contact**	Logic level 0-close to GND Logic level 1-open

Digital Output

▪ **Channels**	2
	Open Collector to 30 V, 30 mA max. load
▪ **Power Dissipation**	300 mW

Specifications (ADAM-4024)

General

▪ **Connectors**	2 x plug-in terminal blocks (#14 ~ 28 AWG)
▪ **Power Consumption**	3 W @ 24 V_{DC}
▪ **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 ~ 20mA, ±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_{DC}
▪ **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_{DC}
▪ **Isolation Voltage**	3,000 V_{DC}

Ordering Information

▪ **ADAM-4021**	1-ch Analog Output Module
▪ **ADAM-4022T**	2-ch Serial Dual Based Loop PID Controller w/ 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_{DC}
- **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_{DC}
- **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_{DC}
- **Input Resistance** 5.2 kΩ
- **Overvoltage Protection** 70 V_{DC}

Specifications

General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 0.4 W @ 24 V_{DC}
- **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_{RMS}
- **Input Resistance** 3 kΩ

Common Specifications

General

- **Power Input** Unregulated 10 ~ 30 V_{DC}

Environment

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

1 WebAccess+ Solution
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ADVANTECH iAutomation
Premier Partner

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_{DC}
- **Watchdog Timer** System (1.6 second) & Communication
- **Supported Protocols** ASCII command and Modbus/RTU
- **Isolation Voltage** 2,500 V_{DC}
- **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_{DC}

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)

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_{DC}
- **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_{DC}
  Current: 1A
  (per channel)
- **Digital Output Type** Source
- **Over Current Detection and Protection**

Specifications

General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 2.0 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 second)
- **Supported Protocols** ASCII command

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_{RMS}
- **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

Common Specifications

General

- **Power Input** Unregulated 10 ~ 30 V_{DC}

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-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

ADAM-4060
4-ch Relay Output Module

ADAM-4068
8-ch Relay Output Module with Modbus

ADAM-4069
8-ch Power Relay Output Module with Modbus

ADAM-4060 FM APPROVED · CE · RoHS COMPLIANT 2002/95/EC

ADAM-4068 FCC · CE · RoHS COMPLIANT 2002/95/EC

ADAM-4069 FCC · CE · RoHS COMPLIANT 2002/95/EC · c UL us LISTED E183381 I.T.E.

Specifications (ADAM-4060)

General
- **Connectors** — 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** — 0.8 W @ 24 V_{DC}
- **Watchdog Timer** — System (1.6 second)
- **Supported Protocols** — ASCII command

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

Specifications (ADAM-4068)

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

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

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

Specifications (ADAM-4069)

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

Relay Output
- **Breakdown Voltage** — 1,000 V_{AC} (50/60 Hz)
- **Channels** — 4 x Form A / 4 x Form C
- **Contact Rating (Resistive)** — 5 A @ 250 V_{AC} / 5 A @ 30 V_{DC}
- **Initial Insulation Resistance** — 1 GΩ min. at 500 V_{DC}
- **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_{DC}

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

Unit: mm

Front View · Rear View · Side View · Panel Mounting View · Top View · Din-Rail Mounting View

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_{DC} (ADAM-4510S)
- **Power Consumption** 1.4 W @ 24 V_{DC}

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_{DC}
- **Power Consumption** 1.2 W @ 24 V_{DC}

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_{DC}
- **Power Consumption** 1.0 W @ 24 V_{DC}
- **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_{DC} 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

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

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_{DC}
- **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_{DC}
- **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_{DC}
- **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_{DC}
- **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

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_{DC}
  ADAM-4562:   2,500 V_{DC}
- **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

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)

1 WebAccess+ Solution
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19 iNetworking

ADAM-4100 Series

Robust Remote Data Acquisition and Control Modules Overview

Introduction

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

The ADAM-4000 robust family is designed to endure more severe and adverse environments. The operating temperature is -40 ~ 85°C which makes them suitable for more widespread applications.

Designed for Severe Industrial Environments

Broader Operating Temperature Range

The ADAM-4000 robust family supports a broad operating temperature range of -40 to 85°C.

Higher Noise Immunity

In order to prevent noise from affecting your system, the ADAM-4000 robust family has been designed with more protection to counteract these effects. New standard features include: 1 kV surge protection on power inputs, 3 kV EFT, and 8 kV ESD protection.

Broader Power Input Range

The ADAM-4000 robust family accepts any unregulated power source between 10 and 48 V_{DC}. In addition, they are also protected against accidental power reversals, and can be safely connected or disconnected without disturbing a running network.

New Features for I/O Modules

- **ADAM-4117/4118**
  1. Supports 200 V_{DC} High Common Mode voltage
  2. Software Filter
  3. Supports Auto Optimized Working Frequency
  4. Auto noise rejection at 50/60 Hz
  5. Higher over voltage protection ±60 V_{DC}
  6. Optional Sampling Rate 10 or 100 samples/sec
  7. Supports unipolar and bipolar input (ADAM-4117 only)
  8. Supports ±15V input range (ADAM-4117 only)

- **ADAM-4150**
  1. Over current and temperature protection circuit
  2. DI channels support counter (32-bit, overflow flag) and frequency type signal input
  3. DO channels support pulse (1 kHz) and delay (high-to-low and low-to-high) type signal output
  4. Support invert DI status
- **ADAM-4168**
  1. Supports 1 kHz pulse output

ADAM-4100 Module with LED Display

The ADAM-4100 series modules have a LED display that lets you monitor the channel status. Using ADAM-4117/4118, the LED will be lit when related channel is active. Using ADAM-4150/4168, the LED will be lit when related channel value is high. The ADAM-4100 series modules have two operating modes (initial and normal), unlike the old module using extra wiring, ADAM-4100 modules can use the switch on the case to set "initial" mode or "normal" mode. It is very convenient for the user to configure. When you set to "initial" mode, the LED display can represent the node address of that module. Besides, when you use multiple ADAM-4100 series modules, you can locate the module through ADAM utility and LED display. All of these functions are very helpful to diagnose the ADAM-4100 series system.

Online Firmware Updates

The ADAM-4100 series modules have a friendly and convenient design where firmware can be updated through a local network or the Internet. You can easily update latest firmware using utility on host PC. This saves time and ensures that the module always runs with the latest functional enhancements.

Legacy Communication Protocol Support

To satisfy both the current ADAM users, and Modbus users, The ADAM-4100 series modules support both the ADAM (ASCII) protocol and the Modbus/RTU protocol. You can select the communication mode you want through the Windows Utility Software. The Modbus protocol not only supports the original data format (N, 8, 1) for (parity check, data bit, stop check) but also accepts (N,8,1) (N, 8, 2) (E, 8, 1) (O, 8, 1).
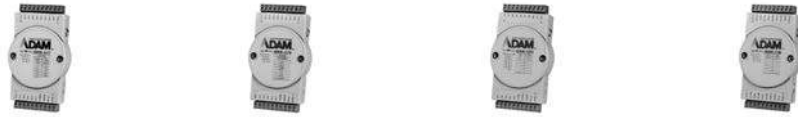

Vertrieb durch **AMC**

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Robust RS-485 I/O Module Selection Guide

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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, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 15 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±15V	±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5V	-	-
		Current Input	0 ~ 20 mA, ±20 mA, 4 ~ 20 mA	±20 mA, 4 ~ 20 mA	-	-
		Direct Sensor Input	-	J, K, T, E, R, S, B Thermocouple	-	-
		Burn-out Detection	Yes (mA)	Yes (mA and All T/C)	-	-
		Channel Independent Configuration	Yes		-	-
Digital Input/ Output		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			-	-	Yes	Yes
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}	0.5 W @ 24 V_{DC}	0.7 W @ 24 V_{DC}	1.8 W @ 24 V_{DC}
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 RS-422/485: plug-in screw terminal
Digital LED Indicators	Communication and Power	
Auto Data Flow Control	Yes	
Isolation Voltage	3,000 V_{DC}	
Power Requirement	10 ~ 48 V_{DC}	
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_{DC}	1.2 W @ 24 V_{DC}
Page	16-18	

AMC

ADVANTECH iAutomation Premier Partner

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 | FCC CE RoHS 2002/95/EC | c(UL)us LISTED E180881 I.T.E. |

| ADAM-4520I | FCC CE RoHS 2002/95/EC | c(UL)us LISTED E180881 I.T.E. |

| ADAM-4117 | FCC CE RoHS 2002/95/EC | c(UL)us LISTED E180881 I.T.E. |

Specifications

General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 1.4 W @ 24 V_{DC}

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_{DC}

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_{DC}

Analog Input

- **Channels** 8 differential and independent configuration channels
- **Input Impedance** Voltage: 800 KΩ Current: 120 Ω
- **Input Type** mV, V (supports unipolar and bipolar), mA
- **Input Range** 0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V, 0 ~ 15V, ±150 mV, ±500 mV, ±1V, ±5 V, ±10 V, ±15V, ±20 mA, 0 ~ 20 mA, 4 ~ 20mA
- **Accuracy**
  Voltage mode : ±0.1% or better
  Current mode : ±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** ±60 V_{DC}
- **High Common Mode** 200 V_{DC}
- **Span Drift** ±25 ppm/°C (Typical)
- **Zero Drift** ±6µV/°C
- **Built-in TVS/ESD Protection**

Common Specifications

General

- **Power Input** Unregulated 10 ~ 48 V_{DC} w/power reversal protection
- **Isolation Voltage** 3,000 V_{DC}

Environment

- **Operating Humidity** 5 ~ 95% RH
- **Operating Temperature** - 40 ~ 85°C (-40 ~ 185°F)
- **Storage Temperature** - 40 ~ 85°C (-40 ~ 185°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   FCC CE RoHS COMPLIANT 2002/95/EC   c(UL)us LISTED E180881 I.T.E.

ADAM-4150   FCC CE RoHS COMPLIANT 2002/95/EC   c(UL)us LISTED E180881 I.T.E.

ADAM-4168   FCC CE RoHS COMPLIANT 2002/95/EC   c(UL)us LISTED E180881 I.T.E.

Specifications

General
- **Power Consumption** 0.5W @ 24 V$_{DC}$

Analog Input
- **Channels** 8 differential and independent configuration channels
- **Input Impedance** Voltage: 20 MΩ
  Current: 120 Ω
- **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 ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V
  Current mode ±20 mA, 4 ~ 20 mA
- **Accuracy** Voltage mode: ±0.1% or better
  Current mode: ±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** ±60 V$_{DC}$
- **High Common Mode** 200 V$_{DC}$
- **Span Drift** ±25 ppm/°C (Typical)
- **Zero Drift** ±6μV/°C
- **Built-in TVS/ESD Protection**
- **Burn-out Detection**

Specifications

General
- **Power Consumption** 0.7 W @ 24 V$_{DC}$

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$_{DC}$

Digital Output
- **Channels** 8, open collector to 40 V (0.8A max. load)
- **Power Dissipation** 1W load max
- **RON Maximum** 150 mΩ
- **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$_{DC}$

Relay Output
- **Output Channels** 8 Form A
- **Contact Rating (Resistive)** 0.5 A @ 120 V$_{AC}$
  0.25 A @ 240 V$_{AC}$
  1 A @ 30 V$_{DC}$
  0.3 A @ 110 V$_{DC}$
- **Breakdown Voltage** 750 V$_{AC}$ (50/60 Hz)
- **Initial Insulation Resistance** 1 G Ω min. @ 500 V$_{DC}$
- **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$_{DC}$
- **Watchdog Timer** System (1.6 second) & Communication
- **Connector** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Isolation Voltage** 3,000 V$_{DC}$
- **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

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