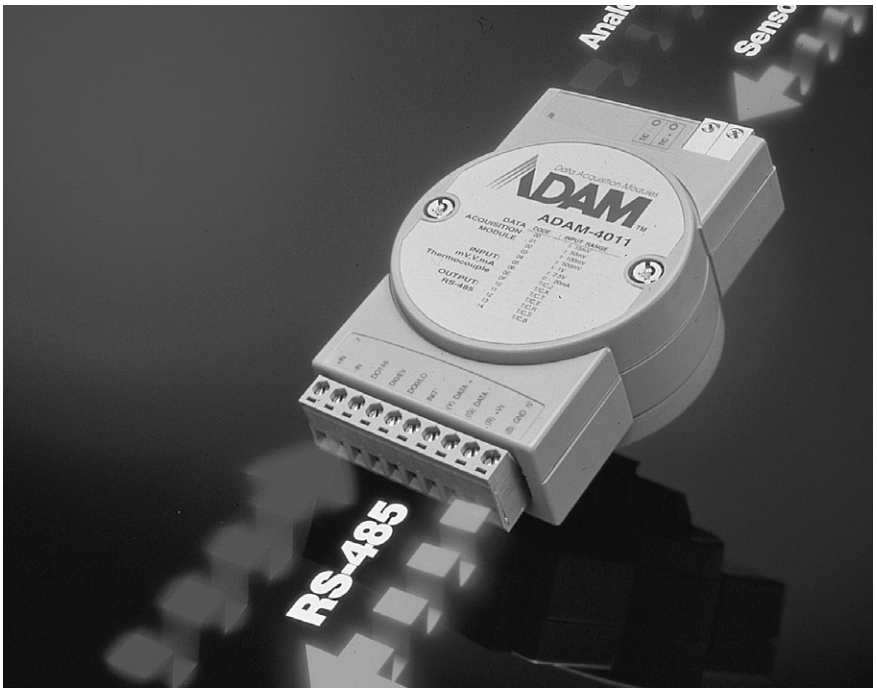
4

RS-485 I/O Modules: ADAM-4000

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 (refer to Page 4-12 and 4-13). 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.

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

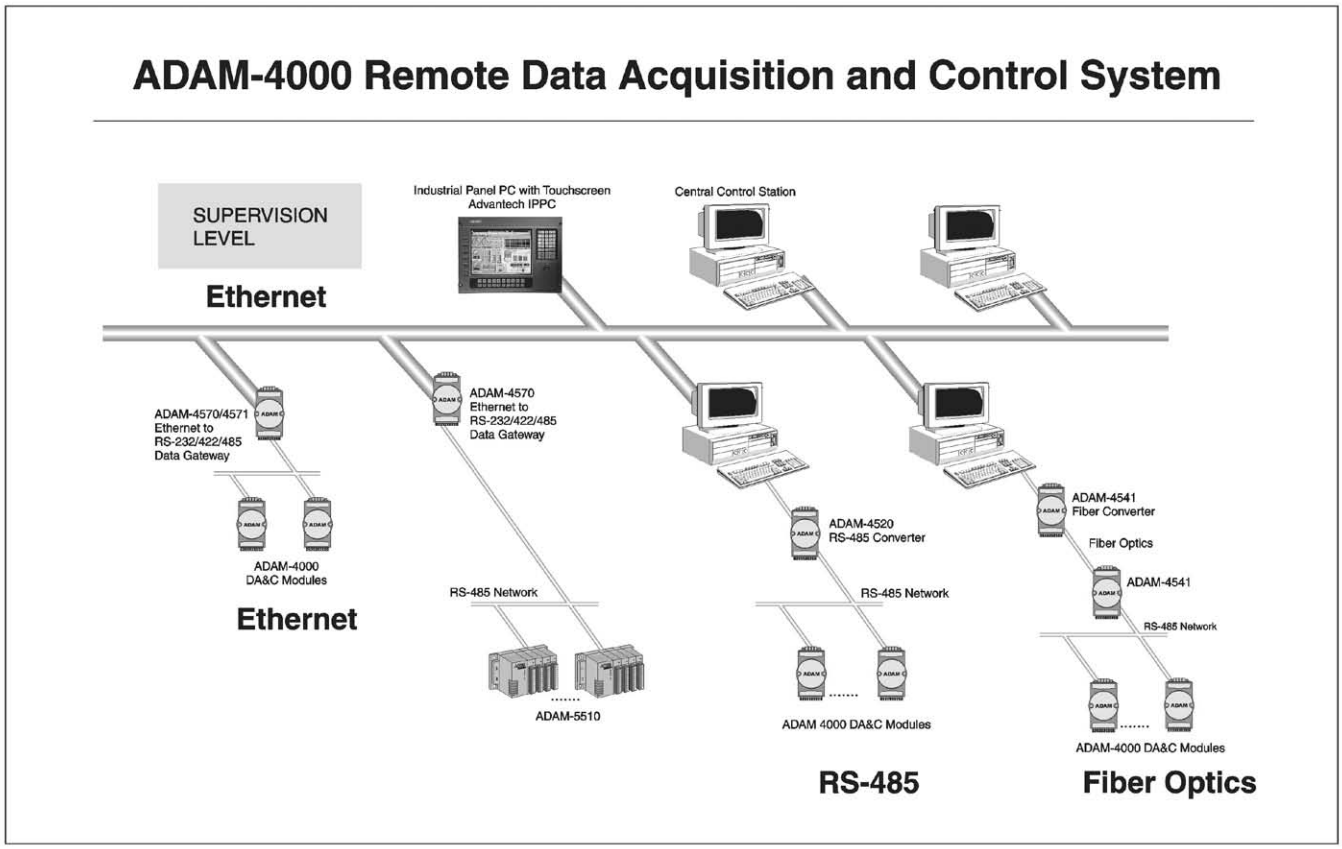
ADAM-4570 and ADAM-4571 are designed for the connection between serial devices (RS-232/422/485) and Ethernet. With ADAM-4570 or ADAM-4571, you can use graphical control software to monitor and control I/O modules. With existing devices, you can connect to an Ethernet network with the benefits of enhanced host performance and convenience. (Please refer to Chapter 17 for more detail)

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 2500 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. (Please refer to Page 4-15 for more detail)

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. (Please refer to Page 4-15 for more detail)



Modules Selection Chart

Controllers

- **4501** Ethernet-enabled Communication Controller with 4DI/4DO (P.4-12)
- **4501D** 4501 with 7-segment LED Display (P.4-12)
- **4502** Ethernet-enabled Communication Controller with 1AI/1AO/2DI/2DO (P.4-13)
- **4502D** 4502 with 7-segment LED Display (P.4-13)
- **4022T** 2-ch Serial Based Dual Loop PID Controller with Modbus (P.4-19)

Communication Modules

Ethernet

- **4570** 2-port Ethernet Data Geteway (Refer to Chapter 17)
- **4571** 1-port Ethernet Data Geteway (Refer to Chapter 17)

Serial

- **4510/4510S** RS-422/485 Repeater (P.4-14)
- **4520/4522** RS-232 to RS-422/485 Converter (P.4-14)
- **4521** Addressable RS-422/485 to RS-232 Converter (P.4-14)

Fiber Optic

- **4541** Multi-mode Fiber Optic to RS-232/422/485 Converter (P.4-15)
- **4542+** Single-mode Fiber Optic to RS-232/422/485 Converter (P.4-15)

USB

- **4561** 1-Port Isolated USB to RS-232/422/485 Converter (P.4-15)
- **4562** 1-Port Isolated USB to RS-232 Converter (P.4-15)

I/O Modules

Analog Input

- **4011** 1-ch Thermocouple Input Module (P.4-16)
- **4011D** 4011 with 7-segment LED Display (P.4-16)
- **4012** 1-ch Analog Input Module (P.4-16)
- **4013** 1-ch RTD Input Module (P.4-16)
- **4015** 6-ch RTD Input Module with Modbus (P.4-17)
- **4015T** 6-ch Thermistor Input Module with Modbus (P.4-17)
- **4017** 8-ch Analog Input Module (P.4-18)
- **4017+** 8-ch Analog Input Module with Modbus (P.4-18)
- **4018** 8-ch Thermocouple Input Module (P.4-18)
- **4018+** 8-ch Thermocouple Input Module with Modbus (P.4-18)
- **4019+** 8-ch Universal Analog Input Module with Modbus (P.4-18)

Analog Output

- **4021** 1-ch Analog Output Module (P.4-19)
- **4024** 4-ch Analog Output Module with Modbus (P.4-19)

Digital Input

- **4051** 16-ch Isolated Digital Input Module with Modbus (P.4-20)
- **4052** 8-ch Isolated Digital Input Module (P.4-20)
- **4053** 16-ch Digital Input Module (P.4-21)

Digital Output

- **4056S** 12-ch Sink Type Isolated Digital Output Module with Modbus (P.4-21)
- **4056SO** 12-ch Source Type Isolated Digital Output Module with Modbus (P.4-21)
- **4060** 4-ch Relay Output Module (P.4-22)
- **4068** 8-ch Relay Output Module with Modbus (P.4-22)
- **4069** 8-ch Power Relay Output Module with Modbus (P.4-22)

Counter

- **4080** 2-ch Counter/Frequency Module (P.4-23)
- **4080D** 4080 with 7-segment LED Display (P.4-23)

Mixed I/O

- **4016** 1-ch Analog Input/Output Module (P.4-17)
- **4050** 15-ch Digital I/O Module (P.4-20)
- **4055** 16-ch Isolated Digital I/O Module with Modbus (P.4-21)

Robust Communication Modules

Serial

- **4510I** Robust RS-422/485 Repeater (P.4-10)
- **4520I** Robust RS-232 to RS-422/485 Converter (P.4-10)

Robust I/O Modules

Analog Input

- **4117** Robust 8-ch Analog Input Module with Modbus (P.4-10)
- **4118** Robust 8-ch Thermocouple Input Module with Modbus (P.4-11)

Mixed I/O

- **4150** Robust 16-ch Isolated Digital I/O Module with Modbus (P.4-11)

Counter

- **4168** Robust 8-ch Relay Output Module with Modbus (P.4-11)

Accessories

- **4914V** 4-ch Voltage Input Surge Protection Module (P.4-23)

Communication and Controller Modules Selection Guide

	Controllers			Repeaters		Converters & Data Gateways			
Module	**ADAM-4501 ADAM-4501D**	**ADAM-4502 ADAM-4502D**	**ADAM-4022T**	**ADAM-4510 ADAM-4510S**	**ADAM-4520 ADAM-4522**	**ADAM-4521**	**ADAM-4541 ADAM-4542+**	**ADAM-4561 ADAM-4562**	**ADAM-4570 ADAM-4571**
Network	Ethernet, RS-232, RS-485		RS-485	RS-422 RS-485	RS-232 to RS-422/485		Fiber Optic to RS-232/422/485	USB to RS-232/485/422	Ethernet to RS-232/422/485
Comm. Protocol	Modbus/RTU, Modbus/TCP TCP/IP, UDP, ICMP, ARP, DHCP		ASCII Command/ Modbus	-					
Comm. Speed (bps)	Ethernet: 10/100M Serial: From 1200 to 115.2 kbps		Serial: From 1200 to 115.2 k						Ethernet: 10/100 M Serial: up to 230.4 k
Comm. Distance	Ethernet: 100 m Serial: 1.2 Km		Serial: 1.2 km	Serial: 1.2 km	Serial: 1.2 km	Serial: 1.2 km	ADAM-4541: 2.5 km ADAM-4542: 15 km	Serial: 1.2 km	LAN: 100 m Serial: 1.2 km
Interface Connectors	Ehternet: RJ-45 RS-485: plug-in screw terminal RS-232: RJ-48		RS-485: plug-in screw terminal	RS-422/485: plug-in screw terminal	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)	Ethernet: RJ-45 RS-232/422/485: RJ-48
LED Indicators	Communication & Power		Power	Communication and Power					Network: Tx/Rx Link, Speed, Power
Data Flow Control	Yes		Yes	-	-	Yes	-	Yes	Yes
Watchdog Timer	Yes		Yes	-	-	Yes	-	Yes	Yes
Isolation Voltage	-	1000 V_{DC}	3000 V_{DC}	3000 V_{DC} (ADAM-4510S)	3000 V_{DC} (ADAM-4520)	1000 V_{DC}	-	ADAM-4561: 3000 V_{DC} ADAM-4562: 2500 V_{DC}	-
Special Features	Email function Built-in HTTP and FTP Server		PID Control	-	-	-	-	-	-
Built-in I/O	4DI/4DO	1AI/1AO/2DI/2DO	-	-	-	-	-	-	-
Power Requirement	+10 ~ +30 V_{DC}								
Operating Temperature	-10 ~ 70° C		-10 ~ 50° C	-10 ~ 70° C					0 ~ 60° C
Humidity	5 ~ 95% RH								20 ~ 95% RH
Power Consumption	4 W @ 24 V_{DC}			1.4 W @ 24 V_{DC}	1.2 W @ 24 V_{DC}	1 W @ 24 V_{DC}	1.5 W @ 24 V_{DC}	ADAM-4561: 1.5 W @ 5 V_{DC} ADAM-4562: 1.1 W @ 5 V_{DC}	4 W @ 24 V_{DC}
Page	4-12	4-13	4-19	4-14	4-14	4-14	4-15	4-15	Chapter 17

I/O Modules Selection Guide

Analog Input

Module		ADAM-4011/ ADAM-4011D	ADAM-4012	ADAM-4013	ADAM-4015 ADAM-4015T	ADAM-4016	ADAM-4017	ADAM-4017+	ADAM-4018	ADAM-4018+	ADAM-4019+
Resolution		16 bit									
Analog Input	Input Channels	1 differential			6 differential	1 differential	6 differential, 2 single-ended	8 differential	6 differential, 2 single-ended	8 differential	8 differential
	Sampling Rate	10 Hz			10 Hz (total)						
	Voltage Input	±15 mV ±50 mV ±100 mV ±500 mV ±1 V ±2.5 V	±150 mV ±500 mV ±1 V ±5 V ±10 V	-	-	±15 mV ±50 mV ±100 mV ±500 mV	±150 mV ±500 mV ±1 V ±5 V ±10 V	±150 mV ±500 mV ±1 V ±5 V ±10 V	±15 mV ±50 mV ±100 mV ±500 mV ±1 V ±2.5 V	-	± 100 mV ± 500 mV ± 1 V ± 2.5 V ± 5 V ± 10 V
	Current Input	±20 mA	±20 mA	-	-	±20 mA	±20 mA	4~20 mA, ±20 mA	±20 mA	4~20 mA, ±20 mA	4 ~ 20 mA ± 20 mA
	Direct Sensor Input	J, K, T, E, R, S, B Thermocouple	-	RTD	ADAM-4015: RTD ADAM-4015T: Thermistor	-	-	-	J, K, T, E, R, S, B Thermocouple	J, K, T, E, R, S, B Thermocouple	J, K, T, E, R, S, B Thermocouple
	Burn-out Detection	Yes	-	-	Yes	-	-	-	-	Yes	Yes (4~20 mA & All T/C)
	Channel Independant Configuration	-	-	-	Yes	-	-	Yes	-	Yes	Yes
Analog Output	Output Channels	-	-	-	-	1	-	-	-	-	-
	Voltage Output	-	-	-	-	0 - 10 V	-	-	-	-	-
	Current Output	-	-	-	-	30 mA	-	-	-	-	-
Digital Input and Output	Digital Input Channels	1	1	-	-	-	-	-	-	-	-
	Digital Output Channels	2	2	-	-	4	-	-	-	-	-
	Alarm Settings	Yes	Yes	-	-	-	-	-	-	-	-
Counter (32-bit)	Channels	-	-	-	-	-	-	-	-	-	-
	Input Frequency	-	-	-	-	-	-	-	-	-	-
Isolation		3000 V_{DC}									
Digital LED Indicator		Yes (4011D)	-								
Watchdog Timer		Yes (System)	Yes (System)	Yes (System)	Yes (System & Comm.)	Yes (System)	Yes (System)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)
Safety Setting		-									
Modbus Support *		-	-	-	Yes	-	-	Yes	-	Yes	Yes
Page		4-16	4-16	4-16	4-17	4-17	4-18	4-18	4-18	4-18	4-18

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

Analog Output		Digital Input/Output						Relay Output			Counter
ADAM-4021	**ADAM-4024**	**ADAM-4050**	**ADAM-4051**	**ADAM-4052**	**ADAM-4053**	**ADAM-4055**	**ADAM-4056S/ ADAM-4056SO**	**ADAM-4060**	**ADAM-4068**	**ADAM-4069**	**ADAM-4080/ ADAM-4080D**
12 bit	12 bit	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
1	4	-	-	-	-	-	-	-	-	-	-
0 ~ 10 V	±10 V	-	-	-	-	-	-	-	-	-	-
0 ~ 20 mA 4 ~ 20 mA	0 ~ 20 mA 4 ~ 20 mA	-	-	-	-	-	-	-	-	-	-
-	4	7	16	8	16	8	-	-	-	-	-
-	-	8	-	-	-	8	ADAM-4056S: 12 (Sink) ADAM-4056SO: 12 (Source)	4-ch relay	8-ch relay	8-ch power relay	2
-	Yes	-	-	-	-	-	-	-	-	-	Yes
-		-		-	-		-	-	-	-	2
-	-	-	-	-	-	-	-	-	-	-	50 kHz
3,000 V_{DC}	3,000 V_{DC}	-	2,500 V_{DC}	5,000 V_{RMS}	-	2,500 V_{DC}	5000 V_{DC}	-	-	-	2,500 V_{RMS}
-	-	-	Yes	-	-	Yes	Yes	-	-	-	Yes (4080D)
Yes (System)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)	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	-	-	Yes	Yes	-	Yes	Yes	-
4-19	4-19	4-20	4-20	4-20	4-21	4-21	4-21	4-22	4-22	4-22	4-23

ADAM-4000 Robust Family

Robust RS-485 Modules Overview

Introduction

The ADAM-4000 robust family includes the ADAM-4100 series modules, ADAM-4510I and ADAM-4520I modules. The ADAM-4100 series modules 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. Support 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. Support ±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. Support 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 Update

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).

Robust RS-485 I/O Modules Selection Guide

Module		ADAM-4117	ADAM-4118	ADAM-4150	ADAM-4168
Resolution		16 bit		-	-
Analog Input	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 and Output	Digital Input Channels	-	-	7	-
	Digital Output Channels	-	-	8	8-ch relay
Counter	Channels	-	-	7	-
	Input Frequency	-	-	3 kHz	-
Isolation Voltage		3000 V_{DC}			
Digital LED Indicator		Communication and Power			
Watchdog Timer		Yes (System & Communication)			
Safety Setting		-		Yes	
Communication Protocol		ASCII Command/Modbus			
Power Requirement		10 ~ 48 V_{DC}			
Operating Temperature		-40 ~ 85° C			
Storage Temperature		-40 ~ 85° C			
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}
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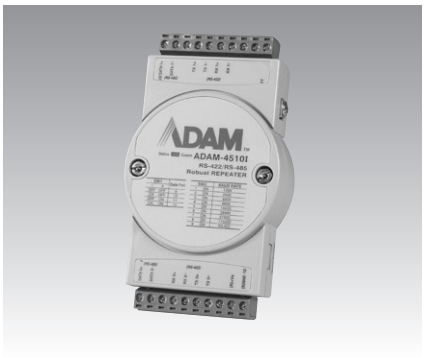
Module	ADAM-4510I	ADAM-4520I
Network	RS-422/485	RS-232 to RS-422/485
Communication Speed (bps)	From 1200 to 115.2k	
Communication Distance	Serial: 1.2 km	
Interface Connectors	RS-422/485: plug-in screw terminal	RS-232: female DB9 RS-422/485: plug-in screw terminal
Digital LED Indicators	Communication and Power	
Auto Data Flow Control	Yes	
Isolation Voltage	3000 V_{DC}	
Power Requirement	10 ~ 48 V_{DC}	
Operating Temperature	-40 ~ 85° C	
Storage Temperature	-40 ~ 85° C	
Humidity	5 ~ 95%	
Power Consumption	1.4 W @ 24 V_{DC}	1.2 W @ 24 V_{DC}
Page	4-10	4-10

ADAM-4510I
ADAM-4520I
ADAM-4117

Robust RS-422/485 Repeater

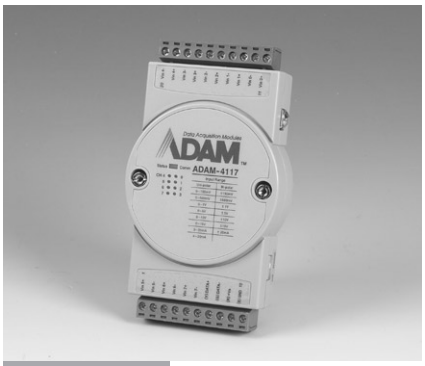
Robust RS-232 to RS-422/485 Converter

Robust 8-ch Analog Input Module with Modbus®



ADAM-4510I

ADAM-4520I



ADAM-4117

Specifications

General

- **Connectors** 2 x Plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 1.4 W @ 24 V_{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)** 1200,2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422. (switchable)
- **Support 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 (4-wire)
- **Output** RS-485 (2-wire) or RS-422 (4-wire).
- **Speed Modes (bps)** 1200,2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422. (switchable)
- **Support Auto Baud-Rate**

Specifications

General

- **Connectors** 2 x Plug-in terminal block (#14 ~ 22 AWG)
- **Watchdog Timer** System (1.6 second) & Communication
- **Support Protocol** 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: 20 MΩ Current: 120 Ω
- **Input Type** mV, V (supports uni-polar 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 bits
- **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
- **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** 3000 V_{DC}

Environment

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

Ordering Information

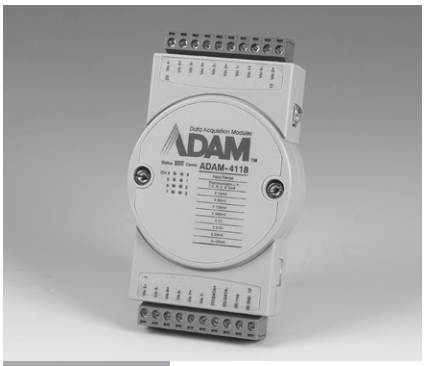
- **ADAM-4510I** Robust RS-422/485 Reapter
- **ADAM-4520I** Robust RS-232 to RS-422/485 Converter
- **ADAM-4117** Robust 8-ch Analog Input Module with Modbus®

ADAM-4118
ADAM-4150
ADAM-4168

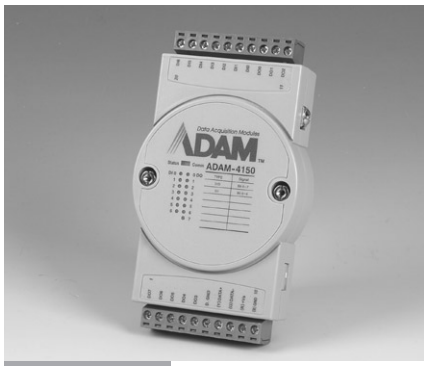
Robust 8-ch Thermocouple Input Module with Modbus®

Robust Digital I/O Module with Modbus

Robust Relay Output Module with Modbus



ADAM-4118



ADAM-4150

ADAM-4168

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
  K 0 ~ 1370 °C
  T -100 ~ 400 °C
  E 0 ~ 1000 °C
  R 500 ~ 1750 °C
  S 500 ~ 1750 °C
  B 500 ~ 1800 °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
- **Zero Drift** ±6μV/° C
- **Built-in TVS/ESD Protection**

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 V to +30 V
  (Note: The Digital Input Level 0 and 1 status can be inverted)
- **Support 3 kHz Counter Input (32-bit + 1-bit overflow)**
- **Support 3 kHz Frequency Input**
- **Support Invert DI Status**

Digital Output

- **Channels** 8, open collector to 40 V (1 A max. load)
- **Power Dissipation** 1W load max
- **Ron Maximum** 150 mΩ
- **Support 1 kHz Pulse Output**
- **Support High-to-Low Delay Output**
- **Support 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)** AC: 0.5 A @ 120 V
  0.25 A @ 240 V
  DC: 1 A @ 30 V
  0.3 A @ 110 V
- **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**

Ordering Information

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

Common Specifications

- **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** 3000 V_{DC}
- **Support Protocol** ASCII Command and Modbus/RTU

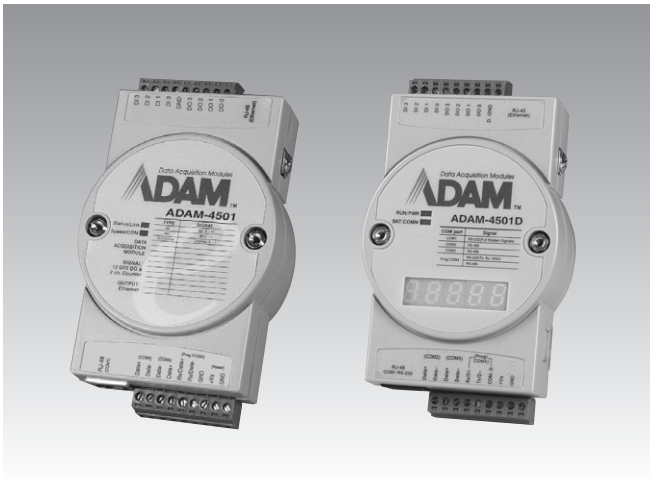
Environment

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

ADAM-4501
ADAM-4501D

Ethernet-enabled Communication Controller with 4 x DI/O

ADAM-4501 with 7-segment LED Display



ADAM-4501 ADAM-4501D

Features

- 10/100Base-T Ethernet Interface
- Email alarm function
- Built-in Web Server
- Built-in FTP Server and Client
- Supports functionally versatile I/O modules
- Full Functions of Standard TCP and UDP Sockets
- Optional 4 digit 7-segment LED display
- Supports Modbus/RTU and Modbus/TCP function libraries
- 1.5 MB Flash ROM/640 KB SRAM
- 4 Serial Ports Available
- Integrated All Operations in Windows Utility

Introduction

The ADAM-4501/4501D consists of compact-sized Ethernet-enabled communication controllers with a x86 CPU architecture. They support not only an Ethernet interface but also 4 serial ports, which makes them very suitable for industrial communication and control applications. The Ethernet-enabled features include built-in HTTP Server, FTP Server and email alarm functions. The modularized I/O design provides high flexibility for versatile application requirements. The ADAM-4501/4501D also supports rich Modbus function libraries including Modbus/RTU (Master/Slave) and Modbus/TCP (Server/Client) function libraries.

Specifications

General

- **Connectors** 1 x RJ45 (Ethernet)
  1 x RJ48 (COM1)
  2 x Plug-in terminal blocks (#14~28 AWG)
- **Indicators** LEDs for Power, run, communication and battery
- **Power Input** Unregulated 10 ~ 30 V_{DC} w/power reversal protection

System

- **CPU** 40 MHz, 16-bit
- **CPU Power Consumption** 4 W @ 24 V_{DC}
- **Memory** 1.5 MB flash memory:
  - 256 KB system flash disk (Drive C: Read Only)
  - 256 KB flash memory (accessed by function LIB)
  - 1024 KB file system, 960 KB for user applications (Drive D: Read/Write)

  640 KB SRAM, up to 384 KB with battery backup (accessed by function LIB)
- **Real-time Clock (RTC)** Yes
- **Watchdog Timer** Yes

Input/Output

- **Digital Input**
  Channels: 4
  Dry Contact: Logic level 0 : Close to GND
  Logic level 1 : Open
  Wet Contact: Logic level 0 : +2 V max.
  Logic level 1 : 4 V ~ 30 V
- **Digital Output**
  Channels: 4
  Open Collector to +30 V, 30 mA max. load
  Power Dissipation 200 mW

Communication

- **LAN** 1 x 10/100Base-T
- **RS-485 Speed** 1.2 to 115.2 kbps
- **Serial Ports** COM1: RS-232 (Full Modem Signals)
  COM2, COM3: RS-485
  COM4: RS-232 (Programming Port)/RS-485 (Selected by Jumper)

Software

- **C Library** Borland C++ 3.0 for DOS
- **Operating System** ROM-DOS

Environment

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

Ordering Information

- **ADAM-4501** Ethernet-enabled Communication Controller with 4 x DI/O
- **ADAM-4501D** ADAM-4501 with 7-segment LED Display

ADAM-4502
ADAM-4502D

Ethernet-enabled Communication Controller with 1 x AI/O, 2 x DI/O

ADAM-4502 with 7-segment LED Display

ADAM-4502 ADAM-4502D

Features

- 10/100Base-T Ethernet Interface
- Email alarm function
- Built-in Web Server
- Built-in FTP Server and Client
- Supports functionally versatile I/O modules
- Full Functions of Standard TCP and UDP Sockets
- Optional 4 digit 7-segment LED display
- Supports Modbus/RTU and Modbus/TCP function libraries
- 1.5 MB Flash ROM/640 KB SRAM
- 4 Serial Ports Available
- Integrated All Operations in Windows Utility

Introduction

With Modular Design, the ADAM-4502/4502D module has all the same functionality as ADAM-4501/4501D module, but provides different I/O option. The ADAM-4502/4502D provides one Ethernet interface and 4 serial ports just like the ADAM-4501/4501D module. Besides, the ADAM-4502/4502D module provides 1 analog input, 1 analog out, 2 digital input and 2 digital output. Therefore, user can implement the rich interfaces to complete various different applications.

Specifications

General

- **Connectors**: 1 x RJ45 (Ethernet)
1 x RJ48 (COM1)
2 x Plug-in terminal blocks (#14 ~ 28 AWG)
- **Indicators**: LEDs for Power, run, communication and battery
- **Power Input**: Unregulated 10 ~ 30 V_{DC} w/power reversal protection

System

- **CPU**: 40 MHz, 16-bit
- **CPU Power Consumption**: 4 W @ 24 V_{DC}
- **Memory**: 1.5 MB flash memory:
- 256 KB system flash disk (Drive C: Read Only)
- 256 KB flash memory (accessed by function LIB)
- 1024 KB file system, 960 KB for user applications (Drive D: Read/Write)
640 KB SRAM, up to 384 KB with battery backup (accessed by function LIB)
- **Real-time Clock (RTC)**: Yes
- **Watchdog Timer**: Yes

Input/Output

- **Analog Input**
  - Channels: 1
  - Input Type: mV, V, mA
  - Input Range: ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, 4~20 mA
  - Resolution: 16-bit
  - Sampling rate: 100 Sample/second
  - Isolation Voltage: 1000 V_{DC}
- **Analog Output**
  - Channels: 1
  - Output Type: V, mA
  - Output Range: 0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
  - Slew Rate: 1 V/μs
  - Isolation Voltage: 1000 V_{DC}
- **Digital Input**
  - Channels: 2
  - Dry Contact: Logic level 0 : Close to GND
Logic level 1 : Open
  - Wet Contact: Logic level 0 : +2 V max.
Logic level 1 : 4 V ~ 30 V
- **Digital Output**
  - Channels: 2
  - Open Collector to +40 V, 1 A max. load
  - Power Dissipation: 1 W load maximum

Communication

- **LAN**: 1 x 10/100Base-T
- **RS-485 Speed**: 1.2 to 115.2 kbps
- **Serial Ports**: COM1: RS-232 (Full Modem Signals)
COM2, COM3: RS-485
COM4: RS-232 (Programming Port)/RS-485 (Selected by Jumper)

Software

- **C Library**: Borland C++ 3.0 for DOS
- **Operating System**: ROM-DOS

Environment

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

Ordering Information

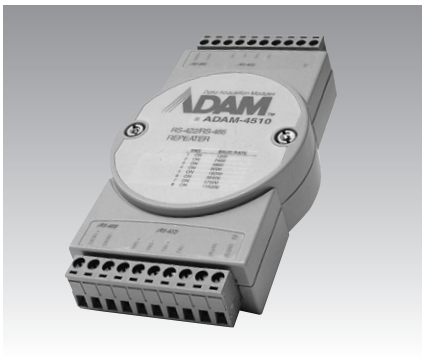
- **ADAM-4502**: Ethernet-enabled Communication Controller with 1 x AI/O, 2 x DI/O
- **ADAM-4502D**: ADAM-4502 with 7-segment LED Display

ADAM-4510/4510S
ADAM-4520/4522
ADAM-4521

RS-422/485 Repeaters

RS-232 to RS-422/485 Converters

Addressable RS-422/485 to RS-232 Converter



ADAM-4510/4510S

Specifications

General

- **Connectors** 2 x Plug-in terminal blocks (#14 ~ 22 AWG) (RS-422/485)
- **Isolation Voltage** 3000 V_{DC} (4510S only)
- **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)** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)

ADAM-4520/4522

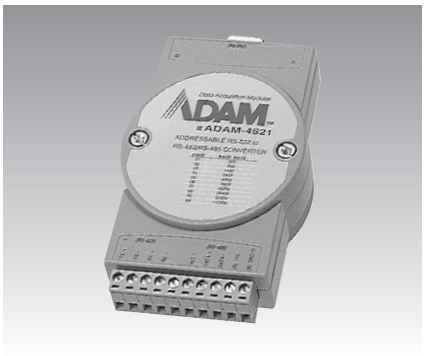
Specifications

General

- **Connectors** 1 x Plug-in terminal block (#14 ~ 22 AWG) (RS-422/485)
  1 x DB9-F (RS-232)
- **Isolation Voltage** 3000 V_{DC} (4520 only)
- **Power Consumption** 1.2 W @ 24 V_{DC}

Serial Communications

- **Input** RS-232 (4-wire)
- **Output** RS-485 (2-wire) or RS-422 (4-wire)
- **Speed Modes (bps)** 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)



ADAM-4521

Specifications

General

- **Connectors** 1 x Plug-in terminal block (#14 ~ 22 AWG) (RS-422/485)
  1 x DB9-F (RS-232)
- **Isolation Voltage** 1000 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 (4-wire)
- **Speed Modes (bps)** 300, 600, 1200, 2400, 4800, 9600, 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 Temperature** - 10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** - 25 ~ 85°C (-13 ~ 185° F)
- **Humidity** 5 ~ 95% RH

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-4522** RS-232 to RS-422/485 Converter
- **ADAM-4521** Addressable RS-422/485 to RS-232 Converter

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

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

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}

Serial Communications

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

Fiber Optic Communications

- **Optical Power Budget (attenuation)** 12.5 dB (measured with 62.5/125 mm)
- **Transmission Distance** 2.5 km
- **Transmission Mode** Multi mode (Send and Receive)
- **Wavelength** 820 nm

Specifications

General

- **Power Input** Unregulated 10 ~ 30 V_{DC}
- **Connectors** 1 x Plug-in terminal block (#14 ~ 22 AWG) (RS-232/422/485)
  1 x SC fiber connector
- **Power Consumption** 1.5 W @ 24 V_{DC}

Serial Communications

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

Fiber Optic Communications

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

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: 3000 V_{DC}
  ADAM-4562: 2500 V_{DC}
- **Power Consumption**
  ADAM-4561: 1.5 W @ 5 V
  ADAM-4562: 1.1 W @ 5 V
- **Driver Support** Windows 98/2000/XP
- **Full Compliance with USB v1.1 specifications**

Serial Communications

- **Speed Modes (bps)** 75 bps to 115.2 kbps
- **Transmission Modes** Full/half duplex, bidirectional

Common Specifications

Environment

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

Ordering Information

- **ADAM-4541** Multi-mode Fiber Optic to RS-232/422/485 Converter
- **ADAM-4542+** Single-mode Fiber Optic 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

ADAM-4011/4011D
ADAM-4012
ADAM-4013

1-ch Thermocouple Input Modules (with 7-segment LED Display)

1-ch Analog Input Module

1-ch RTD Input Module

ADAM-4011/4011D

ADAM-4012

ADAM-4013

Specifications

General

- **Power Consumption** 1.4 W @ 24 V_{DC}
- **Support Protocol** ASCII command
- **LED Indicators** 5-digit (ADAM-4011D)

Analog Input

- **Channels** 1
- **Input Impedance** Voltage: 2 MΩ
  Current: 125 Ω
  (Added by users)
- **Input Type** T/C, mV, V or mA
- **Input Range** ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA
- **Accuracy** Voltage mode: ±0.1% or better
  Current mode: ±0.2% or better
- **T/C Type and Temperature Range**

J	0 ~ 760° C	**R**	500 ~1750° C
K	0 ~ 1370° C	**S**	500 ~1750° C
T	-100 ~ 400° C	**B**	500 ~1800° C
E	0 ~ 1000° C		

- **Span Drift** ±25 ppm/° C
- **Zero Drift** ±6 μV/° C
- **Wire Burnout Detector** ADAM-4011D only

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

Digital Output

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

Specifications

General

- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Support Protocol** ASCII command

Analog Input

- **Channels** 1
- **Input Impedance** Voltage: 20 MΩ
  Current: 125 Ω
  (Added by users)
- **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}
- **Support Protocol** ASCII command

Analog Input

- **Channels** 1
- **Input Connections** 2, 3, or 4-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

Common Specifications

General

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

Analog Input

- **Resolution** 16-bit
- **Sampling Rate** 10 sample/second
- **CMR @ 50/60 Hz** 150 dB
- **NMR @ 50/60 Hz** 100 dB
- **Isolation Voltage** 3000 V_{DC}

Environment

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

Ordering Information

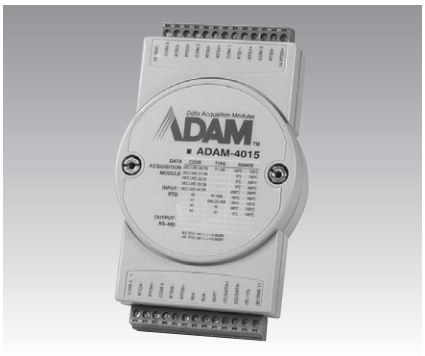
- **ADAM-4011** 1-ch Thermocouple Input Module
- **ADAM-4011D** ADAM-4011 with 7-segment LED Display
- **ADAM-4012** 1-ch Analog Input Module
- **ADAM-4013** 1-ch RTD Input Module

ADAM-4015
ADAM-4015T
ADAM-4016

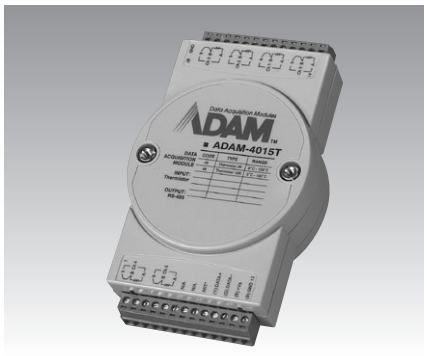
6-ch RTD Module with Modbus®

6-ch Thermistor Module with Modbus

1-ch Analog Input/Output Module



ADAM-4015



ADAM-4015T

ADAM-4016

Specifications

General

- **Connectors**: 2 x Plug-in terminal block (#14 ~ 28 AWG)
- **Power Consumption**: 1.2 W @ 24 V_{DC}
- **Watchdog Timer**: System (1.6 second) & Communication
- **Support Protocol**: ASCII command and Modbus/RTU
- **Wire Burnout Detector**: Yes

Analog Input

- **Channels**: 6 differential
- **Input Connections**: 2, 3, or 4-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% or better
- **CMR @ 50/60 Hz**: 120 dB
- **Span Drift**: ± 25 ppm/° C
- **Zero Drift**: ± 3 µV/° C

Specifications

General

- **Connectors**: 2 x Plug-in terminal block (#14 ~ 28 AWG)
- **Power Consumption**: 1.2 W @ 24 V_{DC}
- **Watchdog Time**: System (1.6 second) & Communication
- **Support Protocol**: ASCII command and Modbus/RTU
- **Wire Burnout Detector**: Yes

Analog Input

- **Channels**: 6 differential
- **Input Connections**: 2, 3-wire
- **Input Impedance**: 10 MΩ
- **Input Type**: Thermistor
- **Thermistor Types and Temperature Ranges**

Thermistor 3 k	0 ~ 100° C
Thermistor 10 k	0 ~ 100° C

- **Accuracy**: ±0.1% or better
- **CMR @ 50/60 Hz**: 120 dB
- **Span Drift**: ± 25 ppm/° C
- **Zero Drift**: ± 3 µV/° C

Specifications

General

- **Connectors**: 2 x Plug-in terminal block (#14 ~ 22 AWG)
- **Power Consumption**: 2.2 W @ 24 V_{DC}
- **Watchdog Timer**: System (1.6 second)
- **Support Protocol**: ASCII command

Analog Input

- **Channels**: 1 differential
- **Input Impedance**: Voltage: 2 MΩ; Current: 125 Ω (Added by users)
- **Input Type**: mV and mA
- **Input Range**: ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±20 mA
- **Accuracy**: Voltage mode: ±0.1% or better; Current mode: ±0.2% or better
- **CMR @ 50/60 Hz**: 150 dB
- **Span Ddrift**: ±25 ppm/° C
- **Zero Drift**: ±6 µV/° C

Analog Output

- **Channels**: 1
- **Accuracy**: 0.05% of FSR
- **Output Type**: V
- **Output Range**: 0 ~ 10 V
- **Drift**: ±50 ppm/° C
- **Drive Current**: 30 mA
- **Isolation Voltage**: 3000 V_{DC}

Digital Output

- **Channels**: 4, open collector to 30 V, 30 mA max. load
- **Power Dissipation**: 300 mW

Common Specifications

General

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

Analog Input

- **Resolution**: 16 bits
- **NMR @ 50/60 Hz**: 100 dB
- **Sampling Rate**: 10 sample/second (total)
- **Isolation Voltage**: 3000 V_{DC}

Environment

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

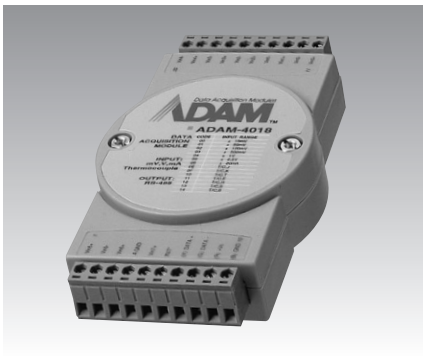
Ordering Information

ADAM-4015	6-ch RTD Input Module with Modbus
ADAM-4015T	6-ch Thermistor Input Module with Modbus
ADAM-4016	1-ch Analog Input/Output Module

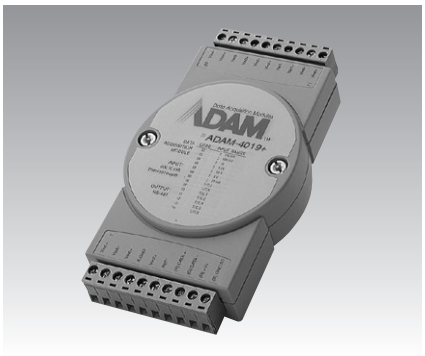
ADAM-4017/4017+
ADAM-4018/4018+
ADAM-4019+

8-ch Analog Input Modules with Modbus®
8-ch Thermocouple Input Modules with Modbus
8-ch Universal Analog Input Module with Modbus

ADAM-4017/4017+



ADAM-4018/4018+



ADAM-4019+

Specifications

General

- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Watchdog Timer** ADAM-4017: System (1.6 second) ADAM-4017+: System (1.6 second) & Communication
- **Support Protocol** ASCII command (ADAM-4017) ASCII command and Modbus/RTU (ADAM-4017+)

Analog Input

- **Channels** ADAM-4017: 6 differential, and 2 single-ended ADAM-4017+: 8 differential
- **Channel Independent Configuration** ADAM-4017+ only
- **Input Impedance** Voltage: 20 MΩ Current: 120 Ω (4017+ only)
- **Input Type** mV, V, mA
- **Input Range**
  ADAM-4017 ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA
  ADAM-4017+ ±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** ADAM-4018: System (1.6 second) ADAM-4018+: System (1.6 second) & Communication
- **Support Protocol** ASCII command (ADAM-4018) ASCII command and Modbus/RTU (ADAM-4018+)

Analog Input

- **Channels** ADAM-4018: 6 differential, and 2 single-ended ADAM-4018+: 8 differential
- **Channel Independent Configuration** ADAM-4018+ only
- **Input Impedance** Voltage: 20 MΩ Current: 120 Ω (4018+ only)
- **Input Type** ADAM-4018 Thermocouple, mV, V, mA ADAM-4018+ Thermocouple, mA
- **Voltage/Current Input Range** ADAM-4018 ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA ADAM-4018+ ±20 mA, 4 ~ 20 mA
- **T/C Types and Temperature Ranges**

J	0 ~ 760° C	**R**	500 ~1750° C
K	0 ~ 1370° C	**S**	500 ~1750° C
T	-100 ~ 400° C	**B**	500 ~1800° C
E	0 ~ 1000° C		

- **Burn-out Detection** All T/C (ADAM-4018+ only)

Specifications

General

- **Power Consumption** 1.0 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 second) & Communication
- **Support Protocol** ASCII command and Modbus/RTU

Analog Input

- **Channels** 8 differential channels for individual input type
- **Channel Independent Configuration** Yes
- **Input Impedance** Voltage: 20 MΩ Current: 120 Ω
- **Input Type** T/C, mV, V, mA
- **Voltage/Current 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 ~ 1750 °C
K	0 ~ 1370 °C	**S**	500 ~ 1750 °C
T	-100 ~ 400 °C	**B**	500 ~ 1800 °C
E	0 ~ 1000 °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** 3000 V_{DC}
- **Overvoltage Protection** ±35 V_{DC}
- **CMR @ 50/60 Hz** 120 dB
- **NMR @ 50/60 Hz** 100 dB
- **Span Drift** ±25 ppm/° C
- **Zero Drift** ±6 μV/° C
- **Built-in TVS/ESD Protection**

Environment

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

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

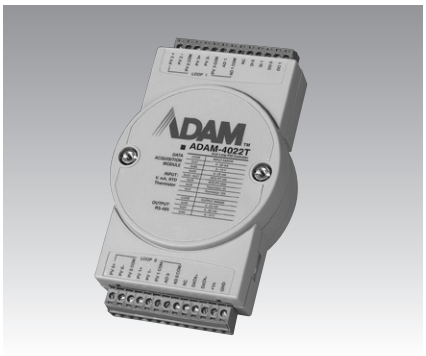
Specifications

General

- **Connectors** 2 x Plug-in terminal block (#14 ~ 22 AWG)
- **Power Consumption** 1.4 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 second)
- **Support Protocol** 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** 3000 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



ADAM-4022T

Specifications

General

- **Connectors** 2 x Plug-in terminal block (#14 ~ 28 AWG)
- **Power Consumption** 4 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 second)
- **Support Protocol** ASCII command and Modbus/RTU

Analog 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 3K: 0 ~ 100° C
  - Thermistor 10K: 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** 3000 V_{DC}

Analog Output

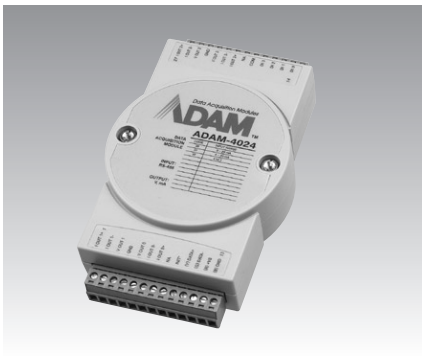
- **Channels** 2
- **Output Range** 0 ~ 20 mA, 4 ~ 20 mA, 0 ~ 10 V
- **Output Type** mA,V
- **Resolution** 12-bit
- **Isolation Voltage** 3000 V_{DC}

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



ADAM-4024

Specifications

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
- **Support Protocol** 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
- **Accuracy** ±0.1 % of FSR for current output ±0.1 % of FSR for voltage output
- **Current Load Resistor** 0 to 500 Ω (source)
- **Resolution** 12-bit
- **Isolation Voltage** 3000 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.: +1V max Logic level 1: 10 ~ 30 V_{DC}
- **Isolation Voltage** 3000 V_{DC}

Common Specifications

General

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

Environment

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

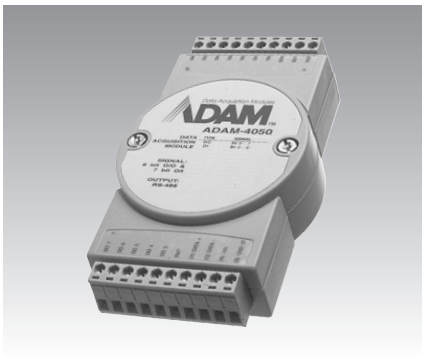
Ordering Information

- **ADAM-4021** 1-ch Analog Output Module
- **ADAM-4022T** 2-ch Serial Based Dual Loop PID Controller with Modbus
- **ADAM-4024** 4-ch Analog Output Module with Modbus

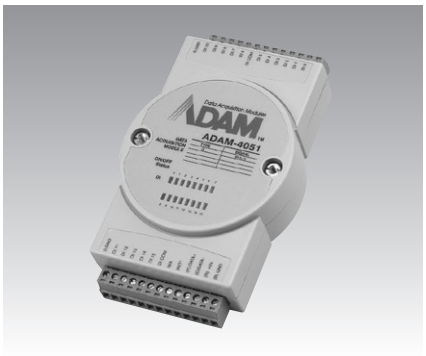
ADAM-4050
ADAM-4051
ADAM-4052

15-ch Digital I/O Module
16-ch Isolated Digital Input Module with Modbus®

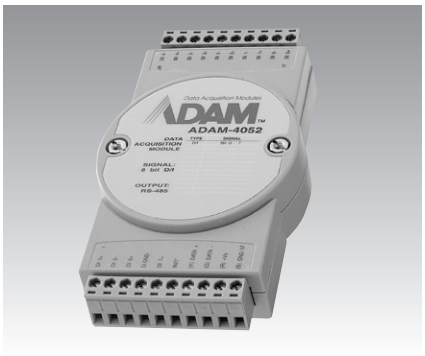
8-ch Isolated Digital Input Module



ADAM-4050



ADAM-4051



ADAM-4052

Specifications

General

- **Connectors** 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- **Power Consumption** 0.4 W @ 24 V_{DC}
- **Watchdog Timer** System (1.6 second)
- **Support Protocol** 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) & Communication
- **Support Protocol** 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: The Digital Input Level 0 and 1 status can be inverted)
- **Isolation Voltage** 2500 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)
- **Support Protocol** 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** 5000 V_{RMS}
- **Input Resistance** 3 kΩ

Common Specifications

General

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

Environment

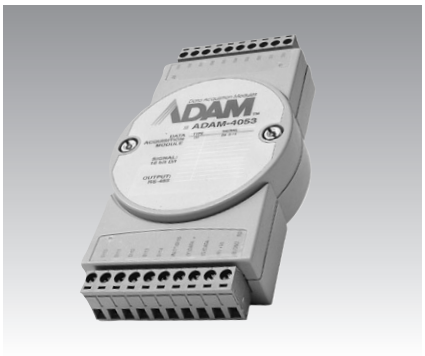
- **Humidity** 5 ~ 95% RH
- **Operating Temperature** - 10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** - 25 ~ 85°C (-13 ~ 185° F)

Ordering Information

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

ADAM-4053
ADAM-4055
ADAM-4056S/4056SO

16-ch Digital Input Module
16-ch Isolated Digital I/O Module with Modbus®
12-ch Sink/Source Type Isolated Digital Output Modules with Modbus



ADAM-4053

ADAM-4055

ADAM-4056S/4056SO

Specifications

General

- **Connectors** 2 x Plug-in terminal blocks (#14 ~ 22 AWG)
- **Watchdog Timer** System (1.6 second)
- **Support Protocol** ASCII command

Digital Input

- **Channels** 16
- **Input Level**
  - Dry contact: Logic level 0: close to GND; Logic level 1: open
  - Wet contact: Logic level 0: +2 V max.; Logic level 1: +4 ~ 30 V
- **Effective Distance (dry contact only)** 500 m max.

Specifications

General

- **Connectors** 2 x Plug-in terminal blocks (#14 ~ 28 AWG)
- **Watchdog Timer** System (1.6 second) & Communication
- **Support Protocol** ASCII command and Modbus/RTU
- **Isolation Voltage** 2500 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 Vmax; Logic level 1: +10 ~ 50 V
  - (Note: The Digital Input Level 0 and 1 status can be inverted)
- **Overvoltage Protection** 70 V_{DC}

Digital Output

- **Channels** 8, open collector to 40 V (200 mA max. load)
- **Power Dissipation** Channel: 1W max; Total: 2.2W (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}
- **Digital Output Channels** 12
- **LED Indicators** Yes

ADAM-4056S

- **Digital Output** Open collector to 40V (200mA max. load)
- **Power Dissipation** Channel: 1 W max; Total: 2.2 W (8 Channels)
- **Digital Output Type** Sink

ADAM-4056SO

- **Digital Output** VCC: 10 ~ 35 V_{DC}; Current: 1A (per channel)
- **Digital Output Type** Source
- **Over Current Detection and Protection**

Common Specifications

- **Power Input** Unregulated 10 ~ 30 V_{DC}
- **Power Consumption** 1W @ 24 V_{DC}

Environment

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

Ordering Information

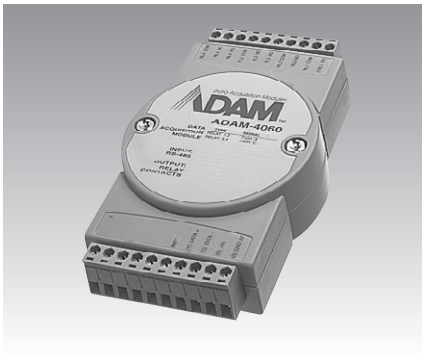
- **ADAM-4053** 16-ch Digital Input Module
- **ADAM-4055** 16-ch Isolated Digital I/O Module with Modbus
- **ADAM-4056S** 12-ch Sink Type Isolated Digital Output Module with Modbus
- **ADAM-4056SO** 12-ch Source Type Isolated Digital Output Module with Modbus

ADAM-4060
ADAM-4068
ADAM-4069

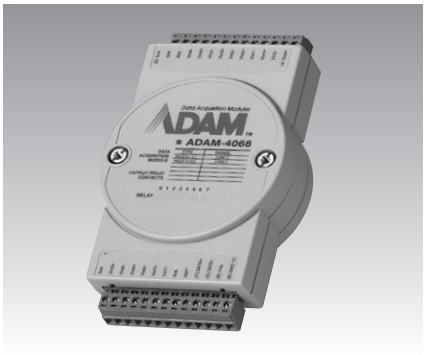
4-ch Relay Output Module

8-ch Relay Output Module with Modbus®

8-ch Power Relay Output Module with Modbus



ADAM-4060



ADAM-4068

ADAM-4069

Specifications

General

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

Relay Output

Breakdown Voltage	500 V_{AC} (50/60 Hz)
Channels	2 x form A 2 x form C
Contact Rating (Resistive)	AC: 0.6 A @ 125 V 0.3 A @ 250 V DC: 2 A @ 30 V 0.6 A @ 110 V
Initial Insulation Resistance	1 G Ω min. at 500 V_{DC}
Relay off Time (typical)	2 ms
Relay on Time (typical)	3 ms

Specifications

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
Support Protocol	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)	AC: 0.5 A @ 120 V 0.25 A @ 240 V DC: 1 A @ 30 V 0.3 A @ 110 V
Initial Insulation Resistance	1 G Ω min. at 500 V_{DC}
Relay off Time (typical)	4 ms
Relay on Time (typical)	3 ms

Specifications

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
Support Protocol	ASCII command and Modbus/RTU

Relay Output

Breakdown Voltage	1000 V_{AC} (50/60 Hz)
Channels	4 x form A 4 x form C
Contact Rating (Resistive)	AC: 5 A @ 250 V DC: 5 A @ 30 V
Initial Insulation Resistance	1 GΩ min. at 500 V_{DC}
Relay off Time (typical)	5.6 ms
Relay on Time (typical)	5 ms

Common Specifications

Power Input	Unregulated 10 ~ 30 V_{DC}

Environment

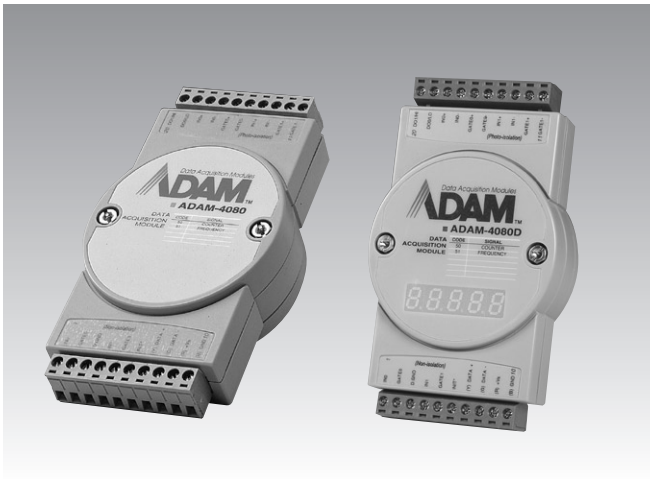
Humidity	5 ~ 95% RH
Operating Temperature	-10 ~ 70° C (14 ~ 158° F)
Storage Temperature	-25 ~ 85°C (-13 ~ 185° F)

Ordering Information

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-4080/4080D
ADAM-4914V

2-ch Counter/Frequency Modules (with 7-segment LED Display)
4-ch Voltage Input Surge Protection Module



ADAM-4080/4080D

ADAM-4914V

Specifications

General

- **Connectors** 2 x Plug-in terminal block (#14 ~ 22 AWG)
- **Power Consumption** 2.0 W @ 24 V_{DC}
- **Power Input** Unregulated 10 ~ 30 V_{DC}
- **Humidity** 5 ~ 95% RH
- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** -25 ~ 85° C (-13 ~ 185° F)
- **Watchdog Timer** System (1.6 second)
- **Support Protocol** ASCII command
- **LED Indicators** 5-digit readout, CH 0 or CH 1 (programmable) (ADAM-4080D only)

Counter Input

- **Channels** 2 independent 32-bit counters
- **Input Frequency** 50 kHz max. (non-isolation)
- **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** 2500 V_{RMS}
- **Non-isolated Input Level** Programmable threshold: Logic level 0: +0.8 V max. Logic level 1: 2.4 ~ 5.0 V
- **Maximum Count** 4,294,967,295 (32 bits)
- **Preset Type** Absolute or relative (ADAM-4080 only)
- **Programmable Digital Noise Filter** 2 µs ~ 65 ms
- **Alarm** ADAM-4080: Alarm comparators on each counter ADAM-4080D: High and Low comparators on counter 0

Frequency Measurement

- **Range** 5 Hz ~ 50 kHz
- **Programmable Built-in Gate Time** 1 or 0.1 second

Digital Output

- **Channels** 2
- **Open Collector** 30 V, 30 mA max. load
- **Power Dissipation** 300 mW for each channel

Specifications

General

- **Connectors** 2 x Plug-in terminal block (#14 ~ 22 AWG)
- **Humidity** 5 ~ 95% RH
- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **Storage Temperature** -25 ~ 85° C (-13 ~ 185° F)
- **Input Channels** 4 differential voltage and thermocouple input

Performance

- **Discharge Current** 5000 A (8/20 µsec.)
- **Discharge Voltage** Between Lines: 18 V min. Line to GND: 350 V max.
- **Internal Series Resistance** Approx. 20 Ω including return
- **Max. Surge Voltage** Between Lines: 23 V min. Line to GND: +4,000 V max.
- **Leakage Current** Between Lines: ≤ 10 µA @ 7.5 V_{DC} Line to GND: ≤ 5 µA @ +140 V_{DC}
- **Maximum Line Voltage** 10 V
- **Response Time** ≤ 0.1 µsec.

Ordering Information

- **ADAM-4080/4080D** 2-ch Counter/Frequency Modules (with 7-segment LED Display)
- **ADAM-4914V** 4-ch Voltage Input Surge Protection Module

ADAM-4000 Series Common Specifications

Communication

- RS-485 (2-wire) to host
- Speeds: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
  (ADAM-4080, ADAM-4080D only support up to 38400 bps)
- Maximum communication distance: 4000 feet (1.2 km)
- Power and communication LED indicator
- ASCII command/response protocol (Selected modules with Modbus protocol)
- Communication error checking with checksum
- Asynchronous data format:
  Advantech (ASCII command) protocol: 1 start bit
  (parity check, data bit, stop bit) = (None, 8, 1)
  Modbus protocol for ADAM-4000 modules: 1 start bit
  (parity check, data bit, stop bit) = (None, 8, 1)
  Modbus protocol for ADAM-4100 series modules: 1 start bit
  (parity check, data bit, stop bit) = (None, 8, 1) (None, 8, 2) (Even, 8, 1) (Odd, 8, 1)
- Up to 256 multidrop modules per serial port
- Online module insertion and removal
- Transient suppression on RS-485 communication lines

Mechanism

- **Dimensions** 70 x 122 x 30 mm (W x H x D)
- **Enclosure** ABS + PC
- **Mounting** DIN 35 rail, stack, wall

Dimensions