Remote DA&C Modules
ADAM-4000 Series

13

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.

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.

Watchdog Timer Inside

A watchdog timer supervisory function will automatically reset the ADAM-4000 series modules if required, which reduces the need for maintenance.

Flexible Networking

The 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.

Alternative Standalone Control Solution

A stand-alone control solution is made possible when the ADAM-4000 series modules are controlled by the ADAM-4500 or ADAM-4501 PC-based communication controller. The ADAM-4500 or ADAM-4501 allows users to download an application (written in a high-level programming language) into its Flash ROM. This allows customization for your applications.

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.

Ready for the Industrial Environment

The ADAM-4000 series modules accept any unregulated power source between +10 and +30 V_{DC}. They are protected from accidental power supply reversals and can be safely connected or disconnected without disturbing a running network.

FM APPROVED
Class I, Div. 2 Groups ABCD
(NI / I / 2 / ABCD / T*)

ADAM-4000 Remote DA&C System

The ADAM-4000 remote DA&C system encompasses a full product line integrating HMI platforms and numerous I/O modules such as DI/O, AI/O, relay and counter modules. In addition, we offer many communication models for data transfer: Ethernet wireless, Modbus, RS-485, and fiber optics. Users can choose among specific modes according to their specific application purposes. Data transfer can be uploaded to HMI platforms via a safe Ethernet channel for monitoring and controlling. All this can be done using an existing data bus without investing in extra hardware.

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. These modules (ADAM-4015/4017+/4018+/4019+/4024/4051/4055/4056S/4056SO/4068/4069), include analog I/O and digital I/O, needed in a data acquisition system. 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.

Ethernet

ADAM-4570 and ADAM-4571 are designed for the connection between serial devices (RS-232/485/422) 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.

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.

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-232/485. It offers a transmission distance of up to 2500 m with a total immunity to electromagnetic noise.

GSM Communication Module

The ADAM-4581 1-port GSM to RS-232/485 Wireless Data Gateway product provides GSM CSD data communication as well as SMS service through the interface with the Dual-band GSM (900/1800) module for applications in facility management systems, water/wastewater monitoring, pipeline monitoring, unmanned telecommunication facility monitoring, surveillance, as well as others. The ADAM-4581's interface uses the industrial device standard RS-232/485 with auto-flow control.
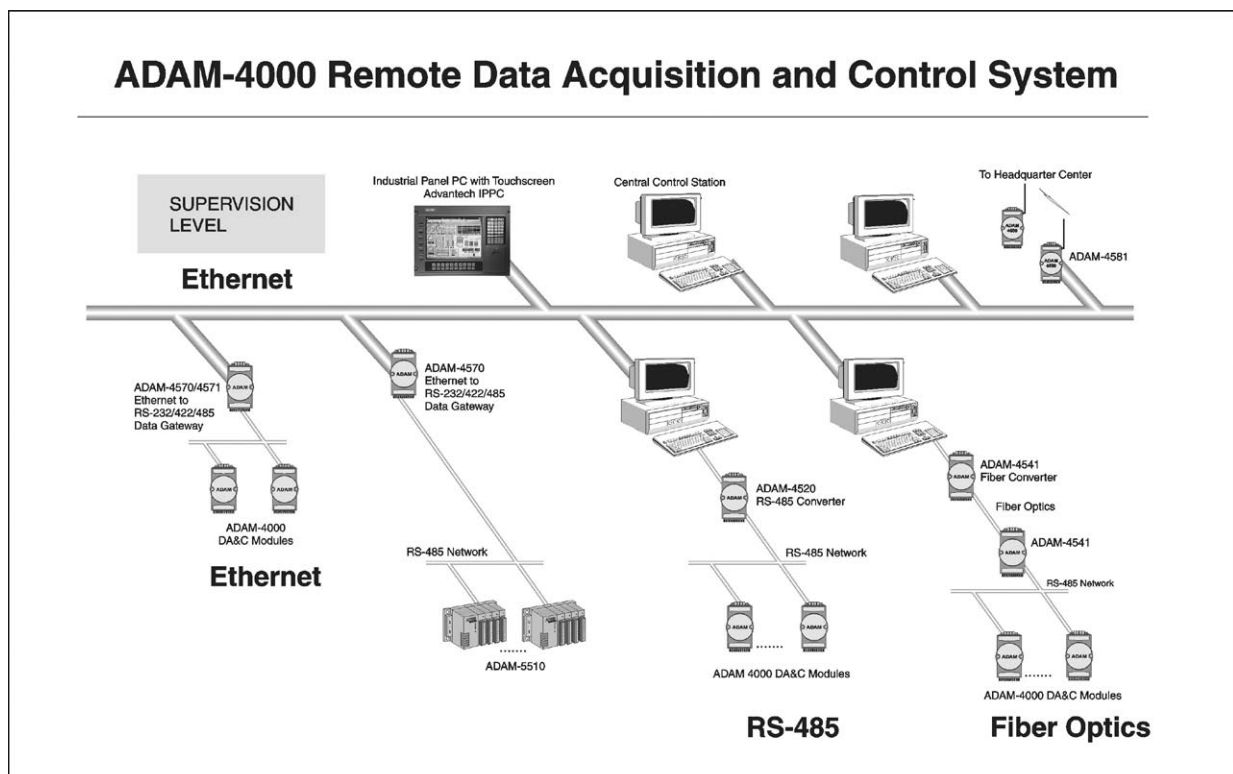
ADAM-4000 Remote Data Acquisition and Control System

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ADAM-4000 Series Modbus I/O Solution

- Multi-channel/Multi-Input
- Open Wired Diagnostic
- 4~20mA Standard

ADAM-4015
ADAM-4017+
ADAM-4018+
ADAM-4019+

Modbus Network

AI

AI — ADAM-4024

DIO

- Isolation
- LED Indicator

ADAM-4051
ADAM-4055
ADAM-4068
ADAM-4056S
ADAM-4056SO
ADAM-4069
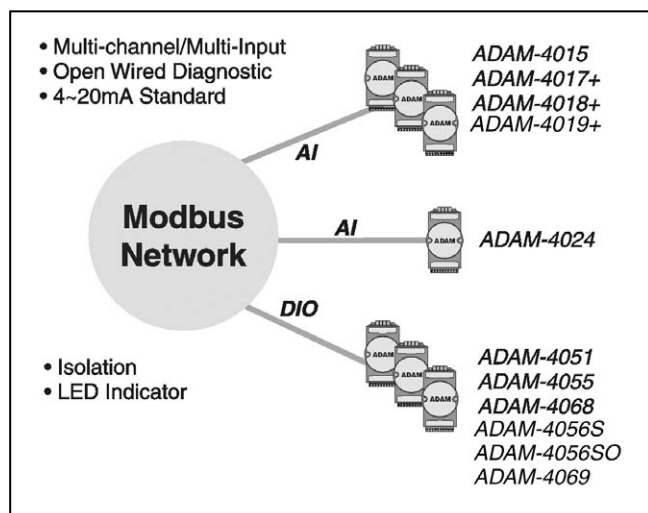
The Advanced I/O Solution for any Modbus System Integration

Introduction

The ADAM-4000 Series is a complete I/O solution, featuring Modbus Network Support, with a robust and intelligent design. It is the easiest to use, and a cost-effective choice for your system I/O needs.

Modbus Network Support

The Modbus® protocol has become a de facto standard for data exchange and information communication in industrial network applications. The Modbus® devices communicate over a serial network in a master/slave (request/response) type relationship using one of two transmission modes: ASCII (American Standard Code for Information Interchange) mode or RTU (Remote Terminal Unit) mode. The ADAM-4000 Modbus I/O modules are designed to operate as slave devices on a Modbus network, which communicates in Modbus/RTU transmission mode.

Easy Plug-in System Integration

With the ADAM-4000 Modbus I/O Built-in Modbus/RTU protocol, any controller bearing Modbus/RTU standard can be integrated as part of a control system. Any Modbus Ethernet data gateway can upgrade these I/O Modules up to the Modbus/TCP Ethernet layer. Most HMI software are bundled with a Modbus driver, and can access the ADAM-4000 I/O directly. Moreover, Advantech provides Modbus OPC Server & Modbus/TCP OPC Server as data exchange interfaces between the ADAM-4000 Modbus I/O and any Windows Applications.

Dual Protocol Support

To satisfy both current ADAM users and Modbus users, these ADAM-4000 Modules support both the ADAM protocol and Modbus/RTU protocol. You can select the communication mode you want through the Windows Utility Software. If users apply the ADAM protocol, the ASCII command/response will remain the same as usual. In RTU mode, data is sent as two four-bit, hexadecimal characters, providing for higher throughput than in ASCII mode for the same baud rate.

Complete I/O Series

We are proud to offer a complete I/O series, which includes Analog Input (ADAM-4017+/ADAM-4019+), T/C Input (ADAM-4018+), RTD Input (ADAM-4015), Analog Output (ADAM-4024), Digital Input/Output (ADAM-4051/4055/4056S/4056SO), and Relay Output (ADAM-4068/4069) Modules.

Robust Design

The ADAM-ADAM/4015/4017+/ADAM-4018+/ADAM-4019+/4024 are designed with Channel differential, $3000V_{DC}$ system isolation. Moreover, ADAM-4017+/4018+/4019+ offer 4~20 mA input range without the use of an additional resistor. The ADAM-4051/4055/4056S/4056SO, built with $2500V_{DC}$ isolation, are a robust & high density DI/O solutions.

Intelligent Function

Different from other ADAM AI/O modules, the ADAM-4015/4017+/4018+/4019+/4024+ can be set in different ranges, and in different channels. The ADAM-4015/4018+/4019+ are even designed with a burned-out diagnostic function to inform users of problems with wire openings. When the alarm triggers, the ADAM-4024 provides 4 alarm DI points to interlock with individual AO channels. The intelligent function consists of the built-in LED indicator. From the front panel of the ADAM-4051/4055/4056S/4056SO/4068, users

Modbus/TCP

Modbus/RTU

Modbus Ethernet Data Gateway

HMI Server (Modbus/RTU)

Modbus Controller

ADAM-4000 Modbus I/O

ADVANTECH **Remote DA&C Modules**

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ADAMView

Data Acquisition Software

Modularized and Prioritized Task Design

ADAMView development environment allows you to decompose your system into several smaller modules or tasks. The modular design is very useful to develop, and facilitate large and complicated system maintenance. Each module or task has its own properties, such as scan rate, start/stop method, and priority etc. With 32-bit Windows' multi-tasking capability, all tasks run simultaneously. Moreover, ADAMView software allows you to prioritize your tasks to increase overall performance.

Powerful BasicScript Scripting Language to Customize Your Needs

ADAMView is easy to use. It fully integrates BasicScript language in its kernel to meet your specific needs. Over 600 commands are available to perform almost any function you can imagine, including calculations, reading and writing files, DDE, and ODBC. It allows you to access and share data with other applications, such as Microsoft Access and Microsoft Excel. With BasicScript scripting language, you can reuse existing code and build your applications faster and easier.

Plug-and-Play Connect with ADAM I/O series

Once you install the ADAMView software, you can immediately connect with ADAM-4000/5000 I/O as a complete Data Acquisition System. Current ADAM users can apply direct driver to access all ADAM-4000 modules and ADAM-5000/485 I/O system. Modbus users can link ADAM-5511, ADAM-4000 Modbus I/O, and ADAM-6000 through the Modbus OPC server and Modbus/TCP OPC Server.

The Operation Interface Software designed for ADAM

We have noticed that many users apply the ADAM Data Acquisition modules in small base projects. Because the cost ran higher than system hardware, Human Machine Interface software were never suitable for these projects. ADAMView, the ADAM Data Acquisition software, is especially designed for low-volume ADAM projects. It provides a 150 physical points database, ADAM Drivers, and OPC Server for all monitoring and control functions. In brief, ADAMView is a cost-effective and simple SCADA software for the ADAM I/O series.

Complete Software Package

ADAMView takes advantage of Microsoft's Windows graphical interface, offering fast and intuitive configuration for human-machine interface and data acquisition applications. This application software combines easy-to-use graphical development and the flexibility of BasicScript, a powerful programming tool. With ADAMView, you can easily design both simple and complex applications, such as factory processes and utility monitoring, Lab testing, or environmental monitoring.

Graphical Panel Configuration

ADAMView provides a wide variety of graphical wizards, allowing users to quickly create an intuitive operator interface. Built-in display objects include bar graph, button, indicator, real time/historical trending, knob, gauge, slider, imported bitmap, numeric display and control.

Hardware Supported

- **ADAM-4000/5000 Series Modules**: Link through DLL Driver (Device Manager)
- **ADAM-4000 Modbus Series Modules:** Link through Modbus® OPC Server
- **ADAM-5511 Modbus Controller:** Link through Modbus® OPC Server
- **ADAM-5000/TCP, ADAM-6000 I/O Modules:** Link through Modbus/TCP OPC Server
- **ADAM-4501 Controller**: Link through Modbus/TCP OPC Server
- **ADAM-5510 Series Controller**: Link through Modbus® OPC Server
- **ADAM-5510KW Series Controller**: Link through Modbus® OPC Server

Ordering Information

- **PCLS-ADAMVIEW32**   ADAMView Data Acquisition Software
- **PCLS-OPC/ADM**   OPC Server for ADAM-4000/5000 Series (RS-485)
- **PCLS-OPC/MOD**   Modbus® OPC Server
- **PCLS-OPC/MTP**   Modbus®/TCP OPC Server

1 Software
2 IPPC
3 TPC
4 FPM
5 ATM & AWS
6 DA&C
7 cPCI
8 ADAM-3000
9 Motion Control
10 ICOM
11 eConnectivity
12 UNO
13 ADAM-4000
14 ADAM-5000
15 ADAM-6000
16 ADAM-8000
17 BAS

All product specifications are subject to change without notice

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ADAM-4000 Series

Analog Input Modules

The ADAM-4000 series of analog input modules use microprocessor-controlled, high-resolution, 16-bit, sigma-delta A/D converters to acquire sensor signals such as voltage, current, thermocouple or RTD. They translate analog data into one of the following formats: engineering units, % of FSR, two's complement or ohms. After the modules receive a request from the host, the data is sent in the desired format over the RS-485 network.

The ADAM 4000 series analog input modules protect your equipment from ground loops by providing 3000 V_{DC} isolation.

The ADAM-4011/4011D/4012 modules feature digital inputs and outputs which may be used for alarms and event counting.

The analog input module's two digital output channels are open-collector transistor switches that you can control from the host computer. By switching solid state relays, the output channels can control heaters, pumps and other power equipment. The module can use its digital input channel to sense the state of a remote digital signal.

Programmable Alarm Output

Analog input modules include high and low alarm signals with remotely configurable limit values. After every A/D conversion, the digital value is compared with the high and low limit. The module can change the state of a digital output depending on the result of this comparison. This allows the on/off control of a device to perform independently of its host PC.

Event Counter

The onboard event counter can count up to 65,535 transitions occurring on the digital input. The counter can be read and cleared by the host computer. The counter can be used in production line applications to record repetitive operations.

Analog Input/Output Modules

The ADAM-4016 is an analog input/output module with 3000 V_{DC} isolation for load cell and stress measurement. It accepts voltage and current input signals. The module includes two digital outputs for programmable alarm output and another two digital outputs for individual use. This enables the ADAM-4016 to control a device's on/off control independently of a host PC.

Eight-channel Analog Input Modules

The ADAM-4017+/4018+/4019+ are 16-bit, 8-channel analog input modules that provide programmable input ranges on all channels. These modules are an extremely cost-effective solution for industrial measurement and monitoring applications. 3000 V_{DC} optical isolation between the analog input and the modules protects the modules and peripherals from damages caused by high input-line voltages.

Analog Input Module with LED Display

The 4½ -digit LED display on the face of the ADAM-4011D lets you monitor process readings right at their source. The module displays readings in a wide variety of data formats as well as high-low alarm messages. The ADAM-4011D offers flexibility, ease of installation and direct availability of process data. This module is the ideal choice for critical process monitoring.

Eight-channel Analog Input Data Logger

The ADAM-4018M features six differential and two single-ended channels. Its 128 KB of Flash memory can accommodate up to about 38,000 data samples and will write until the memory is exhausted. Featuring a remotely configurable sampling interval of 2 seconds to 18 hours, the ADAM-4018M is the perfect link between industrial processes and your PC, enabling remote process monitoring from virtually any kind of computer.
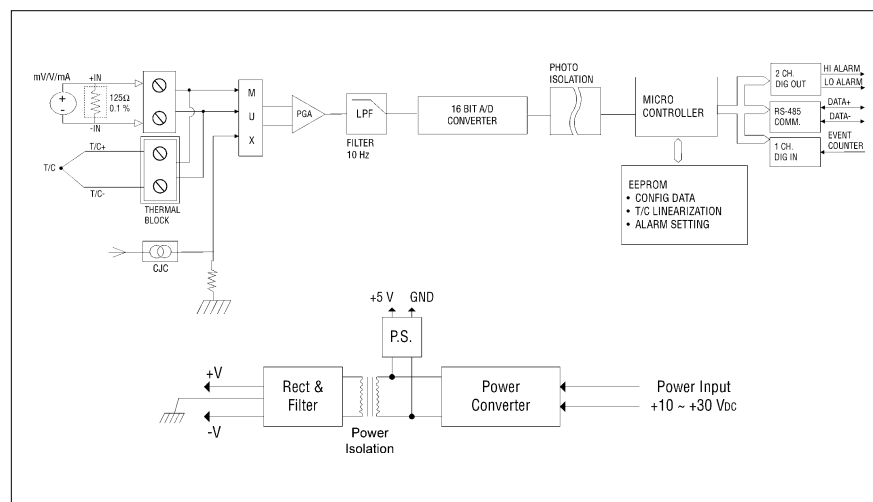
Block Diagram of the ADAM-4011 Analog Input Module

RTD Input Modules

An RTD module is popular for temperature measurement. Unlike traditional designs, the ADAM-4015 provides six RTD input channels for different types of RTD signals as a cost-effective solution for industrial and building automation. Occasionally, broken external wiring can lead to inaccurate current values. The ADAM-4015 provides a broken wiring detection function so users can easily troubleshoot this.

Analog Output Modules

The ADAM-4021 analog output module supplies single-channel analog output in a range of voltages and currents. In order to fully fit multi-channel analog output modules, the ADAM-4024 provides 4 universal type output channels. Moreover, it is designed with 4 digital inputs for integrating applications, such as emergency latch outputs or users default triggers. It uses optical isolators to prevent ground loop effects and limit damage from power surges. You can specify slew rates and start-up currents.

Analog Readback (ADAM-4021 Only)

The analog output module's ADC (Analog to Digital Converter) is independent of the DAC, so it provides true readback of the analog output signal to the microprocessor. While the ADC is not intended to provide highly accurate measurement of the output data, it indicates that analog output is being produced as intended. It also lets you easily detect output fault conditions due to improper wiring or unexpected loads.

Digital Input and Output Modules

The ADAM-4050 features seven digital input channels and eight digital output channels. The outputs are open-collector transistor switches that you can control from the host computer. You can also use the switches to control solid-state relays, which in turn can control heaters, pumps or other power equipment. The host computer can use the module's digital inputs to determine the state of limit switches, safety switches or remote digital signals.

The ADAM-4051 is a 16-ch. digital input module, built with 3000 V_{DC} optical isolation, suitable for critical applications. Different from other modules, the ADAM-4051 accepts 10 ~ 50 V input voltage to fit various digital signals, such as 12 V_{DC}, 24 V_{DC}, 48 V_{DC}. Moreover, users can read the current status from the LED indicators on the front panel.

The ADAM-4052 provides eight digital input channels: six fully independent isolated channels and two isolated channels with a common ground. All have 5000 V_{RMS} isolation to prevent ground loop effects and prevent damage from power surges on the input lines.

The ADAM-4053 provides 16 digital input channels for dry or wet contact signals signals. For dry contact, the effective distance from DI to contact point is up to 500 m.

The ADAM-4055 offers 8-ch. isolated digital inputs and 8-ch. isolated digital outputs for critical applications. The inputs accept 10 ~ 50 V voltage, and the outputs supply 5 ~ 40 V_{DC} open collector. Considered to be very user-friendly, the ADAM-4055 is also built with LED indicator for easy status reading.

Counter/Frequency Module

The ADAM-4080/4080D isolated counter/frequency modules have two 32-bit counter channels and a built-in programmable timer for frequency measurement.

Programmable Alarm Output

The ADAM-4080/4080D modules include digital alarm functions. You can set alarm values (32-bit) into the module from your host computer.

Programmable Digital Filter and Threshold

The ADAM-4080/4080D modules include a unique programmable digital filter to reject noise on the input signal. You can specify separate time constants to provide stable output readings.

Programmable Preset Value

The ADAM-4080 module includes a programmable preset mode. You can preset the value of a counter into the module from your host computer.

Front Panel Display

The ADAM-4080D module's 5-digit LED displays the data being sent over an RS-485 line to the host computer. The module can be programmed to show either channel 0 or channel 1.

Relay Output Modules

As with other ADAM modules, the ADAM-4060/4068 relay modules are controlled remotely and store configuration data in EEPROM. The ADAM-4060/4068 provide 4/8 channels, half being Form A and the rest being Form C. These modules are excellent for on/off control or low-power switching applications.

DIN-rail Mounting
Streamline your system with industry standard DIN-rails

Panel/Wall Mounting
Use this special bracket to mount modules on any flat surface

Piggybacking
Save space by stacking the modules, one on top of the other

Plug-in Terminal Block
Save time by leaving wiring intact while connecting or disconnecting modules

ADAM-4000 Series

Module Selection Chart

Controllers

- 4500 PC-based Communication Controller (P.13-14)
- 4501 Ethernet-enabled Communication Controller with 8 Digital I/O (P.13-12)
- 4022T Serial based Dual Loop PID Controller (P.13-20)

Communication Modules

Ethernet
- 4570 2-port Ethernet Data Gateway (P.13-14)
- 4571 1-port Ethernet Data Gateway (P.13-14)

Serial
- 4510 RS-422/485 Repeater (P.13-15)
- 4510S Isolated RS-422/485 Repeater (P.13-15)
- 4520 Isolated RS-232 to RS-422/485 Converter (P.13-15)
- 4521 RS-422/485 to RS-232 Converter (P.13-15)
- 4522 RS-232 to RS-422/485 Converter (P.13-16)
- 4531 Modbus/RTU to BACnet MS/TP Converter

Fiber Optic
- 4541 Multi-Mode Fiber Optic to Serial Converter (P.13-16)
- 4542+ Single Mode Fiber Optic to Serial Converter (P.13-16)

Wireless
- 4581 Wireless GSM Module

I/O Modules

Digital Input
- 4051 Isolated DI Module (P.13-21)
- 4052 Isolated DI Module (P.13-22)
- 4053 Digital Input Module (P.13-22)

Digital Output
- 4060/4068 Relay Output Module (P.13-23)
- 4069 Power Relay Output Module (P.13-24)
- 4056S/4056SO 12-channel Sink/Source Type Digital Output Module (P.13-23)

Analog Input
- 4012 Analog Input Module (P.13-17)
- 4017/4017+ 8-channel Analog Input Module (P.13-19)
- 4011 T/C Input Module (P.13-17)
- 4011D T/C Input Module with Display (P.13-17)
- 4018/4018+ 8-channel T/C Input Module (P.13-19)
- 4018M Analog Input Data Logger (P.13-19)
- 4019+ 8-channel Universal AI Module (P.13-20)
- 4013 RTD Input Module (P.13-17)
- 4015 6-channel RTD Input Module (P.13-18)
- 4015T 6-channel Thermistor Input Module (P.13-18)

Analog Output
- 4021 Analog Output Module (P.13-20)
- 4024 4-channel Analog Output Module (P.13-21)

Counter
- 4080 Counter/Frequency Module (P.13-24)
- 4080D Counter/Frequency Module (P.13-24)

Mixed I/O
- 4016 Analog I/O Module (P.13-18)
- 4050 Digital I/O Module (P.13-21)
- 4055 Isolated Digital I/O Module (P.13-22)

Accessory
- 4914V 4-channel Voltage Input Surge Protection Module (P.13-24)

Communication Modules Selection Guide

	Controllers			**Repeaters**		**Converters & Data Gateways**			
Module	ADAM-4500	ADAM-4501	ADAM-4022T	ADAM-4510 ADAM-4510S	ADAM-4520 ADAM-4522	ADAM-4521	ADAM-4541/4542+	ADAM-4581	ADAM-4570 ADAM-4571
Network	RS-232 RS-485	Ethernet, RS-485	RS-485	RS-422 RS-485	RS-232 to RS-422 RS-485	RS-232 to RS-422 RS-485	Fiber Optic to RS-232/422/485	GSM to RS-232/485	Ethernet to RS-232/422/485
Comm. Protocol	ADAM	Modbus/RTU, Modbus/TCP	ADAM/Modbus						
Comm. Speed (bps)	From 1200 to 115.2 k	Ethernet: 10/100M Serial: From 1200 to 115.2 kbps	From 1200 to 115.2 k	From 1200 to 115.2 k	From 1200 to 115.2 k	From 1200 to 115.2 k	From 1200 to 115.2 k	900/1800 Band Serial: from 1200 to 9600 bps	Ethernet: 10/100 M Serial: up to 230.4 k
Comm. Distance	Serial: 1.2 km	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		LAN: 100 m Serial: 1.2 km
Interface Connectors	RS-232: female DB9 RS-485: plug-in screw terminal	Ethernet: RJ45 RS-485: plug-in screw terminal RS-232:RJ48	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	Fiber: ST RS-232/422/485: plug-in screw terminal	RS-232/485: plug-in screw terminal	Ethernet: RJ-45 RS-232/422/485: RJ-48
LED Indicators	Comm. & Power	Comm. & Power	Power	Comm. & Power	Comm. & Power	Comm. & Power	Comm. & Power	Comm. & Power	Network: Tx/Rx Link, Speed, Power
Data FlowControl	Yes	Yes	Yes			Yes		Yes	Yes
Watchdog Timer	Yes	Yes	Yes			Yes		Yes	Yes
Isolation Voltage			3000 V_{DC}	3000 V_{DC} (ADAM-4510S)	3000 V_{DC} (ADAM-4520)				
Power Requirement	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}	+10 ~ +30 V_{DC}
Operating Temperature	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	-10 ~ 70° C	0 ~ 60° C
Humidity	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	5 ~ 95 %	20 ~ 95 %
Power Consumption	2.0 W	4 W	4 W	1.4 W	1.2 W	1 W	1 W (typical) 1.5 W (max.)	1 W	4 W
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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-4018M	ADAM-4019+
Resolution	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit	16 bit
Analog Input — Input Channels	1 differential	1 differential	1 differential	6 differential	6 differential	1 differential	8 differential (ADAM-4017+)	8 differential (ADAM-4018+)	6 differential 2 S. E.*	8 differential
Sampling Rate	10 Hz	10 Hz	10 Hz	10 Hz (total)	12 Hz (total)	10 Hz (total)	10 Hz (total)	10 Hz (total)	10 Hz (total)	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	±50 mV ±100 mV ±500 mV ±1 V ±2.5 V (4018)	±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	4~20 mA (4017+)	4~20 mA ±20 mA	±20 mA	4 ~ 20 mA ± 20 mA
Direct Sensor Input	J, K, T, E, R, S, B Thermocouple	-	RTD Pt, Ni	RTD Pt, Ni, Balco	Thermistor 3K, 10 K	-	-	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 (4018+)	-	Yes +4 ~ 20 mA & All T/C
Channel Independant Configuration	-	-	-	Yes	Yes	-	Yes (4017+)	Yes (4018+)	-	Yes
Storage Capacity	-	-	-	-	-	-	-	-	128 KB Flash Memory	-
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										
Counter (32-bit) — Channels										
Input Frequency										
Isolation	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$	3000 V$_{DC}$
Digital LED Indicator	Yes (4011D)	-	-	-	-	-	-	-	-	-
Watchdog Timer	Yes (System)	Yes (System)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)	Yes (System & Comm.)	Yes (System)	Yes (System & Comm.)
Safety Setting										
Modbus Support	-	-	-	Yes	Yes	-	Yes (4017+)	Yes (4018+)	-	Yes
Page	13-17	13-17	13-17	13-18	13-18	13-18	13-19	13-19	13-19	13-20

Analog Output		**Digital Input/Output**						**Relay Output**			**Counter**
ADAM-4021	ADAM-4024	ADAM-4050	ADAM-4051	ADAM-4052	ADAM-4053	ADAM-4056S/ ADAM-4056SO	ADAM-4055	ADAM-4060	ADAM-4068	ADAM-4069	ADAM-4080/ ADAM-4080D
12 bit	12 bit	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	Yes	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
1	4	-	-	-	-	-	-	-	-	-	-
0 - 10 V	0 - 10 V +/-10V	-	-	-	-	-	-	-	-	-	-
0 - 20 mA 4 - 20 mA	0 - 20 mA 4 - 20 mA	-	-	-	-	-	-	-	-	-	-
-	4	7	16	8	16	-	8	-	-	-	-
-	-	8	-	-	-	12 (Sink): ADAM-4056S 12 (Source): ADAM-4056SO	8	4-channel relay	8-channel relay	8-channel 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}	2,500 V_{DC}	-	-	-	2,500 V_{RMS}
-	-	-	Yes	-	-	Yes	Yes	-	-	-	5-digit (4080D)
Yes (System)	Yes (System & Comm.)	(System & Comm.)	(System & Comm.)	Yes (System)	Yes (System)	(System & Comm.)	(System & Comm.)	(System & Comm.)	(System & Comm.)	(System & Comm.)	Yes (System)
-	Yes	Yes	-	-	-	Yes	Yes	Yes	Yes	Yes	-
-	Yes	-	Yes	-	-	Yes	Yes	-	Yes	Yes	-
13-20	13-21	13-21	13-21	13-22	13-22	13-23	13-22	13-23	13-23	13-24	13-24

All product specifications are subject to change without notice   Last updated : January 2005

ADAM-4501

Ethernet-enabled Communication Controller with 8 Digital I/O

NEW

Features

- 10/100Base-T Ethernet Interface
- Email alarm function
- Built-in Web Server
- Built-in FTP Server and Client
- Supports 4 Digital Input and 4 Digital Output
- 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
- Four Serial Ports Available
- Integrated All Operations in Windows Utility

Introduction

The ADAM-4501 is a compact-sized Ethernet-enabled communication controller under x-86 CPU architecture. It supports not only Ethernet interface but also 4 serial ports, which let ADAM-4501 be 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. ADAM-4501 also supports rich Modbus function libraries including Modbus/RTU Master/Slave and Modbus/TCP Server/Client function libraries.

Specifications

System

- **CPU** — 16-bit microprocessor
- **Memory** — 1.5 MB flash memory:
  - 256 KB system flash
  - 256 KB flash memory
  - 1024 KB file system, 960 KB for user applications
    640 KB SRAM, up to 384 KB with battery backup
- **Operating System** — ROM-DOS(MOS-DOS)
- **Timer BIOS** — Yes
- **Real-time Clock** — Yes
- **Watchdog Timer** — Yes
- **COM1** — RS-232 (Full Modem Signals)
- **COM2** — RS-485
- **COM3** — RS-485
- **Programming Port/COM4** — RS-232/485
  RS-232 Interface (TX, RX, GND)
  RS-485
- **Status Display** — Power, CPU, communication and battery
- **CPU Power Consumption** — 4 W

Digital Input

- **Channel** — 4
  Dry Contact:
  Logic level : Open
  Logic level 1 : Close to GND
  Wet Contact:
  Logic level : +2 V max.
  Logic level : 4 V ~ 30 V

Digital Output

- **Channel** — 4
  Open Collector to +40 V, 200 mA max. Load

Network

- **Ethernet** — Speed: 10/100 Mbps
- **RS-485** — Speed: 1200 up to 115.2 kbps
  Maximum Nodes: up to 256 multi-drop system per serial port

Software Support

- **C Library** — Borland C++ 3.0 for DOS

Power

- Unregulated + 10 to + 30 V_{DC}
- Protected against Power Reversal

Mechanical

- **Case** — KJW with captive mounting hardware
- **Plug-in Screw Terminal Block** — Accepts 0.5 mm^2 to 2.5 mm^2, 1 - #12 or 2 - #14 to #22 AWG

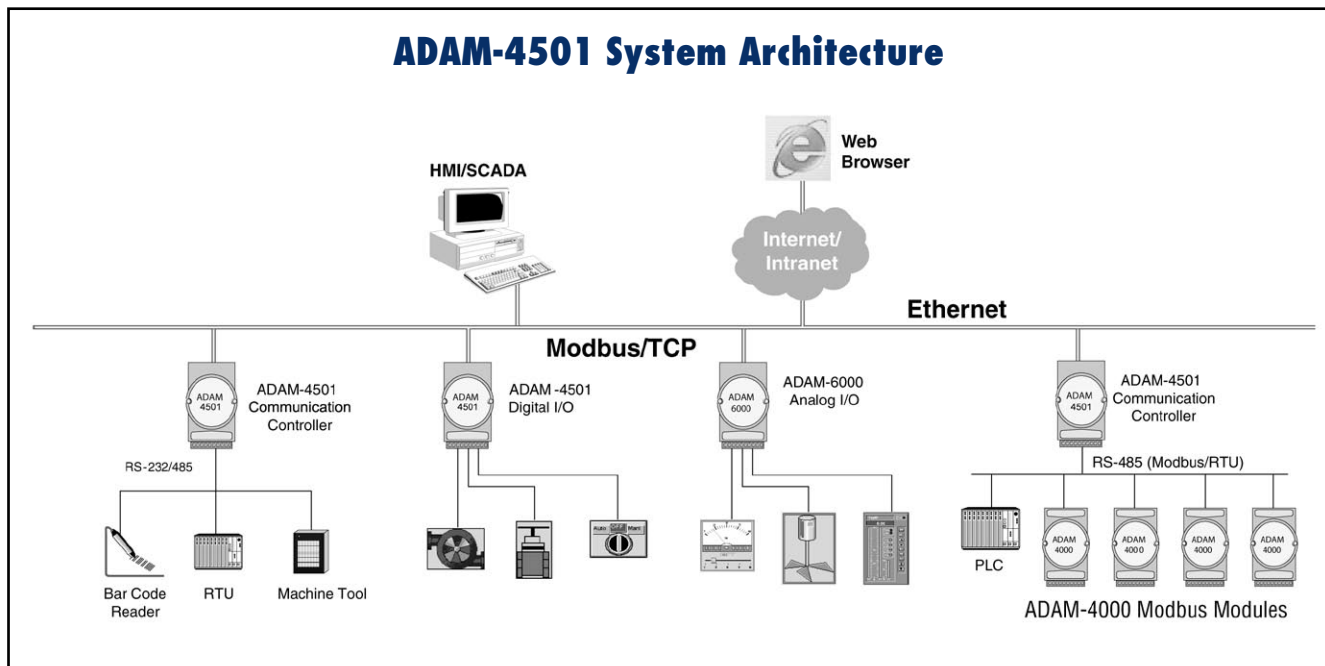### Environment

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

Ordering Information

- **ADAM-4501** — Ethernet-enabled Communication Controller with 8 Digital I/O
- **ADAM-4501D** — Ethernet-enabled Communication Controller with LED and 8 Digital I/O

ADVANTECH | Remote DA&C Modules

ADAM-4501 System Architecture

Designed for Ethernet Connectivity

ADAM-4501 is designed with a 10/100 Mbps Ethernet port. The Ethernet-enabled features include built-in HTTP Server, FTP Server, FTP Client function, Email Alarm function and TCP/UDP connection functions. The HTTP Server will let authorized users to monitor ADAM-4501 I/O status by Internet Explorer via Internet. The FTP Server and Client can be used for remote maintenance. The Email Alarm function of ADAM-4501 can send email to pre-defined users for alarm message. All features are very easy to use and ready-to-use sample programs are available.

Versatile Protocols of Communication Function Libraries

The communication protocol of the ADAM-4501 is user-defined and there are library functions of Modbus/RTU protocol and Modbus/TCP protocol available for users. The function libraries include following protocols.

- Modbus/RTU Master Function for connecting to remote I/O modules via RS-485 port
- Modbus/RTU Slave Function for connecting to HMI/SCADA software via RS-485 port
- Modbus/TCP Server Function for connecting to HMI/SCADA software via Ethernet port
- Modbus/TCP Client Function for connecting to Ethernet-enabled remote I/O modules via Ethernet port

Compact Size and Modularized I/O Design

The ADAM-4501 modularized I/O expansion board provides high flexibility for versatile application requirements. The compact size and modularized design let ADAM4501 can fit to any places with limited space. Advantech will offer versatile I/O expansion modules in the future for different application needs.

More Data Memory to Support Versatile Applications

ADAM-4501 is designed with 640 KB SRAM, 512KB flash memory and 1MB flash disk. So it offers a good supply of memory for developing complex control program or data storage applications, such as data recording, which is difficult for traditional controllers.

Supports 4 Communication Ports

Not only equips with an Ethernet interface, ADAM-4501 also has 4 RS-485 communication ports for system networks. The COM1 features RS-232 port with full modem signals. Both COM2 and COM3 are RS-485 ports which can connect to remote I/O modules or control devices. The COM4 is RS-232/485 selectable which is used for downloading application program by default.

1 Software
2 IPPC
3 TPC
4 FPM
5 ATM & AWS
6 DA&C
7 cPCI
8 ADAM-3000
9 Motion Control
10 ICOM
11 eConnectivity
12 UNO
13 ADAM-4000
14 ADAM-5000
15 ADAM-6000
16 ADAM-8000
17 BAS

All product specifications are subject to change without notice   Last updated : January 2005

ADAM-4500
ADAM-4570
ADAM-4571

PC-based Communication Controller

2-port Ethernet to Serial Data Gateway

1-port Ethernet to Serial Data Gateway

ADAM-4500   CE

ADAM-4570   CE FCC

ADAM-4571   CE FCC

Specifications

CPU	80188, 16-bit microprocessor
Flash ROM	256 KB (170 KB free memory for the user)
Operating System	Boot ROM-DOS
Timer BIOS	Yes
SRAM	256 KB (234 KB free memory for the user)
Real-time Clock	Yes
Watchdog Timer	Yes
COM1	RS-232/485
COM2	RS-485
Program Download Port (RS-232)	Tx, Rx, GND

Communication

RS-232/485 Transmission Speed	Up to 115.2 kbps
RS-232 Interface Connector	Female DB-9
RS-485 Interface Connector	Plug-in screw terminal
RS-485 Auto Flow Control	

Power

Power Requirement	Unregulated +10 ~ +30 V_{DC}
Power Consumption	2.0 W @ 24 V_{DC}

Ordering Information

ADAM-4500	PC-based Communication Controller

Specifications

Protocol	TCP, UDP, IP, ARP
Network Ports	10Base-T (IEEE 802.3) 100Base-TX (IEEE 802.3u) RJ-45 connector
Serial Port	RS-232/485/422

Connector: DTE, DCE
Transmission speeds:
   RS-232: 300 bps to 115.2 kbps
   RS-485/422: 300 bps to 230.4 kbps
Format: parity bit: odd, even, none
Data bit: 5, 6, 7, 8
Stop bit: 1, 1.5, 2
Modem control: Full, RS-232

Compatibility	Ethernet: version 2.0/ IEEE 802.3, IEEE 802.3u
Diagnostic LEDs	Network: Tx/Rx, Link, Speed (10/100 Mbps), Power Serial: Tx/Rx, Status
Utility Software	Windows-based, auto-search for device Device Setting: name, description, serial port
Driver	Windows NT 4.0 driver to redirect the standard Win32 API
Power Requirement	Unregulated 10~ 30 V_{DC} with protection from power surge
Power Consumption	4.0 W @ 24 V_{DC}
Case	ABS with captive mounting hardware
Accessories	nylon DIN-rail mounting adapter SECC panel mounting bracket
Operating Temperature	0 ~ 60° C (32~140° F)
Storage Temperature	-20 ~ 80° C (-4 ~176° F)
Operating Humidity	20~95% (non-condensing)
Storage Humidity	0~ 95% (non-condensing)

Ordering Information

ADAM-4570	2-port Ethernet to RS-232/422/485 Data Gateway

Specifications

Protocol	TCP, UDP, IP, ARP
Network Ports	10Base-T (IEEE 802.3) 100Base-TX (IEEE 802.3u) RJ-45 connector
Serial Port	RS-232/485/422

Connector: DTE, DCE
Transmission speeds:
   RS-232: 300 bps to 115.2 kbps
   RS-485/422: 300 bps to 230.4 kbps
Format: parity bit: odd, even, none
Data bit: 5, 6, 7, 8
Stop bit: 1, 1.5, 2
Modem control: Full, RS-232

|	
Compatibility	Ethernet: version 2.0/ IEEE 802.3, IEEE 802.3u
Diagnostic LEDs	Network: Tx/Rx, Link, Speed (10/100 Mbps), Power Serial: Tx/Rx, Status
Utility Software	Windows-based, auto-search for device Device Setting: name, description, serial port
Driver	Windows NT 4.0 driver to redirect the standard Win32 API
Power Requirement	Unregulated 10 to 30 V_{DC} with protection from power surge
Power Consumption	4.0 W @ 24 V_{DC}
Case	ABS with captive mounting hardware
Accessories	Nylon DIN-rail mounting adapter SECC panel mounting bracket
Operating Temperature	0~ 60° C (32~ 140° F)
Storage Temperature	-20~ 80° C (-4 ~176° F)
Operating Humidity	20 ~ 95% (non-condensing)
Storage Humidity	0~ 95% (non-condensing)

Ordering Information

ADAM-4571	1-port Ethernet to RS-232/422/485 Data Gateway

ADVANTECH   **Remote DA&C Modules**

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4510
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   CE   FM APPROVED

ADAM-4520   CE   FM APPROVED

ADAM-4521   CE   FM APPROVED
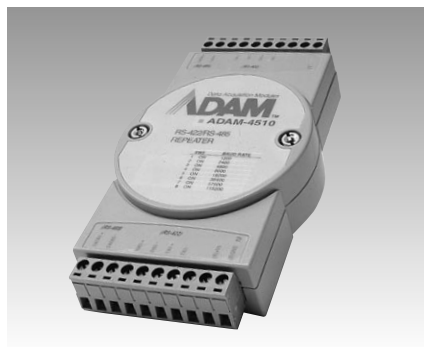
Specifications

- **Input**   RS-485 (2-wire) or RS-422 (4-wire)
- **Output**   RS-485 (2-wire) or RS-422 (4-wire). Speed (bps): 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 mode (switchable)
- **RS-422/485 Interface Connector**   Plug-in screw terminal
- **Isolation Voltage**   3000 V_{DC} (ADAM-4510S only)
- **Power Consumption**   1.4 W @ 24 V_{DC}

Ordering Information

- **ADAM-4510**   RS-422/RS-485 Repeater
- **ADAM-4510S**   Isolated RS-422/RS-485 Repeater

Specifications

- **Input**   RS-232 (4-wire)
- **RS-232 Interface Connector**   female DB-9
- **Output**   RS-485 (2-wire) or RS-422 (4-wire). Speed (bps): 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 mode (switchable)
- **RS-422/485 Interface Connector**   Plug-in screw terminal
- **Isolation Voltage**   3000 V_{DC}
- **Power Consumption**   1.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4520**   Isolated RS-232 to RS-422/RS-485 Converter
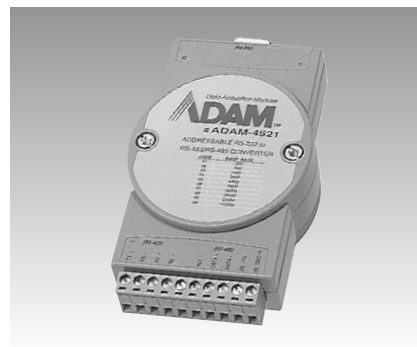
Specifications

- **Built-in microprocessor and watchdog timer**
- **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**
- **Transmission Speed (bps)**   300, 600, 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k (software configurable)
- **RS-232 Interface Connector**   Female DB9
- **RS-422/RS-485 Interface Connector**   Plug-in screw terminal
- **Power Consumption**   1.0 W @ 24 V_{DC}

Ordering Information

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

All product specifications are subject to change without notice   Last updated : January 2005
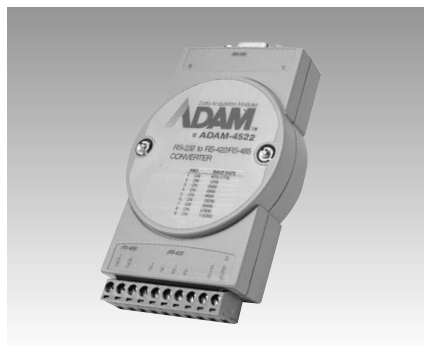
ADAM-4522
ADAM-4541
ADAM-4542+

RS-232 to RS-422/485 Converter

Fiber Optic to RS-232/422/485 Converter

Fiber Optic to RS-232/422/485 Converter

ADAM-4522 CE FM APPROVED

ADAM-4541 CE FM APPROVED

NEW

ADAM-4542+ CE

Specifications

- **Input** — RS-232 (4-wire)
- **RS-232 Interface Connector** — Female DB-9
- **Output** — RS-485 (2-wire) or RS-422 (4-wire). Speed (bps): 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 mode (switchable)
- **RS-422/485 Interface Connector** — Plug-in screw terminal
- **Power Consumption** — 1.2 W

Ordering Information

- **ADAM-4522** — RS-232 to RS-422/485 Converter

Specifications

Communication

- **Fiber Optic Input or Output**
- **RS-232/422/485 Output Transmission Speed (bps)** — 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k and RS-232/422 mode (switchable)
- **Communication Mode** — Asynchronous
- **Transmission Mode** — Full/half duplex, bidirectional
- **RS-232/422/485 Interface Connector** — Plug-in screw terminal
- **Fiber Connector** — ST

ADAM-4541

- **Transmission Distance** — 2.5 km
- **Optical Power Budget (attenuation)** — 12.5 db (measured with 62.5/125 mm)
- **Fiber Optical Type** — Multimode
- **Wavelength** — 820 nm

Power

- **Power Requirement** — Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** — 1 W (typical) 1.5 W (max)

Ordering Information

- **ADAM-4541** — Fiber Optics to RS-232/422 Converter

Specifications

Communication

- **Fiber Optic Input or Output**
- **RS-232/422/485 Output Transmission Speed (bps)** — 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k
- **Communication Mode** — Asynchronous
- **Transmission Mode** — Full/half duplex, bidirectional
- **RS-232/422/485 Interface Connector** — Plug-in screw terminal
- **Fiber Connector** — SC

ADAM-4542+

- **Transmission Distance** — 15 km
- **Optical Power Budget (attenuation)** — 9 dB
- **Fiber Optical Type** — Singlemode
- **Wavelength** — 1310 nm

Power

- **Power Requirement** — Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** — 1 W (typical) 1.5 W (max)

Ordering Information

- **ADAM-4542+** — Single-mode Fiber Optics to Serial Converter

ADVANTECH | **Remote DA&C Modules**

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4011
ADAM-4012
ADAM-4013

Thermocouple Input Module

Analog Input Module

RTD Input Module

ADAM-4011/4011D CE

ADAM-4012 CE FM APPROVED

ADAM-4013 CE FM APPROVED

Specifications

- **LED Indicator** 5-digit (ADAM-4011D)
- **Built-in Watchdog Timer**

Analog Input
- **Effective Resolution** 16-bit
- **Input Types** Th.couple., mV, V or mA
- **Input Range** ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA
- **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		

- **Isolation Voltage** 3000 V_{DC}
- **Input Surge Protection** Yes
- **Sampling Rate** 10 samples/sec.
- **Input Impedance** 2 MΩ
- **Bandwidth** 2.62 Hz
- **Accuracy** ±0.05 % for V input
- **Zero Drift** ±3 mV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 150 dB
- **NMR @ 50/60 Hz** 100 dB

Digital Input
- **Channels** 1
  Logic levels 0: 1 V max. 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
- **Power Consumption** 1.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4011** Thermocouple Input Module
- **ADAM-4011D** Thermocouple Input Module w/ LED Display

Specifications

Analog Input
- **Effective Resolution** 16-bit
- **Input Type** mV, V or mA
- **Input Range** ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V and ±20 mA
- **Isolation Voltage** 3000 V_{DC}
- **Sampling Rate** 10 samples/sec.
- **Input Impedance** 2 MΩ
- **Bandwidth** 2.62 Hz
- **Accuracy** ±0.05% or better
- **Zero Drift** ±6 mV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 150 dB
- **NMR @ 50/60 Hz** 100 dB

Digital Input
- **Channels** 1
  logic level 0: +1 V max.
  logic level 1: +3.5 V ~ +30 V
  pull up current: 0.5 mA, 10 kΩ resistor to +5 V
- **Event Counter** Max. input frequency: 50 Hz
  Min. input pulse width: 1 msec.

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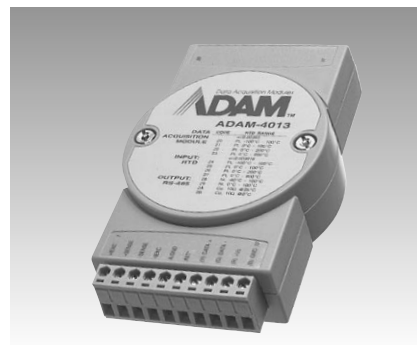- **Channels** 2, open collector to 30 V, 30 mA max. load
- **Power Dissipation** 300 mW

Built-in Watchdog Timer

Power
- **Power Requirements** Unregulated 10~30 V_{DC}
- **Power Consumption** 1.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4012** Analog Input Module – mV, mA, or high voltage

Specifications

Analog Input
- **Effective Resolution** 16-bit
- **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	

- **Isolation Voltage** 3000 V_{DC}
- **Sampling Rate** 10 samples/sec.
- **Input Impedance** 2 MΩ
- **Bandwidth** 2.62 Hz
- **Input Connections** 2, 3 or 4 wire
- **Accuracy** ±0.05% or better
- **Zero Drift** ±3 mV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 150 dB
- **NMR @ 50/60 Hz** 100 dB

Built-in Watchdog Timer

Power
- **Power Requirements** Unregulated 10~30 V_{DC}
- **Power Consumption** 0.7 W @ 24 V_{DC}

Ordering Information

- **ADAM-4013** RTD Input Module – RTD

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4015
ADAM-4015T
ADAM-4016

6-channel RTD Module with Modbus®

6-channel Thermistor Module with Modbus®

Analog Input/Output Module

ADAM-4015   CE

NEW

ADAM-4015T   CE

ADAM-4016   CE FM APPROVED

Specifications

Analog Input

- **Effective Resolution**   16-bit
- **Channels**   6 differential
- **Input Type**   Pt, Balco and Ni RTD
- **RTD Types and Temperature Ranges**
  Pt100 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
- **Isolation Voltage**   3000 V_{DC}
- **Sampling Rate**   10 samples / sec.
- **Input Impedance**   10 MΩ
- **Bandwidth**   2.62 Hz
- **Input Connections**   2 or 3 wire
- **Accuracy**   ± 0.05 % or better
- **Zero Drift**   ± 3 µV/° C
- **Span Drift**   ± 25 ppm/° C
- **CMR @ 50/60 Hz**   150 dB
- **NMR @ 50/60 Hz**   100 dB

Built-in Watchdog Timer and Individual wire burned-out detection

Power

- **Power Requirements**   Unregulated +10 ~ +30 V_{DC}
- **Power Consumption**   1.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4015**   6-channel RTD Input Module w/Modbus®

Specifications

Analog Input

- **Effective Resolution**   16-bit
- **Channels**   6 differential
- **Input Type**   Thermistor
- **Thermistor Types and Temperature Ranges**
  Thermistor 3K   0 ~ 100° C
  Thermistor 10K   0 ~ 100° C
- **Isolation Voltage**   3000 V_{DC}
- **Sampling Rate**   10 samples / sec.
- **Input Impedance**   10 MΩ
- **Bandwidth**   2.62 Hz
- **Input Connections**   2 or 3 wires
- **Accuracy**   ± 0.05% or better
- **Zero Drift**   ± 3 µV/° C
- **Span Drift**   ± 25 ppm/° C
- **CMR @ 50/60 Hz**   150 dB
- **NMR @ 50/60 Hz**   100 dB

- **Built-in Watchdog Timer**
- **Individual Wire Burned-out Detection**

Power

- **Power Requirement**   Unregulated 10~30 V_{DC}
- **Power Consumption**   1.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4015T**   6-channel Thermistor Input Module w/Modbus®

Specifications

Analog Input

- **Effective Resolution**   16-bit
- **Channels**   1 differential
- **Input Type**   mV and mA
- **Input Range**   ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±20 mA
- **Isolation Voltage**   3000 V_{DC}
- **Sampling Rate**   10 samples/sec.
- **Input Impedance**   2 MΩ
- **Bandwidth**   2.62 Hz
- **Accuracy**   ±0.05% or better
- **Zero Drift**   ±6 µV/° C
- **Span Ddrift**   ±25 ppm/° C
- **CMR @ 50/60 Hz**   150 dB
- **NMR @ 50/60 Hz**   100 dB

Analog Output

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

Digital Output

- **Channels**   2, open collector to 30 V, 30 mA max. load

- **Built-in Watchdog Timer**
- **Built-in TVS/ESD Protection**

Power

- **Power Requirements**   Unregulated +10 ~ +30 V_{DC}
- **Power Consumption**   2.2 W @ 24 V_{DC}

Ordering Information

- **ADAM-4016-A2**   Analog Input/Output Module

ADVANTECH   **Remote DA&C Modules**

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4017+
ADAM-4018+
ADAM-4018M

8-channel Analog Input Module with Modbus®

8-channel Thermocouple Input Module with Modbus®

8-channel Analog Input Data Logger

ADAM-4017/4017+ CE

ADAM-4018/4018+ CE

ADAM-4018M CE FM APPROVED

Specifications

Analog Input

- **Effective Resolution** 16-bit
- **Channels** Six differential, two single-ended (4017) eight differential (4017+)
- **Channel Independent Configuration** ADAM-4017+ only
- **Modbus®** ADAM-4017+ only
- **Input Type** mV, V, mA
- **Input Range** ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 4~20mA (4017+ only)
- **Isolation Voltage** 3000 V_{DC}
- **Fault and Overvoltage Protection** Withstands overvoltage up to ±35 V
- **Sampling Rate** 10 samples/sec. (total)
- **Input Impedance** 20 MΩ
- **Bandwidth** 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- **Accuracy** ±0.1% or better
- **Zero Drift** ±6 μV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 92 dB min.

Built-in Watchdog Timer

- **Power Requirements** Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** 1.2 W @ 24 V_{DC}
- **Built-in TVS/ESD Protection**

Ordering Information

- **ADAM-4017-D2** 8-channel Analog Input Module
- **ADAM-4017+** 8-channel Differential Analog Input Module w/Modbus®

Specifications

Analog Input

- **Effective Resolution** 16-bit
- **Channels** Six differential, two single-ended (4018) eight differential (4018+)
- **Ch. Independent Conf.** ADAM-4018+ only
- **Modbus®** ADAM-4018+ only
- **Input Type** Thermocouple, mV, V, mA (4018) (4018+ Supports T/C & 4~20 mA only)
- **Input Range** ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA (4018); 4~20 mA (4018+)

- **T/C Type and Temperature Ranges**

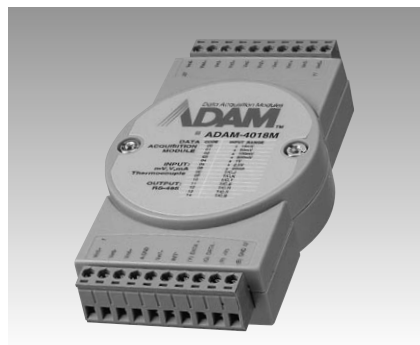| J	0 ~ 760° C	R	500 ~1750° C
K	0 ~ 1370° C	S	500 ~1750° C
T	-100 ~ 400° C	B	500 ~1800° C
E	0 ~ 1000° C		

- **Isolation Voltage** 3000 V_{DC}
- **Fault and Overvoltage Protection** Resists overvoltage up to ±35 V
- **Sampling Rate** 10 samples/sec. (total)
- **Input Impedance** 20 MΩ
- **Bandwidth** 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- **Accuracy** ±0.1% for voltage input
- **Zero Drift** ±3 μV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 92 dB min.

Built-in Watchdog Timer and Individual wire burned-out detection (4018+ only)

- **Power Requirements** Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** 0.8 W @ 24 V_{DC}
- **Built-in TVS/ESD Protection**

Ordering Information

- **ADAM-4018-D2** 8-ch. Th.couple Input Module
- **ADAM-4018+** 8-ch. Differential, mA and Thermocouple Input Module w/Modbus®

Specifications

Analog Input

- **Effective Resolution** 16-bit
- **Channels** Six differential, two single-ended
- **Input Type** Thermocouple, mV, V, mA
- **Input Range** ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA

- **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		

- **Isolation Voltage** 3000 V_{DC}
- **Sampling Rate** 10 samples/sec. (total)
- **Input Impedance** 1.8 MΩ
- **Bandwidth** 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- **Accuracy** ±0.1% for voltage input
- **Zero Drift** ±3 μV/° C
- **Span Drift** ±25 ppm/° C
- **CMR @ 50/60 Hz** 92 dB min.

Storage

- **Capacity** 38,000 samples (total) **(128 KB flash memory)**
- **Storage Mode** Write to end of memory & cyclic
- **Logging Mode** Internal log or event log (high/low)
- **Sampling Interval** 2 secs. ~ 18 hours

Built-in Watchdog Timer

- **Power Requirements** Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** 1.8 W @ 24 V_{DC}

Ordering Information

- **ADAM-4018M** 8-channel Analog Input Data logger – mV, V, mA, or thermocouple

ADAM-4019+
ADAM-4021
ADAM-4022T

8-channel Universal Analog Input Module with Modbus®

Analog Output Module

Serial Based Dual Loop PID Controller

NEW

ADAM-4019+

ADAM-4021 CE FM APPROVED

ADAM-4022T CE

Specifications

Analog Input

- **Effective Resolution**   16-bit
- **Channels**   8 differential channels for individual input type
- **Input Type**   Thermocouple, mV, V,mA
- **Input Range**   +/-1V, +/-2.5V, +/-5V, +/-10V, +/- 100mV, +/-500mV, +/-20mA, +4~20mA
- **T/C Type and Temperature Range**

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

- **Burn-out Detection**   +4~20mA & All T/C
- **Isolation Voltage**   3000 V_{DC}
- **Fault and Over-voltage Protection**   Resists over-voltage up to 35 V
- **Input Impedance**   20 M Ω
- **Bandwidth**   13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- **Accuracy**   ±0.1% of voltage input
- **Zero Drift**   ±3 µV/°C
- **Span Drift**   ±25 ppm/°C
- **CMR @ 50/60 Hz**   92 dB min.

Built-in Watchdog Timer

Power

- **Power Requirements**   Unregulated +10 ~ +30 V_{DC}
- **Power Consumption**   1.0 W @ 24 V_{DC}

Ordering Information

- **ADAM-4019+**   8-channel Universal Analog Input module with Modbus®

Specifications

Analog Output

- **Effective Resolution**   12-bit
- **Output Type**   mA, V
- **Output Range**   0 to 20 mA, 4 to 20 mA, and 0 to 10 V
- **Isolation Voltage**   3000 V_{DC}
- **Output Impedance**   0.5 Ω
- **Accuracy**   ±0.1% of FSR for current output ±0.2% of FSR for voltage output
- **Readback Accuracy**   ±1% of FSR
- **Resolution**   ±0.015% of FSR
- **Zero Drift**   Voltage output: ±30 µV/° C current output: ±0.2 µA/° C
- **Span Temperature Coefficient**   ±25 ppm/° C
- **Programmable Output Slope**   0.125 ~ 128 mA/sec. 0.0625 ~ 64.0 V/sec.
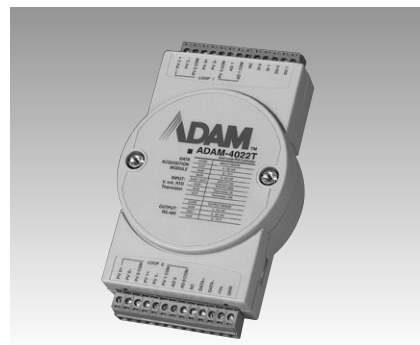- **Current Load Resistor**   0 to 500 Ω (source)

Built-in Watchdog Timer

Power

- **Power Requirement**   Unregulated l+10 ~ +30 V_{DC}
- **Power Consumption**   1.4 W @ 24 V_{DC}

Ordering Information

- **ADAM-4021**   Analog Output Module – V or mA

Specifications

Analog Input

- **Channels**   4
- **Input Type**   mA, V, Thermistor, RTD
- **Input Range**   0 to 20 mA, 4 to 20 mA, 0 to 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 -100 ~ 100° C
  Pt 0 ~ 100° C
  Pt 0 ~ 200° C
  Pt 0 ~ 600° C
  IEC RTD 100 ohms (a = 0.00385)
  JIS RTD 100 ohms (a = 0.00392)
  Pt 1000 RTD
  Pt -40 ~ 160° C

Analog Output

- **Channels**   2
- **Output Type**   mA,V
- **Output Range**   0 to 20 mA, 4 to 20 mA, 0 to 10 V

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, 100 mA max. load

Surge Protection (Power)   3,000 V_{DC}

Built-in Watchdog Timer

- **Power Requirements**   Unregulated 10 ~ 30 V_{DC}
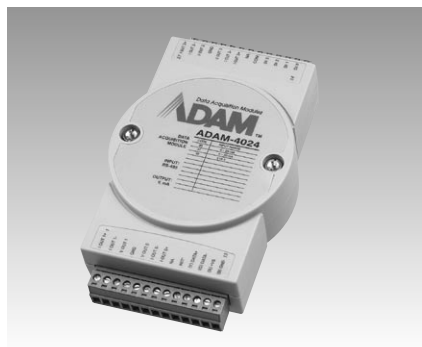- **Power Consumption**   4 W @ 24 V_{DC}

Ordering Information

- **ADAM-4022T**   Serial Based Dual Loop PID Controller

ADVANTECH | **Remote DA&C Modules**

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4024
ADAM-4050
ADAM-4051

4-channel Analog Output Module with Modbus®

Digital I/O Module

16-channel Isolated Digital Input Module with LED & Modbus®

1 Software
2 IPPC
3 TPC
4 FPM
5 ATM & AWS
6 DA&C
7 cPCI
8 ADAM-3000
9 Motion Control
10 ICOM
11 eConnectivity
12 UNO
13 ADAM-4000
14 ADAM-5000
15 ADAM-6000
16 ADAM-8000
17 BAS

ADAM-4024	CE FCC
ADAM-4050	CE FM APPROVED
ADAM-4051	CE FCC

Specifications

Analog Output

- **Effective Resolution** 12-bit
- **Channels** 4
- **Output Type** mA, V
- **Output Range** 0 to 20 mA, 4 to 20 mA, ±10 V
- **Isolated Voltage** 3000 V_{DC}
- **Output Impedance** 0.5 Ω
- **Accuracy** ±0.1 % of FSR for current output ±0.1 % of FSR for voltage output
- **Resolution** ±0.015 % of FSR
- **Zero Drift** Voltage output: ±30 μV/° C current output: ±0.2 μA/° C
- **Span Temperature Coefficient** ±25 ppm/° C
- **Programmable Output Slope** 0.125 ~ 128 mA/sec. 0.0625 ~ 64.0 V/sec.
- **Current Load Resistor** 0 to 500 Ω (source)
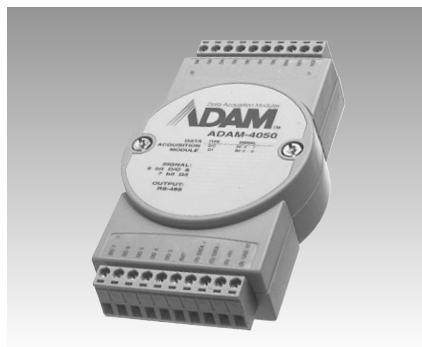
Built-in Watchdog Timer

- **Isolated Digital Input** Channel: 4 level 0: +1 V max level 1: 10 ~ 30 V_{DC}

Built-in Watchdog Timer

- **Power Requirement** Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** 3 W @ 24 V_{DC}

Ordering Information

- **ADAM-4024** 4-channel Analog Output Module w/Modbus® V or mA

Specifications

Digital Input

- **Channels** 7 logic level 0: +1 V max. logic level 1: +3.5 V ~ +30 V pull up current: 0.5 mA, 10 kΩ resistor to +5 V

Digital Output

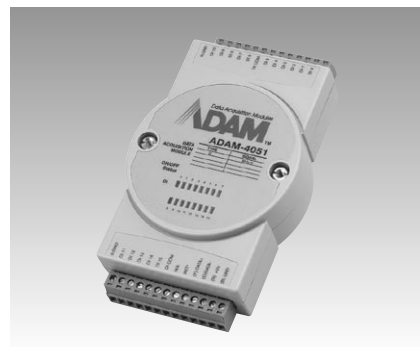- **Channels** 8 open collector to 30 V, 30 mA max. load power dissipation: 300 mΩ

Built-in Watchdog Timer

Power

- **Power Requirements** Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** 0.4 W @ 24 V_{DC}

Ordering Information

- **ADAM-4050** Digital I/O Module

Specifications

Digital Input

- **Channels** 16
- **Input Voltage** 50 V max
- **Input Voltage level** (Configurable) Dry contact: logic level 0: close to GND logic level 1: open wet contact: logic level 0: +3 V max logic level 1: +10 to 50 V
- **Optical Isolation** 2,500 V_{DC}
- **Over Voltage Protection** 70 V_{DC}

Built-in Watchdog Timer

- **Power Consumption** 1 W @ 24 V_{DC} (Typical)
- **LED Indicator** On: Active Off: Non-active

Ordering Information

- **ADAM-4051** 16-channel Isolated Digital Input Module with LED and Modbus®

All product specifications are subject to change without notice.   Last updated : January 2005

ADAM-4052
ADAM-4053
ADAM-4055

Isolated Digital Input Module

16-channel Digital Input Module

16-channel Isolated Digital I/O Module with LED & Modbus

ADAM-4052 CE FM APPROVED

ADAM-4053 CE FM APPROVED

ADAM-4055 CE FCC

Specifications

Digital Input

- **Channels**   8
  six fully independent isolated channels. two isolated channels with common ground
- **Digital Input Level**   Logic level 0: +1 V max. Logic level 1: +3 ~ +30 V
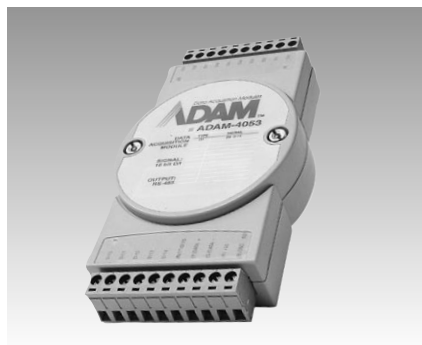- **Isolation Voltage**   5,000 V_{RMS}
- **Input Resistance**   3 kΩ/0.5 W

Built-in Watchdog Timer

Power

- **Power Requirements**   Unregulated +10 ~ +30 V_{DC}
- **Power Consumption**   0.4 W @ 24 V_{DC}

Ordering Information

- **ADAM-4052**   Isolated Digital Input Module

Specifications

Digital Input

- **Channels**   16
- **Digital 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 V ~ +30 V
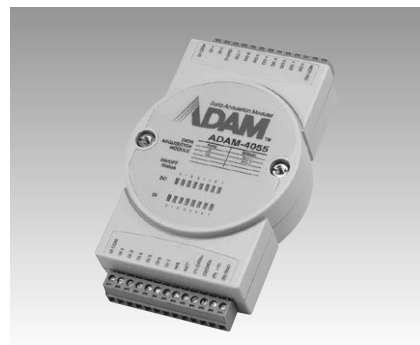- **Effective Distance (dry contact only)**   500 m max.

Built-in Watchdog Timer

Power

- **Power Requirements**   Unregulated +10 ~ +30 V_{DC}
- **Power Consumption**   1.0 W @ 24 V_{DC}

Ordering Information

- **ADAM-4053**   16-channel Digital Input Module

Specifications

Digital Input/Output

- **Channels**   16
- **I/O Type**   8 DO & 8 DI
- **Digital Output**   Open collector to 40 V (200 mA max. load)
- **Digital Input**   (Configurable)
  Dry Contact:
  Logic level 0: open
  Logic level 1: close to GND
  Wet Contact:
  Logic level 0: +3 Vmax
  Logic level 1: +10 to 50 V
- **Optical Isolation**   2500 V_{DC}
- **Over Voltage Protection**   70 V_{DC}

Built-in Watchdog Timer

- **Power Consumption**   1 W @ 24 V_{DC} (Typical)
- **LED Indicator**   On: Active
  Off: Inactive

Ordering Information

- **ADAM-4055**   16-channel Digital I/O Module with LED and Modbus®

ADVANTECH   **Remote DA&C Modules**

Last updated : January 2005

ADAM-4056S
ADAM-4056SO
ADAM-4060
ADAM-4068

12-channel Sink Type Isolated Digital Output Module

12-channel Source Type Isolated Digital Output Module

4-channel Relay Output Module

8-channel Relay Output Module with Modbus® and LED

ADAM-4056S/4056SO   FCC CE

ADAM-4060   CE FM APPROVED

ADAM-4068   CE FCC

1 Software
2 IPPC
3 TPC
4 FPM
5 ATM & AWS
6 DA&C
7 cPCI
8 ADAM-3000
9 Motion Control
10 ICOM
11 eConnectivity
12 UNO
13 ADAM-4000
14 ADAM-5000
15 ADAM-6000
16 ADAM-8000
17 BAS

Specifications

ADAM-4056S and ADAM-4056SO

- **Channels**   12
- **Optical Isolation**   5,000 V_{DC}
- **Power Requirement**   Unregulated 10~30 V_{DC}
- **Power Consumption**   1 W @ 24 V_{DC}
- **Built-in Watchdog Timer**

ADAM-4056S

- **Digital Output Type**   Sink
- **I/O Type**   Sink Type Output
- **Digital Output**   Open collector to 40V (200mA max. load)
- **Certifications**   CE, FCC

ADAM-4056SO

- **Digital Output Type**   Source
- **I/O Type**   Source Type Output
- **Digital Output**   VCC: 10 ~ 35 V_{DC} Current: 1A (per ch.)
- **Certifications**   CE, FCC
- **Over Current Detection and Protection**

Ordering Information

- **ADAM-4056S**   12-channel Sink Type Isolated Digital Output Module
- **ADAM-4056SO**   12-channel Source Type Isolated Digital Output Module

Specifications

Relay Output

- **Channels**   4-channels relay, two Form A and two Form C
- **Contact Rating**   AC: 125 V @ 0.6 A / 250 V @ 0.3 A   DC: 30 V @ 2 A / 110 V @ 0.6 A
- **Breakdown Voltage**   500 V_{AC} (50/60 Hz)
- **Relay on Time (typical)**   3 ms
- **Relay off Time (typical)**   1 ms
- **Total Switching Time**   10 ms
- **Insulation Resistance**   1,000 MΩ minimum at 500 V_{DC}

Built-in Watchdog Timer

Power

- **Power Requirements**   Unregulated 10~30 V_{DC}
- **Power Consumption**   0.8 W @ 24 V_{DC}

Ordering Information

- **ADAM-4060**   4-channel Relay Output Module

Specifications

Relay Output

- **Channels**   Four form A and four form C
- **Contact Rating**   AC: 125 V @ 0.6 A / 250 V @ 0.3 A   DC: 30 V @ 2 A / 110 V @ 0.6 A
- **Breakdown Voltage**   500 V_{AC} (50/60 Hz)
- **Relay on Time (typical)**   2 ms
- **Relay off Time (typical)**   4 ms
- **Insulation Resistance**   1,000 MΩ minimum at 500 V_{DC}

Built-in Watchdog Timer

- **System and Comm. Watchdog**

Power

- **Power Requirements**   Unregulated 10 ~30 V_{DC}
- **Power Consumption**   0.6 W @ 24 V_{DC}

Ordering Information

- **ADAM-4068**   8-channel Relay Output Module with Modbus® and LED

ADAM-4069
ADAM-4080
ADAM-4080D
ADAM-4914V

8-channel Power Relay Output Module with Modbus®

Counter/Frequency Module

Counter/Frequency Module with LED Display

4-channel Voltage Input Surge Protection Module

NEW

ADAM-4069

FM APPROVED

ADAM-4080/4080D

CE

ADAM-4914V

Specifications

Relay Output

- **Channels** — 8 form A
- **Contact Rating** — AC: 250 V @ 5 A
  DC: 30 V @ 5 A
- **Breakdown Voltage** — $1000 \, V_{AC}$ (50/60 Hz)
- **Relay on Time (typical)** — 5 ms
- **Relay off Time (typical)** — 5.6 ms
- **Insulation Resistance** — 1,000 MΩ minimum at $500 \, V_{DC}$
- **Built-in Watchdog Timer** — System and Comm. Watchdog

Power

- **Power Requirements** — Unregulated +10 ~ +30 V_{DC}
- **Power Consumption** — 0.6 W @ 24 V_{DC}

Ordering Information

- **ADAM-4069** — 8-channel Power Relay Output Module with Modbus®
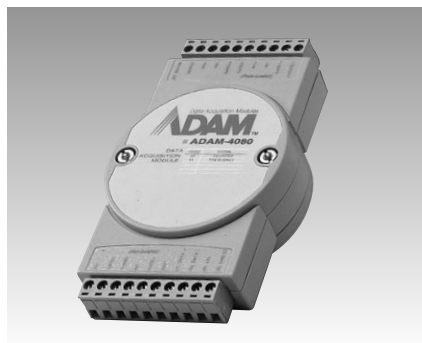
Specifications

Counter Input

- **Channels** — Two independent 32-bit counters
- **Input Frequency** — 50 kHz max.
- **Input Mode** — Isolated or non-isolated
- **Isolation Input Level** — Logic level 0: +1 V max.
  Logic level 1: +3.5 V ~ +30 V
- **Isolation Voltage** — 2500 V_{RMS}
- **Non-isolated** — Programmable threshold:
- **Input Level** — Logic level 0: 0 to +5 V (default = 0.8 V)
  Logic level 1: 0 to +5 V (default = 2.4 V)
- **Input Pulse Width** — >10 ms.
- **Maximum Count** — 4,294,967,295 (32 bits)
- **Programmable Digital Noise Filter** — 2 ~ 65 ms
- **Alarm** — Alarm comparator on each counter
- **Preset Type** — Absolute or relative

Frequency Measurement

- **Range** — 5 Hz ~ 50 kHz
- **Programmable Built-in Gate Time** — 1.0/0.1 sec.

Display (ADAM-4080D Only)

- **LED Indicator** — 5-digit readout, CH 0 or CH 1 (programmable)

Digital Output

- **Channels** — 2
  Open collector to 30 V, 30 mA max. load power dissipation: 300 mW for each channel

Built-in Watchdog Timer

Power

- **Power Requirements** — Unregulated 10~30 V_{DC}
- **Power Consumption** — 2.0 W @ 24 V_{DC}

Specifications

Input

- **Channels** — 4 differential voltage input and thermocouple

Performance

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

Ordering Information

- **ADAM-4914V** — 4-channel Voltage Input Surge Protection Module
- **ADAM-4080** — Counter/Frequency Module
- **ADAM-4080D** — Counter/Frequency Module with LED Display

ADVANTECH | **Remote DA&C Modules**

All product specifications are subject to change without notice

Last updated : January 2005

ADAM-4950-ENC

## IP66 Industrial Enclosure

Features

- Resists temperatures up to 115° C (239° F)
- Sidewall knockouts provide factory molded openings that are conveniently positioned for wire, cable or conduit feeders.
- Groove-and-lip type seal design provides the highest degree of protection
- Built-in DIN-rail for easy mounting of ADAM modules
- Cable glands included

Introduction

The ADAM-4950-ENC IP66 Industrial Enclosure is designed for use in harsh environments. It offers space for 1 to 3 ADAM modules. Its rugged protective housing guards modules from UV radiation, corrosive materials, moisture and extreme temperatures.

Mounts in any position
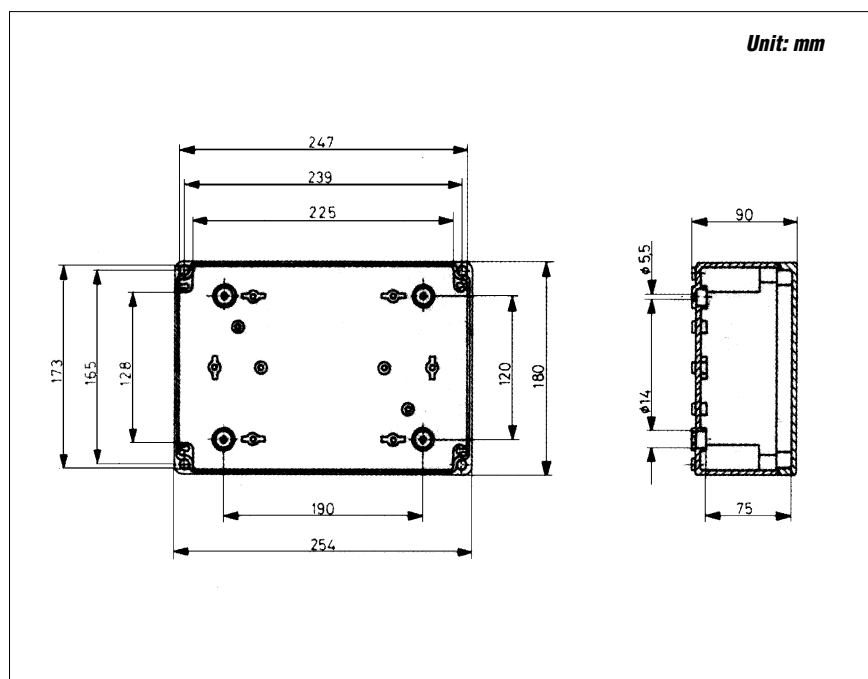**Several screw options let you fasten the box in almost any position.**
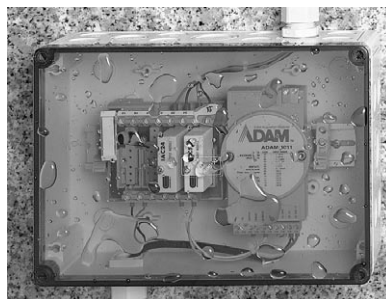
IP66 protection
Resists dust, water jets and even temporary flooding.
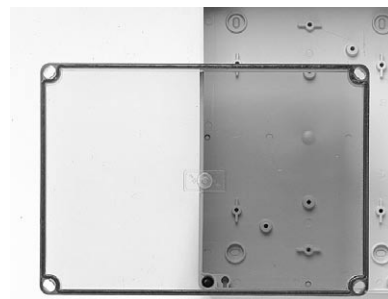
Lip-groove seal
Non-aging polyurethane seal. Cannot fall out or loosen.

Dimensions

Unit: mm

DIN-rail installation
No screws; just snap the module in place.
Offers space for three modules.

Enclosure Components

- **Case** — Glass filled polycarbonate (PC), transparent cover
- **Accessories (included)** — 1 x DIN-rail (21.5 cm)
2 x Polyamide cable glands (seal from 10 - 14 mm)
4 x Captive lid screws

Ordering Information

- **ADAM-4950-ENC** — IP66 Industrial Enclosure

1 Software
2 IPPC
3 TPC
4 FPM
5 ATM & AWS
6 DA&C
7 cPCI
8 ADAM-3000
9 Motion Control
10 ICOM
11 eConnectivity
12 UNO
13 ADAM-4000
14 ADAM-5000
15 ADAM-6000
16 ADAM-8000
17 BAS

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)
- Max. communication distance: 4000 feet (1.2 km)
- Power and communication LED indicator
- ASCII command/response protocol
- Communication error checking with checksum
- Asynchronous data format: 1 start bit, 8 data bits, 1 stop bit, no parity
- Up to 256 multidrop modules per serial port
- Online module insertion and removal
- Transient suppression on RS-485 communication lines

Power Requirements

- Unregulated +10 ~ +30 V_{DC}
- Protected against power reversal

Mechanical

- **Case** ABS with captive mounting hardware
- **Plug-in screw** Accepts 0.5 mm² to 2.5 mm²,
  terminal block 1 - #12 or 2 - #14 to #22 AWG

Environment

- **Operating Temperature** -10 ~ 70° C (14 ~ 158° F)
- **EMI** Meets FCC Class A
- **Storage Temperature** -25 ~ 85° C (-13 ~ 185° F)
- **Humidity** 5 ~ 95%, non-condensing

Dimensions

Unit: mm

FRONT VIEW

REAR VIEW

SIDE VIEW

PANEL MOUNTING
BRACKET

TOP VIEW

DIN - RAIL MOUNTING
ADAPTER

ADVANTECH **Remote DA&C Modules**

All product specifications are subject to change without notice

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