## Remote DA&C Modules
### ADAM-4000 Series

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**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 VDC. They are protected from accidental power supply reversals and can be safely connected or disconnected without disturbing a running network.
Remote Data Acquisition and Control Modules

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-454+ 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 Series

Modbus I/O Solution

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/4056S0), and Relay Output (ADAM-4068/4069) Modules.

Robust Design
The ADAM-ADAM/4015/4017+/ADAM-4018+/ADAM-4019+/4024 are designed with Channel differential, 3000VDC 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/4056S0, built with 2500VDC 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 burnout-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/4056S0/4068, users

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ADAMView

**Data Acquisition Software**

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.

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.

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
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<sub>DC</sub> 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 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<sub>DC</sub> 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<sub>DC</sub> 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\textsubscript{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\textsubscript{DC}, 24 V\textsubscript{DC}, 48 V\textsubscript{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\textsubscript{AC} 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\textsubscript{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.

Analog and Digital I/O Total Solution
ADAM-4000 Series

Module Selection Chart

Controllers

Ethernet

Serial

Communication Modules

Fiber Optic

Wireless

Digital Input

Digital Output

Analog Input

I/O Modules

Analog Output

Counter

Mixed I/O

Accessory

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)
4570 2-port Ethernet Data Gateway (P.13-14)
4571 1-port Ethernet Data Gateway (P.13-14)
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)
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4581 Wireless GSM Module
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4053 Digital Input Module (P.13-22)
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)
4012 Analog Input Module (P.13-17)
4017/4017+ 8-channel Analog Input Module (P.13-19)
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4011D T/C Input Module with Display (P.13-17)
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4018M Analog Input Data Logger (P.13-19)
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## Communication Modules Selection Guide

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

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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 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)
- 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 VDC
- Protected against Power Reversal

**Mechanical**
- Case: KJW with captive mounting hardware
- Plug-in Screw: Accepts 0.5 mm² to 2.5 mm², 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
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 ADAM-4501 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.
Specifications

- CPU: 80188, 16-bit microprocessor
- Flash ROM: 256 KB (170 KB free memory for the user)
- Operating System: Boot ROM-DOS
- 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)

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 Vdc
- Power Consumption: 2.0 W @ 24 Vdc

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: 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
- Network: Tx/Rx, Link, Speed (10/100 Mbps), Power
- Serial: Tx/Rx, Status
- Windows-based, auto-search for device
- Device Setting: name, description, serial port
- Windows NT 4.0 driver to redirect the standard Win32 API

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
- Windows NT 4.0 driver to redirect the standard Win32 API

Driver
- Windows NT 4.0 driver to redirect the standard Win32 API

Power Requirement
- Unregulated 10 ~ 30 Vdc with protection from power surge
- 4.0 W @ 24 Vdc

Accessories
- ABS with captive mounting hardware
- nylon DIN-rail mounting adapter SECC panel mounting bracket

Ordering Information
- ADAM-4571: 1-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: 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
- Network: Tx/Rx, Link, Speed (10/100 Mbps), Power
- Serial: Tx/Rx, Status
- Windows-based, auto-search for device
- Device Setting: name, description, serial port
- Windows NT 4.0 driver to redirect the standard Win32 API

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
- Windows NT 4.0 driver to redirect the standard Win32 API

Driver
- Windows NT 4.0 driver to redirect the standard Win32 API

Power Requirement
- Unregulated 10 to 30 Vdc with protection from power surge
- 4.0 W @ 24 Vdc

Accessories
- ABS with captive mounting hardware
- nylon DIN-rail mounting adapter SECC panel mounting bracket

Ordering Information
- ADAM-4571: 1-port Ethernet to RS-232/422/485 Data Gateway
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)

- **Output**
  - RS-232 Interface Connector
  - Female DB-9
  - 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

- **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
Remote DA&C Modules

13-16

All product specifications are subject to change without notice

Last updated: January 2005

Remote DA&C Modules

13-16

All product specifications are subject to change without notice

Last updated: January 2005

ADAM-4522
ADAM-4541
ADAM-4542+

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 ADAM-4541 ADAM-4542+**
  - **Ordering Information**: ADAM-4522 RS-232 to RS-422/485 Converter

Specifications

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

Ordering Information

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

Specifications

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

Ordering Information

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

Specifications

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

Ordering Information

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

Specifications

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

Power

- **Power Requirement**: Unregulated +10 – +30 VDC
- **Power Consumption**: 1 W (typical) 1.5 W (max)
# 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<sub>oc</sub>
- **Input Impedance**: 2 MΩ
- **Accuracy**: ±0.05% or better
- **Span Drift**: ±25 ppm/° C
- **Zero Drift**: ±6 mV/° C
- **Effective Resolution**: 16-bit

## Digital Input
- **Channels**: 1
- **Logic levels 0**: 1 V max.
- **Logic level 1**: 3.5–30 V
- **Pull up current**: 0.5 mA, 10 kΩ resistor to +5 V
- **Input Impedance**: 2 MΩ
- **Accuracy**: ±0.05% or better
- **Span Drift**: ±25 ppm/° C
- **Zero Drift**: +3 mV/° C
- **Input Connections**: 2, 3 or 4 wire
- **Input Impedance**: 2 MΩ
- **Bandwidth**: 2.62 Hz
- **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
- **Power Consumption**: 300 mW

## 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<sub>oc</sub>
- **Input Impedance**: 2 MΩ
- **Accuracy**: ±0.05% or better
- **Span Drift**: ±25 ppm/° C
- **Zero Drift**: ±6 mV/° C
- **Effective Resolution**: 16-bit

### Digital Input
- **Channels**: 1
- **Logic levels 0**: 1 V max.
- **Logic level 1**: 3.5–30 V
- **Pull up current**: 0.5 mA, 10 kΩ resistor to +5 V
- **Input Impedance**: 2 MΩ
- **Accuracy**: ±0.05% or better
- **Span Drift**: ±25 ppm/° C
- **Zero Drift**: +3 mV/° C
- **Input Connections**: 2, 3 or 4 wire
- **Input Impedance**: 2 MΩ
- **Bandwidth**: 2.62 Hz
- **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
- **Power Consumption**: 300 mW

### Ordering Information
- **ADAM-4011**: Thermocouple Input Module
- **ADAM-4011D**: Thermocouple Input Module w/ LED Display

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**Analog Input Module**  
**ADAM-4012**  
**RTD Input Module**  
**ADAM-4013**

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**Thermocouple Input Module**  
**ADAM-4011**  
**RTD Input Module**  
**ADAM-4013**

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**ANALOG-4012**

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**Power**
- **Unregulated 10–30 V<sub>dc</sub>**
- **Power Consumption**: 0.7 W @ 24 V<sub>dc</sub>

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**Online Download**
[www.advantech.com/products](http://www.advantech.com/products)
ADAM-4015
ADAM-4015T
ADAM-4016

Remote DA&C Modules

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 Drift: ±25 ppm/° C
- CMR @ 50/60 Hz: 150 dB
- NMR @ 50/60 Hz: 100 dB

Analog Output
- Channels: 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

Ordering Information
- ADAM-4015: Analog Input/Output Module
- ADAM-4016: Analog Input/Output Module

6-channel RTD Module with Modbus®
6-channel Thermistor Module with Modbus®

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 -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 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 and Individual wire burned-out detection

Power
- Power Requirement: Unregulated 10 ~ 30 V
- Power Consumption: 1.2 W @ 24 V DC

Ordering Information
- ADAM-4015T: 6-channel RTD Input Module w/Modbus®
- ADAM-4016: Analog Input/Output Module

All product specifications are subject to change without notice Last updated: January 2005
## Specifications
### Analog Input
- **Effective Resolution**: 16-bit
- **Channels**: Six differential, two single-ended (4017+) eight differential (4017+), six differential, two single-ended (4018+) four differential (4018+), six differential (4018+)
- **Channel Independent Configuration**: ADAM-4017+ only
- **Modbus®**: ADAM-4017+ only
- **Input Type**: mV, V, mA
- **Input Range**: ±15 mV, ±50 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 4-20 mA (4017+ only), ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA (4018+)
- **Isolation Voltage**: 3000 Vdc
- **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 Vdc
- **Power Consumption**: 1.2 W @ 24 Vdc
- **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+) four differential (4018+), six differential (4018+)
- **Ch. Independent Conf.**: ADAM-4018+ only
- **Modbus®**: ADAM-4018+ only
- **Input Type**: Thermocouple, mV, V, mA
- **Input Range**: ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA (4018+) Supports T/C & 4-20 mA (4018+)
- **Input Range**: ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA (4018+)
- **Isolation Voltage**: 3000 Vdc
- **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.

### 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 Vdc

### 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)
- **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 Vdc
- **Power Consumption**: 1.8 W @ 24 Vdc

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

### Online Download
www.advantech.com/products
### ADAM-4019+ Specifications

**Analog Input**
- **Effective Resolution**: 16-bit
- **Channels**: 16-bit
- **Input Type**: Differential channels for individual input type (mA, V, Thermocouple, RTD)
- **Input Range**: 
  - +20 mA, -20 mA
  - +5 V, -5 V
  - +10 V
  - +200 mV, +500 mV
  - +300 mV
- **Accuracy**: 
  - +0.1% of FSR for current output
  - +0.2% of FSR for voltage output
- **Span Temperature Coefficient**: ±25 ppm/°C
- **Burn-out Detection**: +20 mA & All T/C
- **Isolation Voltage**: 3000 V DC
- **Fault and Over-voltage Protection**: Resists over-voltage up to 35 V
- **Input Impedance**: 20 MΩ
- **Bandwidth**: 13.1 Hz at 50 Hz, 15.72 Hz at 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**: Unregulated
- **Power Requirements**: +10 ~ +30 VDC
- **Power Consumption**: 1.0 W @ 24 VDC

### ADAM-4021 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
  - ±1% of FSR Voltage output;
  - ±0.015% of FSR current output;
  - ±0.2 µA/°C
- **Span Temperature Coefficient**: ±25 ppm/°C
- **Readback Accuracy**: ±1% of FSR
- **Resolution**: ±0.015% of FSR
- **Zero Drift**: Voltage output:
  - ±30 µV/°C
  - ±0.1 µA/°C

**Built-in Watchdog Timer**
- **Power**: Unregulated
- **Power Requirements**: 4 W @ 24 VDC

### ADAM-4022T Specifications

**Analog Input**
- **Channels**: 16-bit
- **Input Type**: mA, V, Thermocouple, RTD
- **Input Range**: 
  - +20 mA, -20 mA
  - +5 V, -5 V
  - +10 V
  - +200 mV, +500 mV
  - +300 mV
- **Accuracy**: 
  - ±0.1% of FSR for current output
  - ±0.2% of FSR for voltage output
  - ±1% of FSR Voltage output;
  - ±0.015% of FSR current output;
  - ±0.2 µA/°C
- **Span Temperature Coefficient**: ±25 ppm/°C
- **Burn-out Detection**: +20 mA & All T/C
- **Isolation Voltage**: 3000 V DC
- **Fault and Over-voltage Protection**: Resists over-voltage up to 35 V
- **Input Impedance**: 20 MΩ
- **Bandwidth**: 13.1 Hz at 50 Hz, 15.72 Hz at 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**: Unregulated
- **Power Requirements**: +10 ~ +30 VDC
- **Power Consumption**: 1.0 W @ 24 VDC

### Ordering Information

- **ADAM-4019+**: 8-channel Universal Analog Input module with Modbus®
- **ADAM-4021**: Analog Output Module
- **ADAM-4022T**: Serial Based Dual Loop PID Controller
ADAM-4024 4-channel Analog Output Module with Modbus®
ADAM-4050 Digital I/O Module
ADAM-4051 16-channel Isolated Digital Input Module with LED & Modbus®

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 VDC
- Output Impedance: 0.5 Ω
- Accuracy: ±0.1 % of FSR for voltage output, ±0.015 % of FSR for current output

Digital Input
- Channels: 7
- Input Voltage: 50 V max
- Input Voltage level (Configurable)
- Optical Isolation: 2,500 VDC
- Over Voltage Protection: 70 VDC

Digital Output
- Channels: 8
- Output Type: open collector to 30 V, 30 mA max load
- Power dissipation: 300 mW

Built-in Watchdog Timer
- Isolated Digital Input: Channel: 4
  - Power Requirement: Unregulated +10 – +30 VDC
  - Power Consumption: 3 W @ 24 VDC

Ordering Information
- ADAM-4024 4-channel Analog Output Module w/Modbus® V or mA
- ADAM-4050 Digital I/O Module
- ADAM-4051 16-channel Isolated Digital Input Module w/LED and Modbus®
Remote DA&C Modules

All product specifications are subject to change without notice

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 VDC
- Power Consumption: 0.4 W @ 24 VDC

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 VDC
- Power Consumption: 1.0 W @ 24 VDC

Ordering Information
- ADAM-4053: 16-channel Digital Input Module

Specifications

Digital Input/Output
- Channels: 16
- I/O Type
  Dry contact: 8 DO & 8 DI
  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 V max
  Logic level 1: +10 to 50 V
- Optical Isolation: 2500 VDC
- Over Voltage Protection: 70 VDC

Built-in Watchdog Timer

Power
- Power Consumption: 1 W @ 24 VDC (Typical)
- LED Indicator
  On: Active
  Off: Inactive

Ordering Information
- ADAM-4055: 16-channel Digital I/O Module with LED & Modbus

Specifications

Digital Input
- Channels: 8
- 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 VDC
- Power Consumption: 0.4 W @ 24 VDC

Ordering Information
- ADAM-4052: Isolated Digital Input Module
Specifications
ADAM-4056S and ADAM-4056SO
- Channels: 12
- Optical Isolation: 5,000 V<sub>ac</sub>
- Power Requirement: Unregulated 10–30 V<sub>dc</sub>
- Power Consumption: 1 W @ 24 V<sub>dc</sub>
- 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<sub>dc</sub>
  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<sub>ac</sub> (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<sub>dc</sub>

Built-in Watchdog Timer

Power
- Power Requirements: Unregulated 10–30 V<sub>dc</sub>
- Power Consumption: 0.8 W @ 24 V<sub>dc</sub>

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<sub>ac</sub> (50/60 Hz)
- Relay on Time (typical): 2 ms
- Relay off Time (typical): 4 ms
- Insulation Resistance: 1,000 MΩ minimum at 500 V<sub>dc</sub>

Built-in Watchdog Timer
- System and Comm. Watchdog

Power
- Power Requirements: Unregulated 10–30 V<sub>dc</sub>
- Power Consumption: 0.6 W @ 24 V<sub>dc</sub>

Ordering Information
- ADAM-4068: 8-channel Relay Output Module with Modbus® and LED

All product specifications are subject to change without notice.
## Specifications

### Relay Output
- **Channels**: 8 form A
- **Contact Rating**:
  - AC: 250 V @ 5 A
  - DC: 30 V @ 5 A
- **Breakdown Voltage**: 1000 V<sub>ac</sub> (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<sub>ac</sub> System and Comm. Watchdog
- **Built-in Watchdog Timer**
- **Power**
  - **Power Requirements**: Unregulated +10 – +30 V<sub>dc</sub>
  - **Power Consumption**: 0.6 W @ 24 V<sub>dc</sub>

### Ordering Information
- **ADAM-4069**: 8-channel Power Relay Output Module with Modbus®
- **ADAM-4080/4080D**: Counter/Frequency Module
- **ADAM-4914V**: 4-channel Voltage Input Surge Protection Module

## 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 Gate Time**: 2 ~ 65 ms
- **Noise Filter**
- **Alarm**: Alarm comparator on each counter
  - Absolute or relative
- **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<sub>dc</sub>
  - **Power Consumption**: 2.0 W @ 24 V<sub>dc</sub>

### Performance
- **Input**
  - **Channels**: 4 differential voltage input and thermocouple

### Ordering Information

#### ADAM-4914V
- 4-channel Voltage Input Surge Protection Module

#### ADAM-4080
- Counter/Frequency Module

#### ADAM-4080D
- Counter/Frequency Module with LED Display
**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.

**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

**Dimensions**

![Dimensions Diagram]

**Lip-groove seal**

Non-aging polyurethane seal. Cannot fall out or loosen.

**IP66 protection**

Resists dust, water jets and even temporary flooding.

**Mounts in any position**

Several screw options let you fasten the box in almost any position.

**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
### 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 VDC
- 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 ~ 65°C (-13 ~ 185°F)
- Humidity: 5 ~ 95%, non-condensing

#### Dimensions

![Dimensions Diagram]

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**Remote DA&C Modules**

All product specifications are subject to change without notice.

Last updated: January 2005