Remote DA&C Modules
ADAM-4000 Series

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Remote DA&C Modules

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.

Easy Plug-in System Integration

With ADAM-4000’s Modbus I/O, and built-in Modbus/RTU protocol, any controller using the Modbus/RTU standard can be integrated as part of an ADAM-4000 control system. Any Modbus Ethernet data gateway can upgrade these I/O Modules up to the Modbus/TCP Ethernet layer. Most HMI software 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.

Class I, Div. 2 Groups ABCD

(See Note 1/2/ABCD/1*)
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/4058/4068/4069), 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.

**USB Communication**

ADAM-4561/4562 is a one-port isolated USB to RS-232 converter. The major feature of ADAM-4562 are the capability to use 9-wire RS-232, and to get power from the USB port. With 9-wire RS-232 capability, this converter meets the requirements of PLCs, modems, and controller equipment. As a USB-to-serial converter, ADAM-4562 supports Plug & Play, and hot-swapping, which simplifies the configuration process, and it also acts as a power supply for the module. It is no longer necessary to have an external power supply.
ADAM-4100 Series
Wide Temperature Remote Data Acquisition and Control Modules

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

Industrial Design for a Larger Variety of Applications
The ADAM-4100 series is designed to endure more adverse environments than the earlier ADAM-4000 series. This makes them suitable for more widespread applications.

Ready for Unfriendly Industrial Environments

Broader Operating Temperature Range
The ADAM-4100 series supports a broad operating temperature range of -40 to +85° C.

Higher Noise Immunity
In order to prevent noise from affecting your system, the ADAM-4100 series has been designed with more protection to counteract these effects. New standard features include: 1 kV surge protection on power inputs, 3 kV EFT, and 8 kV ESD protection.

Broader Power Input Range
ADAM-4100 modules accept any unregulated power source between +10 and +48 VDC. In addition, they are also protected against accidental power reversals, and can be safely connected or disconnected without disturbing a running network.

New Features for I/O Modules
- Supports 200 VDC Hi common mode voltage (ADAM-4117)
- Supports unipolar and bipolar input (ADAM-4117)
- Supports +/- 15 V input range (ADAM-4117)
- Supports filter auto-tuning or filter-out 50 Hz / 60 Hz (ADAM-4117/4118)
- Digital filter function (ADAM-4150)
- DI channels can be used as 1 kHz counters (ADAM-4150)
- Over current / short circuit protection (ADAM-4150)
- DO channels support pulse output function (ADAM-4150 / 4168)

ADAM-4100 Module with LED Display
ADAM-4100 modules have a LED display that lets you monitor the status address settings. The modules have two operating modes (initial and normal), and a new address mode for easier reading of the address settings.

Online Firmware Update
ADAM-4100 modules have a friendly and convenient design where firmware can be updated through a local network or the Internet. This saves time and ensures that the module always runs with the latest functional enhancements.

Legacy Communication Protocol Support
To satisfy both the current ADAM users, and Modbus users, ADAM-4100 modules support both the ADAM protocol and the Modbus/RTU protocol. You can select the communication mode you want through the Windows Utility Software. The Modbus protocol not only supports the original data format (N, 8, 1) but also accepts 1 start bit, 8 data bits, and 1 or 2 stop bits, with parity check (none, odd, even).
ADAM-4000/4100 Series

Analog Input Modules
The ADAM-4000 and 4100 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 analog input modules protect your equipment from ground loops by providing 3,000 VDC isolation and a wide power supply input of 10 to 30 VDC for ADAM-4000 and 10 to 48 VDC for the ADAM-4100 series.

ADAM-4011, 4011D and 4012 modules feature digital inputs and outputs that may be used for alarms and event counting.

ADAM-4017, 4017+, and 4117 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. The ADAM-4018, 4018+, 4118, and 4119+ are also 8-channel analog input modules that support thermocouple sensor input.

RTD Input Modules
RTD modules are popular for temperature measurements. 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-4017 analog output module supplies single-channel analog output in a range of voltages and currents. In order to fully cover the role as a multi-channel analog output module, ADAM-4024 provides four universal output channels. Moreover, it is designed with four digital inputs for integrating applications, such as emergency latch outputs or 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.

Digital Input and Output Modules
ADAM-4050 and 4150 feature 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 ADAM-4150 digital I/O channels can also support event counter and pulse output functions.

ADAM-4051 is a 16-ch. digital input module with 3,000 VDC optical isolation. It accepts 10 to 50 volts as input voltage for various digital signals, such as 12 VDC, 24 VDC, and 48 VDC. Moreover, users can read the current status from the LED indicators on the front panel.

ADAM-4052 provides eight digital input channels: six fully independent isolated channels and two isolated channels with a common ground. The ADAM-4053 provides 16 digital input channels for dry or wet contact signals. For dry contact, the effective distance from digital input to contact point is up to 500 m.

ADAM-4055 offers 8 isolated digital input channels and 8 isolated digital output channels for critical applications. The inputs accept 10 to 50 volts, and the outputs supply 5 – 40 VDC open collector. Considered to be very user-friendly, the ADAM-4055 is also built with a LED indicator for easy status reading.

ADAM-4056S and 4056SD are 12-channel sink/source type isolated digital output modules. The isolated channels are designed for digital output for critical applications. ADAM-4056S can provide from 5 to 40 VDC, while ADAM-4056SD can be used in the range of 10 to 35 VDC with maximum 1 A per channel.

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

- Programmable Alarm Output
  ADAM-4080 and 4080D include digital alarm functions. You can set alarm values (32-bit) into the module from your host computer.

- Programmable Digital Filter and Threshold
  ADAM-4080 and 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.

Relay Output Modules
As with other ADAM modules, the ADAM-4060, 4068, 4069 and 4168 relay modules are controlled remotely and store configuration data in EEPROM. They provide 4/8 channels, with a mix of form A and form C. These modules are designed for on/off control or low-power switching and power relay output applications. The ADAM-4168 also support pulse output functionality.
# Module Selection Chart

## Communication Modules

### Ethernet
- 4500 PC-based Communication Controller (P.13-10)
- 4501/4501D Ethernet-enabled Communication Controller with 8 Digital I/O (P.13-11)
- 4022T Serial based Dual Loop PID Controller (P.13-17)
- 4570 2-port Ethernet Data Gateway (P.11-16)
- 4571 1-port Ethernet Data Gateway (P.11-16)
- 4510/4510I/4510S RS-422/485 Repeater (P.13-12)
- 4520/4520I/4522 RS-232 to RS-422/485 Converter (P.13-12)
- 4521 Addressable RS-422/485 to RS-232 Converter (P.13-12)

### Serial
- 4541 Multi-mode Fiber Optic to Serial Converter (P.13-13)
- 4542+ Single-mode Fiber Optic to Serial Converter (P.13-13)
- 4561 1-port Isolated USB to RS-232/422/485 Converter (P.13-13)
- 4562 1-port Isolated USB to RS-232 Converter (P.13-13)

### Fiber Optic
- 4542+ Single-mode Fiber Optic to Serial Converter (P.13-13)

### USB
- 4561 1-port Isolated USB to RS-232/422/485 Converter (P.13-13)
- 4562 1-port Isolated USB to RS-232 Converter (P.13-13)

## I/O Modules

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- 4051 16-channel Isolated Digital Input Module (P.13-18)
- 4052 8-channel Isolated Digital Input Module (P.13-18)
- 4053 16-channel Digital Input Module (P.13-19)

### Digital Output
- 4060 4-channel Relay Output Module (P.13-20)
- 4068 8-channel Relay Output Module (P.13-20)
- 4069 8-channel Power Relay Output Module w/Modbus® (P.13-20)
- 4056S/4056SO 12-channel Sink/Source Type Digital Output Module (P.13-19)
- 4168 Relay Output Module (P.13-22)

### Analog Input
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- 4018/4018+ 8-channel T/C Input Module (P.13-16)
- 4019+ 8-channel Universal AI Module (P.13-16)
- 4013 RTD Input Module (P.13-14)
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### Analog Output
- 4021 Analog Output Module (P.13-17)
- 4024 4-channel Analog Output Module (P.13-17)

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- 4055 16-channel Isolated Digital I/O Module (P.13-19)
- 4150 Digital I/O Module (P.13-22)

### Accessory
- 4914V 4-channel Voltage Input Surge Protection Module (P.13-22)
## Communication Modules

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<td><strong>Comm. Protocol</strong></td>
<td>ADAM</td>
<td>Modbus/RTU, Modbus/TCP</td>
<td>ADAM/Modbus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Ethernet: 10/100 M</td>
<td>Ethernet: 10/100 M</td>
<td>Ethernet: 10/100 M</td>
<td>Ethernet: 10/100 M</td>
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<td><strong>Comm. Speed (bps)</strong></td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>From 1200 to 115.2 k</td>
<td>Ethernet: 10/100 M</td>
<td>Ethernet: 10/100 M</td>
<td>Ethernet: 10/100 M</td>
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<td><strong>Comm. Distance</strong></td>
<td>Serial: 1.2 km</td>
<td>Ethernet: 100 m</td>
<td>Serial: 1.2 km</td>
<td>Serial: 1.2 km</td>
<td>Serial: 1.2 km</td>
<td>Serial: 1.2 km</td>
<td>Serial: 1.2 km</td>
<td>Serial: 1.2 km</td>
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<td><strong>Watchdog Timer</strong></td>
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<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Yes</td>
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<td><strong>Isolation Voltage</strong></td>
<td>-</td>
<td>-</td>
<td>3000 VDC (ADAM-4510/ADAM-4510I)</td>
<td>3000 VDC (ADAM-4520/ADAM-4520I)</td>
<td>-</td>
<td>-</td>
<td>3000 VDC</td>
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<td><strong>Operating Temperature</strong></td>
<td>-10 – 70°C</td>
<td>-10 – 70°C</td>
<td>-10 – 50°C</td>
<td>4510/4510S: -10 – 70°C 4510I: -10 – 85°C 4520/4522: -10 – 70°C 4520I: -10 – 85°C</td>
<td>-10 – 70°C</td>
<td>-10 – 70°C</td>
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<tr>
<td><strong>Humidity</strong></td>
<td>5 – 95 %</td>
<td>5 – 95 %</td>
<td>5 – 95 %</td>
<td>5 – 95 %</td>
<td>5 – 95 %</td>
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<td>20 – 95 %</td>
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<td><strong>Power Consumption</strong></td>
<td>2.0 W</td>
<td>4 W</td>
<td>4 W</td>
<td>1.4 W</td>
<td>1.2 W</td>
<td>1 W</td>
<td>1 W (typical)</td>
<td>1.5 W (max.)</td>
<td>1 W</td>
<td>4 W</td>
<td></td>
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<td><strong>Page</strong></td>
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## Analog Input

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<td>Resolution</td>
<td>16 bit</td>
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<td>16 bit</td>
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<tr>
<td>Input Channels</td>
<td>1 differential</td>
<td>1 differential</td>
<td>1 differential</td>
<td>6 differential</td>
<td>1 differential</td>
<td>8 differential</td>
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<td>Sampling Rate</td>
<td>10 Hz</td>
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<td>10 Hz (total)</td>
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<td>Voltage Input</td>
<td>±15 mV</td>
<td>±150 mV</td>
<td>±500 mV</td>
<td>±1 V</td>
<td>±5 V</td>
<td>±10 V</td>
<td>±25 V</td>
<td>±1 V</td>
<td>±5 V</td>
<td>±2.5 V</td>
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<td>Current Input</td>
<td>±20 mA</td>
<td>±20 mA</td>
<td>-</td>
<td>±20 mA</td>
<td>4017+ 4-20 mA</td>
<td>±20 mA</td>
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<td>Burn-out Detection</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Yes</td>
<td>-</td>
<td>Yes</td>
<td>(4018+)</td>
<td>Yes</td>
<td>(4 - 20 mA &amp; All T/C)</td>
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<td>Channel Independant Configuration</td>
<td>-</td>
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<td>-</td>
<td>Yes</td>
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<td>Yes</td>
<td>(4017+)</td>
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<td>Voltage Output</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0 - 10 V</td>
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<tr>
<td>Current Output</td>
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<td>30 mA</td>
<td>-</td>
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<td>1</td>
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<td>2</td>
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<td>4</td>
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<tr>
<td>Watchdog Timer</td>
<td>Yes (System)</td>
<td>Yes (System)</td>
<td>Yes (System)</td>
<td>Yes</td>
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## I/O Modules

### Analog Output

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<tr>
<th>Module</th>
<th>ADAM-4017</th>
<th>ADAM-4018</th>
<th>ADAM-4027</th>
<th>ADAM-4037</th>
<th>ADAM-4047</th>
<th>ADAM-4057</th>
<th>ADAM-4067</th>
<th>ADAM-4077</th>
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<tbody>
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<td>±15 mV</td>
<td>±20 mA</td>
<td>±30 mV</td>
<td>±50 mV</td>
<td>±100 mV</td>
<td>±150 mV</td>
<td>±200 mV</td>
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<td>2,500 V</td>
<td>2,500 V</td>
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### Digital Input/Output

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<th>ADAM-4037</th>
<th>ADAM-4047</th>
<th>ADAM-4057</th>
<th>ADAM-4067</th>
<th>ADAM-4077</th>
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<tbody>
<tr>
<td>Resolution</td>
<td>±15 mV</td>
<td>±20 mA</td>
<td>±30 mV</td>
<td>±50 mV</td>
<td>±100 mV</td>
<td>±150 mV</td>
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<td>2,500 V</td>
<td>2,500 V</td>
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### Relay Output

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<th>ADAM-4067</th>
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<td>Resolution</td>
<td>±15 mV</td>
<td>±20 mA</td>
<td>±30 mV</td>
<td>±50 mV</td>
<td>±100 mV</td>
<td>±150 mV</td>
<td>±200 mV</td>
<td>±500 mV</td>
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<tr>
<td>Isolation</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
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### Counter

<table>
<thead>
<tr>
<th>Module</th>
<th>ADAM-4017</th>
<th>ADAM-4018</th>
<th>ADAM-4027</th>
<th>ADAM-4037</th>
<th>ADAM-4047</th>
<th>ADAM-4057</th>
<th>ADAM-4067</th>
<th>ADAM-4077</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>±15 mV</td>
<td>±20 mA</td>
<td>±30 mV</td>
<td>±50 mV</td>
<td>±100 mV</td>
<td>±150 mV</td>
<td>±200 mV</td>
<td>±500 mV</td>
</tr>
<tr>
<td>Isolation</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
<td>2,500 V</td>
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</table>

Courtesy of Steven Engineering, Inc. ● 230 Ryan Way, South San Francisco, CA 94080-6370 ● General Inquiries: (800) 670-4183 ● www.stevenengineering.com
**ADAM-4500 Series**

** Designed for Ethernet Connectivity **
ADAM-4500 Series are 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-4500 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-4500 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-4500 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-4500 modularized I/O expansion board provides high flexibility for versatile application requirements. The compact size and modularized design makes ADAM-4500 fit into 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-4500 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-4500 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.
Introduction

The ADAM-4501 consists of compact-sized Ethernet-enabled communication controllers with a x-86 CPU architecture. They support not only an Ethernet interface but also 4 serial ports, which makes them very suitable for industrial communication and control applications. The Ethernet-enabled features include built-in HTTP Server, FTP Server and e-mail alarm functions. The modularized I/O design provides high flexibility for versatile application requirements. The ADAM-4501 also supports rich Modbus function libraries including Modbus/RTU Master/Slave and Modbus/TCP function libraries.

Specifications

General
- Certifications: CE
- Connectors: 1 x RJ45 (Ethernet), 1 x RJ48 (COM1), 2 x Plug-in terminal blocks (#14 ~ 28 AWG)
- Enclosure: ABS+PC
- Indicators: LEDs for: Power, CPU, communication and battery
- Mounting: DIN 35 rail, stack, wall
- Power Input: Unregulated 10~30 VDC, w/power reversal protection

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

Input/Output
- Digital Input
  - Channels: 4
  - Dry Contact:
    - Logic level 0: Close to GND
    - Logic level 1: Open
  - Wet Contact:
    - Logic level 0: +2 V max.
    - Logic level 1: 4 V ~ 30 V
- Digital Output
  - Channels: 4
  - Open Collector to +40 V, 200 mA max. load

Communication
- LAN: 1 x 10/100Base-T
- RS-485 Speed: 1.2 to 115.2 kbps
- RS-485 Max. Nodes: 256 multi-drop systems per serial port
- Serial Ports: COM1: RS-232 (Full Modem Signals)
  - COM2, COM3: RS-485
  - COM4 (Programming port): RS-232/485 (jumper)

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

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

Ordering Information
- ADAM-4501: Ethernet-enabled Communication Controller with 8 Digital I/O
- ADAM-4501D: Ethernet-enabled Communication Controller with LED and 8 Digital I/O
## Specifications

### General
- **Connectors**: 2 x Plug-in terminal blocks (#14 ~ 22 AWG)
- **Isolation Protection**: 3000 V DC (4510I/4510S only)
- **Power Consumption**: 1.4 W @ 24 V DC

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

### Environment
- **Operating Temperature**: ADAM-4510/4510S: -10~70° C (14~158° F)
  ADAM-4510I: -40~85° C (-40~185° F)
- **Storage Temperature**: ADAM-4510/4510S: -25~85°C (-13~185° F)
  ADAM-4510I: -40~85° C (-40~185° F)

---

## Specifications

### General
- **Connectors**: 1 x Plug-in terminal block (#14 ~ 22 AWG)
- **Isolation Protection**: 3000 V DC (4520/4520I only)
- **Power Consumption**: 1.2 W @ 24 V DC

### Communications
- **Input**: RS-232 (4-wire)
- **Output**: RS-485 (2-wire) or RS-422 (4-wire).
- **Speed Modes (bps)**: 300, 600, 1200, 2400, 4800, 9600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, software configurable

### Environment
- **Operating Temperature**: ADAM-4520/4522: -10~70° C (14~158° F)
  ADAM-4520I: -40~85° C (-40~185° F)
- **Storage Temperature**: ADAM-4520/4522: -25~85°C (-13~185° F)
  ADAM-4520I: -40~85° C (-40~185° F)

---

## Common Specifications

### General
- **Dimensions (WxDxH)**: 70 x 122 x 30 mm
- **Enclosure**: ABS + PC
- **Mounting**: DIN 35 rail, stack, wall
- **Power Input**: Unregulated 10–30 V DC w/power reversal protection
- **Humidity**: 5 – 95% RH

---

## Ordering Information

- **ADAM-4510**: RS-422/RS-485 Repeater
- **ADAM-4510S**: Isolated RS-422/RS-485 Repeater
- **ADAM-4510I**: Robust Isolated RS-422/RS-485 Repeater
- **ADAM-4520**: Isolated RS-232 to RS-422/RS-485 Converter
- **ADAM-4520I**: Robust Isolated RS-232 to RS-422/RS-485 Converter
- **ADAM-4522**: RS-232 to RS-422/485 Converter
- **ADAM-4521**: Addressable RS-422/485 to RS-232 Converter
Specifications

General
- Connectors: 1 x Plug-in terminal block (#14 – 22 AWG) (RS-232/422/485) 1 x SC fiber connector
- Power Consumption: 1 W (typ), 1.5 W (max)

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

Fiber Optic Communications
- Optical Power Budget (attenuation): 12.5 db (measured with 62.5/125 mm)
- Transmission Distance: 2.5 km Multi mode (Send and receive)
- Wavelength: 820 nm

Common Specifications

General
- Dimensions (WxHxD): 70 x 112 x 25 mm
- Enclosure: ABS+PC
- Mounting: DIN 35 rail, stack, wall
- Power Input: Unregulated 10-30 VDC

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

Ordering Information
- ADAM-4541: Multi-mode Fiber Optic to RS-232/422/485 Converter
- ADAM-4542+: Single-mode Fiber Optic to RS-232/422/485 Converter
- ADAM-4561: 1-port Isolated USB to RS-232 Converter
- ADAM-4562: 1-port Isolated USB to RS-232/485 Converter
**Specifications**

**General**
- **LED Indicators**: 5-digit (ADAM-4011D)
- **Power Consumption**: 1.2 W @ 24 Vdc

**Analog Input**
- **Input Impedance**: Voltage: 2 MΩ, Current: 125 Ω (Added by users)
- **Input Types**: T/C, mV, V or mA
- **Input Range**: ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V and ±20 mA
- **NMR @ 50/60 Hz**: 100 dB
- **Sampling Rate**: 10 samples/sec.
- **Span Drift**: ±25 ppm/° C
- **Zero Drift**: ±3 µV/° C

**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

**Common Specification**

- **Dimensions (WxHxD)**: 70 x 122 x 30 mm
- **Enclosure**: ABS +PC
- **Mounting**: DIN 35 rail, stack, wall
- **Power Input**: Unregulated 10~30 Vdc
- **Watchdog Time**: 1.6 sec. (system)
- **Connectors**: 1 x Plug-in terminal block (#14~22 AWG)

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

**Ordering Information**
- ADAM-4011: Thermocouple Input Module
- ADAM-4011D: Thermocouple Input Module w/LED Display
- ADAM-4012: Analog Input Module
- ADAM-4013: RTD Input Module
### ADAM-4015
**6-channel RTD Module with Modbus®**

### ADAM-4015T
**6-channel Thermistor Module with Modbus®**

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

#### Specifications

<table>
<thead>
<tr>
<th>General</th>
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<th>ADAM-4015T</th>
<th>ADAM-4016</th>
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<tr>
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<td>2 x Plug-in terminal block (#14 – 28 AWG)</td>
<td>2 x Plug-in terminal block (#14 – 28 AWG)</td>
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<td>1.2 W @ 24 V&lt;sub&gt;dc&lt;/sub&gt;</td>
<td>1.2 W @ 24 V&lt;sub&gt;dc&lt;/sub&gt;</td>
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<td>Wire-Burnout Detector</td>
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<td>3 or 3 wire</td>
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<td>Pt, Balco and Ni RTD</td>
<td>Pt, Balco and Ni RTD</td>
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<td>100 dBC</td>
<td>100 dBC</td>
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<td>Pt -50° C to 150° C</td>
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<tr>
<td>Pt 0° C to 100° C</td>
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<tr>
<td>Pt 0° C to 200° C</td>
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<tr>
<td>Pt 0° C to 400° C</td>
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<tr>
<td>Pt -200° C to 200° C</td>
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<tr>
<td>IEC RTD 100 ohms (a = 0.00385)</td>
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<tr>
<td>JIS RTD 100 ohms (a = 0.00392)</td>
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<tr>
<td>Balco 500 RTD</td>
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<td>-90° C to 180° C</td>
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<td>Ni 50 RTD</td>
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<td>Ni -80° C to 100° C</td>
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<td>Ni 508 RTD</td>
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<td>10 samples / sec.</td>
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<td>± 25 ppm/° C</td>
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<tr>
<td>Zero Drift</td>
<td>± 3 µV/° C</td>
<td>± 3 µV/° C</td>
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#### Common Specifications

<table>
<thead>
<tr>
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<th>ADAM-4015</th>
<th>ADAM-4015T</th>
<th>ADAM-4016</th>
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<tbody>
<tr>
<td>Dimensions (WxHxD)</td>
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<td>70 x 122 x 30 mm</td>
<td>70 x 122 x 30 mm</td>
</tr>
<tr>
<td>Enclosure</td>
<td>ABS + PC</td>
<td>ABS + PC</td>
<td>ABS + PC</td>
</tr>
<tr>
<td>Mounting</td>
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<td>DIN 35 rail, stack, wall</td>
<td>DIN 35 rail, stack, wall</td>
</tr>
<tr>
<td>Power Input</td>
<td>Unregulated 10–30 V&lt;sub&gt;oc&lt;/sub&gt;</td>
<td>Unregulated 10–30 V&lt;sub&gt;oc&lt;/sub&gt;</td>
<td>Unregulated 10–30 V&lt;sub&gt;oc&lt;/sub&gt;</td>
</tr>
<tr>
<td>Watchdog Timer</td>
<td>1.6 sec. (system)</td>
<td>1.6 sec. (system)</td>
<td>1.6 sec. (system)</td>
</tr>
<tr>
<td>Analog Input</td>
<td>Accuracy</td>
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<td>±0.05% or better</td>
</tr>
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<td>150 dBC</td>
<td>150 dBC</td>
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<td>5–95% RH</td>
<td>5–95% RH</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-10–70°C (14–158°F)</td>
<td>-10–70°C (14–158°F)</td>
<td>-10–70°C (14–158°F)</td>
</tr>
</tbody>
</table>

#### Ordering Information

- **ADAM-4015**: 6-channel RTD Input Module w/Modbus®
- **ADAM-4015T**: 6-channel Thermistor Input Module w/Modbus®
- **ADAM-4016**: Analog Input/Output Module
## ADAM-4017/4017+ Specifications

**General**
- **Power Consumption**: 1.2 W @ 24 V<sub>dc</sub>

**Analog Input**
- **Channels**: Six differential, two single-ended (4017) eight differential (4017+)
- **Ch. Independent Conf.**: ADAM-4017+ only
- **Input Impedance**: Voltage: 20 MΩ, Current: 120 Ω
- **Input Range**: ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±20 mA, 4–20 mA (4017+ only)
- **Modbus®**: ADAM-4017+ only
- **Overvoltage Protection**: ±35 V
- **Sampling Rate**: 10 samples/sec. (total)
- **Span Drift**: ±25 ppm/°C
- **TVS/ESD Protection**: Built-in
- **Zero Drift**: ±6 µV/°C

## ADAM-4018/4018+ Specifications

**General**
- **Power Consumption**: 0.8 W @ 24 V<sub>dc</sub>
- **T/C-Burnout Detector**: Yes (4018+ only)

**Analog Input**
- **Channels**: Six differential, two single-ended (4018) eight differential (4018+)
- **Ch. Independent Conf.**: ADAM-4018+ only
- **Input Impedance**: Voltage: 20 MΩ, Current: 120 Ω
- **Input Range**: ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V, ±20 mA (4018); 4–20 mA (4018+)
- **Input Types**: Thermocouple, mV, V, mA (4018) (4018+ Supports T/C & 4-20 mA only)
- **Modbus®**: ADAM-4018+ only
- **Overvoltage Protection**: ±35 V
- **Sampling Rate**: 10 samples/sec. (total)
- **Span Drift**: ±25 ppm/°C
- **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 |
- **TVS/ESD Protection**: Built-in
- **Zero Drift**: ±6 µV/°C

## ADAM-4019+ Specifications

**General**
- **Power Consumption**: 1.0 W @ 24 V<sub>dc</sub>

**Analog Input**
- **Accuracy**: ±0.1% of voltage input
- **Bandwidth**: 13.1 Hz @ 50 Hz, 15.72 Hz @ 60 Hz
- **Burn-out Detection**: +4–20mA & all T/C
- **Channels**: 8 differential channels for individual input type
- **CMR @ 50/60 Hz**: 92 dB min.
- **Resolution**: 16 bits
- **Input Range**: +/–1V, +/–2.5V, +/–5V, +/–10V, +/–100mV, +/–500mV, +/–20mA, +/–20mA, +/–50mV, +/–20mA
- **Input Impedance**: Voltage: 20 MΩ, Current: 120 Ω
- **Input Type**: T/C, mV, V, mA
- **Isolation Protection**: 3000 V<sub>dc</sub>
- **Overvoltage Protection**: ±35 V
- **Span Drift**: ±25 ppm/°C
- **TVS/ESD Protection**: Built-in
- **Zero Drift**: ±6 µV/°C

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### Ordering Information

- **ADAM-4017**: 8-channel Analog Input Module
- **ADAM-4017+**: 8-channel Differential Analog Input Module w/Modbus®
- **ADAM-4018**: 8-channel Thermocouple, mV, V, mA Input Module
- **ADAM-4018+**: 8-channel Differential, mA and Thermocouple Input Module w/Modbus®
- **ADAM-4019+**: 8-channel Universal Analog Input Module w/Modbus®

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### Common Specification

**General**
- **Dimensions**: 70 x 122 x 30 mm
- **Connectors**: 2 x Plug-in terminal block (#14–22 AWG)
- **Enclosure**: ABS+PC
- **Mounting**: DIN 35 rail, stack, wall
- **Power Input**: Unregulated 10–30 V<sub>dc</sub>
- **Watchdog Timer**: 1.6 sec. (system)
ADAM-4021
ADAM-4022T
ADAM-4024

Analog Output Module
Serial Based Dual Loop PID Controller
4-channel Analog Output Module with Modbus®

Specifications

General
- Connectors: 2 x Plug-in terminal block (#14 – 22 AWG)
- Power Consumption: 1.4 W @ 24 VDC

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

ADAM-4024

Specifications

General
- Connectors: 2 x Plug-in terminal block (#14 – 28 AWG)
- Power Consumption: 4 W @ 24 VDC

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 0 – 100° C
  - Pt 0 – 600° C
  - Pt 0 – 200° C
  - Pt 1000 RTD: Pt -40 – 160° C

Analog Output
- Channels: 2
- Output Range: 0 to 20 mA, 4 to 20 mA, ±10 V
- Output Type: mA, V
- Programmable: 0.125 – 128 mA/sec.
- Slope: 0.0625 – 64.0 V/sec.
- Resolution: ±0.015% of FSR
- Span Temperature Coefficient: ±25 ppm/°C
- Zero Drift: Voltage output: ±30 µV/°C, current output: ±0.2 µA/°C

Common Specifications

General
- Dimensions (WxHxD): 70 x 122 x 30 mm
- Enclosure: ABS + PC
- Mounting: DIN 35 rail, stack, wall
- Power Input: Unregulated 10~30 VDC
- Watchdog Timer: 1.6 sec. (system)
- Humidity: 5 – 95% RH
- Operating Temperature: -10~70° C (14~158° F)
- Storage Temperature: -25~85° C (-13~185° F)

Ordering Information
- ADAM-4021: Analog Output Module – V or mA
- ADAM-4022T: Serial Based Dual Loop PID Controller
- ADAM-4024: 4-channel Analog Output Module w/Modbus®, V or mA
Remote DA&C Modules

ADAM-4050
15-channel Digital I/O Module

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

ADAM-4052
8-channel Isolated Digital Input Module

Specifications

General
- Certifications: CE, FM
- Connectors: 2 x plug-in terminal blocks (#14 – 22 AWG)
- Power Consumption: 0.4 W @ 24 VDC

Digital Input
- Channels: 7
  - Logic level 0: +1 V max.
  - Logic level 1: 3.5 – 30 V
  - Pull up current: 0.5 mA, 10 kΩ resistor to +5 V

Digital Output
- Channels: 8
  - Open collector to 30 V, 30 mA max. Load power dissipation: 300 mW
  - LED Indicators: On: Active, Off: Non-active
  - Power Consumption: 1 W @ 24 VDC (Typical)

Digital Input
- Channels: 16
  - Logic level 0: +1 V max.
  - Logic level 1: +3 – 30 V
  - Input Resistance: 3 kΩ @ 0.5 W
  - Isolation Voltage: 5,000 Vrms
  - Optical Isolation: 2,500 VDC
  - Overvoltage Protection: 70 VDC

Digital Input Level
- Logic level 0: close to GND
- Logic level 1: open

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

Common Specifications

General
- Dimensions (WxHxD): 70 x 122 x 30 mm
- Enclosure: ABS + PC
- Mounting: DIN 35 rail, stack, wall
- Power Input: Unregulated 10~30 VDC
- Watchdog Timer: 1.6 sec. (system)

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

Ordering Information
- ADAM-4050
  - 15-channel Digital I/O Module
- ADAM-4051
  - 16-channel Isolated Digital Input Module with LED and Modbus®
- ADAM-4052
  - 8-channel Isolated Digital Input Module
# Specifications

## General
- Connectors: 2 x Plug-in terminal blocks (#14 – 28 AWG)
- Power Consumption: 1 W @ 24 V<sub>DC</sub>

## Digital Input
- Channels: 16
- Digital Input Level
  - Dry contact: Logic level 0: close to GND
  - Logic level 1: +2 V max.
  - Logic level 1: +4 – 30 V
  - Effective Distance (dry contact only): 500 m max.

## Digital Output
- Channels: 8
- Digital Output Type
  - Sink
  - I/O Type: Sink Type Output
- Overvoltage Protection: 70 V<sub>DC</sub>

## Power Dissipation
- Channel Max: 1 W
- Total: 2.2 W

## Ordering Information
- ADAM-4053
- ADAM-4055
- ADAM-4056S
- ADAM-4056SO

### General
- Connectors: 2 x Plug-in terminal blocks (#14 – 28 AWG)
- Power Consumption: 1 W @ 24 V<sub>DC</sub>

### Digital Input
- Channels: 8
- Digital Input Level: Logic level 0: open
- Digital Input Level: Logic level 1: close to GND
- Wet Contact: Logic level 0: +3 V max.
- Wet Contact: Logic level 1: +10 – 50 V
- Optical Isolation: 2500 V<sub>DC</sub>
- Overvoltage Protection: 70 V<sub>DC</sub>

### Digital Output
- Channels: 8
- Digital Output Type: Sink
- I/O Type: Sink Type Output
- Over Current Detection and Protection

## Common Specifications
- Dimensions: 70 x 122 x 30 mm
- Enclosure: ABS+PC
- Mounting: DIN 35 rail, stack, wall
- Power Input: Unregulated 10 – 30 V<sub>DC</sub>
- Watchdog Timer: 1.6 sec. (system)

## Environment
- Humidity: 5 – 95% RH
- Operating Temperature: -10–70°C (14–158°F)
- Storage Temperature: -25–85°C (-13–185°F)
### Specifications

#### General
- Connectors 2 x plug-in terminal blocks (#14 – 28 AWG)
- Power Consumption ADAM-4060: 0.6 W @ 24 Vcc

#### Relay Output
- Breakdown Voltage 500 Vcc (50/60 Hz)
- Channels 4 x relay
  - 2 x form A
  - 2 x form C
- Contact Rating AC: 0.6 A @ 125 V
  - 0.3 A @ 250 V
  - DC: 2 A @ 30 V
  - 0.6 A @ 110 V
- Insulation Resistance 1 GΩ min. at 500 Vcc
- Relay off Time (typical) 2 ms
- Relay on Time (typical) 3 ms

### Ordering Information
- ADAM-4060 4-channel Relay Output Module
- ADAM-4068 8-channel Relay Output Module with Modbus® and LED
- ADAM-4069 8-channel Power Relay Output Module with Modbus®

### Common Specifications
- **Dimensions**: 70 x 122 x 30 mm
- **Enclosure**: ABS-PC
- **Mounting**: DIN 35 rail, stack, wall
- **Power Input**: Unregulated 10~30 Vcc
- **Watchdog Timer**: 1.6 sec. (system)
- **Environment**
  - **Humidity**: 5 – 95% RH
  - **Operating Temperature**: -10~70°C (14~158°F)
  - **Storage Temperature**: -25~85°C (-13~185°F)

### ADAM-4060
- 4-channel Relay Output Modules
- 8-channel Relay Output Modules
- 8-channel Power Relay Output Module with Modbus®
### Specifications

#### General
- **LED Indicators**: 5-digit readout, CH 0 or CH 1 (programmable) (ADAM-4080D only)
- **Power Consumption**: 2.0 W @ 24 Vdc
- **Power Input**: Unregulated 10–30 Vdc

#### Counter Input
- **Alarm**: Alarm comparator on each counter
- **Channels**: Two independent 32-bit counters
- **Input Frequency**: 50 kHz max. (non-isolation)
- **Input Pulse Width**: >10 µs
- **Input Mode**: Isolated or non-isolated
- **Isolation Input Level**: Logic level 0: +1 V max. Logic level 1: 3.5–30 V

#### Isolation Voltage
- **Non-isolated Input Level**: Programmable
  - Logic level 0: 0 to ±5 V (default = 0.8 V)
  - Logic level 1: 0 to ±5 V (default = 2.4 V)
- **Maximum Count**: 4,294,967,295 (32 bits)
- **Preset Type**: Absolute or relative
- **Programmable Digital Noise Filter**: 2 – 65 µs

#### Frequency Measurement
- **Range**: 5 Hz – 50 kHz
- **Programmable Built-in Gate Time**: 1.0/0.1 sec.

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

---

### Analog Input
- **Specifications**
  - **Power**: 1.2 W @ 24 Vdc
  - **Communication**: Unregulated 10–48 Vdc

- **Accuracy**
  - Voltage mode: ±0.1% or better
  - Current mode: ±0.2% or better

- **ASCII commands and Modbus protocol**
- **Built-in TIV/ESD Protection**
  - CMR @ 50/60 Hz: 8 x differential and independent configuration channels
  - Fault and Overvoltage: 92 dB min.

- **High Common Mode Voltage**: 200 Vdc
- **Input Impedance**: 120 Ω
- **Input Level**: mV, V (supports uni-polar and bipolar), mA
  - 0–150 mV, 0–500 mV, 0–1 V, 0–5 V, 0–10V, 0–15 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±15 V, ±20 mA, 4–20 mA
- **Input Range**: 2500 V (supports overvoltage protection up to ±60 V)

- **Isolation Protection**: 16 bits
- **Resolution**: 10/100 samples/sec (selected by utility)
- **Sampling Rate**: ±25 ppm/° C
- **Span Drift**: ±6μV/° C
- **Watchdog Timers**: System, Communication

---

### Ordering Information
- **ADAM-4080**: Counter/Frequency module
- **ADAM-4080D**: Counter/Frequency module with LED Display
- **ADAM-4117**: 8-channel Analog Input Module
- **ADAM-4118**: 8-channel Thermocouple Input Module

---

**Common Specifications**

### General
- **Dimensions**: 70 x 122 x 30 mm
- **Connector**: 2 x Plug-in terminal blocks (#14 – 22 AWG)
- **Enclosure**: ABS-PC DIN 35 rail, stack, wall
- **Mounting**: 1.6 sec. (system)
- **Watchdog Timer**: System

### Environment
- **Humidity**: 5 – 95% RH
- **Operating Temperature**:
  - 4080/4080D: ±25–85°C (13–185°F)
  - 4117/4118: ±25–130°C (−13–266°F)

### Ordering Information
- **ADAM-4080**: Counter/Frequency module
- **ADAM-4080D**: Counter/Frequency module with LED Display
- **ADAM-4117**: 8-channel Analog Input Module
- **ADAM-4118**: 8-channel Thermocouple Input Module
**Specifications**

**Digital Input/Output**
- **Channels**
  - 7 input channels
  - 8 output channels
- **Digital Input (Supports 3 kHz counter)**
  - **Dry contact:** Logic level 0: Close to GND.
    - Logic level 1: Open
  - **Wet contact:** Logic level 0: +3 V max.
    - Logic level 1: +10 V to +30 V
- **Isolation Voltage**
  - 3000 V DC
- **Digital Output**
  - Open drain to 40 V, 0.8A max.
  - Maximum power dissipation: 1 W load
  - Ron Maximum: 150m ohm
  - Supports 1 kHz pulse output
- **Power Consumption**
  - 0.4 W (Typical)
  - 0.7 W (Max)
- **Watchdog Timer**
  - System, Communication

**Relay Output**
- **Output Channels**
  - 8 Form A
- **Contact Rating**
  - AC: 125 V @ 0.6 A
  - DC: 30 V @ 2 A
- **Breakdown Voltage**
  - 750 V (50/60 Hz)
- **Insulation Resistance**
  - ≥ 1 GΩ
- **Power Consumption**
  - 0.4 W (typical)
  - 1.8 W (max.)
- **Relay Response Time**
  - ON: 3 ms
  - Off: 1 ms (typical)
- **Total Switching Time**
  - 10 ms
- **Supports 100 Hz pulse output**
- **Watchdog Timer**
  - System, Communication

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

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

**Common Specifications**
- **Dimensions**
  - 70 x 122 x 30 mm
- **Enclosure**
  - ABS+PC
- **Mounting**
  - DIN 35 rail, stack, wall
  - Unregulated 10–48 V DC
  - 1.6 sec. (system)
- **Power Input**
  - 2 x Plug-in terminal blocks (#14 – 22 AWG)
- **Watchdog Timer**
  - 1.6 sec. (system)
- **Connector**
  - 2 x Plug-in terminal blocks (#14 – 22 AWG)
- **Environment**
  - **Humidity**
    - 5 – 95% RH
  - **Operating Temperature**
    - 4149V: -10–70 °C (14 – 158° F)
    - 4150/4158: -40 – 85 °C (-40 – 185° F)
  - **Storage Temperature**
    - 4149V: -25 – 85 °C (-13 – 185° F)
    - 4150/4158: -40 – 85 °C (-40 – 185° F)

**Ordering Information**
- **ADAM-4150**
  - Digital I/O Module
- **ADAM-4168**
  - Relay Output Module
- **ADAM-4914V**
  - 4-channel Voltage Input Surge Protection Module
**ADAM-4950-ENC**

**IP66 Industrial Enclosure**

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**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**
  - Dust-tight, and protected against water jets and even temporary flooding.
- **Lip-groove seal**
  - Non-aging polyurethane seal. Cannot fall out or loosen.

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**Dimensions**

![Dimensions Diagram]

**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

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**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

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**DIN-rail installation**

No screws; just snap the module in place. Offers space for three modules.

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*Courtesy of Steven Engineering, Inc. ● 230 Ryan Way, South San Francisco, CA 94080-6370 ● General Inquiries: (800) 670-4183 ● www.stevenengineering.com*
ADAM 4000/4100 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:
  - Advantech protocol: 1 start bit, 8 data bits, 1 stop bit, no parity
  - Modbus protocol: 1 start bit, 8 data bits, 1 or 2 stop bit, parity check (none, odd, even) (ADAM-4100 series only)
- Up to 256 multidrop modules per serial port
- Online module insertion and removal
- Transient suppression on RS-485 communication lines

Dimensions

<table>
<thead>
<tr>
<th>Unit: mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT VIEW</td>
</tr>
<tr>
<td>REAR VIEW</td>
</tr>
<tr>
<td>SIDE VIEW</td>
</tr>
<tr>
<td>PANEL MOUNTING BRACKET</td>
</tr>
<tr>
<td>TOP VIEW</td>
</tr>
<tr>
<td>DIN - RAIL MOUNTING ADAPTER</td>
</tr>
</tbody>
</table>