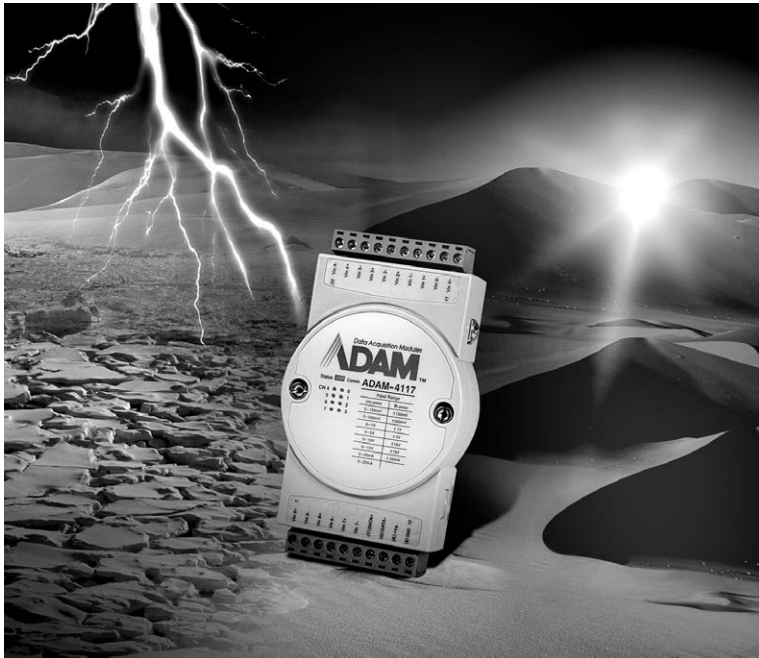


ADAM-4100 Series

Robust Remote Data Acquisition and Control Modules Overview



Introduction

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

The ADAM-4000 robust family is designed to endure more severe and adverse environments. The operating temperature is $-40 \sim 85^{\circ}\text{C}$ which makes them suitable for more widespread applications.

Designed for Severe Industrial Environments

Broader Operating Temperature Range

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

Higher Noise Immunity

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

Broader Power Input Range

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

New Features for I/O Modules

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

- **ADAM-4150**

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

- **ADAM-4168**

1. Supports 1 kHz pulse output

ADAM-4100 Module with LED Display

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

Online Firmware Updates

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

Legacy Communication Protocol Support

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

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- 1 WebAccess+ Solutions
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- 3 Energy Automation
- 4 Building Automation Systems
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Robust RS-485 I/O Module Selection Guide



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Model	ADAM-4117	ADAM-4118	ADAM-4150	ADAM-4168
Resolution	16 bit		-	-
Channels	8 differential		-	-
Sampling Rate	10/100 Hz (total)		-	-
Voltage Input	0 ~ 150 mV, 0 ~ 500 mV, 0 ~ 1 V, 0 ~ 5 V, 0 ~ 10 V, 0 ~ 15 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±15V	±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5V	-	-
Current Input	0 ~ 20 mA, ±20 mA, 4 ~ 20 mA	±20 mA, 4 ~ 20 mA	-	-
Direct Sensor Input	-	J, K, T, E, R, S, B Thermocouple	-	-
Burn-out Detection	Yes (mA)	Yes (mA and All T/C)	-	-
Channel Independent Configuration	Yes		-	-
Digital Input/ Output	Input Channels	-	7	-
	Output Channels	-	8	8-ch relay
Counter	Channels	-	7	-
	Input Frequency	-	3 kHz	-
Isolation Voltage	3,000 V _{DC}			
Digital LED Indicator	Communication and Power			
Watchdog Timer	Yes (System & Communication)			
Safety Setting	-	-	Yes	Yes
Communication Protocol	ASCII Command/Modbus			
Power Requirement	10 ~ 48 V _{DC}			
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F)			
Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)			
Humidity	5 ~ 95% RH			
Power Consumption	1.2 W @ 24 V _{DC}	0.5 W @ 24 V _{DC}	0.7 W @ 24 V _{DC}	1.8 W @ 24 V _{DC}
Page	18-19		18-20	



Model	ADAM-4510I	ADAM-4520I
Network	RS-422/485	RS-232 to RS-422/485
Communication Speed (bps)	From 1,200 to 115.2k	
Communication Distance	Serial: 1.2 km	
Interface Connectors	RS-422/485: plug-in screw terminal	RS-232: female DB9 RS-422/485: plug-in screw terminal
Digital LED Indicators	Communication and Power	
Auto Data Flow Control	Yes	
Isolation Voltage	3,000 V _{DC}	
Power Requirement	10 ~ 48 V _{DC}	
Operating Temperature	-40 ~ 85°C (-40 ~ 185°F)	
Storage Temperature	-40 ~ 85°C (-40 ~ 185°F)	
Humidity	5 ~ 95%	
Power Consumption	1.4 W @ 24 V _{DC}	1.2 W @ 24 V _{DC}
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ADAM-4510I

ADAM-4520I

ADAM-4117

Robust RS-422/485 Repeater

Robust RS-232 to RS-422/485 Converter

Robust 8-ch Analog Input Module with Modbus



ADAM-4510I FCC CE RoHS UL



ADAM-4520I FCC CE RoHS UL



ADAM-4117 FCC CE RoHS UL

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Specifications

General

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

Communications

- Input RS-485 (2-wire) or RS-422 (4-wire)
- Output RS-485 (2-wire) or RS-422 (4-wire)
- Speed Modes (bps) 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)
- Supports Auto Baud-Rate
- Provide RS-485 to RS-422 Convert Ability

Specifications

General

- Connectors 1 x plug-in terminal block (#14 ~ 22 AWG) (RS-422/485) 1 x DB9-F (RS-232)
- Power Consumption 1.2 W @ 24 V_{DC}

Communications

- Input RS-232 (DB9)
- Output RS-485 (2-wire) or RS-422 (4-wire)
- Speed Modes (bps) 1,200, 2,400, 4,800, 9,600, 19.2 k, 38.4 k, 57.6 k, 115.2 k, RTS control and RS-422 (switchable)
- Supports Auto Baud-Rate

Specifications

General

- Connectors 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Watchdog Timer System (1.6 second) & Communication
- Supported Protocols ASCII Command and Modbus/RTU
- Power Consumption 1.2 W @ 24 V_{DC}

Analog Input

- Channels 8 differential and independent configuration channels
- Input Impedance Voltage: 20 M Ω Current: 120 Ω
- Input Type mV, V (supports unipolar and bipolar), mA
- Input Range 0 ~ 150mV, 0 ~ 500mV, 0 ~ 1V, 0 ~ 5V, 0 ~ 10V, 0 ~ 15V, ± 150 mV, ± 500 mV, ± 1 V, ± 5 V, ± 10 V, ± 15 V, ± 20 mA, 0 ~ 20 mA, 4 ~ 20mA
- Accuracy Voltage mode : $\pm 0.1\%$ or better Current mode : $\pm 0.2\%$ or better
- Resolution 16-bit
- Sampling Rate 10/100 samples/sec (selected by utility)
- CMR @ 50/60 Hz 92 dB
- NMR @ 50/60 Hz 60 dB
- Over Voltage Protection ± 60 V_{DC}
- High Common Mode 200 V_{DC}
- Span Drift ± 25 ppm/ $^{\circ}$ C
- Zero Drift $\pm 6\mu$ V/ $^{\circ}$ C
- Built-in TVS/ESD Protection

Common Specifications

General

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

Environment

- Humidity 5 ~ 95% RH
- Operating Temperature -40 ~ 85 $^{\circ}$ C (-40 ~ 185 $^{\circ}$ F)
- Storage Temperature -40 ~ 85 $^{\circ}$ C (-40 ~ 185 $^{\circ}$ F)
- Supports Noise Rejection

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Ordering Information

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

- 1 WebAccess+ Solutions
- 2 Machine Automation
- 3 Energy Automation
- 4 Building Automation Systems
- 5 Automation Software
- 6 Operator Panels
- 7 Automation Panel PCs
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ADAM-4118 ADAM-4150 ADAM-4168

Robust 8-ch Thermocouple Input Module with Modbus

Robust 15-ch Digital I/O Module with Modbus

Robust 8-ch Relay Output Module with Modbus



ADAM-4118



ADAM-4150



ADAM-4168



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Specifications

General

- Power Consumption 0.5W @ 24 V_{DC}

Analog Input

- Channels 8 differential and independent configuration channels
- Input Impedance Voltage: 20 M Ω
Current: 120 Ω
- Input Type T/C, mV, V, mA
- Input Range Thermocouple

J	0 ~ 760°C	R	500 ~ 1,750°C
K	0 ~ 1,370°C	S	500 ~ 1,750°C
T	-100 ~ 400°C	B	500 ~ 1,800°C
E	0 ~ 1,000°C		

- Voltage mode ± 15 mV, ± 50 mV, ± 100 mV, ± 500 mV, ± 1 V, ± 2.5 V
- Current mode ± 20 mA, 4 ~ 20 mA
- Accuracy Voltage mode: $\pm 0.1\%$ or better
Current mode: $\pm 0.2\%$ or better
- Resolution 16-bit
- Sampling Rate 10/100 samples/sec (selected by Utility)
- CMR @ 50/60 Hz 92 dB
- NMR @ 50/60 Hz 60 dB
- Overvoltage Protection ± 60 V_{DC}
- High Common Mode 200 V_{DC}
- Span Drift ± 25 ppm/ $^{\circ}$ C
- Zero Drift $\pm 6\mu$ V/ $^{\circ}$ C
- Built-in TVS/ESD Protection
- Burn-out Detection

Specifications

General

- Power Consumption 0.7 W @ 24 V_{DC}

Digital Input

- Channels 7
- Input Level Dry contact: Logic level 0: Close to GND
Logic level 1: Open
Wet contact: Logic level 0: 3 V max
Logic level 1: 10 ~ 30 V
(Note: The Digital Input Level 0 and 1 status can be inverted)
- Supports 3 kHz Counter Input (32-bit + 1-bit overflow)
- Supports 3 kHz Frequency Input
- Supports Invert DI Status
- Over Voltage Protection 40 V_{DC}

Digital Output

- Channels 8, open collector to 40 V (1 A max. load)
- Power Dissipation 1W load max
- RON Maximum 150 m Ω
- Supports 1 kHz Pulse Output
- Supports High-to-Low Delay Output
- Supports Low-to-High Delay Output

Specifications

General

- Power Consumption 1.8 W @ 24 V_{DC}

Relay Output

- Output Channels 8 Form A
- Contact Rating 0.5 A @ 120 V_{AC} (Resistive)
0.25 A @ 240 V_{AC}
1 A @ 30 V_{DC}
0.3 A @ 110 V_{DC}
- Breakdown Voltage 750 V_{AC} (50/60 Hz)
- Initial Insulation Resistance 1 G Ω min. @ 500 V_{DC}
- Relay Response Time (Typical) On: 3ms
Off: 1ms
- Total Switching Time 10 ms
- Supports 100 Hz pulse output
- Maximum Operating Speed 50 operations/min (at related load)

Common Specifications

General

- Power Input Unregulated 10 ~ 48 V_{DC}
- Watchdog Timer System (1.6 second) & Communication
- Connector 2 x plug-in terminal blocks (#14 ~ 22 AWG)
- Isolation Voltage 3,000 V_{DC}
- Supported Protocols ASCII Command and Modbus/RTU

Environment

- Humidity 5 ~ 95% RH
- Operating Temperature -40 ~ 85 $^{\circ}$ C
(-40 ~ 185 $^{\circ}$ F)
- Storage Temperature -40 ~ 85 $^{\circ}$ C
(-40 ~ 185 $^{\circ}$ F)

Ordering Information

- ADAM-4118 Robust 8-ch Thermocouple Input Module w/ Modbus
- ADAM-4150 Robust 15-ch Digital I/O Module with Modbus
- ADAM-4168 Robust 18-ch Relay Output Module with Modbus

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