RS-485 I/O Modules: ADAM-4000/4100

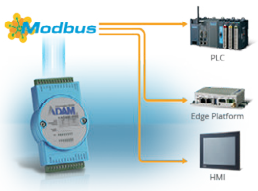
Introduction

The ADAM-4000/ 4100 series feature rugged industrial-grade cases which are specially designed for reliable operation in harsh environments. Built-in microprocessors independently provide intelligent signal conditioning, analog I/O, digital I/O, data display, and RS-485 communication through Modbus protocols.

Feature Highlights

The most used protocol for industrial automation development

The new ADAM-4000/ 4100 modules feature Modbus RTU remote data transmission protocol.



Standardized protocol

- One of the most widely used standard communication protocols for eAutomation development

Centralized control

- Universal remote I/O modules operate the system via Modbus

Easy integration

- We provide sample code and commands for user programming

Non-stop monitoring with watchdog timer and protection

For stable and constant performance, ADAM-4000/ 4100 features a Watchdog Timer and maximum protection to ensure the highest level of system reliability.

Noise protection

- Data accuracy assured by enhanced ESD / EFT / Surge Protection

Module stability ensured

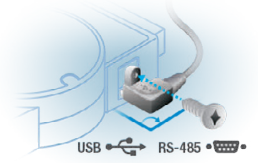
- Once a problem is detected, the Watchdog Timer automatically recovers the system

Save on maintenance costs

- The Watchdog Timer enhances system stability and reduces maintenance costs

Various interfaces to meet your needs

Integration with embedded systems or PLC systems via USB or RS-485



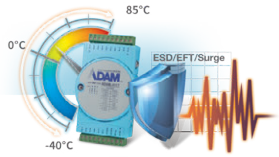
Friendly L-shaped cable design*

- Optional 90 degree input micro USB to a Type-A USB cable with locking mechanism.

Micro USB interface*

- New ADAM-4100 series can be powered and transmit data via micro USB interface

Robust design for industrial IoT applications



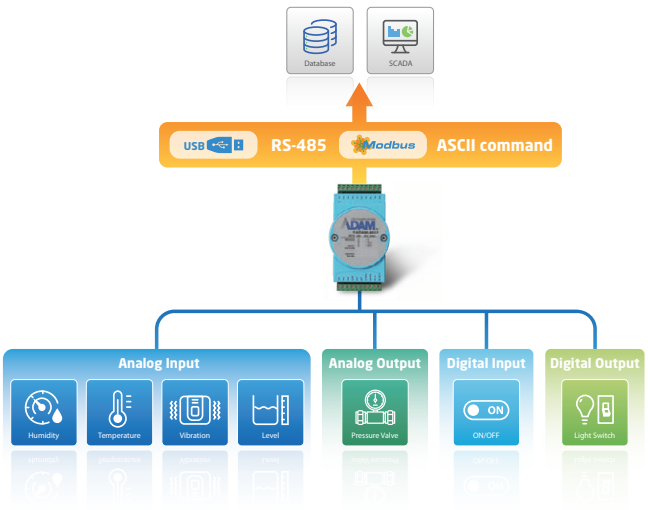
ADAM-4100 Series

- Level-4 ESD/EFT/ surge & isolation protection
- Wide operating temperature support, up to -40 ~ 85°C
- Wide power input range, up to 10 ~ 48 V_{DC}

ADAM-4000/4100 Series Comparison

Series Name		ADAM-4000 Series	ADAM-4100 Series
Operation Temperature		-10 ~ 70°C	-40 ~ 85°C
Power Input		10 ~ 30V_{DC}	10 ~ 48V_{DC}
ESD		8KV Air, 4KV contact	8KV Air, 6KV contact
EFT		2KV	4KV
Surge		0.5KV	4KV
Communication Interface	RS-485	✓	✓
	USB	–	✓

Application Structure



RS-485 I/O Modules: ADAM-4000/4100

Analog Input





Model		ADAM-4015	ADAM-4017	ADAM-4017+	ADAM-4018+	ADAM-4019+
Resolution		16-bit				
Analog Input	Channels	6 differential	8 differential	8 differential	8 differential	8 differential
	Sampling Rate	10 Hz			10 Hz	10 Hz
	Voltage Input	–	0~150 mV, 0~500 mV, 0~1 V, 0~5 V, 0~10 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V	0~150 mV, 0~500 mV, 0~1 V, 0~5 V, 0~10 V, ±150 mV, ±500 mV, ±1 V, ±5 V, ±10 V	–	0~100 mV, 0~500 mV, 0~1 V, 0~5 V, 0~10 V, ±100 mV, ±500 mV, ±1 V, ±5 V, ±10 V
	Current Input	–	0~20 mA, ±20 mA	0~20 mA, 4~20 mA, ±20 mA	4~20 mA, ±20 mA	0~20 mA, 4~20 mA, ±20 mA
	Direct Sensor Input	RTD	–	–	J, K, T, E, R, S, B thermocouple	J, K, T, E, R, S, B thermocouple
	Burn-out Detection	✓	–	–	✓	✓ (4 ~ 20 mA and all T/C)
	Channel Independent Configuration	✓	–	✓	✓	✓
Isolation Voltage		3,000 V_{DC}				
Watchdog Timer		✓ (system and comm.)	–	✓ (system and comm.)	✓ (system and comm.)	✓ (system and comm.)
Modbus Support *		✓	–	✓	✓	✓
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

***All ADAM-4000 I/O modules support ASCII commands**

Analog Output


Model		ADAM-4021	ADAM-4024
Resolution		12-bit	12-bit
Analog Output	Channels	1	4
	Voltage Output	0~10 V	±10 V
	Current Output	0~20, 4~20 mA	0~20, 4~20 mA
Digital I/O	Input Channels	–	4
	Output Channels	–	–
	Alarm Settings	–	✓
Isolation Voltage		3,000 V_{DC}	3,000 V_{DC}
Digital LED Indicator		–	–
Watchdog Timer		✓ (system)	✓ (system and comm.)
Safety Setting		–	✓
Modbus Support*		Supported after F version	✓
Certification		UL, CE, FCC	UL, CE, FCC

Digital Input/Output



ADAM-4050	ADAM-4051	ADAM-4052
–	–	–
–	–	–
–	–	–
–	–	–
7	16	8
8	–	–
–	–	–
–	2,500 V_{DC}	5,000 Vrms
–	✓	–
✓ (system)	✓ (system and comm.)	✓ (system)
–	–	–
Supported after E version	✓	–
UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

***All ADAM-4000 I/O modules support ASCII commands**
✓: supported, – : not supported, △ : optional

RS-485 I/O Modules: ADAM-4000/4100

Digital Input/Output

Relay Output

Counter







Model		ADAM-4053	ADAM-4055	ADAM-4056SO	ADAM-4060	ADAM-4068	ADAM-4069	ADAM-4080
Resolution		–	–	–	–	–	–	–
Analog Input	Channels	–	–	–	–	–	–	–
	Sampling Rate	–	–	–	–	–	–	–
	Voltage Input	–	–	–	–	–	–	–
	Current Input	–	–	–	–	–	–	–
	Direct Sensor Input	–	–	–	–	–	–	–
	Burn-out Detection	–	–	–	–	–	–	–
	Channel Independent Configuration	–	–	–	–	–	–	–
Analog Output	Channels	–	–	–	–	–	–	–
	Voltage Output	–	–	–	–	–	–	–
	Current Output	–	–	–	–	–	–	–
Digital I/O	Input Channels	16	8	–	–	–	–	–
	Output Channels	–	8	12	4-ch relay	8-ch relay	8-ch power relay	2
	Alarm Settings	–	–	–	–	–	–	✓
Counter (32-bit)	Channels	–	–	–	–	–	–	2
	Input Frequency	–	–	–	–	–	–	50 kHz
Isolation Voltage		–	2,500 V_{DC}	5,000 V_{DC}	–	–	–	2,500 Vrms
Digital LED Indicator		–	✓	✓	–	✓	–	–
Watchdog Timer		✓ (system)	✓ (system and comm.)	✓ (system and comm.)	✓ (system)	✓ (system and comm.)	✓ (system and comm.)	✓ (system)
Safety Setting		–	✓	–	✓	✓	✓	–
Modbus Support*		Supported after E version	✓	✓	Supported after E version	✓	✓	Supported after E version
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

*All ADAM-4000 I/O modules support ASCII commands
✓: supported, – : not supported, △ : optional

RS-485 I/O Modules: ADAM-4000/4100





Model		☞ ADAM-4115	☞ ADAM-4117	☞ ADAM-4118	☞ ADAM-4150	☞ ADAM-4168
Resolution		16-bit	16-bit		–	–
Analog Input	Channels	6	8 differential		–	–
	Sampling Rate	10/100 Hz (Total)	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	0~15 mV, 0~50 mV, 0~100 mV, 0~500 mV, 0~1 V, 0~2.5 V, ±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	–	–
	Current Input		0~20, 4~20, ±20 mA	0~20, 4~20, ±20 mA	–	–
	Direct Sensor Input	Pt100,Pt1000,Ni 50, Ni 508	-	J, K, T, E, R, S, B Thermocouple	–	–
	Burn-out Detection	-	✓ (mA)	✓ (mA and All T/C)	–	–
	Channel Independent Configuration	✓	✓	✓	–	–
Digital I/O	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		✓	–	–	✓	✓
Protocol		ASCII, Modbus RTU				
Power Requirements		10 ~ 48 V_{DC}				
Operating Temperature		-40 ~ 85°C (-40 ~ 185°F)				
Storage Temperature		-40 ~ 85°C (-40 ~ 185°F)				
Operating Humidity		5~95% RH (non-condensing)				
Power Consumption		1.2 W @ 24 V_{DC}	1.2 W @ 24 V_{DC}	0.5 W @ 24 V_{DC}	0.7 W @ 24 V_{DC}	1.8 W @ 24 V_{DC}
Communication Interface		RS-485, Micro USB				
Certification		UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC	UL, CE, FCC

✓: supported, – : not supported, △ : optional