



tM-AD4P2C2

4-channel Analog Input, 2-channel Digital Input and 2-channel Digital Output Module

Introduction

The tM-AD4P2C2 is a multifunction module that includes 4 analog input channels, 2 digital input channels and 2 digital output channels. The module provides a programmable analog input range that includes 2 voltage input channels (± 1 V, ± 2.5 V, ± 5 V, and ± 10 V) and 2 current input channels (± 20 mA, $0 \sim 20$ mA and $4 \sim 20$ mA). The analog inputs provide a high overvoltage protection of 120 VDC and an adjustable sampling rate. The module supports sink-type digital output with short circuit protection and the digital outputs can be used as voltage input limit alarms. The digital inputs are source-type and all digital input channels can be used as 16-bit counters. There are options for configuring power-on and safe digital output values. 4 kV ESD protection and 2500 Vdc intra-module isolation are also provided. The tM-AD4P2C2 supports the DCON, Modbus RTU and Modbus ASCII protocols, which can be configured via software.

System Specifications

Communication	
Interface	RS-485
Format	(N, 8, 1), (N, 8, 2), (O, 8, 1), (E, 8, 1)
Baud Rate	1200 ~ 115200 bps
Protocol	DCON, Modbus RTU, Modbus ASCII
Dual Watchdog	Yes, Module(2.3 seconds), Communication (Programmable)
LED Indicators/Display	
System LED Indicator	Yes, 1 LED as Power/Communication Indicator
Isolation	
Intra-module Isolation, Field-to-Logic	2500 Vdc
EMS Protection	
ESD (IEC 61000-4-2)	± 4 kV Contact for each Terminal ± 8 kV Air for Random Point
EFT (IEC 61000-4-4)	± 4 kV for Power Line
Power	
Reverse Polarity Protection	Yes
Input Voltage Range	10 ~ 30 Vdc
Consumption	1 W Max.
Mechanical	
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm
Installation	DIN-Rail Mounting
Environment	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-30 ~ +75°C
Humidity	10 ~ 95% RH, Non-condensing

Features

- Multifunction (4 AI, 2 DI and 2 DO)
- 2 Voltage Input Channels and 2 Current Input Channels
- Digital Input Channels can be used as 16-bit Counters
- Digital Output Channels can be used as Voltage Input Limit Alarms
- 4 kV ESD and EFT Protection
- 120 Vdc Overvoltage Protection
- Adjustable Sampling Rate
- Dual Watchdog
- 2500 Vdc Intra-module Isolation
- Configurable Power-on Value Settings
- Configurable Safe Value Settings
- Wide Operating Temperature Range: -25 ~ +75°C



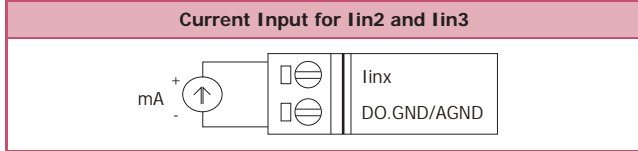
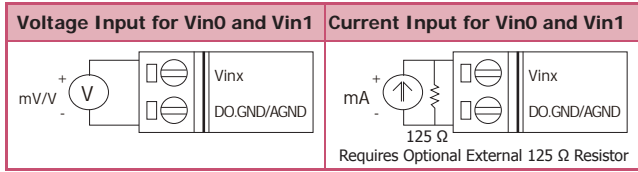
Applications

- Industrial Automation
- Building Automation
- Food and Beverage Systems
- Industrial Machinery
- Control Systems
- Semiconductor Fabrication

I/O Specifications

Analog Input		Voltage	Current
Channels		2 Single-ended	2 Single-ended
Type		± 1 V, ± 2.5 V, ± 5 V, ± 10 V	± 20 mA, $0 \sim 20$ mA, $4 \sim 20$ mA
Resolution	Normal Mode	14-bit	
	Fast Mode	12-bit	
Sampling Rate	Normal Mode	10 Hz total	
	Fast Mode	200 Hz total	
Accuracy	Normal Mode	± 0.1 %	
	Fast Mode	± 0.5 %	
Zero Drift		± 20 μ V/°C	
Span Drift		± 25 ppm/°C	
Input Impedance		10 M Ω	136 Ω
Overvoltage Protection		120 Vdc	-
Overcurrent Protection		-	Yes, 50 mA @ 110 Vdc
Digital Input			
Channels		2	
Type		Wet Contact (Source)	
On Voltage Level		+3.5 ~ 50 Vdc	
Off Voltage Level		+1 Vdc Max.	
Input Impedance		10 K Ω , 0.5 W	
Counters	Channels	2	
	Max. Count	65535 (16-bit)	
	Max. Input Frequency	50 Hz	
	Min. Plus Width	10 ms	
Overvoltage Protection		70 Vdc	
Digital Output			
Channels		2	
Type		Isolated Open Collector (Sink)	
Max. Load Current		700 mA/Channel	
Load Voltage		+3.5 ~ 50 Vdc	
Overvoltage Protection		60 Vdc	
Overload Protection		1.4 A (with short circuit protection)	
Short Circuit Protection		Yes	
Power-on Value		Yes, Programmable	
Safe Value		Yes, Programmable	

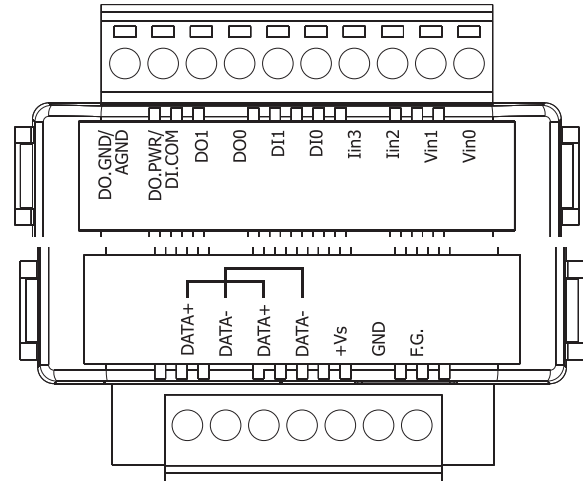
Wire Connections



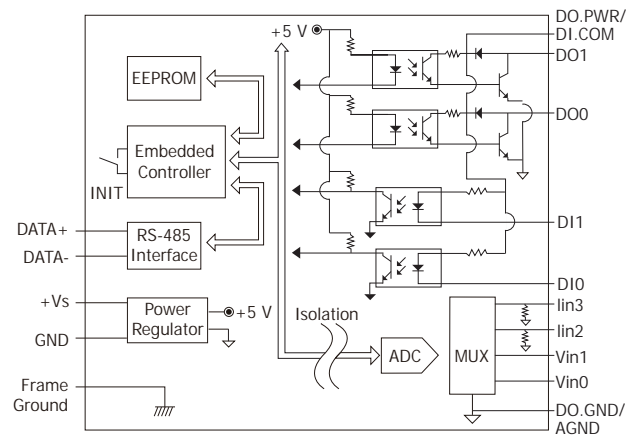
Digital Input/Counter	ON State Readback as 1	OFF State Readback as 0
Source	+3.5 ~ +50 Vdc	OPEN or <1 Vdc

Output Type	ON State Readback as 1	OFF State Readback as 0
	Relay ON	Relay OFF
Drive Relay		
Resistance Load		

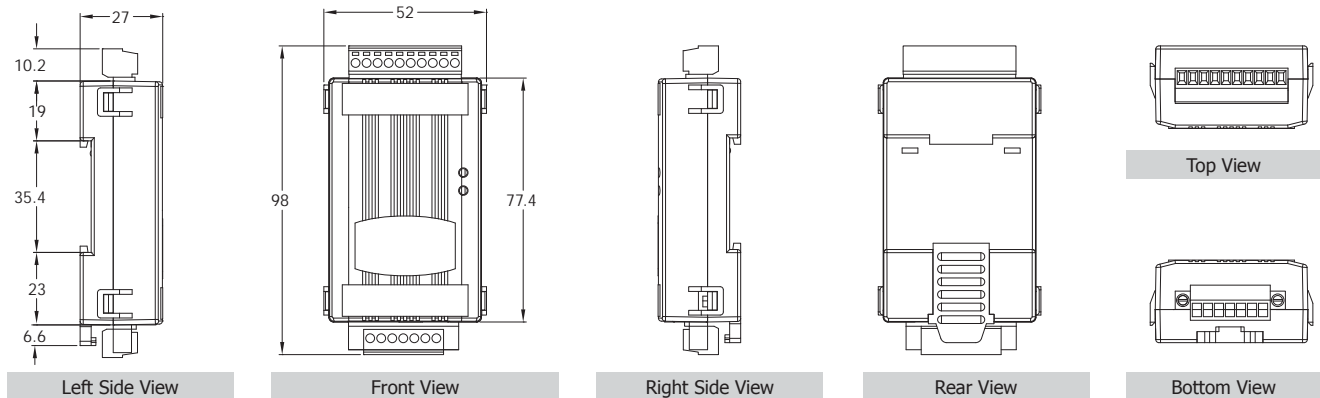
Pin Assignments



Block Diagram



Dimensions (Units: mm)



Ordering Information

tM-AD4P2C2 CR	4-Channel Isolated Analog Input and 2-channel Isolated Digital Input and 2-channel Isolated Digital Output Module(RoHS)
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Related Products

	tM-7561 CR	Isolated USB to RS-485 Converter (RoHS)		tM-7510U CR	Isolated RS-485 Repeater (RoHS)
	tM-7520U CR	Isolated RS-232 to RS-485 Converter (RoHS)		MDR-20-24 CR	24W Single Output Industrial DIN-Rail Power Supply (RoHS)

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Tiny RS-485 Remote I/O Modules

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