



## tM Series

Tiny RS-485 I/O Modules

### Features



- Cost-effective Remote I/O Modules
- Supports Modbus RTU and DCON Protocols
- Photocoupler Isolation
- Isolated Digital Input and Output
- RS-485 Bus Supports Baud Rate up to 115200 bps
- All DI Channels Can Be Used As 16-bit Counters
- Dual-watchdog with Power-on and Safe Value
- Terminal Block Connector for Easy Wiring
- Tiny Form-factor and Low Power Consumption
- Wide Operating Temperature Range: -25 ~ +75°C
- RoHS Compliant and Halogen Free
- Made from Fire-retardant Materials (UL94-V0 Level)
- Easy DIN-Rail Mounting



### System Specifications

Model Name	tM-AD5	tM-AD5C	tM-AD8	tM-AD8C	tM-TH8	tM-P8	tM-C8	tM-P4A4	tM-P4C4	tM-P3R3	tM-R5
	tM-AD4P2C2			tM-DA1P1R1							
<b>Communication</b>											
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)										
<b>LED Indicators</b>											
Power	1 LED as Power Indicator										
<b>Isolation</b>											
Intra-module Isolation, Field-to-Logic	2500 Vdc					3750 Vdc					
<b>EMS Protection</b>											
ESD (IEC 61000-4-2)	±4 kV Contact for Each Terminal										
	±8 kV Air for Random Point										
EFT (IEC 61000-4-4)	±2 kV for Power										
<b>Power Requirements</b>											
Reverse Polarity Protection	Yes										
Powered from Terminal Block	Yes, 10 ~ 30 Vdc										
Consumption	0.6 W		1.2 W			0.5 W Max.					
<b>Mechanical</b>											
Dimensions (W x L x H)	52 mm x 98 mm x 27 mm										
Installation	DIN-Rail Mounting										
<b>Environment</b>											
Operating Temperature	-25 ~ +75°C										
Storage Temperature	-30 ~ +75°C										
Humidity	10 ~ 95% RH, Non-condensing										



## I/O Specifications






Multi-function Module			
Model Name	tM-AD4P2C2		tM-DA1P1R1
Pictures	 Available soon		 Available soon
<b>Analog Input</b>			
Channels	2	2	
Wiring	Differential		
Input Range	+/- 500 mV, +/- 1 V, +/- 2.5 V, +/- 5 V, +/- 10 V	+/- 20 mA, 0 ~ 20 mA, 4 ~ 20 mA	
Resolution	14/12		
Accuracy	Normal mode	0.1%	
	Fast mode	0.5%	
Sampling Rate	Normal mode	10 Hz total	
	Fast mode	200 Hz total	
Input Impedance	10 MΩ		
Overvoltage Protection	120 Vdc		
<b>Analog Output</b>			
Channels			4
Wiring			Bipolar/Unipolar
Range			0 ~ 10 V, 0 ~ 20 mA, 4 ~ 20 mA
Resolution			14-bit
Accuracy			0.1%
DA Output Response Time			10 ms
Open Wire Detection (for current only)			-
Channel to Channel Isolation			-
Power-on Value			Yes
Safe Value			Yes
<b>Digital Input/Counter</b>			
Input Channels	2		1
Contact	Wet Contact		
Sink/Source (NPN/PNP)	Source		Sink/Source
On Voltage Level	+3.5 Vdc ~ 50 Vdc		
Off Voltage Level	+1 Vdc Max.		
Input Impedance	10 KΩ, 0.66 W		
Counters	Channels	4	
	Max. Count	65535 (16-bit)	
	Max. Input Frequency	100 Hz	
	Min. Pulse Width	5 ms	
Overvoltage Protection	70 Vdc		
<b>Digital Output</b>			
Output Channels	2		
Type	Isolated Open Emitter		
Sink/Source (NPN/PNP)	Sink		
Max. Load Current	700 mA/channel		
Load Voltage	3.5 Vdc ~ 50 Vdc		
Overvoltage Protection	60 Vdc		
Overload Protection	Yes, 1.4 A		
Short Circuit Protection	Yes		
Power-on Value	Yes, Programmable		
Safe Value	Yes, Programmable		





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RS-485 Remote I/O Modules

Multi-function Module		
Model Name	tM-AD4P2C2	tM-DA1P1R1
Pictures	Available soon 	Available soon 
<b>Relay Output</b>		
Output Channels		1
Type		Power Relay, Form A (SPST N.O.)
Operating Voltage Range		250 VAC or 30 VDC
Max. Load Current		16 A
Surge Strength		2500 VDC
Operate Time		15 ms
Release Time		5 ms
Electrical Endurance		10 <sup>7</sup> ops.
Mechanical Endurance		5 × 10 <sup>4</sup> ops.
Power-on Value		Yes, Programmable
Safe Value		Yes, Programmable



Analog Input Module					
Model Name	tM-AD5	tM-AD5C	tM-AD8	tM-AD8C	tM-TH8
Pictures	NEW 	NEW 	NEW 	NEW 	Available soon 
<b>Analog Input</b>					
Channels	5		8		8
Wiring	Differential		Single-ended		Single-ended
Input Range	+/- 1 V, +/- 2.5 V, +/- 5 V, +/- 10 V	+/- 20 mA, 0 ~ 20 mA, 4 ~ 20 mA	0 ~ 500 mV, 0 ~ 1 V, 0 ~ 2.5 V, 0 ~ 5 V, 0 ~ 10 V	0 ~ 20 mA, 4 ~ 20 mA	-
★ Thermistor Type	-				Precon ST-A3, Fenwell U, YSI L100, YSI L300, YSI L1000, YSI B2252, YSI B3000, YSI B5000, YSI B6000, YSI B10000, YSI H10000, YSI H30000, User- defined
Resolution	14/12				16
★ Accuracy	Normal mode	0.1%		0.5%	
	Fast mode	0.5%		-	
★ Sampling Rate	Normal mode	10 Hz total		8 Hz total	
	Fast mode	200 Hz total		-	
Input Impedance	10 MΩ	125 Ω	20 MΩ	125 Ω	-
★ Overvoltage Protection	120 VDC				8
★ Open Wire Detection	-	Yes	-	Yes	Yes
★ Dual Watchdog	Yes				

Digital Input/Output Module				
Model Name	tM-P4A4	tM-P4C4	tM-C8	tM-P8
Pictures	NEW 	NEW 	NEW 	NEW 
<b>Digital Input/Counter</b>				
Input Channels	4		8	
Contact	Wet Contact	Wet Contact	Wet Contact	
Sink/Source (NPN/PNP)	Sink	Source	Sink/Source	
On Voltage Level	+3.5 Vdc ~ 50 Vdc		+3.5 Vdc ~ 50 Vdc	
Off Voltage Level	+1 Vdc Max.		+1 Vdc Max.	
Input Impedance	10 K $\Omega$ , 0.66 W		10 K $\Omega$ , 0.66 W	
★ Counters	Channels	4	8	
	Max. Count	65535 (16-bit)	65535 (16-bit)	
	Max. Input Frequency	100 Hz	100 Hz	
	Min. Pulse Width	5 ms	5 ms	
Overvoltage Protection	70 Vdc		70 Vdc	
<b>Digital Output</b>				
Output Channels	4		8	
Type	Isolated Open Emitter	Isolated Open Collector		
Sink/Source (NPN/PNP)	Source	Sink		
Max. Load Current	700 mA/channel			
Load Voltage	+10 Vdc ~ +40 Vdc	3.5 Vdc ~ 50 Vdc		
Overvoltage Protection	47 Vdc	60 Vdc		
Overload Protection	Yes, 1.4 A			
Short Circuit Protection	Yes			
★ Power-on Value	Yes, Programmable			
★ Safe Value	Yes, Programmable			

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Relay Output Module		
Model Name	tM-P3R3	tM-R5
Pictures	 NEW	 NEW
<b>Digital Input/Counter</b>		
Input Channels	3	
Contact	Wet Contact	
Sink/Source (NPN/PNP)	Sink/Source	
On Voltage Level	+3.5 VDC ~ 50 VDC	
Off Voltage Level	+1 VDC Max.	
Input Impedance	10 KΩ, 0.66 W	
Counters	Channels	3
	Max. Count	65535 (16-bit)
	Max. Input Frequency	100 Hz
	Min. Pulse Width	5 ms
Overvoltage Protection	70 VDC	
<b>Relay Output</b>		
Output Channels	3	5
Type	Power Relay, Form A (SPST N.O.)	
Operating Voltage Range	250 VAC or 30 VDC	
Max. Load Current	5 A	
Operate Time	6 ms	
Release Time	3 ms	
Electrical Life (Resistive load)	VDE	5 A @250 VAC 30,000 ops (10 ops/minute) at 75°C
		5 A @30 VDC 70,000 ops (10 ops/minute) at 75°C
	UL	5 A @250 VAC/30 VDC 6,000 ops
		3 A @250 VAC/30 VDC 100,000 ops
Mechanical Life	20,000,000 ops at no load (300 ops/minute)	
Power-on Value	Yes, Programmable	
Safe Value	Yes, Programmable	

**Ordering Information**

<b>tM-AD4P2C2 CR</b>	4-channel Isolation Analog Input, 2-channel Isolation Digital Input and 2-channel Isolation Digital Output Module (RoHS)
<b>tM-AD5 CR</b>	5-channel Isolation Analog Input Module with High Voltage Protection (RoHS)
<b>tM-AD5C CR</b>	5-channel Isolation Current Input Module (RoHS)
<b>tM-AD8 CR</b>	8-channel Isolation Analog Input Module with High Voltage Protection (RoHS)
<b>tM-AD8C CR</b>	8-channel Isolation Current Input Module (RoHS)
<b>tM-DA1P1R1 CR</b>	1-channel Isolation Analog Output, 2-channel Isolation Digital Input and 2-channel Relay Output Module (RoHS)
<b>tM-TH8 CR</b>	8-channel Isolation Thermistor Input Module with High Voltage Protection (RoHS)
<b>tM-P8 CR</b>	8-channel Isolation Digital Input Module (RoHS)
<b>tM-C8 CR</b>	8-channel Isolation Digital Output Module (RoHS)
<b>tM-P4C4 CR</b>	4-channel Isolation Digital Input and 4-channel Isolation Digital Output Module (RoHS)
<b>tM-P4A4 CR</b>	4-channel Isolation Digital Input and 4-channel Source-type Isolated Digital Output Module (RoHS)
<b>tM-P3R3 CR</b>	3-channel Isolation Digital Input and 3-channel Relay Output Module (RoHS)
<b>tM-R5 CR</b>	5-channel Relay Output Module (RoHS)

**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)