



■ Voltage and Current Inputs ■ +/-240 V_{rms} Overvoltage Protection ■ High Resolution: 16 bit ■ 2500 V_{DC} Intra-Module Isolation ■ Sink and Source Type Digital Inputs ■ Photocouple Isolation ■ Support Relay Outputs ■ DIN-Rail Mountable ■ Dual Watchdog ■ Wide Operating Temperature Range: -25 ~ +75°C

Introduction .

The M-7002 is a 16-bit, 4-channel differential analog inputs 5-channel digital inputs and 4-channels for relay output. All of its channels are Form A type relay module that provides programmable input range on all analog channels (+/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V, +/-20 mA, 0 \sim 20 mA and 4 \sim 20 mA) and digital output can be set alarm output with short-circuit protection and overload protection. Each analog channel is allowed to configure an individual range and has 240 Vrms high overvoltage protection. Jumper selectable for voltage or current input. The sampling rate of M-7002 is changeable; there are fast mode and normal mode for your consideration. M-7002 also has qualification for 4 kV ESD protection as well as 2500 Vpc intra-module isolation.

System Specifications _____

Models	M-7002		
Communication			
Interface	RS-485		
Format	N, 8, 1		
Baud Rate	1200 ~ 115200 bps		
Protocol	DCON Modbus/RTU		
Dual Watchdog	Yes, Module (1.6 Seconds), Communication (Programmable)		
LED Indicator/Display			
System LED Indicator	Yes, 1 LED as Power/Communication Indicator		
I/O LED Indicator	-		
7-Segment LED Display	Yes		
Isolation			
Intra-Module Isolation, Field-to-Logic	2500 V _{DC}		
EMS Protection			
ESD (IEC 61000-4-2)	+/-4 kV		
EFT (IEC 61000-4-4)	+/-4 kV		
Surge (IEC 61000-4-5)	+/-3 kV		
Power			
Reverse Polarity Protection	Yes		
Input Range	10 ~ 30 Vpc		
Consumption	1.8 W		
Mechanical			
Dimensions (W x L x H)	72 mm x 123 mm x 35 mm		
Installation	DIN-Rail or Wall Mounting		
Environment			
Operating Temperature	-25 ~ +75°C		
Storage Temperature	-40 ∼ +85°C		
Humidity	10 ~ 95% RH, Non-condensing		

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

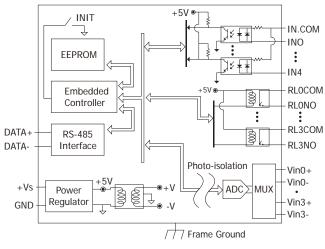
I/O Specifications _

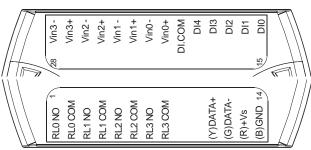
M-7002 Analog Input Channel 4 Wiring Differential Input Range +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V +/-20 mA, 0~20 mA, 4~20 mA (Jumper selectable) Resolution 12/16-bit Accuracy Normal Mode Past Mode O.5% Sampling Rate Normal Mode Fast Mode O.5% Sampling Rate Normal Mode Fast Mode O.1 Hz Input Imput Currnet 139 Ω Common Voltage Protection +/-200 Voc Individual Channel Configuration Ves Overvoltage Protection 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level 4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Voc Isolation Voltage 3750 Voc Relay Ottput Channel 4 Type <	1/O Specifications				
Channel 4 Wiring Differential Input Range +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V +/-20 mA, 0~20 mA, 4~20 mA (Jumper selectable) Resolution 12/16-bit Accuracy Normal Mode No.1% Fast Mode O.5% Sampling Rate Normal Mode Fast Mode Fast Mode O.1% Input Impedance 10 Hz Currnet 139 Ω Common Voltage Protection +/-200 Voc Individual Channel Configuration Yes Corrow Voltage Protection 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Voc Isolation Voltage 3750 Vtc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac	Models		M-7002		
Wiring Differential Input Range +/-150 mV, +/-500 mV, +/-1 V, +/-5 V, +/-10 V +/-20 mA, 0~20 mA, 4~20 mA (Jumper selectable) Resolution 12/16-bit Accuracy Normal Mode No.5% Sampling Rate Normal Mode Fast Mode 10 Hz Fast Mode	Analog Input				
Timput Range	Channel		4		
Hybrit Range	Wiring		Differential		
Normal Mode 0.1% Fast Mode 0.5% Sampling Rate Fast Mode 10 Hz Fast Mode 10 Hz Input Voltage 2 M Impedance Currnet 139 Ω Common Voltage Protection +/-200 Voc Individual Channel Configuration Ves Contact Ves Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection 4/-70 Voc Isolation Voltage 3750 Voc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 10 fops. Power-on Value Yes Power-on Value Yes Output Ves Output Ves Output Ves Voc Output	Input Range				
Accuracy Fast Mode 0.5% Sampling Rate Normal Mode 10 Hz Fast Mode 60 Hz Input Journal Mode 2 M Impedance 139 Ω Common Voltage Protection +/-200 Vpc Individual Channel Configuration Yes Overvoltage Protection 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source Wet On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 10	Resolution		12/16-bit		
Fast Mode 0.5%	A	Normal Mode	0.1%		
Fast Mode 60 Hz Input Impedance Currnet 139 Ω Common Voltage Protection +/-200 Vpc Individual Channel Configuration Versolutage Protection 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 10° ops. Power-on Value Yes	Accuracy	Fast Mode	0.5%		
Rate Fast Mode 60 Hz Input Impedance Voltage 2 M Currnet 139 Ω Common Voltage Protection +/-200 Vpc Individual Channel Configuration Yes Overvoltage Protection 240 Vmms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc Surge Strength 3000 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Sampling	Normal Mode	10 Hz		
Impedance Currnet 139 Ω Common Voltage Protection +/-200 Vpc Individual Channel Configuration Yes Overvoltage Protection 240 Vms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Rate	Fast Mode	60 Hz		
Common Voltage Protection +/-200 Voc Individual Channel Yes Configuration 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Voc Isolation Voltage 3750 Voc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Input	Voltage	2 M		
Individual Channel Configuration Overvoltage Protection Digital Input/Counter Channel S Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Input Impedance 10 kΩ Overvoltage Protection 1-/-70 Voc Isolation Voltage 3750 Voc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating S A @ 250 Vac S A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 10° ops. Power-on Value Yes	Impedance	Currnet	139 Ω		
Configuration Yes Overvoltage Protection 240 Vrms Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Common Volta	ge Protection	+/-200 Vpc		
Digital Input/Counter Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Voc Isolation Voltage 3750 Voc Relay Output 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes			Yes		
Channel 5 Contact Wet Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Overvoltage Pr	otection	240 V _{rms}		
Contact Sink/Source (NPN/PNP) Sink/Source On Voltage Level 10 ~ 50 Voc Off Voltage Level +4 Voc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Voc Isolation Voltage 3750 Voc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 10 ⁵ ops. Power-on Value Yes	Digital Input	/Counter			
Sink/Source (NPN/PNP) Sink/Source On Voltage Level $10 \sim 50 \text{ Voc}$ Off Voltage Level $+4 \text{ Voc Max}$. Counter (50 Hz, 16-bit) Yes Input Impedance $10 \text{ k}\Omega$ Overvoltage Protection $+/-70 \text{ Voc}$ Isolation Voltage 3750 Voc Relay Output Veryold Channel 4 Type Power Relay (Form A) Contact Rating $5 \text{ A} \otimes 250 \text{ Vac}$ $5 \text{ A} \otimes 30 \text{ Voc}$ Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance $2 \times 10^7 \text{ ops}$. Electrical Endurance 10^5 ops . Power-on Value Yes	Channel		5		
On Voltage Level 10 ~ 50 Vpc Off Voltage Level +4 Vpc Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Contact		Wet		
Off Voltage Level +4 V _{DC} Max. Counter (50 Hz, 16-bit) Yes Input Impedance 10 kΩ Overvoltage Protection +/-70 V _{DC} Isolation Voltage 3750 V _{DC} Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 V _{AC} 5 A @ 30 V _{DC} Surge Strength 3000 V _{DC} Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 10 ⁷ ops. Electrical Endurance 10 ⁵ ops. Power-on Value Yes	Sink/Source (NPN/PNP)		Sink/Source		
Counter (50 Hz, 16-bit) Yes Input Impedance $10 \text{ k}\Omega$ Overvoltage Protection $+/-70 \text{ Voc}$ Isolation Voltage 3750 Voc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating $5 \text{ A} @ 250 \text{ Vac} \\ 5 \text{ A} @ 30 \text{ Voc}$ Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance $2 \times 10^7 \text{ ops}$. Electrical Endurance 10^5 ops . Power-on Value Yes	On Voltage Level		10 ~ 50 Vpc		
Input Impedance 10 kΩ Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Off Voltage Level		+4 V _{DC} Max.		
Overvoltage Protection +/-70 Vpc Isolation Voltage 3750 Vpc Relay Output 4 Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vpc 5 A @ 30 Vpc Surge Strength 3000 Vpc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Counter (50 Hz, 16-bit)		Yes		
Isolation Voltage 3750 Voc Relay Output 4 Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Input Impedar	ice	10 kΩ		
Relay Output Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 VAC 5 A @ 30 VbC Surge Strength 3000 VbC Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Overvoltage Pr	otection	+/-70 V _{DC}		
Channel 4 Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Vbc Surge Strength 3000 Vbc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 10 ⁷ ops. Electrical Endurance 10 ⁵ ops. Power-on Value Yes	Isolation Volta	ge	3750 Vbc		
Type Power Relay (Form A) Contact Rating 5 A @ 250 Vac 5 A @ 30 Voc Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 10 ⁷ ops. Electrical Endurance 10 ⁵ ops. Power-on Value Yes	Relay Output	ı			
Contact Rating 5 A @ 250 Vac 5 A @ 30 Vbc Surge Strength 3000 Vbc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 10 ⁷ ops. Electrical Endurance 10 ⁵ ops. Power-on Value Yes	Channel		4		
Surge Strength 3000 Voc Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2 × 107 ops. Electrical Endurance 105 ops. Power-on Value Yes	Туре		Power Relay (Form A)		
Operate Time 6 ms Release Time 3 ms Mechanical Endurance 2×10^7 ops. Electrical Endurance 10^5 ops. Power-on Value Yes	Contact Rating				
Release Time 3 ms Mechanical Endurance 2×10^7 ops. Electrical Endurance 10^5 ops. Power-on Value Yes	Surge Strength		3000 Vpc		
Mechanical Endurance 2×10^7 ops. Electrical Endurance 10^5 ops. Power-on Value Yes	Operate Time		6 ms		
Electrical Endurance 10 ⁵ ops. Power-on Value Yes	Release Time		3 ms		
Power-on Value Yes	Mechanical Endurance		2×10^7 ops.		
	Electrical Endurance		10 ⁵ ops.		
Safe Value Yes	Power-on Value		Yes		
	Safe Value		Yes		

(3)

Internal I/O Structure -

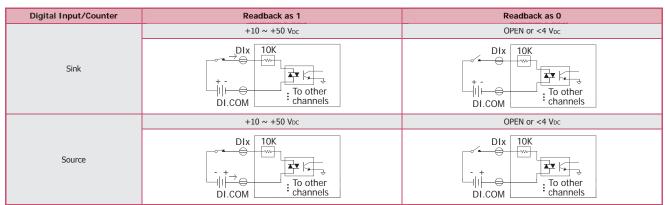
Pin Assignments





Wire Connections .





Power Relay	ON State Readback as 1	OFF State Readback as 0
Relay Output	RLx.COM Relay Close AC/DC LOAD : To other channels	RLx.COM Relay Open AC/DC To other RLx.NO Relay Open Cohering the cohere channels

Ordering Information -

M-7002 CR 4-channel AI, 5-channel DI and 4-channels Relay Output Module with DCON and Modbus Protocol (Gray Cover) (RoHS)

Accessories -

tM-7520U CR	RS-232 to RS-485 converter (RoHS)
tM-7561 CR	USB to RS-485 converter (RoHS)
I-7514U CR	4-channel RS-485 Hub (RoHS)
SG-3000 series	Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Inputs