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I-7011(D) I-7011P(D) M-7011(D)

1-channel Thermocouple Input Module

Features

- 1-channel Analog Input
- Current, Voltage or Thermocouple Input
- Open Thermocouple Detection
- High Resolution: 16-bit
- 1-channel Digital Input as 50 Hz Event Counter
- 1-channel Digital Output as High/Low Alarm
- 3000 VDC Intra-module Isolation
- Dual Watchdog
- Wide Operating Temperature Range: -25 to +75°C

Introduction

The I-7011 series of modules feature current and voltage input, as well as thermocouple input. The module provides 1-channel Analog Input, 1-channel Digital Input that functions as a 50 Hz event counter, and 2-channel Digital Output that can be used as a high/low alarm. The module also features open wire detection for the thermocouple input, and 3000 VDC intra-module isolation. The M-7011 supports both the Modbus RTU and DCON protocols, which can be configured via software, and all hardware specifications are the same as the I-7011. The I-7011P provides support for two additional thermocouple types, L and M.

Applications

- Building Automation
- Factory Automation
- Machine Automation
- Remote Maintenance
- Remote Diagnosis
- Testing Equipment

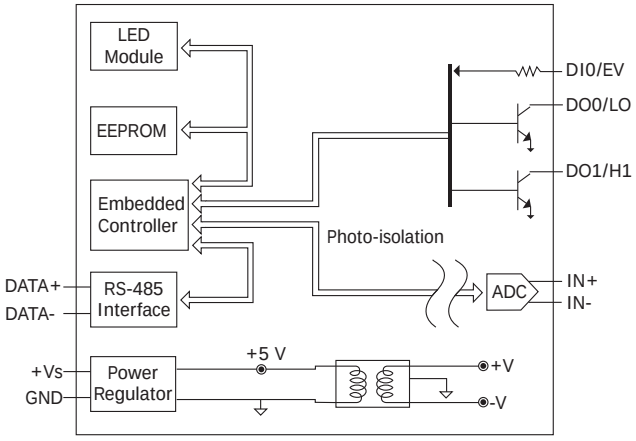
System Specifications

Model	I-7011 / I-7011D	I-7011P / I-7011PD	M-7011 / M-7011D
Communication			
Interface	RS-485		
Bias Resistor	No (Usually supplied by the RS-485 Master. Alternatively, add a tM-SG4 or SG-785.)		
Format	N, 8, 1		
Baud Rate	1200 to 115200 bps		
Protocol	DCON		Modbus RTU, DCON
Dual Watchdog	Yes, Module (1.6 Seconds), Communication (Programmable)		
LED Indicators / Display			
System LED Indicator	Yes, 1 as Power/Communication Indicator		
I/O LED Indicators	-		
7-segment LED Display	-		
	Yes		
Isolation			
Intra-module Isolation, Field-to-Logic	3000 VDC		
EMS Protection			
ESD (IEC 61000-4-2)	±2 kV Contact for each Terminal		
EFT (IEC 61000-4-4)	±4 kV to Power Line		
Surge (IEC 61000-4-5)	±0.5 kV for Power Line		
Power			
Reverse Polarity Protection	Yes		
Input Range	+10 ~ +30 VDC		
Consumption	0.9 W		
	1.5 W		
Mechanical			
Dimensions (L x W x H)	123 mm x 72 mm x 35 mm		
Installation	DIN-Rail or Wall Mounting		
Environment			
Operating Temperature	-25 to +75°C		
Storage Temperature	-40 to +85°C		
Humidity	10 to 95% RH, Non-condensing		

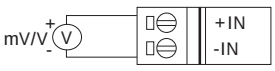
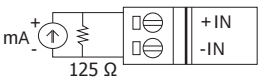
I/O Specifications

Model		I-7011 / I-7011D	I-7011P / I-7011PD	M-7011 / M-7011D
Analog Input				
Channels		1		
Wiring		Differential		
Sensor Types	Thermocouple	J, K, T, E, R, S, B, N, C	J, K, T, E, R, S, B, N, C, L, M	J, K, T, E, R, S, B, N, C
	Voltage	±15 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V		
	Current	±20 mA (requires optional external 125 Ω resistor)		
Resolution		16-bit		
Accuracy		0.1% of FSR		
Sampling Rate		10 Hz (Total)		
Input Impedance		> 400 kΩ		
Common Voltage Protection		±5 VDC		
Individual Channel Configuration		-		
Overvoltage Protection		±5 VDC		
Open Wire Detection (for thermocouple only)		Yes		
Temperature Output Consistency		-		
Stable Temperature Output in the Field		-		
Digital Input				
Channels		1		
Contact		Dry		
Sink/Source (NPN/PNP)		Source		
ON Voltage Level		Close to GND		
OFF Voltage Level		Open		
Counter (50 Hz, 16-bit)		Yes		
Input Impedance		3 kΩ		
Overvoltage Protection		±30 VDC		
Digital Output				
Channels		2		
Type		Open Collector		
Sink/Source (NPN/PNP)		Sink		
Load Voltage		+3.5 ~ +30 VDC		
Max. Load Current		30 mA/Channel		
Power-on Value		Yes		
Safe Value		Yes		

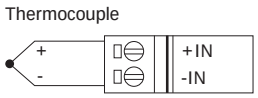
Internal I/O Structure

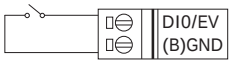
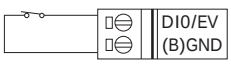


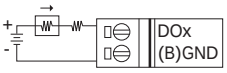
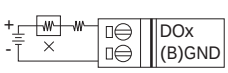
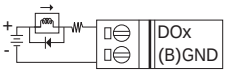
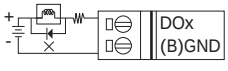
Wire Connections

Voltage Input	Current Input
	 Requires an Optional External 125 Ω Resistc

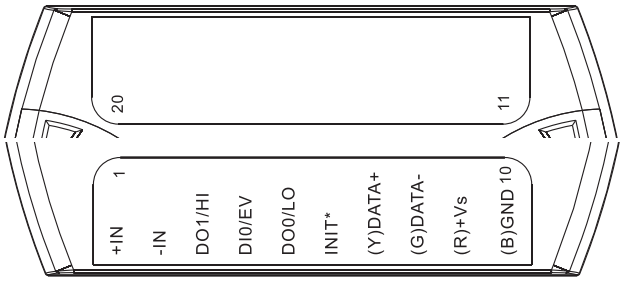
Thermocouple Input



Digital Input / Counter	Readback as 1	Readback as 0
	Open	Closed to GND
Dry Contact		

Digital Output	ON State Readback as 1	OFF State Readback as 0
Resistance Load		
Inductance Load		

Pin Assignments



Ordering Information

I-7011 CR	1-channel Thermocouple Input Module using the DCON Protocol (Blue Cover) (RoHS)
I-7011D CR	I-7011 with with 7-segment LED Display (Blue Cover) (RoHS)
I-7011P CR	1-channel Thermocouple Input Module using the DCON Protocol (Blue Cover) (RoHS)
I-7011PD CR	I-7011P with 7-segment LED Display (Blue Cover) (RoHS)
M-7011-G CR	1-channel Thermocouple Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS)
M-7011D-G CR	M-7011 with 7-segment LED Display (Gray Cover) (RoHS)

Accessories

tM-7520U CR	RS-232 to RS-485 Converter (RoHS)
tM-7561 CR	USB to RS-485 Converter (RoHS)
tM-SG4 CR	RS-485 Bias and Termination Resistor Module (RoHS)
I-7514U CR	4-channel RS-485 Hub (RoHS)
SG-770 CR	7-channel Differential or 14-channel Single-ended Surge Protector (RoHS)
SG-3000 Series	Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Input Transformers