



**I-7013(D)**

**M-7013P(D)**

1-ch RTD Input Module

### Features

- M-7013P and M-7013PD
  - 50 Hz Event Counter for Digital Input
  - High/Low Alarm for Digital Output
- 1 RTD Input
- Lead Resistance Elimination for 3/4-wire Connection
- Open Wire Detection
- Built-in Dual Watchdog



### Introduction

The I-7013(D) and M-7013P(D) is a 1-channel RTD Input module that is used for measuring temperatures via an RTD sensor and supports Pt100, Ni120, and Pt1000 type sensors. The module allows 2/3/4-wire RTD connections and features open wire detection. In addition, the I-7013(D) and M-7013P(D) also includes 3000 VDC intra-module isolation and supports lead resistance elimination for 3/4-wire connections. The M-7013P and M-7013PD added support for 1-channel digital input as 50 Hz event counter and 2-channel digital output as high/low alarm. The M-7013P and M-7013PD support both the Modbus RTU and DCON protocols, which can be configured via software.

### System Specifications

Model	I-7013/7013D	M-7013P/7013PD
<b>CPU Module</b>		
Watchdog Timer	Module, Communication (Programmable)	
<b>Display</b>		
Type	7013D/PD	5-Digit 7 Segment LED Display
<b>Isolation</b>		
Intra-module Isolation	3000 VDC	
<b>EMS Protection</b>		
EFT (IEC 61000-4-4)	±4 kV to Power Line	
ESD (IEC 61000-4-2)	I-7013(D)	±2 kV Contact for Each Terminal
	M-7013P(D)	±4 kV Contact for Each Terminal ±8 kV Air for Random Point
Surge (IEC 61000-4-5)	±0.5 kV for Power Line	
<b>LED Indicators</b>		
Status	1 x Power and Communication	
<b>COM Ports</b>		
Ports	1 x RS-485	
Baud Rate	1200 ~ 115200 bps	
Data Format	(N, 8, 1) (N, 8, 2) (E, 8, 1) (O, 8, 1)	
Protocol	DCON	Modbus RTU, DCON
<b>Power</b>		
Reverse Polarity Protection	Yes	
Input Range	+10 ~ +30 VDC	
Consumption	0.7 W	1.3 W 0.6 W 1.2 W
<b>Mechanical</b>		
Dimensions (mm)	72 x 123 x 35 (W x L x H)	
Installation	DIN-Rail Mounting	
<b>Environment</b>		
Operating Temperature	-25 ~ +75 °C	
Storage Temperature	-40 ~ +85 °C	
Humidity	10 ~ 95% RH, Non-condensing	

### I/O Specifications

Model	I-7013(D)	M-7013P(D)
<b>Analog Input</b>		
Channels	1	
Type	RTD	
Sensor Type	Pt100, Pt1000, Ni120	
Resistance Measurement	3.2 kΩ Max.	
Resolution	16-bit	
Accuracy	±0.05%	
Sampling Rate	10 Hz	
Overvoltage Protection	±5 VDC	±120 VDC
Open Wire Detection	Yes	
3-wire RTD Lead Resistance Elimination	Yes	

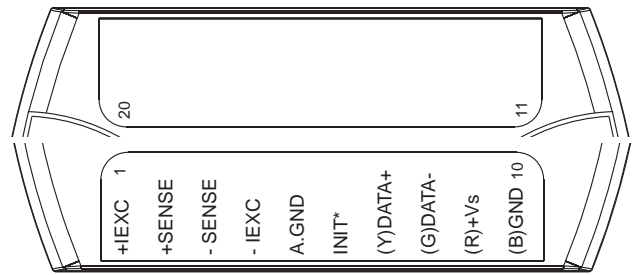
Model	M-7013P(D)
<b>Digital Input/Counter</b>	
Channels	1
Type	Dry Contact
Sink/Source (NPN/PNP)	Source
ON Voltage Level	Close to GND
OFF Voltage Level	Open
Max. Counts	65535 (16-bit)
Frequency	50 Hz
Overvoltage Protection	±30 VDC
<b>Digital Output</b>	
Channels	2
Type	Open Collector, MOSFET
Sink/Source (NPN/PNP)	Sink
Load Voltage	3.5 ~ 50 VDC
Load Current	700 mA/Channel
Overvoltage Protection	60 VDC
Overload Protection	1.4 A
Short-circuit Protection	Yes
Power-on Value	Programmable
Safe Value	Programmable

## RTD Type Settings (TT)

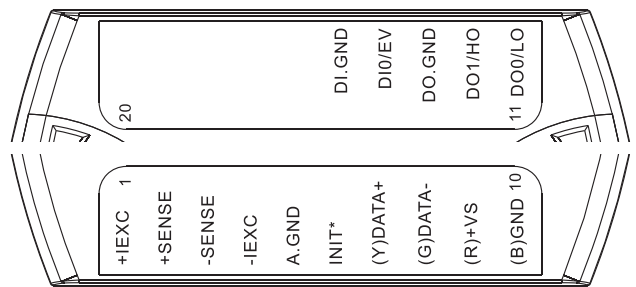
Type Code	RTD Type	Temperature Range
20	Platinum 100, $\alpha = 0.00385$	-100 to +100°C
21	Platinum 100, $\alpha = 0.00385$	0 to +100°C
22	Platinum 100, $\alpha = 0.00385$	0 to +200°C
23	Platinum 100, $\alpha = 0.00385$	0 to +600°C
24	Platinum 100, $\alpha = 0.003916$	-100 to +100°C
25	Platinum 100, $\alpha = 0.003916$	0 to +100°C
26	Platinum 100, $\alpha = 0.003916$	0 to +200°C
27	Platinum 100, $\alpha = 0.003916$	0 to +600°C
28	Nickel 120	-80 to +100°C
29	Nickel 120	0 to +100°C
2A	Platinum 1000, $\alpha = 0.00385$	-200 to +600°C
2E	Platinum 100, $\alpha = 0.00385$	-200 to +200°C
2F	Platinum 100, $\alpha = 0.003916$	-200 to +200°C
80	Platinum 100, $\alpha = 0.00385$	-200 to +600°C
81	Platinum 100, $\alpha = 0.003916$	-200 to +600°C
82	Cu 50 at 0°C	-50 to +150°C

## Pin Assignments

### I-7013/I-7013D



### M-7013P/M-7013PD

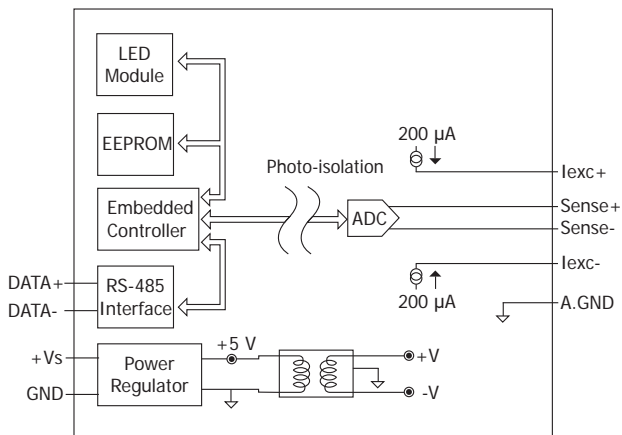


## Applications

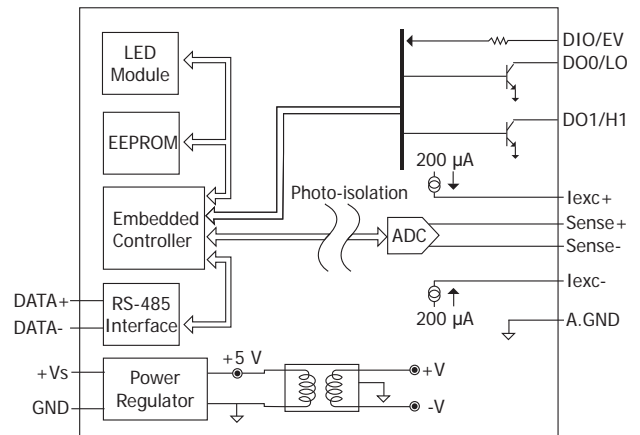
- Building Automation
- Machine Automation
- Remote Diagnosis
- Factory Automation
- Remote Maintenance
- Testing Equipment

## Internal I/O Structure

### I-7013/I-7013D



### M-7013P/M-7013PD



## Wire Connections

### I-7013/I-7013D

2-wire RTD Connection	3-wire RTD Connection	4-wire RTD Connection

2-wire RTD Connection	3-wire RTD Connection	4-wire RTD Connection
Digital Input/Counter	Readback as 0	Readback as 1
Dry Contact	Open	Closed to GND
Digital Output	ON State Readback as 1	OFF State Readback as 0
Resistance Load		
Inductance Load		

### Ordering Information

<b>I-7013 CR</b>	1-ch RTD Input Module using DCON Protocol (Blue Cover) (RoHS)
<b>I-7013-G CR</b>	1-ch RTD Input Module using DCON Protocol (Gray Cover) (RoHS)
<b>I-7013D CR</b>	1-ch RTD Input Module with LED Display using DCON Protocol (Blue Cover) (RoHS)
<b>M-7013P-G CR</b>	1-ch RTD Input Module with 1-ch DI and 2-ch DO using DCON and Modbus Protocols (Gray Cover) (RoHS)
<b>M-7013PD-G CR</b>	1-ch RTD Input Module with 1-ch DI, 2-ch DO and LED Display, using DCON and Modbus Protocols (Gray Cover) (RoHS)

### Accessories

<b>tM-7520U CR</b>	Tiny Isolated RS-232 to RS-485 Converter (RoHS)
<b>tM-7561 CR</b>	Tiny USB to Isolated RS-485 Converter with CA-USB18 Cable (RoHS)
<b>tM-SG4 CR</b>	RS-485 Pull-high/Pull-low and Termination Resistor Module (RoHS)
<b>I-7514U-G CR</b>	Isolated 4-channel RS-485 Repeater/Hub/Splitter (Gray Cover) (RoHS)
<b>SG-770 CR</b>	7/14 channel Surge Protector (RoHS)
<b>SG-3000 Series</b>	Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Input Transformers