I-7018Z M-7018Z

10-channel Thermocouple Input Module

Features

- 10-channel Analog Input
- Temperature Output Consistency
- Stable Temperature Output in the Field
- Current, Voltage and Thermocouple Input
- Overvoltage Protection of up to 240 V_{rms}
- Individual Channel Configuration
- Open Thermocouple Detection
- 4 kV ESD Protection
- 3000 V_{DC} Intra-module Isolation
- Dual Watchdog
- Wide Operating Temperature Range: -25 to +75°C

Introduction

The I-7018Z/M-7018Z is a 10-channel universal Analog Input module with an RS-485 interface that is especially designed for extremely accurate thermocouple measurement and features automatic cold-junction compensation for each channel to ensure temperature output consistency and stable temperature output in the field. The innovative design of the enhanced model ensures that thermocouple measurement is more accurate than with the earlier design. Besides the thermocouple inputs, the I-7018Z/M-7018Z also supports voltage and current input. The voltage input range can be from +/-15 mV to +/-2.5 V. Up to 10 different types of Analog Input can be connected to a single module. Overvoltage protection of up to 240 V_{rms} is provided. The module also features per-channel open wire detection for the thermocouple and +4 ~ +20 mA input channels. The M-7018Z provides additional support for both the Modbus RTU and DCON protocols, which can be configured via software, and all hardware specifications are the same as the I-7018Z.

System Specifications

Model		I-7018Z	M-7018Z
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) (N, 8, 2) (E, 8, 1) (O, 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		-	
Isolation			
Intra-module Isolation, Field-to-Logic		3000 V_{DC}	
EMS Protection			
ESD (IEC 61000-4-2)		±4 kV Contact for each Terminal	
EFT (IEC 61000-4-4)		±4 kV to Power	
Surge (IEC 61000-4-5)		±0.5 kV for Power Line	
Power			
Reverse Polarity Protection		Yes	
Input Range		+10 ~ +30 V_{DC}	
Consumption		1.0 W	
Mechanical			
Dimensions (L x W x H)	M-7019Z	116 mm x 73 mm x 35 mm	
	DB-1820	78 mm x 65 mm x 22 mm	
	DN-1822	103 mm x 96 mm x 27 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	

Applications

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

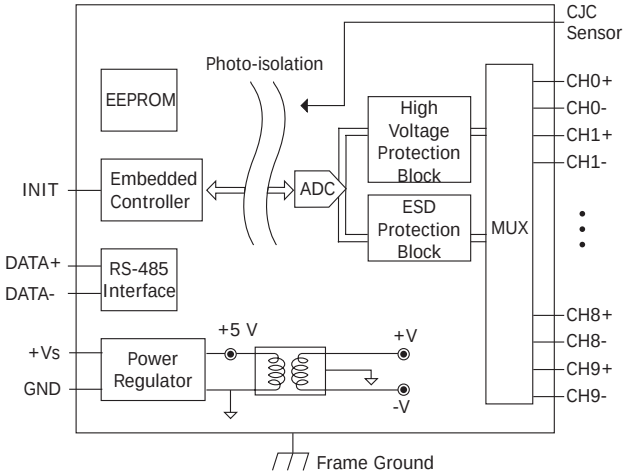
I/O Specifications

Model		I-7018Z	M-7018Z
Analog Input			
Channels		10	
Wiring		Differential	
Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C, L, M, $L_{DIN43710}$	
	Voltage	±1 5 mV, ±50 mV, ±100 mV, ±500 mV, ±1 V, ±2.5 V	
	Current	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA (requires an 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		±200 V_{DC}	
Individual Channel Configuration		Yes	
Overvoltage Protection		240 V_{rms}	
Open Wire Detection (for thermocouple only)		Yes	
Temperature Output Consistency		Yes	
Stable Temperature Output in the Field		Yes	

Thermocouple Types

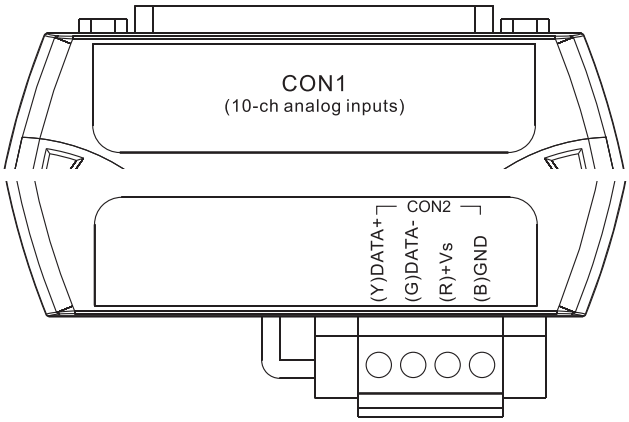
Type Code	Thermocouple Type	Temperature Range
0E	Type J	-210 to +760°C
0F	Type K	-270 to +1372°C
10	Type T	-270 to +400°C
11	Type E	-270 to +1000°C
12	Type R	0 to +1768°C
13	Type S	0 to +1768°C
14	Type B	0 to +1820°C
15	Type N	-270 to +1300°C
16	Type C	0 to +2320°C
17	Type L	-200 to +800°C
18	Type M	-200 to +100°C
19	Type $L_{DIN43710}$	-200 to +900°C

Internal I/O Structure



Pin Assignments

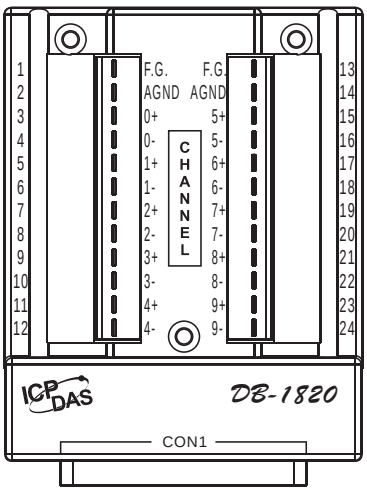
I-7018Z/M-7018Z



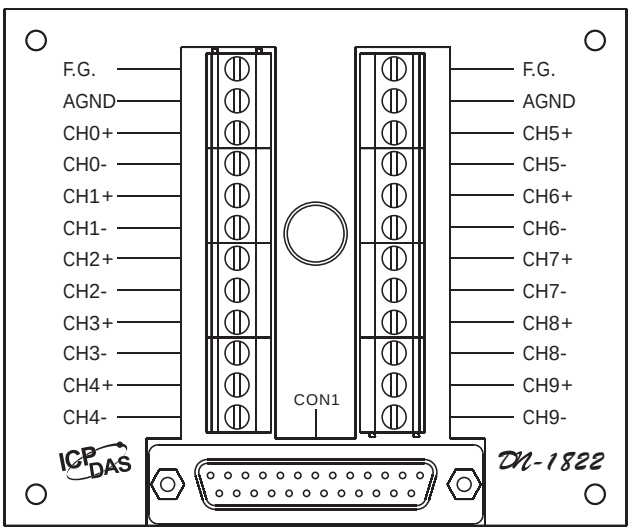
CON1			
Pin Assignment	**Terminal No.**		**Pin Assignment**
+5V	01	14	AGND
CJC	02	15	CH 0+
CH 0-	03	16	CH 1+
CH 1-	04	17	CH 2+
CH 2-	05	18	CH 3+
CH 3-	06	19	CH 4+
CH 4-	07	20	CH 5+
CH 5-	08	21	CH 6+
CH 6-	09	22	CH 7+
CH 7-	10	23	CH 8+
CH 8-	11	24	CH 9+
CH 9-	12	25	N.C.
N.C.	13	Shield	F.G.

25-pin Female D-Sub Connector

DB-1820

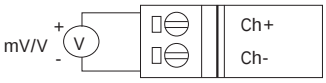


DN-1822

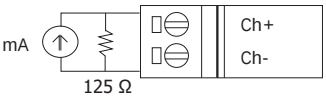


Wire Connections

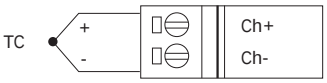
Voltage Input



Current Input

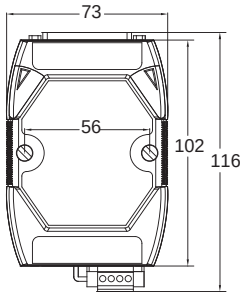


Requires an optional external 125 Ω resistor

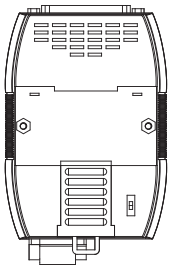


Dimensions (Units: mm)

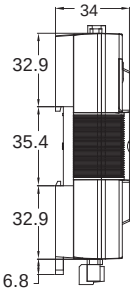
I- 7018Z/M- 7018Z



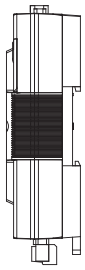
Front View



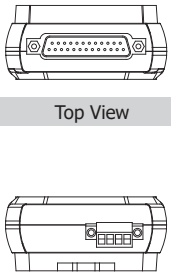
Rear View



Left Side View



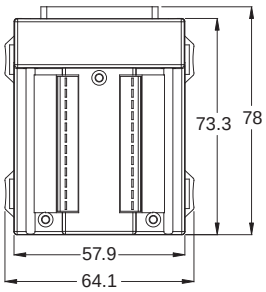
Right Side View



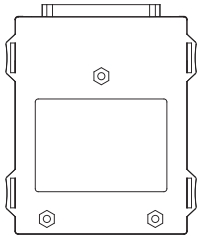
Top View

Bottom View

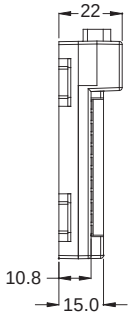
DB-1820



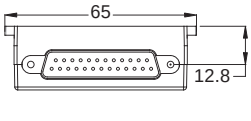
Front View



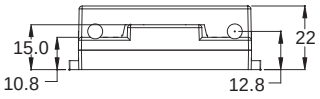
Rear View



Left Side View

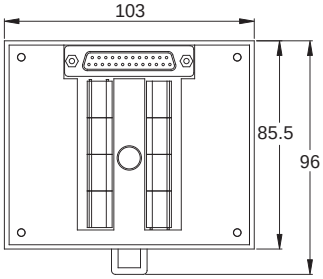


Top View

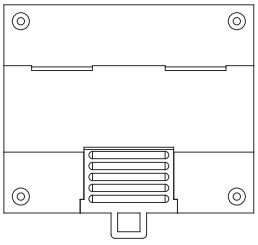


Bottom View

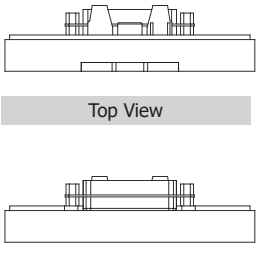
DN-1822



Front View

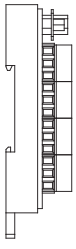


Rear View

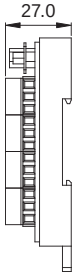


Top View

Bottom View



Left Side View



Right Side View

Ordering Information

I-7018Z-G/S CR	10-channel Thermocouple Input Module using the DCON Protocol (Gray Cover) (RoHS) Includes an I-7018Z Module and a DB-1820 Daughterboard.
I-7018Z-G/S2 CR	10-channel Thermocouple Input Module using the DCON Protocol (Gray Cover) (RoHS) Includes an I-7018Z Module, a DN-1822 Daughterboard and a CD-2518D 1.8 m Cable.
M-7018Z-G/S CR	10-channel Thermocouple Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS) Includes an M-7018Z Module and a DB-1820 Daughterboard.
M-7018Z-G/S2 CR	10-channel Thermocouple Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS) Includes an M-7018Z Module, a DN-1822 Daughterboard and a CD-2518D 1.8 m Cable.

Front Rear

I-7018Z-G/S = I-7018Z + DB-1820
(The DB-1820 connects directly to the I-7018Z)
M-7018Z-G/S = M-7018Z + DB-1820
(The DB-1820 connects directly to the M-7018Z)

I-7018Z-G/S2 = I-7018Z + DN-1822
(The DN-1822 connects directly to the I-7018Z)
M-7018Z-G/S2 = M-7018Z + DN-1822
(The DN-1822 connects directly to the M-7018Z)

Suggested Accessories

 CD-2518D CR	25-pin Female to 25-pin Male 1.8 m Cable for the DB-1820 with DIN-Rail Mount (RoHS)
 CD-25015 CR	25-pin Female to 25-pin Male 15 cm Cable for the DB-1820 with DIN-Rail Mount (RoHS)
 4PAPP-006-G CR	Plastic Rack (RoHS)

I-7018Z-G/S + CD-25015 + 4PAPP-006-G
M-7018Z-G/S + CD-25015 + 4PAPP-006-G

CD-25015
15 cm Cable + DB-1820

4PAPP-006-G

I-7018Z-G/S + CD-2518D
M-7018Z-G/S + CD-2518D

CD-2518D
1.8 m Cable + DB-1820

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
 125 Ω, 0.1% DIP Resistor	125 Ω External Resistor for use with Current Input on I-7011/I-7012/I-7017/I-7018 Series Modules