



M-7019Z

10-ch Universal AI Module

Features

- 10 Analog Inputs
- Provides Stable and Consistent Temperature Output
- Jumper Selectable Voltage or Current Input
- High Over-voltage Input Protection
- High Common Voltage Protection
- Individual Channel Configuration
- Open Thermocouple Detection
- Built-in Dual Watchdog



Introduction

The M-7019Z 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 M-7019Z also supports voltage and current input. The voltage input range can be from ± 15 mV to ± 10 V, and the current input range can be set to either $+4 \sim +20$ mA, $0 \sim +20$ mA, or ± 20 mA. Up to 10 different types of Analog Input can be connected to a single module. Overvoltage protection of up to 240 Vrms is provided. The module also features per-channel open wire detection for thermocouple and $+4 \sim +20$ mA input channels.

Applications

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

System Specifications

CPU Module		
Watchdog Timer	Module, Communication (Programmable)	
Isolation		
Intra-module Isolation	3000 VDC	
EMS Protection		
EFT (IEC 61000-4-4)	± 4 kV for Power Line	
ESD (IEC 61000-4-2)	± 4 kV Contact for Each Terminal	
LED Indicators		
Status	1 x Power and Communication	
COM Ports		
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	Modbus RTU, DCON	
Power		
Reverse Polarity Protection	Yes	
Input Range	$+10 \sim +30$ VDC	
Consumption	1.8 W	
Mechanical		
Dimensions (mm)	M-7019Z	73 x 116 x 34 (W x L x H)
	DB-1820	65 x 78 x 22 (W x L x D)
	DN-1822	103 x 96 x 27 (W x L x D)
	DN-1823	103 x 100 x 27 (W x L x D)
Installation	DIN-Rail Mounting	

I/O Specifications

Analog Input		
Channels	10 Differential	
Type	Voltage, Current, Thermocouple	
Sensor Types	Thermocouple	J, K, T, E, R, S, B, N, C, L, M, LDIN43710
Range	Voltage	± 15 mV, ± 50 mV, ± 100 mV, ± 150 mV, ± 500 mV, ± 1 V, ± 2.5 V, ± 5 V, ± 10 V
	Current	± 20 mA, $0 \sim +20$ mA, $+4 \sim +20$ mA (Jumper selectable)
Resolution	16-bit	
Accuracy	$\pm 0.1\%$ of FSR	
Sampling Rate	10 Hz (Total)	
Input Impedance	Voltage	2 M Ω
	Current	125 Ω
	Thermocouple	> 400 k Ω
Common Voltage Protection	± 200 VDC	
Overvoltage Protection	240 Vrms	
Individual Channel Configuration	Yes	
Open Wire Detection	For Thermocouple (Software Selectable) and $4 \sim 20$ mA	

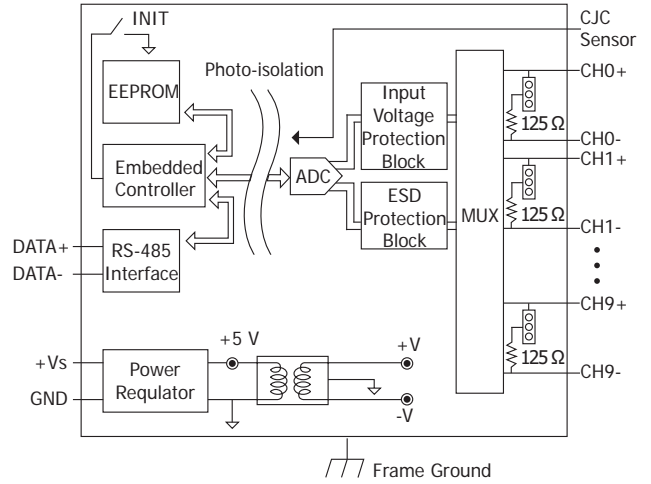
Environment

Operating Temperature	$-25 \sim +75$ °C
Storage Temperature	$-40 \sim +85$ °C
Humidity	10 ~ 95% RH, Non-condensing

Thermocouple Types

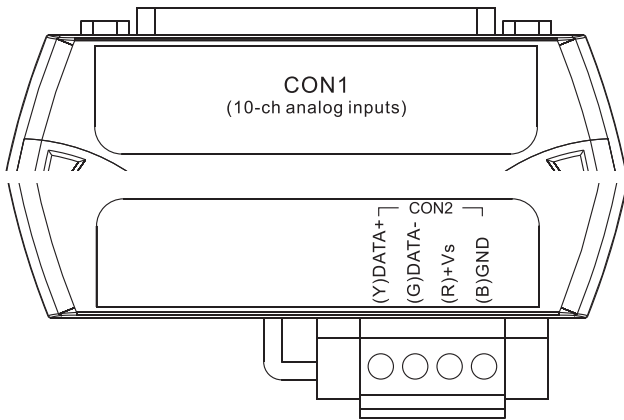
Type Code	Thermocouple Type	Temperature Range
0E	Type J	-210 to +760°C
0F	Type K	-270 to +1372°C
10	Type T	-270 to +400°C
11	Type E	-270 to +1000°C
12	Type R	0 to +1768°C
13	Type S	0 to +1768°C
14	Type B	0 to +1820°C
15	Type N	-270 to +1300°C
16	Type C	0 to +2320°C
17	Type L	-200 to +800°C
18	Type M	-200 to +100°C
19	Type LDIN43710	-200 to +900°C

Internal I/O Structure



Pin Assignments

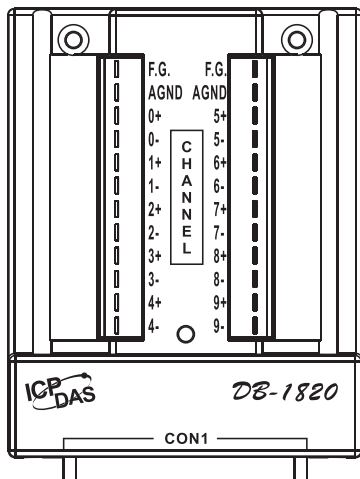
M-7019Z



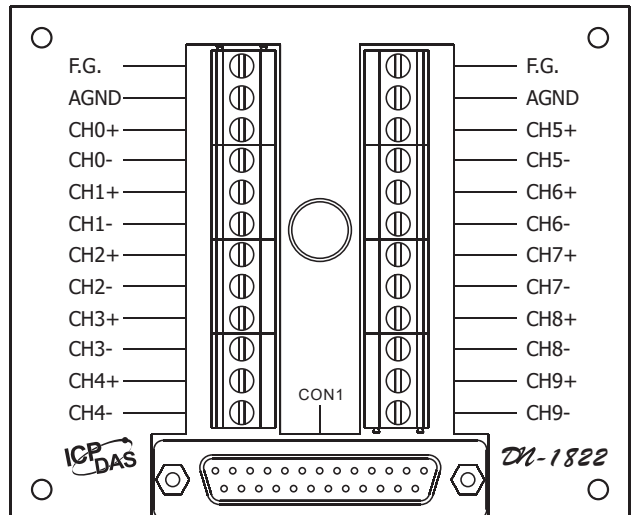
CON1				
Pin Assignment	Terminal	No.	Pin Assignment	
+5V	01	14	AGND	
CJC	02	15	CH 0+	
CH 0 -	03	16	CH 1+	
CH 1 -	04	17	CH 2+	
CH 2 -	05	18	CH 3+	
CH 3 -	06	19	CH 4+	
CH 4 -	07	20	CH 5+	
CH 5 -	08	21	CH 6+	
CH 6 -	09	22	CH 7+	
CH 7 -	10	23	CH 8+	
CH 8 -	11	24	CH 9+	
CH 9 -	12	25	N.C.	
N.C.	13	Shield	F.G.	

25-pin Female D-Sub Connector

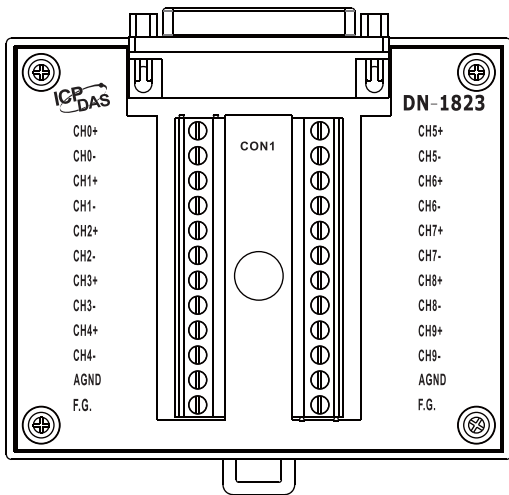
DB-1820



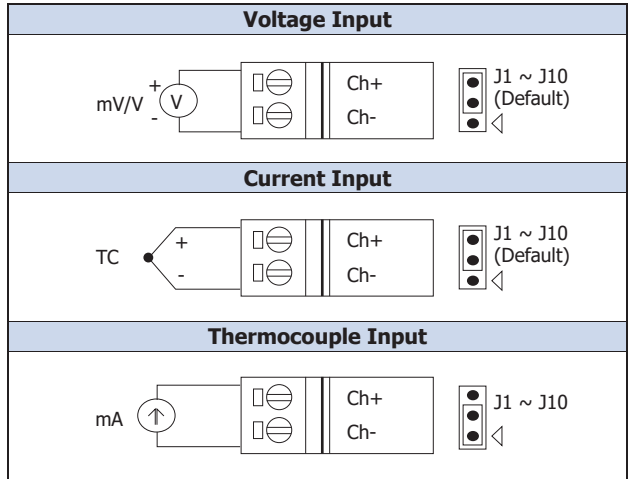
DN-1822



DN-1823

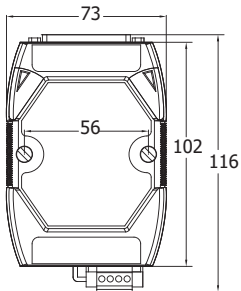


Wire Connections

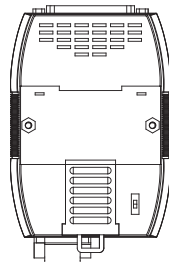


Dimensions (Units: mm)

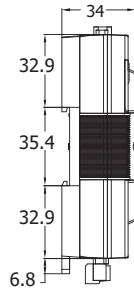
M-7019Z



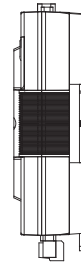
Front View



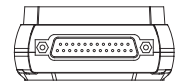
Rear View



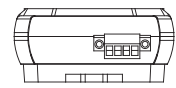
Left Side View



Right Side View

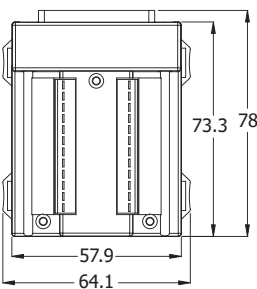


Top View

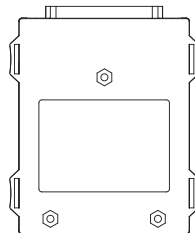


Bottom View

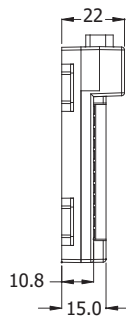
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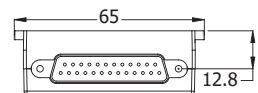
Front View



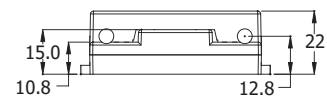
Rear View



Left Side View

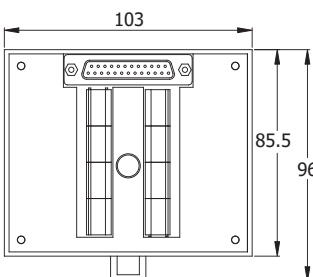


Top View

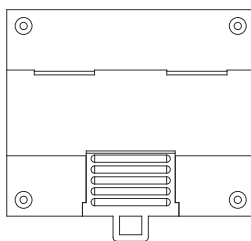


Bottom View

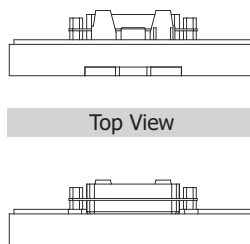
DN-1822



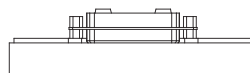
Front View



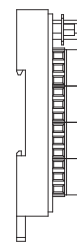
Rear View



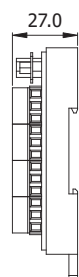
Top View



Bottom View

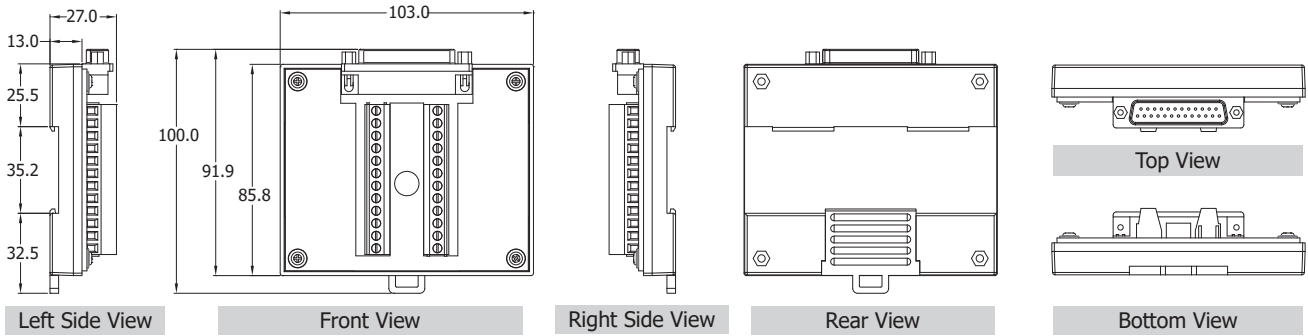


Left Side View



Right Side View

DN-1823



Ordering Information

M-7019Z-G/S CR	10-ch Universal AI Module using DCON and Modbus Protocols (Gray Cover) (RoHS) Includes DB-1820 Daughter Board and Plastic DIN Rail (4PAPP-006-G)
M-7019Z-G/S2 CR	10-ch Universal AI Module using DCON and Modbus Protocols (Gray Cover) (RoHS) Includes DN-1822 Daughter Board, CA-252518D-1 1.8 m Cable and Plastic DIN Rail (4PAPP-006-G)
M-7019Z-G/S3 CR	10-ch Universal AI Module using DCON and Modbus Protocols (Gray Cover) (RoHS) Includes DN-1823 Daughter Board, CA-2525015D 15 cm Cable and 4PAPP-006-G

<p>M-7019Z-G/S = DB-1820 Connects to the M-7019Z Directly</p>	<p>M-7019Z-G/S2 = DN-1822 Connects to the M-7019Z Directly</p>	<p>M-7019Z-G/S3 = DN-1823 Connects to the M-7019Z Directly</p>
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Accessories

CD-2518D CR	DB25 Male to Female 1.8 m Cable (180°) and DIN-Rail Mounting Mount for the DB-1820 (RoHS)
CD-25015 CR	DB25 Male to Female 15 cm Cable (90°) and DIN-Rail Mounting Mount for the DB-1820 (RoHS)

<p>M-7019Z-G/S + CD-25015 + 4PAPP-006-G</p>	<p>M-7019Z-G/S + CD-2518D</p>
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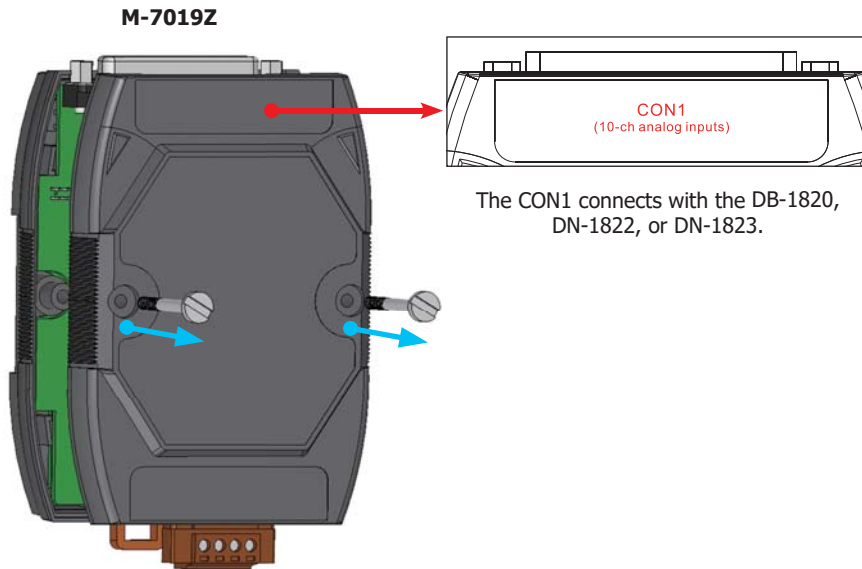
Related Products

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

Jumper

Notice:

1. Remove the top cover of the module before adjusting the jumper. Additionally, some modules may have two screws on the back cover.



2. Users can locate the Jx/JPx jumpers on the board by checking the I/O labels on the cover.

Channel	CH0±	CH1±	CH2±	CH3±	CH4±	CH5±	CH6±	CH7±	CH8±	CH9±
Jumper	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10

