M-7019Z

10-channel Universal Analog Input Module

Features

- 10-channel Analog Input
- Individual Channel Configuration
- Open Thermocouple Detection
- Temperature Output Consistency
- Stable Temperature Output in the Field
- 240 Vrms Overvoltage Protection
- Jumper Selectable Voltage or Current Input
- 4 kV ESD Protection
- Dual Watchdog
- 3000 VDC Intra-module Isolation, Field to Logic

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 ~ +20 mA, 0 ~ +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 ~ +20 mA input channels.

System Specifications

Model		M-7019Z
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		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 VDC
EMS Protection		
ESD (IEC 61000-4-2)		±4 kV Contact for each Terminal
EFT (IEC 61000-4-4)		±4 kV for Power Line
Surge (IEC 61000-4-5)		-
Power		
Reverse Polarity Protection		Yes
Input Voltage Range		+10 VDC ~ +30 VDC
Power Consumption		1.8 W
Mechanical		
Dimensions (W x L x H)	M-7019Z	73 mm x 116 mm x 34 mm
	DB-1820	65 mm x 78 mm x 22 mm
	DN-1822	103 mm x 96 mm x 27 mm
	DN-1823	103 mm x 100 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

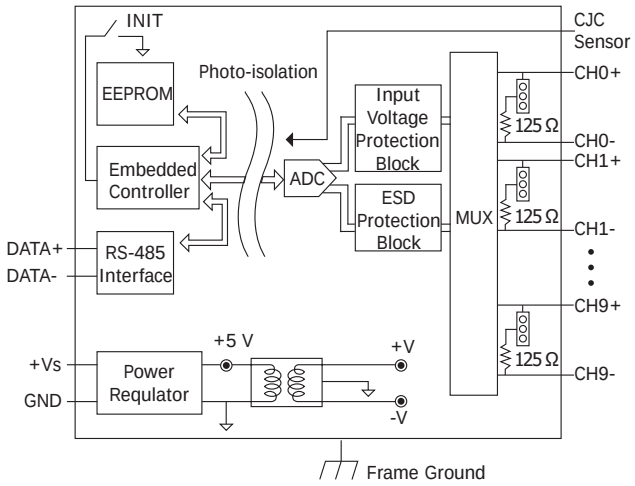
I/O Specifications

Model		M-7019Z
Analog Input		
Channels		10
Wiring		Differential
Sensor Type	Thermocouple	J, K, T, E, R, S, B, N, C, L, M, $L_{DIN43710}$
	Voltage	±15 mV, ±50 mV, ±100 mV, ±150 mV, ±500 mV, ±1 V, ±2.5 V, ±5 V, ±10 V
	Current	±20 mA, 0 ~ 20 mA, 4 ~ 20 mA (Jumper selectable)
Resolution		16-bit
Accuracy		±0.1% of FSR
Sampling Rate		10 Hz (Total)
Input Impedance	Voltage	2 MΩ
	Current	125 Ω
	Thermocouple	> 400 kΩ
Common Voltage Protection		±200 VDC
Individual Channel Configuration		Yes
Overvoltage Protection		240 Vrms
Open Wire Detection (for Thermocouple Input only)		Yes
Temperature Output Consistency		Yes
Stable Temperature Output in the Field		Yes

Thermocouple Types

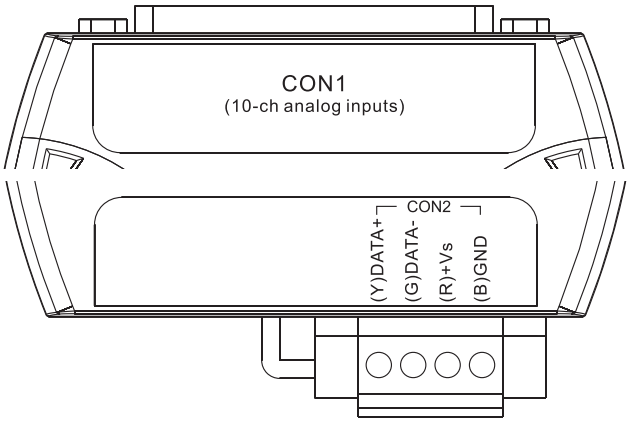
Type Code	Thermocouple Type	Temperature Range
0E	Type J	-210 to +760°C
0F	Type K	-270 to +1372°C
10	Type T	-270 to +400°C
11	Type E	-270 to +1000°C
12	Type R	0 to +1768°C
13	Type S	0 to +1768°C
14	Type B	0 to +1820°C
15	Type N	-270 to +1300°C
16	Type C	0 to +2320°C
17	Type L	-200 to +800°C
18	Type M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

Internal I/O Structure



Pin Assignments

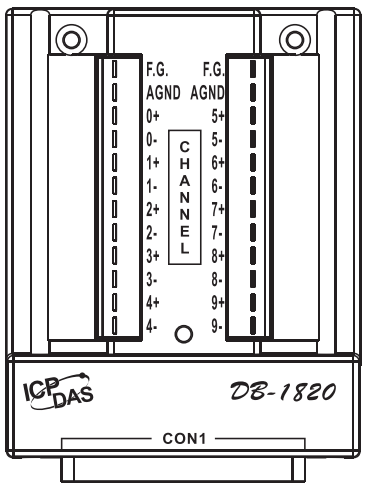
M-7019Z



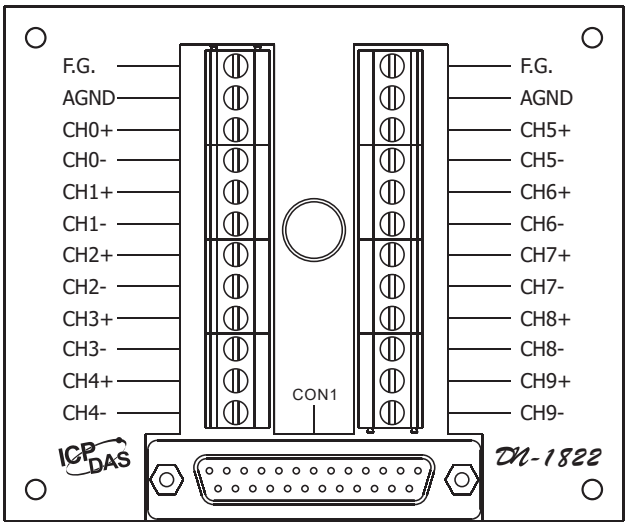
CON1			
Pin Assignment	**Terminal No.**		**Pin Assignment**
+5V	01	14	AGND
CJC	02	15	CH 0+
CH 0-	03	16	CH 1+
CH 1-	04	17	CH 2+
CH 2-	05	18	CH 3+
CH 3-	06	19	CH 4+
CH 4-	07	20	CH 5+
CH 5-	08	21	CH 6+
CH 6-	09	22	CH 7+
CH 7-	10	23	CH 8+
CH 8-	11	24	CH 9+
CH 9-	12	25	N.C.
N.C.	13	Shield	F.G.

25-pin Female D-Sub Connector

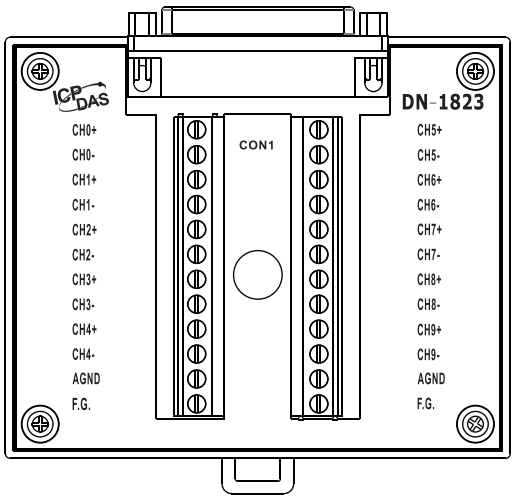
DB-1820



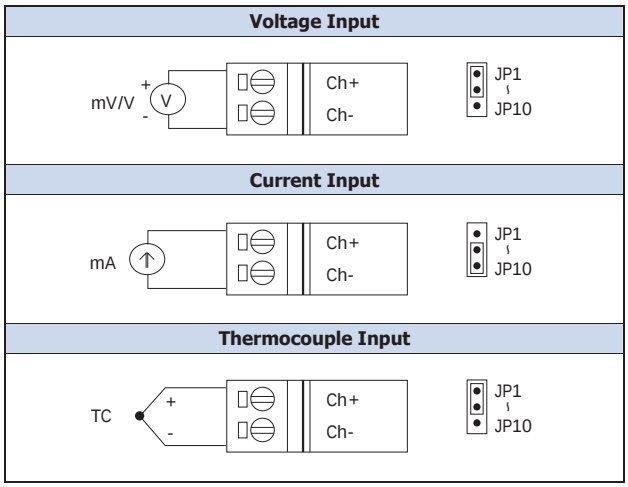
DN-1822



DN-1823

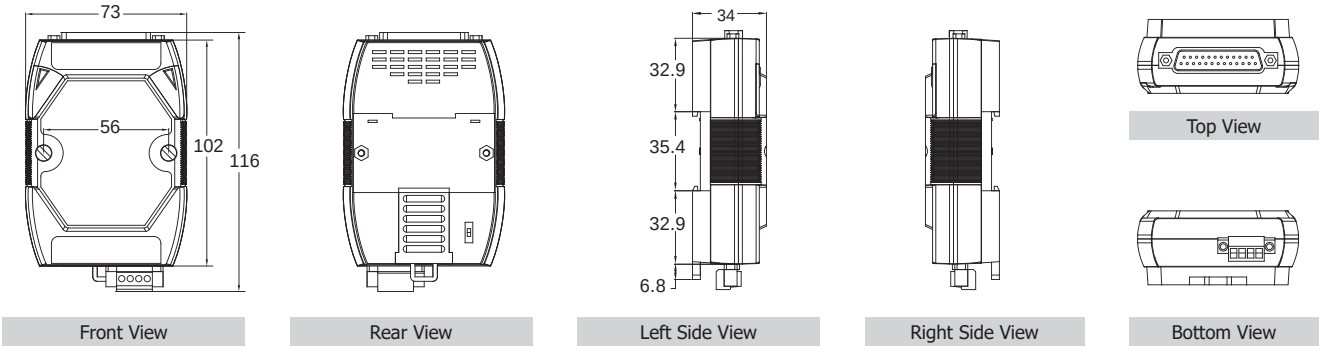


Wire Connections

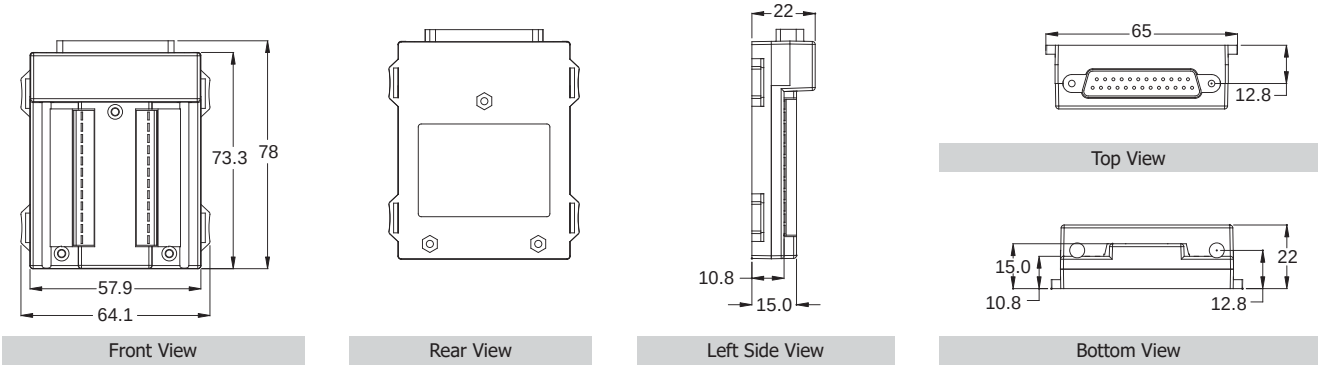


Dimensions (Units: mm)

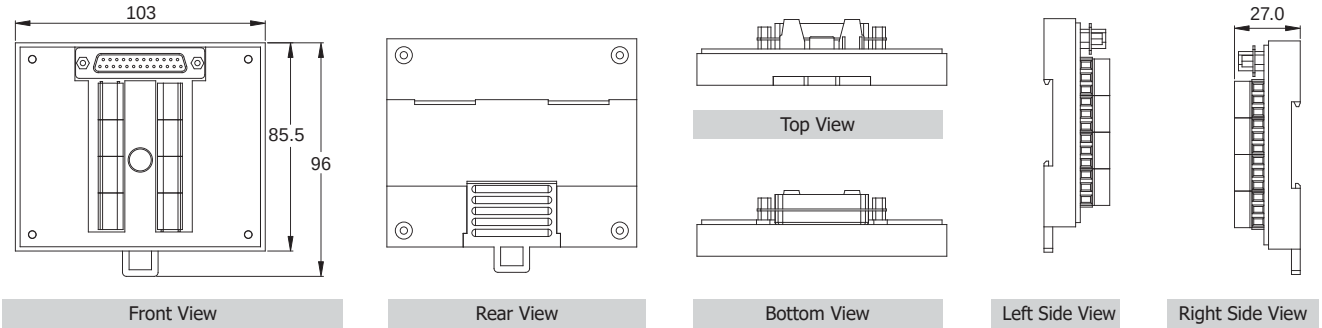
M- 7019Z



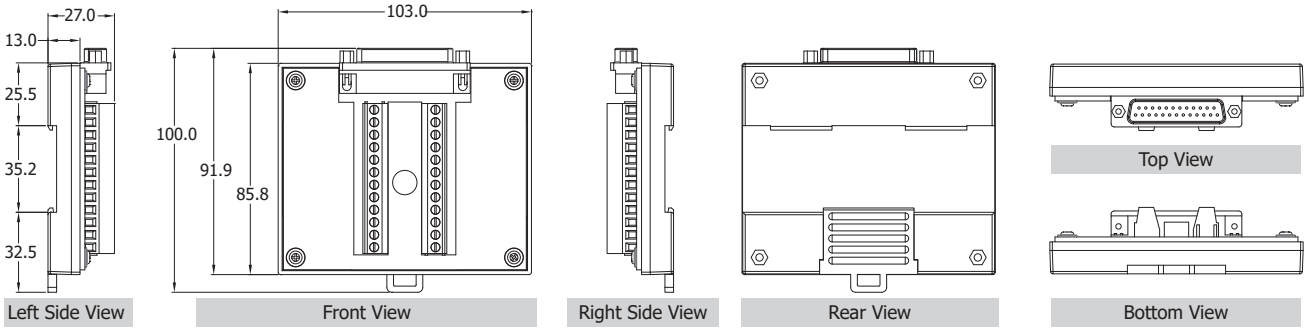
DB-1820



DN-1822



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 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 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

Front Rear

M-7019Z-G/S =
DB-1820 Connects to the M-7019Z Directly

M-7019Z-G/S2 =
DN-1822 Connects to the M-7019Z Directly

M-7019Z-G/S3 =
DN-1823 Connects to the M-7019Z Directly

Accessories

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

CD-25015

4PAPP-006-G

M-7019Z-G/S + CD-25015 + 4PAPP-006-G

CD-2518D

M-7019Z-G/S + CD-2518D

Related Products

 **tM-7520U CR**	Tiny Isolated RS-232 to RS-485 Converter (RoHS)
 **tM-7561 CR**	Tiny USB to Isolated RS-485 Converter with CA-USB18 Cable (RoHS)
 **tM-SG4 CR**	RS-485 Pull-high/Pull-low and Termination Resistor Module (RoHS)

 **I-7514U CR**	Isolated 4-channel RS-485 Repeater/Hub/ Splitter (Gray Cover) (RoHS)
 **SG-770 CR**	7/14 channel Surge Protector (RoHS)
 **SG-3000 Series**	Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Input Transformers