



## I-87019PW

8-channel Universal Analog Input Module with High Overvoltage Protection

### Introduction

The I-87019PW is a 8-channel universal analog input module with an RS-485 interface that is a specially 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-87019PW also supports voltage and current inputs. The voltage input range can be from  $\pm 15$  mV to  $\pm 10$  V, and the current input range can be either  $+4 \sim +20$  mA,  $0 \sim +20$  mA, or  $\pm 20$  mA. Up to 10 analog inputs of different types can be connected to a single module. Overvoltage protection of up to 240 V<sub>rms</sub> is provided. The module also features per-channel open wire detection for thermocouple and  $+4 \sim +20$  mA inputs.

### System Specifications

Communication	
Interface	RS-485
Format	N, 8, 1; N, 8, 2; E, 8, 1; O, 8, 1
Baud Rate	1200 ~ 115200 bps
Protocol	DCON
Dual Watchdog	Yes, Module (1.6 Seconds), Communication (Programmable)
LED Indicator/Display	
System LED Indicator	1 LED as Power/Communication Indicator
I/O LED Indicator	-
Isolation	
Intra-Module Isolation, Field-to-Logic	3000 V <sub>DC</sub>
EMS Protection	
ESD (IEC 61000-4-2)	4 kV Contact for Each Terminal
	8 kV Air for Random Point
Power	
Power Consumption	1.3 W
Mechanical	
Dimensions (W x L x H)	I-87019PW 30 mm x 86 mm x 114 mm
	CN-1824 29 mm x 43 mm x 83 mm
Environment	
Operating Temperature	-25 ~ +75°C
Storage Temperature	-40 ~ +85°C
Humidity	10 ~ 95% RH, Non-condensing

### Features

- 8-channel Analog Input
- Individual Channel Configuration
- Open Thermocouple Detection
- Temperature Output Consistency
- Stable Temperature Output in the Field
- 240 V<sub>rms</sub> Overvoltage Protection
- Jumper Selectable Voltage or Current Input
- 4 kV ESD Protection
- Dual Watchdog
- 3000 V<sub>DC</sub> Intra-Module Isolation, Field-to-Logic
- RoHS Compliant
- Wide Operating Temperature Range: -25 ~ +75°C



### Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

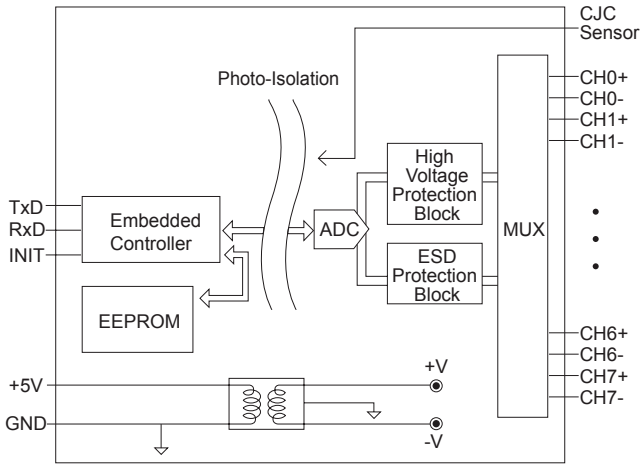
### I/O Specifications

Analog Input	
Channels	8
Wiring	Differential
Sensor Type	$\pm 15$ mV, $\pm 50$ mV, $\pm 100$ mV, $\pm 150$ mV, $\pm 500$ mV, $\pm 1$ V <sub>DC</sub> , $\pm 2.5$ V <sub>DC</sub> , $\pm 5$ V <sub>DC</sub> , $\pm 10$ V <sub>DC</sub>
	-20 mA ~ +20 mA, $0 \sim +20$ mA, $+4 \sim +20$ mA (Jumper Selectable)
	Thermocouple Type: (J, K, T, E, R, S, B, N, C, L, M, and L <sub>DIN43710</sub> )
Resolution	16-bit
Accuracy	$\pm 0.1\%$ of FSR
Sampling Rate	10 Hz (Total)
Zero Drift	$\pm 20$ $\mu$ V/°C
Span Drift	$\pm 25$ ppm/°C
Common Mode Rejection	86 dB
Normal Mode Rejection	100 dB
Input Impedance	Voltage Input: $>400$ k $\Omega$ , Current Input: 125 $\Omega$
Individual Channel Configuration	Yes
Open Wire Detection	Yes, (Software Selectable)
Overvoltage Protection	240 V <sub>rms</sub>

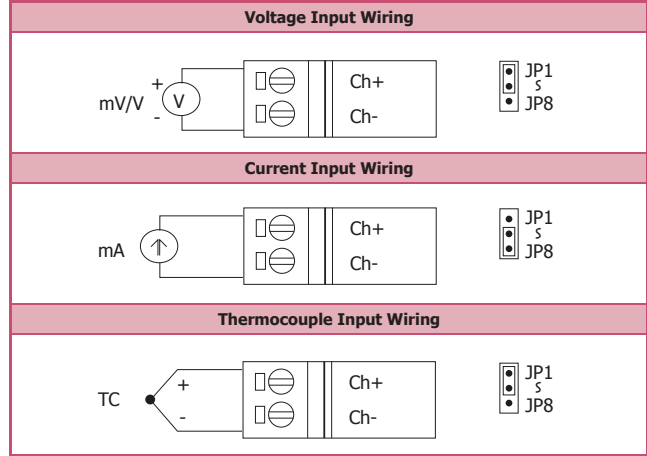
### Thermocouple type

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

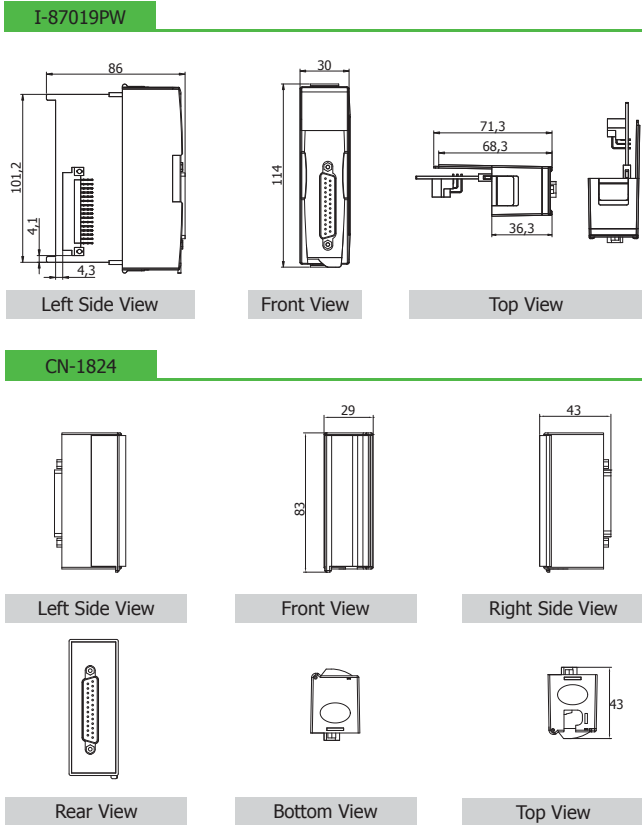
### Internal I/O Structure



### Wire Connections



### Dimensions (Units: mm)



### Pin Assignments

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	N.C.
N.C.	11	24	N.C.
N.C.	12	25	N.C.
N.C.	13	Shield	F.G.

25-pin Female D-Sub Connector

Pin Assignment Name	Pin Assignment Name
CH0+	CH 0+
CH0-	CH 0-
CH1+	CH 1+
CH1-	CH 1-
CH2+	CH 2+
CH2-	CH 2-
CH3+	CH 3+
CH3-	CH 3-
CH4+	CH 4+
CH4-	CH 4-
CH5+	CH 5+
CH5-	CH 5-
CH6+	CH 6+
CH6-	CH 6-
CH7+	CH 7+
CH7-	CH 7-
AGND	AGND
AGND	AGND

### Ordering Information

<b>I-87019PW-G CR</b>	8-channel Universal Analog Input Module (Gray Cover) (RoHS) Includes the I-87019PW Module and a CN-1824 Daughter Board.
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### Accessories

	<b>SG-770 CR</b> 7 channel differential or 14 channel single-ended surge protector (RoHS)
	<b>SG-3000 series</b> Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Inputs

RS-485 Remote I/O Modules

I-87KW Series

I-87019PW