

## Features

- 8-channel Universal Analog Input
- 240 V<sub>rms</sub> Overvoltage Protection
- Individual Channel Configuration
- Jumper Selectable Voltage, Current or Thermocouple Input
- Open Thermocouple Detection
- 4 kV ESD Protection
- 3000 Vdc Intra-module Isolation
- Dual Watchdog
- Wide Operating Temperature Range: -25 to +75°C



## Introduction

The I-7019R is an Analog Input module that includes 8 differential Analog Input channels. Voltage, current or thermocouple input can be selected for all Analog Input channels via a jumper and each channel can be configured for an individual range. The voltage input range can be from  $\pm 15$  mV to 10 V, the current input range can be either +4 to +20 mA, 0 to +20 mA, or  $\pm 20$  mA, and types J, K, T, E, R, S, B, N, C, L, M, LDIN43710 can be used for the thermocouple input. Up to 8 different Analog Input 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 the thermocouple and +4 to +20 mA input types, and provides 4 kV ESD protection as well as 3000 VDC intra-module isolation. The M-7019R supports both the Modbus RTU and DCON protocols, which can be configured via software, and all hardware specifications are the same as the I-7019R.

## System Specifications

| Model                                  | I-7019R  | M-7019R          |
|--|--|------------------|
| <b>Communication</b>                   |  |                  |
| 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)                            |                  |
| <b>LED Indicators/Display</b>          |  |                  |
| System LED Indicator                   | Yes, 1 as Power/Communication Indicator  |                  |
| I/O LED Indicators                     | -  |                  |
| 7-segment LED Display                  | -  |                  |
| <b>Isolation</b>                       |  |                  |
| Intra-module Isolation, Field-to-Logic | 3000 Vdc   |                  |
| <b>EMS Protection</b>                  |  |                  |
| ESD (IEC 61000-4-2)                    | $\pm 4$ kV   |                  |
| EFT (IEC 61000-4-4)                    | $\pm 4$ kV   |                  |
| <b>Power</b>                           |  |                  |
| Reverse Polarity Protection            | Yes  |                  |
| Input Range                            | +10 ~ +30 Vdc  |                  |
| Consumption                            | 1.2 W  |                  |
| <b>Mechanical</b>                      |  |                  |
| Dimensions (L x W x H)                 | 123 mm x 72 mm x 35 mm   |                  |
| Installation                           | DIN-Rail or Wall Mounting  |                  |
| <b>Environment</b>                     |  |                  |
| Operating Temperature                  | -25 to +75°C   |                  |
| Storage Temperature                    | -40 to +85°C   |                  |
| Humidity                               | 10 to 95% RH, Non-condensing   |                  |

## Applications

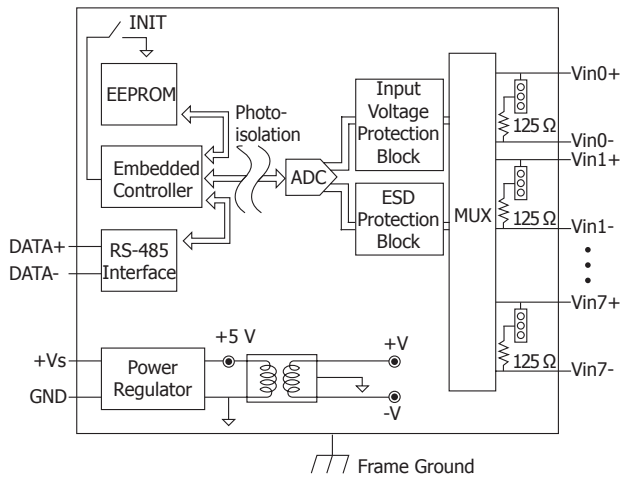
Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

## I/O Specifications

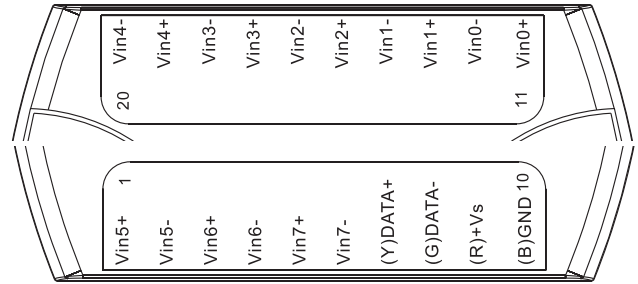
| Model                                       | I-7019R              | M-7019R   |
|---|----------------------|---|
| <b>Analog Input</b>                         |                      |   |
| Channels                                    | 8                    |   |
| Wiring                                      | Differential         |   |
| Sensor Types                                | Thermocouple         | J, K, T, E, R, S, B, N, C, L, M, LDIN43710  |
|   | Voltage              | $\pm 15$ mV, $\pm 50$ mV, $\pm 100$ mV, $\pm 150$ mV, $\pm 500$ mV, $\pm 1$ V, $\pm 2.5$ V, $\pm 5$ V, $\pm 10$ V |
|   | Current              | $\pm 20$ mA, 0 ~ +20 mA, +4 ~ +20 mA (Jumper selectable)  |
| Resolution                                  | 16-bit               |   |
| Accuracy                                    | 0.1% of FSR          |   |
| Sampling Rate                               | 8 Hz (Total)         |   |
| Input Impedance                             | Voltage              | 2 M $\Omega$  |
|   | Current              | 125 $\Omega$  |
|   | Thermocouple         | > 400 k $\Omega$  |
| Common Voltage Protection                   | $\pm 200$ VDC        |   |
| Individual Channel Configuration            | Yes                  |   |
| Overvoltage Protection                      | 240 V <sub>rms</sub> |   |
| Open Wire Detection (for thermocouple only) | Yes                  |   |
| Temperature Outputs consistency             | -                    |   |
| Stable Temperature Output in the Field      | -                    |   |

**Note:** For highly-accurate thermocouple measurement, ICP DAS recommends selecting the I-7018Z/I-7019Z module, which features automatic cold-junction compensation for each channel, ensuring consistent and stable temperature output.

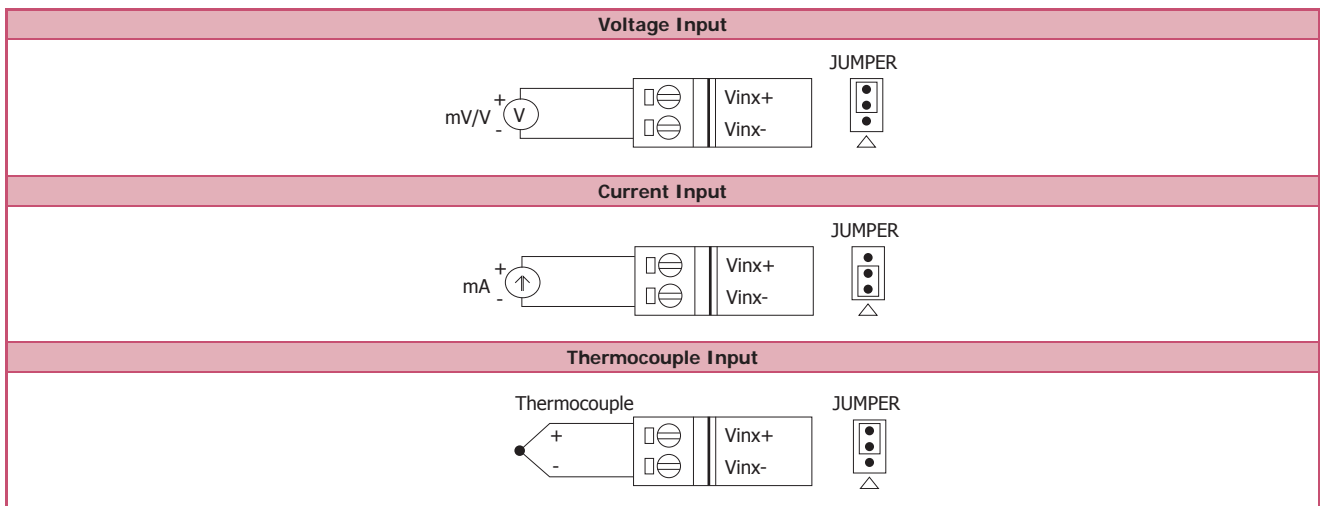
## Internal I/O Structure



## Pin Assignments



## Wire Connections



## Ordering Information

|              |  |
|--------------|--|
| I-7019R CR   | 8-channel Universal Analog Input Module using the DCON Protocol (Blue Cover) (RoHS) Art. No. 116200      |
| I-7019R-G CR | 8-channel Universal Analog Input Module using the DCON Protocol (Gray Cover) (RoHS)                      |
| M-7019R-G CR | 8-channel Universal Analog Input Module using the DCON and Modbus Protocols (Gray Cover) Art. No. 116628 |

## 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 |