



## Features

- 16-channel Differential Analog Input
- $\pm 120$  VDC Overvoltage Protection
- Current, Voltage or Thermocouple Input
- 3000 VDC Intra-module Isolation
- Adjustable CJC offset
- Open Thermocouple Detection
- Dual Watchdog
- Wide Operating Temperature Range:  $-25^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$



## Introduction

The M-6018-16 is an analog input module that includes 16 differential analog input channels. The voltage input range can be from  $\pm 15$  mV to  $\pm 2.5$  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 thermocouple can be used for the thermocouple input. Overvoltage protection of up to 120 VDC is provided. The module also features per-channel open wire detection for the thermocouple input types, and provides 4 kV ESD protection as well as 3000 Vdc intra-module isolation.

## Applications

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

## System Specifications

Communication	
Interface	RS-485
Bias Resistor	Switch Selectable (1 k $\Omega$ resistor)
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)	$\pm 4$ kV Contact for each Terminal
	$\pm 8$ kV Air for Random Point
EFT (IEC 61000-4-4)	$\pm 4$ kV for Power Line
Surge (IEC 61000-4-5)	$\pm 1$ kV for Power Line
Power	
Reverse Polarity Protection	Yes
Input Range	$+10 \sim +48$ VDC
Consumption	0.5 W
Mechanical	
Dimensions (L x W x H)	120 mm x 116 mm x 64 mm
Installation	DIN-Rail or Wall Mounting
Environment	
Operating Temperature	$-25$ to $+75^{\circ}\text{C}$
Storage Temperature	$-40$ to $+85^{\circ}\text{C}$
Humidity	10 to 95% RH, Non-condensing

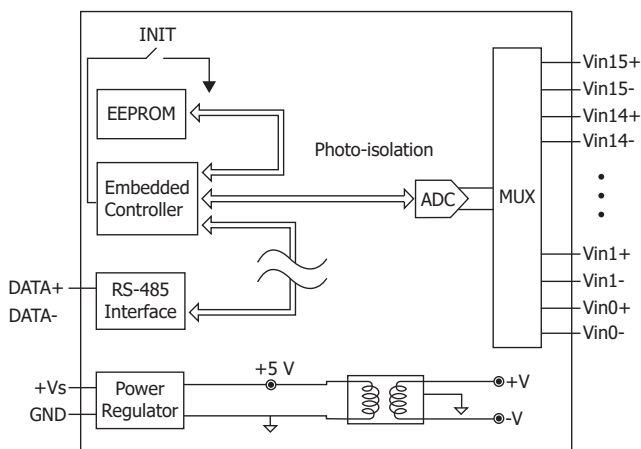
## I/O Specifications

Analog Input		
Channels		16
Wiring		Differential
Sensor Types	Thermocouple	J, K, T, E, R, S, B, N, C
	Voltage	$\pm 15$ mV, $\pm 50$ mV, $\pm 100$ mV, $\pm 500$ mV, $\pm 1$ V, $\pm 2.5$ V
	Current	$\pm 20$ mA, $0 \sim +20$ mA, $+4 \sim +20$ mA (requires an optional external 125 $\Omega$ resistor)
Resolution		16-bit
Accuracy		0.1% of FSR
Sampling Rate		10 Hz (Total)
Input Impedance		$> 400$ k $\Omega$
Common Voltage Protection		25 Vdc
Individual Channel Configuration		-
Overvoltage Protection		120 Vdc
Open Wire Detection (for thermocouple only)		Yes
Temperature Outputs Consistency		-
Stable Temperature Output in the Field		-

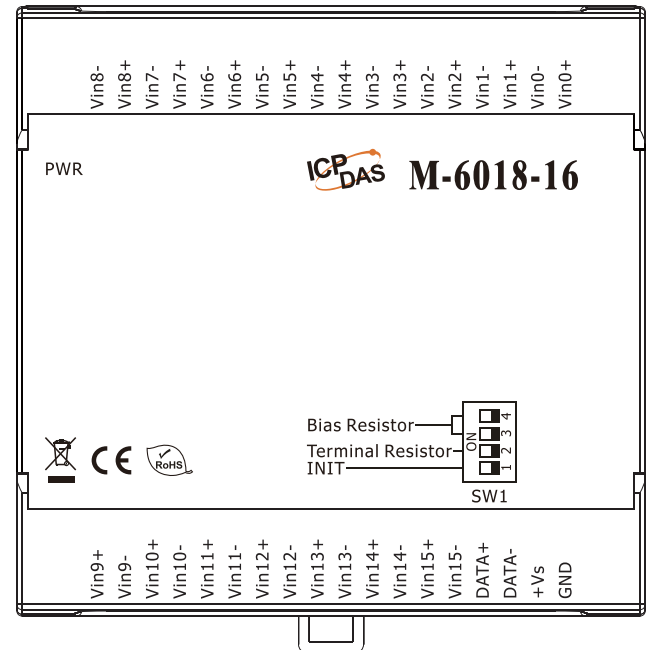
## Thermocouple Type

Type Code	Thermocouple Type	Temperature Range
0E	J	-210 to +760°C
0F	K	-270 to +1372°C
10	T	-270 to +400°C
11	E	-270 to +1000°C
12	R	0 to +1768°C
13	S	0 to +1768°C
14	B	0 to +1820°C
15	N	-270 to +1300°C
16	C	0 to +2320°C

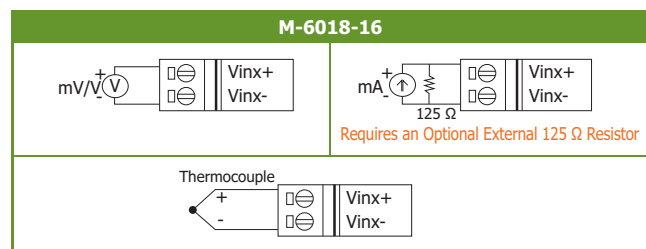
## Internal I/O Structure



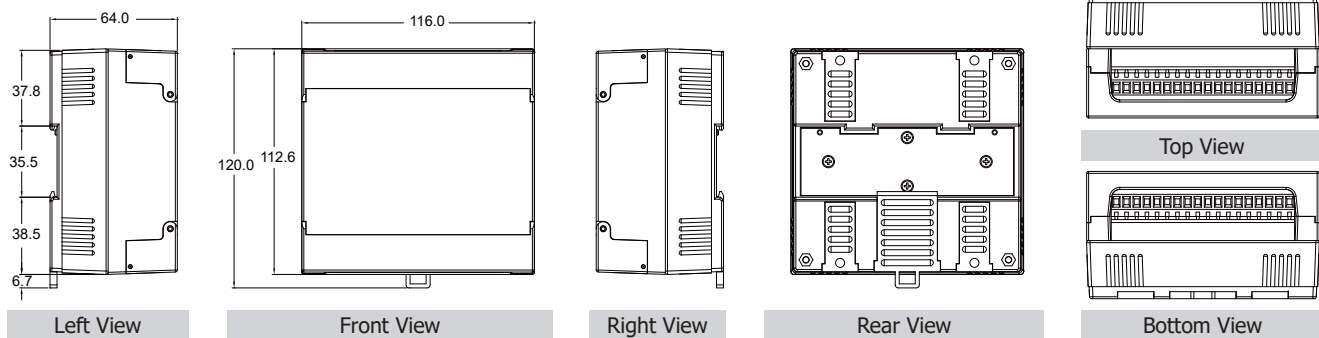
## Pin Assignments



## Wire Connections



## Dimensions (Units: mm)



## Ordering Information

<b>M-6018-16 CR</b>	16-channel Analog Input Module using the DCON and Modbus Protocols (RoHS)
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## 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