



## I-7016(D)

## M-7016(D)

2-channel Strain Gauge Input Module

### Features

- 2-channel Strain Gauge Measurement
- High Resolution: 16-bit
- Excitation Voltage Output: 0 ~ +10 V
- 50 Hz Event Counter (Digital Input)
- High/Low Alarm (Digital Output)
- Linear Mapping Function
- 3000 Vdc Intra-module Isolation
- Dual Watchdog
- Wide Operating Temperature Range: -25 to +75°C



### Introduction

In the industrial environment, there are numerous examples where force needs to be converted into a measurable electrical output. In most cases, a strain gauge or a load cell can be used. But the question is, how do we then deal with these electrical output measurements? In this situation, the I-7016 is definitely the No. 1 choice. Not only can the module process data from a load cell or a strain gauge, it also features linear mapping that can be used to directly convert the resulting data into weight via a user-defined correspondent table. The I-7016 supports full-bridge strain gauges and provides 2 Analog Input channels, 1 excitation voltage output channel, 1 Digital Input channels and 4 Digital Output channels. The module provides a programmable input range ( $\pm 15$  mV,  $\pm 50$  mV,  $\pm 100$  mV,  $\pm 500$  mV,  $\pm 1$  V, and  $\pm 2.5$  V) and each Analog Input channel can be individually configured. Excitation voltage output can be in the range of 0 ~ +10 V, with a 40 mA driving efficiency. Digital Output channels can also be set as high or low alarm outputs. The M-7016 supports both the Modbus RTU and DCON protocols, which can be configured via software, and all hardware specifications are the same as the I-7016.

### System Specifications

Model	I-7016	I-7016D	M-7016	M-7016D
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	DCON		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	-	Yes	-	Yes
Isolation				
Intra-module Isolation, Field-to-Logic	1500 Vdc			
EMS Protection				
ESD (IEC 61000-4-2)	-			
EFT (IEC 61000-4-4)	-			
Surge (IEC 61000-4-5)	-			
Power				
Reverse Polarity Protection	Yes			
Input Range	+10 ~ +30 Vdc			
Consumption	2.4 W	3.0 W	2.4 W	3.0 W
Mechanical				
Dimensions (L x W x H)	123 mm x 72 mm x 35 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			

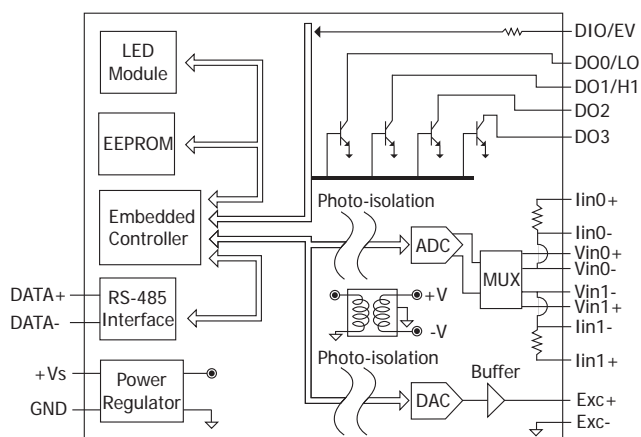
### Applications

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

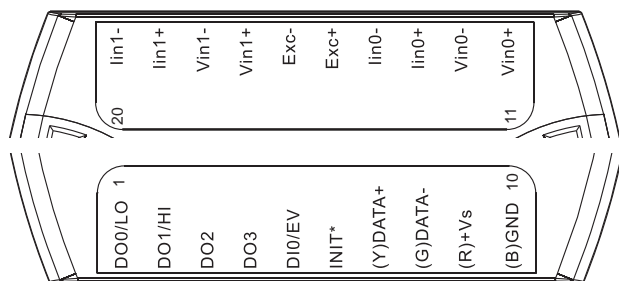
### I/O Specifications

Model	I-7016	I-7016D	M-7016	M-7016D
Strain Gauge Input				
Channels	2			
Wiring	4-wire			
Sensor Types	Full-Bridge			
Resolution	16-bit			
Accuracy	±0.05% of FSR			
Sampling Rate	10 Hz for 1-channel mode or 2 Hz (total) for 2-channel mode			
Input Impedance	20 MΩ			
Individual Channel Configuration	-			
Overvoltage Protection	±5 VDC			
Open Wire Detection	-			
Long Distance Measurement	-			
Excitation Voltage Output				
Channels	1			
Range	0 ~ +10 V			
Max. Load Current	40 mA			
Resolution	16-bit			
Accuracy	±0.05%			
Power-on Value	Yes			
Digital Input				
Channels	1			
Contact	Dry			
Sink/Source (NPN/PNP)	Source			
ON Voltage Level	Close to GND			
OFF Voltage Level	Open			
Counter (50 Hz, 16-bit)	Yes			
Input Impedance	3 kΩ			
Overvoltage Protection	±30 Vdc			
Digital Output				
Channels	4			
Type	Open Collector			
Sink/Source (NPN/PNP)	Sink			
Load Voltage	+3.5 ~ +50 VDC			
Max. Load Current	30 mA/Channel			
Power-on Value	Yes			
Safe Value	Yes			

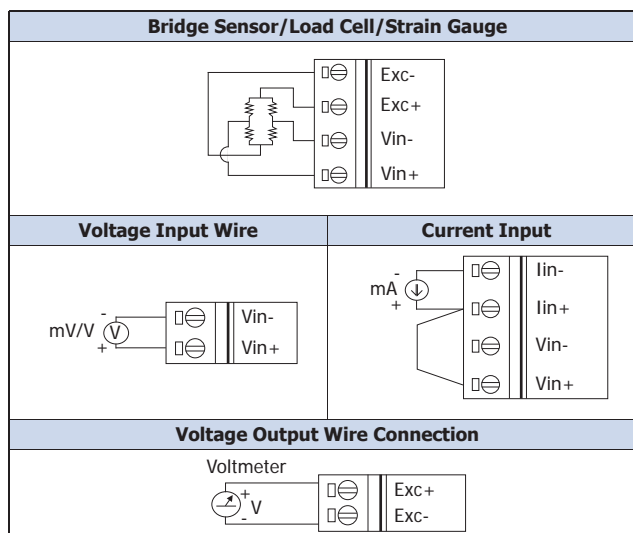
## Internal I/O Structure



## Pin Assignments



## Wire Connections



Digital Input/Counter	Readback as 1	Readback as 0
	Open	Closed to GND
Dry Contact		
Output Type	ON State Readback as 1	OFF State Readback as 0
Resistance Load		
Inductance Load		

## Ordering Information

<b>I-7016 CR</b>	2-channel Strain Gauge Input Module using the DCON Protocol (Blue Cover) (RoHS)
<b>I-7016D CR</b>	I-7016 with 7-segment LED Display (Blue Cover) (RoHS)
<b>I-7016D-G CR</b>	I-7016 with 7-segment LED Display (Gray Cover) (RoHS)
<b>M-7016-G CR</b>	2-channel Strain Gauge Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS)
<b>M-7016D-G CR</b>	M-7016 with 7-segment LED Display (Gray Cover) (RoHS)

## 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
	SG-3000 Series	Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Input Transformers