



**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.

### Applications

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

### I/O Specifications

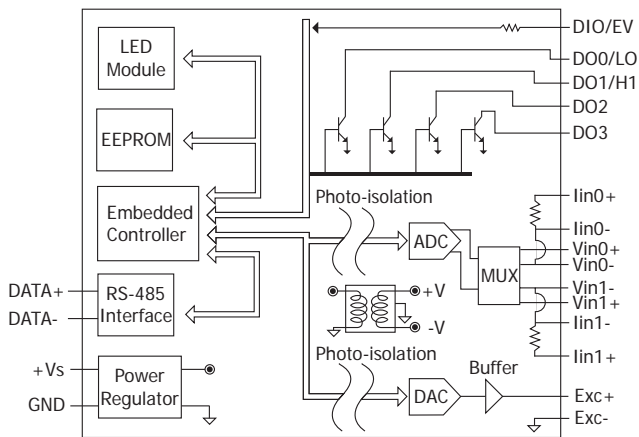
Model	I-7016	I-7016D	M-7016	M-7016D
<b>Strain Gauge Input</b>				
Channels	2			
Wiring	4-wire			
Sensor Types	Full-Bridge			
Resolution	16-bit			
Accuracy	$\pm 0.05\%$ of FSR			
Sampling Rate	2/10 Hz			
Input Impedance	20 M $\Omega$			
Individual Channel Configuration	-			
Overvoltage Protection	$\pm 5$ Vdc			
Open Wire Detection	-			
Long Distance Measurement	-			
<b>Excitation Voltage Output</b>				
Channels	1			
Range	0 ~ +10 V			
Max. Load Current	40 mA			
Resolution	16-bit			
Accuracy	$\pm 0.05\%$			
Power-on Value	Yes			
<b>Digital Input</b>				
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 k $\Omega$			
Overvoltage Protection	$\pm 30$ Vdc			
<b>Digital Output</b>				
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			

### System Specifications

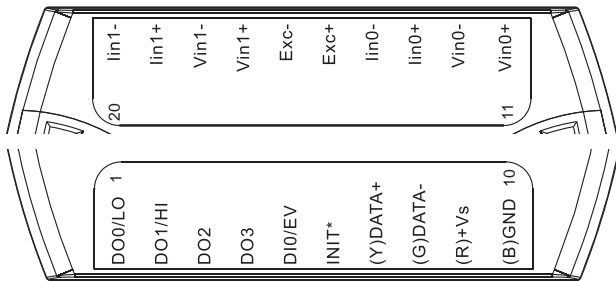
Model	I-7016	I-7016D	M-7016	M-7016D
<b>Communication</b>				
Interface	RS-485			
Bias Resistor	No (Usually supplied by the RS-485 Master. Alternatively, add a tM-SG4 or SG-785.)			
Format	(N, 8, 1) (N, 8, 2) (E, 8, 1) (O, 8, 1)	N, 8, 1		
Baud Rate	1200 to 115200 bps			
Protocol	DCON		Modbus RTU, DCON	
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	-	Yes	-	Yes
<b>Isolation</b>				
Intra-module Isolation, Field-to-Logic	1500 Vdc			
<b>EMS Protection</b>				
ESD (IEC 61000-4-2)	-			
EFT (IEC 61000-4-4)	-			
Surge (IEC 61000-4-5)	-			
<b>Power</b>				
Reverse Polarity Protection	Yes			
Input Range	+10 ~ +30 Vdc			
Consumption	2.4 W	3.0 W	2.4 W	3.0 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			

I-7016/I-7016D/M-7016/M-7016D

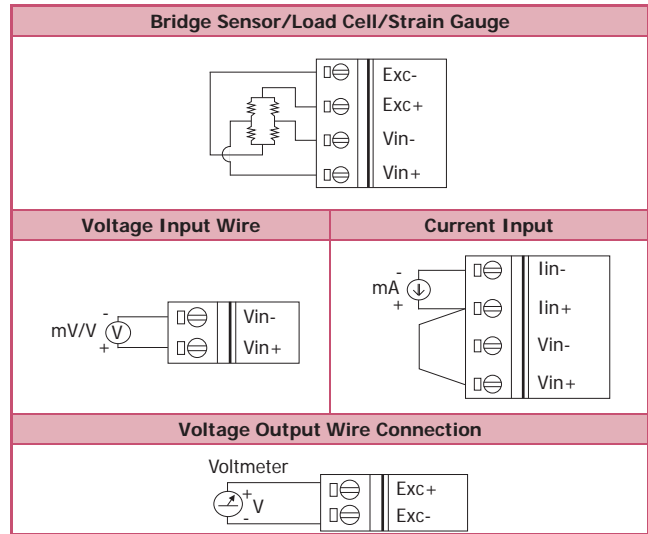
### Internal I/O Structure



### 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

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

I-7016/I-7016D/M-7016/M-7016D