

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, 2 Digital Input channels and 2 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)	N, 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			

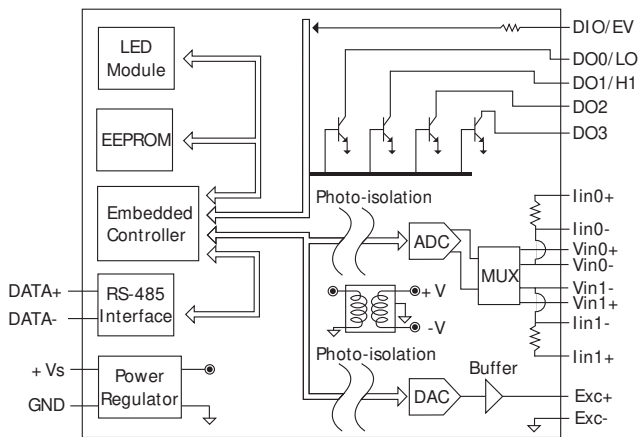
## Applications

- 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	2/10 Hz			
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

Bridge Sensor/ Load Cell/ Strain Gauge		
Voltage Input Wire	Current Input	
Voltage Output Wire Connection		
Digital Input/ Counter	Readback as 1	Readback as 0
Dry Contact	Open 	Closed to GND 
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