



## Introduction

The M-7000 series is a family of network data acquisition and control modules that support Modbus RTU and DCON protocols. With the Modbus RTU protocol, it can easily communicate with most popular SCADA/ HMI software and PLC. It has the same form factor as the I-7000 series.

## Features

- 3000 VDC isolation (inter-module)
- High voltage overload protection: M-7017R, M-7018R, M-7019R, M-7055
- High digital input voltage, 50 Vdc: M-7055
- Short circuit protection for digital output: M-7055
- Open thermocouple detection: M-7018R, M-7019R
- Open RTD detection: M-7015, M-7033
- Individual channel configurable: M-7015, M-7019R

# M-7000

## Analog Input Modules Selection Guide

### SERIES

#### Analog Input Modules Selection Guide

Module		M-7005	M-7015	M-7033 M-7033D
Analog Input	Resolution	16 bit	16 bit	16 bit
	Input channel	8 diff.	6 diff.	3 diff.
	Sampling rate	8Hz	12Hz	10Hz
	Voltage input	–	–	–
	Current input	–	–	–
	Sensor input	Thermistor (2 wire)	Pt/Ni/Cu RTD (2/3 wire)	Pt Ni-RTD (2/3/4 wire)
	4 1/2 digit LED Display	–	–	Yes for M-7033D
	Isolated loop power	–	–	–
	Input Linear scaling	–	–	–
	Isolation Voltage	3000V	3000V	3000V
Digital Input & Digital Output	Digital input channels	–	–	–
	Digital output channels	6	–	–
	Event counter	–	–	–
	High/Low Alarm	Yes	–	–
Individual Channel Configurable		Yes	Yes	–
Dual Watchdog Timer		Yes	Yes	Yes
Frame Ground		Yes	Yes	–
Availability		Call	Yes	Yes

### Analog Input Modules Selection Guide

Module		M-7016/ M-7016D	M-7017	M-7017R
Analog Input	Resolution	16 bit	16 bit	16/12 bit
	Input channel	2 diff.	8 diff.	8 diff.
	Sampling rate	2/10Hz	10Hz (total)	10/60Hz (total)
	Fast Mode (12bit)	—	—	Yes
	Voltage input	+/-15mV +/-50mV +/-100mV +/-500mV +/-1V +/-2.5V	+/-150mV +/-500mV +/-1V +/-5V +/-10V	+/-150mV +/-500mV +/-1V +/-5V +/-10V
	Current input	+/-20mA	+/-20mA	+/-20mA
	Sensor input	4-wire Strain gauge Input	—	—
	4 1/2 digit LED Display	Yes for M-7016D	—	—
	Input Linear scaling	Yes	—	—
	Isolation Voltage	3000V	3000V	3000V
Digital Input & Digital Output	Digital input channels	1	—	—
	Digital output channels	4	—	—
	Event counter	Yes	—	—
	High/Low Alarm	Yes	—	—
Dual Watchdog Timer		Yes	Yes	Yes
Over voltage protection		—	+/-35V	240Vrms
Frame Ground		—	Yes	Yes
Availability		Call	Yes	Yes

# M-7000

## Analog Input Modules Selection Guide

### SERIES

**Analog Input Modules Selection Guide**

Module		M-7018	M-7018R	M-7019R
Analog Input	Resolution	16 bit	16 bit	16 bit
	Input channel	8 diff.	8 diff.	8 diff.
	Sampling rate	10Hz (total)	10Hz (total)	8Hz (total)
	Voltage input	+/-15mV +/-50mV +/-100mV +/-500mV +/-1V +/-2.5V	+/-15mV +/-50mV +/-100mV +/-500mV +/-1V +/-2.5V	+/-15mV +/-50mV +/-100mV +/-150mV +/-500mV +/-1V +/-2.5V +/-5V +/-10V
	Current input	+/-20mA	+/-20mA	+/-20mA
	Sensor input	J.K.T.E.R.S.B N.C. thermocouple	J.K.T.E.R.S.B N.C.L.M. thermocouple	J.K.T.E.R.S.B N.C.L.M.L2 (DIN43710) thermocouple
	4 1/2 digit LED Display	—	—	—
	Isolation Voltage	3000V	3000V	3000V
	Break Line Detection	—	Yes	Yes
Individual Channel Configurable		—	—	Yes
Dual Watchdog Timer		Yes	Yes	Yes
Over voltage protection		+/-35V	240Vrms	240Vrms
Frame Ground		Yes	Yes	Yes
Availability		Yes	Yes	Yes

**Analog Output Module Selection Guide**

Module		M-7022	M-7024
Analog Output	Resolution	12 bit	14 bit
	Output Channels	2(*1)	4
	Voltage Output	0-10V	+/-10V, 0-10V +/-5V, 0-5V
	Current Output	0-20mA 4-20mA	0-20mA 4-20mA
Safe Value (When Host Fail or communication fail)		Yes	Yes
Power-on Preset Value		Yes	Yes
Dual Watchdog Timer		Yes	Yes
Availability		Yes	Yes
* 1: channel to channel isolation			

# M-7000

## Digital I/O Modules Selection Guide

### SERIES

**Digital I/O, Relay and Counter Selection Guide**

Module		M-7041/ M-7041D	M-7045/ M-7045D	M-7050/ M-7050D	M-7051/ M-7051D
Digital input and Digital output	Digital input channels	14 Isolation (3750V)	—	7	16 Isolation (3750V)
	Digital output channels (open collector)	—	16 Isolation (3750V)	8	—
	Alarm Setting	—	—	—	—
Counter	Channels	14	—	7	16
	Input frequency	100Hz	—	100Hz	100Hz
LED Display		Yes for M-7041D	Yes for M-7045D	Yes for M-7050D	Yes for M-7051D
Safe Value (When Host Fail or communication fail)		—	Yes	Yes	—
Power-on Preset Value		—	Yes	Yes	—
Dual Watchdog Timer		Yes	Yes	Yes	Yes
Availability		Yes	Yes	Yes	Yes

**Digital I/O, Relay and Counter Selection Guide**

Module		M-7052/ M-7052D	M-7053/ M-7053D	M-7055/ M-7055D
Digital input and Digital output	Digital input channels	8 Isolation (5000V)	16	8 Isolation (3750V)
	Digital output channels (open collector)	—	—	8 Isolation (3750V)
	Alarm Setting	—	—	—
Counter	Channels	8	16	8
	Input frequency	100Hz	100Hz	100Hz
LED Display		Yes for M-7052D	Yes for M-7053D	Yes for M-7055D
Safe Value (When Host Fail or communication fail)		—	—	Yes
Power-on Preset Value		—	—	Yes
Dual Watchdog Timer		Yes	Yes	Yes
Availability		Yes	Yes	Yes

#### Digital I/O, Relay and Counter Selection Guide

Module		M-7060/ M-7060D	M-7067/ M-7067D	M-7080/ M-7080D
Digital input and Digital output	Digital input channels	4 Isolation (3750V)	—	—
	Digital output channels	4 Channel Relay Form A x 2 Form C x 2	7 Channel Relay Form A	2 Channel
	Alarm Setting	—	—	—
Counter	Channels	4	—	2
	Input frequency	100Hz	—	100 KHz
LED Display		Yes for M-7060D	Yes for M-7067D	Yes for M-7080D
Safe Value (When Host Fail or communication fail)		Yes	Yes	Yes
Power-on Preset Value		Yes	Yes	Yes
Dual Watchdog Timer		Yes	Yes	Yes
Availability		Yes	Yes	Yes

# M-7000 Analog I/O Modules

## SERIES

M-7005



*Available soon*

### M-7005:

#### 8-channel Thermistor Input and 6-channel Digital Output Module

- Analog Input channels: 8
- Input Type: Precon ST-A3, Type u Fenwell, YSI, User-defined
- Accuracy:  $\pm 0.1\%$
- Sampling Rate: 8 samples/second (Total)
- Common Mode Rejection: Typical 86dB
- Voltage Input Impedance:  $>1\text{M Ohms}$
- Alarm Output: 6 Open Collector to 30V, 100mA, load (per channel)
- Isolation Voltage: 3000VDC
- Individual Channel Configurable
- Wire Opening Detection
- Power consumption: 1.1W

M-7015



### M-7015:

#### 6-channel 3 wire RTD Input Module

- Analog input types: Pt, Ni or Cu RTD
- Sampling rate: 12 samples/sec
- Accuracy: 0.05%
- Input Connection: 2 or 3 wires
- Individual channel configurable
- Wire Opening Detection

M-7016

M-7016D



*Available soon*

### M-7016/7016D:

#### Strain Gauge Input Module

- Resolution: 16 bit
- Channels: 2 channel
- Input type: mV, V and mA
- Input range:  $\pm 15\text{mV}$ ,  $\pm 50\text{mV}$ ,  $\pm 100\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 2.5\text{V}$ ,  $\pm 20\text{mA}$
- Isolation: 3000V
- Sampling rate: 10Hz for 1 channel mode  
2Hz for 2 channel mode

M-7017



### M-7017:

#### 8-channel Analog Input Module

- Input Channels: 6 differential and 2 single-ended or 8 differential (jumper selectable)
- Input Types: mV, V, mA  
(requires optional external 125 ohms resistor)
- Input Ranges:  $\pm 150\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 5\text{V}$ ,  $\pm 10\text{V}$ ,  $\pm 20\text{mA}$
- Sampling Rate: 10 samples/sec total



# M-7000 Analog I/O Modules

## SERIES

**M-7017R**



### **M-7017R:**

#### **8-channel Analog Input Module**

- Input Channels: 8 differential
- Over Voltage Protection:  $\pm 240\text{VRMS}$
- Sampling Rate: 10/60 samples/sec total
- Other Spec. is the same as M-7017

### **M-7018:**

#### **8-channel Thermocouple Input Module**

- Input Channels: 6 differential and 2 single-ended or 8 differential (jumper selectable)
- Input Types: mV, V, mA (requires optional external 125 ohms resistor), Thermocouple
- Input Ranges:  $\pm 15\text{mV}$ ,  $\pm 50\text{mV}$ ,  $\pm 100\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 2.5\text{V}$ ,  $\pm 20\text{mA}$
- Thermocouple Types: J, K, T, E, R, S, B, N, C
- Sampling Rate: 10 samples/sec total

**M-7018**



### **M-7018R:**

#### **8-channel Thermocouple Input Module**

- Input Channels: 8 differential
- Over Voltage Protection:  $\pm 240\text{VRMS}$
- Other Spec. is the same as M-7018

**M-7018R**



### **M-7019R:**

#### **8-channel Universal Analog Input Module**

- Input Channels: 8 differential
- Input Types: mV, V, mA (jumper selectable), Thermocouple
- Input Ranges:  $\pm 15\text{mV}$ ,  $\pm 50\text{mV}$ ,  $\pm 100\text{mV}$ ,  $\pm 150\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 2.5\text{V}$ ,  $\pm 5\text{V}$ ,  $\pm 10\text{V}$ ,  $\pm 20\text{mA}$
- Thermocouple Types: J, K, T, E, R, S, B, N, C, L, M, L2
- Sampling Rate: 8 samples/sec total
- Accuracy:  $\pm 0.15\%$
- Over Voltage Protection:  $\pm 240\text{VRMS}$
- Isolation Voltage: 3000 VDC

**M-7019R**



# M-7000 Analog I/O Modules

## SERIES

M-7022

**M-7022:****2-channel Analog Output Module**

- Resolution: 12 bit
- Analog output channel: 2
- Current output: 0-20mA, 4-20mA
- Voltage output: 0-10V
- Channel to channel isolated
- Programmable output slew rate  
0.0625 to 512 V/sec  
0.125 to 1024 mA/sec

M-7024

**M-7024:****4-channel Analog Output Module**

- Resolution: 14 bit
- Current output 0-20mA, 4-20mA
- Voltage output: +/-10V, 0-10V, +/-5V, 0-5V
- Programmable output slew rate  
0.0625 to 1024V/sec  
0.125 to 2048 mA/sec

M-7033

M-7033D

**M-7033:****3-channel RTD Input Module****M-7033D:****M-7033 with LED Display**

- Sampling rate: 15Hz (Total)
- Analog input type: Pt, Ni RTD
- Input Channel: 3 diff
- Input Connection: 2,3 or 4 wire
- Pt 100 input range:  
+/-100°C, 0~100°C, 0~200°C, 0~600°C
- Ni 120 input range:  
-80~100°C, 0~100°C

# M-7000 Digital I/O Modules

## SERIES

**M-7041**



**M-7041D**



### **M-7041: Isolated Digital Input Module**

#### **M-7041D: M-7041 with LED Display**

- Input: 14 single-ended
- ON Voltage Level: 4V to 30V.
- OFF Voltage Level: 0 to 1V.
- Isolation voltage: 3750V rms
- Input resistance: 3K Ohms, 1/4W

**M-7045**



**M-7045D**



### **M-7045: 16 channel Isolated Digital Output Module**

#### **M-7045D: M-7045 with LED Display**

- Channels : 16
- External Voltage : 10 to 40V max.
- Output current : 650mA per channel
- Isolation Voltage : 3750Vrms
- Direct drive power relay module
- Power consumption: 0.5W
- Short circuit protection

**M-7050**



**M-7050D**



### **M-7050: Non-isolated Digital I/O Module**

#### **M-7050D: M-7050 with LED Display**

- Digital input channels: 7
- Level:
  - OFF Voltage Level: +1V max.
  - ON Voltage Level: +3.5 ~ +30V
- Digital output channels: 8
- Open collector to 30V, 30mA max. load
- Power dissipation: 300mW

**M-7051**



**M-7051D**



### **M-7051: Isolated Digital Input Module**

#### **M-7051D: M-7051 with LED Display**

- Digital Input Channels: 16
- Isolation voltage: 3750 Vrms
- Digital input status:
  - Dry contact:
    - OFF Voltage Level: open
    - ON Voltage Level: close to GND
  - Wet contact:
    - OFF Voltage Level: +3V max
    - ON Voltage Level: +10V to +50V
- Effective distance for dry contact: 500m max

**M-7052**



**M-7052D**



### **M-7052: Isolated Digital Input Module**

#### **M-7052D: M-7052 with LED Display**

- Input: 6 differential and 2 single-ended
- ON Voltage Level: 3.5V to 30V.
- OFF Voltage Level: 0 to 1V.
- Isolation voltage: 5000V rms
- Input resistance: 3K Ohms, 1/4W

# M-7000 Digital I/O Modules

## SERIES

**M-7053****M-7053D****M-7053: Non-isolated Digital Input Module****M-7053D: M-7053 with Display**

- Input: 16 single-ended  
ON Voltage Level: 4V to 30V.  
OFF Voltage Level: 0 to 2V.

**M-7055****M-7055D****M-7055: Isolated Digital Input Module****M-7055D: M-7055 LED Display**

- Digital Input Channels: 8
- Digital Input status  
Dry contact: OFF Voltage Level: open  
ON Voltage Level: close to GND  
Wet contact: OFF Voltage Level: +3V max  
ON Voltage Level: +10V to +50V  
Effective distance for dry contact: 500m max
- Digital Output channels: 8
- Open collector to 40V, 650mA max. load  
( Short Circuit Protection )
- Optical Isolation: 3750VDC

**M-7060****M-7060D****M-7060: Relay Output & Isolated Digital Input Module****M-7060D: M-7060 with LED Display**

- Input: 4 single-ended  
ON Voltage Level: 4V to 30V.  
OFF Voltage Level: 0 to 1V.
- Isolation voltage: 3750V rms
- Input resistance: 3K Ohms, 1/4W
- Output: 4-channel relay

**M-7067****M-7067D****M-7067: Relay Output Module****M-7067D: M-7067 with Display**

- Relay output: 7 Form A  
Contact rating: AC: 125V @0.5A  
DC: 24V @2A

## Counter Modules

**M-7080****M-7080D****M-7080: Counter/Frequency Input Module****M-7080D: M-7080 with LED Display**

- Counter input: 2 independent 32 bit counter
- Frequency input: 100K Hz max
- Input: 3750V isolated or non-isolated
- Non-isolated programmable threshold value  
Programmable digital noise filter
- LED indicator: 5 digit readout (1-7080D)