

## Features

- I-7052(D)/M-7052(D)
  - Differential Digital Inputs
  - Sink- or Source-type Input
  - 4 kV ESD Protection
  - 5000 Vrms Isolation Voltage
- I-7053(D)\_FG/M-7053(D)\_FG
  - 16 Source-type Digital Inputs
  - Long Effective Distance
  - Dry Contact Input
  - Non-isolated for all Channels
- All Channels Can Be Used As 16-bit Counters
- Dual Watchdog
- Wide Operating Temperature Range: -25 to +75°C



## Introduction

The I-7052 offers 6 fully independent channels and 2 common ground channels for digital input. The differential inputs feature channel-to-channel Photocouple isolation. In addition, you can choose either sink- or source-type input via wire connections. All channels are able to be used as 16-bit counters. The I-7052D has 8 LED indicators for DI channel status monitoring. 4 kV ESD protection and 5000 Vrms intra-module isolation are standard. The M-7052 has the same

## System Specifications

| Model                                  | I-7052   | M-7052           | I-7053-FG                                | M-7053           |
|--|--|------------------|--|------------------|
|  | I-7052D  | M-7052D          | I-7053D-FG                               | M-7053D          |
| <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)  |                  |  |                  |
| Baud Rate                              | 1200 to 115200 bps   |                  |  |                  |
| Protocol                               | DCON   | Modbus RTU, DCON | 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                     | Yes, 8 LEDs as Digital Input Indicators  |                  | Yes, 16 LEDs as Digital Input Indicators |                  |
| 7-segment LED Display                  | -  |                  |  |                  |
| <b>Isolation</b>                       |  |                  |  |                  |
| Intra-module Isolation, Field-to-Logic | 5000 Vrms  |                  | -  |                  |
| <b>EMS Protection</b>                  |  |                  |  |                  |
| ESD (IEC 61000-4-2)                    | 4 kV Contact for each Terminal   |                  | -  |                  |
|  | 8 kV Air for Random Point  |                  | -  |                  |
| EFT (IEC 61000-4-4)                    | ±4 kV for Power Line   |                  | -  |                  |
| Surge (IEC 61000-4-5)                  | -  |                  |  |                  |
| <b>Power</b>                           |  |                  |  |                  |
| Reverse Polarity Protection            | Yes  |                  |  |                  |
| Input Range                            | +10 ~ +30 Vdc  |                  |  |                  |
| Consumption                            | 0.2 W  | 0.2 W            | 0.7 W                                    | 0.7 W            |
|  | 0.6 W  | 0.6 W            | 0.9 W                                    | 0.9 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   |                  |  |                  |

hardware specifications as the I-7052, but provides additional support for the Modbus RTU protocol as well as the DCON protocol.

The I-7053-FG features a long effective distance measurement for dry contact digital input of up to 500 meters. The I-7053\_FG supports source-type input. All 16 channels are also able to be used as 16-bit counters, each of which are non-isolated. The I-7053D-FG has 16 LED indicators for channel status monitoring. The M-7053 has the same hardware specifications as the I-7053-FG, but provides additional support for the Modbus RTU protocol as well as the DCON protocol.

## Applications

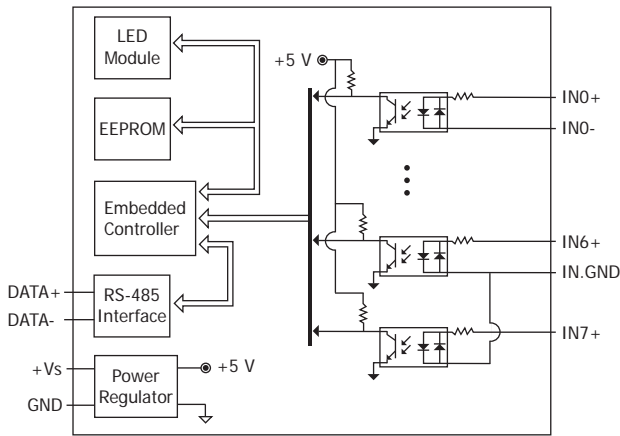
Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote Diagnosis, Testing Equipment.

## I/O Specifications

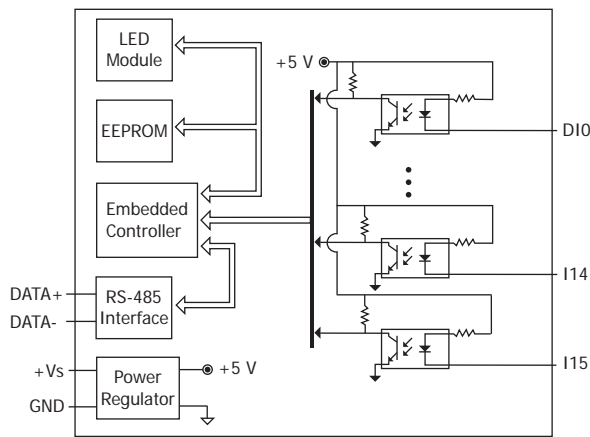
| Model                        | I-7052                             | M-7052         | I-7053-FG  | M-7053       |
|------------------------------|------------------------------------|----------------|------------|--------------|
|                              | I-7052D                            | M-7052D        | I-7053D-FG | M-7053D      |
| <b>Digital Input/Counter</b> |                                    |                |            |              |
| Channels                     | 8                                  |                | 16         |              |
| Type                         | Dry Contact                        | -              |            | Source       |
|                              | Wet Contact                        | Sink/Source    |            | -            |
| Wet Contact                  | ON Voltage Level                   | +4 ~ 30 Vdc    |            | -            |
|                              | OFF Voltage Level                  | +1 Vdc Max.    |            | -            |
| Dry Contact                  | ON Voltage Level                   | -              |            | Open         |
|                              | OFF Voltage Level                  | -              |            | Close to GND |
|                              | Effective Distance for Dry Contact | -              |            | 500 m Max.   |
| Counters                     | Max. Count                         | 65535 (16-bit) |            |              |
|                              | Max. Input Frequency               | 100 Hz         |            |              |
|                              | Min. Pulse Width                   | 5 ms           |            |              |
| Input Impedance              | 3 kΩ                               |                | -          |              |
| Channel-to-Channel Isolation | Yes, ±2 kV for differential only.  |                | -          |              |
| Overvoltage Protection       | ±35 Vdc                            |                | -          |              |

## Internal I/O Structure

I-7052(D)/M-7052(D)



I-7053(D)-FG/M-7053(D)



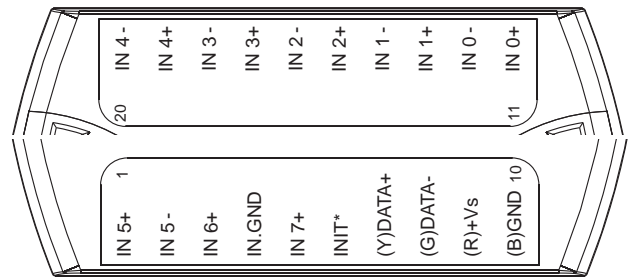
## Wire Connections

| I-7052(D)/M-7052(D)                       |                           |                            |
|---|---------------------------|----------------------------|
| Digital Input/Counter                     | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
| Channel 0 to 5<br>Wet Contact<br>(Sink)   | +4 ~ +30 VDC<br>          | Open or +1 VDC Max.<br>    |
| Channel 0 to 5<br>Wet Contact<br>(Source) | +4 ~ +30 VDC<br>          | Open or +1 VDC Max.<br>    |
| Channel 6 to 7<br>Wet Contact<br>(Sink)   | +4 ~ +30 VDC<br>          | Open or +1 VDC Max.<br>    |

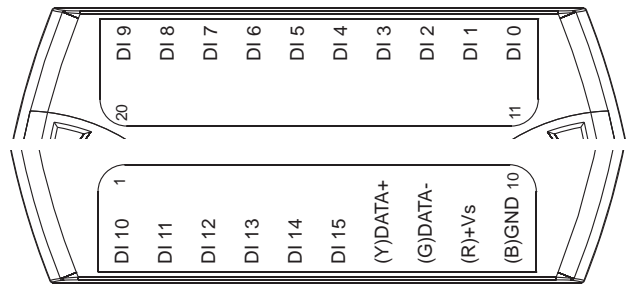
| I-7053(D)-FG/M-7053(D) |                           |                            |
|------------------------|---------------------------|----------------------------|
| Digital Input/Counter  | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
| Dry Contact            | OPEN or <4 VDC<br>        | +3.5 ~ +30 VDC<br>         |

## Pin Assignments

I-7052(D)/M-7052(D)



I-7053(D)-FG/M-7053(D)



## Ordering Information

|                        |  |
|------------------------|--|
| <b>I-7052 CR</b>       | 8-channel Isolated Digital Input Module using the DCON Protocols (Blue Cover) (RoHS)                 |
| <b>I-7052D CR</b>      | I-7052 with LED Display (Blue Cover) (RoHS)  |
| <b>I-7052D-G CR</b>    | I-7052 with LED Display (Gray Cover) (RoHS)  |
| <b>M-7052-G CR</b>     | 8-channel Isolated Digital Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS)      |
| <b>M-7052D-G CR</b>    | M-7052 with LED Display (Gray Cover) (RoHS)  |
| <b>I-7053-FG CR</b>    | 16-channel Non-isolated Digital Input Module using the DCON Protocols (Blue Cover) (RoHS)            |
| <b>I-7053-FG-G CR</b>  | 16-channel Non-isolated Digital Input Module using the DCON Protocols (Gray Cover) (RoHS)            |
| <b>I-7053D-FG CR</b>   | I-7053_FG with LED Display (Blue Cover) (RoHS)   |
| <b>I-7053D-FG-G CR</b> | I-7053_FG with LED Display (Gray Cover) (RoHS)   |
| <b>M-7053-G CR</b>     | 16-channel Non-isolated Digital Input Module using the DCON and Modbus Protocols (Gray Cover) (RoHS) |
| <b>M-7053D-G CR</b>    | M-7053 with 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 (RoHS)                               |
|  | SG-3000 Series | Signal Conditioning Modules for Thermocouple, RTD, DC Voltage, DC Current and Power Input Transformers |