

# **FnIO M – Series :**

## ***M12DF***

***M12DF(16 Channels, Universal Input Terminal, 24Vdc)***

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History

REV.	PAGES	REMARKS	DATE	Editor
-		Preliminary	2018/6/18	BS HA
1.00			2018/11/14	YM KIM
1.01		Image, Torque, Hotswap Function	2020/04/21	CW SEO
1.02		Vibration specification, Product certification changed	2020/04/27	CW SEO
1.03	10~13	Added ATEX certificate	2020/05/07	CW SEO
1.04	6	Input specification changed	2020/07/01	BS HA
1.05		Remove Description pages of Hot Swap Function, Use in Hazardous Environments and Caution(Before using the unit)	2020/12/08	SJ LIM
1.06	5	Power dissipation changed	2021/04/13	BS HA
1.07	4	Environment Specification Update	2021/11/16	EC KIM
1.08	4	Certificate Update and Field Power dissipation changed	2023/06/02	CW SEO
1.09	5	Input specification changed	2024/09/26	CW SEO

## 1. ENVIRONMENT SPECIFICATION

Environmental specification	
Operating Temperature	-25℃~60℃
UL Temperature	-25℃~60℃
Storage Temperature	-40℃~85℃
Relative Humidity	5% ~ 90% non-condensing
Mounting	DIN rail
General specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	IEC 60068-2-6, 4g
Industrial Emissions	EN 61000-6-4/A11 : 2011
Industrial Immunity	EN 61000-6-2 : 2019
Installation Position	Vertical and horizontal installation is available.
Product Certifications	UL, ATEX, CE, UKCA, ABS, BV, CCS, DNV, KR, LR

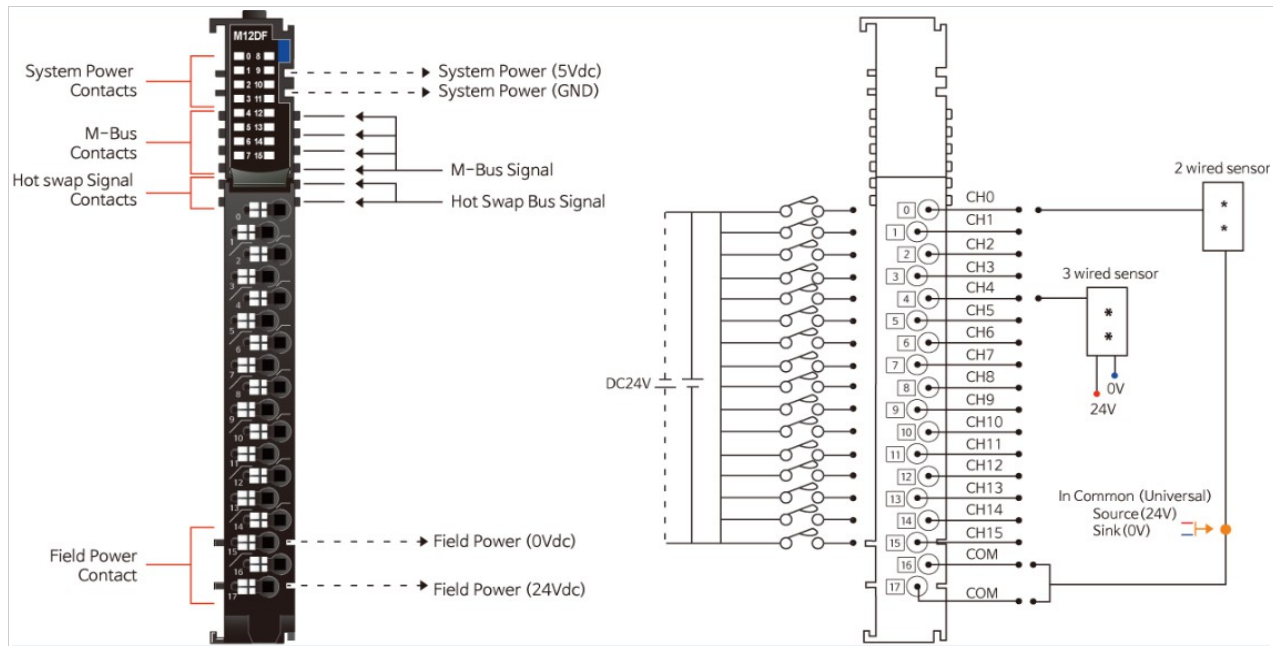
## 2. M12DF (16 Channels Universal Input Terminal)

### 2.1. M12DF Specification

Items	Specification
<b>Input Specification</b>	
Inputs per module	16 channels Universal Digital Type
Indicators	16 Green input state
ON-state Voltage	24Vdc nominal, 15~28.8Vdc@25°C Max. 26.4Vdc@60°C
OFF-state voltage	11Vdc @ 25°C
ON-state current	4mA @ 24Vdc 4.9mA @ 28.8Vdc
Input Signal Delay	OFF to ON : 0.5ms Max ON to OFF : 0.5ms Max
Nominal Input Impedance	5.6Kohm typical
COMMON Type	16 channels / 2 COM (Universal Common)
<b>General specification</b>	
Power dissipation	40mA maximum @ 5.0Vdc
Isolation	I/O to Logic : Photocoupler isolation
UL Field Power	Supply voltage : 24Vdc nominal, Class 2
Field Power	Supply voltage : 24Vdc nominal Voltage range : 15~28.8Vdc Power dissipation: 0mA @ 24Vdc
Single Wire	0.205mm - 1.3mm (24-16 AWG)
Torque	0.8Nm(7 lb-in)
Weight	72g
Module Size	12mm x 110mm x 75mm
Hot Swap	Possible
<b>Environment Condition</b>	<b>Refer to '1. Environment Specification'</b>

\* Class 2, adjacent to voltage rating (30Vmax)

## 2.2. M12DF Wiring Diagram



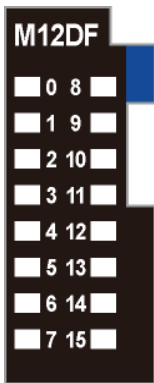
Pin No.	Signal Description
0	Input Channel 0
1	Input Channel 1
2	Input Channel 2
3	Input Channel 3
4	Input Channel 4
5	Input Channel 5
6	Input Channel 6
7	Input Channel 7
8	Input Channel 8
9	Input Channel 9
10	Input Channel 10
11	Input Channel 11
12	Input Channel 12
13	Input Channel 13
14	Input Channel 14
15	Input Channel 15
16	Common(Sink 0V / Source 24V)
17	Common(Sink 0V / Source 24V)

Series No	Through Air	Over Surface	CTI
RTB18C	1.5mm	1.5mm	175≤CTI≤400

Spacings : The following minimum spacing in inches (millimeters) shall be maintained between uninsulated live parts of opposite polarity; and between an uninsulated live part and a grounded part including any mounting surface or exposed metal part.

2.3. M12DF LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green
4	INPUT Channel 4	Green
5	INPUT Channel 5	Green
6	INPUT Channel 6	Green
7	INPUT Channel 7	Green
8	INPUT Channel 8	Green
9	INPUT Channel 9	Green
10	INPUT Channel 10	Green
11	INPUT Channel 11	Green
12	INPUT Channel 12	Green
13	INPUT Channel 13	Green
14	INPUT Channel 14	Green
15	INPUT Channel 15	Green

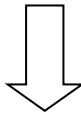
2.3.2. Channel Status LED

Status	LED	To indicate
Not Signal	Off	Normal Operation
On Signal	Green	Normal Operation

2.4. Mapping data into the image table

● Input Module Data

D7	D6	D5	D4	D3	D2	D1	D0
D15	D14	D13	D12	D11	D10	D9	D8



● Input Image Value

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8

2.5. Parameter Data

- Valid Parameter length: 2 Bytes
- Parameter Data

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Input Filter value : 0 ~ 10 (unit : ms)							
Byte1	Reserved							