# FnIO M – Series :

# *M1428*

***M1428(8 Channels, Source Input / 8 channels Source Output with Diagnostic, 24Vdc)***

Date: 2019.09.23

# Table of Contents

## History

| REV. | PAGES | REMARKS | DATE | Editor |
|---|---|---|---|---|
| Preliminary | | Preliminary | Sept. 23, 2019 | BS, HA |
| 1.01 | | Image, UL Spec, Torque, Hotswap Function | 2020/04/21 | CW SEO |
| 1.02 | | Vibration specification, Product certification changed | 2020/04/27 | CW SEO |
| 1.03 | 10~14 | Added ATEX certificate | 2020/05/07 | CW SEO |
| 1.04 | 7 | Delete LED Off state | 2020/0527 | CW SEO |
| 1.05 | | Input specification changed | 2020/07/09 | BS HA |
| 1.06 | | Remove Description pages of Hot Swap Function, Use in Hazardous Envirnments and Caution(Before using the unit) | 2020/12/07 | SJ LIM |

# 1. ENVIRONMENT SPECIFICATION

| Environmental specification | |
|---|---|
| Operating Temperature | -25℃~60℃ |
| UL Temperature | -20℃~60℃ |
| Storage Temperature | -40℃~85℃ |
| Relative Humidity | 5% ~ 90% non-condensing |
| Mounting | DIN rail |
| | |
| **General specification** | |
| Shock Operating | IEC 60068-2-27 |
| Vibration Resistance | Based on IEC 60068-2-6<br>DNVGL-CG-0039 : Vibration Class B, 4g |
| Industrial Emissions | EN 61000-6-4/A11 : 2011 |
| Industrial Immunity | EN 61000-6-2 : 2005 |
| Installation Position | Vertical and horizontal installation is available. |
| Product Certifications | CE, UL, FCC, DNV, ATEX |

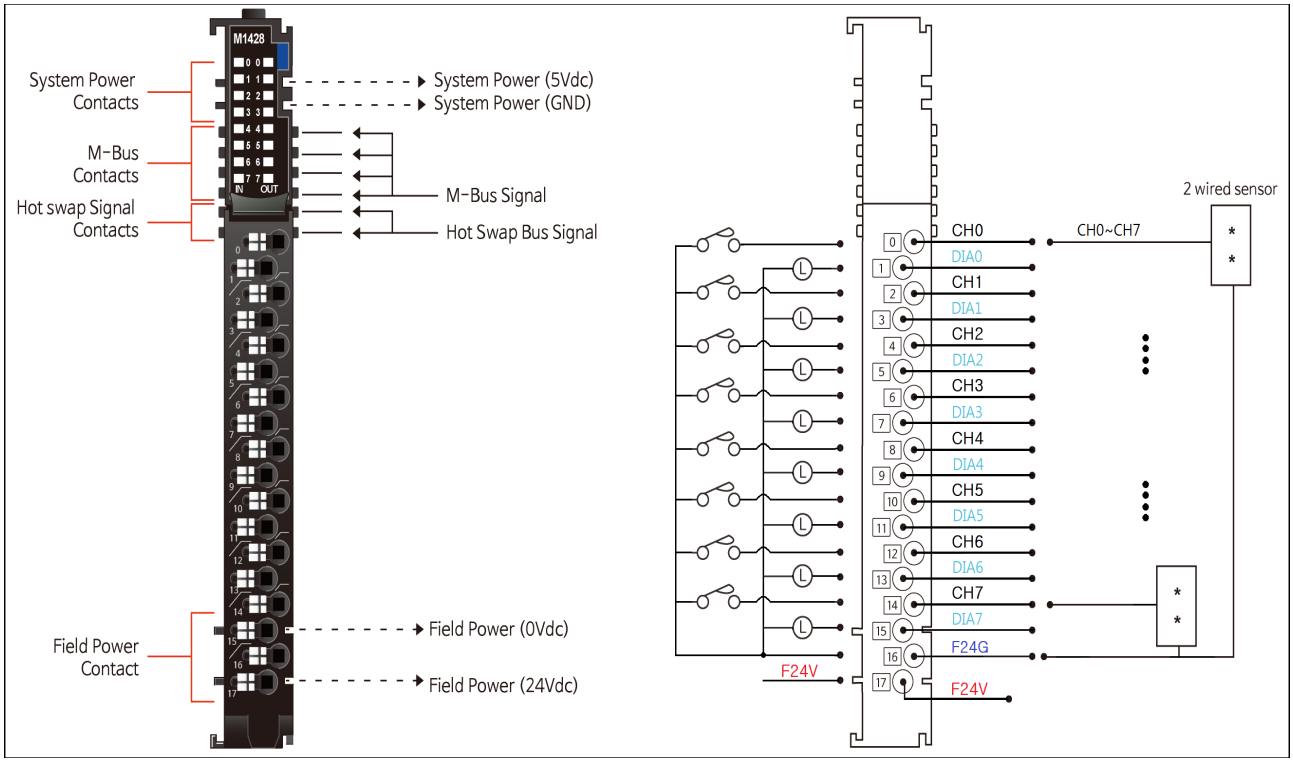
# 2. M1428 (8 Source Input / 8 Sink Output with Diagnostic, 24Vdc)

## 2.1. M1428 Specification

| Items | Specification |
|---|---|
| **Input Specification** | |
| Input per module | 8 Points Source type |
| Indicators | 8 Green input state |
| ON–state Voltage | 24Vdc nominal<br>Min. 9Vdc to Max. 28.8Vdc |
| OFF-state voltage | 6Vdc @ 25℃ |
| ON-state current | 3.1mA maximum/point @28.8Vdc |
| Input Signal Delay | OFF to ON : 0.2ms Max<br>ON to OFF : 0.4ms Max |
| Input filter | Adjustable, up to 10ms |
| Nominal Input Impedance | 14.8K ohm typical |
| **Output Specification** | |
| Output per module | 8 Points Source type |
| Indicators (Logic side) | 8 Green output state |
| Output Voltage Range | Nominal 24Vdc, Min. 15Vdc to Max. 28.8Vdc |
| ON-state voltage drop | Max. 0.5Vdc @ -25℃~ 60℃ |
| Field Power OFF-state voltage | 5.0Vdc @ 25℃ |
| ON-State Min. Current | 1mA per channel |
| OFF-State Leakage current | Max. 10uA |
| Output Signal Delay | OFF to ON : 0.1ms maximum<br>ON to OFF : 0.3ms maximum |
| Output Current Rating | Max. 0.5A per channel / Max. 4A per unit |
| Output Protection<br>(NCV8461DR2G/SO8) | Over Current limit : 1.9A@ 25℃ per each channels<br>Thermal Shutdown : 175℃<br>Short circuit protection |
| **General specification** | |
| Power dissipation | 45mA 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<br>Voltage range : 15~28.8Vdc<br>Power dissipation : 40mA @ 24Vdc |
| Single Wire | 0.205㎟ - 1.3㎟ (24-16 AWG) |
| Torque | 0.8Nm(7 lb-in) |
| Weight | 72g |
| Module Size | 12mm x 110mm x 72mm |
| Hot Swap | Possible |
| **Environment Condition** | **Refer to 'Environment Specification'** |

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

## 2.2. M1428 Wiring Diagram



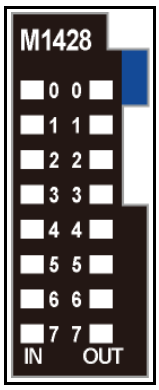

| Pin No. | Signal Description |
|---|---|
| 0 | Input Channel 0 |
| 1 | Diagnostic Output Channel 0 |
| 2 | Input Channel 1 |
| 3 | Diagnostic Output Channel 1 |
| 4 | Input Channel 2 |
| 5 | Diagnostic Output Channel 2 |
| 6 | Input Channel 3 |
| 7 | Diagnostic Output Channel 3 |
| 8 | Input Channel 4 |
| 9 | Diagnostic Output Channel 4 |
| 10 | Input Channel 5 |
| 11 | Diagnostic Output Channel 5 |
| 12 | Input Channel 6 |
| 13 | Diagnostic Output Channel 6 |
| 14 | Input Channel 7 |
| 15 | Diagnostic Output Channel 7 |
| 16 | Common (Field Power 0V) |
| 17 | Common (Field Power 24V) |

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

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

## 2.3. M1428 LED Indicator

### 2.3.1. LED Indicator




| LED No. | LED Function / Description | LED Color |
|---|---|---|
| 0(Left side) | 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 |
| 0(Right side) | OUTPUT Channel 0 | Green |
| 1 | OUTPUT Channel 1 | Green |
| 2 | OUTPUT Channel 2 | Green |
| 3 | OUTPUT Channel 3 | Green |
| 4 | OUTPUT Channel 4 | Green |
| 5 | OUTPUT Channel 5 | Green |
| 6 | OUTPUT Channel 6 | Green |
| 7 | OUTPUT Channel 7 | Green |

### 2.3.2. Channel Status LED

- **LED No. 0~7 (Left side)**

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

- **LED No. 0~7 (Right side)**

| Status | LED | To indicate |
|---|---|---|
| Not Signal | Off | Normal Operation |
| On Signal | Green | Normal Operation |
| Channel Fault | Flashing Green | Short to GND(On State) |
| | | Overcurrent |
| | | Overtemprature |

## 2.4. Mapping data into the image table

- **Input Module Data**

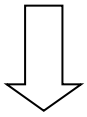
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| D15 | D14 | D13 | D12 | D11 | D10 | D9 | D8 |

- **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 |

- **Output Image Value**

| Bit No | Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|---|
| Byte0 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |



- **Output Module Data**

| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|---|---|---|---|---|---|---|---|

## 2.5. Parameter Data

- **Valid Parameter length: 4 Bytes**
- **Parameter Data**

| Bit No | Bit7 | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---|---|---|---|---|---|---|---|---|
| **Byte0** | Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state | | | | | | | |
| **Byte1** | Fault value (ch0~ch7) 0:Off, 1:On | | | | | | | |
| **Byte2** | Input Filter value : 0 ~ 10 (unit : ms) | | | | | | | |
| **Byte3** | Reserved | | | | | | | |