

# **FnIO M – Series :**

## **M3C28, M3C48, M3C68**

**M3C28 (8 Channels, Voltage Input, Voltage Output, 0~10V, 12Bits)**

**M3C48 (8 Channels, Voltage Input, Voltage Output, 0~10V, 14bits)**

**M3C68 (8 Channels, Voltage Input, Voltage Output, 0~10V, 16bits)**

History

| REV. | PAGES     | REMARKS                                  | DATE         | Editor        |
|------|-----------|------------------------------------------|--------------|---------------|
| 1.00 | 12        |                                          | jun 24, 2022 | Soyeong, Park |
| 1.01 | 4,7,14,21 | Certificate Update and LED spec modified | 2023/06/05   | CW SEO        |
|      |           |                                          |              |               |
|      |           |                                          |              |               |
|      |           |                                          |              |               |
|      |           |                                          |              |               |

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# Specification

## 1. Environment Specification

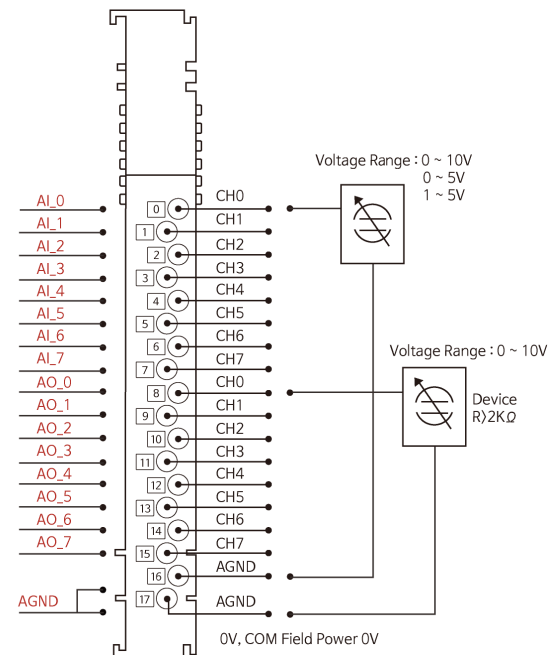
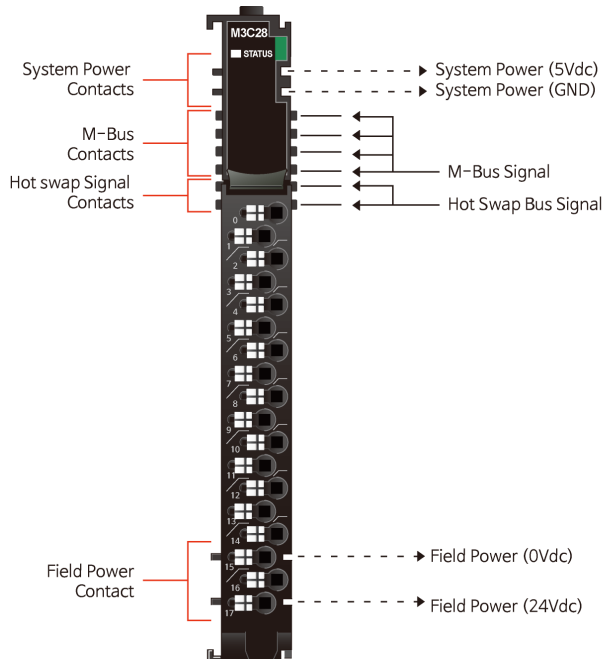
| Environmental specification |                                                                 |
|-----------------------------|-----------------------------------------------------------------|
| Operating Temperature       | -25 °C ~ 60 °C                                                  |
| UL Temperature              | -20 °C ~ 60 °C                                                  |
| Storage Temperature         | -40 °C ~ 85 °C                                                  |
| 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      | UL, ATEX, CE, UKCA                                              |

## 2. M3C28 (8 Channels, Voltage Input, Voltage Output, 0~10V , 12Bits)

### 2.1. M3C28 Specification

| Items                        | Specification                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Input Specification</b>   |                                                                                                      |
| Inputs Per Module            | 8 Channels single ended, non-isolated between channel                                                |
| Resolution in Ranges         | 12 bits : 2.44mV/Bit(0~10V)<br>12 bits : 1.22mV/Bit(0~5V)<br>12 bits : 0.98mV/Bit(1~5V)              |
| Input Range                  | 0~10Vdc, 0~5Vdc, 1~5Vdc                                                                              |
| Data Format                  | 16Bits Integer (2' compliment)                                                                       |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                            |
| Input Impedance              | 470kΩ                                                                                                |
| <b>Output Specification</b>  |                                                                                                      |
| Output Per Module            | 8 Channels, Single ended, non-isolated between channel                                               |
| Resolution in range          | 12bit : 2.44mV/bit                                                                                   |
| Output Voltage Range         | 0V ~ 10V                                                                                             |
| Data Format                  | 16Bits Integer (2' compliment)                                                                       |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                            |
| Load resistance              | Min 2KΩ                                                                                              |
| <b>General Specification</b> |                                                                                                      |
| Diagnostic                   | Diagnostic Field Power Off : LED Blinking                                                            |
| Conversion Time              | 1.5msec / All channel                                                                                |
| Common Type                  | 2 Common, Field Power 0V is Common(AGND)                                                             |
| Power Dissipation            | Max. 30mA @ 5Vdc                                                                                     |
| Isolation                    | I/O to Logic : Photocoupler Isolation<br>Field power : Non-Isolation                                 |
| UL Field Power               | Supply Voltage : 24Vdc nominal, Class 2                                                              |
| Field Power                  | Supply Voltage : 24Vdc nominal<br>Supply Voltage : 18~28.8Vdc<br>Power Dissipation : Max. 50mA@24Vdc |
| Wiring                       | I/O Cable Max. 2.0mm <sup>2</sup> (AWG 14)                                                           |
| Torque                       | 0.8Nm(7lb-in)                                                                                        |
| Weight                       | 72g                                                                                                  |
| Module Size                  | 12mm x 110mm x 75mm                                                                                  |
| Hot Swap                     | Possible                                                                                             |
| <b>Environment Condition</b> | <b>Refer to '1. Environment Specification'</b>                                                       |

## 2.2. M3C28 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       | Output Channel 0   |
| 9       | Output Channel 1   |
| 10      | Output Channel 2   |
| 11      | Output Channel 3   |
| 12      | Output Channel 4   |
| 13      | Output Channel 5   |
| 14      | Output Channel 6   |
| 15      | Output Channel 7   |
| 16      | AGND               |
| 17      | AGND               |

| 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. M3C28 LED Indicator

2.3.1. LED Indicator



| LED No. | LED Function / Description | LED Color |
|---------|----------------------------|-----------|
| STATUS  | Status LED                 | Green     |

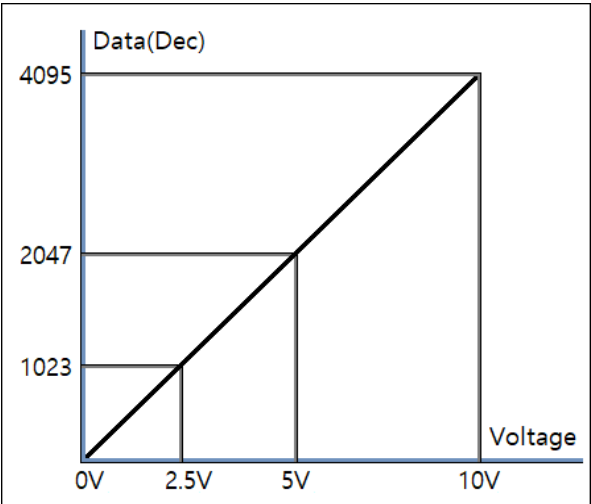
2.3.2. Channel Status LED

| Status            | LED          | To indicate                 |
|-------------------|--------------|-----------------------------|
| M-Bus Status      | Off<br>Green | Disconnection<br>Connection |
| Field Power Error | LED Blinking | Field power is unconnected. |

2.4. Data Value / Voltage

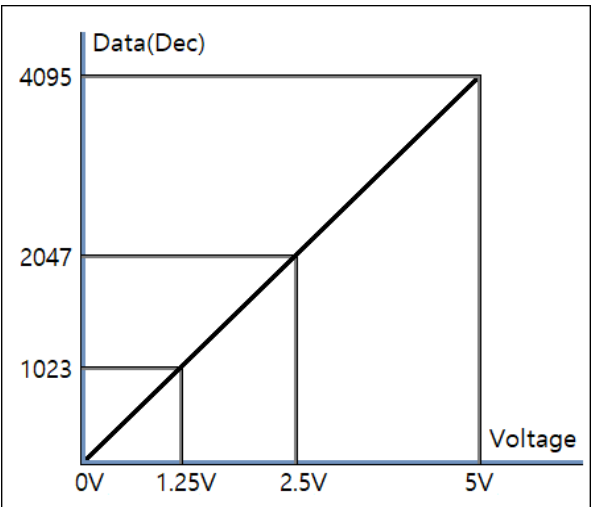
Voltage Range : 0~10V

| Voltage   | 0V    | 2.5V  | 5.0V  | 10.0V |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H03FF | H07FF | H0FFF |



Voltage Range : 0~5V

| Current   | 0V    | 1.25V | 2.5V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H03FF | H07FF | H0FFF |

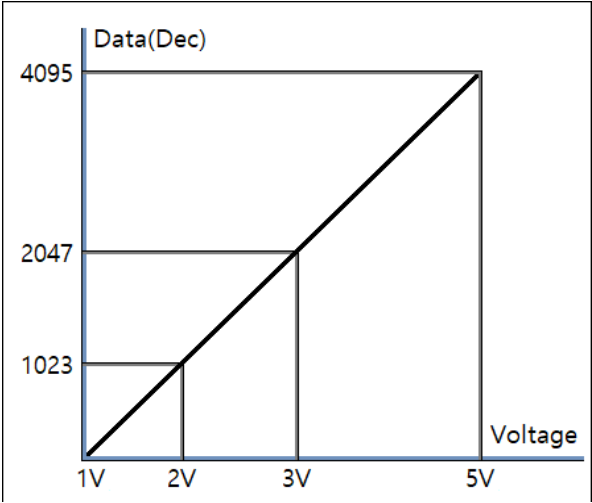




Specification

Voltage Range : 1~5V

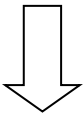
| Current   | 1.0V  | 2.0V  | 3.0V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H03FF | H07FF | H0FFF |



2.5. Mapping Data into the Image Table

● Input Module Data

|  |                  |
|--|------------------|
|  | Analog Input Ch0 |
|  | Analog Input Ch1 |
|  | Analog Input Ch2 |
|  | Analog Input Ch3 |
|  | Analog Input Ch4 |
|  | Analog Input Ch5 |
|  | Analog Input Ch6 |
|  | Analog Input Ch7 |



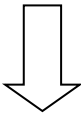
● Input Image Value

| Bit No  | Bit7 | Bit6 | Bit5 | Bit4                       | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|------|------|------|----------------------------|------|------|------|------|
| Byte 0  |      |      |      | Analog Input Ch0 Low byte  |      |      |      |      |
| Byte 1  |      |      |      | Analog Input Ch0 High byte |      |      |      |      |
| Byte 2  |      |      |      | Analog Input Ch1 Low byte  |      |      |      |      |
| Byte 3  |      |      |      | Analog Input Ch1 High byte |      |      |      |      |
| Byte 4  |      |      |      | Analog Input Ch2 Low byte  |      |      |      |      |
| Byte 5  |      |      |      | Analog Input Ch2 High byte |      |      |      |      |
| Byte 6  |      |      |      | Analog Input Ch3 Low byte  |      |      |      |      |
| Byte 7  |      |      |      | Analog Input Ch3 High byte |      |      |      |      |
| Byte 8  |      |      |      | Analog Input Ch4 Low byte  |      |      |      |      |
| Byte 9  |      |      |      | Analog Input Ch4 High byte |      |      |      |      |
| Byte 10 |      |      |      | Analog Input Ch5 Low byte  |      |      |      |      |
| Byte 11 |      |      |      | Analog Input Ch5 High byte |      |      |      |      |
| Byte 12 |      |      |      | Analog Input Ch6 Low byte  |      |      |      |      |
| Byte 13 |      |      |      | Analog Input Ch6 High byte |      |      |      |      |
| Byte 14 |      |      |      | Analog Input Ch7 Low byte  |      |      |      |      |
| Byte 15 |      |      |      | Analog Input Ch7 High byte |      |      |      |      |

Specification

● Output Image Value

| Bit No  | Bit7                        | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|-----------------------------|------|------|------|------|------|------|------|
| Byte 0  | Analog Output Ch0 Low byte  |      |      |      |      |      |      |      |
| Byte 1  | Analog Output Ch0 High byte |      |      |      |      |      |      |      |
| Byte 2  | Analog Output Ch1 Low byte  |      |      |      |      |      |      |      |
| Byte 3  | Analog Output Ch1 High byte |      |      |      |      |      |      |      |
| Byte 4  | Analog Output Ch2 Low byte  |      |      |      |      |      |      |      |
| Byte 5  | Analog Output Ch2 High byte |      |      |      |      |      |      |      |
| Byte 6  | Analog Output Ch3 Low byte  |      |      |      |      |      |      |      |
| Byte 7  | Analog Output Ch3 High byte |      |      |      |      |      |      |      |
| Byte 8  | Analog Output Ch4 Low byte  |      |      |      |      |      |      |      |
| Byte 9  | Analog Output Ch4 High byte |      |      |      |      |      |      |      |
| Byte 10 | Analog Output Ch5 Low byte  |      |      |      |      |      |      |      |
| Byte 11 | Analog Output Ch5 High byte |      |      |      |      |      |      |      |
| Byte 12 | Analog Output Ch6 Low byte  |      |      |      |      |      |      |      |
| Byte 13 | Analog Output Ch6 High byte |      |      |      |      |      |      |      |
| Byte 14 | Analog Output Ch7 Low byte  |      |      |      |      |      |      |      |
| Byte 15 | Analog Output Ch7 High byte |      |      |      |      |      |      |      |



● Output Module Data

|                   |
|-------------------|
| Analog Output Ch0 |
| Analog Output Ch1 |
| Analog Output Ch2 |
| Analog Output Ch3 |
| Analog Output Ch4 |
| Analog Output Ch5 |
| Analog Output Ch6 |
| Analog Output Ch7 |

# Specification

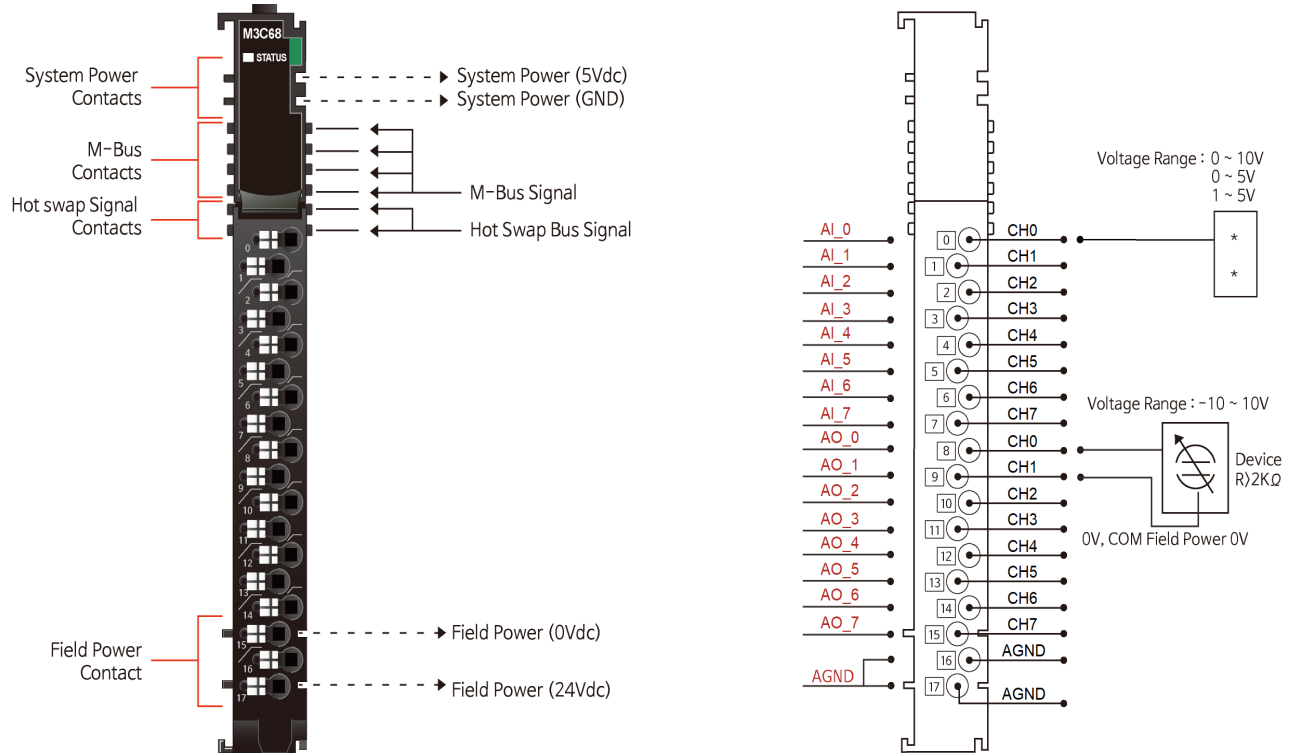
## 3. M3C48 (8 Channels, Voltage Input, Voltage Output, 0~10V , 14bits)

### 3.1. M3C48 Specification

| Items                        | Specification                                                                                        |
|------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Input Specification</b>   |                                                                                                      |
| Inputs Per Module            | 8 Channels single ended, non-isolated between channel                                                |
| Resolution in Ranges         | 14 bits : 0.61mV/Bit(0~10V)<br>14 bits : 0.305mV/Bit(0~5V)<br>14 bits : 0.244mV/Bit(1~5V)            |
| Input Range                  | 0~10Vdc, 0~5Vdc, 1~5Vdc                                                                              |
| Data Format                  | 16bits Integer (2' compliment)                                                                       |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                            |
| Input Impedance              | 470kΩ                                                                                                |
| <b>Output Specification</b>  |                                                                                                      |
| Output Per Module            | 8 Channels, Single ended, non-isolated between channel                                               |
| Resolution in range          | 14bit : 0.61mV/bit                                                                                   |
| Output Voltage Range         | 0V ~ 10V                                                                                             |
| Data Format                  | 16bits Integer (2' compliment)                                                                       |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                            |
| Load resistance              | Min 2KΩ                                                                                              |
| <b>General Specification</b> |                                                                                                      |
| Diagnostic                   | Diagnostic Field Power Off : LED Blinking                                                            |
| Conversion Time              | 1.5msec / All channel                                                                                |
| Common Type                  | 2 Common, Field Power 0V is Common(AGND)                                                             |
| Power Dissipation            | Max. 30mA @ 5Vdc                                                                                     |
| Isolation                    | I/O to Logic : Photocoupler Isolation<br>Field power : Non-Isolation                                 |
| UL Field Power               | Supply Voltage : 24Vdc nominal, Class 2                                                              |
| Field Power                  | Supply Voltage : 24Vdc nominal<br>Supply Voltage : 18~28.8Vdc<br>Power Dissipation : Max. 50mA@24Vdc |
| Wiring                       | I/O Cable Max. 2.0mm <sup>2</sup> (AWG 14)                                                           |
| Torque                       | 0.8Nm(7lb-in)                                                                                        |
| Weight                       | 72g                                                                                                  |
| Module Size                  | 12mm x 99mm x 70mm                                                                                   |
| Environment Condition        | Refer to 'Environment Specification'                                                                 |

# Specification

## 3.2. M3C48 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       | Output Channel 0   |
| 9       | Output Channel 1   |
| 10      | Output Channel 2   |
| 11      | Output Channel 3   |
| 12      | Output Channel 4   |
| 13      | Output Channel 5   |
| 14      | Output Channel 6   |
| 15      | Output Channel 7   |
| 16      | AGND               |
| 17      | AGND               |

| 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.

3.3. M3C48 LED Indicator

3.3.1. LED Indicator



| LED No. | LED Function / Description | LED Color |
|---------|----------------------------|-----------|
| STATUS  | Status LED                 | Green     |

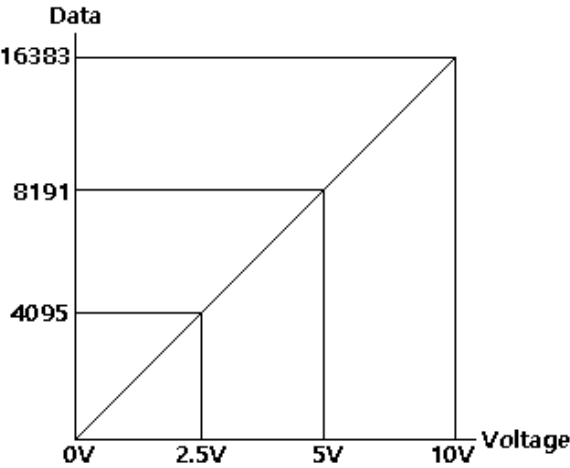
3.3.2. Channel Status LED

| Status            | LED          | To indicate                 |
|-------------------|--------------|-----------------------------|
| M-Bus Status      | Off<br>Green | Disconnection<br>Connection |
| Field Power Error | LED Blinking | Field power is unconnected. |

3.4. Data Value / Voltage

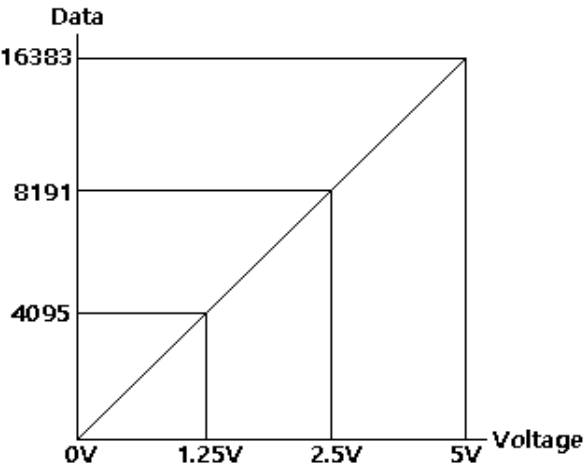
Voltage Range : 0~10V

| Voltage   | 0V    | 2.5V  | 5.0V  | 10.0V |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H0FFF | H1FFF | H3FFF |



Voltage Range : 0~5V

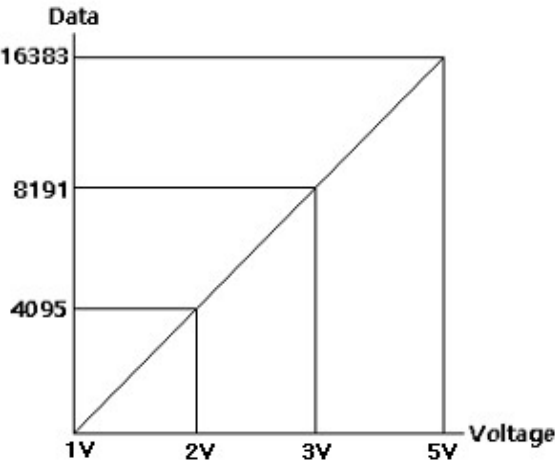
| Current   | 0V    | 1.25V | 2.5V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H0FFF | H1FFF | H3FFF |



Specification

Voltage Range : 1~5V

| Current   | 1.0V  | 2.0V  | 3.0V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H0FFF | H1FFF | H3FFF |

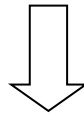




### 3.5. Mapping Data into the Image Table

#### ● Input Module Data

|                  |
|------------------|
| Analog Input Ch0 |
| Analog Input Ch1 |
| Analog Input Ch2 |
| Analog Input Ch3 |
| Analog Input Ch4 |
| Analog Input Ch5 |
| Analog Input Ch6 |
| Analog Input Ch7 |



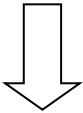
#### ● Input Image Value

| Bit No  | Bit7                       | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|----------------------------|------|------|------|------|------|------|------|
| Byte 0  | Analog Input Ch0 Low byte  |      |      |      |      |      |      |      |
| Byte 1  | Analog Input Ch0 High byte |      |      |      |      |      |      |      |
| Byte 2  | Analog Input Ch1 Low byte  |      |      |      |      |      |      |      |
| Byte 3  | Analog Input Ch1 High byte |      |      |      |      |      |      |      |
| Byte 4  | Analog Input Ch2 Low byte  |      |      |      |      |      |      |      |
| Byte 5  | Analog Input Ch2 High byte |      |      |      |      |      |      |      |
| Byte 6  | Analog Input Ch3 Low byte  |      |      |      |      |      |      |      |
| Byte 7  | Analog Input Ch3 High byte |      |      |      |      |      |      |      |
| Byte 8  | Analog Input Ch4 Low byte  |      |      |      |      |      |      |      |
| Byte 9  | Analog Input Ch4 High byte |      |      |      |      |      |      |      |
| Byte 10 | Analog Input Ch5 Low byte  |      |      |      |      |      |      |      |
| Byte 11 | Analog Input Ch5 High byte |      |      |      |      |      |      |      |
| Byte 12 | Analog Input Ch6 Low byte  |      |      |      |      |      |      |      |
| Byte 13 | Analog Input Ch6 High byte |      |      |      |      |      |      |      |
| Byte 14 | Analog Input Ch7 Low byte  |      |      |      |      |      |      |      |
| Byte 15 | Analog Input Ch7 High byte |      |      |      |      |      |      |      |

Specification

● Output Image Value

| Bit No  | Bit7                        | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|-----------------------------|------|------|------|------|------|------|------|
| Byte 0  | Analog Output Ch0 Low byte  |      |      |      |      |      |      |      |
| Byte 1  | Analog Output Ch0 High byte |      |      |      |      |      |      |      |
| Byte 2  | Analog Output Ch1 Low byte  |      |      |      |      |      |      |      |
| Byte 3  | Analog Output Ch1 High byte |      |      |      |      |      |      |      |
| Byte 4  | Analog Output Ch2 Low byte  |      |      |      |      |      |      |      |
| Byte 5  | Analog Output Ch2 High byte |      |      |      |      |      |      |      |
| Byte 6  | Analog Output Ch3 Low byte  |      |      |      |      |      |      |      |
| Byte 7  | Analog Output Ch3 High byte |      |      |      |      |      |      |      |
| Byte 8  | Analog Output Ch4 Low byte  |      |      |      |      |      |      |      |
| Byte 9  | Analog Output Ch4 High byte |      |      |      |      |      |      |      |
| Byte 10 | Analog Output Ch5 Low byte  |      |      |      |      |      |      |      |
| Byte 11 | Analog Output Ch5 High byte |      |      |      |      |      |      |      |
| Byte 12 | Analog Output Ch6 Low byte  |      |      |      |      |      |      |      |
| Byte 13 | Analog Output Ch6 High byte |      |      |      |      |      |      |      |
| Byte 14 | Analog Output Ch7 Low byte  |      |      |      |      |      |      |      |
| Byte 15 | Analog Output Ch7 High byte |      |      |      |      |      |      |      |



● Output Module Data

|                   |
|-------------------|
| Analog Output Ch0 |
| Analog Output Ch1 |
| Analog Output Ch2 |
| Analog Output Ch3 |
| Analog Output Ch4 |
| Analog Output Ch5 |
| Analog Output Ch6 |
| Analog Output Ch7 |

# Specification

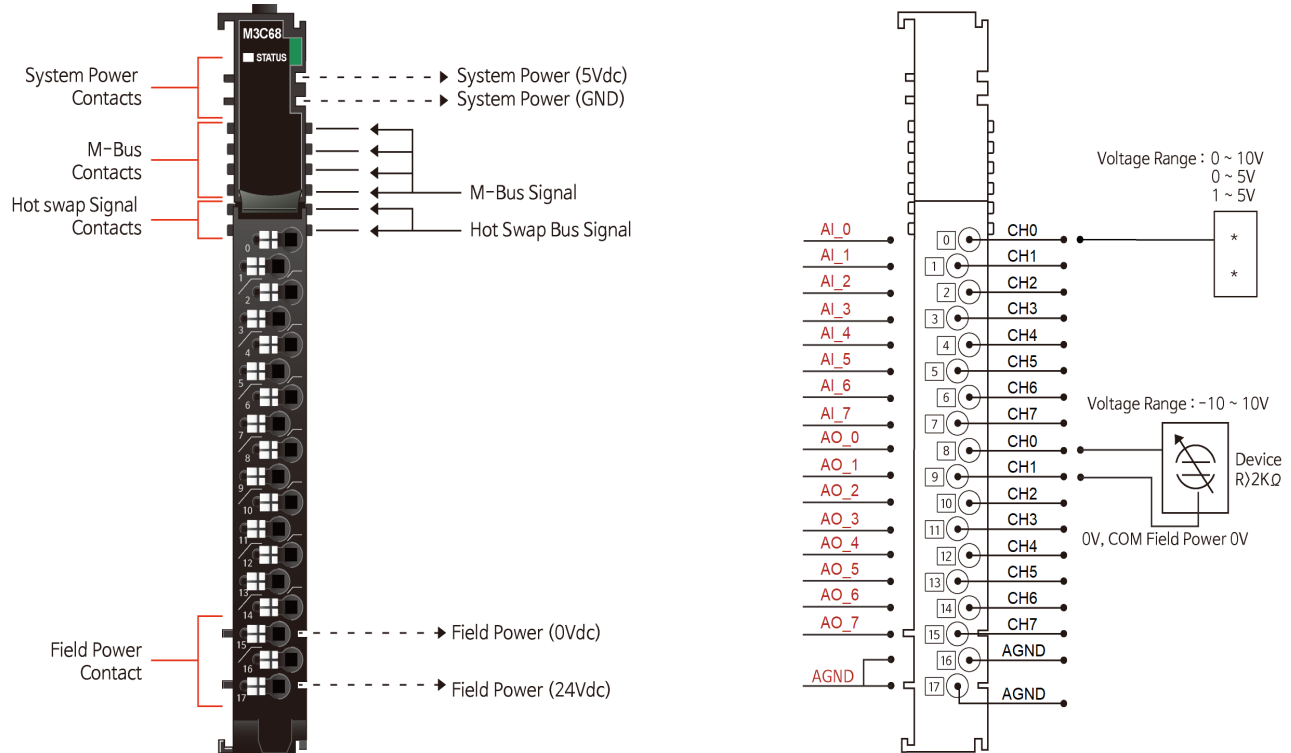
## 4. M3C68 (8 Channels, Voltage Input, Voltage Output, 0~10V , 16bits)

### 4.1. M3C68 Specification

| Items                        | Specification                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Input Specification</b>   |                                                                                                                   |
| Inputs Per Module            | 8 Channels single ended, non-isolated between channel                                                             |
| Resolution in Ranges         | 16bit (Include Sign)<br>15 bits : 0.31mV/Bit(0~10V)<br>15 bits : 0.153mV/Bit(0~5V)<br>15 bits : 0.122mV/Bit(1~5V) |
| Input Range                  | 0~10Vdc, 0~5Vdc, 1~5Vdc                                                                                           |
| Data Format                  | 16bits Integer (2' compliment)                                                                                    |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                                         |
| Input Impedance              | 470kΩ                                                                                                             |
| <b>Output Specification</b>  |                                                                                                                   |
| Output Per Module            | 8 Channels, Single ended, non-isolated between channel                                                            |
| Resolution in range          | 16bit : 0.31mV/bit                                                                                                |
| Output Voltage Range         | 0~ 10V                                                                                                            |
| Data Format                  | 16bits Integer (2' compliment)                                                                                    |
| Module Error                 | ±0.1% Full Scale @ 25°C<br>±0.3% Full Scale @ -25°C, 60°C                                                         |
| Load resistance              | Min 2KΩ                                                                                                           |
| <b>General Specification</b> |                                                                                                                   |
| Diagnostic                   | Diagnostic Field Power Off : LED Blinking                                                                         |
| Conversion Time              | 1.5msec / All channel                                                                                             |
| Common Type                  | 2 Common, Field Power 0V is Common(AGND)                                                                          |
| Power Dissipation            | Max. 30mA @ 5Vdc                                                                                                  |
| Isolation                    | I/O to Logic : Photocoupler Isolation<br>Field power : Non-Isolation                                              |
| UL Field Power               | Supply Voltage : 24Vdc nominal, Class 2                                                                           |
| Field Power                  | Supply Voltage : 24Vdc nominal<br>Supply Voltage : 18~28.8Vdc<br>Power Dissipation : Max. 50mA@24Vdc              |
| Wiring                       | I/O Cable Max. 2.0mm <sup>2</sup> (AWG 14)                                                                        |
| Torque                       | 0.8Nm(7lb-in)                                                                                                     |
| Weight                       | 72g                                                                                                               |
| Module Size                  | 12mm x 110mm x 75mm                                                                                               |
| Hot Swap                     | Possible                                                                                                          |
| <b>Environment Condition</b> | <b>Refer to '1. Environment Specification'</b>                                                                    |

# Specification

## 4.2. M3C68 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       | Output Channel 0   |
| 9       | Output Channel 1   |
| 10      | Output Channel 2   |
| 11      | Output Channel 3   |
| 12      | Output Channel 4   |
| 13      | Output Channel 5   |
| 14      | Output Channel 6   |
| 15      | Output Channel 7   |
| 16      | AGND               |
| 17      | AGND               |

| 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.

4.3. M3C68 LED Indicator

4.3.1. LED Indicator



| LED No. | LED Function / Description | LED Color |
|---------|----------------------------|-----------|
| STATUS  | Status LED                 | Green     |

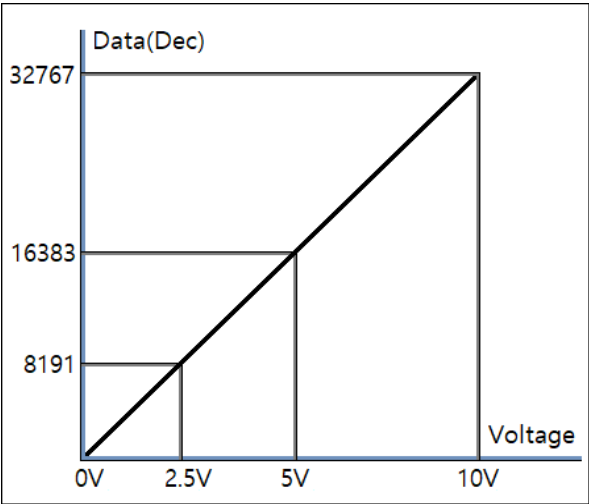
4.3.2. Channel Status LED

| Status            | LED          | To indicate                 |
|-------------------|--------------|-----------------------------|
| M-Bus Status      | Off<br>Green | Disconnection<br>Connection |
| Field Power Error | LED Blinking | Field power is unconnected. |

4.4. Data Value / Voltage

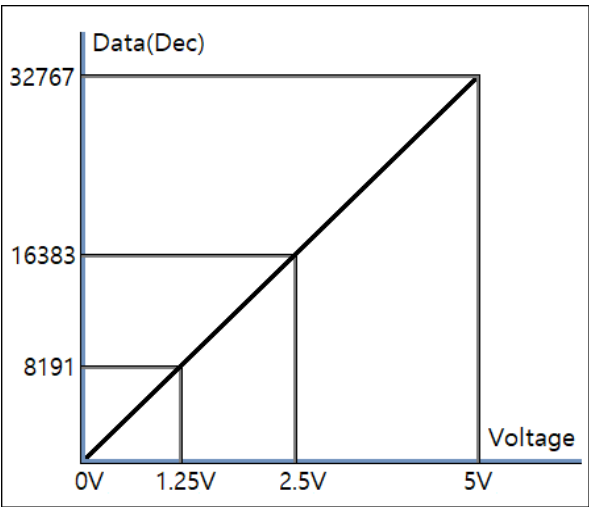
Voltage Range : 0~10V

| Voltage   | 0V    | 2.5V  | 5.0V  | 10.0V |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H1FFF | H3FFF | H7FFF |



Voltage Range : 0~5V

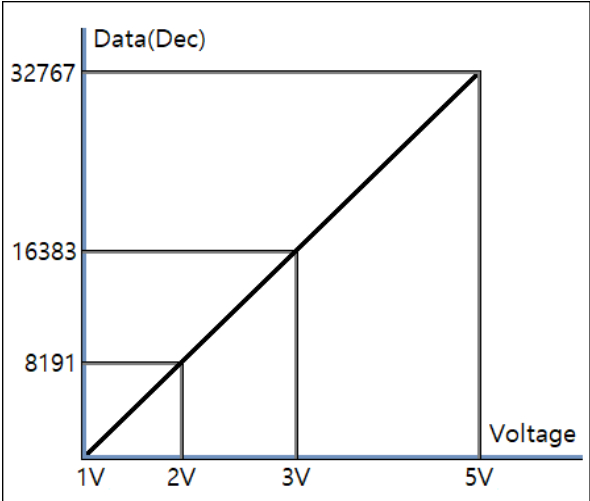
| Current   | 0V    | 1.25V | 2.5V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H1FFF | H3FFF | H7FFF |



Specification

Voltage Range : 1~5V

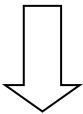
| Current   | 1.0V  | 2.0V  | 3.0V  | 5.0V  |
|-----------|-------|-------|-------|-------|
| Data(Hex) | H0000 | H1FFF | H3FFF | H7FFF |



4.5. Mapping Data into the Image Table

● Input Module Data

|  |                  |
|--|------------------|
|  | Analog Input Ch0 |
|  | Analog Input Ch1 |
|  | Analog Input Ch2 |
|  | Analog Input Ch3 |
|  | Analog Input Ch4 |
|  | Analog Input Ch5 |
|  | Analog Input Ch6 |
|  | Analog Input Ch7 |



● Input Image Value

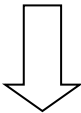
| Bit No  | Bit7 | Bit6 | Bit5 | Bit4                       | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|------|------|------|----------------------------|------|------|------|------|
| Byte 0  |      |      |      | Analog Input Ch0 Low byte  |      |      |      |      |
| Byte 1  |      |      |      | Analog Input Ch0 High byte |      |      |      |      |
| Byte 2  |      |      |      | Analog Input Ch1 Low byte  |      |      |      |      |
| Byte 3  |      |      |      | Analog Input Ch1 High byte |      |      |      |      |
| Byte 4  |      |      |      | Analog Input Ch2 Low byte  |      |      |      |      |
| Byte 5  |      |      |      | Analog Input Ch2 High byte |      |      |      |      |
| Byte 6  |      |      |      | Analog Input Ch3 Low byte  |      |      |      |      |
| Byte 7  |      |      |      | Analog Input Ch3 High byte |      |      |      |      |
| Byte 8  |      |      |      | Analog Input Ch4 Low byte  |      |      |      |      |
| Byte 9  |      |      |      | Analog Input Ch4 High byte |      |      |      |      |
| Byte 10 |      |      |      | Analog Input Ch5 Low byte  |      |      |      |      |
| Byte 11 |      |      |      | Analog Input Ch5 High byte |      |      |      |      |
| Byte 12 |      |      |      | Analog Input Ch6 Low byte  |      |      |      |      |
| Byte 13 |      |      |      | Analog Input Ch6 High byte |      |      |      |      |
| Byte 14 |      |      |      | Analog Input Ch7 Low byte  |      |      |      |      |
| Byte 15 |      |      |      | Analog Input Ch7 High byte |      |      |      |      |



# Specification

● Output Image Value

| Bit No  | Bit7                        | Bit6 | Bit5 | Bit4 | Bit3 | Bit2 | Bit1 | Bit0 |
|---------|-----------------------------|------|------|------|------|------|------|------|
| Byte 0  | Analog Output Ch0 Low byte  |      |      |      |      |      |      |      |
| Byte 1  | Analog Output Ch0 High byte |      |      |      |      |      |      |      |
| Byte 2  | Analog Output Ch1 Low byte  |      |      |      |      |      |      |      |
| Byte 3  | Analog Output Ch1 High byte |      |      |      |      |      |      |      |
| Byte 4  | Analog Output Ch2 Low byte  |      |      |      |      |      |      |      |
| Byte 5  | Analog Output Ch2 High byte |      |      |      |      |      |      |      |
| Byte 6  | Analog Output Ch3 Low byte  |      |      |      |      |      |      |      |
| Byte 7  | Analog Output Ch3 High byte |      |      |      |      |      |      |      |
| Byte 8  | Analog Output Ch4 Low byte  |      |      |      |      |      |      |      |
| Byte 9  | Analog Output Ch4 High byte |      |      |      |      |      |      |      |
| Byte 10 | Analog Output Ch5 Low byte  |      |      |      |      |      |      |      |
| Byte 11 | Analog Output Ch5 High byte |      |      |      |      |      |      |      |
| Byte 12 | Analog Output Ch6 Low byte  |      |      |      |      |      |      |      |
| Byte 13 | Analog Output Ch6 High byte |      |      |      |      |      |      |      |
| Byte 14 | Analog Output Ch7 Low byte  |      |      |      |      |      |      |      |
| Byte 15 | Analog Output Ch7 High byte |      |      |      |      |      |      |      |



● Output Module Data

|                   |
|-------------------|
| Analog Output Ch0 |
| Analog Output Ch1 |
| Analog Output Ch2 |
| Analog Output Ch3 |
| Analog Output Ch4 |
| Analog Output Ch5 |
| Analog Output Ch6 |
| Analog Output Ch7 |

## 5. Input Range Setting & Conversion Time Setting

### 5.1. M3C28, M3C48, M3C68

|    | Byte   | Bit 7                                                                      | Bit 6 | Bit 5                       | Bit 4 | Bit 3                       | Bit 2 | Bit 1                       | Bit 0 |
|----|--------|----------------------------------------------------------------------------|-------|-----------------------------|-------|-----------------------------|-------|-----------------------------|-------|
| AI | Byte 0 | Voltage Range for Channel 3                                                |       | Voltage Range for Channel 2 |       | Voltage Range for Channel 1 |       | Voltage Range for Channel 0 |       |
|    | Byte 1 | Voltage Range for Channel 7                                                |       | Voltage Range for Channel 6 |       | Voltage Range for Channel 5 |       | Voltage Range for Channel 4 |       |
|    |        | 00 : 0~10Vdc   01 : 0~5Vdc   10 : 1~5Vdc                                   |       |                             |       |                             |       |                             |       |
|    | Byte 2 | Filter Time ( H00 : Default Filter(20) / H01 : Fastest ~ / H3E : Slowest ) |       |                             |       |                             |       |                             |       |
|    | Byte 3 | Not Used (=00)                                                             |       |                             |       |                             |       |                             |       |
| AO | Byte 4 | Fault Action for Channel 3                                                 |       | Fault Action for Channel 2  |       | Fault Action for Channel 1  |       | Fault Action for Channel 0  |       |
|    | Byte 5 | Fault Action for Channel 7                                                 |       | Fault Action for Channel 6  |       | Fault Action for Channel 5  |       | Fault Action for Channel 4  |       |
|    |        | 00 : Fault Value   01 : Hold Last State   10 : Low Limit   11 : High Limit |       |                             |       |                             |       |                             |       |
|    | Byte 6 | Fault Value Low Byte                                                       |       |                             |       |                             |       |                             |       |
|    | Byte 7 | Fault Value High Byte                                                      |       |                             |       |                             |       |                             |       |

\* ID\_PARAMETER (8Byte)