F&eIT Series Isolated Digital I/O Module
12 - 24VDC specification
DIO-8/8(FIT)GY

The Module, which is an interface module that sends and receives digital signals to and from external devices, can be used by connecting it to F&eIT series controller modules <CPU-CA10(FIT)GY, CPU-SB10(FIT)GY etc>. This product can be connected to the DIO-8/8(USB)GY to increase the number of I/O channels.

Since an opto-coupler is used to insulate the CPU controlling the Module and external signals, it does not produce external electric effects directly on the host computer. This product can perform a maximum of 8 points of input and 8 points of output per module.

* This module is available in different product models. "x" in each model number represents a blank or one alphanumeric character. This is applicable to the rest of this document.

**Features**

Isolated I/O operations using an opto-coupler improves noise immunity.

This product can perform 8-point digital input and 8-point digital output, treating 8 points as a group.

Input section is ready to accept both the current sinking output and current source output.

The output section is a high sink current, open collector type 150mA/24VDC (par channel)(Max.)

A rotary switch allows you to set device IDs to help you keep track of device numbers.

The system incorporates a screwless connector plug that allows you to easily attach and detach wires without using any special tools.

Like other F&eIT series products, the module has a 35mm DIN rail mounting mechanism as standard. A connection to a controller module can be effected on a lateral, stack basis in a unique configuration, which permits a simple, smart system configuration without the need for a backbone board.

**Specifications**

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**Specifications**

**Input section**

- Input format: Opto-isolated input (compatible with current sink output and current source output)
- Input resistance: 3kΩ
- Input ON current: 3.4mA (Min.)
- Input OFF current: 0.16mA (Max.)
- Number of input signal points: 8 points (8 points/common)
- Response time: 1ms (Max.)
- External circuit power supply: 12 - 24VDC (±15%) (4mA/12V - 8mA/24V per channel)

**Output section**

- Output format: Opto-isolated open collector output (current sink type)
- Output voltage: 12 - 24VDC (±15%)
- Output current: 150mA (par channel) (Max. )
- Number of output signal points: 8 points (8 points/common)
- Response time: 1ms (Max.)
- External circuit power supply: 12 - 24VDC (±15%)

**Common section**

- Internal current consumption: 5VDC(±5%) 150mA(Max.) *1
- Allowable distance of signal extension: Approx. 50m (depending on wiring environment)
- Physical dimensions (mm): 25.2(W) x 64.7(D) x 94.0(H) (exclusive of protrusions)
- Weight of the module itself: 100g
- Module connection method: Stack connection by means of a connection mechanism that is provided in the system as a standard item
- Module installation method: One-touch connection to 35mm DIN rails (standard connection mechanism provided in the system)
- Applicable wire: AWG 28 - 20
- Applicable plug: FK-MC0.5/9-ST-2,5 (made by Phoenix Contact Corp.) 2.5 mm-pitch, nominal current: 4A (Max.)

*1 Allowable current for the stack connector: 3.0A (Max.)

**CAUTION**

When connecting one of the modules to a controller module, the internal power consumption should be taken into account. If the total current exceeds the capacity of the power supply unit, the integrity of the operation cannot be guaranteed. For further details, please see the Controller Module manual.

**Installation Environment Requirements**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Requirement description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>0 - 50°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-10 - 60°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>10 - 90%RH (No condensation)</td>
</tr>
<tr>
<td>Floating dust particles</td>
<td>Not to be excessive</td>
</tr>
<tr>
<td>Corrosive gases</td>
<td>None</td>
</tr>
<tr>
<td>Line-Noise resistance</td>
<td>Line-noise *1 (IEC1000-4-2Level 3, EN61000-4-2Level 3)</td>
</tr>
<tr>
<td>Static electricity resistance</td>
<td>Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Sweep resistance 10 - 57Hz/semi-amplitude 0.15mm, 57 - 150Hz/2.0G</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>15G, half-sine shock for 11ms in X, Y, and Z directions</td>
</tr>
</tbody>
</table>

*1 When using a POW-AD22GY
**Packing List**

- Module [DIO-8/8(FIT)GY] …1
- First Step Guide … 1
- CD-ROM [F&IT Series Setup Disk] *1…1
- Interface connector plugs...2

*1  The CD-ROM contains various software and User’s Guide.

**Physical Dimensions**

![Module Diagram]

**How to Connect an Interface Connector**

When connecting the Module to an external device, you can use the supplied connector plug. When wiring the Module, strip off approximately 7 - 8 mm of the covering for the cable, and insert the bare wire by pressing the orange button on the connector plug. Releasing the orange button after the wire is inserted fixes the cable. Compatible wires are AWG 28 - 20.

![Connector Plug Instructions]

⚠️ **CAUTION**

Removing the connector plug by grasping the cable can break the wire.

**Signal Layout on the Interface Connector**

The Module can be connected to an external device using a 9-pin connector that is provided on the Module face.

![Connector Layout Diagram]

**External I/O Circuits**

**Input section**

The below figure shows the input equivalent circuit for the interface section of this product. The signal input section consists of an opto-isolated input (compatible with both current sink output and current source output). The power requirement for this product is about 8mA per input channel at 24VDC (about 4mA at 12VDC).

**Input Circuit**

![Input Circuit Diagram]

**Example of a Connection to Current Sink Output**

![Current Sink Connection Example]

Applicable plug :
Front-operable spring gauge type
FK-MC(0.09-8P-2) plug (made by Phoenix Contact Corp.)
Applicable wire : AWG 28 - 20
Example of a Connection to Current Source Output

Output section
The below figure shows the output circuit for the interface section of this product. The signal output section consists of an opto-isolated open collector method (current sink type). The maximum output current rating per channel is 150mA for this product (at 12 - 24VDC).

A surge voltage protection circuit is not provided on the output transistors. Therefore, when driving relays, lamps, and other induction loads using this Module, a surge voltage countermeasure should be provided on the load side.

CAUTION
When the power is turned on, all output will be OFF.

Output Circuit

Connection example:
Using Inputs X0 and X00

Using Outputs Y0 and Y00

Example of Connecting Outputs and Inputs

Setting a Device ID
The controller module distinguishes and keeps track of the modules that are connected to it by assigning device IDs to them. Each module, therefore, should be assigned a unique ID.

A Device ID can be assigned in a 0 - 7 range, so that a maximum of eight modules can be distinguished.
To connect the module to the USB module, assign a device ID between 1 and 3. The factory setting for the Device ID is [0].

Setup Method
A Device ID can be set by turning the rotary switch that is located on the module face.
A Device ID can be assigned by turning the switch.

Block Diagram