F&eIT Series

Isolated Digital Input/Output Module
DIO-4/4(FIT)GY
Isolated Digital Input Module
DI-8(FIT)GY
Isolated Digital Output Module
DO-8(FIT)GY
User's Manual

CONTEC CO.,LTD.

Check Your Package

Thank you for purchasing the CONTEC product.

The product consists of the items listed below.

Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

- Module (One of the following) ...1
  [DIO-4/4(FIT)GY, DI-8(FIT)GY, or DO-8(FIT)GY]

- First Step Guide … 1

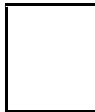- CD-ROM [F&eIT Series Setup Disk] *1…1

- Interface connector plug ...1

*1 The CD-ROM contains various software and User's Guide (this manual)

Module   Interface connector plug   First step guide [F&eIT Series Setup Disk]
CD-ROM

Copyright

Copyright 2004 CONTEC CO., LTD.   ALL RIGHTS RESERVED.

No part of this document may be copied or reproduced in any form by any means without prior written consent of CONTEC CO., LTD.

CONTEC CO., LTD. makes no commitment to update or keep current the information contained in this document.   The information in this document is subject to change without notice.

All relevant issues have been considered in the preparation of this document.   Should you notice an omission or any questionable item in this document, please feel free to notify CONTEC CO., LTD.

Regardless of the foregoing statement, CONTEC assumes no responsibility for any errors that may appear in this document or for results obtained by the user as a result of using this product.

Trademarks

F&eIT is a registered trademark or trademark of CONTEC CO., LTD.   Other company and product names that are referred to in this manual are generally trademarks or registered trade trademark.

Table of Contents

1. Before Using the Product

This chapter provides information you should know before using the product.

About the Module

This product is an expansion module (device module) that adds digital signal I/O interfaces to one of various types of controllers. The product is used in combination with the I/O controller module <CPU-CAxx(FIT)GY> (*1) or microcontroller unit <CPU-SBxx(FIT)GY> (*1) in the F&eIT Series.

The <DIO-4/4(FIT)GY> can perform a maximum of 4 points of opto-isolated input and 4 points of opto-isolated output per module. (Input: 12 - 24 VDC specified, output: 12 - 48 VDC specified)
The <DI-8(FIT)GY> can perform a maximum of 8 points of opto-isolated input per module.
(12 - 24 VDC specified)
The <DO-8(FIT)GY> can perform a maximum of 8 points of opto-isolated output per module.
(12 - 48 VDC specified)

By reading this manual carefully, please build a system by creating applications programs, setting the switches, and connecting the module to external devices.

*1   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

- The <DIO-4/4(FIT)GY> can perform 4-point digital signal input and 4-point digital signal output, treating 4 points as a group.

- The <DI-8(FIT)GY> can perform 8-point digital signal input, treating 8 points as a group.

- The <DO-8(FIT)GY> can perform 8-point digital signal 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 using high-capacitance transistors.
  <DIO-4/4(FIT)GY>: 150 mA/24 VDC or 50 mA/48 VDC max. (per channel)
  <DO-8(FIT)GY>:   150 mA/24 VDC or 50 mA/48 VDC max. (per channel)

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

- A rotary switch allows you to set device IDs, making it easy to keep track of device numbers.

- 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 backplane board.

Functions

Generic I/O functions (data I/O operations that directly access the I/O ports)

- Input

The Module transmits a maximum of 8 points (<DI-8(FIT)GY>) or 4 points (<DIO-4/4(FIT)GY>) of externally supplied digital signals to a controller module that is connected to it. Access to the Module from a controller module is performed through the input port that is specified by means of a Device ID. When an input port is read by the execution of an input command, the buffer gate associated with the input port is opened, and the digital signals supplied from an external device are fetched in groups. During this operation, if the module is the DI-8(FIT)GY, DIO-4/4(FIT)GY, signals that are transmitted to the controller module will be [ON (closed): 1, OFF (open): 0].

- Output

The Module writes a maximum of 8 points (<DO-8(FIT)GY>) or 4 points (<DIO-4/4(FIT)GY>) of digital signals to an external device. Access to the Module from a controller module is performed through the output port that is specified by means of a Device ID. When data is written to the output port by the execution of an output command, the data is held on the latch circuit that is associated with the output port. After being electrically isolated by an optocoupler, if the module is the DO-8(FIT)GY, DIO-4/4(FIT)GY, the digital signals are transmitted to the connected external device through transistors. During this operation, signals that are transmitted to the external device will be [ON (closed): 1, OFF (open): 0].

Output data monitoring function

This function allows you to keep track of the signal data that is being output.

Functions and control method by controller connected

The DIO-4/4(FIT)GY, DI-8(FIT)GY, and DO-8(FIT)GY can be connected to a variety of controllers.

Supported controllers

Microcontroller Unit	: CPU-SBxx(FIT)GY
I/O Controller Module	: CPU-CAxx(FIT)GY
Monitoring & Control Server Unit	: SVR-MMF2(FIT)
Monitoring & Control Server Unit	: SVR-MMF(FIT)GY

Check each controller to which the module can be connected as well as the method of controlling the module when connected to that controller.

Connections to controllers

O: Permitted ×: Not permitted	CPU-SBxx(FIT)GY	CPU-CAxx(FIT)GY	SVR-MMF2(FIT)	SVR-MMF(FIT)GY
DIO-4/4(FIT)GY	O	O	O	O
DI-8(FIT)GY	O	O	O	O
DO-8(FIT)GY	O	O	O	O
Device ID setting range	0 - 7	0 - 7	0 - 7	0 - 7

Control method by controller connected

	CPU-SBxx(FIT)GY	CPU-CAxx(FIT)GY	SVR-MMF2(FIT)	SVR-MMF(FIT)GY
Control using the I/O address map	O			
Control using the memory address map		O		
Control via the Windows driver * FIT Protocol		O		
API-CAP(W32)		O		
API-SBP(W32)	O			
Control over the web (as set from within the browser)			O	O

* The API-SBP(W32) is included in the development kit [DTK-SBxx(FIT)GY]; the other drivers are bundled with each controller.

Control using the I/O address map
When connected to the CPU-SBxx(FIT)GY, the module can receive I/O instructions directly from the controller module. For details, see Chapter 4 "Using the I/O Address Map".

Control using the memory address map
When connected to the CPU-CAxx(FIT)GY, the module can be accessed from the host computer over the network. The module is assigned with its device ID in the memory managed by the controller module. The application running on the host computer controls the module by reading/writing the memory managed by the controller module. For details, see Chapter 5 "Using the Memory Address Map".

Control via the Windows driver
For the functions and settings available when using the Windows driver, refer to the reference manual and online help for each module.

Control over the web
You can monitor collected data and manage the log over the web. You can use your familiar browser to easily make various settings. For details, refer to the reference manual for the SVR-MMF2(FIT), SVR-MMF(FIT)GY.

Customer Support

CONTEC provides the following support services for you to use CONTEC products more efficiently and comfortably.

Web Site

Japanese	http://www.contec.co.jp/
English	http://www.contec.com/
Chinese	http://www.contec.com.cn/

Latest product information

CONTEC provides up-to-date information on products.
CONTEC also provides product manuals and various technical documents in the PDF.

Free download

You can download updated driver software and differential files as well as sample programs available in several languages.

Note! For product information

Contact your retailer if you have any technical question about a CONTEC product or need its price, delivery time, or estimate information.

Limited One-Year Warranty

CONTEC F&eIT products are warranted by CONTEC CO., LTD. to be free from defects in material and workmanship for up to one year from the date of purchase by the original purchaser.
Repair will be free of charge only when this device is returned freight prepaid with a copy of the original invoice and a Return Merchandise Authorization to the distributor or the CONTEC group office, from which it was purchased.
This warranty is not applicable for scratches or normal wear, but only for the electronic circuitry and original products. The warranty is not applicable if the device has been tampered with or damaged through abuse, mistreatment, neglect, or unreasonable use, or if the original invoice is not included, in which case repairs will be considered beyond the warranty policy.

How to Obtain Service

For replacement or repair, return the device freight prepaid, with a copy of the original invoice. Please obtain a Return Merchandise Authorization number (RMA) from the CONTEC group office where you purchased before returning any product.

* No product will be accepted by the CONTEC group without the RMA number.

Liability

The obligation of the warrantor is solely to repair or replace the product. In no event will the warrantor be liable for any incidental or consequential damages due to such defect or consequences that arise from Safety Precautions.
Understand the following definitions and precautions to use the product safely.

Safety Precautions

Understand the following definitions and precautions to use the product safely.

Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources. Understand the meanings of these labels to operate the equipment safely.

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

Handling Precautions

⚠ CAUTION

- Do not modify the module. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this module.

- Do not use or store the module in a hot or cold place, or in a place that is subject to severe temperature changes.
  (Operating temperature range: 0 - 50°C)

- Do not use or store the module in a place subject to direct sunlight or near a heating device, such as a stove.

- Do not use or store the module in a dusty or humid place.
  (Operating humidity range: 10 - 90%RH, no condensation)

- As this module contains precision electronic components, do not use or store it in environments subject to shock or vibration.

- Do not use or store the module near equipment generating a strong magnetic field or radio waves.

- If you notice any strange odor or overheating, please unplug the power cable immediately.

- In the event of an abnormal condition or malfunction, please consult the dealer from whom the module was purchased.

- To avoid electric shock, please do not touch the module with a wet hand.

- Do not open the module casing. CONTEC will disclaim any responsibility for module whose casing has been opened.

- Do not strike or bend the module. Doing so could damage the module.

- To prevent contact malfunction, please do not touch the metallic pins on the external module connector.

- The module contains switches that need to be properly set. Before using the module, please check its switch settings.

- To avoid malfunction, please do not change the module switch settings in an unauthorized manner.

- Do not connect the device module to the controller module already energized. To avoid malfunction, please be sure to turn off the control module before connecting the device module to it.

FCC PART 15 Class A Notice

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference at his own expense.

WARNING TO USER

Change or modifications not expressly approved the manufacturer can void the user's authority to operate this equipment.

Environment

Use this product in the following environment. If used in an unauthorized environment, the module may overheat, malfunction, or cause a failure.

Operating temperature

0 - 50°C

Operating humidity

10 - 90%RH (No condensation)

Corrosive gases

None

Floating dust particles

Not to be excessive

Inspection

Inspect the product periodically as follows to use it safely.

- Check that the ventilation slit has no obstruction and has no dust or foreign matter adhering.
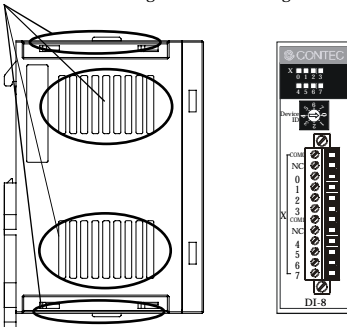
Storage

When storing this product, keep it in its original packing form.

(1) Put the module in the storage bag.

(2) Wrap it in the packing material, then put it in the box.

(3) Store the package at room temperature at a place free from direct sunlight, moisture, shock, vibration, magnetism, and static electricity.

Disposal

When disposing of the product, follow the disposal procedures stipulated under the relevant laws and municipal ordinances.

2. Module Nomenclature and Settings

Nomenclature of Module Components

Figure 2.1 shows the names of module components.

In the figure, the indicated switch settings represent factory settings.
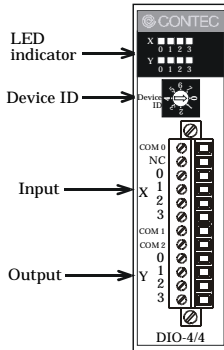
DIO-4/4(FIT)GY   DI-8(FIT)GY
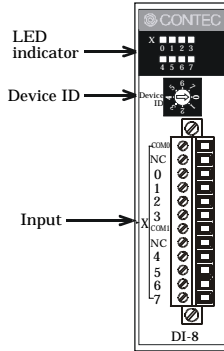
DO-8(FIT)GY
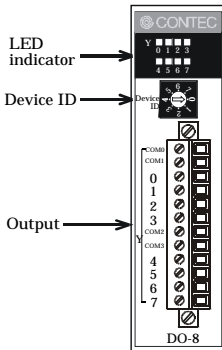
Figure 2.1.   Names of Module Components

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.

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.
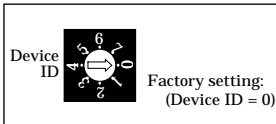
Figure 2.2. Setting a Device ID

LED Indicator

DIO-4/4(FIT)GY

Table 2.1. LED Indicator <DIO-4/4(FIT)GY>

Name	Function	LED indicator
Status LED	Input indicator (X0 - X3): GREEN	ON: Input ON
		OFF: Input OFF
	Output indicator (Y0 - Y3): RED	ON: Output ON
		OFF: Output OFF

DI-8(FIT)GY

Table 2.2. LED Indicator <DI-8(FIT)GY>

Name	Function	LED indicator
Status LED	Input indicator (X0 - X7): GREEN	ON: Input ON
		OFF: Input OFF

DO-8(FIT)GY

Table 2.3. LED Indicator <DO-8(FIT)GY>

Name	Function	LED indicator
Status LED	Output indicator (Y0 - Y7): RED	ON: Output ON
		OFF: Output OFF

3. Connecting to an External Device

Interface Connector

How to Connect an Interface Connector

When connecting the Module to an external device, you can use the supplied connector plug.
To wire the Module, strip the sheath about 9 - 10mm from an end of the wire and insert the exposed wire into an opening. Tighten the screw to fasten the inserted wire. Applicable wires are AWG28 - 16.

Turn the screw to fasten the wire.

9 - 10mm

- Applicable wire:
    3.81mm pitch, 12-pin type, 8.0A rated current
    MC1, 5/12-GF-3.81 [made by Phoenix Contact Corp.]

- Applicable plug:
    Front screw type with connector stopper flange
    FRONT-MC1, 5/12-SFT-3.81 [made by Phoenix Contact Corp.]
    Applicable cable: AWG28-16
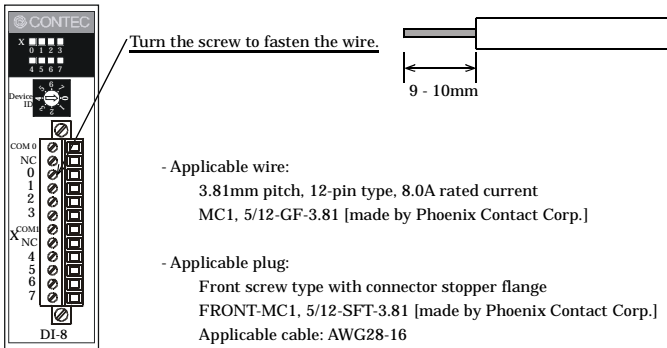
Figure 3.1. Connecting an Interface Connector and Connectors That Can Be Used

⚠ 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 12-pin connector that is provided on the Module face.

```
COM 0 --- +/-COM  ─ Input port
                    plus / minus common
N.C.
X 0 --- IN 0      ┐
X 1 --- IN 1      │
X 2 --- IN 2      │  Digital Input: 4points
X 3 --- IN 3      ┘
COM 1 --- +COM    ─ Output port plus common
COM 2 --- -COM    ─ Output port minus common
Y 0 --- OUT 0     ┐
Y 1 --- OUT 1     │  Digital Output: 4points
Y 2 --- OUT 2     │
Y 3 --- OUT 3     ┘
```
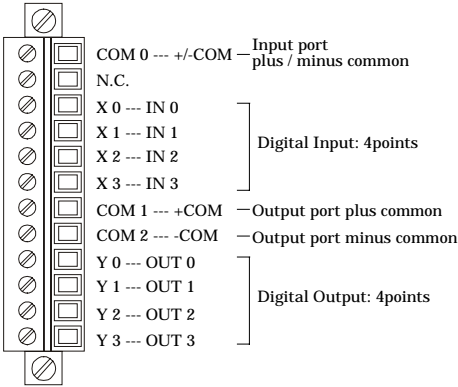
Figure 3.2. Signal Layout on the Interface Connector <DIO-4/4(FIT)GY>

```
COM 0 --- +/-COM  ─ Input port
                    plus / minus common
N.C.
X 0 --- IN 0      ┐
X 1 --- IN 1      │
X 2 --- IN 2      │  Digital Input: 4points
X 3 --- IN 3      ┘
COM 1 --- +/-COM
N.C.
X 4 --- IN 4      ┐
X 5 --- IN 5      │
X 6 --- IN 6      │  Digital Input: 4points
X 7 --- IN 7      ┘
```
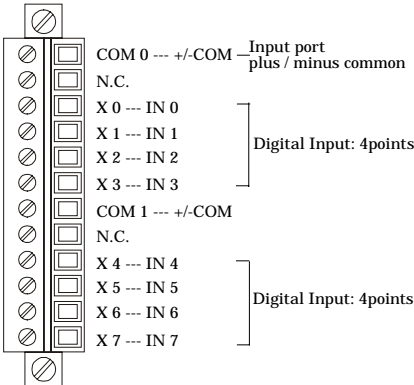
Figure 3.3. Signal Layout on the Interface Connector <DI-8(FIT)GY>

COM 0 --- +COM — Output port plus common
COM 1 --- -COM — Output port minus common
Y 0 --- OUT 0
Y 1 --- OUT 1   Digital Output: 4points
Y 2 --- OUT 2
Y 3 --- OUT 3
COM 2 --- +COM — Output port plus common
COM 3 --- -COM — Output port minus common
Y 4 --- OUT 4
Y 5 --- OUT 5   Digital Output: 4points
Y 6 --- OUT 6
Y 7 --- OUT 7
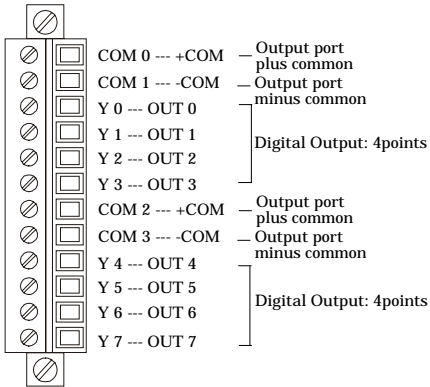
Figure 3.4. Signal Layout on the Interface Connector <DO-8(FIT)GY>

External I/O Circuits

Input section <DIO-4/4(FIT)GY>, <DI-8(FIT)GY>

Figure 3.5 shows the input equivalent circuit for the interface section of the <DIO-4/4(FIT)GY> and <DI-8(FIT)GY>.

The signal input section consists of an opto-isolated input (compatible with both current sink output and current source output). An external power supply is therefore required to drive the input section of this module. The power requirement for the <DIO-4/4(FIT)GY> or <DI-8(FIT)GY> is about 8 mA per input channel at 24 VDC (about 4 mA at 12 VDC).
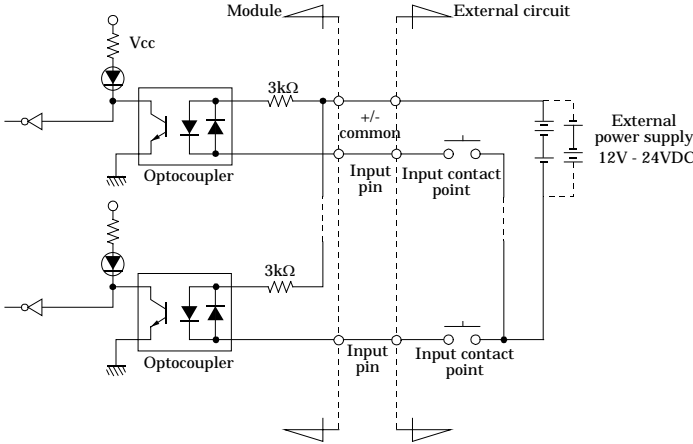
Figure 3.5. Input Circuit   <DIO-4/4(FIT)GY>, <DI-8(FIT)GY>
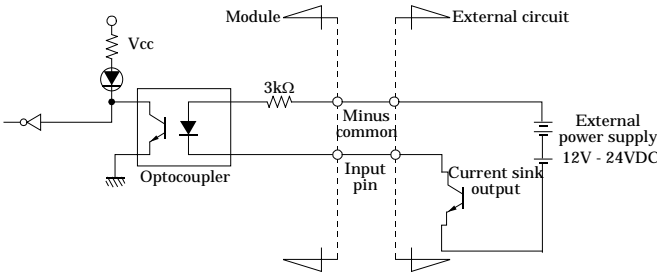
**Figure 3.6. Example of a Connection to Current Sink Output
                <DIO-4/4(FIT)GY>, <DI-8(FIT)GY>**
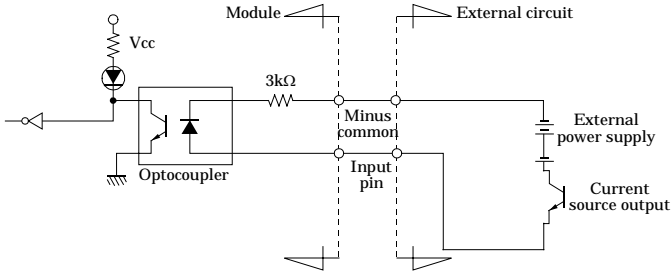
**Figure 3.7. Example of a Connection to Current Source Output
              <DIO-4/4(FIT)GY>, <DI-8(FIT)GY>**

Output section

Figure 3.8 shows the output circuit for the interface section of the <DIO-4/4(FIT)GY> and <DO-8(FIT)GY>. The signal output section consists of an opto-isolated open collector output (current sink type). An external power supply is therefore required to drive the output section of this module. The maximum output current rating per channel is 150 mA for the <DIO-4/4(FIT)GY> or <DO-8(FIT)GY> (at 12 - 24 VDC) or 50mA for the <DIO-4/4(FIT)GY> or <DO-8(FIT)GY> (at 36 - 48 VDC). A surge voltage protection circuit (zener diode) is provided for the output transistors of this module. When the module drives relays, lamps, and other induction loads, however, another surge voltage countermeasure should be provided on the load side.

⚠ CAUTION

When the power is turned on, all output will be OFF.
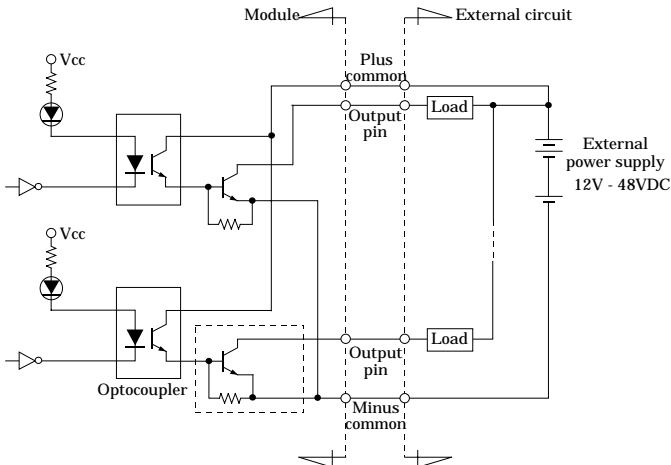
Figure 3.8. Output Circuit <DIO-4/4(FIT)GY>, <DO-8(FIT)GY>

Connection example:
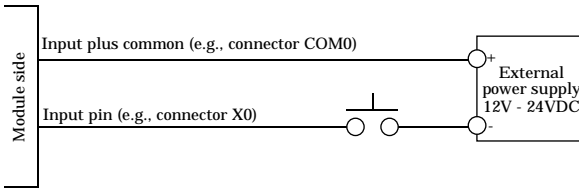
Figure 3.9. Using Inputs X0 <DIO-4/4(FIT)GY>, <DI-8(FIT)GY>
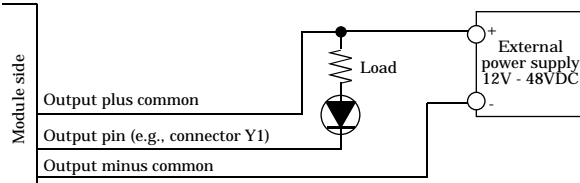
Figure 3.10. Using Outputs Y0 <DIO-4/4(FIT)GY>, <DO-8(FIT)GY>
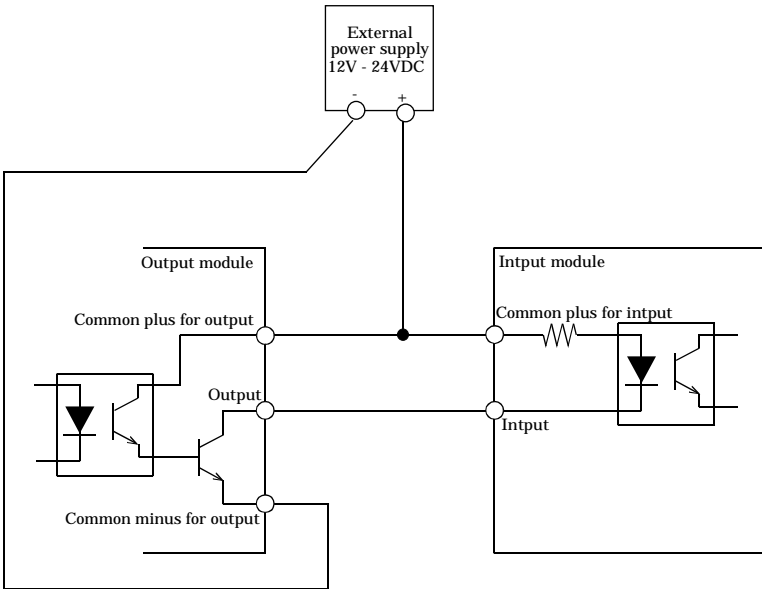
Figure 3.11. Example of Connecting Outputs and Inputs
            <DIO-4/4(FIT)GY>, <DI-8(FIT)GY> >, <DO-8(FIT)GY>

Surge Voltage Countermeasures

When a load that generates surge voltages and inrush currents, such as an induction load (relay coil) or an incandescent light bulb, is connected to the digital output, appropriate protection must be provided in order to prevent damage to the output stage or a malfunction due to noise. The rapid shutoff of a coil, such as in a relay, generates a sudden high-voltage pulse. If this voltage exceeds the withstand voltage of the output transistor, it can cause the transistor to gradually deteriorate, or even completely damage the transistor. Therefore, when driving an induction load, such as a relay coil, you should always connect a surge-absorbing device. The following illustrates a surge voltage countermeasure that can be employed:

Examples of use of relay coil

Output pin

Diode

Relay coil

Minus common

Output pin

Relay coil

Zener diode

Minus common
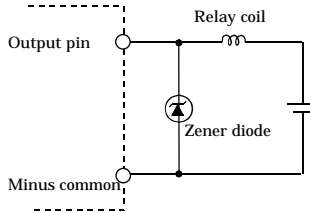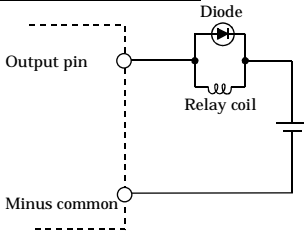
External power voltage < Zener diode voltage

Examples of use of lump

Output pin

Surge current prevention resistor

Minus common

Output pin

Resistor

Minus common
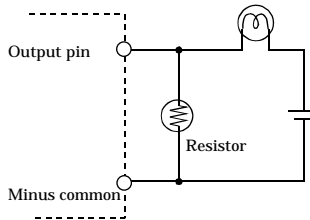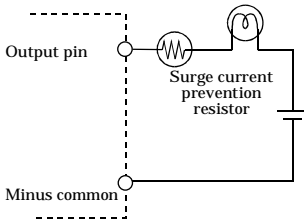
Figure 3.12.   Surge Voltage Countermeasure <DIO-4/4(FIT)GY>, <DO-8(FIT)GY>

⚠ CAUTION

In order for a protection circuit to operate effectively, it must be connected within 50 cm from a load and a contact point.

4. Using the I/O Address Map

Starting I/O Address

When connected to a CPU-SBxx(FIT)GY, the Module can directly receive I/O commands from the controller module. Depending on how the Device ID is set, the I/O addresses indicated below will be used exclusively by the Module.

Because the address bus on which I/O address space is allocated is not fully decoded in 16 bits, four starting I/O addresses exist for each Device ID.

If the Device ID is set to 0h, one of the four addresses (0800h, 0840h, 0880h, or 08C0h) will be used as a starting I/O address.

Table 4.1. List of Starting I/O Addresses
          <DIO-4/4(FIT)GY, DI-8(FIT)GY, DO-8(FIT)GY>

ID No.	Occupied I/O address			
0	0800h - 081Fh(recommended)	0840h - 085Fh	0880h - 089Fh	08C0h - 08DFh
1	1800h - 181Fh(recommended)	1840h - 185Fh	1880h - 189Fh	18C0h - 18DFh
2	2800h - 281Fh(recommended)	2840h - 285Fh	2880h - 289Fh	28C0h - 28DFh
3	3800h - 381Fh(recommended)	3840h - 385Fh	3880h - 389Fh	38C0h - 38DFh
4	4800h - 481Fh(recommended)	4840h - 485Fh	4880h - 489Fh	48C0h - 48DFh
5	5800h - 581Fh(recommended)	5840h - 585Fh	5880h - 589Fh	58C0h - 58DFh
6	6800h - 681Fh(recommended)	6840h - 685Fh	6880h - 689Fh	68C0h - 68DFh
7	7800h - 781Fh(recommended)	7840h - 785Fh	7880h - 789Fh	78C0h - 78DFh

For detailed specifications on the I/O space that is managed by the controller module, see the controller module manual.

List of I/O Address Maps

DIO-4/4(FIT)GY

Starting I/O address Input	D7	D6	D5	D4	D3	D2	D1	D0
		Products Category				Rivision Data		
+0 (00h)	0	0	0	1	Rivision Data 3	Rivision Data 2	Rivision Data 1	Rivision Data 0
				Products ID Number				
+1 (01h)	0	0	0	0	0	1	0	1
				Interrupt Status				
+2 (02h)	Enable (0)	Status (0)				IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)
+3 (03h)				Digital Filter				
	0	0	0	ST4	ST3	ST2	ST1	ST0
+4 (04h) +15 (0Fh)				N/A				
+16 (10h)				Input Group +0				
	0	0	0	0	IN 03	IN 02	IN 01	IN 00
+17H (11h) +19 (13h)				N/A				
+20 (14h)				Output Group +0				
	0	0	0	0	OUT 03	OUT 02	OUT 01	OUT 00
+21 (15h) +23 (17h)				N/A				
+24 (18h)				Interrupt Status 0				
	0	0	0	0	IN 03 Status	IN 02 Status	IN 01 Status	IN 00 Status
+25 (19h) +27 (1Bh)				Reserved				
+28 (1Ch)				Interrupt Edge Setting Data 0				
	0	0	0	0	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge
+29 (1Dh) +31 (1Fh)				Reserved				

OUTxx is provided for output data read-back purposes.

Figure 4.1. Input Port <DIO-4/4(FIT)GY>

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output +0 (00h) +1 (01h)				N/A				
+2 (02h)	Interrupt Status							
	Enable (0)					IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)
+3 (03h)	Digital Filter							
	0	0	0	ST4	ST3	ST2	ST1	ST0
+4 (04h) +19 (13h)				N/A				
+20 (14h)	Output Group +0							
	0	0	0	0	OUT 03	OUT 02	OUT 01	OUT 00
+21 (15h) +23 (17h)				N/A				
+24 (18h)	Interrupt Mask 0							
	0	0	0	0	IN 03 Mask	IN 02 Mask	IN 01 Mask	IN 00 Mask
+25 (19h) +27 (1Bh)				N/A				
+28 (1Ch)	Interrupt Edge Setting 0							
	0	0	0	0	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge
+29 (1Dh) +31 (1Fh)				N/A				

Figure 4.2. Output Port <DIO-4/4(FIT)GY>

DI-8(FIT)GY

Starting I/O address Input	D7	D6	D5	D4	D3	D2	D1	D0
+0 (00h)	Products Category				Rivision Data			
	0	0	0	1	Rivision Data 3	Rivision Data 2	Rivision Data 1	Rivision Data 0
+1 (01h)	Products ID Number							
	0	0	0	0	0	1	1	0
+2 (02h)	Interrupt Status							
	Enable (0)	Status (0)				IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)
+3 (03h)	Digital Filter							
	0	0	0	ST4	ST3	ST2	ST1	ST0
+4 (04h) +15 (0Fh)	N/A							
+16 (10h)	Input Group +0							
	IN 07	IN 06	IN 05	IN 04	IN 03	IN 02	IN 01	IN 00
+17H (11h) +23 (17h)	N/A							
+24 (18h)	Interrupt Status 0							
	IN 07 Status	IN 06 Status	IN 05 Status	IN 04 Status	IN 03 Status	IN 02 Status	IN 01 Status	IN 00 Status
+25 (19h) +27 (1Bh)	Reserved							
+28 (1Ch)	Interrupt Edge Setting Data 0							
	IN 07 Edge	IN 06 Edge	IN 05 Edge	IN 04 Edge	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge
+29 (1Dh) +31 (1Fh)	Reserved							

Figure 4.3. Input Port <DI-8(FIT)GY>

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output +0 (00h) +1 (01h)				N/A				
+2 (02h)	Interrupt Status							
	Enable (0)					IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)
+3 (03h)	Digital Filter							
	0	0	0	ST4	ST3	ST2	ST1	ST0
+4 (04h) +23 (17h)				N/A				
+24 (18h)	Interrupt Mask 0							
	IN 07 Mask	IN 06 Mask	IN 05 Mask	IN 04 Mask	IN 03 Mask	IN 02 Mask	IN 01 Mask	IN 00 Mask
+25 (19h) +27 (1Bh)				N/A				
+28 (1Ch)	Interrupt Edge Setting 0							
	IN 07 Edge	IN 06 Edge	IN 05 Edge	IN 04 Edge	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge
+29 (1Dh) +31 (1Fh)				N/A				

Figure 4.4. Output Port <DI-8(FIT)GY>

DO-8(FIT)GY

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Input	Products Category				Rivision Data			
+0 (00h)	0	0	0	1	Rivision Data 3	Rivision Data 2	Rivision Data 1	Rivision Data 0
	Products ID Number							
+1 (01h)	0	0	0	0	0	1	1	1
+2 (02h)	Reserved							
+19 (13h)								
+20 (14h)	Output Group +0							
	Out 07	Out 06	Out 05	Out 04	Out 03	Out 02	Out 01	Out 00
+21 (15h)	Reserved							
+31 (1Fh)								

OUTxx is provided for output data read-back purposes.

Figure 4.5. Input Port <DO-8(FIT)GY>

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output +0 (00h)								
					N/A			
+19 (13h)								
+20 (14h)				Output Group +0				
	Out 07	Out 06	Out 05	Out 04	Out 03	Out 02	Out 01	Out 00
+21 (15h)								
					N/A			
+31 (1Fh)								

Figure 4.6. Output Port <DO-8(FIT)GY>

Specifications Common to F&eIT Products

The starting I/O address range from +0h - +Fh is mapped commonly to all modules in the F&eIT series.

Product Information

Starting I/O address Input	D7	D6	D5	D4	D3	D2	D1	D0
	Product Category				Rivision Data			
+0 (00h)	0	0	0	1	Revision Data3	Revision Data2	Revision Data1	Revision Data0
	Product ID Number							
+1 (01h)	0	0	0	0	0	0	0	0
	Interruput Status							
+2 (02h)	Enable(0)	Status(0)	0	0	0	IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)

Figure 4.7. Product Information

- Revision Data [D3 - D0]:

    This is product update information, subject to change without notice, that is managed by CONTEC.

- Product Category [D7 - D4]:

    This is a module function classification code. For the DIO-4/4(FIT)GY, DI-8(FIT)GY and DO-8(FIT)GY, the code is "1h".

Table 4.2. Product Category

Code	Function
0	Bus expansion
1	Digital input-output
2	Analog input-output
3	Counter
4	Serial communications
5	GPIB
6-F	Reserved

- Products ID Number [D7 - D0]:

    This is the product ID within the same product category.

    DIO-4/4(FIT)GY : 5h
    DI-8(FIT)GY   : 6h
    DO-8(FIT)GY   : 7h

Following are examples of initialization coded in high-level languages:

Microsoft C	Microsoft QBASIC
ProductID = inp(ADR+1);	ProductID = INP(ADR+1)

* ADR is the starting I/O address for the DIO-4/4(FIT)GY, DI-8(FIT)GY and DO-8(FIT)GY.

Interrupt status

This is a common port on which the interrupt status requested by the Module can be verified.
Information on interrupt sources varies from module to module.

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Input	Interruput Status							
+2 (02h)	Enable (0)	Status (0)	0	0	0	IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)

Figure 4.8. Interrupt Status

-    Enable [D7]:

     This bit verifies the interrupt source enabled/disabled status.
     The value "1" indicates that a hardware interrupt on the controller module is enabled.

-    Status [D6]:

     This bit indicates an interrupt request status in the module. When an interrupt event has occurred in the module and IRQ5, IRQ7, or IRQ9 is "1", this bit will also be "1".

-    IRQ* [D2 - D0]:

     These bits allow you to verify the interrupt level that is currently set. The current interrupt level is indicated as "1".

Setting an interrupt level

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output	Interruput Status							
+2 (02h)	Enable (0)	Status (0)	0	0	0	IRQ 9 (0)	IRQ 7 (0)	IRQ 5 (0)

Figure 4.9. Setting an interrupt level

-    Enable [D7]:

     This bit enables an interrupt source. Setting the bit to "1" enables hardware interrupts to the controller module.

-    IRQ* [D2 - D0]:

     The interrupt level used by the module is set in these bits. Setting any of the IRQs to "1" makes the signal on that IRQ active upon reception of an interrupt request.

Interrupt Control Function

All of the input signals can be used as interrupt request signals. (DIO-4/4(FIT)GY: 4 points, DI-8(FIT)GY: 8 points)

When an input signal goes OFF from ON or vice versa, an interrupt request signal can be generated to the controller.

Note that, when a digital filter is used, the input signal passing through the filter generates an interrupt request.

Input Port < DIO-4/4(FIT)GY >

Starting I/O address

	D7	D6	D5	D4	D3	D2	D1	D0
	Interrupt Status 0							
+24 (18h)	0	0	0	0	IN 03 Status	IN 02 Status	IN 01 Status	IN 00 Status
	Interrupt Edge Setting Data 0							
+28 (1Ch)	0	0	0	0	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge

Figure 4.10. Interrupt Control Function Input Port < DIO-4/4(FIT)GY >

Intput Port < DI-8(FIT)GY >

Starting I/O address

	D7	D6	D5	D4	D3	D2	D1	D0
	Interrupt Status 0							
+24 (18h)	IN 07 Status	IN 06 Status	IN 05 Status	IN 04 Status	IN 03 Status	IN 02 Status	IN 01 Status	IN 00 Status
	Interrupt Edge Setting Data 0							
+28 (1Ch)	IN 07 Edge	IN 06 Edge	IN 05 Edge	IN 04 Edge	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge

Figure 4.11. Interrupt Control Function Input Port < DI-8(FIT)GY >

Output Port < DIO-4/4(FIT)GY >

Starting I/O address

	D7	D6	D5	D4	D3	D2	D1	D0
	Interrupt Mask 0							
+24 (18h)	0	0	0	0	IN 03 Mask	IN 02 Mask	IN 01 Mask	IN 00 Mask
	Interrupt Edge Setting 0							
+28 (1Ch)	0	0	0	0	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge

Figure 4.12. Interrupt Control Function Output Port < DIO-4/4(FIT)GY >

Output Port < DI-8(FIT)GY >

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
				Interrupt Mask 0				
+24 (18h)	IN 07 Mask	IN 06 Mask	IN 05 Mask	IN 04 Mask	IN 03 Mask	IN 02 Mask	IN 01 Mask	IN 00 Mask
				Interrupt Edge Setting 0				
+28 (1Ch)	IN 07 Edge	IN 06 Edge	IN 05 Edge	IN 04 Edge	IN 03 Edge	IN 02 Edge	IN 01 Edge	IN 00 Edge

Figure 4.13.   Interrupt Control Function Output Port < DI-8(FIT)GY >

Interrupt signal status

When an input signal goes OFF from ON or vice versa, an interrupt request generates to the controller. The "interrupt status" input port is provided to identify the input signal that requests the interrupt.

Clearing an interrupt signal

Once an interrupt has been generated, the next interrupt request cannot be accepted until the current interrupt signal is cleared. When the interrupt function is used, therefore, the interrupt signal must be cleared within the interrupt handling program. Reading the interrupt status port clears the interrupt signal and the status in the port read at the same time.

Disabling/enabling interrupts

Using the interrupt mask port to, set each bit to enable or disable interrupts.
If you set an interrupt mask bit to "1", no interrupt occurs even when the input signal of the corresponding bit causes state transition.
To generate an interrupt, set the corresponding interrupt mask bit to "0" to enable interrupts.

Selecting an interrupt trigger edge

Interrupt input logic is set by using the interrupt edge select port.
If you set an interrupt edge select bit to "0", an interrupt occurs when the input signal of the corresponding bit falls from ON to OFF (upon "0" to "1" transition).
If you set an interrupt edge select bit to "1", an interrupt occurs when the input signal of the corresponding bit rises from OFF to ON (upon "1" to "0" transition).

Digital Filter (Hardware)

Using this feature, this product can apply a digital filter to every input pin, thereby preventing the input signal from being affected by noise or chattering.

Digital Filter Operation Principle

The digital filter checks the input signal level during the sampling time of 1/4 cycles of digital filter setting time. When the signal level remains the same for the digital filter setting time (four time sampling), the digital filter recognizes that signal as the normal input signal and changes the filter output signal level.

When there will be a change in the signal in the digital filter setting time (sampling four times), the input signal till then is disregarded and it continues the level check again.

If the signal level changes at a frequency shorter than the set time, therefore, the level change is ignored.
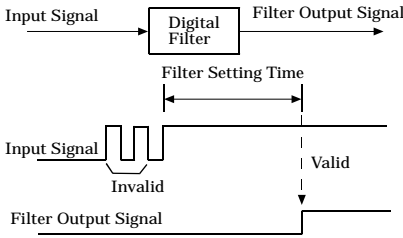
Figure 4.14.   Digital Filter Operation Principle

Set Digital Filter Time

Input Port

	D7	D6	D5	D4	D3	D2	D1	D0
	Digital Filter Data							
+3 (03h)	0	0	0	ST4	ST3	ST2	ST1	ST0

Output Port

	D7	D6	D5	D4	D3	D2	D1	D0
	Digital Filter Data							
+3 (03h)	0	0	0	ST4	ST3	ST2	ST1	ST0

Figure 4.15.   Set Digital Filter Time

Set Digital Filter Time

Output setting data "ST4 - ST0" to the "time setting" output port to set the digital filter time.

Table 4.3. Digital Filter Time and Setting Data
The table below lists the relationships between digital filter time and setting data.

Digital Filter Time [sec] = $2^n / (8 \times 10^6)$

n: Setting Data (0 - 20)

Setting Data (n)	Digital Filter Time	Setting Data (n)	Digital Filter Time	Setting Data (n)	Digital Filter Time
0 (00h) *1	Not used	7 (07h)	16μSec	14 (0Eh)	2.048mSec
1 (01h)	0.25μSec	8 (08h)	32μSec	15 (0Fh)	4.096mSec
2 (02h)	0.5μSec	9 (09h)	64μSec	16 (10h)	8.192mSec
3 (03h)	1μSec	10 (0Ah)	128μSec	17 (11h)	16.384mSec
4 (04h)	2μSec	11 (0Bh)	256μSec	18 (12h)	32.768mSec
5 (05h)	4μSec	12 (0Ch)	512μSec	19 (13h)	65.536mSec
6 (06h)	8μSec	13 (0Dh)	1024μSec	20 (14h)	131.072mSec

*1: Factory setting

⚠ CAUTION ─────────────────────────────────

- The default value for digital filter setting time is "Not used". The default setting is used when the power is turned on.

- The digital filter applies to all input channels; it cannot apply to specific input pins only.

- Do not set the setting data to any value other than the above. Doing so may result in a malfunction.

- A digital filter doesn't work effectively when the filter time is set in the opto-coupler response time.

- It differs according to the product at the opto-coupler response time. (For more details, refer to the functional specification.)

Data I/O Operations that Directly Access an I/O Port

Data Input

DIO-4/4(FIT)GY

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Input	Input Group +0							
+16 (10h)	0	0	0	0	IN 3	IN 2	IN 1	IN 0

Figure 4.16.   Input Port [Starting I/O Address +10h] <DIO-4/4(FIT)GY>

DI-8(FIT)GY

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Input	Input Group +0							
+16 (10h)	IN 07	IN 06	IN 05	IN 04	IN 03	IN 02	IN 01	IN 00

Figure 4.17.   Input Port [Starting I/O Address +10h] <DI-8(FIT)GY>

Data can be input by using the input port [starting I/O address + 10h].

When input is [ON], the corresponding bit for the input data will be [1]. Conversely, when input is [OFF], the corresponding bit for the input data will be [0].

Data Output

DIO-4/4(FIT)GY

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output	Output Group +0							
+20 (14h)	0	0	0	0	OUT 3	OUT 2	OUT 1	OUT 0

Figure 4.18.   Output Port [Starting I/O Address +14h] <DIO-4/4(FIT)GY>

DO-8(FIT)GY

Starting I/O address	D7	D6	D5	D4	D3	D2	D1	D0
Output	Output Group +0							
+20 (14h)	OUT 07	OUT 06	OUT 05	OUT 04	OUT 03	OUT 02	OUT 01	OUT 00

Figure 4.19.   Output Port [Starting I/O Address +14h] <DO-8(FIT)GY>

Data can be output by using the output port [starting I/O address + 14h (<DIO-4/4(FIT)GY>, <DO-8(FIT)GY>)].

When the value [1] is written to the corresponding bit for the output data, the corresponding transistor will be [ON]. Conversely, when the value [0] is written to the corresponding bit for the output data, the corresponding transistor will be [OFF].

⚠ CAUTION
    When the power is turned on, all output ports will be [0].

Monitoring the Output Data

In the <DIO-4/4(FIT)GY> or <DO-8(FIT)GY>, this function allows you to read the status of the current output data without affecting the output data itself.

DIO-4/4(FIT)GY

Starting I/O address Output	D7	D6	D5	D4	D3	D2	D1	D0
	Output Group +0							
+20 (14h)	0	0	0	0	OUT 3	OUT 2	OUT 1	OUT 0

Figure 4.20.   Output Data-Monitoring Input Port <DIO-4/4(FIT)GY>

DO-8(FIT)GY

Starting I/O address Output	D7	D6	D5	D4	D3	D2	D1	D0
	Output Group +0							
+20 (14h)	OUT 07	OUT 06	OUT 05	OUT 04	OUT 03	OUT 02	OUT 01	OUT 00

Figure 4.21.   Output Data-Monitoring Input Port <DO-8(FIT)GY>

Examples

Software Mode

Flowchart

Following is a description of an example where the DIO-4/4(FIT)GY is installed at device ID: 0.

```
      ┌─────────────┐
      │    Start    │
      └─────────────┘
             │
    ┌──────────────────┐
    │  Read input data │      Address: Reading the address "base I/O address + 10h" obtains digital input data.
    └──────────────────┘
             │                Address: Data can be output by writing the digital output data to the address
    ┌──────────────────┐               "base I/O address + 14h".
    │  Set output data │
    └──────────────────┘
             │
      ┌─────────────┐
      │     End     │
      └─────────────┘
```
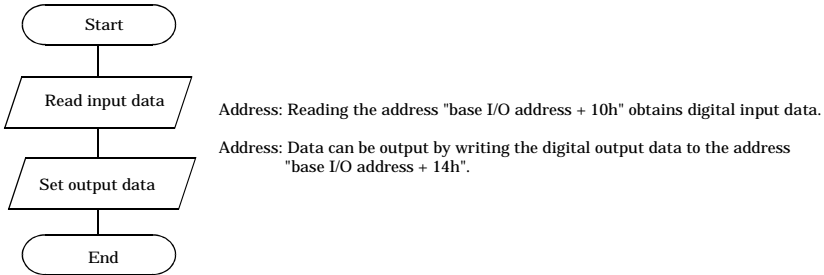
Sample program

```c
/* ========================================================================
    Sample program 1

    DEVICE ID:       0
    Channel:         Input 1ch/Output 1ch
==================================================================== */
#include  <stdio.h>
#include  <conio.h>

/* ----- Constant --------------------------------------------------- */
#define   ADR   0x0800       /* I/O address */

/* ----- Prototype -------------------------------------------------- */
void  main( void );

/* ----- Main ------------------------------------------------------- */
void  main( void )
{
    unsigned char    inData;
    unsigned char    outData=0xff;

    inData=(unsigned char)inp( ADR+0x10 );
    outp( ADR+0x14, outData );

    printf("Input Data %02x\n", inData);
    printf("Output Data %02x\n", outData);
}
```

5. Using the Memory Address Map

When connected to a CPU-CAxx(FIT)GY, the DIO-4/4(FIT)GY, DI-8(FIT)GY and DO-8(FIT)GY can be accessed by a host computer through a network. In addition, the Module can be allocated to the memory controlled by the Controller Module according to a given Device ID. Applications running on the host computer control the I/O modules by reading/writing the memory that is controlled by the Controller Module.

For detailed specifications on the memory controlled by the Controller Module, see the Controller Module manual.

Following is an explanation of the memory areas necessary for the use of this I/O module: the "module area", the "module information area", and the "basic data area".

Module Information area

This area controls the settings and how the module is started.

The module becomes available when the necessary settings are written into this area and the module activation option is set in the [module startup register].

Module information area

The current module settings are stored in this area.

When the Module is started, the contents of the Module Information Area are copied to the Module Information Area. By reading this area, you can verify the current module settings.

Basic input data area

Basic input data is read in this area.

DIO-4/4(FIT)GY

Module Information Area

A module information area, which is a 128-byte (80h) area beginning with address 301000h and corresponding to a given Device ID, is where the settings for the given device are read and written.

The starting address can be determined according to the following expression:

Starting address = 301000h + 80h x (Device ID)

Table 5.1. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value(h)	Initial settings
Starting address+00	Module-specific information	Module type (category)	1	R	01	
Starting address+01		Module type (serial No.)	1	R	05	DIO-4/4(FIT)GY
Starting address+02		System-reserved (revision No.)	1	R	None	
Starting address+03		Supported functions	1	R	03	Basic I/O
Starting address+04		Number of basic input channels	1	R	01	1 channel
Starting address+05		Basic input data size	1	R	01	1 byte
Starting address+06		Number of basic output channels	1	R	01	1 channel
Starting address+07		Basic output data size	1	R	01	1 byte
Starting address+08		Input channel settings address	1	R	20	20h
Starting address+09		Input channel settings data size	1	R	18	24 bytes
Starting address+0A		Output channel settings address	1	R	50	50h
Starting address+0B		Output channel settings data size	1	R	18	24 bytes
Starting address+0C - Starting address+0F		Reserved	4	R	None	
Starting address+10	Common to modules	Module startup register	1	R	01	
Starting address+11		Error status	1	R	00	
Starting address+12		Hardware Digital filter setting	1	R/W	00	Not used
Starting address+13 - Starting address+1F		Reserved	13	R	None	
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None	

Module-specific information

- Module type (category)

  The DIO-4/4(FIT)GY belongs to the digital module (01h) category.

- Module type (serial No.)

  The DIO-4/4(FIT)GY is a digital module with a serial No. 5 (05h).

- Supported functions

  The DIO-4/4(FIT)GY supports the basic input function (03h).

  Basic I/O data takes digital values.

- Number of basic input channels

  The number of basic input channels for the DIO-4/4(FIT)GY is 1 (01h).

  One digital input channel is provided.

- Basic input data size

  The basic input data size for the DIO-4/4(FIT)GY is 1 (01h) byte.

  This is equal to an 8-bit data area.

- Number of basic output channels

  The number of basic output channels for the DIO-4/4(FIT)GY is 1 (01h).

  One digital output channel is provided.

- Basic output data size

  The basic output data size for the DIO-4/4(FIT)GY is 1 (01h) byte.

  This is equal to an 8-bit data area.

- Input channel settings address

  The DIO-4/4(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Input channel settings data size

  The DIO-4/4(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings address

  The DIO-4/4(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings data size

  The DIO-4/4(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

Items common to modules

- Module startup register

  The DIO-4/4(FIT)GY does not contain a module shutdown function.

  01h : Module startup

- Error status

  The error status bits, which are not reflected in the module information area, always remain [00h].

  The error status on a module is stored in the module information area.

- Hardware Digital Filter setup

  Set the time for the hardware digital filter. The factory setting is "00h" (digital filter disabled). The other settings available are shown in "Digital Filter (Hardware)".

Module Information Area

The module information area, which is a 128-byte (80h) area beginning with address 300000h and corresponding to a given Device ID, is the area into which settings are read.

The starting address can be determined according to the following expression:

Starting address = 300000h + 80h x (Device ID)

Table 5.2. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value (h)
Starting address+00	Module-specific information	Module type (category)	1	R	00
Starting address+01		Module type (serial No.)	1	R	00
Starting address+02		System-reserved (revision No.)	1	R	None
Starting address+03		Supported functions	1	R	00
Starting address+04		Number of basic input channels	1	R	00
Starting address+05		Basic input data size	1	R	00
Starting address+06		Number of basic output channels	1	R	00
Starting address+07		Basic output data size	1	R	00
Starting address+08		Input channel settings address	1	R	00
Starting address+09		Input channel settings data size	1	R	00
Starting address+0A		Output channel settings address	1	R	00
Starting address+0B		Output channel settings data size	1	R	00
Starting address+0C - Starting address+0F		Reserved	4	R	None
Starting address+10	Common to modules	Module startup register	1	R	01
Starting address+11		Error status	1	R	00
Starting address+12		Hardware Digital filter setting	1	R	00
Starting address+13 - Starting address+1F		Reserved	13	R	None
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None

When the module is started, the contents of the module information area are stored in the module information area, with the exception of the [Module Startup Register] and the [Error Status].

- Module startup register
  The DIO-4/4(FIT)GY does not contain a module shutdown function.
  01h : Module operating

- Error status

  This register stores the error status of the module.
  The error status register is reset when the module is restarted.
        00h : Normal status

Basic I/O Data Area

The basic input data area, which a 128-byte (80h) area beginning with address 304000h, corresponds to a given Device ID.

The starting address can be determined according to the following expression:

Starting address = 304000h + 80h x (Device ID)

Table 5.3. Basic Input Data Area

Address(h)	Area	Item	Size	Access type
Starting address+00	IN0	Digital input values	1	R
Starting address+01 - Starting address+7F	Reserved		127	R

Digital input values

Input values IN00 - IN03 are stored as follows:

Table 5.4. Digital Input Values

	D7	D6	D5	D4	D3	D2	D1	D0	
+0h	-	-	-	-	IN03	IN02	IN01	IN00	IN0

The basic output data area, which is a 128-byte (80h) area beginning with address 305000h, corresponds to a given Device ID.

The starting address can be determined according to the following expression:

Starting address = 305000h + 80h x (Device ID)

Table 5.5. Basic Output Data Area

Address(h)	Area	Item	Size	Access type
Starting address+00	OUT0	Digital output values	1	R/W
Starting address+01 - Starting address+7F	Reserved		127	R

Digital output values

Output values OUT00 - OUT03 are stored as follows:

Table 5.6. Digital Output Values

	D7	D6	D5	D4	D3	D2	D1	D0	
+0h	-	-	-	-	OUT03	OUT02	OUT01	OUT00	OUT0

DI-8(FIT)GY

Module Information Area

A module information area, which is a 128-byte (80h) area beginning with address 301000h and corresponding to a given Device ID, is where the settings for the given device are read and written.

The starting address can be determined according to the following expression:

Starting address = 301000h + 80h x (Device ID)

Table 5.7. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value(h)	Initial settings
Starting address+00	Module-specific information	Module type (category)	1	R	01	
Starting address+01		Module type (serial No.)	1	R	06	DI-8(FIT)GY
Starting address+02		System-reserved (revision No.)	1	R	None	
Starting address+03		Supported functions	1	R	01	Basic input
Starting address+04		Number of basic input channels	1	R	01	1 channel
Starting address+05		Basic input data size	1	R	01	1 byte
Starting address+06		Number of basic output channels	1	R	00	0 channel
Starting address+07		Basic output data size	1	R	00	0 byte
Starting address+08		Input channel settings address	1	R	20	20h
Starting address+09		Input channel settings data size	1	R	18	24 bytes
Starting address+0A		Output channel settings address	1	R	50	50h
Starting address+0B		Output channel settings data size	1	R	18	24 bytes
Starting address+0C - Starting address+0F		Reserved	4	R	None	
Starting address+10	Common to modules	Module startup register	1	R	01	
Starting address+11		Error status	1	R	00	
Starting address+12		Hardware Digital filter setting	1	R/W	00	Not used
Starting address+13 - Starting address+1F		Reserved	13	R	None	
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None	

Module-specific information

- Module type (category)

  The DI-8(FIT)GY belongs to the digital module (01h) category.

- Module type (serial No.)

  The DI-8(FIT)GY is a digital module with a serial No. 6 (06h).

- Supported functions

  The DI-8(FIT)GY supports the basic input function (01h).

  Basic input data takes digital values.

- Number of basic input channels

  The number of basic input channels for the DI-8(FIT)GY is 1 (01h).

  Two digital input channels are provided.

- Basic input data size

  The basic input data size for the DI-8(FIT)GY is 1 (01h) byte.

  This is equal to an 8-bit data area.

- Number of basic output channels

  The number of basic output channels for the DI-8(FIT)GY is 0 (00h).

  No digital output channels are provided.

- Basic output data size

  The basic output data size for the DI-8(FIT)GY is 0 (00h) byte.

- Input channel settings address

  The DI-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Input channel settings data size

  The DI-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings address

  The DI-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings data size

  The DI-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

Items common to modules

-    Module startup register

     The DI-8(FIT)GY does not contain a module shutdown function.
     01h : Module startup

-    Error status

     The error status bits, which are not reflected in the module information area, always remain [00h].

     The error status on a module is stored in the module information area.

-    Hardware Digital Filter setup

     Set the time for the hardware digital filter. The factory setting is "00h" (digital filter disabled). The other settings available are shown in "Digital Filter (Hardware)".

Module Information Area

The module information area, which is a 128-byte (80h) area beginning with address 300000h and corresponding to a given Device ID, is the area into which settings are read.

The starting address can be determined according to the following expression:

Starting address = 300000h + 80h x (Device ID)

Table 5.8. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value (h)
Starting address+00	Module-specific information	Module type (category)	1	R	00
Starting address+01		Module type (serial No.)	1	R	00
Starting address+02		System-reserved (revision No.)	1	R	None
Starting address+03		Supported functions	1	R	00
Starting address+04		Number of basic input channels	1	R	00
Starting address+05		Basic input data size	1	R	00
Starting address+06		Number of basic output channels	1	R	00
Starting address+07		Basic output data size	1	R	00
Starting address+08		Input channel settings address	1	R	00
Starting address+09		Input channel settings data size	1	R	00
Starting address+0A		Output channel settings address	1	R	00
Starting address+0B		Output channel settings data size	1	R	00
Starting address+0C - Starting address+0F		Reserved	4	R	None
Starting address+10	Common to modules	Module startup register	1	R	01
Starting address+11		Error status	1	R	00
Starting address+12		Hardware Digital filter setting	1	R	00
Starting address+13 - Starting address+1F		Reserved	13	R	None
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None

When the module is started, the contents of the module information area are stored in the module information area, with the exception of the [Module Startup Register] and the [Error Status].

- Module startup register

  The DI-8(FIT)GY does not contain a module shutdown function.
  01h : Module operating

- Error status

  This register stores the error status of the module.
  The error status register is reset when the module is restarted.
  00h : Normal status

Basic I/O Data Area

The basic I/O data area, which a 128-byte (80h) area beginning with address 304000h, corresponds to a given Device ID.

The starting address can be determined according to the following expression:

Starting address = 304000h + 80h x (Device ID)

Table 5.9. Basic I/O Data Area

Address(h)	Area	Item	Size	Access type
Starting address+00	IN0	Digital input values	1	R
Starting address+01 - Starting address+7F	Reserved		127	R

Digital input values

Input values IN00 - IN07 and IN10 - IN17 are stored as follows:

Table 5.10. Digital Input Values

	D7	D6	D5	D4	D3	D2	D1	D0	
+0h	IN07	IN06	IN05	IN04	IN03	IN02	IN01	IN00	IN0

DO-8(FIT)GY

Module Information Area

A module information area, which is a 128-byte (80h) area beginning with address 301000h and corresponding to a given Device ID, is where the settings for the given device are read and written.

The starting address can be determined according to the following expression:

Starting address = 301000h + 80h x (Device ID)

Table 5.11. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value(h)	Initial settings
Starting address+00		Module type (category)	1	R	01	
Starting address+01		Module type (serial No.)	1	R	07	DO-8(FIT)GY
Starting address+02		System-reserved (revision No.)	1	R	None	
Starting address+03		Supported functions	1	R	02	Basic input
Starting address+04		Number of basic input channels	1	R	00	0 channel
Starting address+05		Basic input data size	1	R	00	0 byte
Starting address+06	Module-specific information	Number of basic output channels	1	R	01	1 channel
Starting address+07		Basic output data size	1	R	01	1 byte
Starting address+08		Input channel settings address	1	R	20	20h
Starting address+09		Input channel settings data size	1	R	18	24 bytes
Starting address+0A		Output channel settings address	1	R	50	50h
Starting address+0B		Output channel settings data size	1	R	18	24 bytes
Starting address+0C - Starting address+0F		Reserved	4	R	None	
Starting address+10		Module startup register	1	R	01	
Starting address+11		Error status	1	R	00	
Starting address+12	Common to modules	Hardware Digital filter setting	1	R/W	00	Not used
Starting address+13 - Starting address+1F		Reserved	13	R	None	
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None	

Module-specific information

- Module type (category)

    The DO-8(FIT)GY belongs to the digital module (01h) category.

- Module type (serial No.)

    The DO-8(FIT)GY is a digital module with a serial No. 7 (07h).

Supported functions

    The DO-8(FIT)GY supports the basic output function (02h).

    Basic output data takes digital values.

- Number of basic input channels

    The number of basic input channels for the DO-8(FIT)GY is 0 (00h).

    No digital input channels are provided.

- Basic input data size

    The basic input data size for the DO-8(FIT)GY is 0 (00h) byte.

- Number of basic output channels

    The number of basic output channels for the DO-8(FIT)GY is 1 (01h).

    Two digital output channels are provided.

- Basic output data size

    The basic output data size for the DO-8(FIT)GY is 1 (01h) byte.

- Input channel settings address

    The DO-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Input channel settings data size

    The DO-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings address

    The DO-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

- Output channel settings data size

    The DO-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

Items common to modules

- Module startup register

    The DO-8(FIT)GY does not contain a module shutdown function.
    01h : Module startup

- Error status

    The error status bits, which are not reflected in the module information area, always remain [00h].

    The error status on a module is stored in the module information area.

Chanel settings

The DO-8(FIT)GY does not have channel-specific settings. This field is provided for compatibility with other device modules.

Module Information Area

The module information area, which is a 128-byte (80h) area beginning with address 300000h and corresponding to a given Device ID, is the area into which settings are read.

The starting address can be determined according to the following expression:

Starting address = 300000h + 80h x (Device ID)

Table 5.12. Module Information Area

Address(h)	Area	Item	Size	Access type	Initial value (h)
Starting address+00	Module-specific information	Module type (category)	1	R	00
Starting address+01		Module type (serial No.)	1	R	00
Starting address+02		System-reserved (revision No.)	1	R	None
Starting address+03		Supported functions	1	R	00
Starting address+04		Number of basic input channels	1	R	00
Starting address+05		Basic input data size	1	R	00
Starting address+06		Number of basic output channels	1	R	00
Starting address+07		Basic output data size	1	R	00
Starting address+08		Input channel settings address	1	R	00
Starting address+09		Input channel settings data size	1	R	00
Starting address+0A		Output channel settings address	1	R	00
Starting address+0B		Output channel settings data size	1	R	00
Starting address +0C - Starting address+0F		Reserved	4	R	None
Starting address+10	Common to modules	Module startup register	1	R	01
Starting address+11		Error status	1	R	00
Starting address+12		Hardware Digital filter setting	1	R	00
Starting address+13 - Starting address+1F		Reserved	13	R	None
Starting address+20 - Starting address+7F	Channel settings	Reserved	96	R	None

When the module is started, the contents of the module information area are stored in the module information area, with the exception of the [Module Startup Register] and the [Error Status].

- Module startup register

    The DO-8(FIT)GY does not contain a module shutdown function.
    01h : Module operating

- Error status

     This register stores the error status of the module.
    The error status register is reset when the module is restarted.
        00h : Normal status

Basic I/O Data Area

The basic I/O data area, which a 128-byte (80h) area beginning with address 305000h, corresponds to a given Device ID.

The starting address can be determined according to the following expression:

Starting address = 305000h + 80h x (Device ID)

Table 5.13. Basic I/O Data Area

Address(h)	Area	Item	Size	Access type
Starting address+00	OUT0	Digital output values	1	R/W
Starting address+01 - Starting address+7F	Reserved		127	R

Digital output values

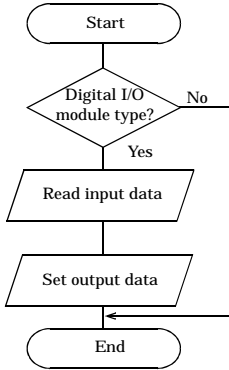Output values Y00 - Y07 and Y10 - Y17 are stored as follows:

Table 5.14. Digital Output Values

	D7	D6	D5	D4	D3	D2	D1	D0	
+0h	OUT 07	OUT 06	OUT 05	OUT 04	OUT 03	OUT 02	OUT 01	OUT 00	OUT0

Examples

Flowchart

The following flowchart illustrates an example where the DIO-4/4(FIT)GY is installed at device ID: 0.

Address: Reading the address 301000h identifies the module type (category).
 If the module is a digital I/O module, the module type (category)
 will be [01h].
 This operation also determines the existence of a module.
 (If no modules are found, the result will be [00h].)

Address: Reading the address 304000h obtains digital input data.

Address: Writing 2 bytes of analog output data to 35000h enables output from CH0.
 Subsequently, analog output data can be written in 2 bytes up to CH3.

Sample program

```
/*======================================================================

    F&eIT I/F Sample Program

    DEVICE ID:      0

==================================================================== */
#include  <windows.h>

#include  <stdio.h>

#include  <stdlib.h>

#include  <conio.h>

#include  "Fit.h"


/* Address(common) */
#define   FIT_IO                    (0x00300000)

#define   FIT_IO_DEVICE_INFOR       (0x0000)

#define   FIT_IO_DEVICE_CONFIG      (0x1000)

#define   FIT_IO_INPUT              (0x4000)

#define   FIT_IO_OUTPUT             (0x5000)


#define   FIT_IO_DEVICE_SIZE        (0x0080)


#define   FIT_PRODUCT_CATEGORY      (0x00)
```

```
#define   FIT_INPUT_CHANNELS          (0x04)
#define   FIT_OUTPUT_CHANNELS         (0x06)


#define   FIT_MODULE_START            (0x10)
#define   FIT_ERROR_STATUS            (0x11)


/* Information(Common) */
#define   FIT_PRODUCT_DIGITAL         (0x01)
#define   FIT_PRODUCT_ANALOG          (0x02)
#define   FIT_PRODUCT_COUNTER         (0x03)


#define   FIT_MODULE_START_OFF        (0x00)
#define   FIT_MODULE_START_ON         (0x01)


/* Sample */
#define   FIT_SAMPLE_IP_ADDRESS       "192.168.132.211"
#define   FIT_SAMPLE_PORT             (0x5007)
#define   FIT_SAMPLE_DEVICE_ID        (0)


int main(void)
{
    DWORD dwIpAddress;
    DWORD dwVaBase;
    DWORD dwVaOffset;
    WORD  hHandle;
    WORD  wStatus;
    BYTE  byCategory;
    BYTE  byInputChannels;
    BYTE  byOutputChannels;
    BYTE  byData[0x80];
    BYTE  byChCount;

    /* Open  */
    dwIpAddress = FIT_IpChenge((BYTE *)FIT_SAMPLE_IP_ADDRESS);
    hHandle = FIT_Open((BYTE *)&dwIpAddress, FIT_SAMPLE_PORT, NULL);
```

```c
if (hHandle == 0) {
    printf("Error! FIT_Open = %04X(H)\n", hHandle);
    return 1;
}


/* Offset Address  */
dwVaOffset = FIT_IO_DEVICE_SIZE * FIT_SAMPLE_DEVICE_ID;


/* Read 'Category' */
dwVaBase = FIT_IO + FIT_IO_DEVICE_CONFIG;
wStatus = FIT_Read(hHandle, dwVaBase + dwVaOffset + FIT_PRODUCT_CATEGORY,
            1, &byCategory);
if (wStatus != 0) {
    printf("Error! FIT_Read = %04X(H)\n", wStatus);
    return 1;
}
if (byCategory != FIT_PRODUCT_DIGITAL) {
    printf("Error! Category = %02X(H)\n", byCategory);
    return 1;
}


/* Read 'Input Channels'  */
wStatus = FIT_Read(hHandle, dwVaBase + dwVaOffset + FIT_INPUT_CHANNELS,
            1, &byInputChannels);
if (wStatus != 0) {
    printf("Error! FIT_Read = %04X(H)\n", wStatus);
    return 1;
}


/* Read 'Output Channels' */
wStatus = FIT_Read(hHandle, dwVaBase + dwVaOffset + FIT_OUTPUT_CHANNELS,
            1, &byOutputChannels);
if (wStatus != 0) {
    printf("Error! FIT_Read = %04X(H)\n", wStatus);
    return 1;
}
```

```
    /* Read 'Input Data'  */
    dwVaBase = FIT_IO + FIT_IO_INPUT;
    wStatus = FIT_Read(hHandle, dwVaBase + dwVaOffset, byInputChannels,
                &byData[0]);
    if (wStatus != 0) {
        printf("Error! FIT_Read = %04X(H)\n", wStatus);
        return 1;
    }
    for (byChCount = 0; byChCount < byInputChannels; byChCount++) {
        printf("Input CH%d Data:%02X(H)\n", byChCount, byData[byChCount]);
    }


    /* Write 'Output Data' */
    for (byChCount = 0; byChCount < byOutputChannels; byChCount++) {
        byData[byChCount] =  0x55;
        printf("Output CH%d Data:%02X(H)\n", byChCount, byData[byChCount]);
    }
    dwVaBase = FIT_IO + FIT_IO_OUTPUT;
    wStatus = FIT_Write(hHandle, dwVaBase + dwVaOffset, byOutputChannels,
                &byData[0]);
    if (wStatus != 0) {
        printf("Error! FIT_Write = %04X(H)\n", wStatus);
        return 1;
    }


    /* Close */
    FIT_Close(hHandle);

    return 0;
}
```

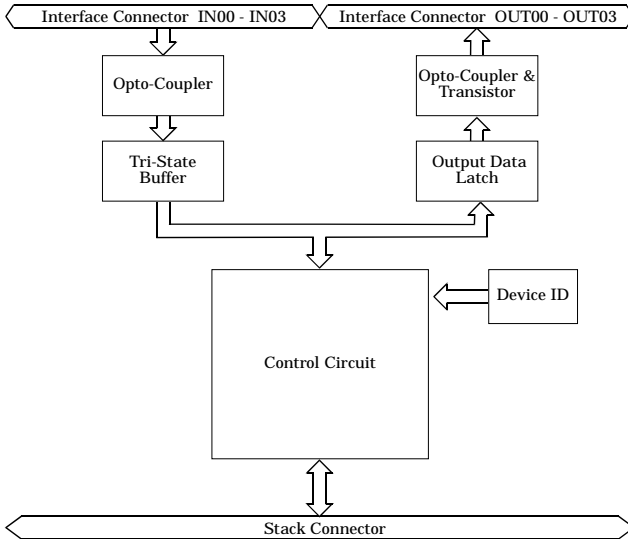# 6. System Reference

Circuit Block Diagram <DIO-4/4(FIT)GY>

Figure 6.1. Circuit Block Diagram

Specifications <DIO-4/4(FIT)GY>

Table 6.1. Specifications

Item		Specifications
		DIO-4/4(FIT)GY
Input section		
Input format		Opto-isolated input (compatible with current sink output and current source output)
Input resistance		3kΩ
Input ON current		3.4mA or more
Input OFF current		0.16mA or less
Number of input signal points		4 points (4 points/common)
Response time		Within 1msec
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)
Ratings	Output voltage	12 - 48VDC (±15%)
	Output current	150mA (12 - 24V) (per channel) (Max.) 50mA (36 - 48V) (per channel) (Max.)
Number of output signal points		4 points (4 points/common)
Response time		Within 1msec
External circuit power supply		12 - 48VDC (±15%)
Common section		
Interrupt level		Using CPU-SBxx(FIT)GY: IRQ 5, 7, or 9
Internal current consumption		5VDC(±5%) 150mA(Max.) *1
Allowable distance of signal extension		Approx. 50m (depending on wiring environment)
External 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 standard with the system.
Module installation method		One-touch connection to 35mm DIN rails (standard connection mechanism provided in the system)
Applicable wire		AWG 28 - 16 wire type: 0.32 - 1.30mm
Applicable plug		MC1.5/12-GF-3.81 (made by Phoenix Contact Corp.) 3.81mm-pitch, rated current: 8A (Max.)

*1 The stack connector accepts currents of up to 3.0A (Max.).

Table 6.2. Installation Environment Requirements

Item		Requirement description
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Noise immunity	Line-noise *1	AC line/2kV, Signal line/1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2) Atmospheric discharge/8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.15mm, 57 - 150Hz/2.0G 80minutes each in X, Y, and Z directions (JIS C0040-compliant, IEC68-2-6-compliant)
Impact resistance		15G half-sine shock for 11ms in X, Y, and Z directions (JIS C0041-compliant, IEC68-2-27-compliant)

*1 When using a POW-AD22GY

⚠ CAUTION

When connecting one of the modules to a controller module, the internal current 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.
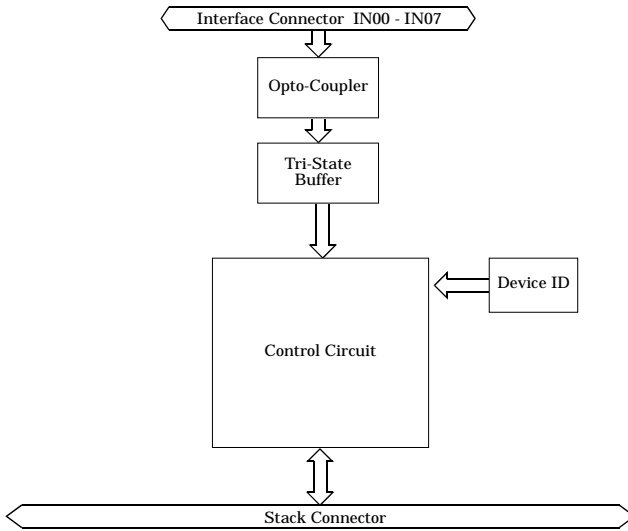
Circuit Block Diagram <DI-8(FIT)GY>

```
┌──────────────────────────────────────┐
   Interface Connector  IN00 - IN07
└──────────────────────────────────────┘
              ⇓
        ┌──────────────┐
        │ Opto-Coupler │
        └──────────────┘
              ⇓
        ┌──────────────┐
        │  Tri-State   │
        │   Buffer     │
        └──────────────┘
              ⇓
   ┌──────────────────┐      ┌───────────┐
   │                  │ ⇐    │ Device ID │
   │  Control Circuit │      └───────────┘
   │                  │
   └──────────────────┘
              ⇕
┌──────────────────────────────────────┐
            Stack Connector
└──────────────────────────────────────┘
```

Figure 6.2. Circuit Block

Specifications <DI-8(FIT)GY>

Table 6.3. Specifications

Item	Specifications
	DI-8(FIT)GY
Input section	
Input format	Opto-isolated input (compatible with current sink output and current source output)
Input resistance	3kΩ
Input ON current	3.4mA or more
Input OFF current	0.16mA or less
Number of input signal points	8 points (8 points/common)
Response time	Within 1msec
External circuit power supply	12 - 24VDC (±15%) (4mA/12V - 8mA/24V per channel)
Common section	
Interrupt level	Using CPU-SBxx(FIT)GY: IRQ 5, 7, or 9
External circuit power supply	12 - 24VDC (±15%)
Internal current consumption	5VDC(±5%) 150mA(Max.) *1
Allowable distance of signal extension	Approx. 50m (depending on wiring environment)
External 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 standard with the system
Module installation method	One-touch connection to 35mm DIN rails (standard connection mechanism provided in the system)
Applicable wire	AWG 28 - 16 wire type: 0.32 - 1.30mm
Applicable plug	MC1.5/12-GF-3.81 (made by Phoenix Contact Corp.) 3.81mm-pitch, rated current: 8A (Max.)

*1 The stack connector accepts currents of up to 3.0A (Max.).

Table 6.4. Installation Environment Requirements

Item		Requirement description
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Noise immunity	Line-noise *1	AC line/2kV, Signal line/1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2) Atmospheric discharge/8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.15mm, 57 - 150Hz/2.0G 80minutes each in X, Y, and Z directions (JIS C0040-compliant, IEC68-2-6-compliant)
Impact resistance		15G half-sine shock for 11ms in X, Y, and Z directions (JIS C0041-compliant, IEC68-2-27-compliant)

*1 When using a POW-AD22GY

⚠ CAUTION

When connecting one of the modules to a controller module, the internal current 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.
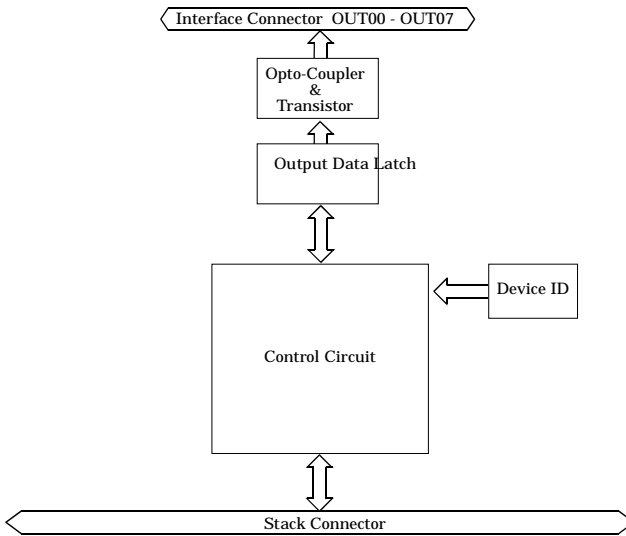
Circuit Block Diagram <DO-8(FIT)GY>

Figure 6.3. Circuit Block Diagram

Specifications <DO-8(FIT)GY>

Table 6.5. Specifications

Item		Specifications
		DO-8(FIT)GY
Output section		
Output format		Opto-isolated open collector output (current sink type)
Ratings	Output voltage	12 - 48VDC (±15%)
	Output current	150mA (12 - 24V) (per channel) (Max.)
		50mA (36 - 48V) (per channel) (Max.)
Number of output signal points		8 points (8 points/common)
Response time		Within 1msec
Common section		
External circuit power supply		12 - 48VDC (±15%)
Internal current consumption		5VDC(±5%) 150mA(Max.) *1
Allowable distance of signal extension		Approx. 50m (depending on wiring environment)
External 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 standard with the system
Module installation method		One-touch connection to 35mm DIN rails (standard connection mechanism provided in the system)
Applicable wire		AWG 28 - 16 wire type: 0.32 - 1.30mm
Applicable plug		MC1.5/12-GF-3.81 (made by Phoenix Contact Corp.) 3.81mm-pitch, rated current: 8A (Max.)

*1 The stack connector accepts currents of up to 3.0A (Max.).

◎ CONTEC

6. System Reference

Table 6.6. Installation Environment Requirements

Item		Requirement description
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Operating humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Noise immunity	Line-noise *1	AC line/2kV, Signal line/1kV (IEC1000-4-4Level 3, EN61000-4-4Level 3)
	Static electricity resistance	Contact discharge/4kV (IEC1000-4-2Level 2, EN61000-4-2Level 2) Atmospheric discharge/8kV (IEC1000-4-2Level 3, EN61000-4-2Level 3)
Vibration resistance	Sweep resistance	10 - 57Hz/semi-amplitude 0.15mm, 57 - 150Hz/2.0G 80minutes each in X, Y, and Z directions (JIS C0040-compliant, IEC68-2-6-compliant)
Impact resistance		15G half-sine shock for 11ms in X, Y, and Z directions (JIS C0041-compliant, IEC68-2-27-compliant)

*1 When using a POW-AD22GY

⚠ CAUTION

When connecting one of the modules to a controller module, the internal current 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.

External Dimensions
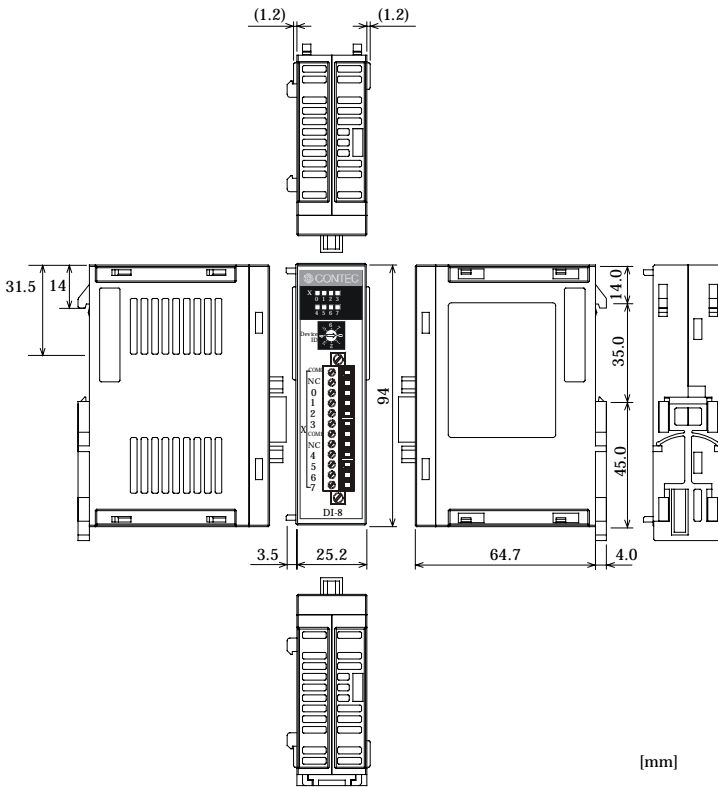

Figure 6.4. External Dimensions

DIO-4/4(FIT)GY
DI-8(FIT)GY
DO-8(FIT)GY

User's Manual

CONTEC CO., LTD.   November 2006 Edition

3-9-31, Himesato, Nishiyodogawa-ku, Osaka 555-0025, Japan
Japanese   http://www.contec.co.jp/
English   http://www.contec.com/
Chinese   http://www.contec.com.cn/