F&eIT Series

I/O Assist Server

SVR-IOA(FIT)GY
SVR-IOA2(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.

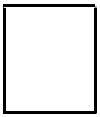
Check, with the following list, that your package is complete. If you discover damaged or missing items, contact your retailer.

Product Configuration List

- System unit (One of the following)…1
  [SVR-IOA(FIT)GY, or SVR-IOA2(FIT)GY]
- First Step Guide …1
- CD-ROM [F&eIT Series Setup Disk] *1 …1
- Power connector…1

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


System Unit


First step guide


Power connector


CD-ROM
[F&eIT Series Setup Disk]

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Table of Contents

1. Before Using the Product

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

About the Unit

Congratulations on your recent purchase of the I/O Assist Server Unit.
The SVR-IOAx(FIT)GY *1(the "Assist Server") is a management unit controller that automatically collects data from I/O controller units, which are F&eIT series products, and can load data onto I/O controller units.
The Assist Server is configured so that it can be connected to a host controller through a 10BASE-T/100BASE-TX I/F.
A single Assist Server can collect and load data from and onto a maximum of eight I/O controller units.

Please read this manual carefully to create application programs and configure the system, such as setting the switches and connecting it to external devices.

*1 The Assist Server is available in different product models. "x" in each model number represents a blank or one numeric character. (This is applicable to the rest of this document.)

Features

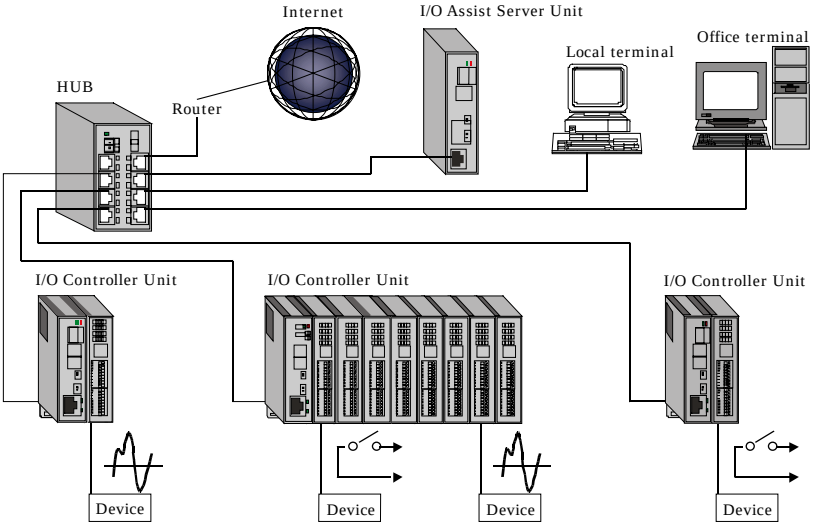
- The management function can substantially reduce the network overhead between host controllers.
- The system includes a function that allows you to monitor the collected data by connecting to the browser running on the host controller.
- Similar to other F&eIT series products, the system is equipped with a 35mm DIN rail attachment mechanism as a standard item.

Functions

- Reduces the circuit load by concentrating data from the I/O controller units.
  Because the Assist Server collects data from the I/O control units, the higher hosts can get data from multiple modules by accessing the Assist Server once, without having to access the individual modules. (The I/O controller units identified by Unit ID switches ID 0 to 7 on the I/O controller units are subject to this control.)
- Auto-detection of I/O controller units
  When started, the Assist Server searches for the I/O controller units (belonging to the same group) to be monitored, and obtains any necessary module information.
  Because it repeats the process of finding I/O controller units at regular intervals, the Assist Server can flexibly respond to any changes in the boot-up process or partial restarting of the system.
- Monitoring function
  You can get connected to the Assist Server from your browser to monitor and view the I/O data on the I/O controller units.
  On the monitoring screen, you can modify its layout or display channels from your browser. In this manner, you can quickly create a screen that matches the required layout.
- Device module settings
  You can view and modify I/O module settings on a specific I/O controller unit.

System Configuration Image

Multiple I/O controller units (a maximum of eight units) and the Assist Server can be installed on the same network. When connected to the Assist Server, the host controller can read and write signals from and to the devices that are connected to the subordinate I/O controller units.



Explanation of names

- I/O Assist Server Unit:
  This refers to the product SVR-IOAx(FIT)GY.
  The I/O Assist Server Unit can collect data from the I/O controller units that belong to the same group as the Group ID that is identified by the Group ID switches on the individual devices, and load data onto the I/O controller units, in a function called the management function. Group IDs can be set in a range of 0 to 7. When connected to I/O controller units from a local or office terminal using a Web browser, the I/O Assist Server Unit can monitor the conditions of the devices that are connected to the I/O controller unit.
- I/O Controller Unit:
  This is a general term that refers to the CPU-CAxx(FIT)GY (made by CONTEC) to which various device modules are attached. The devices contain Group ID and Unit ID switches, which must be set so that they are all unique within the network. The I/O Controller Unit transmits the data collected from the devices to the Assist Server that has a specified Group ID setting. A Group ID can be set in a 0 - 8 range. A Unit ID can be set in a 0 - 7 range. Setting the Group ID to 8 disables the I/O Controller Unit from sending data to the Assist Server. The following device modules are available: Digital I/O module, input analog/digital converter module, output digital/analog converter module, input counter module.
  Further details may be found on the specific device module manuals.
- HUB:
  This is a line concentration unit that allows you to build a LAN using twisted-pair cables. The F&eIT series includes an 8-port switching HUB unit (SH-8008(FIT)GY) with a built-in DIN rail attachment mechanism.

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 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 product 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 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 inexperienced usage, misuse, or malfunction of this device.

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 unit. CONTEC will bear no responsibility for any problems, etc., resulting from modifying this unit.
- Do not use or store the equipment 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 equipment in a place subject to direct sunlight or near a heating device, such as a stove.
- Do not use or store the equipment in a dusty or humid place.
  (Operating humidity range: 10 - 90%RH, no condensation)
- As this product contains precision electronic components, do not use or store in environments subject to shock or vibration.
- Do not use or store the product 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 equipment was purchased.
- To avoid electric shock, please do not touch the system with a wet hand.
- Do not open the unit casing. CONTEC will disclaim any responsibility for equipment whose casing has been opened.
- To prevent damage, please do not subject the unit to impact or bend it.
- To prevent contact malfunction, please do not touch the metallic pins on the external unit connector.
- The unit contains switches that need to be properly set. Before using the unit, please check its switch settings.
- To avoid malfunction, please do not change the unit switch settings in an unauthorized manner.

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 unit may overheat, malfunction, or cause a failure.

Operating temperature

0 - 50°C

Humidity

10 - 90%RH (No condensation)

Corrosive gases

None

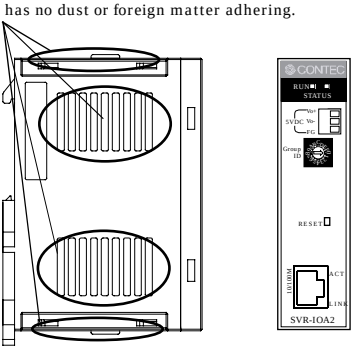
Floating dust particles

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 unit 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. Nomenclature of Unit Components and Their Settings

Nomenclature of Unit Components

Figure 2.1, 2.2 shows the nomenclature of unit components.

In the figure, the switch settings indicate the factory settings.

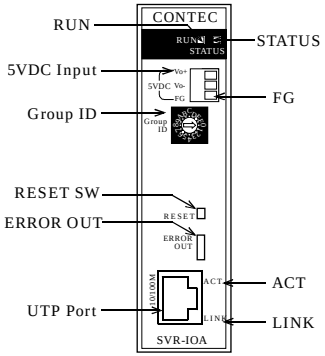


Figure 2.1. Nomenclature of Unit Components [SVR-IOA(FIT)GY]

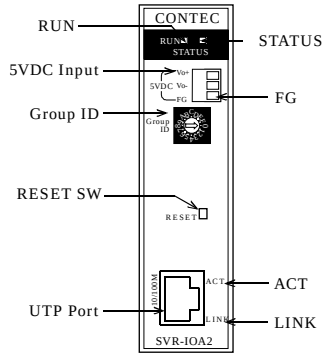


Figure 2.2. Nomenclature of Unit Components [SVR-IOA2(FIT)GY]

Nomenclature and Functions [Common]

Table 2.1. Names and Functions

Name	Function	Setting & Indicator
Status LED	RUN	Refer to Table 2.2. Operating Modes and Status Indicators
	STATUS	
LAN LED	LINK	OFF: Not connected ON: Connected to the LAN
	ACT	OFF: No communication Flashing: Sending / receiving data
Group ID	Group ID setup switch : 0 - F	Group ID settings: 0 - 7 8 - D: Not used E: Version upgrade and system repair mode F: Default initialization mode
RESET SW	Manual reset	
ERROR OUT *1	External output contacts, such as Power OFF, Link disconnection and Memory check error for abnormal conditions	
UTP port	10BASE-T / 100BASE-TX LAN connect	

*1 Provided only for the SVR-IOA(FIT)GY.

Operating Modes and Status Indicators [Common]

Table 2.2. Operating Modes and Status Indicators

Operating mode	Starting an operation	Condition of Group ID	Status indicator		
			RUN	STATUS	Condition
Normal operation mode	Power ON: Reset switch ON: Remote-reset:	Settings other than 0 - 7	ON	OFF	Normal operation
			Continuous, alternating flashing		Resetting
			OFF	Continuous flashing	Abnormal conditions (e.g., memory check error)
			ON	ON	Abnormal conditions (e.g., start error)
Initialization mode (factory settings)	Power ON: Reset switch ON: Remote-reset: (does not automatically return to normal operating mode)	F switch settings	Continuous flashing	Continuous flashing	Initializing
			ON	ON	Initialization complete (To return to the normal operation mode, change the Group ID and turn the power on, otherwise press the reset switch.)
			OFF	Continuous flashing	Error during initialization
			ON	ON	Abnormal conditions (e.g., start error)
Repair & version upgrade mode	Power ON: Reset switch ON: Remote-reset: (does not automatically return to normal operating mode)	E switch settings	Continuous flashing	OFF	Starting
			Continuous flashing	Continuous flashing	Writing to firmware
			OFF	Continuous flashing	Write error
			ON	ON	Abnormal conditions (e.g., start error)

Connectors [Common]

Table 2.3. Connectors

Name	Specifications / Function
UTP port	Network connection port. Connected at a 10 /100Mbps rate, auto-recognized, and in full-duplex / half-duplex
ERROR-OUT *1	Output specs: Open collector output by photo coupler insulation Output ratings: 30VDC (Max.), 10mA (Min) Response time: 100 sec (Max.)
Power input connector	5VDC±5% 2-piece detachable power input connector, FG pin Dedicated screw-type plug that can be operated from the side (MC 1.5/3-ST-3.5 Phoenix Contact Compliant cable: AWG28 - 16)

*1 Provided only for the SVR-IOA(FIT)GY.

Error Output [SVR-IOA(FIT)GY only]

Table 2.4. Error Output

Function	Output specification		Error detection
The detection circuit is normally made; when an error is detected, the circuit is broken.	Output specs:	Open collector output by photo-coupler insulation	Power supply off, LINK disconnect, Memory check error, and other system errors
	Output ratings:	30VDC (Max.), 10mA (Min.)	
	Response time:	100µsec (Max.)	

Reference Equivalent Circuit [Only SVR-IOA(FIT)GY]

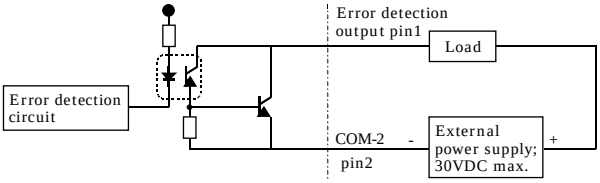


Figure 2.3. Reference Equivalent Circuit

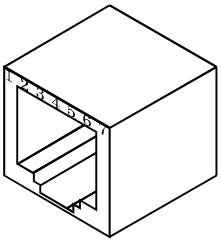
Table 2.5. Error Output Pin Assignments

Item	Model	
Connector used	S2B-EH (made by J.S.T. Mfg Co.,Ltd.)	pin 1 pin 2
Housing	EHR-2 (made by J.S.T. Mfg Co.,Ltd.)	
Contact	SEH-001T-P0.6 (made by J.S.T. Mfg Co.,Ltd.)	

UTP Port Pin Assignments [Common]

Table 2.6. UTP Port Pin Assignments

Pin No.	Signal
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used



Setting a Group ID

By setting a Group ID, it is possible to manage the I/O controller unit is belonging to the same group.
A Group ID can be set in a range of 0 - F.

Setup Method

A Group ID can be set by turning the rotary switch on the unit face.

To set a Group ID, turn the switch knob.

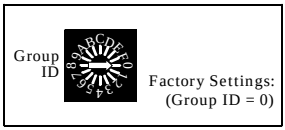


Figure 2.4. Setting a Group ID Switch

0 - 7 : I/O Controller management mode

8 - D : Not used

E : System repair and firmware upgrade mode

F : Initialization mode *1

⚠ CAUTION

Group ID settings "8 - D", "E", and "F" cannot be used as Group IDs.

*1 About Initialization mode

Restore the setting of this product to its factory settings. Set the Group ID to "F" and turn the power on. RUN and STATUS LEDs will start to flash. Once these LEDs stop flashing and grow solid, all settings (IP address etc.) will be initialized and return to its factory settings after next boot.

3. Installation and Connection

Installing Method

Mounting on a DIN Rail

Mounting procedure

(1) Pushing the fixing hook with a flat-blade screwdriver renders it into a lock-enabled condition.

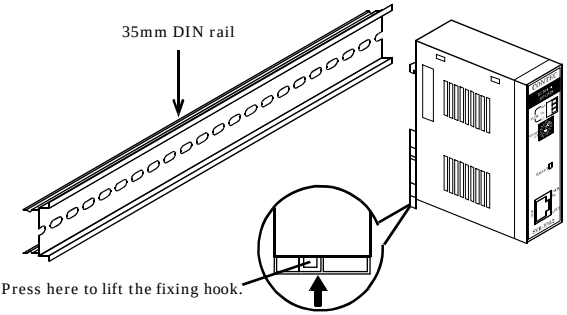


Figure 3.1. Mounting on a DIN Rail ***< 1 / 3 >***

(2) Hook the unit from the upper part of the DIN rail, and press the lower part of the unit onto the DIN rail.

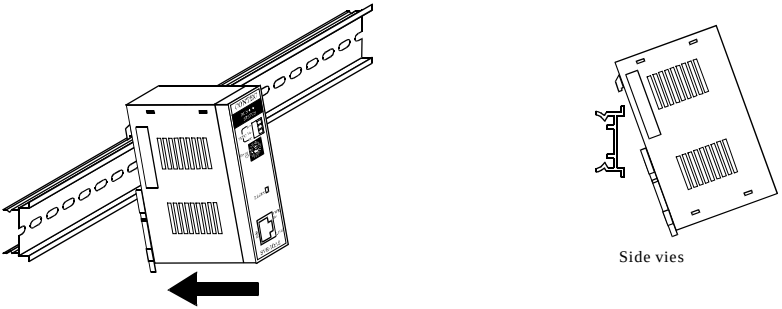


Figure 3.1. Mounting on a DIN Rail ***< 2 / 3 >***

(3) The fixing hook is automatically locked, and the module can be mounted in one-touch.

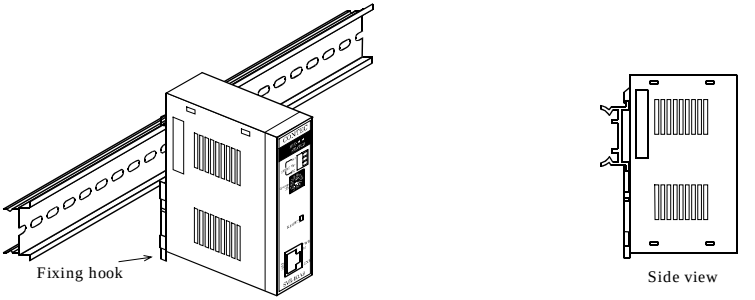


Figure 3.1. Mounting on a DIN Rail ***< 3 / 3 >***

Removal procedure

(1) Lower the fixing hook for the unit to unlock it.

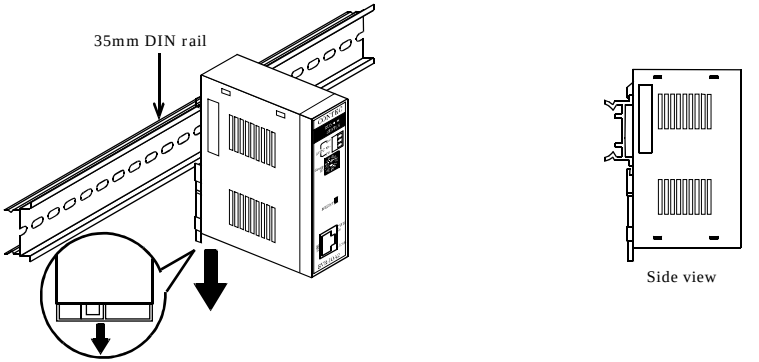


Figure 3.2. Removing the Module from the DIN Rail ***<1 / 3 >***

(2) With the fixing hook unlocked, pull the lower part of the unit toward you.

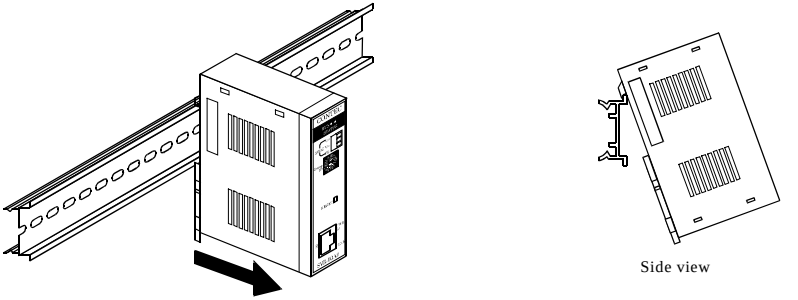


Figure 3.2. Removing the Module from the DIN Rail ***< 2 / 3 >***

(3) By lifting the unit, you can easily remove it from the DIN rail.

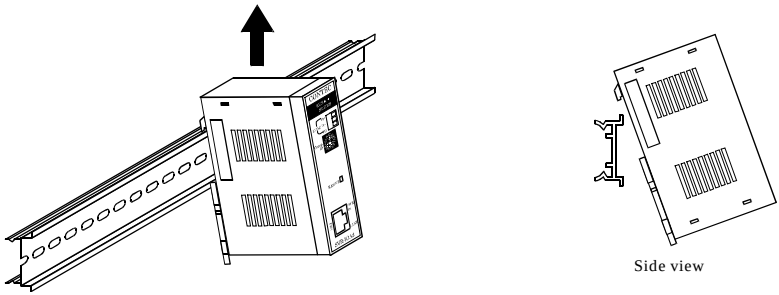


Figure 3.2. Removing the Module from the DIN Rail ***< 3 / 3 >***

Connection Method

Supplying the Power to the Unit

The DC-DC power supply (POW-DDxx) and the controller module can be cable-connected using the detachable connector that is provided on the unit face (compatible cables: AWG 28 - 16).
Third-party DC output power supply units can also be connected in the same way.

⚠ CAUTION

- Because the DC-DC power supply generates heat, a minimum spacing of 2.0cm should be provided between the unit and any adjoining units, and care should be taken so that the ventilation holes are not covered.
- Input power requirements of the SVR-IOA(FIT)GY: 5.0VDC ±5%, 0.5A (Max.)
  Input power requirements of the SVR-IOA2(FIT)GY: 5.0VDC ±5%, 0.7A (Max.)

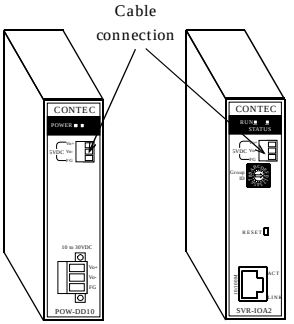


Figure 3.3. Connecting the Unit to the DC-DC Power Supply

Connecting the Unit to the SH-8008(FIT)GY

- These units are connected by means of an Ethernet interface.
- In situations where many lower-level groups are used, a hub should be provided between those groups and the unit.

(CONTEC recommends the use of the switching HUB unit [SH-8008(FIT)GY] in the F&eIT series of products.)

Network cable

Cables complying with the following specifications should be used:

Category 3, 4, 5 UTP cable (for 10BASE-T)

Category 5 UTP cable (for 100BASE-TX)

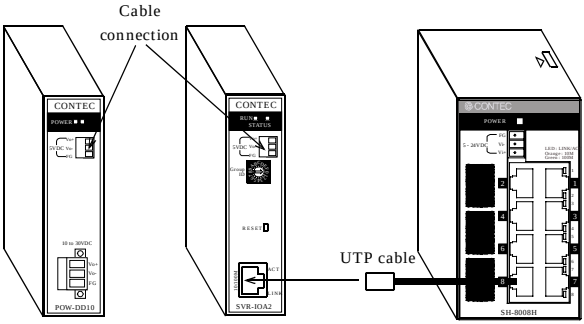


Figure 3.4. Connecting the Network Cable

4. Setup

Setup Procedures

The Assist Server and the I/O controller units must be assigned unique IP addresses.

The section below explains the "**Quick Setup**", in which the default IP addresses are used "as is", and the "**Custom Setup**", in which utility software is used.

Quick Setup

In the default settings, the I/O controller unit and the I/O assist server unit are assigned IP addresses using Ethernet addresses so that default IP addresses are always unique. The item indicated as "M/A" on the label affixed on the side of the respective unit represents the unit's Ethernet address (MAC address).

An IP address is generated by using the last three digits of an Ethernet address.

Example: M/A: "00.80.4C.AA.BB.CC"
The code "00.80.4C" is common to all units.
The unit's IP address will be "10.170.187.204".
The subnet mask is assigned as "255.0.0.0.

(1) Check the Group ID for the Assist Server and the Group ID and the Unit ID of the I/O Controller Unit.

Make sure that the I/O Controller Unit has a Device ID that is unique for the device module.

(2) Connect the power and network cables to the I/O Controller Unit.

(3) Connect the power and network cables to the Assist Server.

(4) When the I/O Controller Unit and the Assist Server are started, the Assist Server finds the I/O Controller Unit in the same Group ID, and automatically collects input data.

(5) By connecting to the Assist Server from the browser running on the host controller, you can view the input data.

Set the IP address and the network mask so that the host controller belongs to the same network as the Assist Server.

Example: If no devices other than F&eIT series devices are connected, the IP address "10.1.1.1" and the netmask "255.0.0.0" can be assigned to the host controller.

(6) For procedures on how to view input data using a browser, see the section entitled "Verifying the Operation".

Custom Setup

When installing a F&eIT series module on an existing network, you need to assign an IP address so that it will not conflict with the IP addresses of other network devices.

An IP address can be assigned by using the utility software that is included in the product.

Installing the utility software

(1) Checking the operating environment for the utility software

OS	Windows Vista, XP, 2000, NT 4.0 Service Pack 3 or later, Me, 98.
Hardware	A personal computer with any of the above operating systems running and that can be connected to a TCP/IP network.

(2) Preparation before installation

Shut down all the extraneous applications running on the computer on which to install the files for the Module. If a screensaver or virus detection software is up and running, make it inactive temporarily.

(3) Installation

Insert the disc bundled with the Module into the CD-ROM drive.
A menu will be ran and displayed automatically. Follow the on-screen instructions to install the "Development environment" or "Runtime environment" of [API-CAP(W32)].

[Runtime environment]
Install the F&eIT Setting Utility and the library for using programs such as API functions, F&eIT common functions, and F&eIT DDE Server on the PC.

[Development environment]
Install the F&eIT Setting Utility and the library, help files, and sample programs for creating control programs for F&eIT devices on the PC.
The "development environment" installed contains the "runtime environment."
Follow the on-screen instructions to carry out the installation.
When the installation has been completed normally, some programs are registered.

(4) Starting an application and checking some notes

The entry "CONTEC API-CAP(W32)" is added to the Programs list on the Start menu. Following items are registered in the list.

[When the runtime environment has been installed]

F&eIT Setting Utility	:	This program sets up and diagnoses the I/O Assist Server, I/O Controller, and device module.
FIT_PCSERVER	:	This program stays resident to collect data from the I/O controller unit.
FIT_SVR (DDE SERVER)	:	This program is DDE SERVER supporting the I/O Assist Server and I/O controller unit.
FIT_SVR_R (F&eIT GENERIC DDE SERVER)	:	This program is DDE SERVER that can access devices which support the F&eIT protocol using their IP address and virtual address.

[When the development environment has been installed]

The following items are added to those registered [when the runtime environment has been installed].

Pt folder	:	This folder contains the entries of the program for diagnosing a temperature measurement device and of the sample program for accessing the temperature measurement device using an API.
Aio folder	:	This folder contains the entries of the program for diagnosing an analog device and of the sample program for accessing the analog device using the API.
Cnt folder	:	This folder contains the entries of the program for diagnosing a counter device and of the sample program for accessing the counter device using an API.
Dio folder	:	This folder contains the entries of the program for diagnosing a digital device and of the sample program for accessing the digital device using the API.
API-CAP(W32) HELP	:	Help file for API function library [API-CAP(W32)]
F&eIT Common Functions HELP	:	Help file for F&eIT common functions and Remote I/O functions.

Setting up a unit

(1) Determine the desired Group ID.

The Group ID on the front panel can be selected from any number in the 0 to 7 range.

Use the same Group ID as the I/O Controller Unit from which data is to be collected.

(2) Connect the power and network cables to the Assist Server.

Figure 4.1. Front Panel

Setting an IP address for the Assist Server

Open the Start menu, choose "CONTEC API-CAP(W32)," then start the "F&eIT Setup Utility." Specify the IP address and net mask in the setup dialog box.

For details on how to use the setup utility, consult the help file.

Completing the settings

When you have finished setting up the Assist Server, restart it for the settings to take effect.

Utility Software Operating Procedures

The F&eIT Setting utility can be used to make network settings such as IP addresses, specify device names, and diagnose or set up device modules.

For details on how to use the utility, consult the help file.

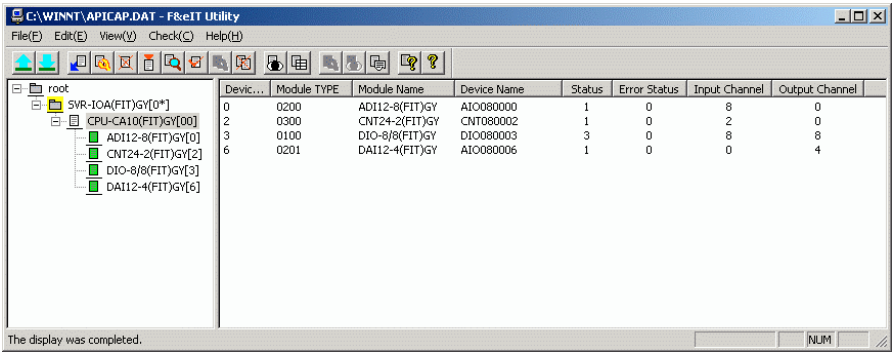


Figure 4.2. Main Menu

Verifying the Operation

The Assist Server continually collects the latest data on the devices that are connected to the I/O controller units in the same group. The following method can be employed to check and view the collected data:

- Connecting from the host computer to the Assist Server using a browser to view the data status.
- Connecting from the host computer to the Assist Server using a browser to create and view a monitoring screen.
- Creating a program to check and update the virtual memory on the Assist Server from the host computer.

Checking the Status from the Browser [SVR-IOA(FIT)GY]

You can connect to the Assist Server from a host computer by using a browser to view the data status.

Operating procedures

(1) Start the browser. In the browser's address field, enter the IP address that was set on the Assist Server.

Example: For an IP address 172.17.8.155, enter the following:
"http://172.17.8.155/".

(2) The following screen comes up:

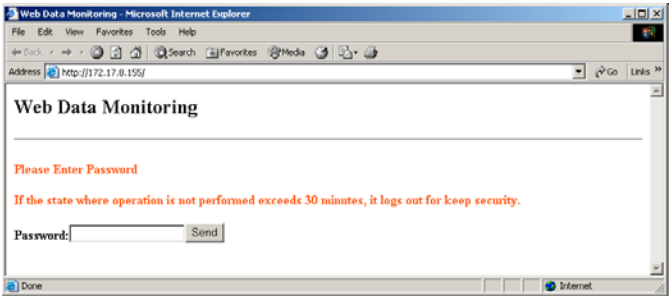


Figure 4.3. Entering a Password

Enter the password, and click on [Send]. Initially, no password is set in the system, so it is only necessary to click on [Send].

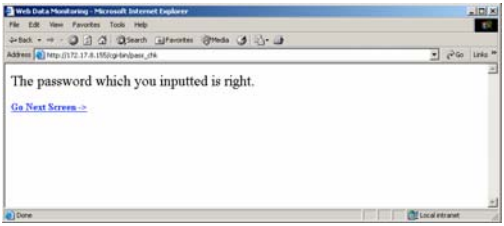


Figure 4.4. Transmission

When the above screen is displayed, click on [Go to Monitoring Menu].
If the password is entered incorrectly, control returns to the password entry screen.
Check your password, enter the correct password, and continue with the remainder of the operations.

(3) The following screen comes up:

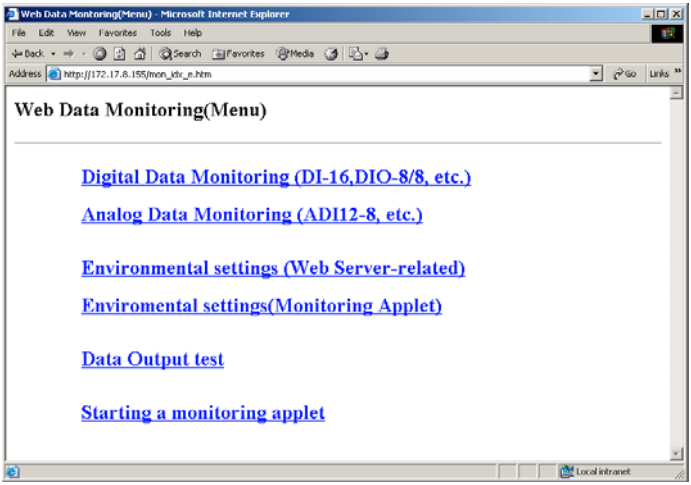


Figure 4.5. Web Data Monitoring

- Digital Data Monitoring (DI-16, DIO-8/8, etc.)

  Select the desired Unit ID, Device ID, and CH (channel) to view the input data.
  The raw input data is displayed in either decimal or hexadecimal representation.

- Analog Data Monitoring (ADI12-8, etc.)

  Select the desired Unit ID, Device ID, and CH (channel) to view the input data.
  The conversion data or input digital data in decimal / hexadecimal representation is displayed.

- Environmental settings (Web Server-related)

  The display of input data can be switched between decimal and hexadecimal.
  You can also change the password for logging on to the Web.

- Environmental settings (Monitoring Applet)

  For bringing up an applet, you can specify a screen size and display refreshing intervals.
  A maximum of 10 monitoring screens that are created by an applet can be stored; for each screen, a specific screen size can be defined.

- Data Output test

  You can specify a Unit ID, a Device ID, and a CH (channel) to direct any keyboard input to module output.
  This feature can be used to test values upon completion of hardware installation and cable connection tasks to check the operation of the system.

- Starting a monitoring applet

  This feature starts a monitoring screen based on a Java applet.
  Display channels on the monitoring screen and the layout of the screen can be changed in any way to suit your preferences.
  A maximum of 10 user-created monitoring screens can be saved.

Web Data Monitoring screen

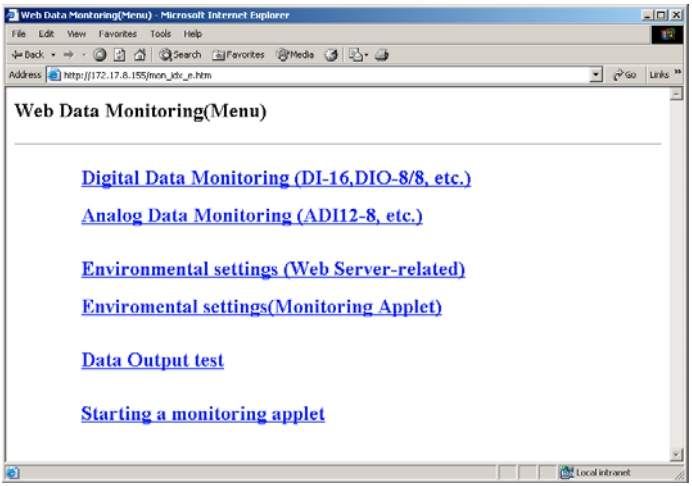


Figure 4.6. Web Data Monitoring Screen

- Digital Data Monitoring (DI-16, DIO-8/8, etc.)

  Clicking on [Digital Data Monitoring (DI-16, DIO-8/8, etc.)] brings up the following screen:

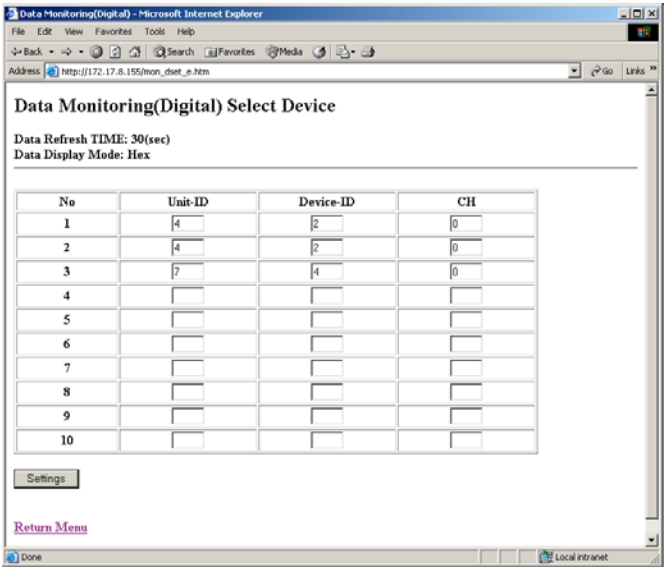


Figure 4.7. Selecting a Data Monitoring (Digital) Module

Enter the Unit ID, Device ID, and CH (channel) to be displayed, and click on [Settings].

The following confirmation screen comes up.

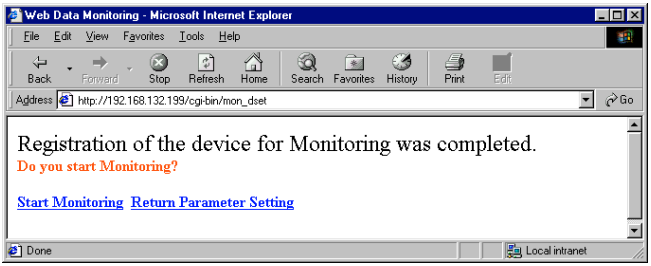


Figure 4.8. Monitoring Confirmation Screen

To start the monitoring process, click on [Start Monitoring].

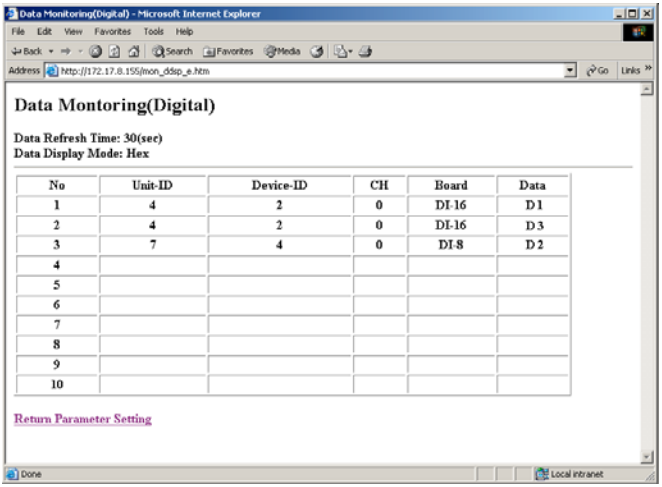


Figure 4.9. Data Monitoring (Digital)

The input data on the selected channels is displayed.

This screen is refreshed at fixed intervals to display the current input values.

- Analog Data Monitoring (ADI12-8, etc.)

  Clicking on [Analog Data Monitoring (ADI12-8, etc.)] brings up the following screen:

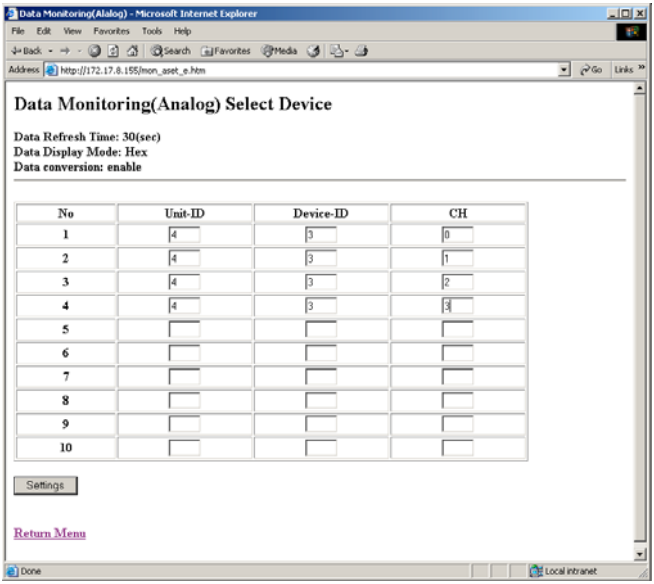


Figure 4.10. Data Monitoring (Analog)

Enter the Unit ID, Device ID, and CH (channel) to be displayed, and click on [Settings].

The following confirmation screen comes up.

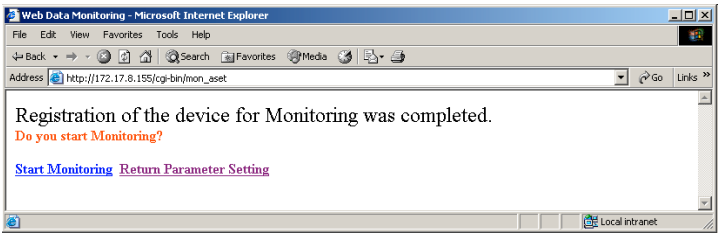


Figure 4.11. Monitoring Confirmation Screen

To start the monitoring process, click on [Start Monitoring].

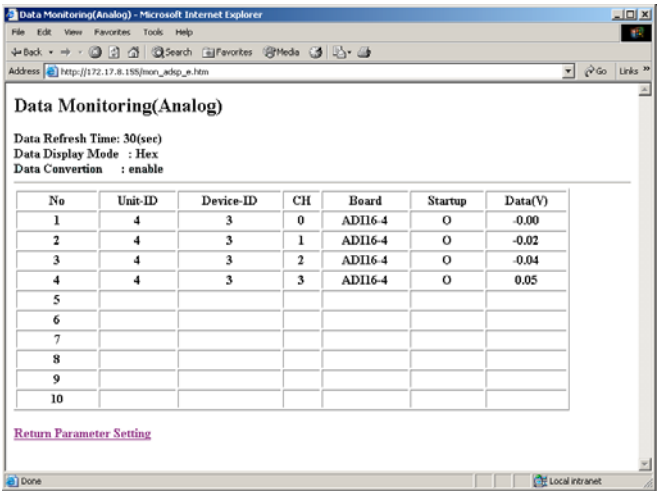


Figure 4.12. Data Monitoring (Analog)

The input data on the selected channels is displayed.

The data is refreshed at fixed intervals to display the current input values.

If the data conversion option is on, the input digital values are converted from the input range specified on the module into analog values, and the results are displayed.

If the data conversion option is off, the input digital values are displayed "as is".

- Environmental settings (Web Server-related)

Clicking on [Environmental settings (Web Server-related)] brings up the following screen:

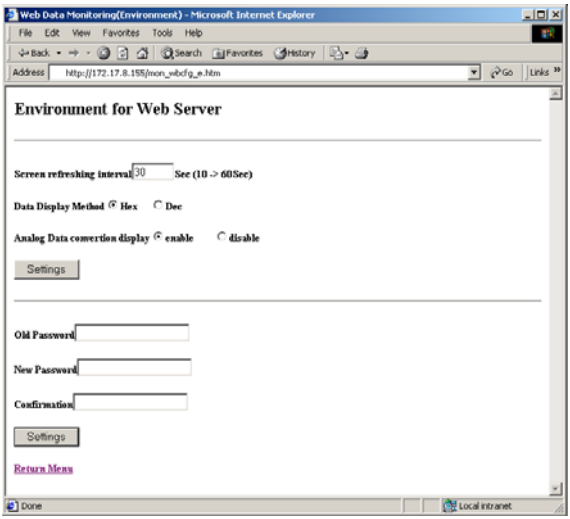


Figure 4.13. Web Server Environmental Settings

Screen refreshing interval : Specify screen-refreshing intervals when input data is to be displayed on [Digital Data Monitoring (DI-16, DIO-8/8, etc.)] or [Analog Data Monitoring (ADI12-8, etc.)].

Data Display Method : Specify decimal/hexadecimal switching when input data is to be displayed on [Digital Data Monitoring (DI-16, DIO-8/8, etc.)] or [Analog Data Monitoring (ADI12-8, etc.)].

Analog Data conversion display : When input data is to be displayed on [Analog Data Monitoring (ADI12-8, etc.)], specify whether the input digital values are to be converted from their input range into analog values for display in analog values, or they are to be displayed in the digital form.

Upon completion of the settings, click on [Settings].

Old Password : This option allows you to change the password that must be entered when connecting to the Web.
To change a password, enter your current password in the [Old Password] field.

New Password : The new password in the [New Password] field.

Confirmation : In the [Confirmation] field, re-enter the password that was typed in the [New password] field.

When finished with the input process, click on [Settings].

- Environmental settings (Monitoring Applet)

Clicking on [Environmental settings (Monitoring Applet)] brings up the following screen:

Figure 4.14. Entering an Applet Password

Enter the password, and click on [Send].

Initially, no password is set in the system, so it is only necessary to click on [Send].

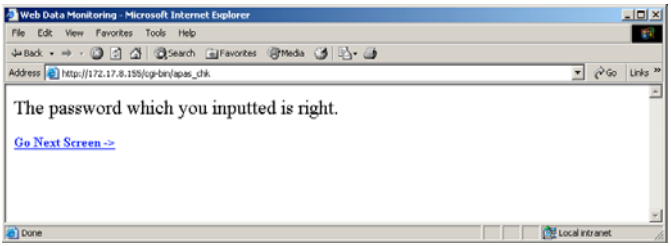


Figure 4.15. Entering an Applet Password

When the above screen is displayed, click on [Go Next Screen].

If the password is entered incorrectly, control returns to the password entry screen.

Check your password, enter the correct password, and continue with the remainder of the operations.

The following screen comes up:

Figure 4.16. Monitoring Menu

- Settings the Applet environmental-setting password

Clicking on [Settings the Applet environmental-setting password] brings up the following screen:

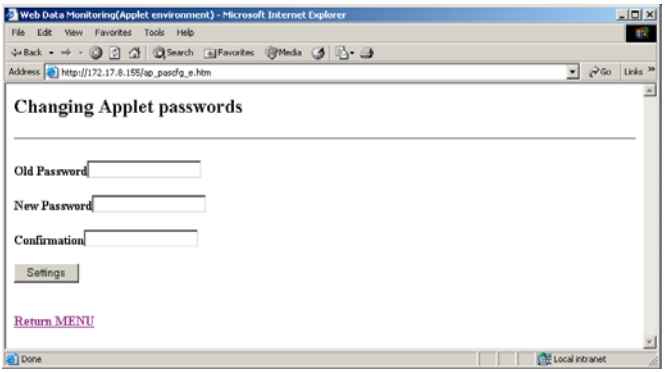


Figure 4.17. Changing Applet Passwords

Old Password : Change the password that is entered for specifying Applet environmental settings.
Enter your current password in the [Old Password] field.

New Password : Enter the new password.

Confirmation : Re-enter the password that was typed in the [Confirmation] field.

When finished with the input, click on [Settings].

- Monitoring Applet environmental settings

Clicking on [Monitoring Applet environmental settings] brings up the following screen:

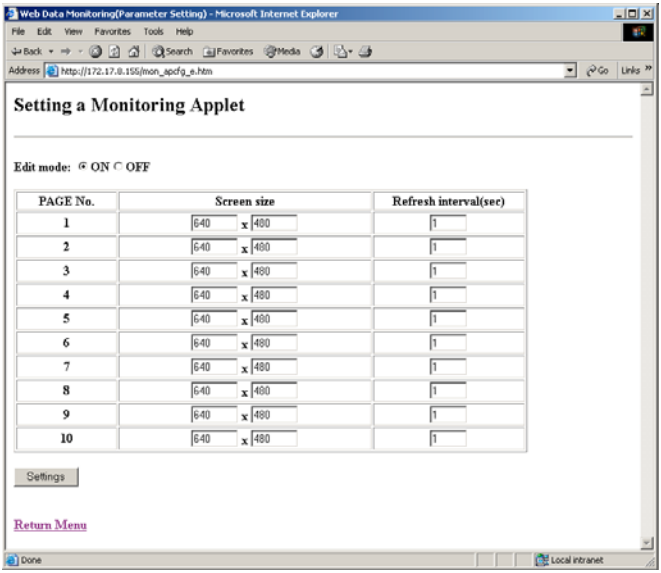


Figure 4.18. Setting a Monitoring Applet

Edit mode : When changing the monitoring screen, set the [Edit mode] on. When the [Edit mode] is on, the monitoring screen will display a Load/Save/Clear/Grid on/off/Component Selection menu.

A maximum of 10 monitoring screens can be created and saved.

This option allows you to specify the display size and the refreshing interval for each screen.

Screen size : Specify the X size (width) x Y size (height) in pixels.

Refresh interval : This refers to the interval in which the monitoring screen obtains the latest data from the Assist Server.
In the case of monitoring conducted using a relatively slow communication circuit (e.g., a modem), the refreshing interval can be increased in order to reduce the network overhead.

- Data output test

Clicking on [Data output test] brings up the following screen:

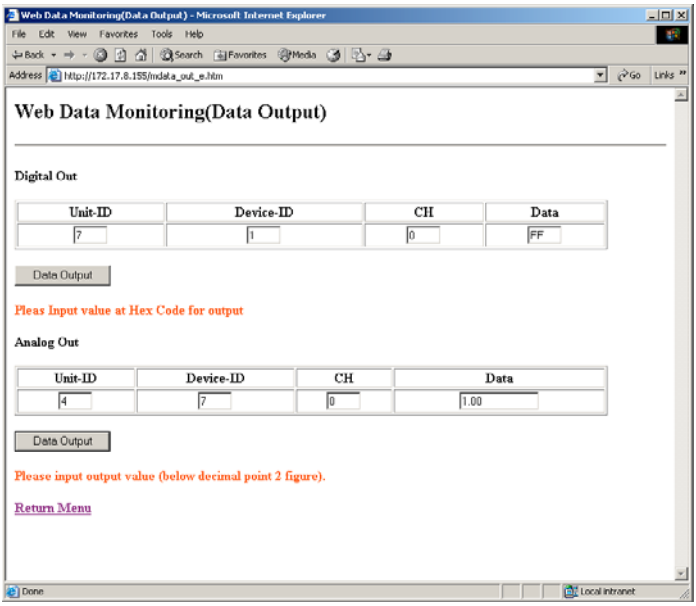


Figure 4.19. Web Data Monitoring (Data Output)

Digital Out : Specify a Unit ID, a Device ID, and a CH (channel), enter data, and click on [Data Output]. This causes the system to output the values entered in [Data] to the specified channel.

Analog Out : Specify a Unit ID, a Device ID, and a CH (channel), and click on [Data Output]. This causes the system to output the values entered in [Data] to the specified channel.
Enter output data in voltages (a value to the second decimal place).

- Starting the monitoring applet

Clicking on [Starting the monitoring applet] brings up the following screen:

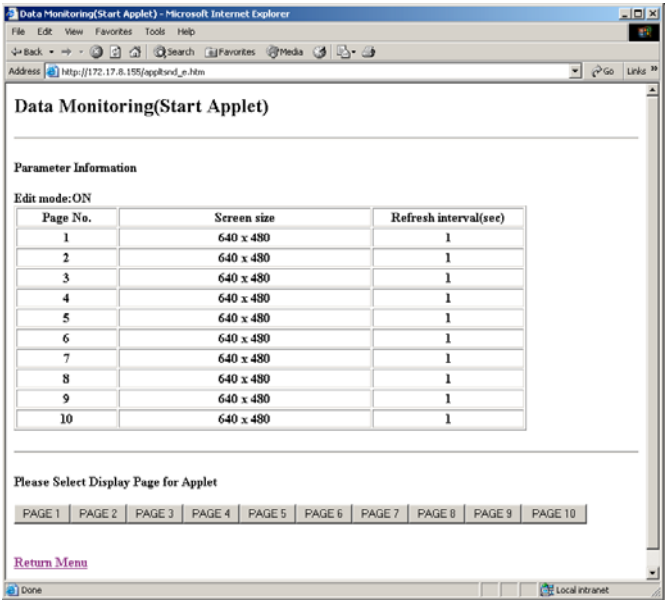


Figure 4.20. Data Monitoring (Start Applet)

The screen shows the current page size and the refreshing interval.

Clicking on a [Page 1] ... [Page 10] button on the bottom row of the screen displays the monitoring screen for the specified page.

A description of how to operate the monitoring screen may be found in the next Chapter.

Checking the Status from the Browser [SVR-IOA2(FIT)GY]

You can connect to the Assist Server from a host computer by using a browser to view the data status.

Operating procedures

(1) Start the browser. In the browser's address field, enter the IP address that was set on the Assist Server.

Example: For an IP address 192.168.132.200, enter the following:
"http://192.168.132.200/".

(2) The following screen comes up:

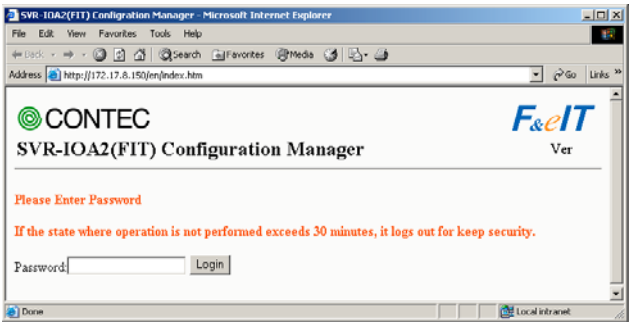


Figure 4.21. Entering a Password

Enter the password, and click on [Login].
There are two types of passwords: [administrator password] and [monitoring password]. The password entered here determines the operations allowed from then on.

Administrator password	Enables all the functions on the pages that follow.
Monitoring password	Enables only the monitoring functions.

Initially, no password is set in the system, so it is only necessary to click on [Send]. (Logged on as an administrator.)

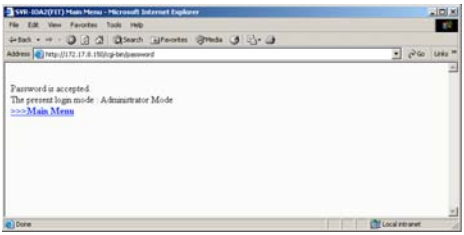


Figure 4.22. Log-in

If the above message appears, your browser will change to the next page in a few seconds.
Clicking on [Main Menu] has the same effect.
If the password is entered incorrectly, control returns to the password entry screen.
Check your password, enter the correct password, and continue with the remainder of the operations.

(3) The following screen comes up:

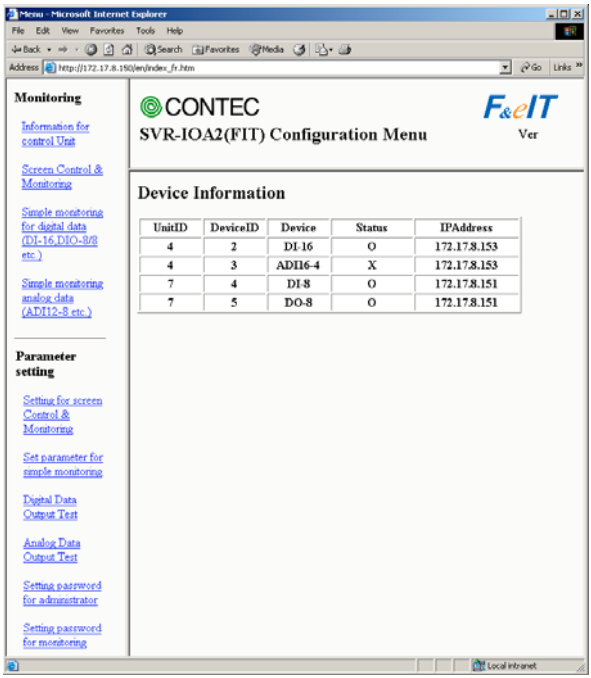


Figure 4.23. SVR-IOA2(FIT)GY Configuration Menu

Monitoring (Displayed in the administrator mode and in monitoring mode)

- Information for control Unit

  Provides information on the units from which the Assist Server collects data with the same Group ID.
  Lists the Unit IDs, Device IDs, Device names, Status, and IP Addresses of individual units.

- Screen Control & Monitoring

  This feature starts a monitoring screen based on a Java applet.
  Display channels on the monitoring screen and the layout of the screen can be changed in any way to suit your preferences.
  A maximum of 10 user-created monitoring screens can be saved.

  * You can change the screen only when you have logged in as an administrator.

- Simple monitoring for digital data (DI-16, DIO-8/8, etc.)

  Select the desired Unit ID, Device ID, and CH (channel) to view the input data.
  The raw input data is displayed in either decimal or hexadecimal representation.

- Simple monitoring analog data (ADI12-8, etc.)

  Select the desired Unit ID, Device ID, and CH (channel) to view the input data.
  Converted data or decimal/hexadecimal input digital data is displayed.

Paramater setting (The following items appear only in the administrator mode.)

- Setting for screen Control & Monitoring

  For bringing up an applet, you can specify a screen size and display refreshing intervals.
  A maximum of 10 monitoring screens that are created by an applet can be stored; for each screen, a specific screen size can be defined.

- Set parameter for simple monitoring

  The display of input data can be switched between decimal and hexadecimal.

- Digital Data Output Test

  The value input at the keyboard can be output to the DO device identified with the Unit ID, Device ID, and CH (channel) specified.
  This feature can be used to test values upon completion of hardware installation and cable connection tasks to check the operation of the system.

- Analog Data Output Test

  The value input at the keyboard can be output to the DA device identified with the Unit ID, Device ID, and CH (channel) specified.
  This feature can be used to test values upon completion of hardware installation and cable connection tasks to check the operation of the system.

- Setting password for administrator

  You can change the administrator password to be input at login.
  Logging in with the password set here enables all the functions available by setting from within the browser.

- Setting password for monitoring

  You can change the monitoring password to be input at login.
  Logging in with the password set here enables only data monitoring.

SVR-IOA2(FIT)GY Configuration Menu Screen

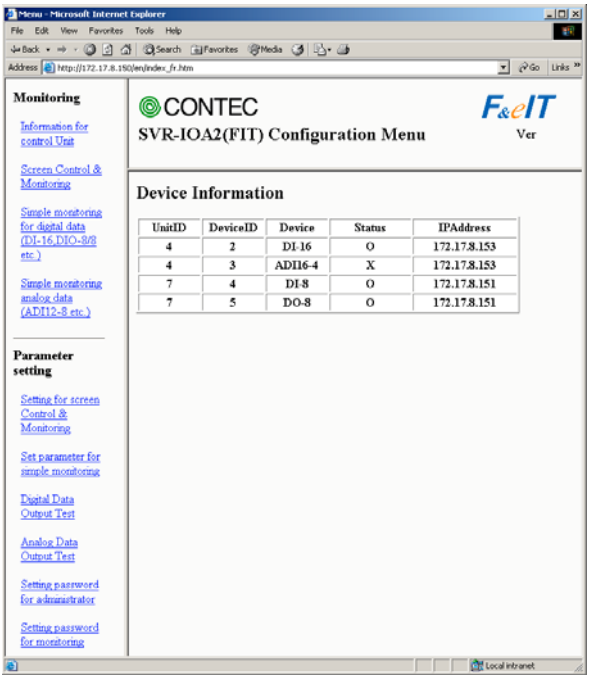


Figure 4.24. SVR-IOA2(FIT)GY Configuration Menu Screen

Selecting a menu item in the left frame displays the corresponding processing page in the lower right frame.

- Information for control Unit

  When clicking on [Information for control Unit], the following screen comes up:

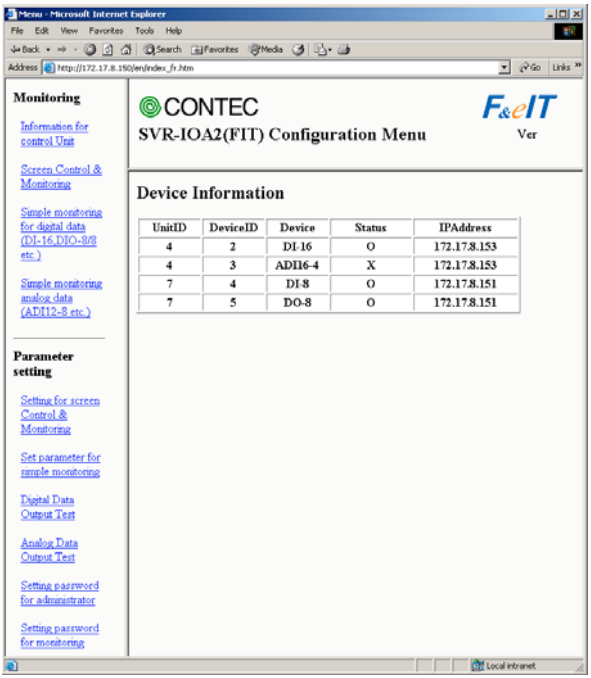


Figure 4.25. Information for control Unit

The table provides information on the units that the current Assist Server can reads and writes data to/from.

- Screen Control & Monitoring

When clicking on [Screen Control& Monitoring], the following screen comes up:

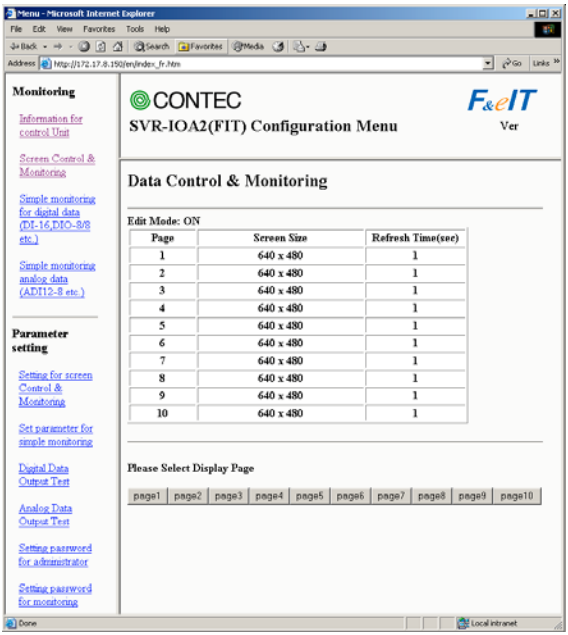


Figure 4.26. Screen Control & Monitoring

The screen shows the current page size and the refreshing interval.

Clicking on a [Page 1] ... [Page 10] button on the bottom row of the screen displays the monitoring screen for the specified page.

A description of how to operate the monitoring screen may be found in the next Chapter.

- Simple monitoring for digital data (DI-16, DIO-8/8, etc.)

  When clicking on [Simple monitoring for digital data (DI-16, DIO-8/8, etc.)], the following screen comes up:

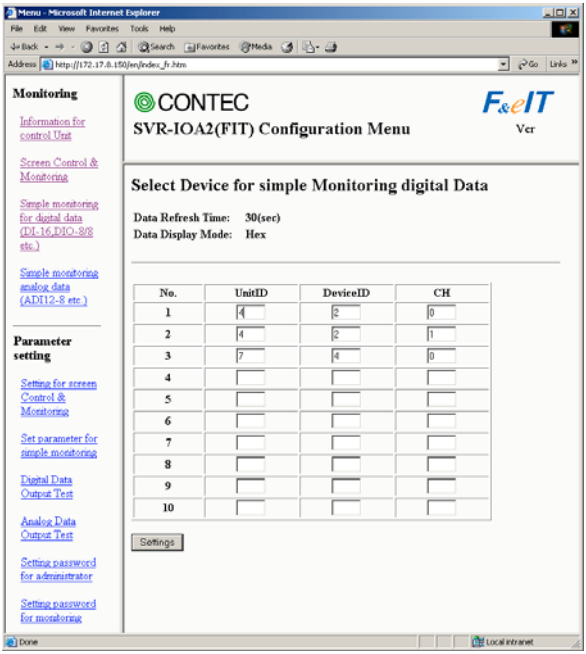


Figure 4.27. Select Device for simple Monitoring digital Data

Enter the Unit ID, Device ID, and CH (channel) to be displayed, and click on [Setting].

The following confirmation screen comes up.

Figure 4.28. Monitoring Confirmation Screen

To start the monitoring process, click on [Start Monitoring].

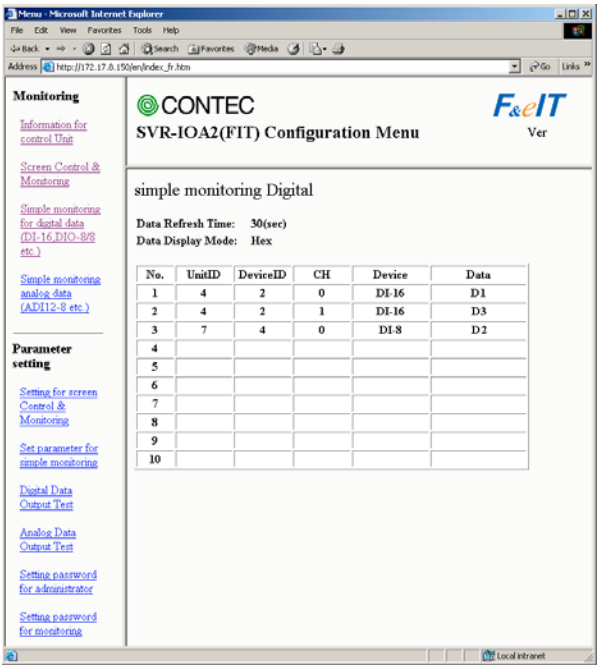


Figure 4.29. Simple monitoring Digital

The input data on the selected channels is displayed.

This screen is refreshed at fixed intervals to display the current input values.

- Simple monitoring analog data (ADI12-8, etc.)

  When clicking on [Simple monitoring analog data (ADI12-8, etc.)], the following screen comes up:

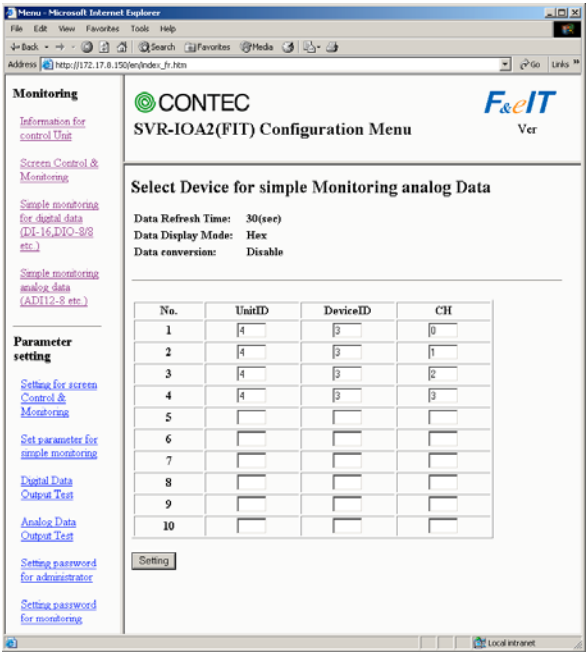


Figure 4.30. Select Device for simple Monitoring analog Data.

Enter the Unit ID, Device ID, and CH (channel) to be displayed, and click on [Settings].

The following confirmation screen comes up.

Figure 4.31. Monitoring Confirmation Screen

To start the monitoring process, click on [Start Monitoring].

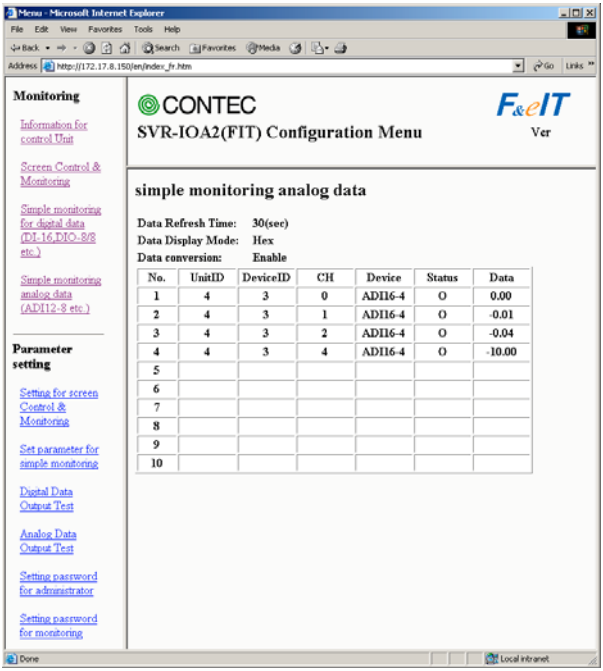


Figure 4.32. Simple monitoring analog data

The input data on the selected channels is displayed.

This screen is refreshed at fixed intervals to display the current input values. "O" in the Status column indicates that the corresponding device is operating.

If the data conversion option is on, the input digital values are converted from the input range specified on the module into analog values, and the results are displayed.

If the data conversion option is off, the input digital values are displayed "as is".

- Setting for screen Control & Monitoring (administrator mode only)

When clicking on [Setting for screen Control & Monitoring], the following screen comes up:

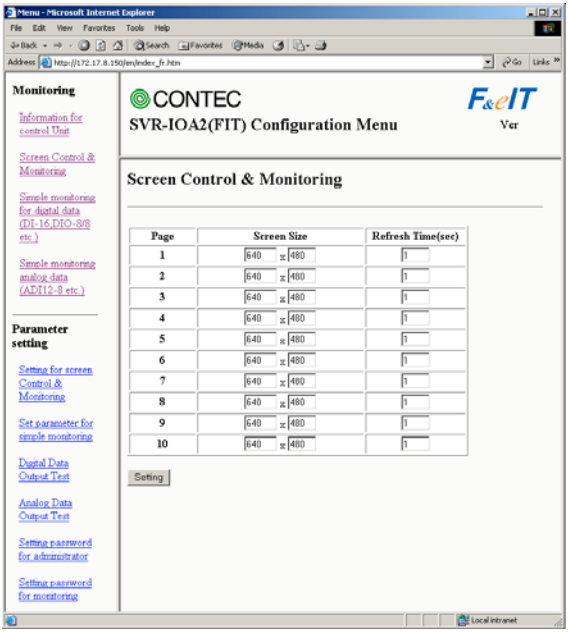


Figure 4.33. Setting for screen Control & Monitoring

A maximum of 10 monitoring screens can be created and saved.

This option allows you to specify the display size and the refreshing interval for each screen.

Screen size : Specify the X size (width) x Y size (height) in pixels.

Refresh interval : This refers to the interval in which the monitoring screen obtains the latest data from the Assist Server.
In the case of monitoring conducted using a relatively slow communication circuit (e.g., a modem), the refreshing interval can be increased in order to reduce the network overhead.

- Set parameter for simple monitoring (administrator mode only)

  When clicking on [Set parameter for simple monitoring], the following screen comes up:

Figure 4.34. Set parameter for simple monitoring

Data Refresh Time : Specify screen-refreshing intervals when input data is to be displayed on [Simple monitoring for digital data (DI-16, DIO-8/8, etc.)] or [Simple monitoring analog data (ADI12-8, etc.)]

Data Display Mode : Specify decimal/hexadecimal switching when input data is to be displayed on [Simple monitoring for digital data (DI-16, DIO-8/8, etc.)] or [Simple monitoring analog data (DAI12-4, etc.)].

Analog Data conversion : When input data is to be displayed on [Simple monitoring analog data (DAI12-4, etc.)], specify whether the input digital values are to be converted from their input range into analog values for display in analog values, or they are to be displayed in the digital form.

Upon completion of the settings, click on [Setting].

- Digital Data Output Test

When clicking on [Digital Data Output Test], the following screen comes up:

Figure 4.35. Digital Data Output Test (for Digital Module)

Digital Data Output Test : Specify a Unit ID, a Device ID, and a CH (channel), enter data, and click on [output]. This causes the system to output the values entered in [Data] to the specified channel.
This option can be used to direct output to the DIO-8/8(FIT)GY and DO-16(FIT)GY, etc.

- Analog Data Output Test

When clicking on [Analog Data Output Test], the following screen comes up:

Figure 4.36. Analog Data Output Test

Analog Data output test : Specify a Unit ID, a Device ID, and a CH (channel), enter data, and click on [output]. This causes the system to output the values entered in [Data] to the specified channel.
This option can be used to direct output to the DAI12-4(FIT)GY, etc.
Enter output data in voltages (a value to the second decimal place).

- Setting password for administrator

When clicking on [Setting password for administrator], the following screen comes up:

Figure 4.37. Setting password for administrator

Old Password : This page allows you to change the password to be input to log in as an administrator.
Enter your current password in the [Old Password] field.

New Password : Enter the new password.

Confirmation : Re-enter the password that was typed in the [New Password] field.

When finished with the input, click on [Setting].

- Setting password for monitoring

When clicking on [Setting password for monitoring], the following screen comes up:

Figure 4.38. Setting password for monitoring

Old Password : This page allows you to change the password to be input to log in as a monitoring mode.

Enter your current password in the [Old Password] field.

New Password : Enter the new password.

Confirmation : Re-enter the password that was typed in the [New Password] field.

When finished with the input, click on [Setting].

Creating and Viewing a Monitoring Screen [Common]

By connecting to the Assist Server from the host computer using a browser, you can create and view a monitoring screen. (You can create it only in the administrator mode.)

Operating procedures

(1) Clicking on page number button of Control & Monitoring screen brings up the following screen:

(As Java VM is not installed depending on the version of the OS in use, the following screen may not appear. If this is the case, install Java VM downloaded from http://java.com/ja/.)

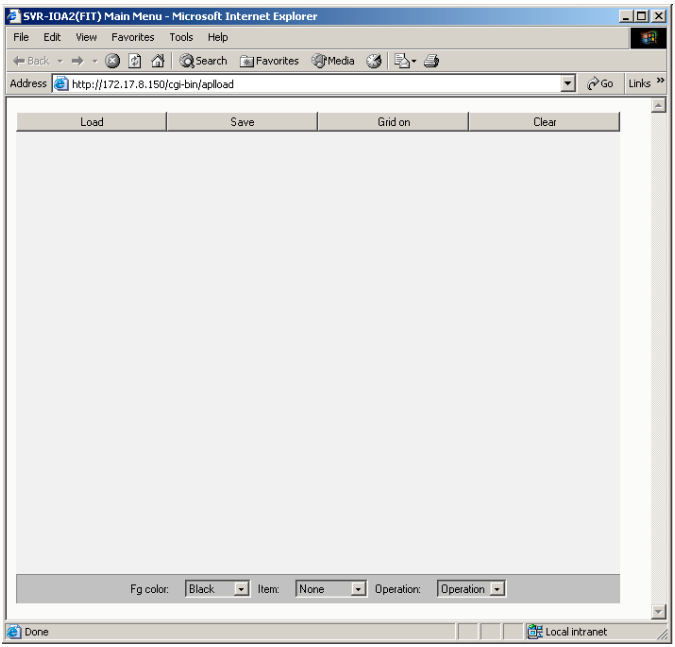


Figure 4.39. Menu

Menu bar functions:

Load	:	Loads and displays a previously saved page.
Save	:	Saves the monitoring screen that has been created.
Grid on/off	:	Displays and undisplays the grid.
Clear	:	Clears the current monitoring screen.
Fg Color	:	Selects the color in which the screen is to be drawn.
Item	:	Selects the component to be laid out.
Operation	:	Selects the specific operation to be performed.

Load: Loads and displays a previously saved page.

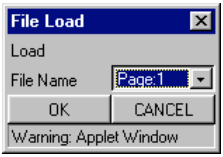


Figure 4.40. File Load

Save: Saves the monitoring screen that has been created.

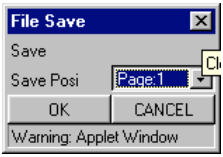


Figure 4.41. File Save

Grid on/off: Turning the grid on changes the view as follows. Clicking on [Grid-off] removes the grid.

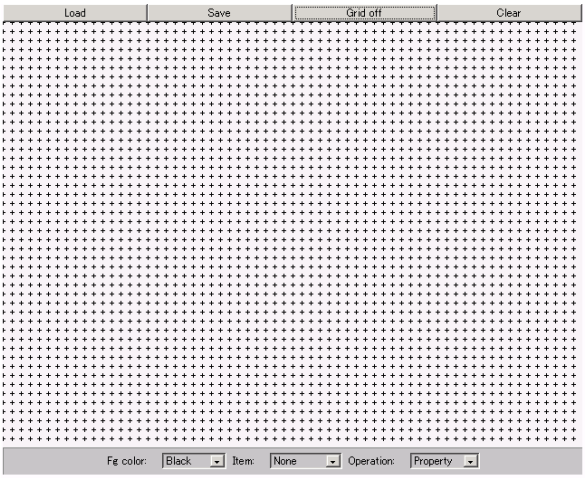


Figure 4.42. Grid Display

Clear: Clears the current monitoring screen.

Figure 4.43. Clear

Fg Color: Selects the color in which the screen is to be drawn.

Figure 4.44. Fg Color

Item: Selects the component to be laid out.

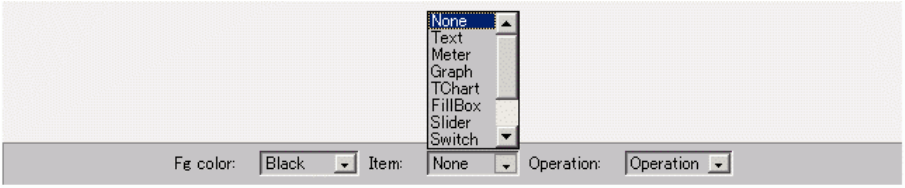


Figure 4.45. Item

Operation: Selects the specific operation to be performed.

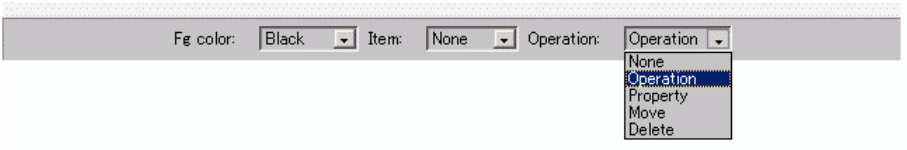


Figure 4.46. Operation

Basic operations

(1) Laying out a component

In [Item], select the desired component, and click on it on the screen in order to lay it out.

Example: Laying out a [Meter]

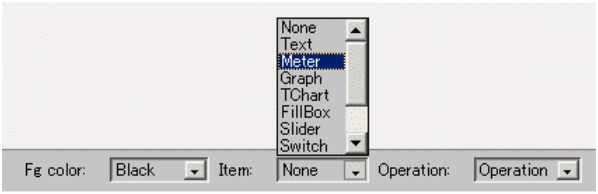


Figure 4.47. Item

↓

Figure 4.48. Item Meter

Single-clicking on the screen displays the meter.

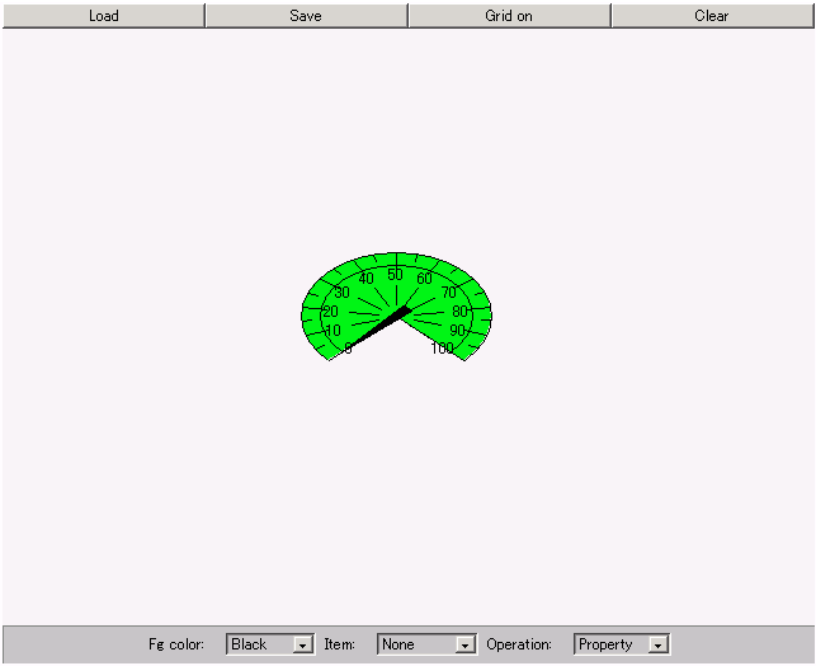


Figure 4.49. Meter

(2) In [Operation], select [Property], and click on the component to open the [Property] box.

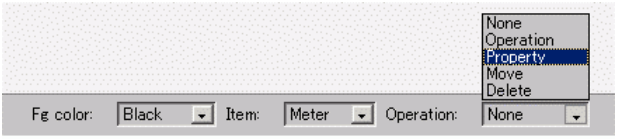


Figure 4.50. Operation

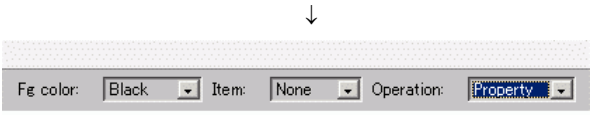


Figure 4.51. Operation Property

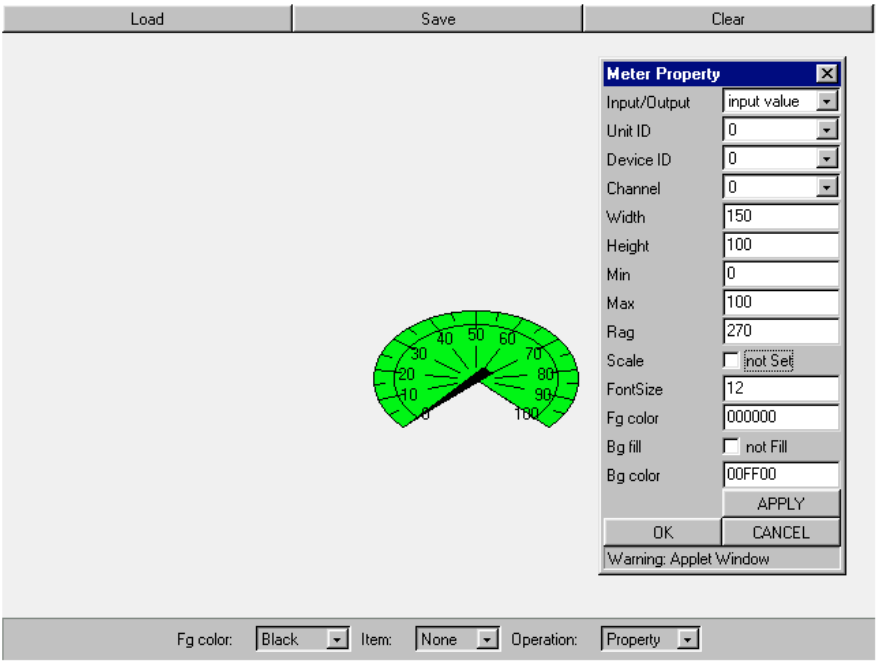


Figure 4.52. Property

Each component to be laid out is associated with its own Unit ID, Device ID, and Channel parameters for display purposes.

(3) You can also move a component by selecting [Move] in [Operation].

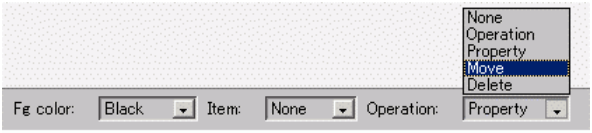


Figure 4.53. Operation

↓

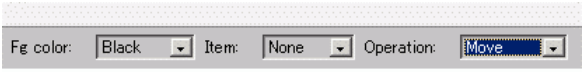


Figure 4.54. Operation Move

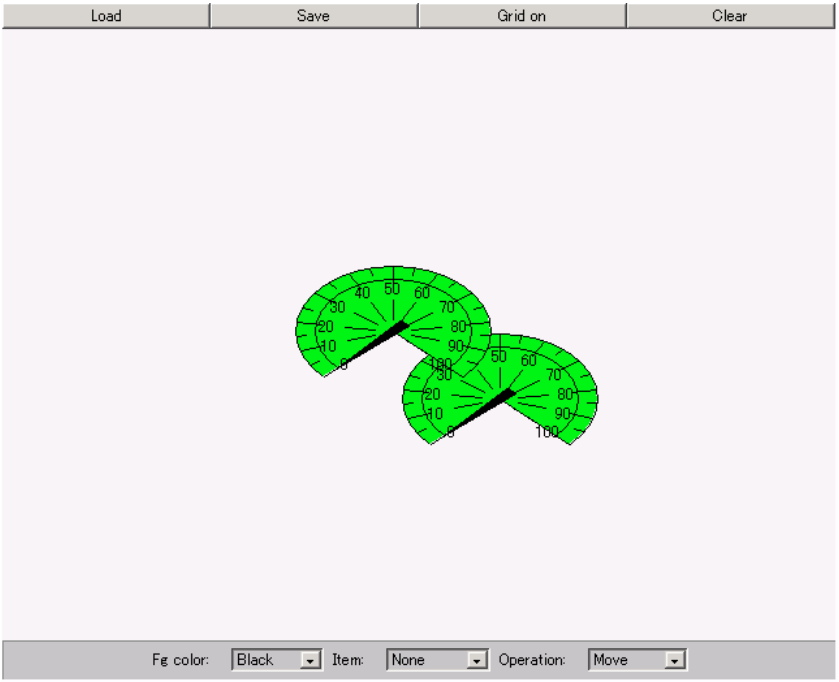


Figure 4.55. Move

By left-clicking the mouse on the component and dragging the mouse, you can move the components. Releasing the mouse fixes the component at the current mouse position.

(4) You can delete a component by selecting [Delete] in [Operation].

Figure 4.56. Operation

↓

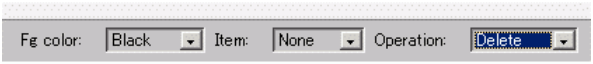


Figure 4.57. Operation Delete

Left-clicking on the component deletes it.

(5) A monitoring screen can be created by laying out the various components according to the procedures described above.
Once a monitoring screen is created, you can display a dialog by selecting [Save] on the menu in order to save it on a desired page. You can bring up a previously saved page by selecting [Load] on the menu to display a dialog and select the desired page.

Types of available components and their overview

Components that can be selected from [Item] on the Menu bar are described below.

Parameters that are common to the various components are also explained below.

Parameters that are specific to a given components are explained in the section dealing with that component.

- Input/Output : In terms of Input/Output, select [Output value] for displaying values from an output-capable module.
  The default is [Input value], which indicates an input value.
- Unit ID, Device ID, Channel : Select the I/O module to be monitored.
- Width : Specify the width of the component.
- Height : Specify the height of the component.
- Min : Specify the minimum value to be displayed.
- Max : Specify the maximum value to be displayed.
- Scale(not Set) : Checking this item suppresses the Min/Max range scaling.
- FontSize : Specify the font size to be used in the component.
- Fg color : Specify the display color to be used.
  This parameter is specified in hexadecimal, where a group of two digits, from left to right, indicates an RGB color, as follows:
  000000: black; FFFFFF: white;
  FF0000: red; 00FF00: green; 0000FF: blue.
- Bg fill(not Fill) : The component is not to be filled with the background color.
- Bg color : Specify a background color in hexadecimal, using the same conventions as in Fg color.

(1) Text : This is a component on which fixed text is displayed.

External view of the component Properties dialog box

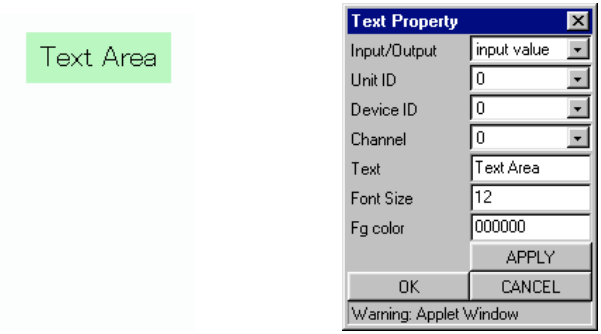


Figure 4.58. Text

Displays the fixed character string that is assigned to the [Text] field.
The Font Size can be changed.
By specifying a Unit ID, a Device ID, a Channel, and [%d] in [Text], you can display the input values in decimal.
Similarly, by specifying a Unit ID, a Device ID, a Channel, and [%x] in [Text], you can display the input values in hexadecimal.

(2) Meter : Displays the [meter] data type.

External view of the component Properties dialog box

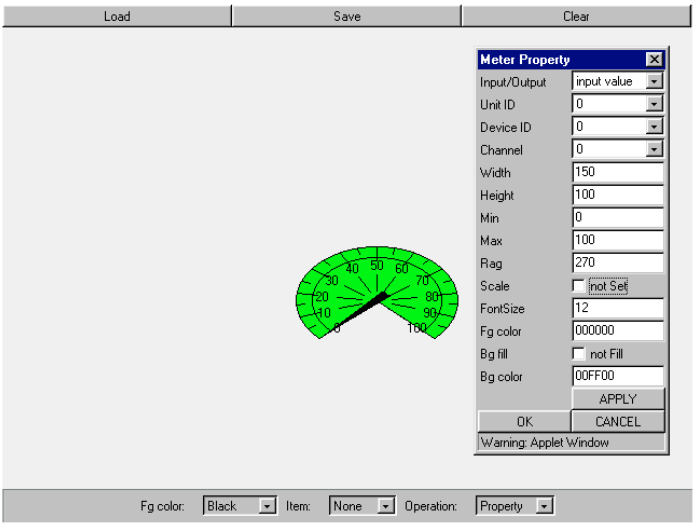


Figure 4.59. Meter

- Rag : Specify an arc angle for a meter display in a range from 90 to 360.

(3) Graph : Graph display

External view of the component Properties dialog box

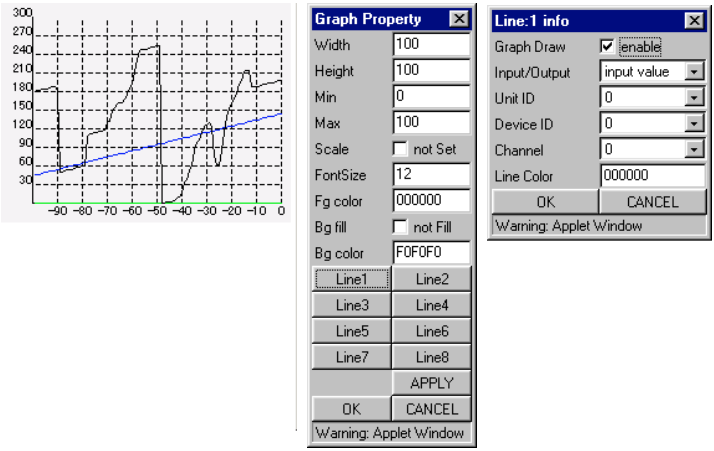


Figure 4.60. Graph

Indicates changes in I/O values in a polygon graph format.
An input channel can be specifying by clicking on the [Line] button and specifying a value in units of "Lines".
A maximum of eight channels can be displayed simultaneously.
The horizontal axis represents up to 100 count values for the scanning interval.

(4) Tchart : Timing chart display

External view of the component Properties dialog box

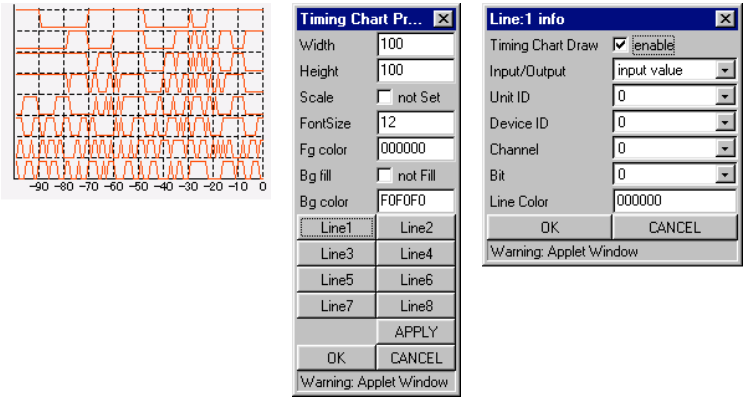


Figure 4.61. Tchar

Displays changes in I/O bit on/off patterns in a polygon graph format.

An input channel can be specifying by clicking on the [Line] button and specifying a value in units of "Lines".
A maximum of eight channels can be displayed simultaneously.
The horizontal axis represents up to 100 count values for the scanning interval.

(5) FillBox : Fill box display

External view of the component Properties dialog box

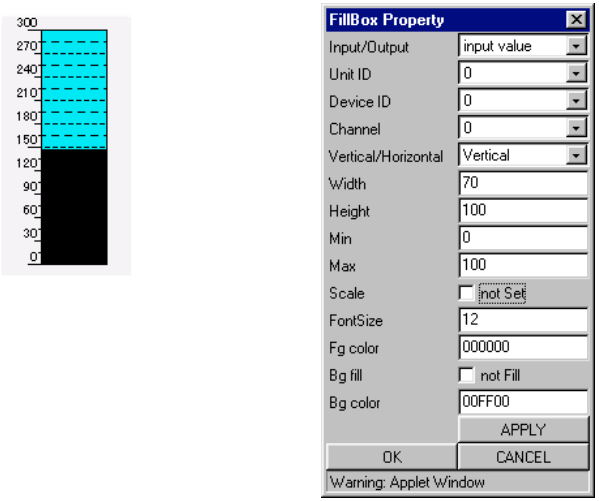
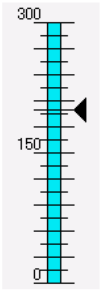


Figure 4.62. FillBox

- Vertical/Horizontal : Switches the display orientation between horizontal and vertical orientations.
  The default is [Vertical].

(6) Slider : Slider switch

External view of the component Properties dialog box



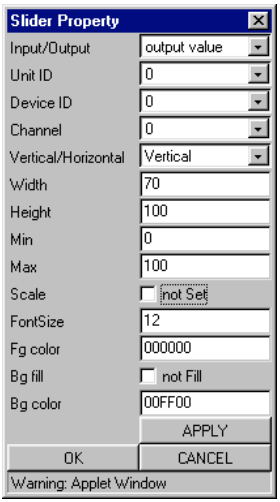
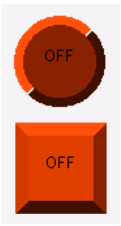


Figure 4.63. Slider

- Vertical/Horizontal : Switches the display orientation between horizontal and vertical orientations.
  The default is [Vertical].

(7) Switch : Switch display

External view of the component Properties dialog box



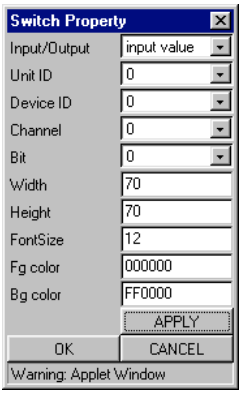


Figure 4.64. Switch

This switch displays I/O bits.
In terms of Input/Output, selecting [Input value] displays round buttons, which indicate input values. Selecting [Output value] displays square switches, which indicate output values.

(8) Seg7 : Segment-7 display

External view of the component

Properties dialog box

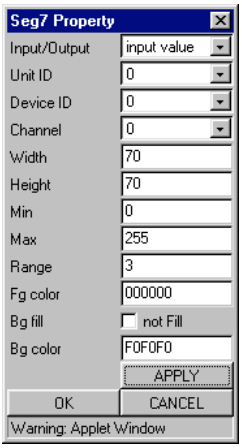
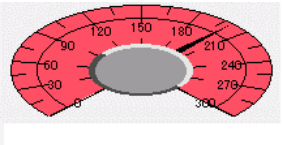


Figure 4.65. Seg7

- Range : Specify the number of digit positions to be made available for display purposes.

(9) Volume : Volume display

External view of the component



Properties dialog box

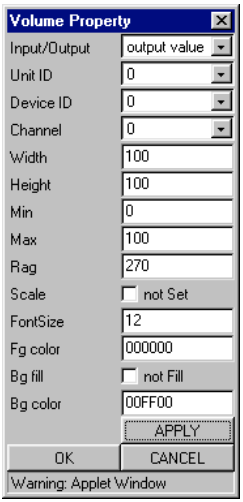


Figure 4.66. Volume

- Rag : Specify a meter display arc angle in a range from 90 - 360.
  In terms of Input/Output, selecting [Output value] causes a meter to be displayed.

(10) Status : Unit device status display

External view of the component

DevID	Device Type	Set	Run	Err
0	DIO-8/8	○	○	0
1	DI-16	○	○	0
2	DO-16	○	○	0
3	AD12-8	○	○	0
4	DA12-4	○	○	0
5	CNT24-2	○	○	0

Properties dialog box

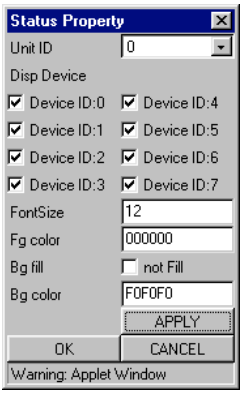


Figure 4.67. Status

When the monitoring screen is running under the [Operation] mode, clicking on the [Device Type] field brings up a setup dialog for each device.

- Unit ID : Specify the Unit ID about which the module installation status is to be displayed.
- DispDevice : Assign the desired Device ID from Device IDs 0 - 7.

(11) Page Text : Unit device status display

External view of the component

Properties dialog box

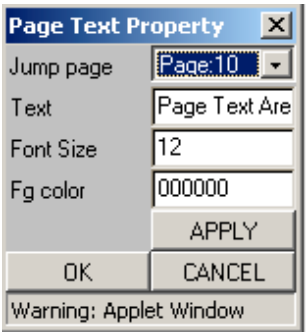


Figure 4.68. Page Text

- Jump page : Select the page to which to jump when you click on [OK] or [APPLY].
- Text : Enter the text to be displayed.

Creation screen image

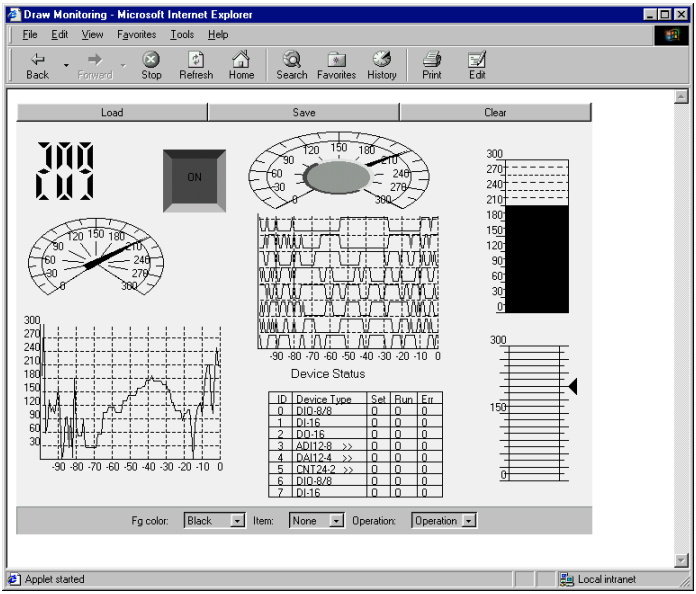


Figure 4.69. Creation Screen

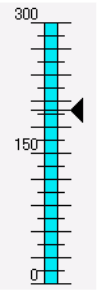
Monitoring-screen operation

On the monitoring screen, the following components can provide directives to devices:

- Slider
- Switch
- Seg7
- Volume
- Satus

(1) Slider

By left-clicking on the triangle bar and sliding it, you can change the output from the slider.



Triangle slider

F

igure 4.70. Slider

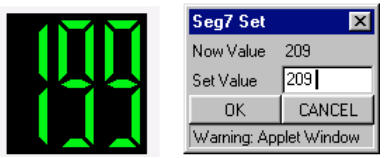
(2) Switch

Displays the status of the bit that was set.
Left-clicking on an ON bit turns it off.
Left-clicking on an OFF bit turns it on.

Figure 4.71. Switch

(3) Seg7

Left-clicking on this component brings up a dialog box that enables you to set an output value from the keyboard.



igure 4.72. Seg7

(4) Volume

By left-clicking on the memory content of the value to be output, you can change the output value.

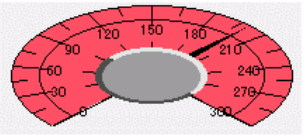


Figure 4.73. Volume

(5) Status

Left-clicking on [Run] for a given Device ID brings up a [Start/Stop] dialog box.
Left-clicking on [Device Type] for a given Device ID brings up a basic setup dialog box.

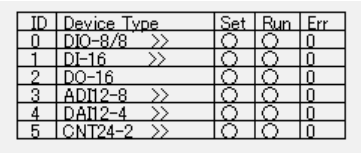


Figure 4.74. Basic Setup Dialog

1) ADI12-8(FIT)GY
An input signal range must be set.
The following module ranges can be used: -10 - +10V, -5 - +5V, 0 - +10V, and 0 - +5V.
Please refer to the Module Manual for further details.

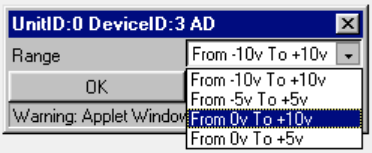


Figure 4.75. ADI12-8(FIT)GY

2) DAI12-4(FIT)GY
An output signal range must be set.
The following module ranges can be used: -10 - +10V, -5 - +5V, 0 - +10V, 0 - +5V, and 0 - 20mA.
Please refer to the Module Manual for further details.

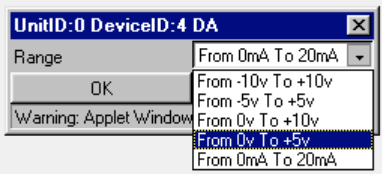


Figure 4.76. DAI12-4(FIT)GY

3) ADI16-4(FIT)GY
An input signal range must be set.
The following module ranges can be used: -10 - +10V, 0 - 20mA.
Please refer to the Module Manual for further details.

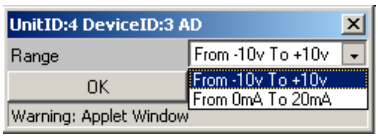


Figure 4.77. ADI16-4(FIT)GY

4) DAI16-4(FIT)GY
An output signal range must be set.
The following module ranges can be used: -10 - +10V, 0 - 20mA.
Please refer to the Module Manual for further details.

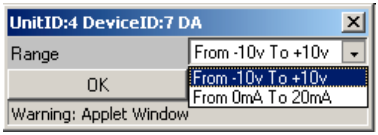


Figure 4.78. DAI16-4(FIT)GY

5) CNT24-2(FIT)GY

This brings up the type of dialog shown on the right. CH0 and CH1 are used to set the desired channel for counting input signals.

The generic output provides output-related settings. Please refer to the Module Manual for further details.

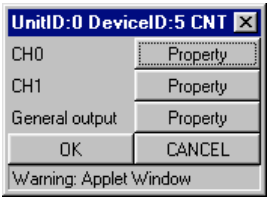


Figure 4.79. CNT24-2(FIT)GY

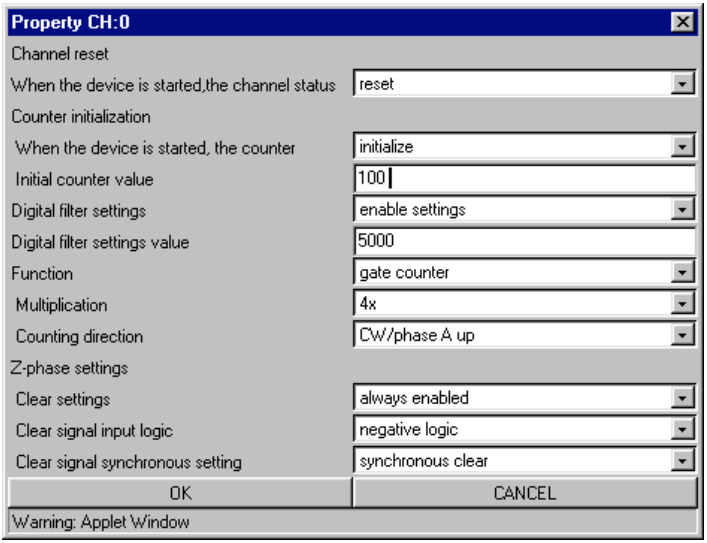


Figure 4.80. Property CH0

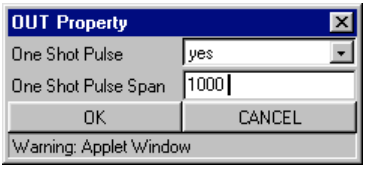


Figure 4.81. OUT Property

6) DI-16(FIT)GY, DIO-8/8(FIT)GY, DI-8(FIT)GY, DIO-8D(FIT)GY

This brings up the type of dialog shown on the right.

The dialog box is used to set the Hardware Filter, Software Filter, and Mode Change.

Please refer to the Module Manual for further details.

Figure 4.82. DIO-8D(FIT)GY

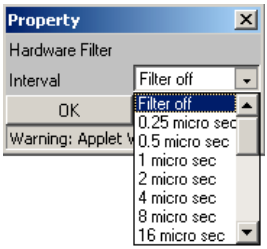


Figure 4.83. Hardware Digital Filter

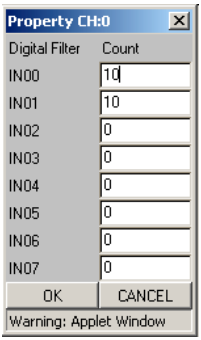


Figure 4.84. Software Digital Filter

5. Accessing the Devices

This chapter provides information on using API functions [API-CAP(W32)] and DDE Server [FIT_SVR(W32)] to create access applications.

Access using API- CAP(W32)

API-CAP(W32) is a library of functions positioned above F&eIT common functions and RemoteIO functions.
The API-CAP(W32) library is a DLL which provides function interfaces customized for individual categories of devices to be used in connection with the I/O controller unit, such as digital, analog, counter, and temperature measurement devices. The library itself is created based on F&eIT common functions. You can easily control devices connected to the I/O controller unit only by calling specific API-CAP(W32) library functions provided for different categories without paying attention to the virtual address map, F&eIT protocol, and to device-specific control sequences.

For details on how to use API functions, consult the help file.

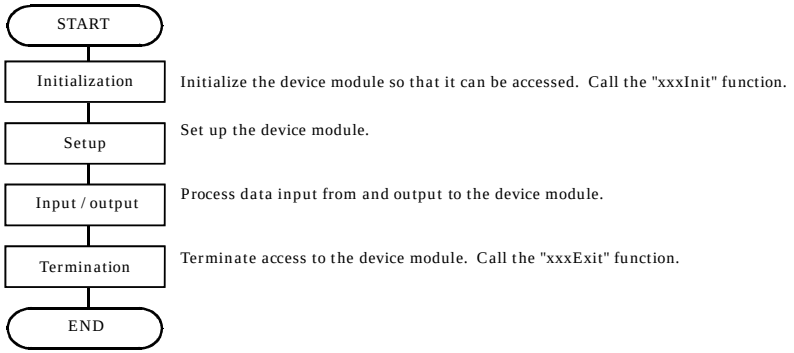


Figure 5.1. API-CAP(W32) Function Calling Sequence

API-CAP(W32) is provided as a group of functions and programs facilitating access to F&eIT device modules. The F&eIT protocol itself remains unchanged as it has been provided. The introduction of API-CAP(W32) has no effect on applications created so far by using F&eIT common functions and RemoteIO functions.

Applications based on conventional F&eIT common functions and RemoteIO functions run normally even in the API-CAP(W32) installed environment.

For details on F&eIT common functions and RemoteIO functions, consult the help file.

Access Using DDE

FIT-SVR (DDE Server) contains DDE server function.
The application that has DDE client function is able to access to the FIT-SVR then get an input of the device.
For settings method of FIT-SVR, refer to the Help on FIT-SVR.

In the case of access by DDE, Topic and Item is defined as follows:

Application : FIT_SVR

Topic : GRPxx
"GRP" is a fixed item representing a group; "xx" indicates a two-digit (00 - 08) Group ID.

Item : UxxDyyTzz

U Fixed item representing a unit.
xx Unit ID. Set a two-digit numeric value. (00 - 07)

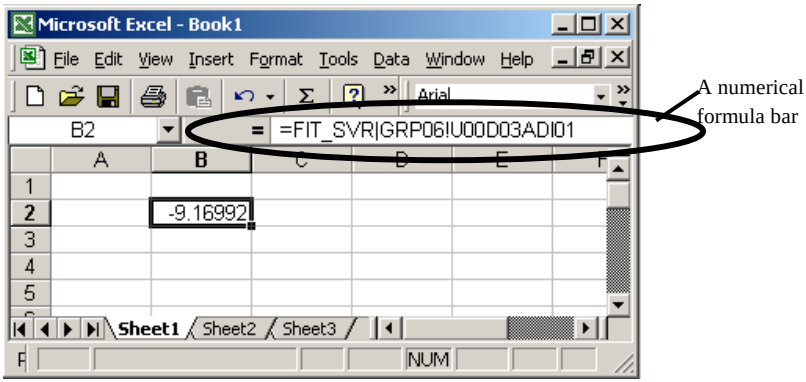
D Fixed item representing a device.
yy Device ID. Set a two-digit numeric value. (00 - 07)

T Set the type of device data, selected from among the following options:

DI_BIT : Bit input (Logical type)
DI_BYTE : Byte input (Integer type)
DI_WORD : Word input (Integer type)
DO_BIT : Bit output (Logical type)
DO_BYTE : Byte output (Integer type)
DO_WORD : Word output (Integer type)
ADI : Analog input (Real number type)
DAI : Analog output (Real number type)
CNT : Count input (Integer type)
* Integer type is 32Bit.

zz Channel no. Set a two-digit numeric value. (Prefix 0 - 9 with a 0.)

For Example; Getting the data into Microsoft Excel



It is specified in the form of = Application name|Topic name!Item name

For Example:

GroupID:06 UnitID:00 DeiceID:03 (In the case that ADI12-8(FIT)GY is used)
In the case getting the data of Channel: 01 into a cell,

=FIT_SVR|GRP06!U00D03ADI01
is inputted into a cell.

6. Troubleshooting

When encountering a problem during the operation of the Assist Server, you can follow the following procedures to verify the source of the problem:

(1) Check the LED on the front panel.

There are [RUN] and [STATUS] LED indicators on the front panel.

- Check to see that the [RUN] LED is on.
  If this LED is not on (or is flashing), refer to the preceding chapter and check the names and functions of the various components.
- Check to see that the [STATUS] LED is off.
  If [STATUS] is not off, refer to Chapter 2, "Nomenclature of Unit Components and Their Settings".

(2) Check the LED for the network port.

Check the LED for the UTP connector on the front panel.

If the network cable is securely connected to the HUB, the [LINK] LED remains on. If this LED is not on, refer to Chapter 3, "Installation and Connection" to verify that everything is in order.

The [ACT] LED flashes when communications are conducted through the network port.

(3) Check to see whether the PING command generates a response from the host computer.

Issue PING to the IP address of this device.

If the device is operating normally, the host computer will respond.

Example: The device IP address is set as 192. 168. 1. 1:

ping 192.168.1.1<Enter>:
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
Reply from 192.168.1.1: bytes=32 time<10ms TTL=255
A response is displayed.

If there is no response, use the Utility software to verify the IP address that is set.

7. Appendix

System Reference

Product Specifications

SVR-IOA(FIT)GY

Table 7.1. Product Specifications [SVR-IOA(FIT)GY]

Item	Specification
CPU	SH3 100MHz
Memory	Flash ROM: 1Mbyte(8Mbit) EDO DRAM: 2Mbyte(16Mbit)
LAN controller	ASIX 10BASE-T/100BASE-TX controller AX88796 Build-in 16K byte SRAM & single PHY Full-duplex, half-duplex-capable NE2000-compatible registers
Interface (host side)	10BASE-T/100BASE-TX(IEEE802.3/802.3u)
Power supply voltage	Power is supplied by means of a 2-piece power input connector (detachable), 5VDC±5%, on the front side. Use of a F&eIT series power supply unit or an off-the-shelf stabilized power supply unit is recommended.
Power consumption	0.5A(Max.)
FG pin	The power supply input connector includes a FG pin.
External dimensions(mm)	25.2(W) x 64.7(D) x 94.0(H) (exclusive of any protrusions)
Weight	100g
Installation method	One-touch installation on a 35mm DIN rail. The system unit includes a DIN rail mounting mechanism as a standard feature.

Table 7.2. Installation Environment Requirements [SVR-IOA(FIT)GY]

Parameter		Requirement description
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-Noise resistance	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)
Grounding		Class D grounding (previous class 3 grounding)

*1 Assuming that the AC-DC power supply POW-AD22GY is used.

SVR-IOA2(FIT)GY

Table 7.3. Product Specifications [SVR-IOA2(FIT)GY]

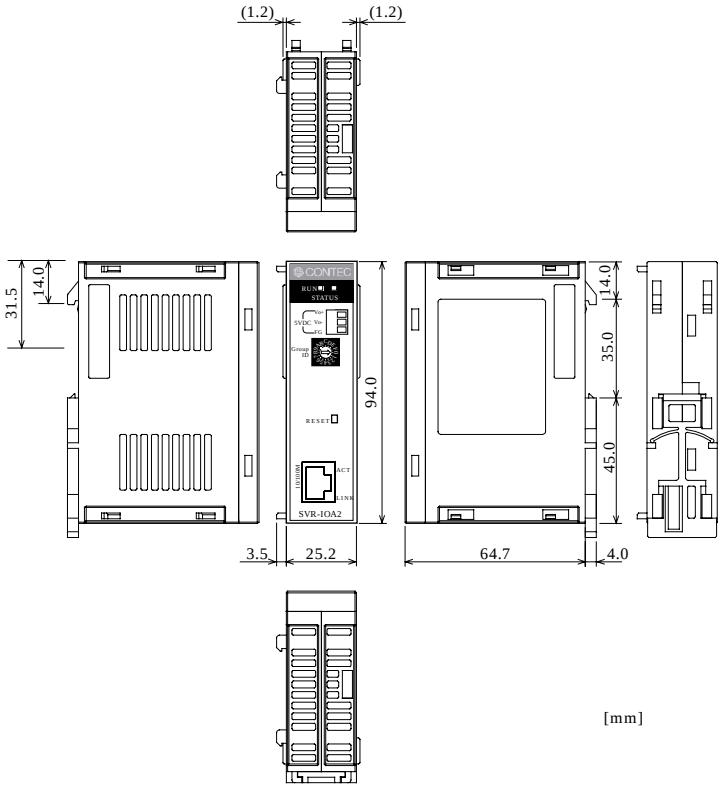
Item	Specification
CPU	SH4 240MHz
Memory	Flash ROM: 4Mbyte(32Mbit) SDRAM: 32Mbyte(256Mbit)
LAN controller	National Semiconductor 10/100BASE-TX controller DP83815 Build-in sending: 2Kbyte, receiving: 2Kbyte buffer Full-duplex-capable
Interface (host side)	10BASE-T/100BASE-TX(IEEE802.3/802.3u)
Power supply voltage	Power is supplied by means of a 2-piece power input connector (detachable), 5VDC±5%, on the front side. Use of a F&eIT series power supply unit or an off-the-shelf stabilized power supply unit is recommended.
Power consumption	0.7A(Max.)
FG pin	The power supply input connector includes a FG pin.
External dimensions(mm)	25.2(W) x 64.7(D) x 94.0(H) (exclusive of any protrusions)
Weight	100g
Installation method	One-touch installation on a 35mm DIN rail. The system unit includes a DIN rail mounting mechanism as a standard feature.

Table 7.4. Installation Environment Requirements [SVR-IOA2(FIT)GY]

Parameter		Requirement description
Operating temperature		0 - 50°C
Storage temperature		-10 - 60°C
Humidity		10 - 90%RH (No condensation)
Floating dust particles		Not to be excessive
Corrosive gases		None
Line-Noise resistance	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)
Grounding		Class D grounding (previous class 3 grounding)

*1 Assuming that the AC-DC power supply POW-AD22GY is used.

External Dimensions



The illustration above is of the SVR-IOA2(FIT)GY but it is the same as with the SVR-IOA(FIT)GY.

Figure 7.1. External Dimensions

F&eIT Protocol Specifications

The sudden spread of the Internet has resulted in networks springing up in a wide range of fields. This, in turn, has resulted in the appearance of many information devices that make use of this infrastructure. Yet, it is a fact that interconnectivity - the greatest advantage of networks - is not being used to its fullest. CONTEC sees networks as a prime part of the system bus concept and has developed distributed monitor & control networks that organically integrate various applications from corporate offices through to field applications.

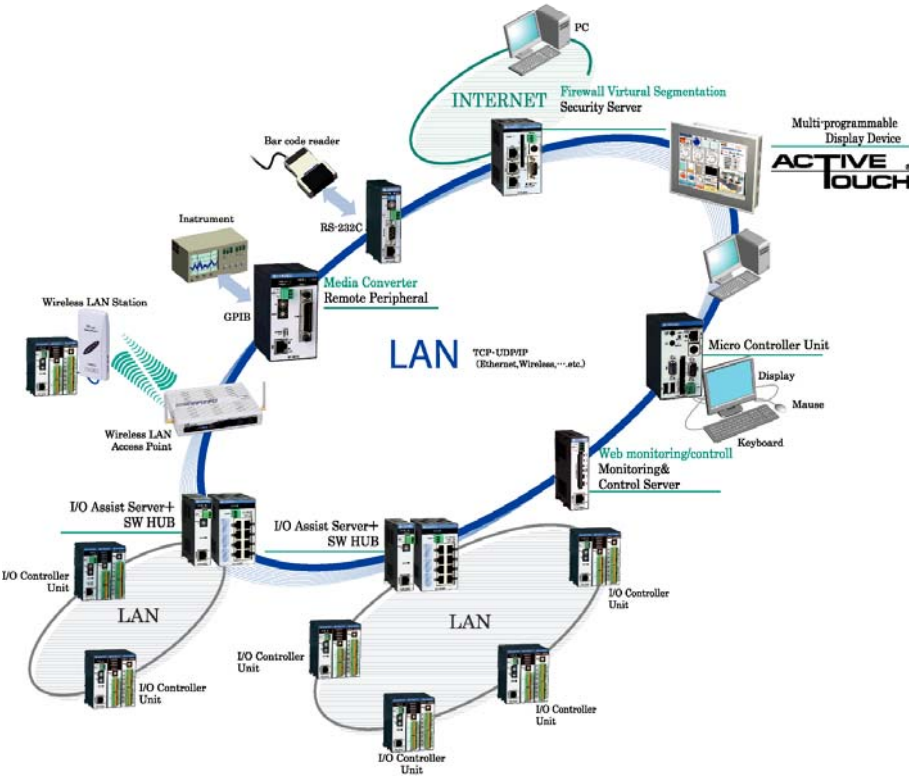


Figure 7.2. Communications Server Concept-Overall Diagram

The following defines the common protocol layers that will be provided in all products based upon the communications server concept.
Such products, complying with the communications server specifications, will be able to access device information using the same protocol.

The role of the F&eIT Protocol

The F&eIT Protocol defines the following protocol layers.

Table 7.5. Table of Protocol Levels

Application layer	ACX, DLL, etc
Device-dependent control layer	
F&eIT protocol layer	F&eIT protocol specifications
Transport layer	UDP, ICMP
Network layer	IP, ARP
Data link layer	Ethernet (IEEE802.3), etc.
Physical layer	

Basic Specifications

Concepts

The F&eIT Protocol assigns all device resources (including resource, information) to virtual space so that any access to a device will be performed by specifying a virtual address. The virtual space is divided into information common to devices, device-specific information, I/O space, and memory space. The specific location in the virtual space where information is stored and the method by which information is stored is completely transparent with respect to where or how information is stored in actual physical resources.

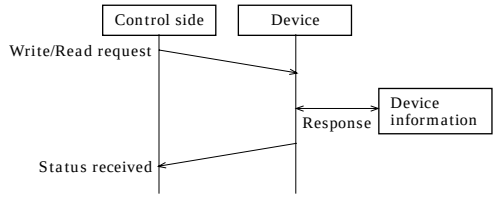
Table 7.6. Overview of Virtual Space

00000000h - 000FFFFFh	Information common to devices (1MB)
00100000h - 001FFFFFh	Device-specific information (1MB)
00200000h - 002FFFFFh	Definition of device-specific information (1MB)
00300000h - 003FFFFFh	I/O space (1MB)
00400000h - 004FFFFFh	Memory space (1MB)
FFE00000h - FFFFFFFFh	Firmware update area (2MB)

Data Communications Protocol

The F&eIT Protocol has two access procedures on the connectionless UDP/IP: response-type access and trap-type access.

(Response-type)



(Trap-type)

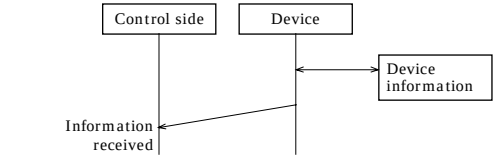


Figure 7.3. Communications Protocol

Frame format

Using the UDP/IP port address 5007h, the F&eIT Protocol is installed in the data section.
The frame structure takes the format described below. Due to the header byte order conventions, the Ethernet, IP, and UDP are treated as Big Endians; all other entities are treated as Little Endians, for which controls exerted by an x86 CPU hold priority.

Table 7.7. Frame Structure

	Header name	Size (byte)	Remarks
Ethernet section	Destination Address	6	Remote MAC address
	Source Address	6	Local MAC address
	Type Field	2	Ethernet II
IP section	IP Ver4 Header	20	Fragment disabled
UDP section	UDP Header	8	Port Address 5007h Check Sum disabled
Communication servier section	Identifier	2	"SV"
	Version	1	Version of the header structure
	Command	1	Command and the ACK flag
	Sequence number	2	Frame ID
	Response ID	2	Identifies the sender.
	Virtual address	4	Specifies a virtual address space.
	Access size	2	1436 bytes maximum
	Status	2	Result of command execution
	Access ID	8	Identifies the Read/Write privilege
	Remote MAC address	6	Specifies a remote MAC address when using IP multicasting.
	Reserved	6	Reserved for future use
	Data section	1436	Data area

[Description of communications server headers]

(1) Identifier --- Identifies the frame as a F&eIT Protocol frame.

(2) Version --- Indicates the frame version.

(3) Command --- The virtual address access command.

(4) Sequence no. --- A counter that prevents the occurrence of duplicate frames, wherein the sequence number is incremented each time a packet is transmitted.

(5) Response ID --- When a response-type command is transmitted, the contents of the response ID are copied to the response ID for the response frame.

(6) Virtual address --- Specifies the virtual address being accessed, e.g., device information can be read by specifying the address 0000h.

(7) Access size --- Specifies the size of the data to be accessed, from 1 to a maximum of 1436 bytes.

(8) Status --- Stores status information after the command is executed.

(9) Access ID --- This is an ID for virtual address access control.

(10) Remote MAC address --- When data is read/written using IP Multicast, the MAC address of the remote device is set in this header. When data is to be sent to all devices on the network, the value ALL[F] is set in this header. (For Unicast: "ALL [0]")

Commands in detail

The following command is set in the command section (Offset = 4 in the F&eIT Protocol header section.):

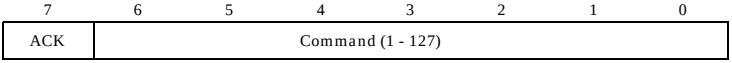


Figure 7.4. Command Structure

Bits 0 to 6 represent the command; the MSB indicates a response frame (ACK).

7Bit = 0: command request

1: command response

Table 7.8. Commands in Detail

Command number	Command description	Type	Remarks
1	Reads from a virtual address.	Response	Reads device information by specifying a virtual address.
2	Writes to a virtual address.	Response	Updates device information by specifying a virtual address.
3	Transmits messages.	Response	Exchanges messages between devices.
4	Trap	Trap	Transmits trap information from a device, based on various events.
5	Reset	Response	Resets a device after returning a response frame.
7 - 127	Reserved	Undefined	Undefined

Command-issuing procedures

- Read a virtual address (command = 1)

  A virtual address and its size are specified, and the frame is transmitted to the target device. The result is received as a response frame with data.
  (Example: reading a vendor name)

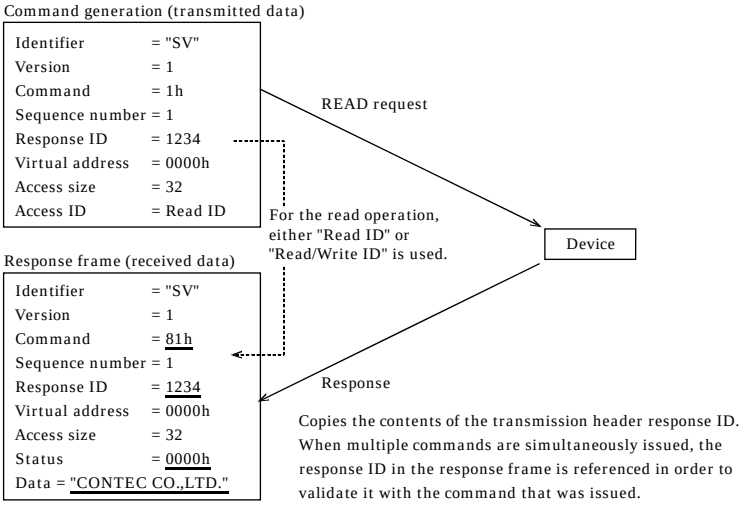


Figure 7.5. Reading Procedures

- Writing to a virtual address (command = 2)

  A virtual address ,its size and data are specified, and the frame is transmitted to the target device. The result is received as a response frame status.
  (Example: setting an IP address)

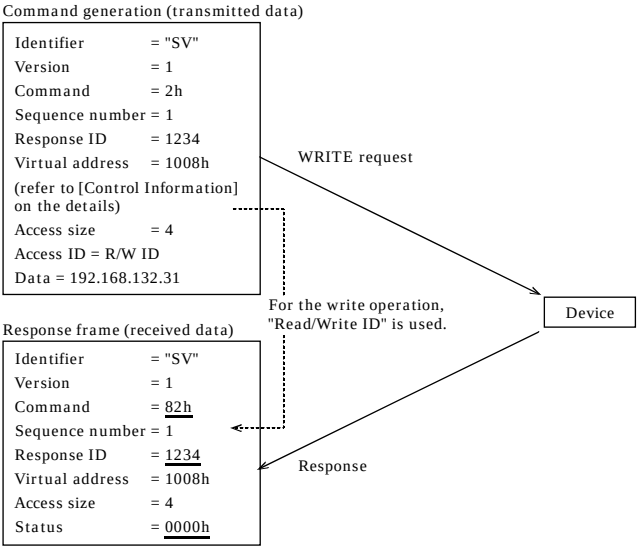


Figure 7.6. Write Procedures

- Message transmission (command = 3)

  Writes the message to be transmitted into the data section. The result is received as a response frame status. The maximum data size that can be transmitted per command is 1436 bytes.
  (Example: data transmission)

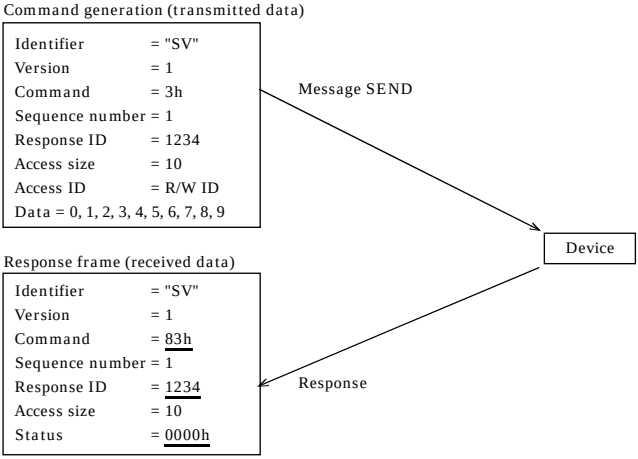


Figure 7.7. Message Transmission

- Trap transmission (command = 4)
  This command is used by devices to send a signal to the controller when a trap event occurs (an interval timer event or a pre-set event). If a response is required, the MSB in the command is set to 0.

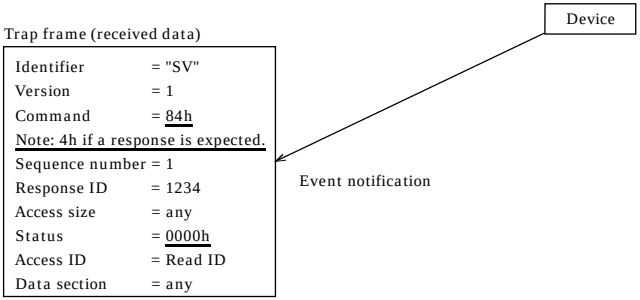


Figure 7.8. Trap Transmission

- Reset (command = 5)
  This command resets a given device. Before resetting itself, the device will return a response frame.

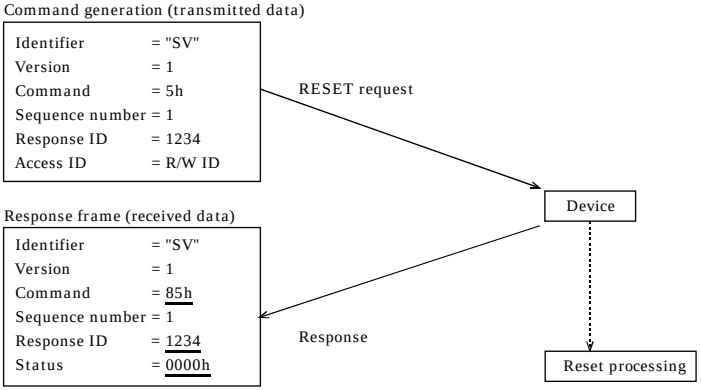


Figure 7.9. Reset Transmission

Response status

Following is a table of status information that is returned by response-type commands:

Table 7.9. Table of Status Information

Code	Description	Remarks
0000h	Normal termination	
0001h	Access violation	An attempt was made to write to a Read-only area.
0002h	Area error	Access was made to an area not defined on the device.
0003h	Access size error	An access request greater than 1436 bytes was made.
0004h	Parameter error	Invalid parameter contents, such as receipt of a non-supported command.
0005h	Length error	Invalid transmission length, such as an inconsistent data size with the number of data items calculated from the UDP/IP.
0006h	Insufficient resources	Too many tasks are waiting for ACK data, causing a resource shortfall. The resources can be released by a timeout.

Control Information

The F&eIT Protocol assigns all resources that are disclosed outside the devices to 32-bit virtual space. Following is a table of correspondence between virtual addresses and device information. Bytes order is Little Endian.

Information common to devices

The following types of information are provided in all F&eIT Protocol-compliant devices:

Table 7.10. Information Common to Devices (Example) *< 1 / 2 >*

Address	Size	Access Type	Description	Remarks	
0000h - 0FFFh	32	R	Vendor name	"CONTEC CO.,LTD."	
	32	R	Model	"SVR-IOAx(FIT)GY"	
	2	R	Equipment version	1.0	
	2	R	Firmware version	1.0	
	6	R	MAC address	00804C******	
	2	R	Installation function	Bit 0: I/O space Bit 1: Memory space Bit 2: Trap function Bit 3: Message send Bit 4: Reset function Bits 5 and higher: reserved	
	4	R	IP address		
	2	R	Product type		
	4	R	Reserved		
	2	R	F&eIT protocol version		
	4008	R	Reserved		
1000h - 1FFFh	8	W	Read privilege ID	(Initial value: 00h)	
	8	W	Read/Write privilege ID	(Initial value: 00h)	
	4	R/W	IP address	(Ex.) 192.168.132.31	
	4	R/W	Subnet mask	(Ex.) 255.255.255.0	
	4	R/W	Default gateway	(Ex.) 192.168.132.1	
	4	R/W	Trap-to IP address	(Ex.) 192.168.132.21	
	4	R/W	Number of effective multicast devices	0 - 4 (Initial value = 0)	
	4	R/W	Multicast IP 1	Indicates the group address for multicast communications.	
	4	R/W	Multicast IP 2		
	4	R/W	Multicast IP 3		
	4	R/W	Multicast IP 4		
	2	R/W	UDP port	5007h (Initial value)	
	2		Reserved		
	32	R/W	Device name	User-defined	*1
	32	R/W	Device physical position	User-defined	*1
	32	R/W	Contact point	User-defined	*1
	4	R/W	SNMP trap-to IP address		*1
	32	R/W	Community name		*1
	4	R/W	Access right	0: Read Only 1: Read/Write	*1
	3904	R	Reserved		

*1 These resources are not used for the SVR-IOAx(FIT)GY as it has no SNMP agent installed.

Table 7.10. Information Common to Devices (Example) < *2 / 2* >

Address	Size	Access Type	Description	Remarks
2000h	4	R	Elapsed time after the system is started	Seconds
	4	R	Total number of transmitted frames	Counter
	4	R	Total number of transmitted bytes	Counter
	4	R	Total number of received frames	Counter
	4	R	Total number of received bytes	Counter
	4	R	Total number of transmission errors	Counter
	4	R	Total number of reception errors	Counter

Device-specific information

Table 7.11. Device-Specific Information (Example)

Address	Size	Access Type	Description	Remarks
100000h - 1FFFFFh	1M	R	Device-specific information	Defines device-specific information.
200000h - 2FFFFFh	1M	R	Explanation of device-specific information	Defines device-specific information in text. Kanji characters are not allowed; characters that can be viewed on Windows Notepad can be used.

Information common to devices (2)

Table 7.12. Information Common to Devices (2) (Example)

Address	Size	Access Type	Description	Remarks
300000h - 3FFFFFh	1M max	Arbitrary	I/O space	Assigns the I/O resource to be disclosed.
400000h - 4FFFFFh	1M max	Arbitrary	Memory space	Assigns the memory resource to be disclosed.
500000h - FFDFFFFFh			Reserved	
FFE00000h - FFFFFFFFh	2M max	Arbitrary	Firmware	Optional

In the above table, the entries in the "size" column are in bytes.

R : Read-only area

W : Write-only area

R/W : Read/Write area

For details on this product, see the "Virtual Address Map".

Virtual Address Map

Virtual Address Space

In the Assist Serve, virtual space is defined as indicated below. For the mapping of device module-specific information (I/O space, memory space, and so forth), please refer to the manual that is supplied with the device module.

-- I/O Section Overview of the Virtual Memory Map --

- In F&eIT devices, 1MB is the virtual memory map is reserved as an I/O space and a memory space.
- The I/O space is used for assigning modules that is connected to each I/O Controller Unit; it is also used for I/O data access purposes.
- A maximum of eight I/O controller units can be controlled.

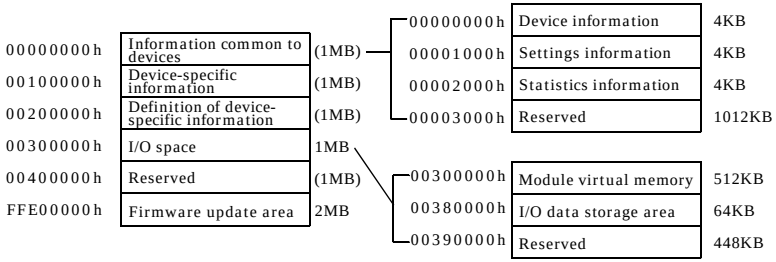


Figure 7.10. Virtual Address

Common device information : Information common to the F&eIT series of devices.
Holds version, IP address, and send/receive frame information.

Device-specific information : Holds I/O controller unit operating status in the same Group ID and installed device module information.

Def. of device-specific information : Holds a description of device-specific information in text format (not implemented).

I/O space : Holds an I/O controller unit I/O area.
Any data collected by the I/O controller unit is stored in the I/O space.
When this area is updated, the output is posted to the I/O Controller Unit for output to the device module.

Firmware update area : The area in which the firmware of this device can be updated.

Information Common to Devices (00000000h)

Device information

This is a virtual address space common to all devices that provides integrated device information.

Table 7.13. Virtual Address Space

Address (h)	Area	Information	Size	Access Type	Remarks
00000000	Device information	Vendor name	32	R	"CONTEC CO.,LTD."
		Model	32	R	*2
		Device version	2	R	1.0
		Firmware version	2	R	1.0
		MAC address	6	R	00804C******
		Installed functions *1	2	R	Bit 0: I/O space
					Bit 1: Memory space
					Bit 2: Trap function
					Bit 3: Message send
					Bit 4: Reset function
					Bits 5 and above: Reserved
		IP address	4	R	
		Product type	2	R	*3
		Reserved	4	R	
		F&eIT Protocol version	2	R	
		Reserved	4008	R	

*1 Installed functions: For I/O space, the trap function, and the reset function, in the Assist Server value 0x19, 0x00 are assigned to this area.

*2 SVR-IOA (FIT)GY : “SVR-IOA(FIT)GY”, SVR-IOA2(FIT)GY : “SVR-IOA2(FIT)GY” (string) are set.

*3 The item is set to 5 for the SVR-IOA(FIT)GY or 23 for the SVR-IOA2(FIT)GY (in decimal).

Settings

Parameters that are necessary for communications are set in this area. Only the communications parameters that have the same ID as the privilege ID can be written in this area.

Table 7.14. Settings

Address (h)	Area	Information	Size	Access Type	Remarks
00001000	Settings	Read-privilege identifier	8	W	*1 (Initial value: 00h)
		Read/Write privilege identifier	8	W	*1 (Initial value: 00h)
		IP address	4	R/W	(Ex.)192.168.132.31
		Subnet mask	4	R/W	(Ex.)255.255.255.0
		Default gateway	4	R/W	(Ex.)192.168.132.1
		Trap-to IP address	4	R/W	*2 (Ex.)192.168.132.21
		Effective multicast	4	R/W	0 - 4 (Initial value = 0)
		Multicast IP 1	4	R/W	*3 Indicates Group 3 address for multicasting communications.
		Multicast IP 2	4	R/W	
		Multicast IP 3	4	R/W	
		Multicast IP 4	4	R/W	
		UDP port	2	R/W	5007h (Initial value)
		Reserved	2	R	
		Device name	32	R/W	"I/O Assist Server"
		Device physical position	32	R/W	User-defined
		Contact information	32	R/W	User-defined
		SNMP trap-to IP address	4	R/W	*4
		Community name	32	R/W	
		Access right	2	R/W	0: Read Only, 1: Read/Write
		Reserved	3906	R	

*1 For security, the identifier is verified to determine whether the data can be read/written. (Because this is a write-only area, if the current settings are lost, you need to initialize the area and re-do the setup process.)

*2 Trap-to IP address: When started, the system transmits device-specific information to the host identified in the specified IP address.

*3 Multicast IP1 - 4: Register the multicast group that accepts multicast communications.

*4 SNMP trap-to IP address: Not supported in the current version. The following are areas to be set by SNMP: device name, device physical position, contact information, SNMP trap-to IP address, community name, and access right.

Statistics

This area provides statistics on various devices, including Assist Server send/receive information and error statistics.

Table 7.15. Statistics

Address (h)	Area	Information	Size	Access Type	Remarks
00002000	Statistics	Elapsed time after the system is started	4	R	Seconds
		Total number of transmitted frames	4	R	Counter
		Total number of transmitted bytes	4	R	Counter
		Total number of received frames	4	R	Counter
		Total number of received bytes	4	R	Counter
		Total number of transmission errors	4	R	Counter
		Total number of reception errors	4	R	Counter
		Reserved	4068	R	

Device-Specific Information (00100000h)

In the Assist Server, data with the same format as the startup-time trap information is defined as device-specific information.

Table 7.16. Device-Specific Information

Address (h)	Area	Information	Size	Access Type	Remarks
00100000	Device–specific information	Vendor name	32	R	"CONTEC CO.,LTD."
		Model	32	R	"SVR-IOAx(FIT)GY"
		Hardware version	2	R	1.0
		Firmware version	2	R	1.0
		MAC address	6	R	00804C******
		Installed functions	2	R	*1 Installation function indicated by Bit 1 (see “Device information”).
		IP address	4	R	
		Product type	2	R	*2
		Group ID	2	R	
		Device ID	2	R	0 x 10 (Fixation)
		F&eIT protocol version	2	R	
		Unit ID 0 information	36	R	*3
		Unit ID 1 information	36	R	*3
		Unit ID 2 information	36	R	*3
		Unit ID 3 information	36	R	*3
		Unit ID 4 information	36	R	*3
		Unit ID 5 information	36	R	*3
		Unit ID 6 information	36	R	*3
		Unit ID 7 information	36	R	*3
		Status control Unit ID 0	32	R	*4
		Status control Unit ID 1	32	R	*4
		Status control Unit ID 2	32	R	*4
		Status control Unit ID 3	32	R	*4
		Status control Unit ID 4	32	R	*4
		Status control Unit ID 5	32	R	*4
		Status control Unit ID 6	32	R	*4
		Status control Unit ID 7	32	R	*4

* 1 Installed functions: For the I/O space, the trap function, and the reset function, in the Assist Server values 0x19, 0x00 are assigned to this area.

*2 The item is set to 5 for the SVR-IOA(FIT)GY or 23 for the SVR-IOA2(FIT)GY (in decimal).

*3 Table 7.17 shows the more details on the Unit ID xx information.

*4 Table 7.18 shows the more details on the Status control Unit ID xx.

Table 7.17. Unit ID xx Information

Information			Size	Access Type	Remarks
Module operating status (Unit ID 0)			4	R	Each set of 4 bits indicates the status of a slot : bit0 - 3 : Device ID=0 bit4 - 7 : Device ID=1 … bit28 - 31 : Device ID=7 Value : bit0 : 0 : Does not exist, 1 : Exists, 1: Operating
Module information	Device ID 0	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 1	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 2	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 3	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 4	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 5	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 6	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	
	Device ID 7	Module type (category)	1	R	
		Module type (serial No.)	1	R	
		System Reserved (revision No.)	1	R	
		Reserved	1	R	

Table 7.18. Status control Unit ID xx

Information	Size	Access Type	Remarks
Elapsed time after the system is started	4	R	Unit (sec.)
Total number of transmitted frames	4	R	Obtained from each module statistics area.
Total number of transmitted bytes	4	R	Obtained from each module statistics area.
Total number of received frames	4	R	Obtained from each module statistics area.
Total number of received bytes	4	R	Obtained from each module statistics area.
Total number of transmission errors	4	R	Obtained from each module statistics area.
Total number of reception errors	4	R	Obtained from each module statistics area.
Reserved	4	R	

Table 7.19. Module Types

Module type		Model	Function
Category	Serial No.		
0x01	0x00	DIO-8/8(FIT)GY	Digital input 8ch, output 8ch
0x01	0x01	DI-16(FIT)GY	Digital input 16ch
0x01	0x02	DO-16(FIT)GY	Digital output 16ch
0x01	0x03	DIO-8/8H(FIT)GY	Digital input 8ch, output 8ch
0x01	0x04	DO-16H(FIT)GY	Digital input 16ch
0x01	0x05	DIO-4/4(FIT)GY	Digital input 4ch, output 4ch
0x01	0x06	DI-8(FIT)GY	Digital input 8ch
0x01	0x07	DO-8(FIT)GY	Digital output 8ch
0x01	0x08	DIO-8D(FIT)GY	Digital I/O 8ch
0x02	0x00	ADI12-8(FIT)GY	Analog input 8ch
0x02	0x01	DAI12-4(FIT)GY	Analog output 4ch
0x02	0x02	ADI16-4(FIT)GY	Analog input 4ch
0x02	0x03	DAI16-4(FIT)GY	Analog output 4ch
0x03	0x00	CNT24-2(FIT)GY	Counter input 2ch

Defining Device-Specific Information (00200000h)

Provides the definition of device-specific information in the text format.

I/O Space (00300000h)

This space is defined as an I/O space data concentration structure for the I/O Control Unit. The 64KB device module virtual memory space is partitioned into a basic function and expanded function areas. The I/O data storage area is reserved for expansion purposes.

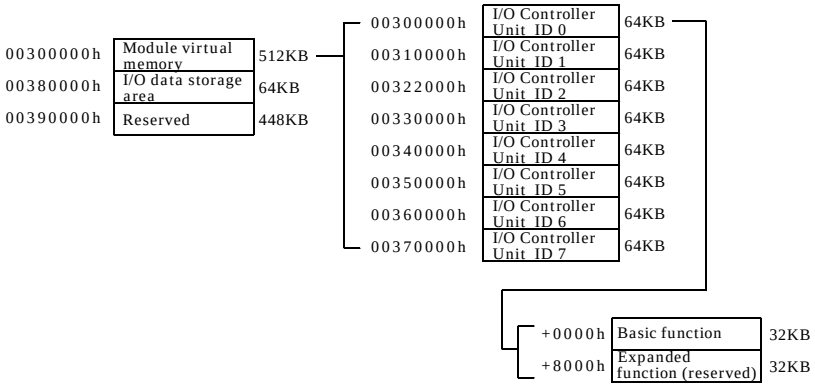


Figure 7.11. I/O Space

* The I/O data storage area is a mirror area in which the I/O data sections for device modules for control units are consolidated. The I/O data storage area can be used to update all I/O data in a single operation.

Module Virtual Memory

Basic function

Each area is split into 128-byte spaces by module. An expansion area is allocated so that a maximum of 8 modules can be accommodated.

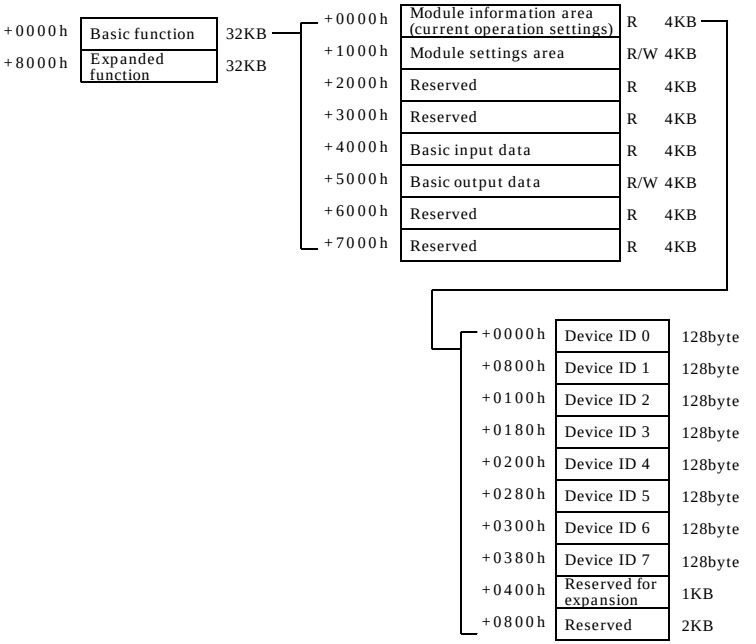


Figure 7.12. Basic Functions

Module information area : Stores the current settings of the module that is installed on the I/O Controller Unit.

Module settings area : Any changes to the current settings of the module that is installed on the I/O Controller Unit are written in this area.

- **Module information area (H +0000 128byte)**

  The module information includes device-specific information, module settings, and channel settings. Device-specific information contains module-specific information with a format that is common to all modules. Module settings contain settings that are common to all modules with a module-dependent format (with a common module-startup register and error status positions). Channel settings contain channel-specific settings with a module-dependent format.

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

  Starting address = 00300000h + (10000h x (Module ID)) + (80h x (Device ID))

Table 7.20. Module Information

Address (h)	Area	Size	Information	Size	Remarks
Starting address +0000	Specific information	16	Module type (category)	1	See hardware specs.
			Module type (serial No.)	1	See hardware specs.
			System-reserved (revision No.)	1	
			Supported functions: Indicates supported functions by bits (0: OFF; 1: ON): D0: Basic input D1: Basic output D2: Expanded function D3: Reserved D4: Continuous input D5: Continuous output D6: Reserved D7: Save settings	1	When the expanded function is supported (D2 = ON), the host checks the expanded function information in the expanded function area to obtain details of the expanded function.
			Number of basic input channels	1	0 - 16
			Basic input data size: input data size per channel	1	0 - 128
			Number of basic output channels	1	0 - 16
			Basic output data size: output data size per channel	1	0 - 128
			Input channel setting address	1	0x20 fixation
			Input channel setting data size	1	Setting data size per channel
			Output channel setting address	1	Stores the output channel settings starting position.
			Output channel setting data size	1	Setting data size per channel
			Reserved	4	
Starting address +0010	Module settings	16	Module startup register	1	0 : OFF ; 1 : ON D0 : Module start/stop
			Error status:	1	0 : Normal operation Non-zero : Error (Principally module startup setting errors are stored here.)
			Module-dependent	14	
Starting address +0020	Channel settings	96	Module-dependent	96	

[Remarks]

In the case of a counter, the Input and Output channel settings use the same area; therefore, the output channel settings address holds the value 0x20, which is the same as the input channel settings address.

- **Module settings area**

  The module settings area contains a 128-byte image for each module that is the same as the module information. Settings are written into the module settings area by a higher host. Assigning the value 0x1 to the module startup register causes the module to be activated according to the settings that are provided in the module settings area, and the module is reflected in the module information when a module startup command is issued. When reset-activated, the module is reflected in the module settings area.

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

  Starting address = 00301000h + (10000h x (Module ID)) + (80h x (Device ID))

  Example: Analog I/O terminal

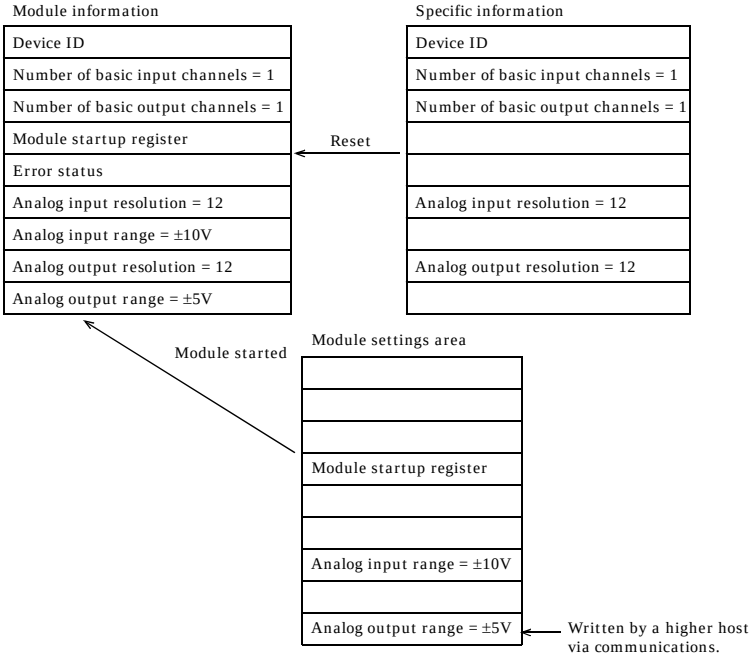


Figure 7.13. Analog I/O Terminal

[Remarks]

When the module is successfully started, the value 0 x 01 is stored in the module startup register for module information and the value 0x00 in the error status. If an error is found in the settings parameter, the value 0x00 is stored in the module startup register for module information and an error status other than 0x00 in the error status register.

If the module startup instruction is asserted when the module is already operating (module startup register = 0x01), the settings that are provided in the module settings area will be reflected in the operation of the module.

The startup of the module by means of the module startup register is executed upon completion of virtual address access to the I/O unit. This structure takes into account the fact that the host may simultaneously access both the settings data and the module startup register.

- **Basic I/O data**

  Basic I/O data is stored in the Little Endian. Details on the number of channels for stored data and the data size for each channel may be found in the respective device module information. The maximum allowable data size per device module is 128 bytes.

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

  Starting address = 00304000h + 10000h x (Module ID)

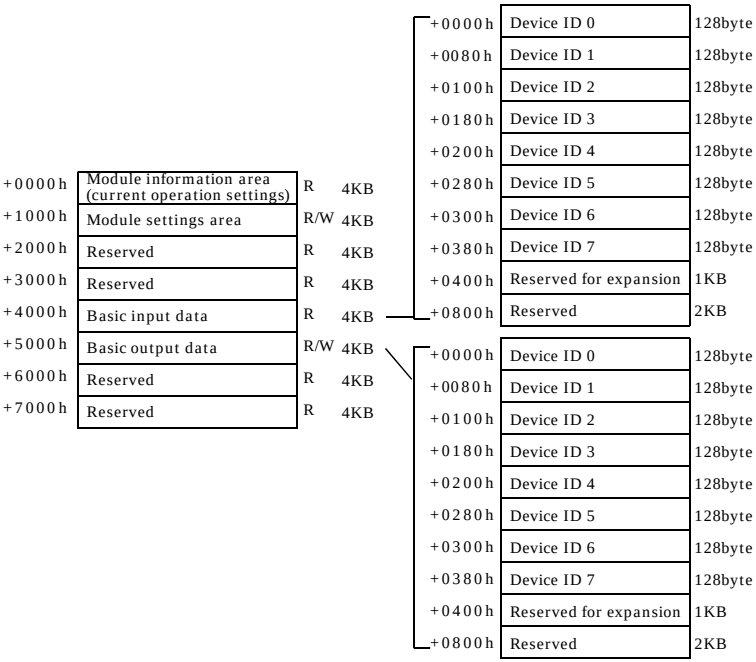


Figure 7.14. Basic I/O Data

Expansion function (not implemented)

The expansion function is an area reserved for future expansion; it is intended to provide functions that cannot be accommodated by the basic I/O functions.

- Expansion function information (H +0000 128byte)

  This area is divided into 128-byte spaces by module.

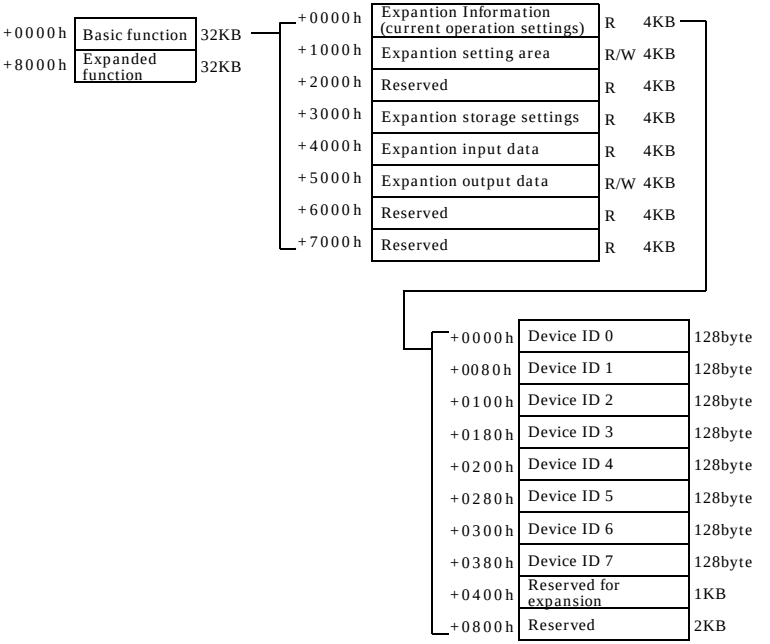


Figure 7.15. Expanded Function Information

- Expanded information (128byte)

Table 7.21. Expanded Information

Item	Size	Description	Remarks
Supported function	1	Supported functions are indicated by bits. (0 : OFF, 1 : ON) * Supported functions are module-dependent.	

I/O data storage area

The I/O data storage area is a mirror area in which the I/O data sections of the modules are consolidated. This area can be used by the Assist Server when collecting module data in a single operation.

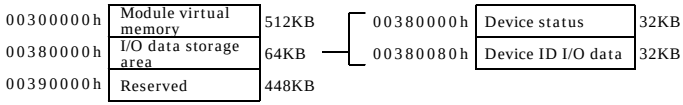


Figure 7.16. I/O Data Storage Area

- The contents of the module status consist of mirroring information on the module startup register and the error status as part of the module information stored in this function area.
- The contents of the I/O module I/O data consist of mirroring information comprised of the higher 16 bytes of the basic input and output data stored in the function area.
  The starting address can be determined according to the following expression :
  Starting address = 00380000h

Table 7.22. I/O Data Storage Area

Address	Area	Size	Information	Size	Remarks
Starting address+000 - Starting address+00F	Device status	128	I/O Controller Unit ID 0	16	*1
Starting address+010 - Starting address+01F			I/O Controller Unit ID 1	16	
Starting address+020 - Starting address+02F			I/O Controller Unit ID 2	16	
Starting address+030 - Starting address+03F			I/O Controller Unit ID 3	16	
Starting address+040 - Starting address+04F			I/O Controller Unit ID 4	16	
Starting address+050 - Starting address+05F			I/O Controller Unit ID 5	16	
Starting address+060 - Starting address+06F			I/O Controller Unit ID 6	16	
Starting address+070 - Starting address+07F			I/O Controller Unit ID 7	16	
Starting address+080 - Starting address+0FF	Device ID I/O data	1024	I/O Controller Unit ID 0	128	*2
Starting address+100 - Starting address+07F			I/O Controller Unit ID 1	128	
Starting address+180 - Starting address+1FF			I/O Controller Unit ID 2	128	
Starting address+200 - Starting address+27F			I/O Controller Unit ID 3	128	
Starting address+280 - Starting address+2FF			I/O Controller Unit ID 4	128	
Starting address+300 - Starting address+37F			I/O Controller Unit ID 5	128	
Starting address+380 - Starting address+3FF			I/O Controller Unit ID 6	128	
Starting address+400 - Starting address+47F			I/O Controller Unit ID 7	128	

*1 Table 7.23 shows the more details on the I/O Controller Unit ID xx.

*2 Table 7.24 shows the more details on the I/O Controller Unit ID xx I/O data.

Table 7.23. More details on the I/O Controller Unit ID xx

Information		Size	Remarks
Device ID 0	Module startup status	1	R
	Error status	1	R
Device ID 1	Module startup status	1	R
	Error status	1	R
Device ID 2	Module startup status	1	R
	Error status	1	R
Device ID 3	Module startup status	1	R
	Error status	1	R
Device ID 4	Module startup status	1	R
	Error status	1	R
Device ID 5	Module startup status	1	R
	Error status	1	R
Device ID 6	Module startup status	1	R
	Error status	1	R
Device ID 7	Module startup status	1	R
	Error status	1	R

Table 7.24. More details on the I/O Controller Unit ID xx I/O data

Information	Size	Remarks
Device ID 0 I/O data	16	R/W
Device ID 1 I/O data	16	R/W
Device ID 2 I/O data	16	R/W
Device ID 3 I/O data	16	R/W
Device ID 4 I/O data	16	R/W
Device ID 5 I/O data	16	R/W
Device ID 6 I/O data	16	R/W
Device ID 7 I/O data	16	R/W

Shared Memory Area (00400000h)

This area can be used commonly irrespective of the device configuration.

The area is NULL-cleared when the power is turned on.

Once written to, the area retains its content until it is written to next or until the power is turned off.

Table 7.25. Shared Memory Area

Address (h)	Area	Information	Size	Remarks
00400000	Shared Memory Area	Message	Max. 2K	R/W

Firmware Update Area (FFE00000h)

By accessing this area, you can read and write the firmware.

Table 7.26. Firmware Update Area

Address (h)	Area	Information	Size	Remarks
FFE00000 -FFFFFFFF	Firmware Update Area	Firmware	Max. 2M	R/W

[Notes on performing firmware access]

(1) Read/write operations are performed by shifting the offset.

1st operation : Offset = 0x00000000, number of data pieces = 1024

2nd operation : Offset = 0x00000400, number of data pieces = 1024

3rd operation : Offset = 0x00000800, number of data pieces = 1024

.

.

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(2) Detection of the End of File

Read operation …The EOF is reached when the response packet has a normal status and the access size is [0].

Write operation …The EOF is reached when the access size of the requesting packet is [0].

Operating Procedures

Startup Sequence - Routine Startup

(1) Module devices are polled by means of the multicast IP; of the modules that respond to the polling, those in which the same Group ID are assigned are registered as modules that are subject to control.

(2) The polling process uses module device information requests to determine module types, the types of cards that are installed in module slots, and startup and settings information. This information is used by PCs that obtain information from the Assist Server (for the conversion of physical quantities involving Analog Input data).

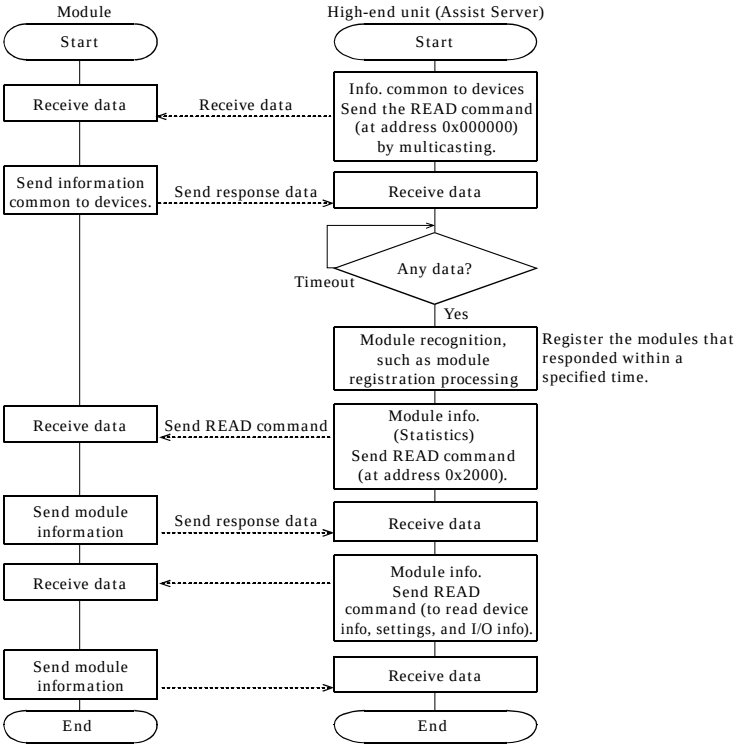

Figure 7.17. Startup Sequence-Routine Startup

Reading/Writing Data

Overview of Module Communications Processing

Communications with modules are performed by mutually independent and module-specific processes.

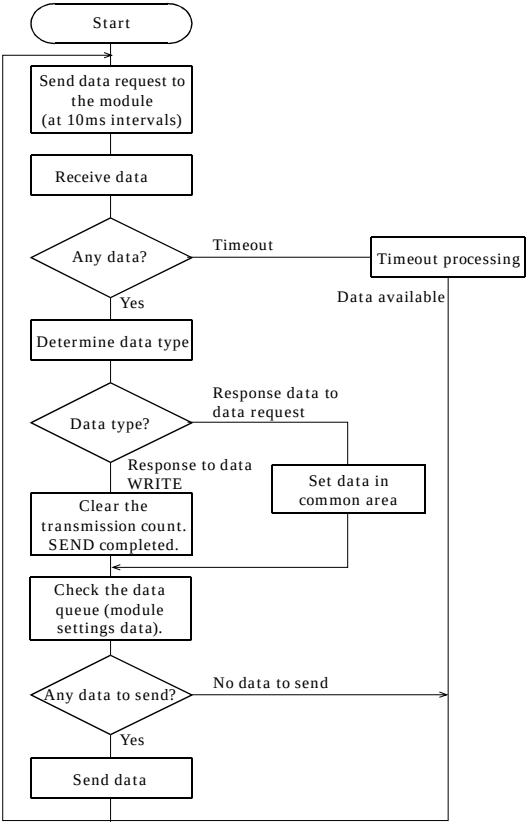

Figure 7.18. Overview of Module Communications Processing

* If waiting on the data queue can be terminated when data is entered into the queue or at a specified time, waiting on the queue is assumed to be the default condition.

Overview of the Communications Process with a Higher HOST (PC)

Communications with a higher HOST (PC) are conducted in a process in which the 5007h port remains open. Because this port is also used for the reception of module Trap information, data must be properly assigned to it.

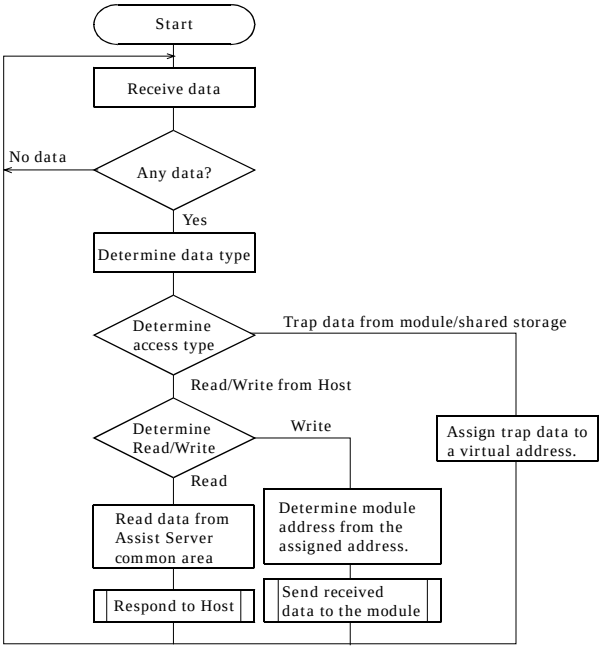

Figure 7.19. Overview of Processing of Communications with a Higher Host (PC)

Procedures for collecting monitoring data through the Web

(1) For each I/O module, a specific communications process is provided, and each process polls modules independently.

(2) The data obtained by means of the polling is set in a common area. The data is read in response to queries received from a higher PC via the F&eIT (this table is managed by the control process and the data queue).

(3) Data requests received from a Java applet running on a client PC are also processed according to F&eIT specifications.

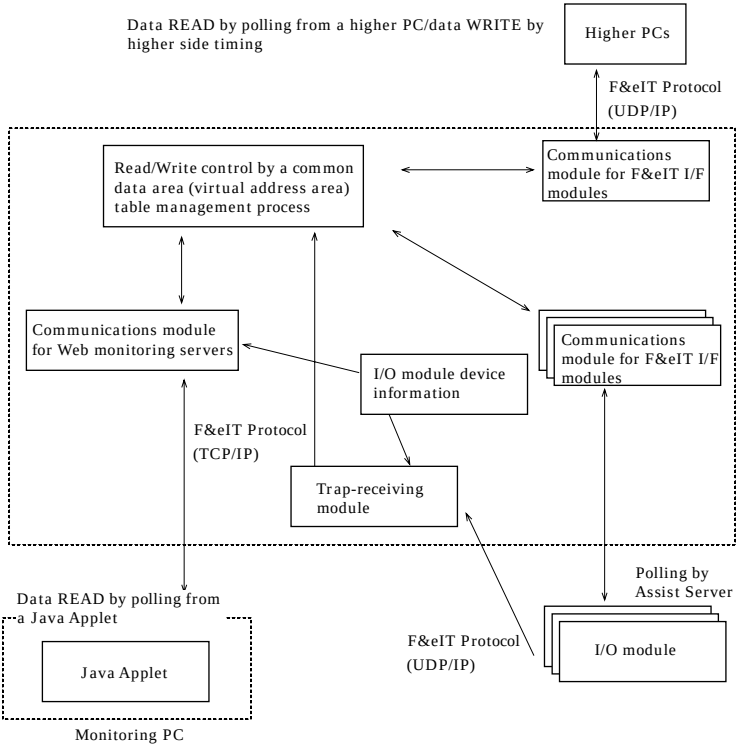

Figure 7.20. Procedures for Collecting Monitoring Data through the Web

Initialization of Settings

If the initialization process is assigned to the Group ID rotary switch "F" and the system is started (reset), the system boots itself by initializing module information and the information common to devices.

Forced Startup of a Loader (Loader Specifications)

If the initialization process is assigned to the Group ID rotary switch "E" and the system is started (reset), only the Loader is started without loading the firmware. This option can be used when it is necessary to bypass the loading of the firmware, such as when there is a firmware problem, so that new firmware can be downloaded.

SVR-IOA(FIT)GY
SVR-IOA2(FIT)GY
User's Manual

CONTEC CO.,LTD.

April 2007 Edition

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[03122004]
[04122007_rev5]

Management No. A-46-816
Parts No. LYDD043