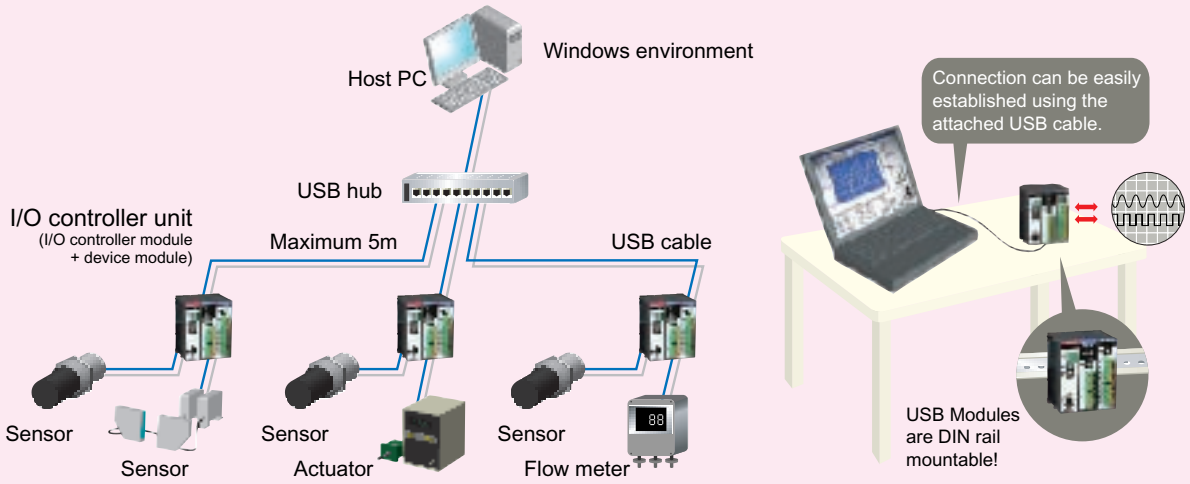
# USB-Based Remote I/O

These USB-based ultra-compact remote I/O systems are optimal for use in any environment (such as laboratories) where computers and I/O modules are placed close to each other. They allow you to design a remote I/O system using the I/O controller (USB interface) and device modules as easily as designing one using controller boards and computer cards. Also, by using an off-the-shelf USB hub, you can connect up to 127 I/O controller modules to a single host computer for central control. The method of interfacing with each device can be either independent or in combination with any of the diverse I/O device modules (digital input/output, analog input/output, counter input) listed on Page P-04.

## Example of USB-based remote I/O system configuration




## Module Configuration

The USB I/O controller modules are used in combination with corresponding device modules (to a maximum of 8 modules). The combined modules are called the I/O Controller Unit.

- I/O controller module [CPU-CA10(USB)GY]

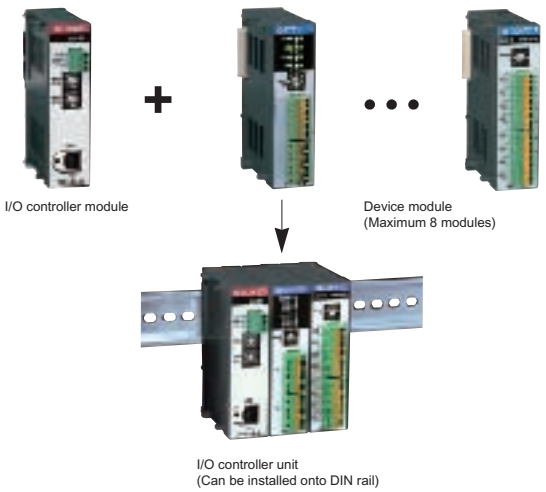
  This module receives and transmits control and monitoring information with the host PC using standard USB. It also enables signal I/O processing by connecting with one of the many device modules.
  Please refer to L-02 for details.

- Device modules

  Device modules monitor and control external devices. Modules include digital input / output, analog input / output and counter input.
  Please refer to P-04 for the modules that can be used in this

- Power supplies

  CONTEC dedicated power supplies allow for selection according to available power input and required power output.
  Please refer to P-04 for details.




## Facilitates application software development

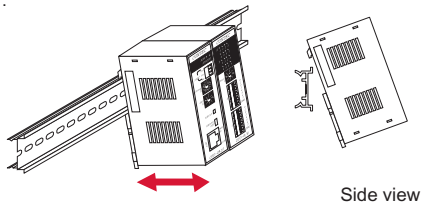
- By using CONTEC's API-function driver library [API-USBP(WDM)]*, you can easily use the the I/O controller unit to monitor and control external devices from a host PC.

* Included with I/O controller module [CPU-CA10(USB)GY].

## Installation on DIN rail and 'stack' connection of CONTEC's F&eIT bus

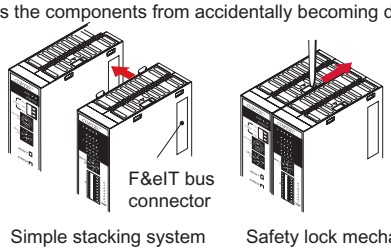
### Equipped with 35mm DIN rail mount mechanism

The DIN rail mounting mechanism is compliant with standard general-purpose 35mm DIN rail, allowing for easy installation. Installation and removal can be accomplished with nothing more than a straight slot screwdriver.




### Stack connection of F&eIT bus eliminates need for backplane

I/O devices are added by using the 'stacking' connection on the sides of the modules. The connection is set in place by a safety lock mechanism that prevents the components from accidentally becoming disconnected.



# Remote I/O

## I/O Controller Module

### CPU-CA10(USB)GY

Included Software -
Driver Library Attachment for Windows [API-USBP(WDM)]

### Features

- Power-saving and low heat-generating CPU
- Fanless operation
- Compact design allows for flexible installation sites
- Controls stack-connected device modules including digital I/O
- Communicates monitor and control information to host PC

### Specifications

| Item | Model |
|---|---|
| CPU | SH3 |
| Memory | Flash ROM: 512Kbyte (4Mbit)<br>EDO DRAM: 2Mbyte (16Mbit) |
| USB Transfer Speed | 12Mbps (full speed), 480Mbps (high speed) *1 |
| Connectable Device Modules | 8 (Maximum) *2 |
| Power Supply | Supplied by 5VDC ±5% 2-piece power input connector (removable) located on the front side<br>Use of F&eIT Series power unit (Power Supply Series) is recommended. |
| Power Consumption | 0.3A (Max.) *3<br>(Exclusive of Power supplied to device modules) |
| FG terminal | Power input connector is equipped with FG terminal. |
| Operating Conditions | 0 - 50°C / 10 - 90% RH (no condensation) |
| Dimensions (mm) | 25.2 (w) x 64.7 (d) x 94.0 (h) (1"×2.55"×3.7") |
| Weight | 100g (3.53 oz) |
| Included AC adapter | Input: 90 to 264VAC, Output: 5VDC 2.0A (Max.) |
| Included cable | USB cable 1.8m |

*1 USB module executes the API function via USB communication. The actual transfer speed of API function via USB is several milliseconds.
*2 Total maximum power consumption by stacked modules can not exceed the rated output current of the power supply unit.
*3 Stack connector supplies power to each device module - permissible current of the stack connector is 3.0A.



L-02



## High-Level Instrument and Control in a Compact Design

These compact modules provide high-level functions including the monitoring of digital signals and A to D conversion via an internal sampling clock. Additional input/output modules, up to a maximum 3 device modules of the same type, can be connected (such as adding a DI-16(FIT)GY to DI-16(USB)GY).

### Opto-Isolated Digital Input Module

**(USB cable included)**

**DI-16(USB)GY** Input 16 Isolated CE

- 16 Opto-Isolated Inputs
- Onboard trigger monitoring function

### Opto-Isolated Digital Output Module

**(USB cable included)**

**DO-16(USB)GY** Input 16 Isolated CE

- 16 Opto-Isolated outputs
- Output is designed to accommodate a maximum DC 24V and 150 mA per point

### Opto-Isolated Digital I/O Module

**(USB cable included)**

**DIO-8/8(USB)GY** Input 8 Output 8 Isolated CE

- 8 Opto-Isolated Inputs
- 8 Opto-Isolated Open Collector Outputs
- Onboard trigger monitoring function
- Output is designed to accommodate a maximum DC 24V and 150 mA per point

### Isolated Analog Input Module

**(USB cable and AC adapter included)**

**ADI12-8(USB)GY** Isolated CE

- 8 differential inputs, 12-bit resolution
- Onboard buffer memory capable of storing 256K words of conversion data

### Isolated Analog Output Module

**(USB cable and AC adapter included)**

**DAI12-4(USB)GY** Isolated CE

- 4 Output Channels, 12-bit Resolution
- Cyclical arbitrary waveform output possible with onboard 256K-word memory

### Isolated Counter Input Module

**(USB cable and AC adapter included)**

**CNT24-2(USB)GY** Isolated CE

- 2 channels
- 24-bit up/down counter (Two-phase / Single-phase/Single-phase with Gate control)

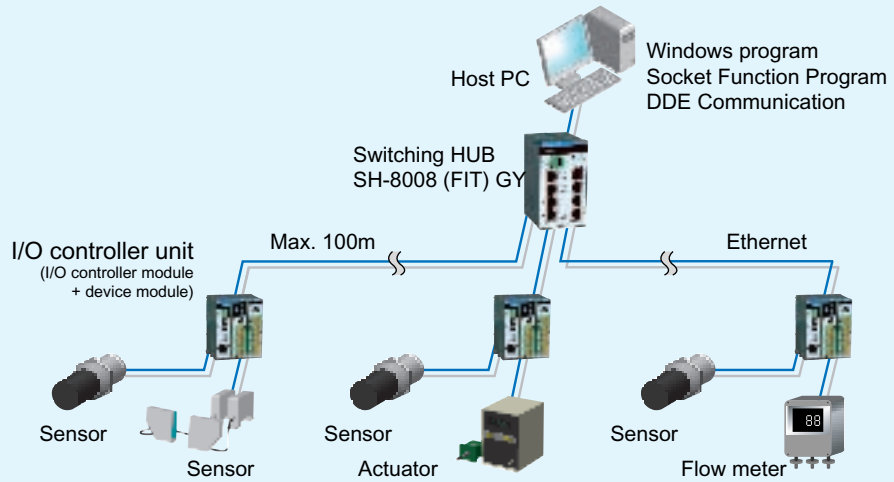
# Remote I/O



## Ethernet-based Remote I/O

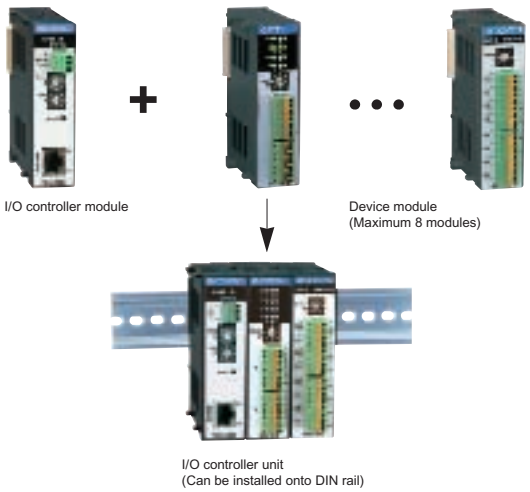
These Ethernet-based ultra-compact remote I/O systems are ideal for applications where equipment is scattered across a wide area yet monitoring and control needs to be centrally located. It is a low-cost and flexible system that utilizes existing network infrastructure and wireless LAN. Systems each device can be easily configured using the abundant I/O device modules (digital input/output, analog input/output, counter input) listed on Page P-04.

### Example of Ethernet-based remote I/O system configuration




### Module Configuration

The Ethernet I/O controller modules are used in combination with corresponding device modules (to a maximum of 8 modules). The combined modules are called the I/O Controller Unit.




- I/O controller module [CPU-CA20(FIT)GY, CPU-CA10(FIT)GY]
  This module receives and transmits control and monitoring information with the host PC using ethernet protocol. It also enables signal I/O processing by connecting with one of the many device modules.
  Please refer to L-04 for details.
- Device modules
  Device modules monitor and control external devices. Modules include digital input/output, analogue input/output and counter input.
  Please refer to P-04 for the modules that can be used in this configuration.
- Power supplies
  CONTEC dedicated power supplies allow for selection according to available power input and required power output.
  Please refer to P-04 for details.

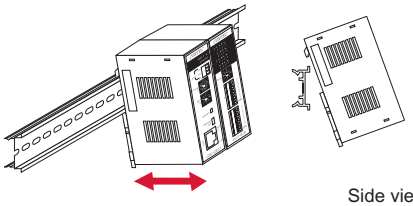
### Facilitates application software development

- PC control of external devices over the network is easily developed by using the driver library for Windows, The same easy development is available on non-Windows OS (i.e. UNIX) by using the general-purpose socket function.
- CONTEC's DDE Server [FIT-SVR(W32)] facilitates monitoring using Excel or a SCADA/HMI.
  * Included with I/O controller module [CPU-CA20(FIT)GY, CPU-CA(FIT)GY].

### Installation on DIN rail and 'stack' connection of CONTEC's F&eIT bus

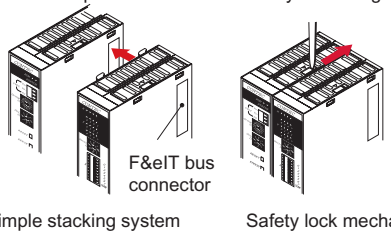
#### Equipped with 35mm DIN rail mount mechanism

The DIN rail mounting mechanism is compliant with standard general-purpose 35mm DIN rail, allowing for easy installation. Installation and removal can be accomplished with nothing more than a straight slot screwdriver.




#### Stack connection of F&eIT bus eliminates need for backplane

I/O devices are added by using the 'stacking' connection on the sides of the modules. The connection is set in place by a safety lock mechanism that prevents the components from accidentally becoming disconnected.



# Remote I/O

## I/O Controller Module

**High-speed/high-performance model**

**CPU-CA20(FIT)GY**

**CPU-CA10(FIT)GY**

Included Software:
- Driver library for Windows (for use with all for F&eIT products)
- DDE, suiteLink server [FIT-SVR(W32)]
- Utility software for node setting and firmware updating

### Features

- Power-saving and low heat-generating CPU
- Fanless operation
- Compact design allows for flexible installation sites
- Controls stack-connected device modules including digital I/O
- When used with an I/O assist server unit and a monitor / control server unit it can serve as the controller of a subsystem of a web-enabled I/O system.
- Compliant with our multi-programmable display unit ACTIVE TOUCH, it can be used as a dedicated remote I/O device.

**The difference between CPU-CA20(FIT)GY and CPU-CA10(FIT)GY**

- About 3 times faster than CPU-CA10(FIT)GY
  With the introduction of SH4 240MHz CPU, the bandwidth was expanded to 100Mbs(100BASE-TX), achieving a significant increase in I/O and communication processing speed. As a result, communication response time has been reduced to one third (1.5msec to 0.5msec).*
  * These figures may vary depending on the environment.
- Significant increase in the number of units installable within the same network
  A new operation mode was added to allow maximum 128 units to be installed within the same network in individual startup mode (without I/O assist server unit).

### Specifications

| Item | CPU-CA20(FIT)GY | CPU-CA10(FIT)GY |
|---|---|---|
| CPU | SH4 240MHz | SH3 60MHz |
| Memory | Flash ROM: 4Mbyte (32Mbit)<br>SDRAM: 32Mbyte (256Mbit) | Flash ROM: 512Kbyte (4Mbit)<br>SDRAM: 2Mbyte (16Mbit) |
| Interface (to host) | 100BASE-TX / 10BASE-T (IEEE802.3u) | 10BASE-T (IEEE802.3) |
| Connectable device Modules | Max. 8 *1 | |
| Power Supply | Supplied by 5VDC ± 5% 2-piece power input connector (removable) located on the front.<br>Use of F&eIT dedicated power supply series is recommended. | |
| Power Consumption | 0.7A (Max.)*2 (Exclusive of the power consumption to device module) | 0.5A (Max.) *2(Exclusive of the power consumption to device module) |
| FG terminal | Power input connector is equipped with FG terminal. | |
| Operating Conditions | 0 - 50ºC / 10 - 90%RH (no condensation) | |
| Dimensions (mm) | 25.2(w ) × 64.7(d ) × 94.0(h ) (1" × 2.54" × 3.7") | |
| Weight | 100g (3.52 oz) | |

*1. Total maximum power consumption by each module can not exceed the rated output current of the power supply unit.
*2. A stack connector supplies the power to each device module. Supplied power can not exceed the permissible current of a stack connector (max.3.0A). The sum of power consumption within the system can not be larger than the rated output current of the power supply unit.

### Other F&eIT series

| Model | Description |
|---|---|
| SVR-MMF(FIT)GY | Server Unit for Monitor and Control |
| SVR-SEC(FIT)GY | Security Server Unit |
| SH-8008(FIT)GY | 10M/100M<br>Auto-Recognition Switching HUB |

## Management of I/O Controller Unit

These server units control the I/O information that is received from a maximum 8 units of I/O controller units and then provides data to the host in a single transfer thus helping to alleviate the line load.

**I/O assist server unit**

**High-speed/high-performance model**

**SVR-IOA2(FIT)GY**

**SVR-IOA(FIT)GY**

**Advantages of the SVR-IOA2(FIT)GY over the SVR-IOA(FIT)GY**

- The processing speed is almost doubled
  By using the H4 240MHz CPU, I/O and communication processing speed has improved significantly.
- Web monitoring function makes it easier to operate the network
  CONTEC's web monitoring page function has been made easier to remotely view and operate