

# Inflex™ GC

## Multipurpose Controller

### Model WY5111

#### General

Inflex GC (Inflex: named for “Infinity” and “Flexible”) Model WY5111 is a multipurpose controller designed to control building equipment, such as air handling unit (AHU).

Inflex GC enables to control the temperature and humidity, as well as building equipment operation.

Inflex GC consists of a basic unit and I/O modules, UT module, integral type Operator Panel, and SAnet interface module. The number and types of the modules can be changed corresponding to the control or management to fit in various applications. Additionally, since the software to be installed can be freely edited, an optimum application for building equipment is configured in terms of both the software and hardware.

Inflex GC is operated with a user terminal and with Operator Panel to correspond with various situations. Besides, Inflex GC communicates with Azbil Corporation’s **savic-net™ FX** BMS through the transmission trunk line called NC-bus. By sending the operation status to the BMS center unit or by controlling the operation based on the commands sent from the BMS center unit, the integrated control of the entire building can be performed. Azbil Corporation’s field devices, Intelligent Component Series devices, are also connectable to Inflex GC via SAnet, allowing high-performance control.



#### Features

- Compact design:  
Small size body allows free installation in a desired place.
- I/O module configurations:  
Input and output types can be selected, and the number of points to be mounted can be increased or decreased corresponding to the application.
- Editable software configuration:  
Optimal software for the contents of your application can be configured.
- User interface module (Operator Panel):  
Operator Panel (panel mount type/integral type) connected to Inflex GC allows you, without changing the settings from the BMS center unit, to change the Inflex GC settings.
- Remote control with a user terminal:  
Neopanel or Neoplate is connectable, so that a user in a room (remote location) can perform ON/OFF operation and change temperature setting.
- Cooperation with BMS:  
Inflex GC integrated into **savic-net FX** enables to centrally monitor and control building equipment from the BMS center unit (client PC).
- Autonomous distributed control:  
Even if a trouble occurs in the BMS, the backup operation is performed individually to distribute potential risks caused by malfunction of the system.
- Installation:  
A quick-fit screwless (clamp) terminal block for the communication line reduces wiring work load. Additionally, either DIN rail mounting or screw mounting can be selected.
- Connection to Intelligent Component Series devices:  
Intelligent Component Series devices offering advanced control are connectable via SAnet.
- CE Marking certified:  
Inflex GC Model WY5111W0000 (NC-bus model (Line A)) conforms to all the applicable standards of CE Marking (Class A).

\* Azbil Corporation’s controller Inflex series: Inflex is named for “Infinity” and “Flexible”.



## Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual near by for ready reference.

### Usage Restrictions

This product is targeted for general air conditioning. Do not use this product in a situation where human life may be affected. If this product is used in a clean room or a place where reliability or control accuracy is particularly required, please contact Azbil Corporation's sales representative. Azbil Corporation will not bear any responsibility for the results produced by the operators.

### WARNING



- DANGER: To prevent the risk of severe or fatal electrical shock, always disconnect power source and product power supply before performing any wiring.



- Be sure to ground with 100 Ω or lower ground resistance. Improper grounding may cause electrical shock or equipment damages.



- Do not detach the terminal cover at any time except when wiring. After wiring, be sure to attach the terminal cover. Before attaching/detaching the terminal cover, make sure that the wires are not current-carrying to prevent electrical shock.



- Disconnect power before the product replacement to prevent electrical shock.



- Wire strip length to be connected to the quick-fit screwless terminal block must be 8 mm. If the strip length is longer than 8 mm, the conductor will be exposed, causing electrical shock or short circuit between adjacent terminals. If it is shorter, the conductor will not contact the connector.



- Do not disassemble the product. Disassembly may result in electrical shock or equipment damage.

### CAUTION



- Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.



- Installation must be carried out according to the operating conditions (power, temperature, humidity, vibration, shock, installation position, atmospheric condition, etc) specified in this manual to prevent equipment damages.



- All wiring must comply with local codes of indoor wiring and electric installation rules.



- Use crimp terminal lugs with insulation for electric wires connected to the screw terminals.



- Connect cables to the power source with terminals or the like for permanent connection.



- Make sure all the wires are tightly connected to prevent heat generation or equipment damages.



- If more than the rated power supply voltage is applied, product replacement is required for safety.



- Install this product in a location out of reach of unauthorized people. (e.g. Inside of the control panel cabinet)



- Lightning protection based on the regional characteristics and the building structure is needed to minimize equipment damages.



- Noise protection is necessary when the product is installed in a location close to many noise sources.



- Do not block the vent holes of the product to prevent equipment damages. Remove protective sheet after installation and wiring.



- After mounting the product on DIN rail, make sure that the holding parts of all the modules are properly fixed with their whole parts lifted. The product may drop from the DIN rail and be damaged due to improper mounting.



- Dispose of the lithium battery in accordance with your local regulations.



- Dispose of this product in accordance with your local regulations. Do not reuse all or a part of this product.

Trademark information:

ACTIVAL, Inflex, PARAMATRIX and savic-net are trademarks of Azbil Corporation in Japan or in other countries.

BACnet is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

KPEV is a registered trademark of Furukawa Electric Co., Ltd.

**System Configurations**

**Inflex GC integrated into BMS: *savic-net™ FX***

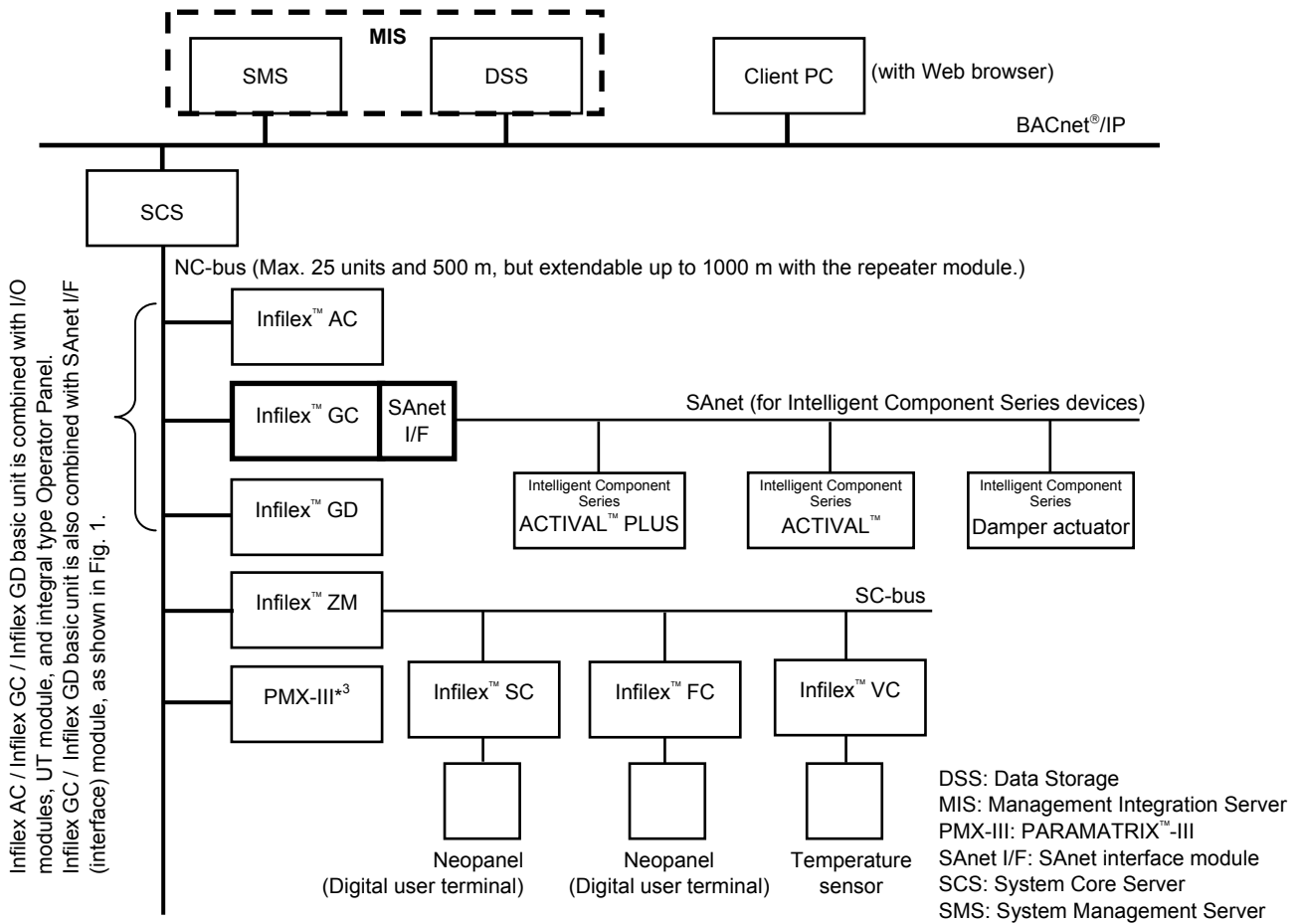


Figure 1. System configuration example: Inflex GC integrated into *savic-net FX* BMS

**Notes:**

- \* MIS may be used instead of SMS and DSS for your system. Note that MIS cannot be mixed with SMS or DSS in the same system.
- \* For details of I/O modules, UT module, integral type Operator Panel and SAnet interface module to be assembled with Inflex GC basic unit, refer to the Specifications/Instructions of Model RY50XX (AB-6527).
- \* SAnet is connectable to Inflex GC/Inflex GD for NC-bus and IP, not connectable to those for LC-bus.
- \* Up to two SAnet I/F module can be connected to one Inflex GC/Inflex GD.
- \* For detailed specifications of SAnet, refer to Installation Manual of Intelligent Component Series for SAnet Communication (AB-6713).
- \* 1 ACTIVAL PLUS requires 2 SAnet addresses.
- \* For constraint and requirement of SC-bus, refer to the Specifications/Instructions of Inflex ZM/Inflex SC/Inflex FC/Inflex VC.

**Model Numbers**

Model number	Description
WY5111	Basic model number
W	100 V AC to 240 V AC power
0000	NC-bus model (Line A) * CE Marking (Class A) certified
0010	Redundant NC-bus model (Lines A and B)

**Notes:**

- \* For I/O modules, UT module, integral type Operator Panel, and SAnet interface module to be combined with Inflex GC basic unit Model WY5111, separate order is required.
- \* Regarding I/O modules, UT module, integral type Operator Panel, and SAnet interface module to be combined with Model WY5111, refer to AB-6527 Specifications/Instructions of Model RY50XX.

**Parts for Installation (optional)**

Part number	Description
83165861-001	Screw tab
83104567-001	DIN rail mounting bracket

**Note:**

For mounting Inflex GC, either the screw tab (for screw mounting) or the DIN rail mounting bracket (for DIN rail mounting) is required. Be sure to separately order depending on your mounting type.

## Specifications

### Basic specifications

Item		Specification	
Power supply	Rated voltage	100 V AC to 240 V AC, 50 Hz/60 Hz	
	Allowable voltage range	85 V AC to 264 V AC, 50 Hz/60 Hz	
	Power shutdown detection	80 V AC or less	
	Power consumption	40 VA	
	Leakage current	1 mA or less	
Environmental conditions	Rated operating conditions	Ambient temperature	0 °C to 50 °C
		Ambient humidity	10 %RH to 90 %RH (Non-condensing)
		Altitude	2000 m or lower
		Vibration	Max. 3.2 m/s <sup>2</sup> (at 10 Hz to 150 Hz)
	Transport/storage conditions	Ambient temperature	-20 °C to 60 °C
		Ambient humidity	5 %RH to 95 %RH (Non-condensing)
		Vibration for storage	Max. 3.2 m/s <sup>2</sup> (at 10 Hz to 150 Hz)
Vibration for transport	Max. 9.8 m/s <sup>2</sup> (at 10 Hz to 150 Hz)		
LED indication	Operation	Power supply (POWER)	Green LED ON: Power ON Green LED OFF: Power OFF
		Major failure (ERR1)	Red LED ON: Major failure or system restart Red LED OFF: Normal operation
		Minor failure (ERR2)	Red LED ON: Minor failure or system restart Red LED OFF: Normal operation
	Communication	NC-bus	Transmit (TX), Receive (RX)
Power failure backup		RAM, RTC*	Lithium battery backup
		Data file	Non-volatile memory backup
Communications	NC-bus	Transmission system	Current transmission
		Transmission speed	4800 bps
		Transmission distance	500 m
		Remote units	Max. 25 remote units connectable
Weight			400 g
Material (housing), color			Modified PPE, light gray
Terminals connection	Power supply, ground	M3 screw terminals (7.62 mm pitch between terminals)	
	NC-bus communication	Quick-fit screwless (clamp) terminal block	

### Wiring specifications

#### Basic unit

Item	Wiring	Wiring length	Condition
Power supply	JIS IV2.0 mm <sup>2</sup> or JIS CVV2.0 mm <sup>2</sup> or greater	—	—
Grounding	JIS IV2.0 mm <sup>2</sup> or JIS CVV2.0 mm <sup>2</sup> or greater	—	Ground resistance: 100 Ω or lower
NC-bus	JCS IPEV-S 0.9 mm <sup>2</sup>	500 m	

#### Notes:

- \* Pin terminals cannot be used.
- \* JIS: Japanese Industrial Standards
- \* JCS: Japanese Electric Wire and Cable Makers' Association

**I/O module**

Item	Wiring	Wiring length
Temperature input	JIS IV, JIS CVV, KPEV® 1.25 mm <sup>2</sup>	100 m
Voltage/Current input	JIS IV, JIS CVV, KPEV® 1.25 mm <sup>2</sup>	100 m
Voltage/Current output	JIS IV, JIS CVV, KPEV® 0.9 mm <sup>2</sup> , 1.25mm <sup>2</sup>	100 m
Modutrol Motor output	JIS IV, JIS CVV, KPEV® 1.25 mm <sup>2</sup>	100 m
Digital input	JIS IV, JIS CVV, KPEV® 0.5 mm <sup>2</sup> , 0.75 mm <sup>2</sup> , 0.9 mm <sup>2</sup> , 1.25 mm <sup>2</sup>	100 m
Relay output	JIS IV, JIS CVV, KPEV® 1.25 mm <sup>2</sup>	100 m
Remote control relay output	JIS IV, JIS CVV, KPEV® 1.25 mm <sup>2</sup>	100 m

Notes:

- \* Since a quick-fit screwless terminal block is provided on I/O modules, the wires can be connected only by stripping the sheath.  
Sheath stripped length: 8 mm (Pin terminal cannot be used.)
- \* KPEV is a wiring standard provided by Furukawa Electric Co., Ltd.

**Specifications of I/O modules, integral type Operator Panel, UT module, and SAnet I/F module**

For the specifications of I/O modules, UT module, and SAnet interface module, refer to Specifications/Instructions of Model RY50XX (AB-6527). For the specifications of integral type of Operator Panel, refer to Specifications/Instructions of Model RY5001Q/QY5100W (AB-6546).

**CE Marking Conformity**

This product must be installed in a panel cabinet. Besides, the product in the panel cabinet must be out of reach of unauthorized people who are not well-trained for electric facilities.

This product complies with the following Electromagnetic Compatibility (EMC) and the Low Voltage Directive (LVD).

EMC: EN61326-1 Class A, Table 2 (For use in an industrial electromagnetic environment)

LVD: EN61010-1 Overvoltage category II

Pollution degree 2

**Input/Output and Terminal Arrangement**

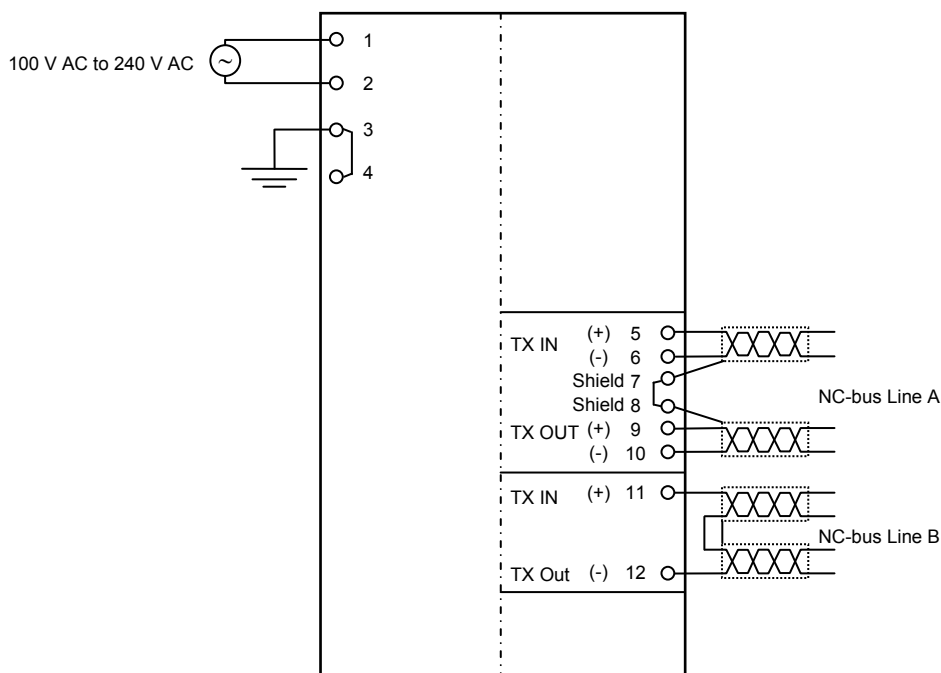


Figure 2. Input/output and terminal arrangement

Dimensions

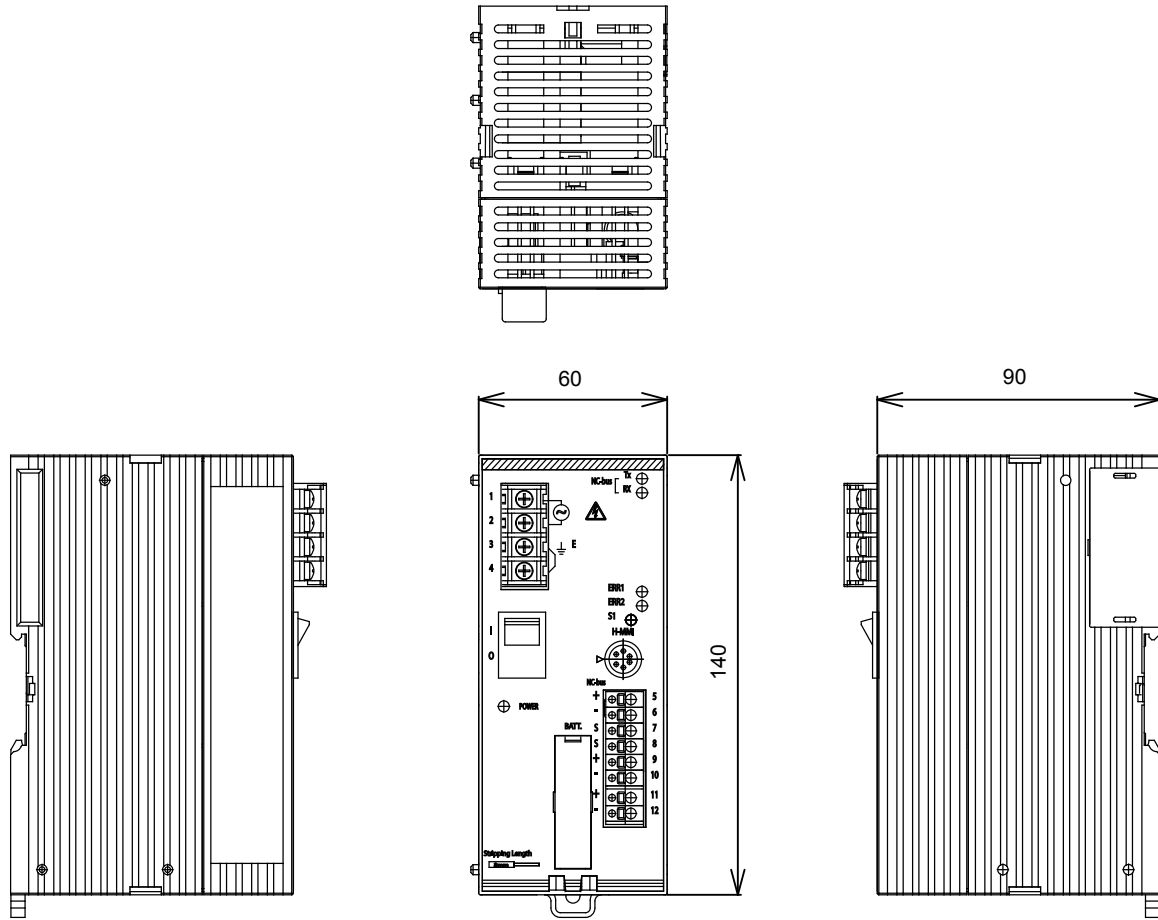


Figure 3. Dimensions (mm)

Parts Identification

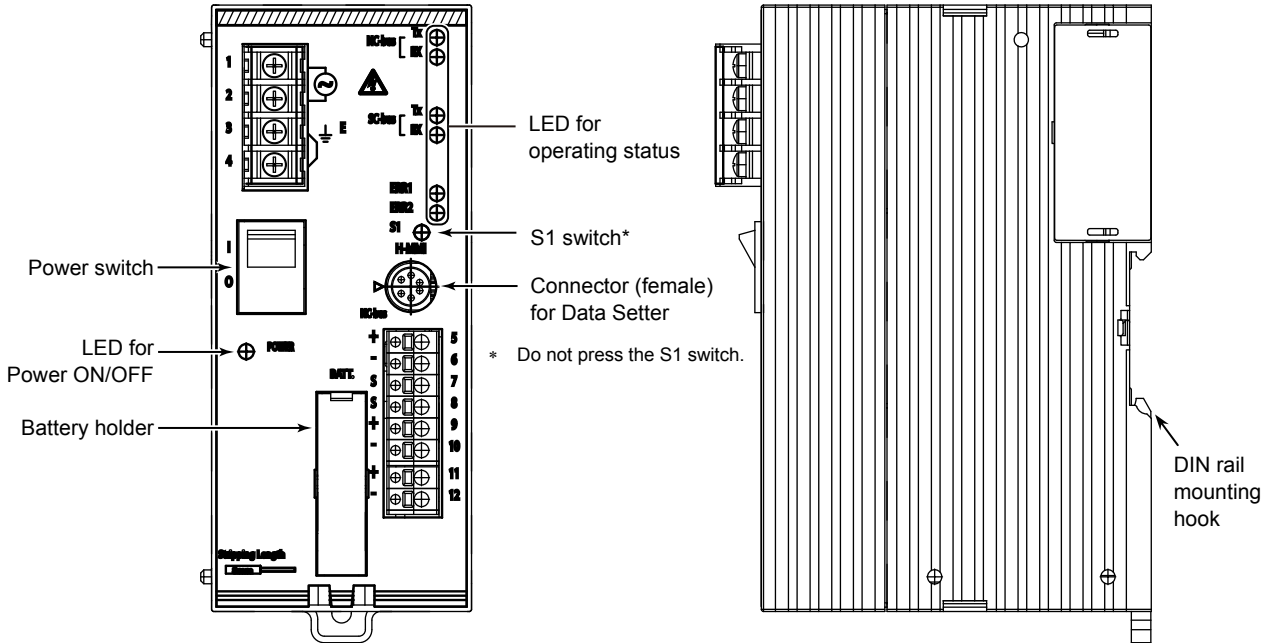


Figure 4. Parts identification

Table 1. Indication and operation of operating status LED

LED indication	LED operation
Data transmitting	NC-bus TX LED: flashing
Data receiving	NC-bus RX LED: flashing
Major failure / system restart	ERR1: ON
Minor failure / system restart	ERR2: ON

Connection of Data Setter (H-MMI) / PC-MMI

- 1) Connection of Data Setter Model QY5111B  
 No conversion cable is required. Directly insert the male connector of the Data Setter into the female connector provided on the Inflex GC basic unit.  
 At this time, hold the male connector with the ◀ mark facing left and insert it as the mark points to the ▶ mark on the Inflex GC basic unit.
- 2) Connection of Data Setter Model QY7211B / PC-MMI  
 Convert the D-SUB connector to the mini DIN connector with the conversion cable (Part No. 83104995-001).  
 At this time, hold the male connector with the ◀ mark facing left and insert it as the mark points to the ▶ mark on the Inflex GC basic unit.

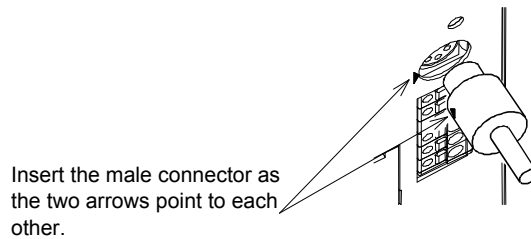


Figure 5. Connecting Data Setter/PC-MMI

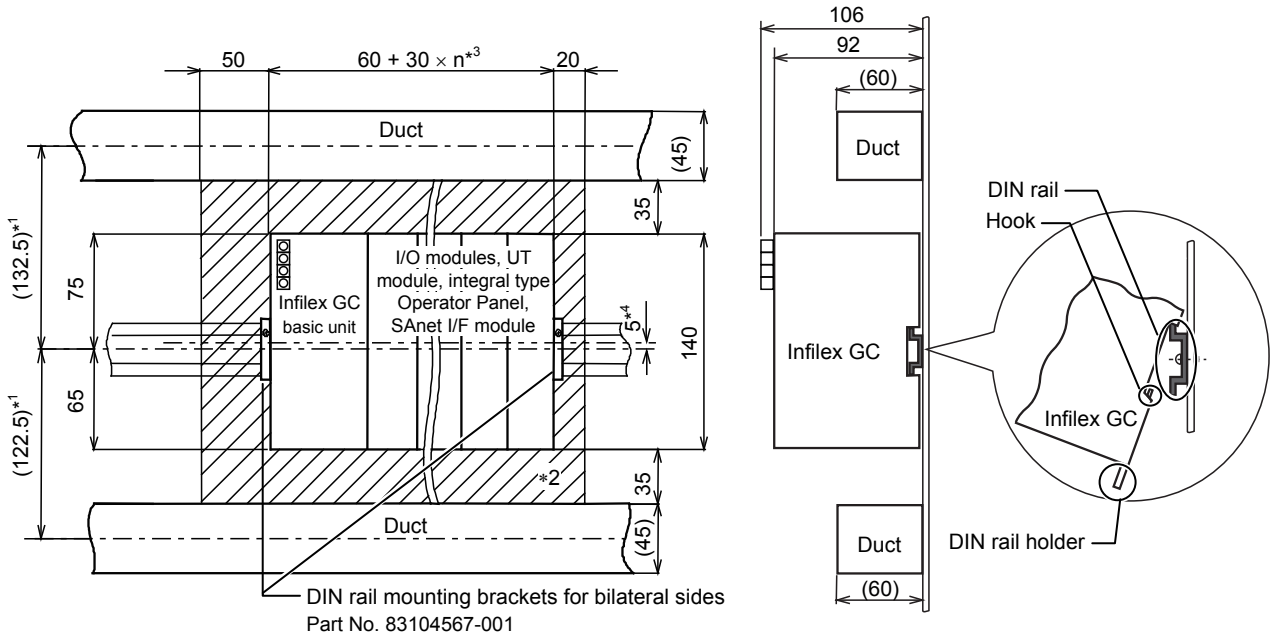
## Mounting Dimensions

### DIN rail mounting

Fig. 6 shows the mounting dimensions of Inflex GC on the DIN rail.

Mount and fix Inflex GC on DIN rail so that it does not fall from the DIN rail. Check that the DIN rail holders of each module are pushed up and fixed on the DIN rail.

Fasten the bilateral sides of Inflex GC with two DIN rail mounting brackets (Part No. 83104567-001, separate order is required).



**Notes:**

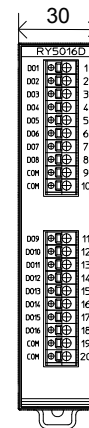
- \*1 Pitch between upper/lower duct and DIN rail.
- \*2 Hatched area shows the maintenance space.
- \*3 'n' indicates the number of I/O module, UT module, integral type Operator Panel, and/or SAnet I/F module assembled with Inflex GC basic unit.
- \*4 DIN rail position is shifted 5 mm downward from the center of Inflex GC.

The width of Inflex GC may vary depending on the number of an I/O module, UT module, integral type Operator Panel, and/or SAnet I/F module to be assembled. Their outside dimensions are the same.

Width of Inflex GC = One module (30 mm) × n (quantity) + Inflex GC basic unit (60 mm)

**Notes:**

- \* Panel mount type Operator Panel is not directly assembled with Inflex GC. To connect it to Inflex GC, a UT module is required. For details of panel mount type Operator Panel, please refer to Specifications/Instructions of Operator Panel (AB-6546).
- \* For details of I/O modules, UT module, integral type Operator Panel, and SAnet I/F module that can be assembled with Inflex GC, refer to Specifications/Instructions of Model RY50XX (AB-6527).



I/O module (mm)

Figure 6. Mounting dimensions: DIN rail mounting (mm)

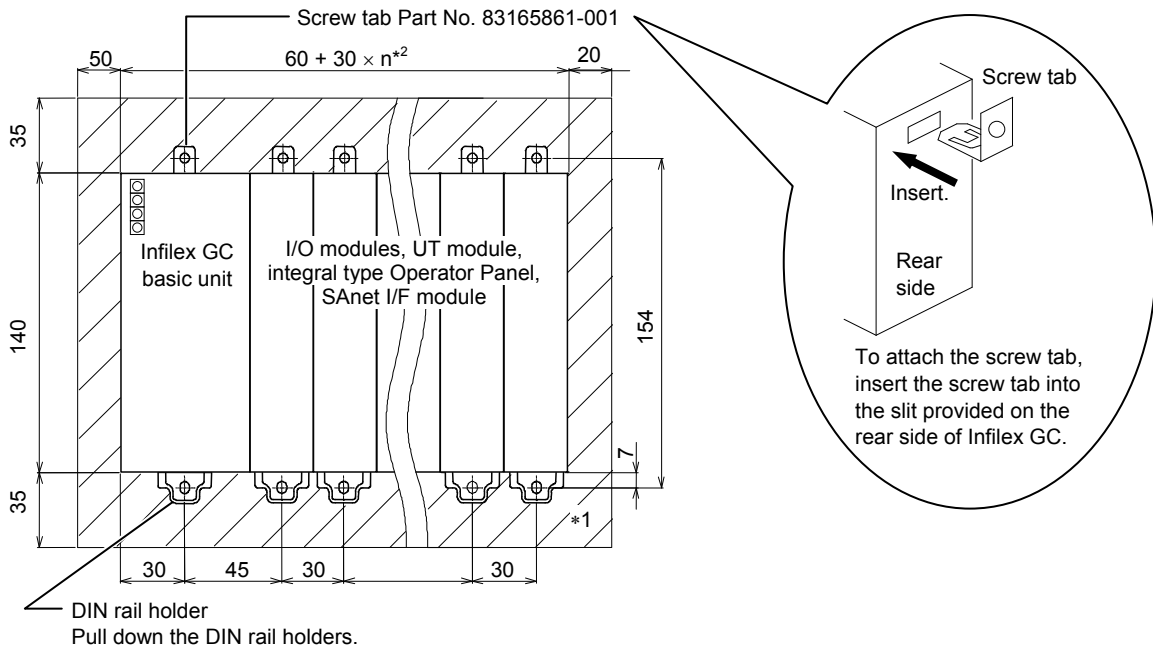


**Direct screw mounting**

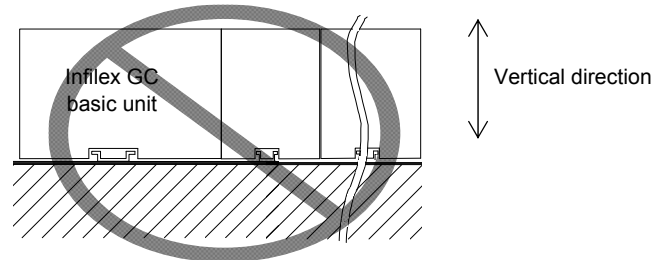
Fig. 7 shows the mounting dimensions of Inflex GC directly on a mounting surface, with screws.

To mount Inflex GC with screws, the screw tabs (Part No. 83165861-001, with separate order required) are required. Mount and fix Inflex GC on the mounting surface with M4 × 8 screws. (1 screw tab and 2 screws for 1 basic unit/module are required.)

Lengthwise mounting



Incorrect mounting: Crosswise, face-up/face-down\*3



Notes:

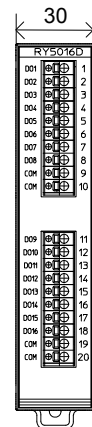
- \*1 Hatched area shows the maintenance space.
- \*2 'n' indicates the number of I/O module, UT module, integral type Operator Panel, and/or SAnet I/F module assembled with Inflex GC basic unit.
- \*3 Do not mount Inflex GC in the crosswise direction (basic unit positioned above or below the assembled modules). Do not mount it with the front surface facing upward or downward, either.

The width may vary depending on the number of an I/O module, UT module, integral type Operator Panel, and/or SAnet I/F module to be assembled. Their outside dimensions are the same.

One module (30 mm) × n (quantity) + Inflex GC basic unit (60 mm)

Notes:

- \* Panel mount type Operator Panel is not directly assembled with Inflex GC. To connect it to Inflex GC, a UT module is required. For details of panel mount type Operator Panel, please refer to Specifications/Instructions of Operator Panel (AB-6546).
- \* For details of I/O modules, UT module, integral type Operator Panel, and SAnet I/F module that can be assembled with Inflex GC, refer to Specifications/Instructions of Model RY50XX (AB-6527).



I/O module (mm)

Figure 7. Mounting dimensions: Direct screw mounting (mm)

## Wires Connection

### Connection to the power supply terminal block

Crimp the terminal lugs for the M3 screw terminal block to the wire ends, and connect them to the terminal block.

### Connection to I/O modules and NC-bus terminal block

Since quick-fit screwless terminal block is used for the I/O modules and the NC-bus terminal block, the procedure for connection is specified as follows.

- 1) Strip the wire sheath 8 mm. (The gauge for the strip length is located at the front lower part of Inflex GC basic unit. If the stripped part is longer than 8 mm, the conductor will be exposed, causing electrical shock or short circuit between adjacent terminals. If it is shorter, the conductor may not contact the connector.)
- 2) Make sure that no wire fiber is protruded from the conductor (stripped wire).
- 3) Press the button on the terminal block deeply enough to insert the wire using a slotted screwdriver. (Maximum button-pressing force is 14 N.)
- 4) Release the button, and gently pull out the wire horizontally to make sure that it is tightly fastened. (If you pull out the wire diagonally, it may be disconnected.) Make sure that no wire fiber is protruded from the conductor (stripped conductor).

### Positions for connected wires

Neatly place the wires, using cable ties or the like, connected to Inflex GC so as not to hide LED, Data Setter connector, ▶ mark, S1 switch, battery holder, or indication tag, as shown in Fig. 8.

Make sure there is no slack in the wires from the cable ducts to Inflex GC.

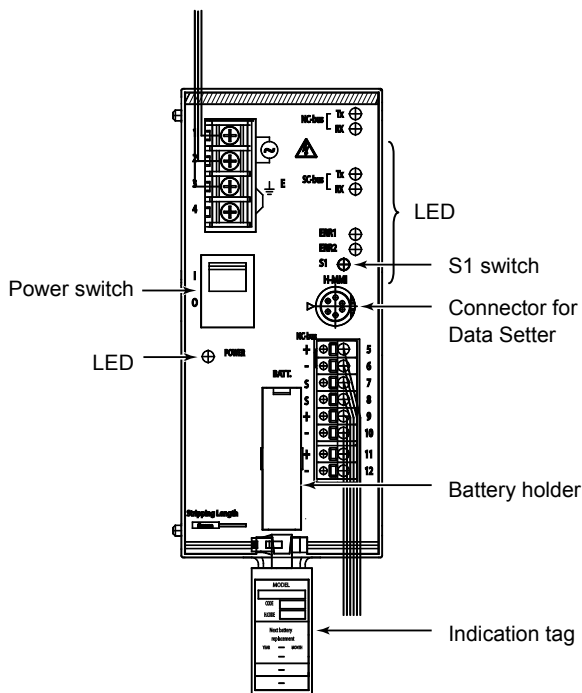


Figure 8. Connected wires in position (example)

## Tube marker

Since Inflex GC adopts a quick-fit screwless terminal block, wires are connected without crimp terminals. Therefore, if normal tube markers are used, they may come off when the wires are disconnected. To prevent this, use the following Flat Tube Marker. It is held on a wire by friction and thus does not come off easily.

Manufacturer	Phoenix Contact
Part name	Flat Tube Marker
Part number	5880029
Model	TMC-3
Applicable wire size	0.4 mm <sup>2</sup> to 2 mm <sup>2</sup>
Package unit	200 m/roll

### System indication label for the controller number

The indication tag has the system indication label on its back. Turn it over and fill in the controller number on the label.

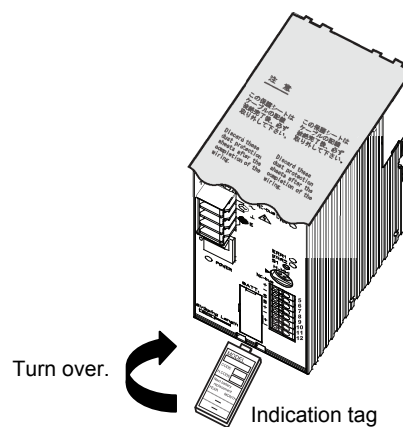


Figure 9. System indication label

### Protective sheet

After connecting the wires, be sure to peel off the protective sheet before turning on the power.

- 1) Adhesive is applied to the sheet approximately 20 mm from the front edge. Peel off this area.
- 2) Tear off the sheet along the perforations.

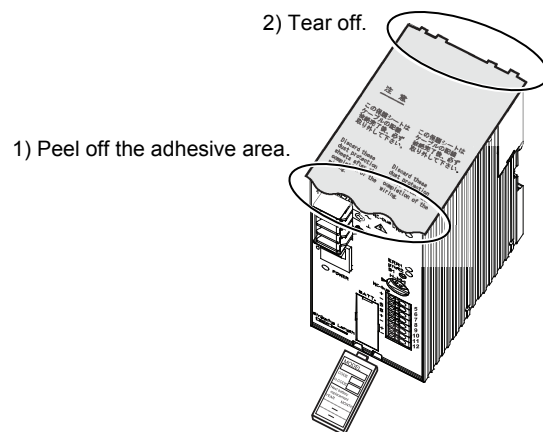


Figure 10. Protective sheet

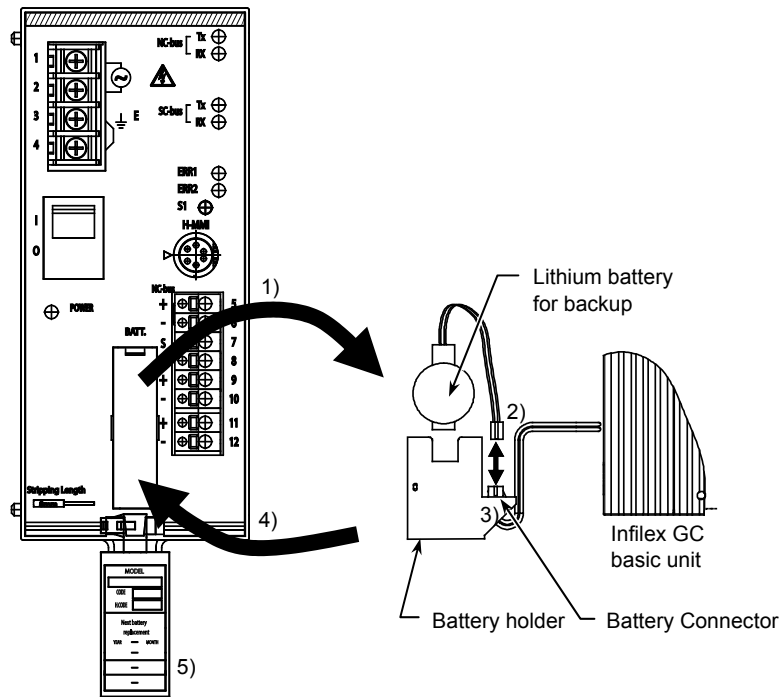
**Maintenance (Lithium Battery Replacement)**

Replace the lithium battery for backup (Part No. 83104934-001) every 5 years.

**IMPORTANT:**

- Since the remaining battery capacity cannot be checked by measuring the terminal voltage, be sure to replace the battery every 5 years.
- Only authorized service personnel is allowed to replace the battery.
- Do not touch the power supply unit when replacing the battery.
- Replace the lithium battery every 5 years if the product is always in use (in ON state).
- Replace the lithium battery with the power ON.
- If the product has never or hardly been operated (in OFF state) for a year, replace the lithium battery before the product operation.

**Battery replacement**



\* Replace the lithium battery while Inflex GC is ON.

Figure 11. Battery replacement

- 1) Pull out the battery holder using a slotted screwdriver.
- 2) Disconnect the connector and detach the lithium battery from the battery holder.
- 3) Place a new lithium battery in the battery holder and connect the connector to it.
- 4) Insert the battery holder into the basic unit.
- 5) Fill in the month and year for next replacement (5 years after the replacement) on the indication tag using an oil-based pen.

**Precautions for Use**

- Do not mount the product under the conditions of high temperature and humidity.
- Do not drop the product.
- For the wire replacement, be sure to shut down the power. (Disconnect the wiring between the power supply and the product power terminals.)
- Before turning on the power, make sure that the wires are correctly connected.
- Several tens of seconds are required for the product normal operation after the power is turned on. During this time, the red LED "ERR1" (major failure) on the front lights up indicating major failure temporarily, but this does not indicate an error.
- Do not connect wires to vacant terminals.
- Leave at least 35 mm clearance between the top/bottom surfaces of the product and other devices.
- Peel off the protective sheet on the top surface of the product before turning ON the power. (See Figs. 10 and 12.)

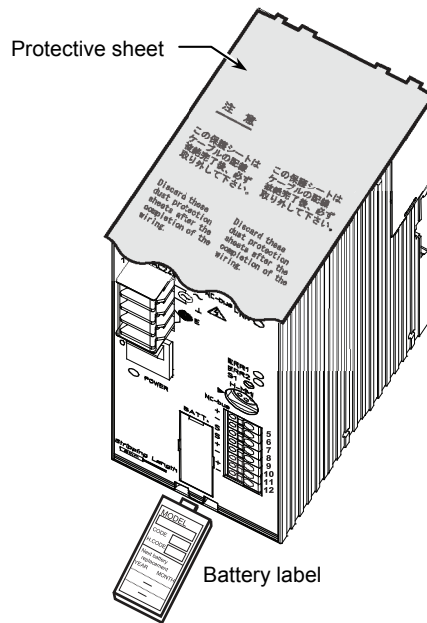


Figure 12. Batter label and protective sheet



*Specifications are subject to change without notice.*

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