

Direct Mount I/O Modules, Setting-Device connection Module (SD) , and SAnet Interface Module

■ Overview

This product (model RY51) represents Direct Mount I/O Modules, Setting-Device connection Module (SD Module) , and SAnet Interface Module (hereinafter SAnet I/F Module) for General Controller. According to the applications, up to 16 of these modules can be configured and attached to General Controller.



■ Features

- Saving space
The compact body and the power supplied by the basic unit enable to be installed in a minimum space.
- Supporting various I/Os
Various types of the Direct Mount I/O Modules are available. According to the applications or usage, it is possible to select suitable I/O types, increase or decrease the number of installed points. By connecting the SAnet I/F Module, it is possible to connect the Intelligent Component series devices.
- Simple installation
Since the push-in terminal blocks for the Direct Mount I/O Module, 2-piece terminal blocks for the SAnet I/F Module, and the modular connectors for the Setting-Device connection Module and Operator Panel (Integral Type) are provided, it is easy for wiring the system.

Safety Precautions

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

Restrictions on Use

This product was developed, designed, and manufactured for general air conditioning use.

Do not use the product in a situation where human life may be at risk or for nuclear applications in radiation-controlled areas. If you wish to use the product in a radiation-controlled area, please contact Azbil Corporation.

Particularly when the product is used in applications like the following where safety is especially required, implementation of fail-safe design, redundant design, regular maintenance, etc., should receive appropriate consideration so that the product can be used safely and reliably.

- Safety devices for protecting the human body
- Start/stop control devices for transportation machines
- Aeronautical/aerospace machines

For system design, application design, instructions for use, or product applications, please contact Azbil Corporation. Azbil Corporation bears no responsibility for any result, or lack of result, deriving from the customer's use of the product.

Caution for Instrumentation Design

Considering unexpected failures or contingencies, be sure to design and check safety of the system and equipment.

Recommended Design Life (Recommended Period of Use)

It is recommended that this product be used within its design life. The design life is the period during which you can use the product safely and reliably based on the design specifications. If the product is used beyond this period, its failure ratio may increase due to time-related deterioration of parts, etc. The design life during which the product can operate reliably with the lowest failure ratio and least deterioration over time is estimated scientifically based on acceleration tests, endurance tests, etc., taking into consideration the operating environment, conditions, and frequency of use as basic parameters.

The design life of this product is 10 years.

The design life specified for this product assumes that maintenance, such as replacement of the limited-life parts, is carried out properly. Refer to the section on maintenance in this manual.

Warnings and Cautions



WARNING

Alerts users that improper handling may cause death or serious injury.



CAUTION

Alerts users that improper handling may cause minor injury or material loss.






Symbols

















Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside ⊘ graphically indicates the prohibited action. (For example, the sign on the left means that disassembly is prohibited.)



Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside ● graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

 WARNING	
	Install this product in a place, such as a control cabinet, where only the administrator has access to it. Otherwise there is a danger of electric shock.
	Before wiring or maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.
	Do not insert conductive objects through product ventilation holes. Doing so may cause electric shock.
	Do not touch electrically charged parts. Doing so may cause electric shock.

 CAUTION	
	Take anti-lightning surge measures based on regional and building characteristics. Lightning may cause fire or critical damage to this product if protective measures are not taken.
	Keep this product in the package for storage. Failure to do so may damage or stain the product.
	Install, wire, and use this product according to the specifications stated in this manual. Failure to do so may cause fire or device failure.
	Take anti-noise measures if this product is installed in a location near source of electric noise. Failure to do so may cause malfunction or device failure.
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Failure to do so may cause fire or electric shock.
	After installing this product, check that it is steady and does not move. Otherwise it may fall or fail.

 CAUTION	
	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.
	Do not block the ventilation holes of this product. Doing so may cause device failure.
	Do not allow wire clippings, metal shavings, and other refuse to enter into the product. Doing so may cause fire or product damage.
	Do not disassemble this product. Doing so may cause device failure.
	Before cleaning the product, be sure to turn off the power to the product. Failure to do so may cause electric shock, device failure, or malfunction.

System Configuration

System connection

The product operates connected to the central monitoring unit.

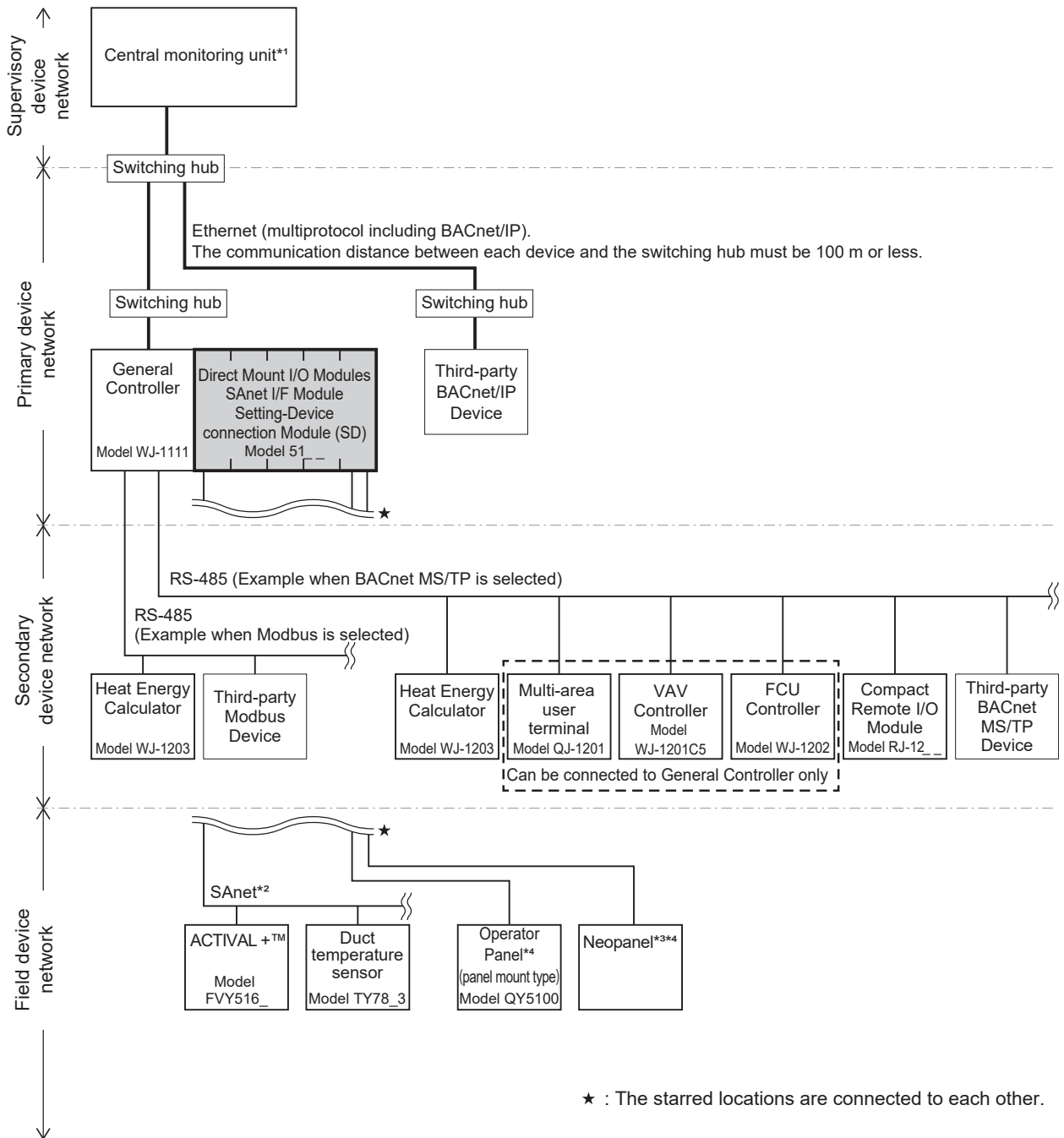


Figure 1. System configuration example

- *1 Azbil's Supervisory Controller (model BH-101G0W0000) or a third-party central monitoring unit using BACnet/IP communications can be used for central monitoring.
- *2 By connecting the SAnet Interface Module, it is possible to connect the Intelligent Component Series devices.
☞ For restrictions on the SAnet communication line, refer to AB-6713, *Intelligent Component Series for SAnet Communication: Installation Manual*.
- *3 Neopanel2 (model QJ-1301) or Neopanel (model QY7205) can be connected.
- *4 By connecting the Setting-Device connection Module (SD), the Operator Panel (panel mount type), Neopanel2, Neopanel, or Neoplate can be connected. By connecting the Operator Panel (integral type), Neopanel2, Neopanel, or Neoplate can be connected.
☞ AB-7530, *Operator Panel (Panel Mount Type), Operator Panel (Integral Type), Specifications/Instructions*.

● **Standalone**

Without connecting to the central monitoring unit, the controller is operated by connecting to the operator panel.

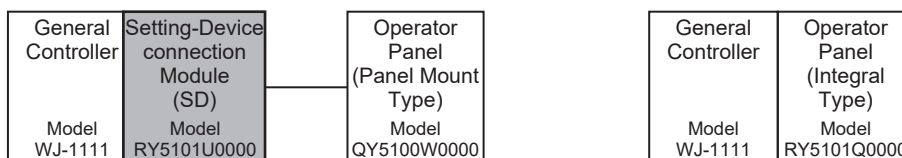


Figure 2. System configuration example

■ Hardware Configuration

By attaching the Direct Mount I/O Modules to General Controller, it is possible to configure various instrumentation.

In addition to the Direct Mount I/O Modules, the SAnet I/F modules also can be attached.

There are restrictions for attaching them as described below. The following three conditions must be satisfied.

(1) Total number of Direct Mount I/O Modules and SAnet I/F modules must be 16 or less.

However, 16 devices may not be attached due to power supply limitations.

(2) One Setting-Device connection Module (SD) or one Operator Panel (Integral Type) can be connected.

(3) Number of SAnet I/F modules must be 2 or less.

■ Model Numbers

Model number				Description	Objects to be assigned for	Module abbr. name
RY51	08	S	0000	8 digital input points	BI, MI	DI
	16	S	0000	16 digital input points		
	08	D	0000	8 relay output points (normally open contacts)	BO, MO*1	DO
	16	D	0000	16 relay output points (normally open contacts)		
	16	R	0000	8 relay output points (normally open contacts) + 8 digital input points	Relay output: BO, MO*1 Digital input: BI, MI	DO + DI
	08	C	0000	8 relay output points (normally open/normally closed contacts)	BO, MO*1	DOC
	04	Y	0000	4 remote-control relay outputs	BO, BI	RRD
	04	T	0000	4 totalizing pulse input points	AC	TOT
	16	T	0000	16 totalizing pulse input points		
	02	M	0000	2 voltage/current output points	AO	AO
	04	M	0000	4 voltage/current output points		
	04	A	0000	4 voltage/current input points	AI	AI
	04	P	0000	4 temperature input points (Pt100)	AI	Pt
	04	P	000K	4 temperature input points (Pt1000)		
	04	J	0000	2 voltage/current input points + 2 temperature input points (Pt100)	AI	AI + Pt
	04	J	000K	2 voltage/current input points + 2 temperature input points (Pt1000)		
	01	F	0000	1 modutrol motor output point	Output: AO	MM
	03	F	0000	3 modutrol motor output points	Actual valve position measurement: AI	
	01	U	0000	Setting-Device connection	Neopanel2, Neopanel, Neoplate	SD
	01	Q	0000	Operator Panel (Integral Type)	Neopanel2, Neopanel, Neoplate	OP
01	E	0000	SAnet interface*2	Intelligent component	SAnet I/F	
	-U		UL-certified*2			

*1 Outputs 1 point for the maintained output, 2 points (ON and OFF) for the momentary output.

*2 UL-certified product is not available for model RY5101E0000.

● Replacement parts

Model number	Description	Remarks
83957018-038	Fuse	SAnet I/F module

■ Specifications

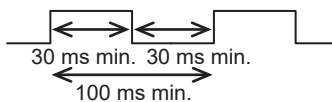
● Basic specifications

Item		Specification	
Memory backup in case of power failure		Non-volatile memory	
Major material	Case, cover	Modified PPE resin	
	DIN holder	POM resin	
Weight	DI	0.16 kg	
	DO	0.21 kg	
	DO + DI	0.19 kg	
	DOC	0.23 kg	
	RRD	0.17 kg	
	TOT	0.16 kg	
	AO	0.17 kg	
	AI	0.16 kg	
	Pt	0.16 kg	
	AI + Pt	0.16 kg	
	MM	0.19 kg	
	SD	0.16 kg	
	OP	0.17 kg	
SAnet I/F	0.17 kg		
Environmental conditions	Operating conditions	Ambient temperature	0–50 °C
		Ambient humidity	10–90 % RH (without condensation)
		Altitude	2000 m max.
		Vibration	3.2 m/s ² max., 10–150 Hz
	Transport/storage conditions	Ambient temperature	-20–60 °C
		Ambient humidity	5–95 % RH (without condensation)
		Vibration (storage)	3.2 m/s ² max., 10–150 Hz
		Vibration (transport)	9.8 m/s ² max., 10–150 Hz
	Others	<ul style="list-style-type: none"> - No corrosive gas should be detected. - The product should not be exposed to direct sunlight. - Do not let the product get wet. 	
	Installation location		In the control panel
Installation method		Installed on a DIN rail or with screws	

● Direct Mount I/O Module input/output specifications

Item		Specification	
Input	Digital input Totalizing pulse input*	Current	5 mA (typ.)
		Voltage	24 V DC (typ.)
		Connectable output	Dry contact or open collector
		Rated dry contact resistance	Allowable ON contact resistance: 100 Ω max. Allowable OFF contact resistance: 100 kΩ min.
		Rated open collector voltage	Allowable ON residual voltage: 3 V max.
	Temperature input	Input signal	RTD (Pt100) RTD (Pt1000)
		Measuring range	-50–100 °C
		Settable range	0–100 °C, 0–50 °C, -20–80 °C, -20–30 °C, -50–100 °C
	Voltage input	Input voltage range	2–10 V, 0–10 V, 1–5 V, 0–5 V
		Input impedance	≥ Hcode 10: 1 MΩ (typ.) ≤ Hcode 09: 500 kΩ (typ.)
	Current input	Input range	4–20 mA
		Input impedance	≥ Hcode 10: 23.5 Ω (typ.) ≤ Hcode 09: 250 Ω (typ.)
	Output	Relay output (normally open contact)	Output type
Rated contact voltage			24 V AC, 0.5 A max. (inductive load: cos φ0.4 or more) 24 V DC, 0.5 A max.
Min. applicable load			5 V, 10 mA
Relay output (normally open/ normally closed contact)		Output type	Relay output, normally open/normally closed contact
		Rated contact voltage	24 V AC, 1 A max. (inductive load: cos φ0.4 or more) 24 V DC, 1 A max.
		Min. applicable load	5 V, 100 mA
Voltage output		Output voltage range	2–10 V, 0–10 V, 1–5 V, 0–5 V
		Min. load resistance	10 kΩ min.
Current output		Output current range	4–20 mA
		Max. load resistance	500 Ω max.
Remote-control relay output		Output type	Thyristor output
		Output rating	24 V AC, 1.5 A max.
		Number of connectable devices	1 remote-control relay per point
Modutrol motor output		Output type	Relay output, normally open contact
		Rated contact voltage	24 V AC or 24 V DC, 1 A max.
		Input signal	3-wire feedback potentiometer Load resistance range: 100 Ω–10 kΩ

* The pulse width and interval should meet the following 3 conditions shown in the figure below.




● **User I/F communication specifications (for connecting Neopanel2, Neopanel, or Neoplate)**

Transmission method	Voltage transmission
Transmission speed	100 bps
Transmission distance	50 m

● **DP-bus communication specifications
(for connecting Setting-Device connection Module and Operator Panel (Panel Mount Type))**

Transmission method	RS-485
Transmission speed	4800 bps
Number of connected units	One line for a General Controller
Transmission distance	Modular cable 10 m

● **SAnet I/F module communication specifications**

Transmission method	Voltage transmission (SAnet)
Transmission speed	1200 bps
Transmission distance	 For the transmission distance, refer to AB-6713, <i>Intelligent Component Series for SAnet Communication Installation Manual</i> .

■ Specifications for Wiring

Item	Recommended wire	Rating		Maximum length	Connection type
Temperature input*2*3	600 V PVC-insulated (IEC-60227-3), control-use vinyl insulated vinyl sheathed (CVV), or equivalent	≥ Hcode 10	1.25 or 1.5 mm ² stranded wire	100 m	Screwless push-in terminal
		≤ Hcode 09	1.25 mm ² stranded wire		
Voltage/current input*3		≥ Hcode 10	1.25 or 1.5 mm ² stranded wire	100 m	
		≤ Hcode 09	1.25 mm ² stranded wire		
Voltage/current output*3		≥ Hcode 10	0.9, 1.25, or 1.5 mm ² stranded wire	100 m	
		≤ Hcode 09	0.9 or 1.25 mm ² stranded wire		
Modutrol motor output*3		≥ Hcode 10	1.25 or 1.5 mm ² stranded wire	100 m	
		≤ Hcode 09	1.25 mm ² stranded wire		
Digital input, totalized pulse input*3		≥ Hcode 10	0.5, 0.75, 0.9, 1.25, or 1.5 mm ² stranded wire	100 m	
		≤ Hcode 09	0.5, 0.75, 0.9, or 1.25 mm ² stranded wire		
Relay output*3	≥ Hcode 10	1.25 or 1.5 mm ² stranded wire	100 m		
	≤ Hcode 09	1.25 mm ² stranded wire			
Remote control relay output*3	≥ Hcode 10	1.25 or 1.5 mm ² stranded wire	100 m		
	≤ Hcode 09	1.25 mm ² stranded wire			
Setting-Device connection Module	LAN cable	EIA/TIA-568 category 5e or higher		50 m (user I/F)	
				10 m (DP-bus)	
Operator Panel (integral type) module	LAN cable	EIA/TIA-568 category 5e or higher		50 m (user I/F)	
SAnet I/F module*4	600 V PVC-insulated (IEC-60227-3), CVV, 600 V grade polyvinyl chloride insulated and sheathed portable power cables, or equivalent	0.75, 1.25, 1.5, or 2.0 mm ² stranded wire		*1	Screwless push-in 2-piece terminal

*1 Refer to AB-6713, "Intelligent Component Series for SAnet Communication Installation Manual." The length is the total distance from the module to the load, including the wire between the module and the relay terminal block.

*2 Since the resistance temperature detector (Pt1000) has 2 wires, the resistance of the wiring will cause a measurement error. If the cross-sectional area of the wire is 1.25 mm², the measurement error will be approximately 0.1 °C per 10 m. Adjust for the error at the controller depending on the situation.

*3 For Hcode 10 or later, ferrule terminals can be used. The ferrule part numbers that can be used are as follows. Select a suitable part number according to the size of stranded wire.

AI0.5-8__ (applicable wire size: 0.5 mm²)

AI0.75-8__ (applicable wire size: 0.75 mm²)

AI1-8__ (applicable wire size: 1.0 mm²)

AI1.5-8__ (applicable wire size: 1.5 mm²)

*4 The SAnet I/F module must not use ferrule terminals.

- The screwless push-in terminals are used for the Direct Mount I/O Modules. Contact can be made by simply removing the wire sheath.

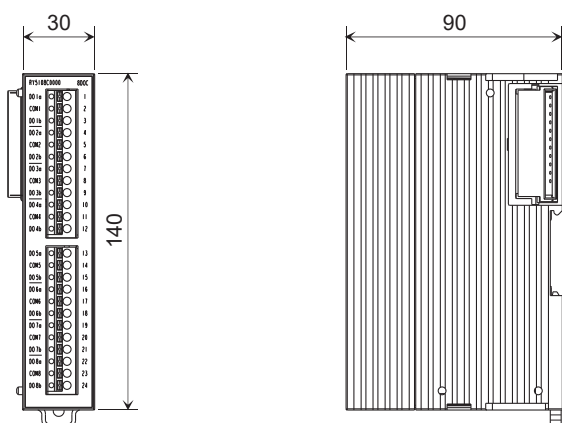
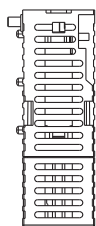
Sheath stripping length: 8 mm. Pin terminal cannot be used. Button pressing force: 17 N

- The screwless push-in 2-piece terminal is used for SAnet I/F module.

Sheath stripping length: 10 mm. Pin terminal cannot be used. Button pressing force: 30 N

■ Dimensions

140 mm (H) x 30 mm (W) x 90 mm (D)



Note: The figure above shows Model RY5108C0000.
The same dimensions are applied for other Direct Mount I/O Modules.

Figure 3. Direct Mount I/O Module dimensions (mm)

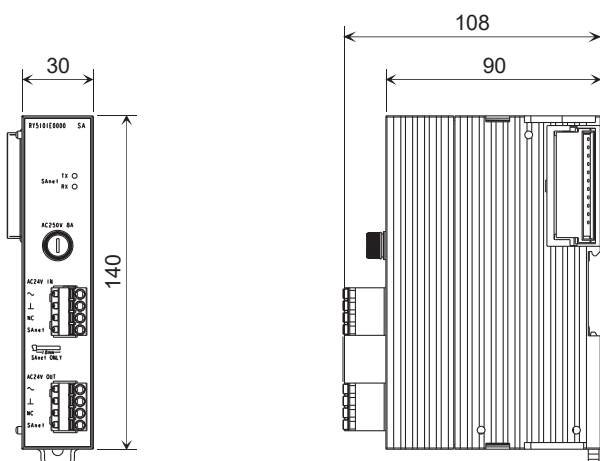
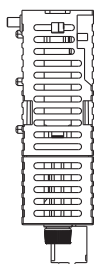


Figure 4. SAnet I/F Module dimensions (mm)

■ Installation

⚠ WARNING	
	Install this product in a place, such as a control cabinet, where only the administrator has access to it. Otherwise there is a danger of electric shock.

⚠ CAUTION	
	Install, wire, and use this product according to the specifications stated in this manual. Failure to do so may cause fire or device failure.
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Failure to do so may cause fire or electric shock.
	After installing this product, check that it is steady and does not move. Otherwise it may fall or fail.

For installation and maintenance space, refer to AB-7456, *General Controller Specifications/Instructions*.

■ Wiring

⚠ WARNING	
	Before wiring, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.

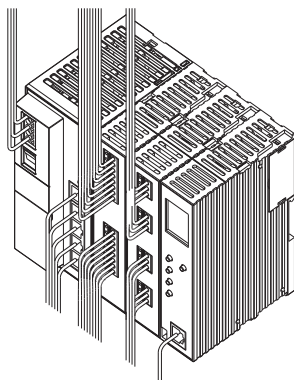
⚠ CAUTION	
	Take anti-noise measures if this product is installed in a location near source of electric noise. Failure to do so may cause malfunction or device failure.
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards. Failure to do so may cause fire or electric shock.

⚠ CAUTION	
!	All wiring must comply with applicable codes and ordinances. Otherwise there is a danger of fire.
!	For wiring, strip the insulation from cables as specified in this manual. If the length of exposed wire is longer than specified, it may cause electric shock or short circuit between adjacent terminals. If it is too short, it may not make proper contact.

<p>IMPORTANT:</p> <ul style="list-style-type: none"> • Incorrect wiring may cause the device to fail. Before turning on the power, check that all wires are correctly connected. • Do not test the withstand voltage of this product. Doing so may cause the device to fail. • If more than the rated voltage is accidentally applied to this product, replace the product with a new one. Failure to do so may cause device failure.

● **Notes for wiring**

- Do not use unused/spare terminals on this product as relay terminals. Doing so may cause device failure.
- When supplying power from outside using a transformer to input/output ports, etc., install a protective circuit such as a breaker on the power supply source.
- Power wires must be routed separately from communication wires and signal wires. Failure to do so may cause communication errors.
- Do not hide the front of the product with the wires because it has areas for LED displays and to adjust the product. Draw the wires upward or downward of the product.
- After wiring, reconfirm that the wiring is done correctly.
- Use the specified cables.
- Take care that tension caused by the wired cables is not applied to the unit.

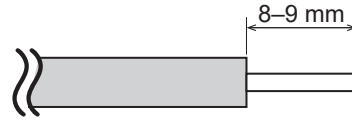


● **Wiring the terminal blocks**

Wiring method for Hcode10 or later

- (1) Strip 8–9 mm of sheath from the cable core wire.

Note: There is an insulation stripping gauge on the front of the product.



Make sure that there are no stray wires from the stripped conductor.

The following restrictions apply when using ferrules for spring terminal blocks.

Table 1. Available ferrules (__ specifies the color)

Manufacturer's part number (Phoenix Contact)	Wire size
AI0.5-8 __	0.5mm ²
AI0.75-8 __	0.75mm ²
AI1-8 __	1.0mm ²
AI1.5-8 __	1.5mm ²

Note: The crimping tool for the ferrules (made by Phoenix Contact) is CRIMPFOX 6: part No. 1212034.

- The length of insulation to strip is 11 mm.

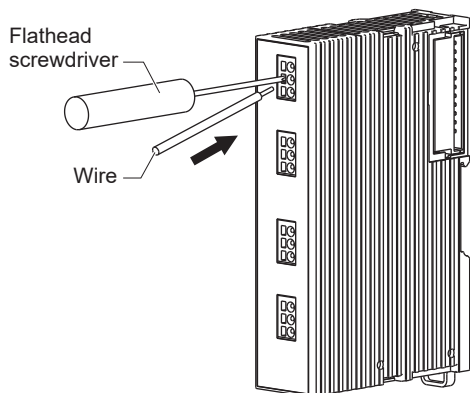
Note: This length is different from the length of the insulation stripping gauge (8 mm) on the front of the product.



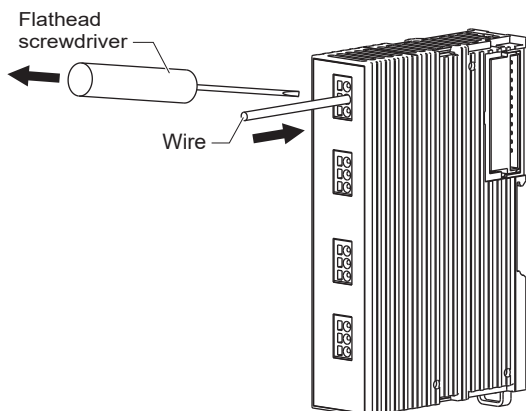
Make sure that there are no stray wires from the stripped conductor.

- If the wire protrudes out of the ferrule, cut the wire so that it does not protrude more than 0.5 mm.
- Lightly pull on the ferrule and wire to make sure they are correctly connected.

- (2) Insert a flathead screwdriver* into the screwdriver insertion slot (square hole). While keeping the screwdriver there, insert the wire into the terminal (round hole) until it reaches the back end.

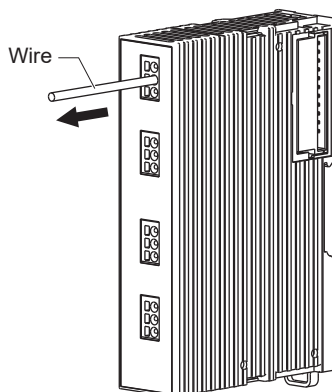


- (3) Pull out the screwdriver while holding the wire in.



- (4) Lightly pull on the wire to check that it does not come out.

Note: If you pull the wire diagonally, it may be disconnected.

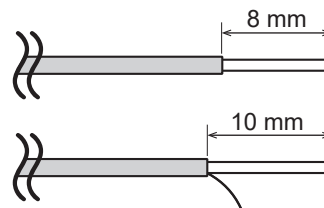


- (5) Check again that there are no stray wires.

* Recommended screwdriver:
SZF 0-0,4x2,5 model 1204504 made by Phoenix Contact

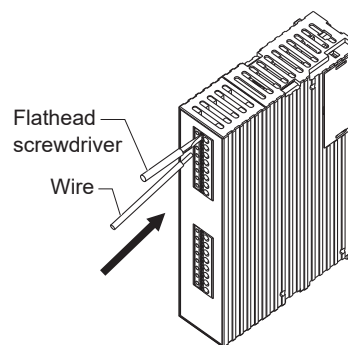
Wiring method for Hcode09 or earlier

- (1) Strip 8 mm of sheath from the cable core wire.
For SAnet I/F, strip 10 mm of sheath.



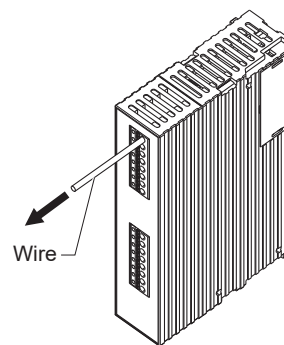
Make sure that there are no stray wires from the stripped conductor.

- (2) Pressing the button on the terminal block to the bottom with a flathead screwdriver and insert a wire, and then release the button. The button-pressing force is 17 N.
For SAnet I/F, the button-pressing force is 30 N.



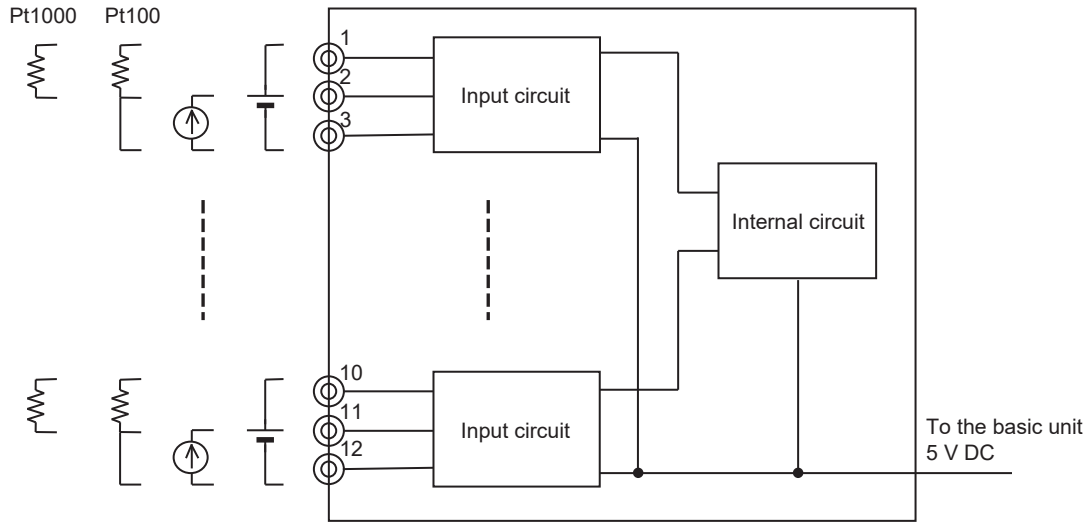
- (3) Lightly pull on the wire to check that it does not come out.

Note: If you pull the wire diagonally, it may be disconnected.



- (4) Check that there are no stray wires at the hole in which the wire was inserted.

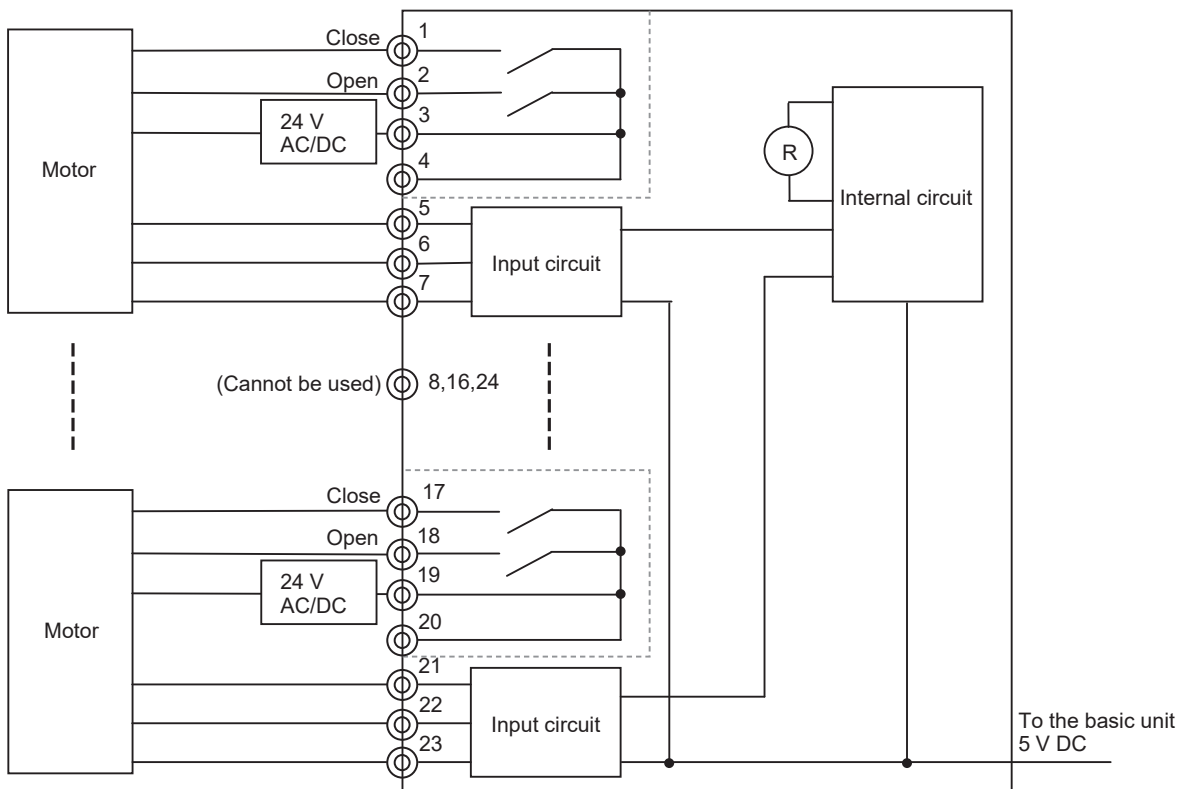
- AI module Model RY5104A (all 4 points are voltage/current inputs)
- Pt module Model RY5104P (all 4 points are Pt inputs)
- AI + Pt module Model RY5104J (1-3, 4-6 terminals: voltage/current inputs 2 points
7-9, 10-12 terminals: Pt inputs 2 points)



Note: Wire the voltage/current input while being careful of the insulation of the connected equipment.

Figure 5. Wiring (AI/Pt/AI + Pt module)

- MM module Model RY5101F, Model RY5103F

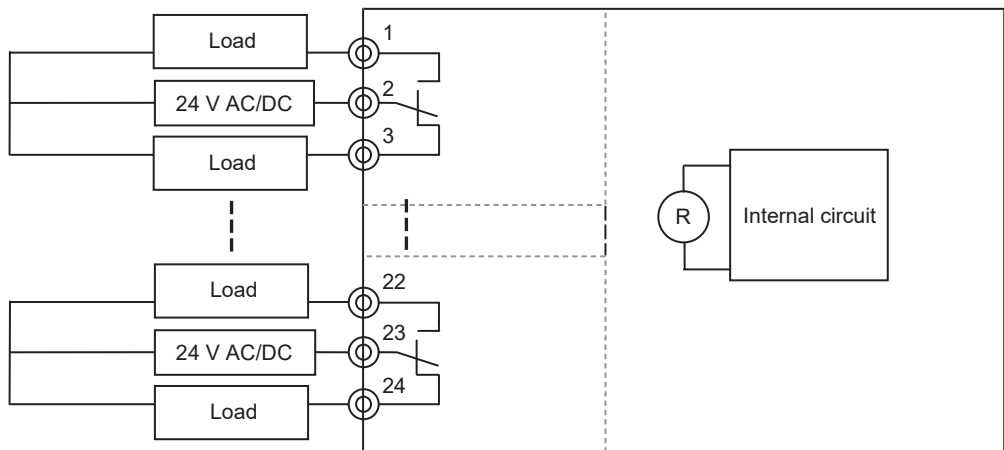


Note: 1. --- denotes the insulated areas.

2. Provide the power supply for output with an overcurrent protection device such as a fuse.

Figure 6. Wiring (MM module)

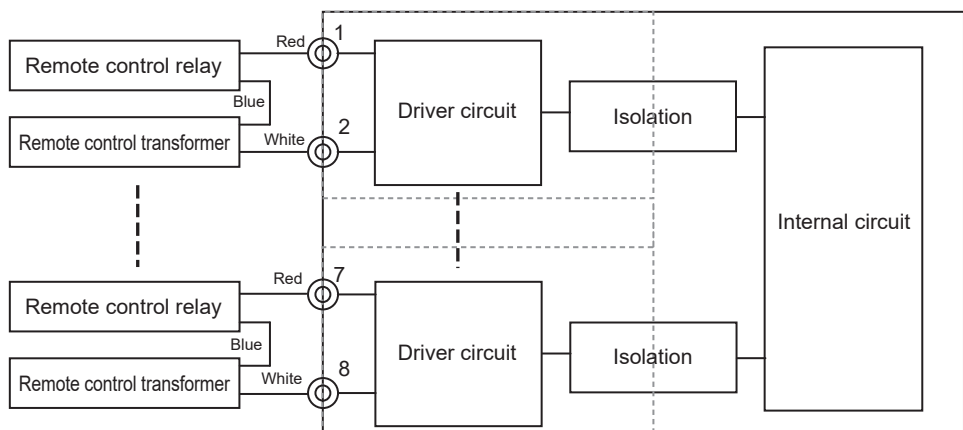
● DOC module Model RY5108C



- Note: 1. --- denotes the insulated areas.
 2. Provide the power supply for output with an overcurrent protection device such as a fuse.

Figure 7. Wiring (DOC module)

● RRD module Model RY5104Y

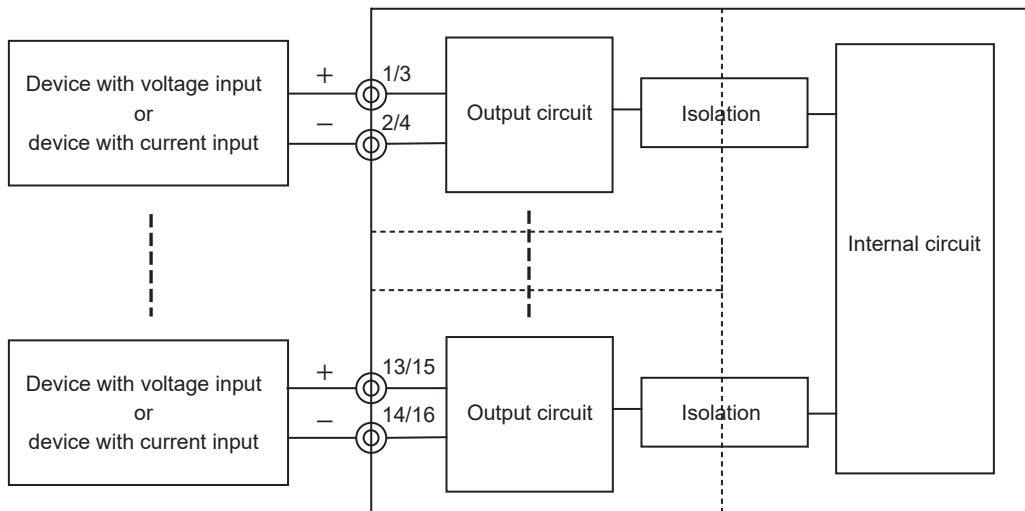


- Note: 1. --- denotes the insulated areas.
 2. Provide the power supply for output with an overcurrent protection device such as a fuse.

Figure 8. Wiring (RRD module)

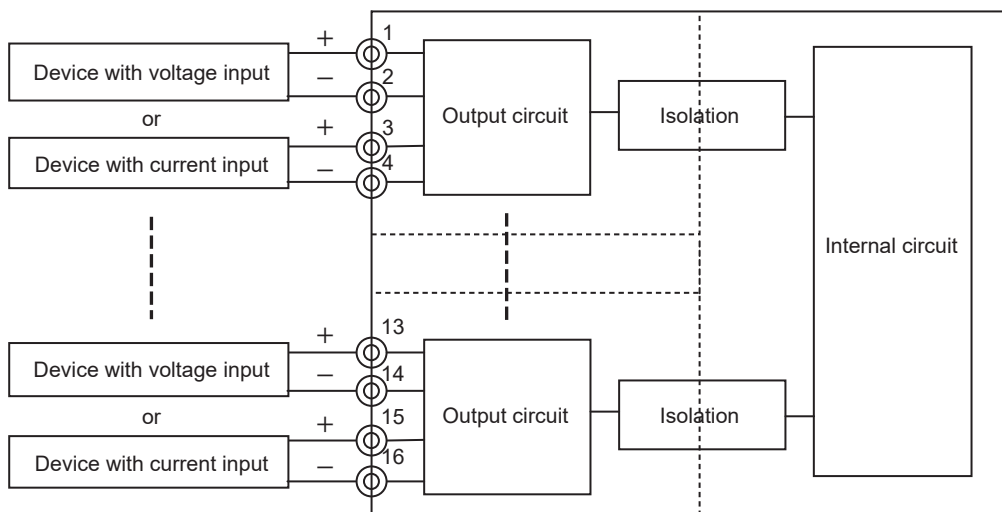
● AO module Model RY5102M, Model RY5104M

For Hcode10 or later



Note: 1. The areas enclosed by "-" lines are internally isolated.

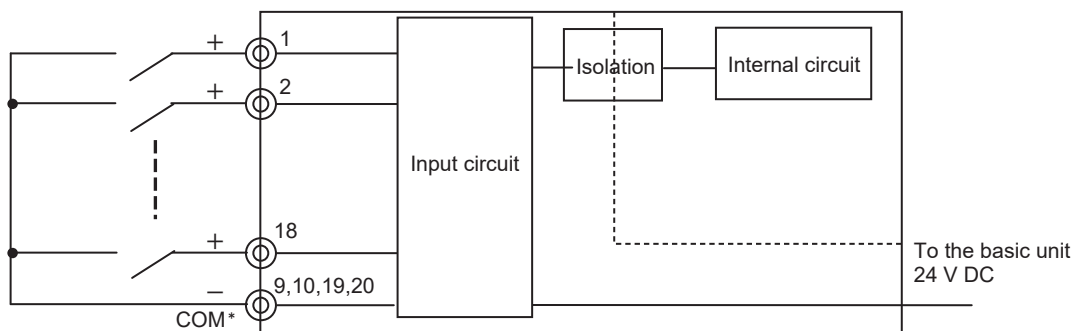
For Hcode09 or earlier



Note: 1. The areas enclosed by "-" lines are internally isolated.
 2. Connecting voltage output and current output terminals is prohibited.

Figure 9. Wiring (AO module)

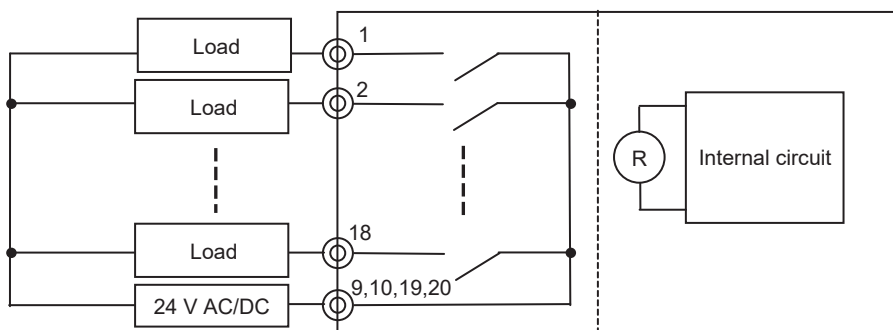
● **DI module** **Model RY5108S, Model RY5116S**
TOT module **Model RY5104T, Model RY5116T**



Note: 1. --- denotes the insulated areas.
 2. COM terminals of other DI and TOT modules cannot be used.

Figure 10. Wiring (DI/TOT module)

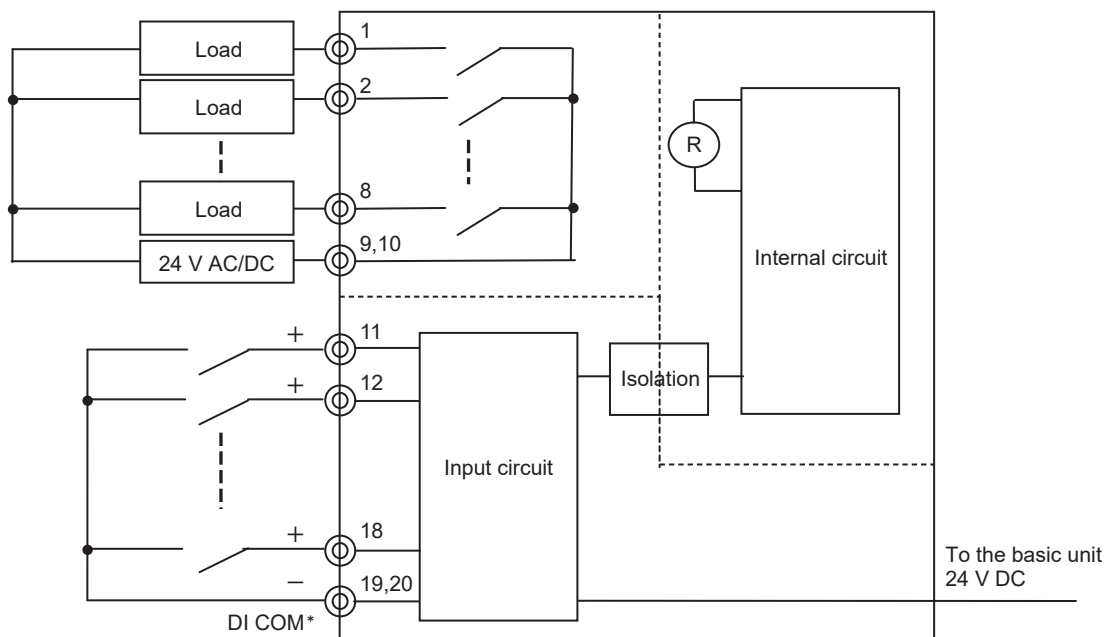
● **DO module** **Model RY5108D, Model RY5116D**



Note: 1. --- denotes the insulated areas.
 2. Provide the power supply for output with an overcurrent protection device such as a fuse.

Figure 11. Wiring (RRD module)

● **DO + DI module** **Model RY5116R**

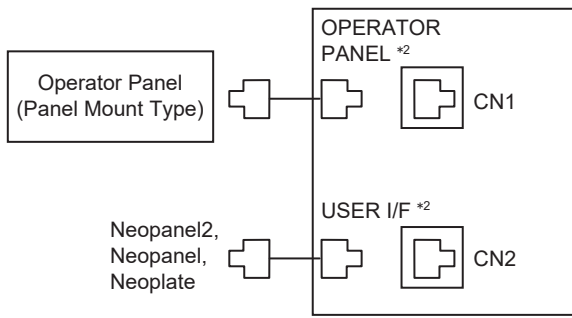


Note: 1. --- denotes the insulated areas.
 2. COM terminals of other DO + DI modules cannot be used.
 3. Provide the power supply for output with an overcurrent protection device such as a fuse.

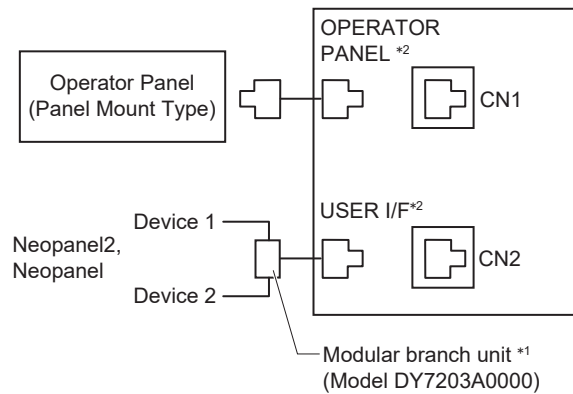
Figure 12. Wiring (DO + DI module)

● **Setting-Device connection module** **Model RY5101U**

Connecting 1 device



Connecting 2 devices



*1 When connecting 2 devices, use the modular branch unit to connect them.

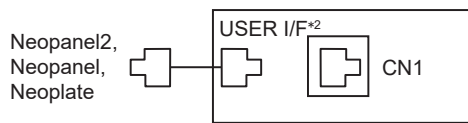
*2 Use the following connector. Plug: SS-37000-002 (manufactured by Bel Stewart Connector)
Azbil Corporation provides the same plugs as construction parts. (Model DY7207A0100, 100 pieces)
Use the following LAN cable. Conforms to EIA/TIA-568 category 5e or higher, φ 0.5 x 4 P

Note: LAN cables with connectors, Model DY7210 (cable with connectors) and Model DY7220 (short cable with connectors), are also available as the construction parts.

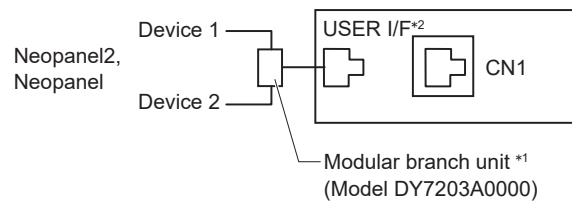
Figure 13. Wiring (SD module)

● **Operator panel (integral type) module** **Model RY5101Q**

Connecting 1 device



Connecting 2 devices



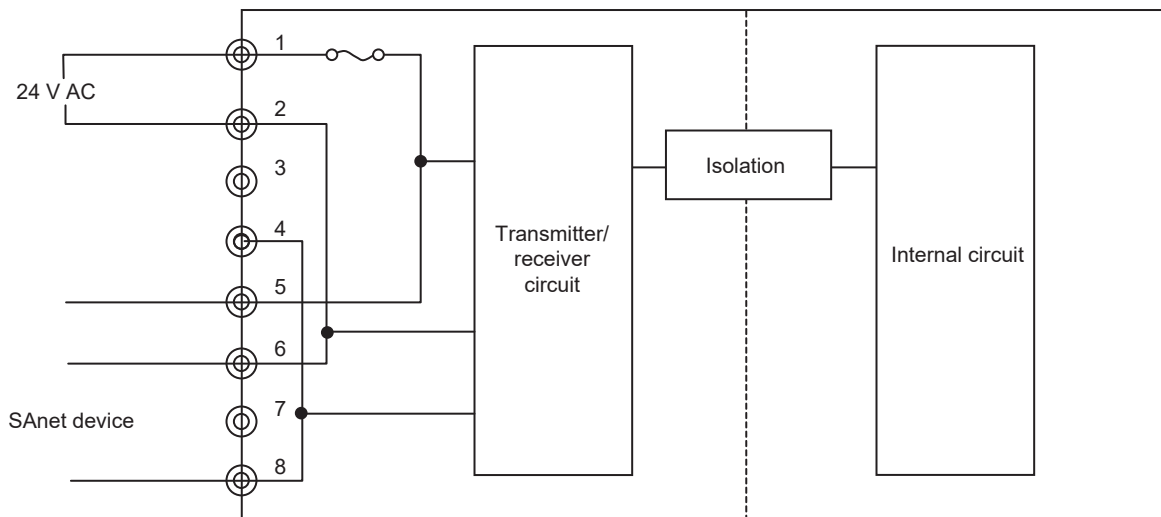
*1 When connecting 2 devices, use the modular branch unit to connect them.

*2 Use the following connector. Plug: SS-37000-002 (manufactured by Bel Stewart Connector)
Azbil Corporation provides the same plugs as construction parts. (Model DY7207A0100, 100 pieces)
Use the following LAN cable. Conforms to EIA/TIA-568 category 5e or higher, φ 0.5 x 4 P

Note: LAN cables with connectors, Model DY7210 (cable with connectors) and Model DY7220 (short cable with connectors), are also available as the construction parts.

Figure 14. Wiring (OP module)

● **SAnet I/F Module**



Note: For details, refer to AB-6713, *Intelligent Component Series for SAnet Communication Installation Manual*.

Figure 15. Wiring (SAnet I/F Module)

■ Notes for Configuring Direct Mount I/O Modules

● Current limitations

Up to 16 Direct Mount I/O Modules can be connected to the General Controller.

In addition to the above limitation, there are limitations imposed by the capacity of the power that is supplied by the basic unit to the Direct Mount I/O Modules.

Note: For the SAnet communication line, a separate isolation transformer (24 V AC) is required.

(1) Current to be supplied by the basic unit

5 V DC and 24 V DC are supplied by the basic unit to the Direct Mount I/O Modules (5 V DC and 24 V DC are isolated from each other).

The following table shows the capacity and usages of 5 V DC and 24 V DC power.

Power supply	Maximum suppliable current*	Maximum suppliable power*	Use of supplied power
5 V DC	1650 mA	15.5 W	I/O operation, driving relays
24 V DC	625 mA		I/O operation, DI circuit

* Indicates the maximum current / suppliable power to the Direct Mount I/O Modules and SAnet I/F Modules.

Requirement: The current of each power supply system must not exceed the maximum suppliable current.

Requirement: Total power capacity for both 5 V DC and 24 V DC must not exceed the maximum suppliable power.

(E.g. 1) When supplying 1650 mA for 5 V DC power, up to 302 mA for 24 V DC power can be supplied.

(E.g. 2) When supplying 0 mA for 5 V DC power, up to 625 mA for 24 V DC power can be supplied.

(E.g. 3) When supplying 1000 mA for 5 V DC power, up to 437 mA for 24 V DC power can be supplied.

(2) Rules for calculating the total consumption current of Direct Mount I/O Modules

The number of Direct Mount I/O Modules that can be connected is determined by the total consumption current calculated from the basic capacities and additional capacities. If the output of the Direct Mount I/O Modules cannot be specified, the number of modules to be connected is determined by the value calculated from the maximum consumption current.

Basic capacities:

Consumed current necessary to operate the module. Basic capacities are the value of the consumed current under the following conditions.

- DO, DO+DI, and DOC modules:
Current when all the outputs are OFF
- AO module:
Current when all of the outputs are voltage output
- Other modules:
No conditions

Additional capacities:

Consumed current determined for each use. DO, DO + DI, DOC, and AO modules have additional capacity.

(1) Basic capacities

	Number of points	Power supply (mA)	
		5 V DC	24 V DC
DI module	8	20	40
	16	20	80
DO module*	8/16	20	0
DOC module*	8	20	0
DO + DI module*	16	20	40
TOT module	4	20	20
	16	20	80
R RD module	4	20	0
MM module	1	70	0
	3	150	0
AO module*	2/4	40	80
AI module	4	20	20
Pt module	4	20	20
AI + Pt module	4	20	20
SD module	–	20	40
OP module	–	30	60
SAnet I/F module	1	30	0

* Add the additional capacity to the basic capacity for the modules according to the application.

(2) Additional capacities

DO, DO + DI, and DOC modules

Maintain output	DO module: Add [5 V, 30 mA] per output to the basic capacity.
	DO + DI module: Add [5 V, 30 mA] per output to the basic capacity.
	DO module: Add [5 V, 50 mA] per output to the basic capacity.
Momentary output	Add [5 V, 100 mA] in total for basic unit. (Additional capacity of the momentary output is not related to the number of outputs.)

AO module

Current per output	DO module: Add [24 V, 25 mA] per output to the basic capacity.
--------------------	--

(3) Max. consumption current of each module

	Number of points	Power supply (mA)	
		5 V DC	24 V DC
DI module	8	20	40
	16	20	80
DO module	8	260	0
	16	500	0
DOC module	8	420	0
DO + DI module	16	260	40
TOT module	4	20	20
	16	20	80
RRD module	4	20	0
MM module	1	70	0
	3	150	0
AO module	2	40	130
	4	40	180
AI module	4	20	20
Pt module	4	20	20
AI + Pt module	4	20	20
SD module	–	20	40
OP module	–	30	60
SAnet I/F module	1	30	0

(4) Calculation examples

1. Calculate points for each input/output type

Contact outputs	8 (momentary x 6, maintain x 2)
Contact inputs	8
Pt100	3
AI (1–5 V)	3 (voltage input)
AO	3 (voltage output x 1, current output x 2)

2. Choose the Direct Mount I/O Modules to be connected

DO + DI module	1
Pt module	1
AI module	1
AO module with 4 outputs	1

3. Calculate the power supply capacity

		Power supply (mA)	
		5 V DC	24 V DC
Basic capacity	DO + DI module	20	40
	Pt module	20	20
	AI module	20	20
	AO module with 4 output points	40	80
Additional capacity	DO + DI module (maintain)	30 x 2	0
	DO + DI module (momentary)	100	0
	AO (current output)	0	25 x 2
Total		260	210
Power consumption	Total 6.34 W	1.30 W	5.04 W

(Unit: mA)

In this example, the specified values for both the output capacity of each power supply (5 V DC: 1650 mA, 24 V DC: 625 mA) and consumption power (total: 15.5 W) are within the limits. Therefore, all the modules can be used.

If the output type cannot be specified, since the total consumption power is calculated by the maximum consumption current of each module, the total consumption current and power are given as follows.

		Power supply (mA)	
		5 V DC	24 V DC
Max. consumption current	DO + DI module	260	40
	Pt module	20	20
	AI module	20	20
	AO module	40	180
Total		340	260
Power consumption	Total 7.94 W	1.70 W	6.24 W

● **Restrictions for connecting Setting-Device connection module**

One Setting-Device connection module or one Operator Panel module can be connected to one General Controller. The module has two connectors for OPERATER PANEL and USER I/F. The configuration of devices that can be connected to the module is shown below. The Operator Panel (Panel Mount Type) can be connected regardless of the configuration of devices that are connected to USER I/F.

Table 2. Configuration for connecting Setting-Device connection module

Config.	USER I/F			OPERATER PANEL
	Neopanel2/ Neopanel ad.1	Neopanel2/ Neopanel ad.2	Neoplate	Operator Panel (Panel Mount Type)
1	Yes			Yes
2	Yes	Yes		Yes
5			Yes	Yes

When connecting 2 devices to USER I/F, use the modular branch unit to connect them.

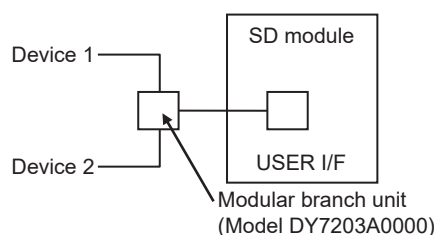


Figure 16.

● **Restrictions for connecting Operator Panel (Integral Type) module**

One Setting-Device connection module or one Operator Panel module can be connected to one General Controller. Operator Panel (Integral Type) module a USER I/F connector. The configuration of devices that can be connected to the module is shown below.

Table 3. Configuration for connecting Operator Panel (Integral Type) module

Config.	USER I/F		
	Neopanel2/ Neopanel ad.1	Neopanel2/ Neopanel ad.2	Neoplate
1	Yes		
2	Yes	Yes	
5			Yes

● **Restrictions on SAnet I/F Module connections**

Up to two SAnet I/F Modules can be connected to one General Controller.

■ **Notes for Connecting Direct Mount I/O Modules**

● **Module connection order**

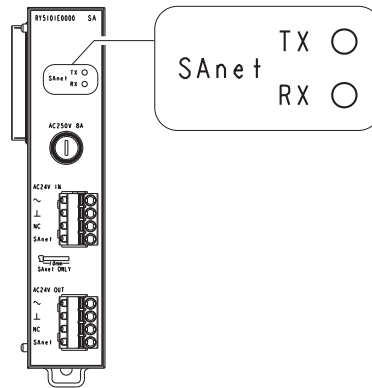
Power is supplied to the Direct Mount I/O Modules from the basic unit via the connector. In order to reduce the voltage drop, it is recommended to connect modules that have a larger consumption current to a slot close to the basic unit.

Connect the modules in the order described below.

Basic unit → DO modules (DO, DO + DI, DOC) → MM module → Other modules

■ Indicators

● Communication status LEDs




Item	Indicator	Color	State	Description
Communication status	SAnet TX	Green	Not lit	No data, Idling
			Flashing	Sending or receiving data
	SAnet RX	Green	Not lit	No data, Idling
			Flashing	Sending or receiving data

Maintenance

For replacement of the fuse and battery, please contact Azbil Corporation.

Fuse replacement

⚠ WARNING
 <p>Before doing maintenance, be sure to turn off the power to this product. Failure to do so may result in electric shock or device failure.</p>

IMPORTANT: •Fuses must be replaced only by Azbil service staff.

The SAnet I/F Module has a fuse.
If this fuse blows, it needs to be replaced by Azbil service staff according to the following procedure.

- (1) Turn off the 24 V AC power fed to the SAnet I/F Module for SAnet communication.
- (2) Hold the fuse holder in the front surface of the SAnet I/F Module, and push it while turning it 90° counterclockwise.

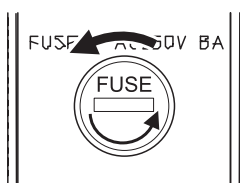


Figure 17. Fuse holder

- (3) Remove the fuse from the fuse holder and replace it with a new one.

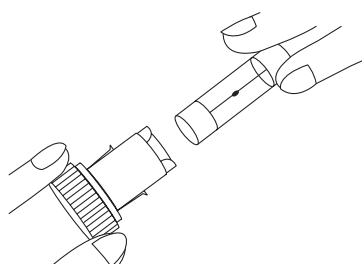


Figure 18. Fuse replacement

- (4) Align one of the tabs of the fuse holder and the opening of the mounting hole of the SAnet I/F Module, and insert the fuse holder.

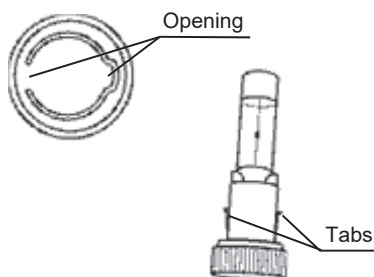


Figure 19. Fuse holder attachment

- (5) Hold the fuse holder and push it while turning it 90° clockwise.

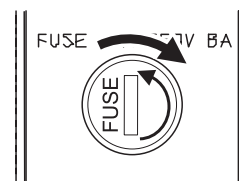


Figure 20. Attaching the fuse holder

- (6) Turn on the 24 V AC power fed to the SAnet I/F Module for SAnet communication.

Disposal

Dispose of this product as industrial waste in accordance with your local regulations.
Do not reuse all or any part of this product.

■ For CE-Marked Products

Install this product in a panel cabinet.

This product complies with the following harmonised standards of the Electromagnetic Compatibility Directive (EMCD).

EMCD: EN 61326-1 Class A, Table 2 (for use in an industrial electromagnetic environment)

■ For UL-Marked Products

Install this product in a panel cabinet.

- PAZX ENERGY MANAGEMENT EQUIPMENT
- E492866
- UL 60730-1
- Pollution degree 2
- OVERVOLTAGE CATEGORY I
- Rated impulse voltage 330V
- IP20
- TYPE 1 ACTION
- CLASS III CONTROL
- Class 2 power source



The model number of the UL-certified product is RY51_____U.

UL-certified product is not available for model RY5101E0000.

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Azbil Corporation
Building Systems Company

The azbil logo features the word 'azbil' in a bold, lowercase, italicized sans-serif font.

<https://www.azbil.com/>

Specifications are subject to change without notice.

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Rev. 7.0, May. 2024
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