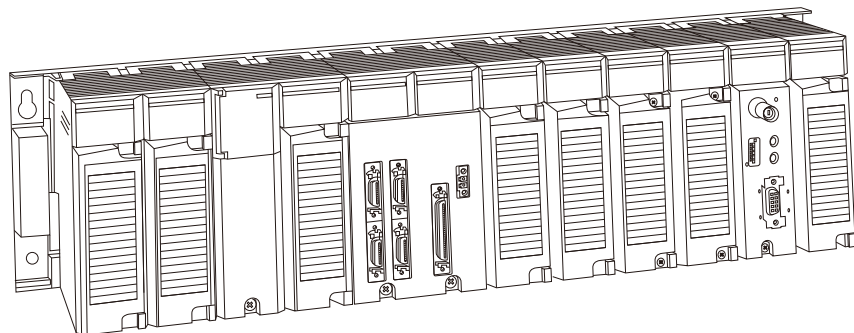


MEMOCON GL120, GL130

120-SERIES I/O MODULES USER'S MANUAL



Manual Contents

This manual describes specifications, connections, and precautions for 120-series I/O Modules. The 120-series I/O Modules are used with the MEMOCON GL120, GL130 Programmable Controllers (PLCs).

Read this manual carefully and be sure to understand the information provided before attempting to install or use 120-series I/O Modules.

Also, keep this manual in a safe place so that it can be used whenever necessary.

Visual Aids

The following aids are used to indicate certain types of information for easier reference.



Indicates references for additional information.



Indicates important information that should be memorized.



Indicates application examples.



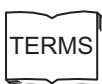
Indicates supplemental information.



Indicates a summary of the important points of explanations.

Note

Indicates inputs, operations, and other information required for correct operation but that will not cause damage to the device.



Indicates definitions of terms used in the manual.

Notice

The following conventions are used to indicate precautions in this manual. Failure to heed precautions provided in this manual can result in injury to people or damage to the products.



Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.



Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

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Introduction and Precautions

1

This chapter introduces the features of 120-series I/O Modules and provides precautions for the use of this manual and the product.

Read this chapter before attempting to read the rest of the manual or use the product.

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1.1 Overview of Manual

- This manual describes the functional specifications of the 120-series I/O Modules used for the MEMOCON GL120 and GL130 Programmable Controllers. Read this manual carefully in order to use the 120-series I/O Modules properly. Also, keep this manual in a safe place so that it can be used whenever necessary.
- Refer to the following manuals for related Peripheral Devices and Modules.

Product	Manual Name	Manual No.	Contents
CPU Module	MEMOCON GL120, GL130 Hardware User's Manual	SIEZ-C825-20.1	Gives information on the GL120 and GL130 hardware, including explanations on the following items. <ol style="list-style-type: none"> 1) System configuration 2) System components 3) Function and specifications of system components 4) Installation and wiring 5) Examples of panel-layout and hole dimensions 6) External Dimensions
	MEMOCON GL120, GL130 Software User's Manual Vol. 1	SIEZ-C825-20.11	Describes the following items for the GL120 and GL130. <ol style="list-style-type: none"> 1) Operating principles 2) I/O allocation 3) Overview of instructions 4) Instruction processing times
	MEMOCON GL120, GL130 Software User's Manual Vol.2	SIEZ-C825-20.12	Describes the programming instructions used to create ladder programs for the GL120 and GL130. The following items are explained in other manuals. <ol style="list-style-type: none"> 1) Expansion Math instructions 2) Process control instructions 3) Communications instructions 4) Motions control instructions (ladder motion instructions) 5) Motion language
Human-Machine Interface	MEMOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual	SIEZ-C825-60.7	Describes the functions, specifications, and operational methods of the Programming Panel P120 with built-in MEMOSOFT.
	MEMOCON GL120, GL130 MEMOSOFT User's Manual	SIEZ-C825-60.10	Describes the functions and operational methods of MEMOSOFT for DOS.
	MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual	SIEZ-C825-60.25	Describes the functions and operational methods of MEMOSOFT for Windows.

- Thoroughly check the specifications and conditions or restrictions of the product before use.

1.2 Precautions

This section outlines general precautions that apply to using this manual and the product. Read this section first before reading the remainder of the manual.

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1.2.1 Safety Precautions

- The GL120 and GL130 were not designed or manufactured for use in devices or systems directly related to human life. Users who intend to use the product described in this manual for special purposes such as devices or systems relating to transportation, medical, space aviation, atomic power control, or underwater use must contact Yaskawa Electric Corporation beforehand.
- This product has been manufactured under strict quality control guidelines. However, if this product is to be installed in any location in which a failure of GL120 and GL130 involves a life and death situation or in a facility where failure may cause a serious accident, safety devices **MUST** be installed to minimize the likelihood of any accident.
- Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products to which this manual is applicable.
- The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual. A new version of the manual will be released under a revised manual number when any changes are made.
- Contact your Yaskawa representative or a Yaskawa office listed on the back of this manual to order a new manual whenever this manual is damaged or lost. Please provide the manual number listed on the front cover or this manual when ordering.
- Contact your Yaskawa representative or a Yaskawa office listed on the back of this manual to order new nameplates whenever a nameplate becomes worn or damaged.
- Yaskawa cannot guarantee the quality of any products that have been modified. Yaskawa assumes no responsibility for any injury or damage caused by a modified product.

1.2.2 Installation Precautions

Abide by the following precautions when installing MEMOCON systems.

CAUTION

- The installation environment must meet the environmental conditions given in product catalogs and manuals. Using the GL120 and GL130 in environments subject to high temperatures, high humidity, excessive dust, corrosive gases, vibration, or shock can lead to electrical shock, fire, or faulty operation. Do not use the GL120 and GL130 in the following locations.

- Locations subject to direct sunlight or ambient temperatures not between 0 °C and 60 °C.
- Locations subject to relative humidity in excess of 95%, or condensation because of rapid changes in humidity.
- Locations subject to corrosive or flammable gas.
- Locations that would subject the GL120 and GL130 to direct vibration or shock.
- Locations subject to contact with water, oil, chemicals, and so on.

CAUTION

- Install Modules as described in the user's manuals.

Faulty or inappropriate installation may result in detachment or malfunction.

CAUTION

- Do not remove the connector covers from the Module connectors on the Mounting Base slots where no Modules are installed.

The presence of any foreign matter in a Module connector may cause the GL120 and GL130 to malfunction.

CAUTION

- Make sure that all mounting screws for the Modules are securely tightened.

Loose screws may cause malfunction of the GL120 and GL130.

CAUTION

- Make sure that all mounting screws for the terminal block are securely tightened.

Loose screws may cause a malfunction of the GL120 and GL130.

CAUTION

- When installing the terminal block for the AC I/O Modules, turn OFF the AC power supply to the I/O Modules for inputting signals and for driving load.

Installing a terminal block with the AC power being supplied to the terminal of the external power supply for the AC I/O Modules may cause an electric shock if the power supply terminals are touched.

CAUTION

- When using a single-phase AC power supply (100/200 VAC) for driving loads of the Relay Contact Output Module, turn OFF the AC power to the Modules for driving loads before installing the terminal block for the Modules.


Installing a terminal block with the AC power being supplied to the external power supply terminal of the Relay Contact Output Module may cause an electric shock if the power supply terminals are touched.

CAUTION


- Make sure that all cable connectors for the Module are securely inserted and tightened.

Incorrect connections may cause malfunction of the GL120 or GL130.


1.2.3 Removal Precautions

-  CAUTION • Always turn OFF the AC power supply to the AC I/O Modules that are used for inputting signals and driving loads before removing the terminal block from the AC I/O Modules.


Removing a terminal block with AC power to the external power supply terminal of the AC I/O Modules may cause an electric shock at touching the power supply terminals.

-  CAUTION • When using a single-phase AC power supply (100/200 VAC) for driving loads of the Relay Contact Output Module, turn OFF the AC power to the Modules for driving loads before removing the terminal block for the Modules.

Removing a terminal block with the AC power being supplied to the external power supply terminal of the Relay Contact Output Module may cause an electric shock if the power supply terminals are touched.








-  CAUTION • When inserting or removing an AC I/O Module while the AC power supply is turned ON, install a safety switch for each Module and always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing an AC I/O Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

-  CAUTION • When using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, install a safety switch for each Module. Before inserting or removing the Relay Contact Output Module, always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing a Relay Contact Output Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

1.2.4 Wiring Precautions

-  **CAUTION** • Wiring must be performed by qualified personnel.
- Wrong or inappropriate wiring may result in fire, product failure, or electric shock.
-  **CAUTION** • Connect the correct power supply for the required ratings.
- Connecting unsuitable power supplies may result in fires.
-  **CAUTION** • Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.
- Foreign matter in the Modules or Mounting Bases may cause fire, failures and/or malfunctions.
-  **CAUTION** • Connect power supplies of the same phases to the common 1 and common 2 of the AC I/O Module.
- If power supplies of different phases are connected, overheating or fire may occur.
-  **CAUTION** • If using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, connect power supplies with the same phases to the common 1 and common 2 of the Module.
- If power supplies of different phases are connected, overheating or fire may occur.
-  **CAUTION** • If using an Output Module, connect a fuse that complies with the load specifications in series with the load.
- A protective fuse is not built into the following Output Modules. If a fuse is not connected, a fire or damage to the device or output circuits may occur if the load is short-circuited or the circuit overloaded.
- 100/200-VAC 8-point Output Module: Model No. JAMSC-120DAO083000
 - Relay contact 16-point Output Module: Model No. JAMSC-120DRA84300
-  **CAUTION** • If using an Output Module, connect a fuse that complies with the load specifications in series with the load.
- A protective fuse built into the following Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the device or output circuits may occur if the load is short-circuited or the circuit overloaded.
- 100/200-VAC 16-point Output Module: Model No. JAMSC-120DAO84300
 - 12/24-VDC 8-point Output Module: Model No. JAMSC-120DDO33000
 - 12/24-VDC 16-point Output Module: Model No. JAMSC-120DAO34310
 - 12/24-VDC 16-point Output Module: Model No. JAMSC-120DAO34320
 - 12/24-VDC 32-point Output Module: Model No. JAMSC-120DAO35410
 - 12/24-VDC 64-point Output Module: Model No. JAMSC-120DAO36410

 CAUTION

- Connect an AC power supply (100/200 VAC) or a DC power supply (12/24 VDC) to the Power Supply for driving loads of the Relay Contact Output Module.

Do not connect both an AC power supply and a DC power supply to one Module at the same time. If unsuitable power supplies are connected, in overheating or fire may result.

 CAUTION

- Although a 0.6-A load can be connected to each output point for the AC 16-point Output Module, the total load must be 2.4A or less for each common. Keep the maximum load at 2.4A for each common.

If this limit is exceeded, damage may occur to the output circuit.

 CAUTION

- Although a 0.5-A load can be connected to each output point for the DC 16-point Output Module, the total load must be 1.0 A or less for each of the four output points. Keep the load distribution within the 1.0 A limit.

If this limit is exceeded, damage may occur to the output circuit.

 CAUTION

- Although a 0.3-A load can be connected to each output point of the DC 32-point Output Module, the total load must be 0.4 A or less for each of the four output points. Keep the load distribution within the 0.4 A limit.

If this limit is exceeded, damage may occur to the output circuit.

 CAUTION

- If using an Output Module, connect a fuse that complies with the load specifications in series with the load.

- 100/200-VAC 8-point Output Module: Model No. JAMSC-120DAO83000
- 100/200-VAC 16-point Output Module: Model No. JAMSC-120DAO84300
- 12/24-VDC 16-point Output Module (sinking output):
Model No. JAMSC-120DDO33000
- 12/24-VDC 16-point Output Module (sourcing output):
Model No. JAMSC-120DAO34320
- 12/24-VDC 32-point Output Module (sinking output):
Model No. JAMSC-120DAO35410
- 12/24 VDC 64-point Output Module (sinking output):
Model No. JAMSC-120DAO36410
- Relay Contact 16-point Output Module: Model No. JAMSC-120DAO84300

If a fuse is not connected, a fire or damage to the device or output circuit may occur if the load is short-circuited or the circuit overloaded.

 CAUTION

- If connecting an inductive load in parallel with AC Input Module, connect the surge absorber in parallel with the inductive load to prevent surge voltage.

Failure to connect a surge absorber may result in damage to the AC Input Module.

 CAUTION

- If connecting an inductive load to the AC Output Module, connect the surge absorber in parallel with the inductive load to prevent surge voltage.

Failure to connect a surge absorber may result in damage to the AC Output Module.

 CAUTION

- If connecting an inductive load in parallel with DC Input Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Input Module.

 CAUTION

- If connecting an inductive load to the DC Output Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Output Module.

 CAUTION

- If connecting a contact to an inductive load of the DC Output Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Output Module.

 CAUTION

- Insulation is not provided between the channels of the Analog Input Module. To insulate all the analog signals connected to the Analog Input Module, use a commercial isolation amplifier for each channel.

Incorrect connections may cause damages and malfunctions of the Analog Input Modules.

 CAUTION

- The maximum allowable load current for Analog Output Modules ($\pm 10\text{V}$, 2 channels) is $\pm 5\text{ mA}$ ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

 CAUTION

- The maximum allowable load current for Analog Output Modules (0 to 10V , 2 channels) is 5 mA ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

 CAUTION

- The maximum allowable load current for Analog Output Modules (0 to 5V , 2 channels) is 2.5 mA ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

 CAUTION

- The maximum allowable load resistance for Analog Output Modules (4 mA to 20 mA , 2 channels) is $550\text{ k}\Omega$. The load resistance must be $550\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

 CAUTION

- If using Low Voltage Directive compliant products, always use round crimp terminals for M3 screws and mount insulation cover at each crimp when connecting wires to wiring terminals.

If bare wires are used, an electric shock or a short-circuit may result if the wires become loose.

 CAUTION

- Ground the shield of the shielded twisted-pair wire that connects to the Analog I/O Module to one point (a resistance of 100 Ω max.).

Not grounding the shield of the shielded twisted-pair wire may result in malfunction of the GL120 and GL130.

 CAUTION

- Ground the ground terminal of the Analog Input Module to a resistance of 100 Ω max.

Not grounding the ground terminal may result in malfunction of the GL120 and GL130.

1

Power Supply Noise Reduction

- Prevent noise from penetrating into the product by installing an isolation transformer or a noise filter for the external power supply.

Noise from power supply may result in malfunction of the GL120 and GL130.

- Do not install the GL120 and GL130 system components in the same control panel as high-voltage or high-current circuits.

Here, high-voltage circuits are those with voltages of 600 VAC or 750 VDC min. and high-current circuits are those with amperages of 800 A min.

- When installing the GL120 and GL130 system components in the same control panel as low-voltage main circuits, separate the low-voltage circuits and related devices as far as possible from the GL120 and GL130 system components and wiring.

The recommended separation is 200 mm min. Here, low-voltage main circuits are those with voltages up to 600 VAC or 750 VDC and amperages of 20 A min.

- Do not bundle GL120 and GL130 wiring together with wiring for normal control circuits.

Here, normal control circuits are those with voltages up to 600 VAC or 750 VDC and amperages up to 20 A.

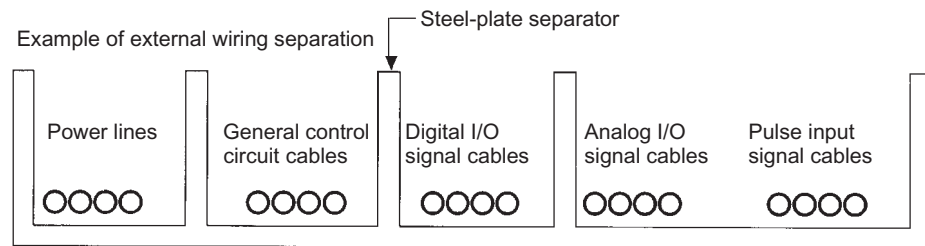
Insert the Interface Cables Properly

- Insert the connectors of the various interface cables that are to be connected to the GL120 and GL130 into the communication ports and secure them properly.

Improper insertion of interface cables may cause operational errors in the GL120 and GL130.

Select, Separate, and Lay External Wiring Correctly

- I/O lines connecting external devices to the 120-series I/O Modules must be selected based on the following considerations: mechanical strength, resistance to noise, wiring distance, signal voltage, and so on.
- I/O lines must be separated from power lines both inside and outside the control panel to minimize the affects of noise. Faulty operation may result if I/O lines are not sufficiently separated from power lines.



1.2.5 Application Precautions

⚠ WARNING • Do not touch the Module terminals while the power is ON.

Touching live terminals may cause electric shock.

⚠ WARNING • Construct an emergency stop circuit and an interlock circuit outside of the GL120 and GL130.

The absence of emergency stop and interlock circuits may result in machine damage or accidents should the GL120 or GL130 fail.

1

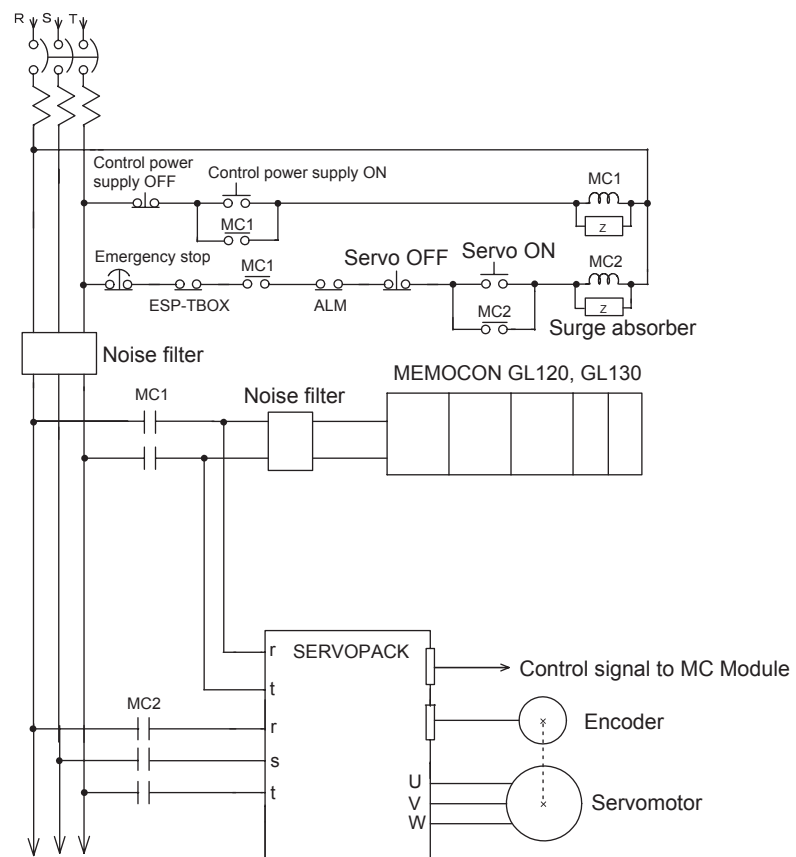
Install an Emergency Stop Circuit Outside the GL120 and GL130.

⚠ WARNING

An emergency stop circuit for the control system should not be constructed using the ladder programming in the GL120 and GL130. Always construct the emergency stop circuit externally using a relay circuit, as shown in the figure below.

Use an N.C. contact (mechanical contact) in the emergency stop switch. The main power supply to the servo must be cut off by pressing the switch.

Failure to provide an emergency stop circuit as described above, may result in failure of the emergency stop when input circuits fail or cables break, and may cause machine damage or injury.



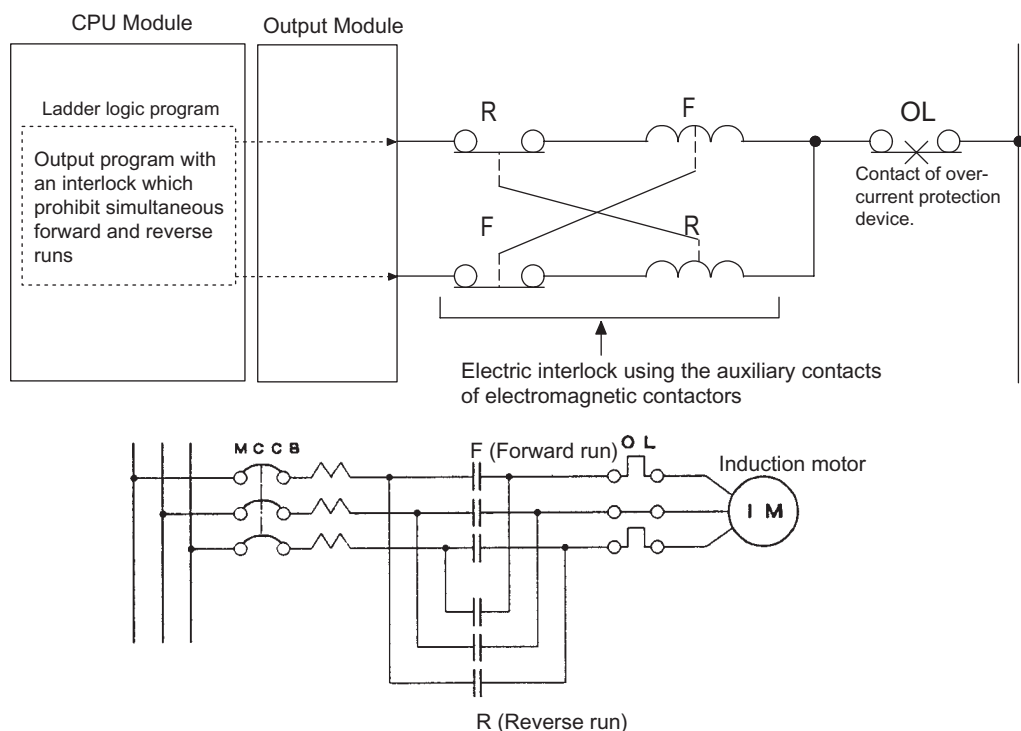
External Interlocks for the GL120 and GL130

⚠ WARNING

Externally connect an interlock to the GL120 and GL130 if there is any chance that GL120 and GL130 failure could result in bodily harm or equipment damage.

Always use an external interlock system as shown in the following example when reciprocal operations (e.g., forward and reverse directions) are being performed with a motor.

An interlock is generally programmed in the GL120 and GL130 ladder program to ensure that forward and reverse signals are not simultaneously output. An external interlock circuit must also be provided using the auxiliary contacts of electromagnetic contactors.



⚠ CAUTION

- When inserting or removing an AC I/O Module while the AC power supply is turned ON, install a safety switch for each Module and always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing an AC I/O Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

⚠ CAUTION

- When using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, install a safety switch for each Module. Before inserting or removing the Relay Contact Output Module, always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing a Relay Contact Output Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

**CAUTION**







- The following CPU Modules, Remote I/O Receiver Modules, and MEMOSOFT versions are required to use DC 64-point I/O Modules.

Using a version that is not recommended may result in failure or malfunction.

Name	Model Name	Model No.	Version Number	Location of Version Number
CPU Module (8 kW)	CPU10	DDSCR-120CPU14200	□□A01 and later	Module nameplate
CPU Module (16 kW)	CPU20	DDSCR-120CPU34100	□□B05 and later	Module nameplate
CPU Module (16 kW)	CPU21	DDSCR-120CPU34110	□□A01 and later	Module nameplate
CPU Module (32 kW)	CPU30	DDSCR-120CPU54100	□□B05 and later	Module nameplate
CPU Module (40 kW)	CPU35	DDSCR-120CPU154110	□□A01 and later	Module nameplate
Remote I/O Receiver Module	RIOR-COAX	JAMSC-120CRR13100	□□A10 and later	Module nameplate
MEMOSOFT		FMSG-L-AT3 (for English DOS)	1.21□ and later	In the middle at the bottom of the MEMOSOFT startup screen.
		FMSG-L-PP3E (for P120 English version)		

* The nameplate is on the right side of the Module.

1.2.6 Maintenance

-  **CAUTION** • Do not disassemble or modify Modules and Mounting Bases.
- Failure to observe this caution may result in fire, product failure, or malfunction.
-  **CAUTION** • Do not replace the built-in fuses of the AC 16-point Output Modules.
- If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the AC 16-point Output Modules, and the guarantee is void.
-  **CAUTION** • Do not replace the built-in fuses of the DC 8-point Output Modules.
- If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 8-point Output Modules, and the guarantee is void.
-  **CAUTION** • Do not replace the built-in fuses of the DC 32-point Output Modules.
- If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 32-point Output Modules, and the guarantee is void.
-  **CAUTION** • Do not replace the built-in fuses of the DC 64-point Output Modules.
- If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 64-point Output Modules, and the guarantee is void.
-  **CAUTION** • Do not replace the built-in fuses of the Register I/O Modules.
- If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the Register I/O Modules, and the guarantee is void.

1.3 Using This Manual

This manual is written for those who already have a basic knowledge of MEMOCON PLCs. We recommended reading the *MEMOCON GL120, GL130 Hardware User's Manual* (manual No. *SIEZ-C825-20.1*) before attempting to read this manual.

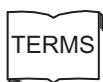
• Meaning of Basic Terms

In this manual, the following terms indicate the meanings as described below, unless otherwise specified.

Terms		Meaning	Remarks
PLC		Programmable (Logic) Controller	Does not mean "personal computer."
PP		Programming Panel	–
GL120, GL130		MEMOCON GL120 and MEMOCON GL130 Programmable Controllers	–
AC I/O Module	AC input Module	100-VAC 16-point Input Module 200-VAC 16-point Input Module	–
	AC output Module	100/200-VAC 8-point Output Module 100/200-VAC 16-point Output Module Relay Contact 16-point Output Module* ¹	* ¹ When the AC load is applied.
DC I/O Module	DC input Module	12/24-VDC 16-point Input Module 12/24-VDC 32-point Input Module 12/24-VDC 64-point Input Module	–
	DC output Module	12/24-VDC 8-point Output Module 12/24-VDC 16-point Output Module 12/24-VDC 32-point Output Module 12/24-VDC 64-point Output Module Relay contact 16-point Output Module* ²	* ² When the DC load is applied.
Analog I/O Module	Analog input Module	Analog Input Module ($\pm 10V$, 4CH) Analog Input Module (0 to 10V, 4CH) Analog Input Module (4 to 20mA, 4CH)	–
	Analog output Module	Analog Output Module ($\pm 10V$, 2CH) Analog Output Module (0 to 10V, 2CH) Analog Output Module (0 to 5V, 2CH) Analog Output Module (4 to 20mA, 2CH)	–
Register I/O Module		Register Input Module	–
		Register Output Module	

• Description of Technical Terms

The bold technical terms in this manual are briefly explained in the **Glossary** provided at the bottom of the page. An example is shown below.



Glossary

The following types of terms are described.

- Specific sequence control terms required for explanation of functions.
- Terms that are specific to programmable controllers and electronic devices.

Models and General Specifications of I/O Modules

2

This chapter describes the models and general specifications of I/O Modules.

2.1	General Specifications	-----	2-2
2.2	I/O Modules	-----	2-3
2.2.1	Models of I/O Modules	-----	2-3
2.2.2	Overview of I/O Module Specifications	-----	2-5
2.2.3	Using I/O Modules	-----	2-10

2.1 General Specifications

This section gives the general specifications of I/O Modules.

Table 2.1 General Specifications

	Item	Specification
Environmental Conditions	Ambient Operating Temperature	0 °C to 60 °C
	Ambient Storage Temperature	-25 C° to 85 °C (excluding battery)
	Ambient Operating Humidity	30 % to 95 % RH (with no condensation)
	Ambient Storage Humidity	5 % to 95 % RH (with no condensation)
	Pollution Level	Pollution level 1 (according to JIS B3502)
	Corrosive Gas	No corrosive gas
	Operating Altitude	Less than 2,000 m above sea level
Mechanical Operating Conditions	Vibration Shock	10 to 57 Hz with half-amplitude of 0.075mm 57 to 150 Hz with fixed acceleration of 9.8 m/s ² 10 sweep times each in X, Y, and Z directions (sweep time: 1 octave/min) (according to JIS B3502)
	Shock Resistance	Peak acceleration of 147 m/s ² twice for 11 ms in X, Y, and Z directions (according to JIS B3502)
Electrical Operating Conditions	Noise Resistance	1,500 V in either normal or common mode with pulse widths of 100 ns and 1 μs and rise time of 1 ns (with impulse noise simulator) (according to JIS B3502)
Installation Requirements	Ground	Ground to 100 Ω or less
	Configuration	Building-block, wall-mounted, or DIN track mounted
	Cooling Method	Natural cooling
	Mass	See specifications for individual I/O Modules.
	External Dimensions	See specifications for individual I/O Modules.

2.2 I/O Modules

This section describes various input modules and output modules.

2.2.1 Models of I/O Modules	-----2-3
2.2.2 Overview of I/O Module Specifications	-----2-5
2.2.3 Using I/O Modules	-----2-10

2.2.1 Models of I/O Modules

Twenty models of I/O Modules are available.

Table 2.2 I/O Modules

Product	Name	Model Name	Model No.	Features	Number of slots required
Digital Input Modules	100-VAC 16-point Input Module	AC100IN-16P	JAMSC-120DAI54300	1) Used to input digital signals. 2) 100VAC, 16 points, 7mA (50Hz)	1
	200-VAC 16-point Input Module	AC200IN-16P	JAMSC-120DAI74300	1) Used to input digital signals. 2) 200VAC, 16 points, 7mA (50Hz)	1
	12/24-VDC 16-point Input Module	DC24IN-16P	JAMSC-120DDI34300	1) Used to input digital signals. 2) 12/24VDC, 16 points, 4mA (12VDC), 8mA (24VDC)	1
	12/24-VDC 32-point Input Module	DC24IN-32P	JAMSC-120DDI35400	1) Used to input digital signals. 2) 12/24VDC, 32 points, 2mA (12VDC), 4mA (24VDC)	1
	12/24-VDC 64-point Input Module	DC24IN-64P	JAMSC-120DDI36400	1) Used to input digital signals. 2) 12/24VDC, 64 points, 2mA (12VDC), 4mA (24VDC)	1
Analog Input Modules	Analog Input Module ($\pm 10V$, 4 channels)	A/D-VOL-4CH	JAMSC-120AVI02000	1) Used to input analog signals. 2) -10 to 10V, 4 channels	1
	Analog Input Module (0 to 10V, 4 channels)	A/D 0-10V 4CH	JAMSC-120AVI02100	1) Used to input analog signals. 2) 0 to 10V, 4 channels	1
	Analog Input Module (4 to 20mA, 4 channels)	A/D-CUR-4CH	JAMSC-120ACI02000	1) Used to input analog signals. 2) 4 to 20mA/1 to 5V, 4 channels	1
Digital Output Modules	100/200-VAC 8-point Output Module	ACOUT-8P	JAMSC-120DAO83000	1) Used to output digital signals. 2) 100/200VAC, 8 points, 1.0 A/point	1
	100/200-VAC 16-point Output Module	ACOUT-16P	JAMSC-120DAO84300	1) Used to output digital signals. 2) 100/200VAC, 16 points, 0.3 A/point	1
	12/24-VDC 8-point Output Module	DC24OUT-8P	JAMSC-120DDO33000	1) Used to output digital signals. 2) 12/24VDC, 8 points, sourcing/sinking outputs, 2.0 A/point	1
	12/24-VDC 16-point Output Module (sinking)	DC24OUT-16PSN	JAMSC-120DDO34310	1) Used to output digital signals. 2) 12/24VDC, 16 points, sinking outputs, 0.5 A/point, 1.0 A/4points	1

Table 2.2 I/O Modules

Product	Name	Model Name	Model No.	Features	Number of slots required
Digital Output Modules	12/24-VDC 16-point Output Module (sourcing)	DC24OUT-16PSR	JAMSC-120DDO34320	1) Used to output digital signals. 2) 12/24VDC, 16 points, sourcing outputs, 0.5 A/point, 1.0 A/4points	1
	12/24-VDC 32-point Output Module (sinking)	DC24OUT-32PSN	JAMSC-120DDO35410	1) Used to output digital signals. 2) 12/24VDC, 32 points, sinking outputs, 0.3 A/point, 0.4 A/4points	1
	12/24-VDC 64-point Output Module (sinking)	DC24OUT-64PSN	JAMSC-120DDO36410	1) Used to output digital signals. 2) 12/24VDC, 64 points, sinking outputs, 0.1 A/point	1
	Relay Contact 16-point Output Module	RELAY-16P	JAMSC-120DRA84300	1) Used to output digital signals. 2) Relay contacts, 16 points, 1.0 A/point	1
Analog Output Modules	Analog Output Module ($\pm 10V$, 2 channels)	D/A-VOL-2CH	JAMSC-120AVO01000	1) Used to output analog signals. 2) -10 to 10V, 2 channels	1
	Analog Output Module (0 to 10V, 2 channels)	D/A 0-10V 2CH	JAMSC-120AVO01100	1) Used to output analog signals. 2) 0 to 10V, 2 channels	1
	Analog Output Module (0 to 5V, 2 channels)	D/A 0-5V 2CH	JAMSC-120AVO01200	1) Used to output analog signals. 2) 0 to 5V, 2 channels	1
	Analog Output Module (4 to 20mA, 2 channels)	D/A-CUR- 2CH	JAMSC-120ACO01000	1) Used to output analog signals. 2) 4 to 20mA, 2 channels	1
Special Purpose Modules	Register Input Module	REGISTER-IN	JAMSC-120RDI34410	1) Used to input a maximum of 8 sets (8 channel) or 16 sets (16 channel) of 16-bit or BCD 4-digit values. 2) The data input cycle can be selected: For 8 channels: 10/32/64/192/320 ms For 16 channels: 20/64/128/384/640 ms	1
	Register Output Module	REGISTER-OUT	JAMSC-120RDO34410	1) Used to output a maximum of 8 sets (8 channel) or 16 sets (16 channel) of 16-bit or BCD 4-digit values. 2) Select the data output cycle. For 8-channel: 32/64/192/320 ms For 16-channel: 64/128/640 ms	1

Note: The 64-point I/O Modules are limited to versions for the CPU Module, remote I/O Receiver Module and MEMOSOFT. Refer to 2.2.3 *Using I/O Modules* for details.

2.2.2 Overview of I/O Module Specifications

1) Digital Input Modules

a) Function

A Digital Input Module converts the digital signals coming from pushbutton switches, limit switches, and digital switches into signals of appropriate voltage for PLC internal processing. The converted digital signals are stored by the CPU Module as input relays and input registers in state memory.

b) Specifications

The following table shows the main specifications of Digital Input Modules.

Table 2.3 Main Specifications of Digital Input Modules

Name	Model Name	Model No.	Rated Voltage	Rated Current	Input Impedance	Input Delay Times	Number of inputs	Internal Current Consumption	Maximum Heating Value	Hot Swapping
100-VAC 16-point Input Module	AC100IN-16P	JAMSC-120DAI54 300	100 VAC	7 mA (50Hz)	14.3 kΩ (50 Hz) 12.5 kΩ (60 Hz)	OFF→ON: Max. 20 ms ON→OFF: Max. 35 ms	16	With all points ON: 90 mA	2.0 W	Permitted
200-VAC 16-point Input Module	AC200IN-16P	JAMSC-120DAI74 300	200 VAC	7 mA (50Hz)	28.6 kΩ (50 Hz) 23.1 kΩ (60 Hz)	OFF→ON: Max. 20 ms ON→OFF: Max. 35 ms	16	With all points ON: 90 mA	3.5 W	Permitted
12/24-VDC 16-point Input Module	DC24IN-16P	JAMSC-120DDI34 300	12/24 VDC	4 mA (12 VDC) 8 mA (24 VDC)	3.0 kΩ	OFF→ON: Max. 5 ms ON→OFF: Max. 5 ms	16	With all points ON: 100 mA	3.7 W	Permitted
12/24-VDC 32-point Input Module	DC24IN-32P	JAMSC-120DDI35 400	12/24 VDC	2 mA (12 VDC) 4 mA (24 VDC)	5.6 kΩ	OFF→ON: Max. 5 ms ON→OFF: Max. 5 ms	32	With all points ON: 80 mA	3.6 W	Permitted
12/24-VDC 64-point Input Module	DC24IN-64P	JAMSC-120DDI36 400	12/24 VDC	2 mA (12 VDC) 4 mA (24 VDC)	5.6 kΩ	OFF→ON: Max. 5 ms ON→OFF: Max. 5 ms	64	With all points ON: 100 mA	7.0 W	Permitted

Other Specifications

- 1) Slots required: 1
- 2) Width: 40.3 mm Height: 130 mm Depth: 103.9 mm
- 3) Approx. mass
 16-point Input Module: 250 g
 32-point Input Module: 250 g
 64-point Input Module: 300 g
- 4) Field connections
 16-point Input Module: terminal block
 32-point Input Module: connector
 64-point Input Module: connector
- 5) Number of points per common
 16-point Input Module: 8 points per common
 32-point Input Module: 16 points per common
 64-point Input Module: 16 points per common

2) Analog Input Modules

a) Function

An Analog Input Module converts the analog signals coming from weight sensors, temperature sensors, etc., into numeric data appropriate for PLC internal processing. The converted numeric data is stored by the CPU Module as the input registers in state memory.

b) Specifications

The following table shows the main specifications of the Analog Input Modules.

Table 2.4 Main Specifications of Analog Input Modules

Name	Model Name	Model No.	Input Signal Range	Overall Accuracy	Resolution and Data Types	Input Impedance	Number of Channels	Internal Current Consumption	Maximum Heating Value	Hot Swapping
Analog Input Module (± 10 V, 4 channels)	A/D-VOL-4CH	JAMSC-120AVI02000	-10 to +10 V	$\pm 0.5\%$ F.S. (25°C) $\pm 1.0\%$ F.S. (0 to 60°C)	0 to 4000 mode: 12 bits, binary between 0 and 4000 ± 2000 mode: 12 bits, 2's complement between -2000 and +2000	1 M Ω min.	4	450 mA	2.3 W	Permitted
Analog Input Module (0 to 10 V, 4 channels)	A/D 0-10V 4CH	JAMSC-120AVI02100	0 to +10 V	$\pm 0.5\%$ F.S. (25°C) $\pm 1.0\%$ F.S. (0 to 60°C)	12 bits, binary between 0 and 4000	1 M Ω min.	4	450 mA	2.3 W	Permitted
Analog Input Module (4 to 20 mA, 4 channels)	A/D-CUR-4CH	JAMSC-120ACI02000	Current input: 4 to 20 mA Voltage input: 1 to 5 V	$\pm 0.5\%$ F.S. (25°C) $\pm 1.0\%$ F.S. (0 to 60°C)	12 bits, binary between 0 and 4000	Current input: 250 Ω voltage input: 1 M Ω min.	4	450 mA	2.3 W	Permitted
Other Specifications										
1) Slots required: 1										
2) Approx. mass: 300 g										
3) Width: 40.3 mm Height: 130 mm Depth: 103.9 mm										
4) Field connections: Terminal block										

3) Digital Output Modules

a) Function

A Digital Output Module converts the numeric data stored in output registers or the ON/OFF state of the output coil in the state memory of the CPU Module into digital signals for control of indicators, electromagnetic switches, relays, solenoid valves, numeric indicators, etc.

b) Specifications

The following table shows the main specifications of Digital Output Modules.

Table 2.5 Main Specifications of Digital Output Modules

Name	Model Name	Model No.	Rated Voltage	Load Current	Remarks	Output Delay Times	Number of Outputs	Internal Current Consumption	Maximum Heating Value	Hot Swapping
100/200-VAC 8-point Output Module	ACOUT -8P	JAMSC- 120DAO83 000	100/ 200 VAC	1.0 A/ point	Unpro- tected outputs	OFF→ON: Max. 5 ms ON→OFF: 1/2 cycle + 5 ms max.	8	With all points ON: 150 mA	9.0 W	Per- mit- ted
100/200-VAC 16-point Output Module	ACOUT -16P	JAMSC- 120DAO84 300	100/ 200 VAC	0.6 A/ point	Unpro- tected outputs	OFF→ON: Max. 5 ms ON→OFF: 1/2 cycle + 5 ms max.	16	With all points ON: 300 mA	5.5 W	Per- mit- ted
12/24-VDC 8-point Output Module	DC24O UT-8P	JAMSC- 120DDO33 000	12/24 VDC	2.0 A/ point	Short-cir- cuit pro- tection Sourcing/ sinking outputs	OFF→ON: Max. 3 ms ON→OFF: Max. 5 ms	8	With all points ON: 220 mA	1.6 W	Per- mit- ted
12/24-VDC 16-point Output Module (sinking)	DC24O UT- 16PSN	JAMSC- 120DDO34 310	12/24 VDC	0.5 A/ point, 1.0 A/ 4 points	Unpro- tected outputs Sinking outputs	OFF→ON: Max. 1 ms ON→OFF: Max. 1 ms	16	With all points ON: 220 mA	7.1 W	Per- mit- ted
12/24-VDC 16-point Output Module (sourcing)	DC24O UT- 16PSR	JAMSC- 120DDO34 320	12/24 VDC	0.5 A/ point, 1.0 A/ 4 points	Unpro- tected outputs Sourcing outputs	OFF→ON: Max. 1 ms ON→OFF: Max. 1 ms	16	With all points ON: 300 mA	7.5 W	Per- mit- ted
12/24-VDC 32-point Output Module (sinking)	DC24O UT- 32PSN	JAMSC- 120DDO35 410	12/24 VDC	0.3 A/ point, 0.4 A/ 4 points	Unpro- tected outputs Sinking outputs	OFF→ON: Max. 1 ms ON→OFF: Max. 1 ms	32	With all points ON: 330 mA	6.5 W	Per- mit- ted
12/24-VDC 64-point Output Module (sinking)	DC24O UT- 64PSN	JAMSC- 120DDO36 410	12/24 VDC	0.1 A/ point	Unpro- tected output Sinking outputs	OFF→ON: Max. 1 ms ON→OFF: Max. 1 ms	64	With all points ON: 650 mA	13.0 W	Per- mit- ted
Relay con- tact 16-point Output Module	RELAY- 16P	JAMSC- 120DRA84 300	Relay contact	1.0 A/ point	Unpro- tected outputs	OFF→ON: Max. 10 ms ON→OFF: Max. 15 ms	16	With all points ON: 610 mA	3.1 W	Per- mit- ted

Table 2.5 Main Specifications of Digital Output Modules

Name	Model Name	Model No.	Rated Voltage	Load Current	Remarks	Output Delay Times	Number of Outputs	Internal Current Consumption	Maximum Heating Value	Hot Swapping
Other Specifications										
1) Slots required: 1 2) Width: 40.3 mm Height: 130 mm Depth: 103.9 mm 3) Approx. mass AC Output Module: 300 g DC Output Module (8-point, 16-point, 32-point): 250 g DC Output Module (64-point): 300 g Relay Contact Output Module: 300 g 4) Field connections 8-point Output Module: terminal block 16-point Output Module: terminal block 32-point Output Module: connector 64-point Output Module: connector Relay Contact Output Module: terminal block 5) Number of points per common 8-point Output Module: Independent outputs 16-point Output Module: 8 points per common 32-point Output Module: 16 points per common 64-point Output Module: 16 points per common Relay Contact Output Module: 8 points per common										

4) Analog Output Module

a) Function

An Analog Output Module converts the numeric data stored in output registers in the state memory of the CPU Module into analog signals for control of heaters, pumps, PID adjusters, inverters, etc.

b) Specifications

The following table shows the main specifications of the Analog Output Modules.

Table 2.6 Main Specifications of Analog Output Modules

Name	Model Name	Model No.	Output Signal Range	Overall Accuracy	Resolution and Data Types	Maximum Permissible Load Current	Number of Channels	Internal Current Consumption	Maximum Heating Value	Hot Swapping
Analog Output Module (± 10 V, 2 channels)	D/A-VOL-2CH	JAMSC-120AVO 01000	-10 to +10 V	$\pm 0.2\%$ F.S. (25 °C) $\pm 0.5\%$ F.S. (0 to 60 °C)	0 to 4000 mode: 12 bits, binary between 0 and 4000 ± 2000 mode: 12 bits, 2's complements between -2000 and +2000	± 5 mA, 2 k Ω min.	2	400 mA	2.0 W	Permitted
Analog Output Module (0 to 10 V, 2 channels)	D/A 0-10V 2CH	JAMSC-120AVO 01100	0 to +10 V	$\pm 0.2\%$ F.S. (25 °C) $\pm 0.5\%$ F.S. (0 to 60 °C)	12 bits, binary between 0 and 4000	5 mA, 2 k Ω min.	2	400 mA	2.0 W	Permitted
Analog Output Module (0 to 5 V, 2 channels)	D/A 0-5V 2CH	JAMSC-120AVO 01200	0 to +5 V	$\pm 0.2\%$ F.S. (25 °C) $\pm 0.5\%$ F.S. (0 to 60 °C)	12 bits, binary between 0 and 4000	2.5 mA, 2 k Ω min.	2	400 mA	2.0 W	Permitted
Analog Output Module (4 to 20 mA, 2 channels)	D/A-CUR-2CH	JAMSC-120AC 001000	4 to 20 mA	$\pm 0.2\%$ F.S. (25 °C) $\pm 0.5\%$ F.S. (0 to 60 °C)	12 bits, binary between 0 and 4000	550 Ω max.	2	500 mA	2.5 W	Permitted
Other Specifications										
1) Slots required: 1										
2) Approx. mass : 350 g										
3) Width: 40.3 mm			Height: 130 mm			Depth: 103.9 mm				
4) Field connection: Terminal block										

2.2.3 Using I/O Modules

1) Installation Location of I/O Modules

(1) I/O Modules can be mounted to any slot of the Mounting Base of any Rack. Each I/O Module occupies one slot.

(2) The following diagram shows an example on where to mount I/O Modules.

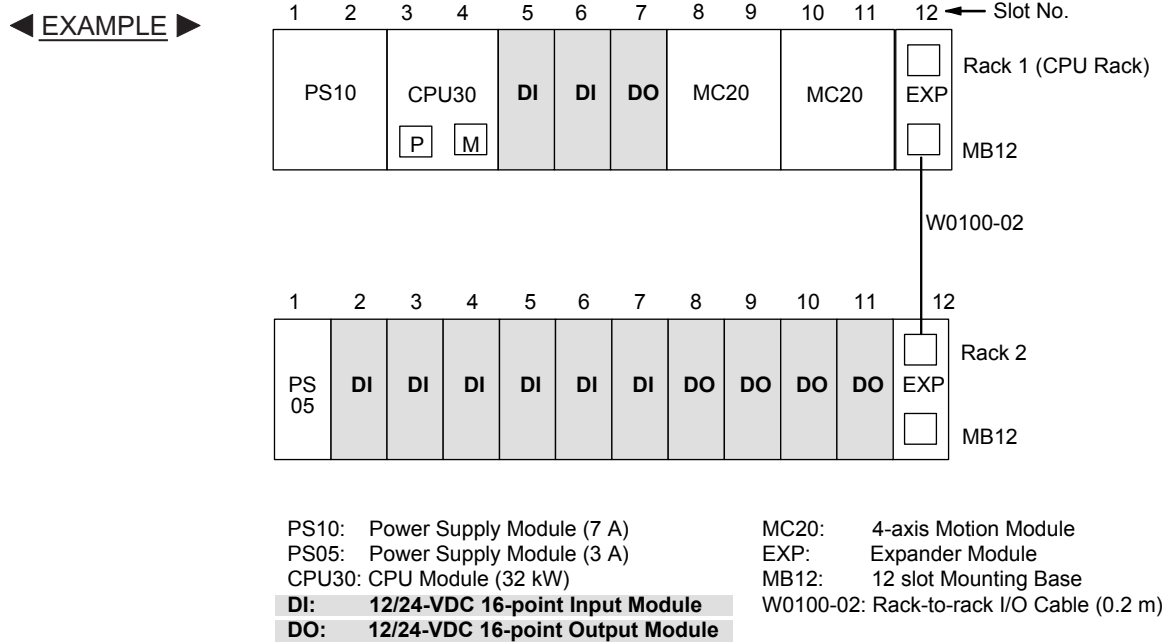


Fig. 2.1 Example of Mounting I/O Modules

2) Versions Supporting 64-point I/O Modules

The following CPU Modules, Remote I/O Receiver Modules, and MEMOSOFT versions are required to user 64-point I/O Modules.

Table 2.7 Versions Supporting 64-point I/O Modules

Name	Model Name	Model No.	Version Number	Location of Version Number
CPU Module (8 kw)	CPU10	DDSCR-120CPU14200	□□A01 and later	Module nameplate
CPU Module (16 kw)	CPU20	DDSCR-120CPU34100	□□B05 and later	Module nameplate
CPU Module (16 kw)	CPU21	DDSCR-120CPU34110	□□A01 and later	Module nameplate
CPU Module (32 kw)	CPU30	DDSCR-120CPU54100	□□B05 and later	Module nameplate
CPU Module (40 kw)	CPU35	DDSCR-120CPU54110	□□A01 and later	Module nameplate
Remote I/O Receiver Module	RIOR-COAX	DDSCR-120CRR13100	□□A10 and later	Module nameplate
MEMOSOFT		FMSGGL-AT3 (for English DOS)	1.21□ and later	In the middle at the bottom of the MEMOSOFT startup screen
		FMSGGL-PP3E (for P120 English version)		

Note: The nameplate is on the right side of the Module.

This chapter describes the specifications of Digital I/O Modules.

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3.1 Digital Input Module specifications

This section describes the performance specifications, circuit configuration, external connections, and the external appearance of the 120-series Digital Input Modules.

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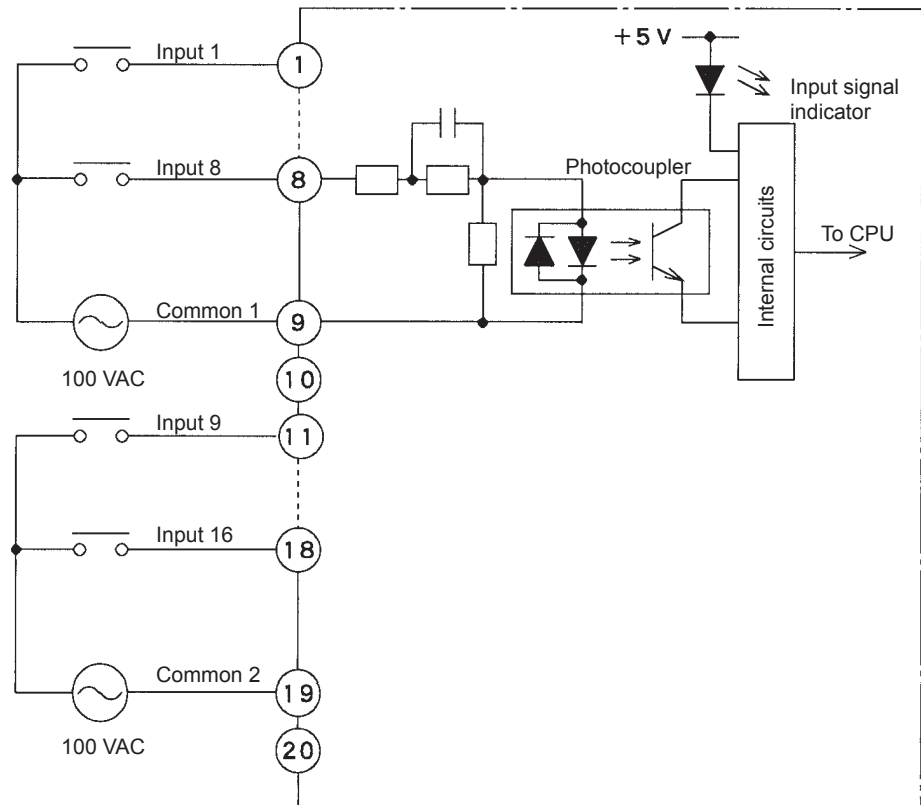
3.1.1 100-VAC 16-point Input Module

1) Performance Specifications

Item	Specifications
Name	100-VAC 16-point Input Module
Model Name	AC100IN-16P
Model No.	JAMSC-120DAI54300
Rated Voltage	100 VAC
Maximum Allowable Voltage	132 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Inrush Current	160 mA
Rated Current	7 mA (at 100 VAC, 50 Hz)
Input Impedance	14.3 k Ω (at 100 VAC, 50 Hz) 12.5 k Ω (at 100 VAC, 50 Hz)
Standard Operating Ranges	ON voltage range: 74 to 132 VAC OFF voltage range: 30 VAC max.
Input Type	AC type2 (according to JIS B3502)
Input Delay Times	OFF to ON: 20 ms max. ON to OFF: 35 ms max.
Number of common	2
Number of Inputs per Common	8 points/common
Input Power Supply per Common	Connect power supplies of the same phase to the Common 1 and Common 2.
External Connections	Removable terminal block with M3 screw terminals
Number of Inputs	16
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during input processing
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons.
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	100 VAC supplied to signals
Derating Conditions	None
Internal Current Consumption	90 mA max. at 5 VDC (with all points ON)

Item	Specifications
Maximum Heating Value	2.0 W
Hot Swapping (Removal/insertion under power)	Permitted
Approx. Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

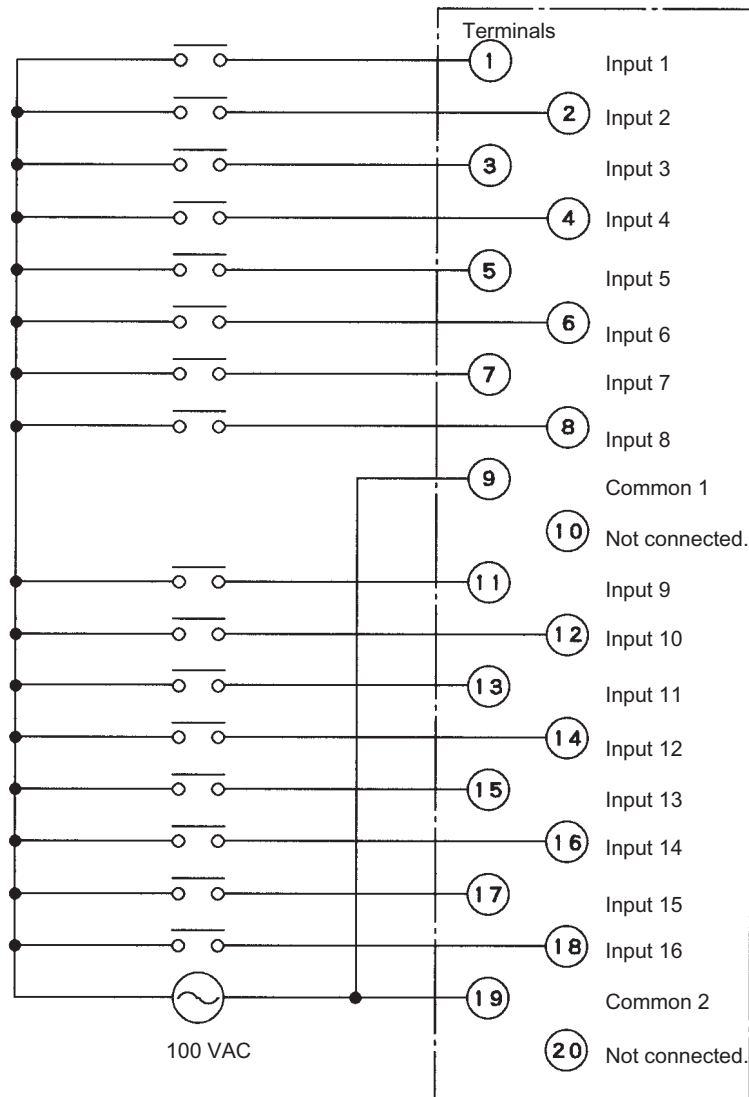


CAUTION Connect power supplies of the same phase to the Common 1 and Common 2.

If power supplies of different phases are connected, overheating or fire may occur.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



⚠ CAUTION Connect power supplies of the same phase to the Common 1 and Common 2.

If power supplies of different phases are connected, overheating or fire may occur.

Note: (1) Crimp Terminals

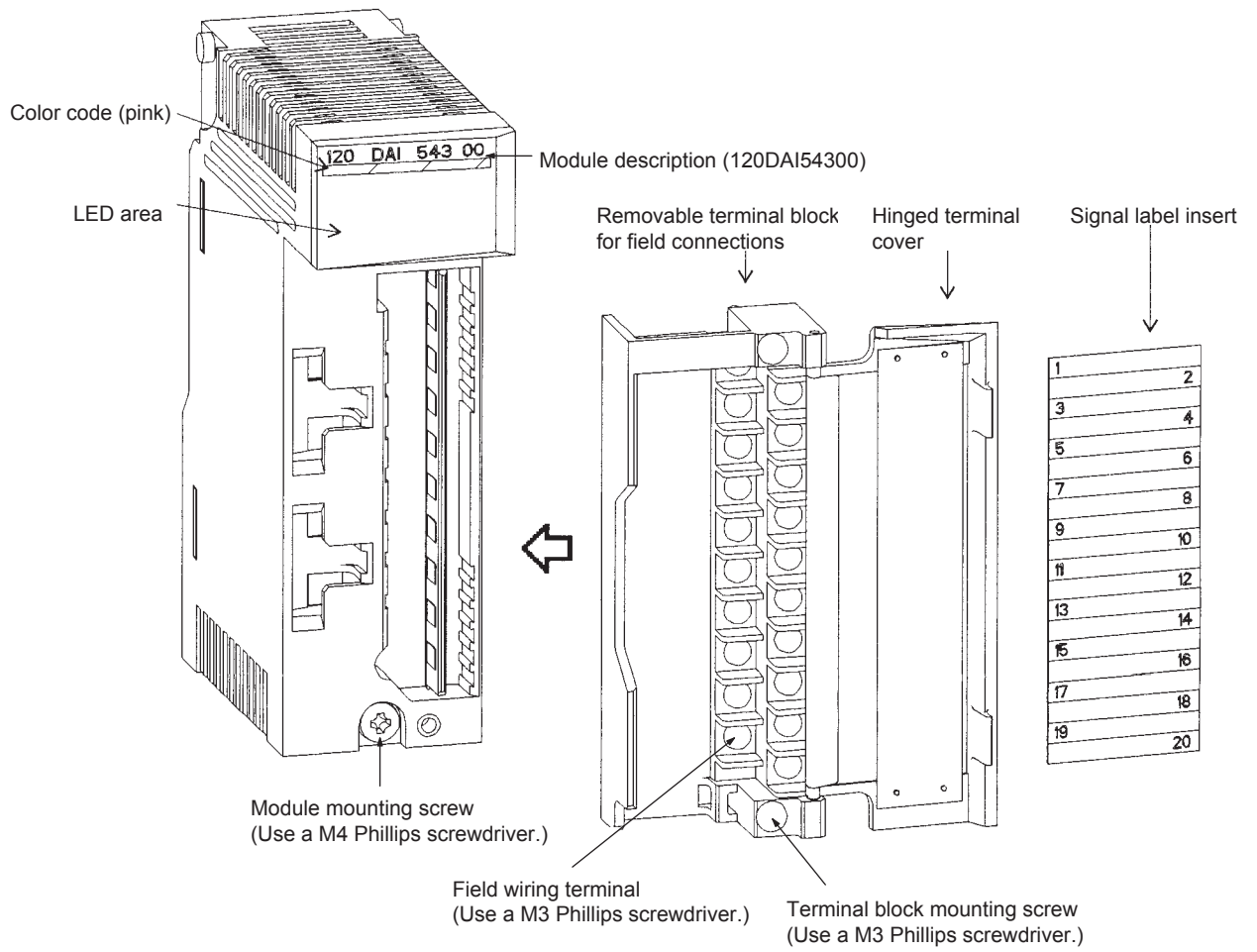
Use M3 terminal for crimping to the terminal block.

(2) Recommended Wires

Use wires of 1.3 mm² (AWG16) to 0.5mm² (AWG20) to connect to the terminal block.

(3) Terminal 10 and terminal 20 are not connected.

4) External Appearance



LED Area	
120 DIA 543 00	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

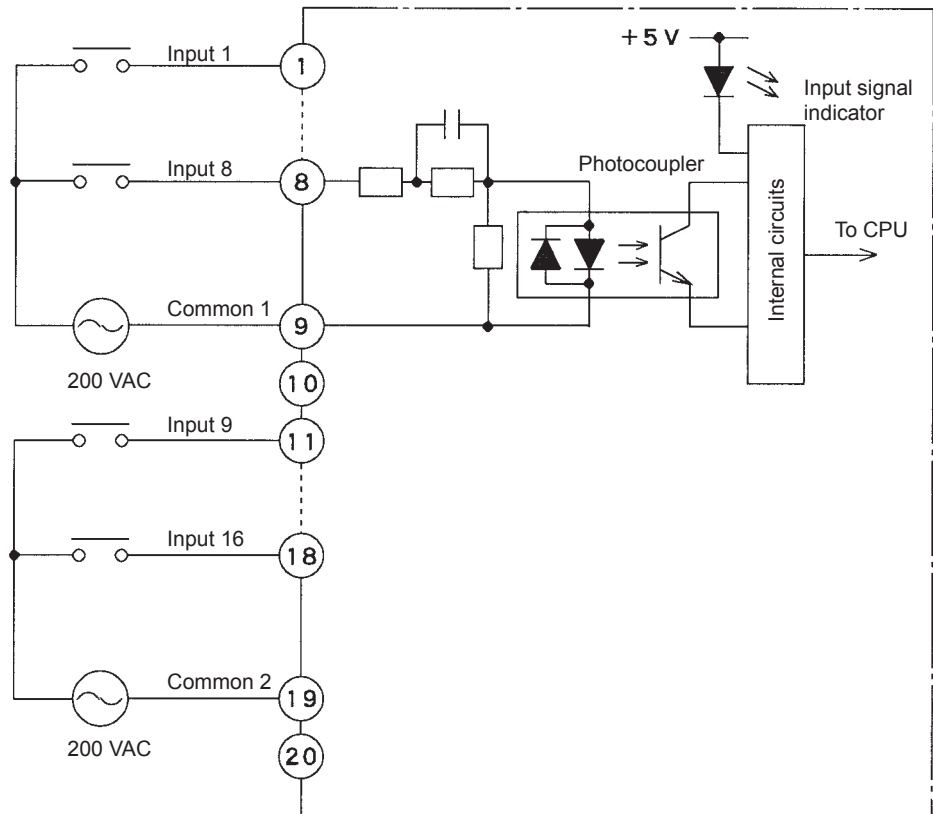
LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Always not lit.
1 to 16	Green	The corresponding LED is lit when the input signal is ON.

3.1.2 200-VAC 16-point Input Module

1) Performance Specifications

Item	Specifications
Name	200-VAC 16-point Input Module
Model Name	AC200IN-16P
Model No.	JAMSC-120DAI74300
Rated Voltage	200 VAC
Maximum Allowable Voltage	264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Inrush Current	320 mA
Rated Current	7 mA (at 200 VAC, 50 Hz)
Input Impedance	28.6 k Ω (at 200 VAC, 50 Hz) 23.1 k Ω (at 200 VAC, 50 Hz)
Standard Operating Ranges	ON voltage range: 159 to 264 VAC OFF voltage range: 40 VAC max.
Input Type	AC type 2 (according to JIS B3502)
Input Delay Times	OFF to ON: 20ms max. ON to OFF: 35ms max.
Number of commons	2
Number of Inputs per Common	8 points/common
Input Power Supply per Common	Connect power supplies of the same phases to the Common 1 and Common 2.
External Connections	Removable terminal block with M3 screw terminals
Number of Inputs	16
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during input processing
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons.
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	200 VAC supplied to signals
Derating Conditions	None
Internal Current Consumption	90 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	3.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approx. Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

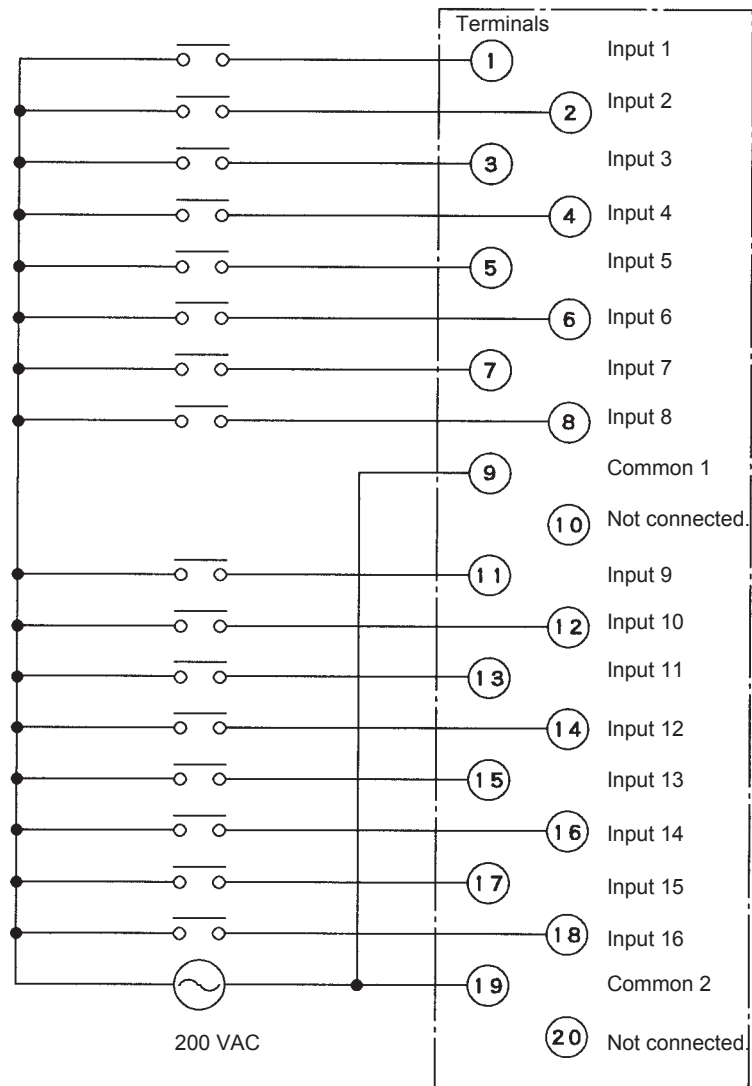


⚠ CAUTION Connect power supplies of the same phase to the Common 1 and Common 2.

If power supplies of different phases are connected, overheating or fire may occur.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



⚠ CAUTION Connect power supplies of the same phase to the Common 1 and Common 2.

If power supplies of different phases are connected, overheating or fire may occur.

Note: (1) Crimp Terminals

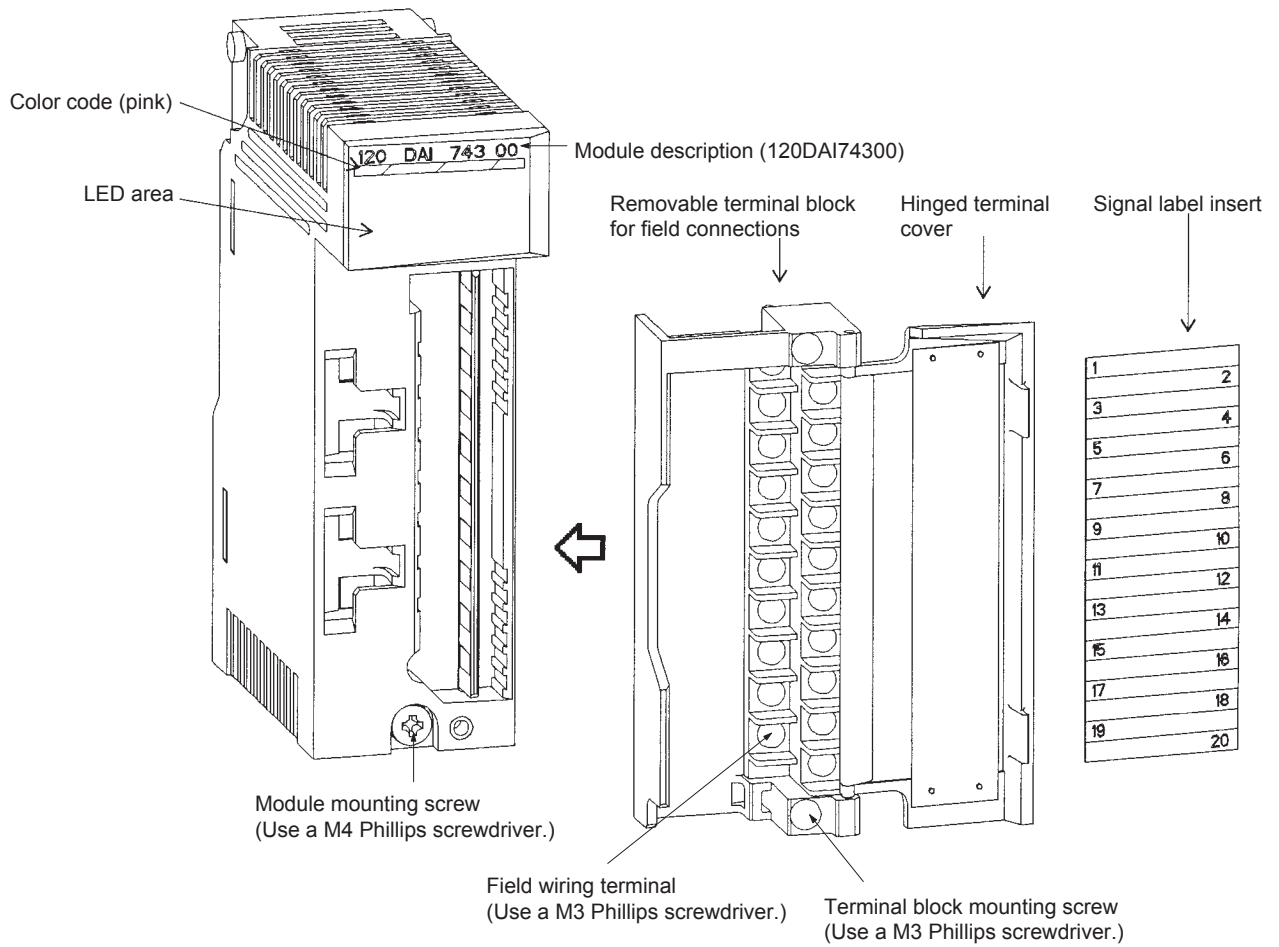
Use M3 terminal for crimping to the terminal block.

(2) Recommended Wires

Use wires of 1.3 mm² (AWG16) to 0.5mm² (AWG20) to connect to the terminal block.

(3) Terminal 10 and terminal 20 are not connected.

4) External Appearance



LED Area	
120 DIA 743 00	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Always not lit.
1 to 16	Green	The corresponding LED is lit when the input signal is ON.

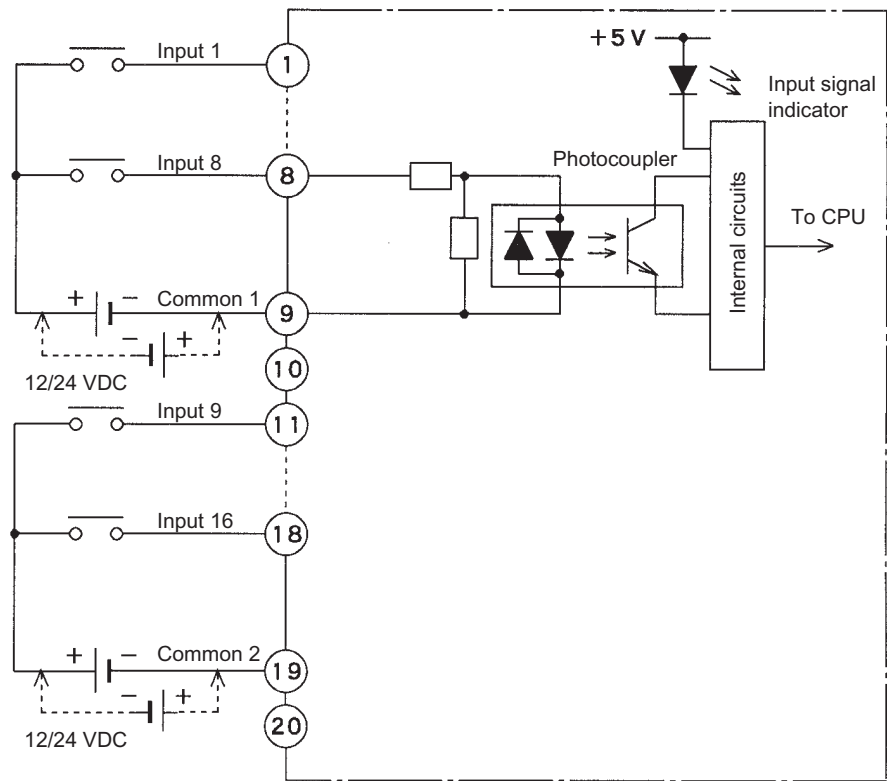
3.1.3 12/24-VDC 16-point Input Module

1) Performance Specifications

When 12-VDC Modules are used, the specifications do not comply with JIS B3502.

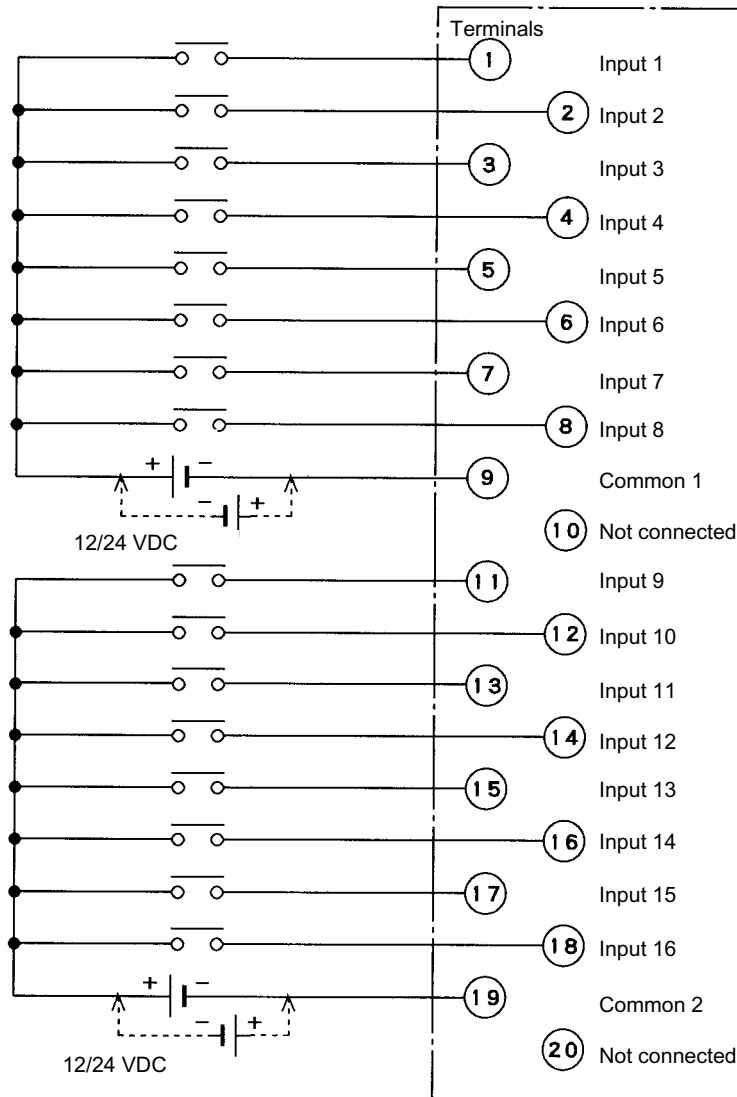
Item	Specification	
	At 12 VDC	At 24 VDC
Name	12/24 VDC 16-point Input Module	
Model Name	DC24IN-16P	
Model No.	JAMSC-120DDI34300	
Rated Voltage	12/24 VDC	
Maximum Allowable Voltage	30 VDC	
Input Form	Sourcing or sinking	
Rated Current	4 mA	8 mA
Input Impedance	3.0 k Ω	
Standard Operating Ranges	ON voltage range: 9 VDC OFF voltage range: 5 VDC	
Input Type	Not covered under JIS B3502	DC type 2 (according to JIS B3502)
Input Delay Times	OFF to ON: 5 ms max. ON to OFF: 5 ms max.	
Number of Commons	2	
Number of Inputs per Common	8 points/common	
External Connections	Removable terminal block with M3 screw terminals	
Number of Inputs	16	
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic.	
Status Indication	ACTIVE: Lights during input processing	
Insulation Method	Photocoupler	
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons	
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).	
External Power Supply	12 VDC supplied to signals	24 VDC supplied to signals
Derating Conditions	None	
Internal Current Consumption	100 mA max. at 5 VDC (with all points ON)	
Maximum Heating Value	3.7 W	
Hot Swapping (Removal/insertion under power)	Permitted	
Approximate Mass	250 g	
External Dimensions	40.3×130×103.9 mm (W×H×D)	

2) The following diagram shows the circuit configuration.



3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



Note: (1) Crimp Terminals

Use M3 terminal for crimping to the terminal block.

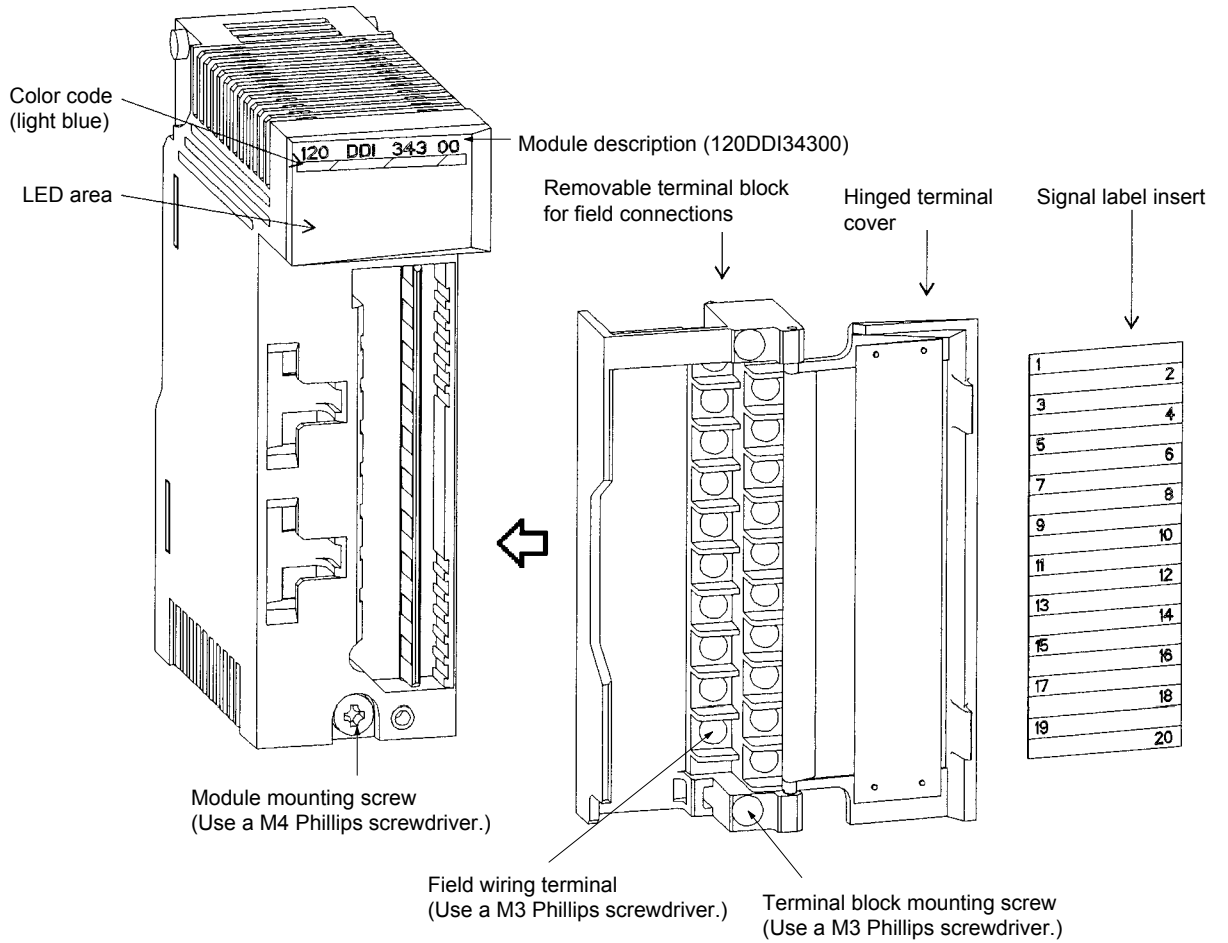
(2) Recommended Wires

Use wires of 0.8 mm² (AWG18) to 0.2 mm² (AWG24) to connect to the terminal block.

(3) Terminal 10 and terminal 20 are not connected.

(4) The polarity of the external power supply for signals can be either positive or negative.

4) External Appearance



LED Area	
120 DDI 343 00	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Always not lit.
1 to 16	Green	The corresponding LED is lit when the input signal is ON.

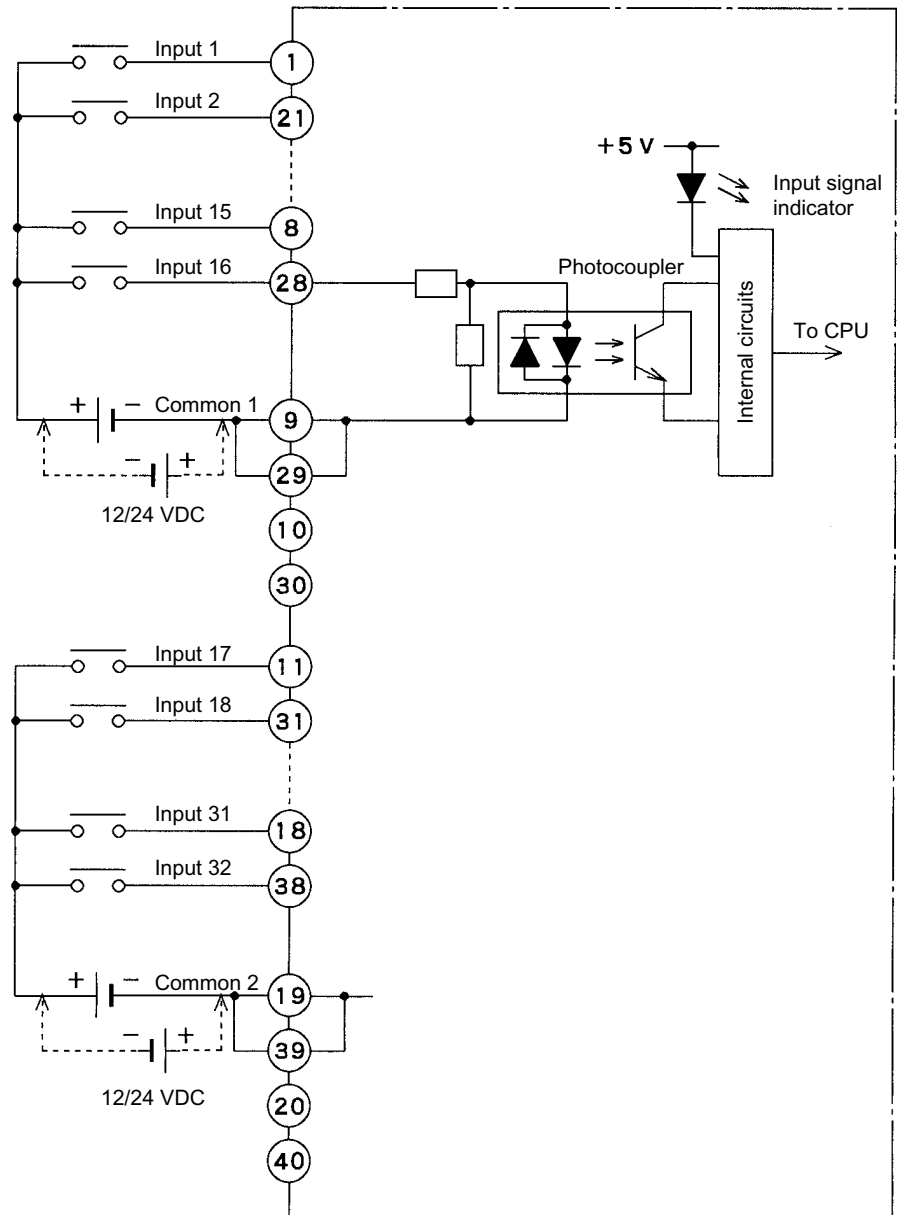
3.1.4 12/24-VDC 32-point Input Module

1) Performance Specifications

When 12VDC Modules are used, the specifications do not comply with JIS B3502.

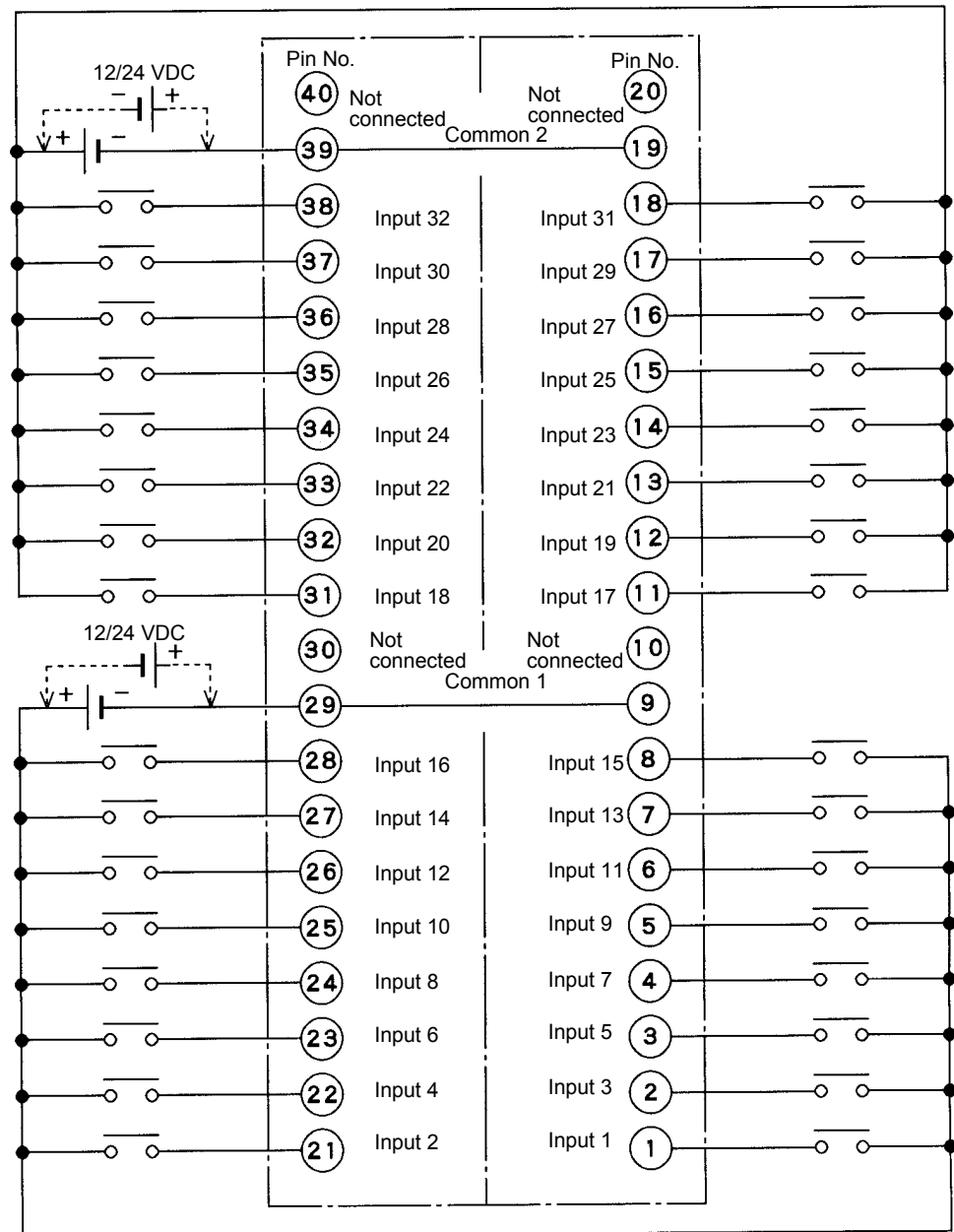
Item	Specification	
	At 12 VDC	At 24 VDC
Name	12/24-VDC 32-point Input Module	
Model Name	DC24IN-32P	
Model No.	JAMSC-120DDI35400	
Rated Voltage	12/24 VDC	
Maximum Allowable Voltage	30 VDC	
Input Form	Sourcing or sinking	
Rated Current	2 mA	4 mA
Input Impedance	5.6 k Ω	
Standard Operating Ranges	ON voltage range: 9 VDC OFF voltage range: 5VDC	
Input Type	Not covered under JIS B3502	DC type 2 (according to JIS B3502)
Input Delay Times	OFF to ON: 5 ms max. ON to OFF: 5 ms max.	
Number of Commons	2	
Number of Inputs per Common	16 points/common	
External Connections	40-pin connector: one piece Connector: 10340-52A2JL (made by 3M)	
Number of Inputs	32	
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic.	
Status Indication	ACTIVE: Lights during input processing	
Insulation Method	Photocoupler	
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons	
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).	
External Power Supply	12 VDC supplied to signals	24 VDC supplied to signals
Derating Conditions	None	
Internal Current Consumption	80 mA max. at 5 VDC (with all points ON)	
Maximum Heating Value	3.6 W	
Hot Swapping (Removal/insertion under power)	Permitted	
Approximate Mass	250 g	
External Dimensions	40.3×130×103.9 mm (W×H×D)	

2) The following diagram shows the circuit configuration.



3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



Note: (1) Pins 9 and 29, pins 19 and 39 are internally connected. Connect these pins externally as well. Not connecting them can cause malfunction.

(2) Connectors for External Connections

On the Module: 10240-52A2JL (manufactured by 3M)

(3) Recommended wires

Use wires of 0.08mm^2 (AWG28) to connect to each pin of the connector.

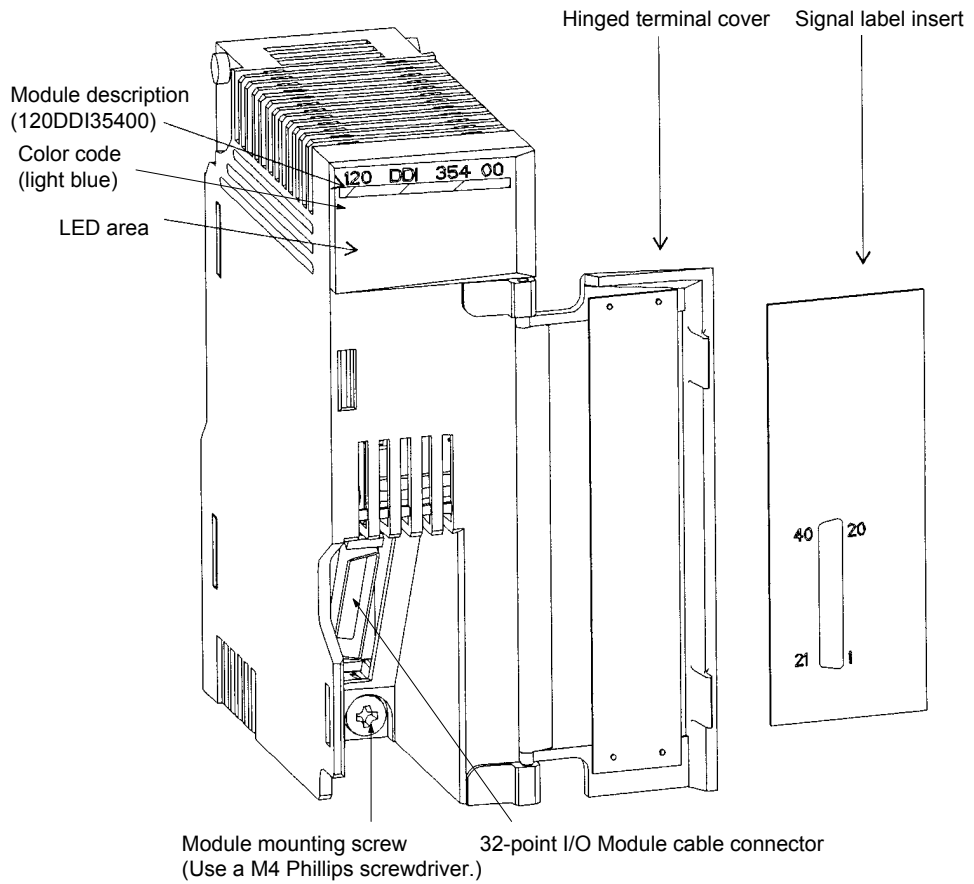
(4) The polarity of the external power supply for signals can be connected with either plus or minus.

(5) Pins 10, 20, 30, and 40 are not connected.

(6) External Connection Cable

Use a 32-point I/O Module Cable to connect to field devices. Refer to 3.3 I/O Module Cables for details.

4) External Appearance



3

LED Area			
120 DDI 354 00			
ACTIVE			
1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
1 to 32	Green	The corresponding LED is lit when the input signal is ON.

5) Special Purpose Components

The following components must be purchased separately.

- 32-point I/O Module Cable Type: JZMSZ-120W0300-□□
or
- 32-point I/O Module Cable Type: JZMSZ-120W0302-□□
or
- 32-point I/O Module Cable Type: JZMSZ-120W0301-□□
Terminal block connector for 32-point I/O type: XW2B-40F5-P (manufactured by OMRON)

- Note:** (1) The symbol “-□□” in the type stands for length for the cable. See 3.3 *I/O Module Cables* for details.
- (2) The terminal block number for the 32-point I/O connector type (manufactured by OMRON) is not that same as that for the 12/24-VDC 32-point Output Module. Refer to 3.3 *I/O Module Cables* for details.

3.1.5 12/24-VDC 64-point Input Module

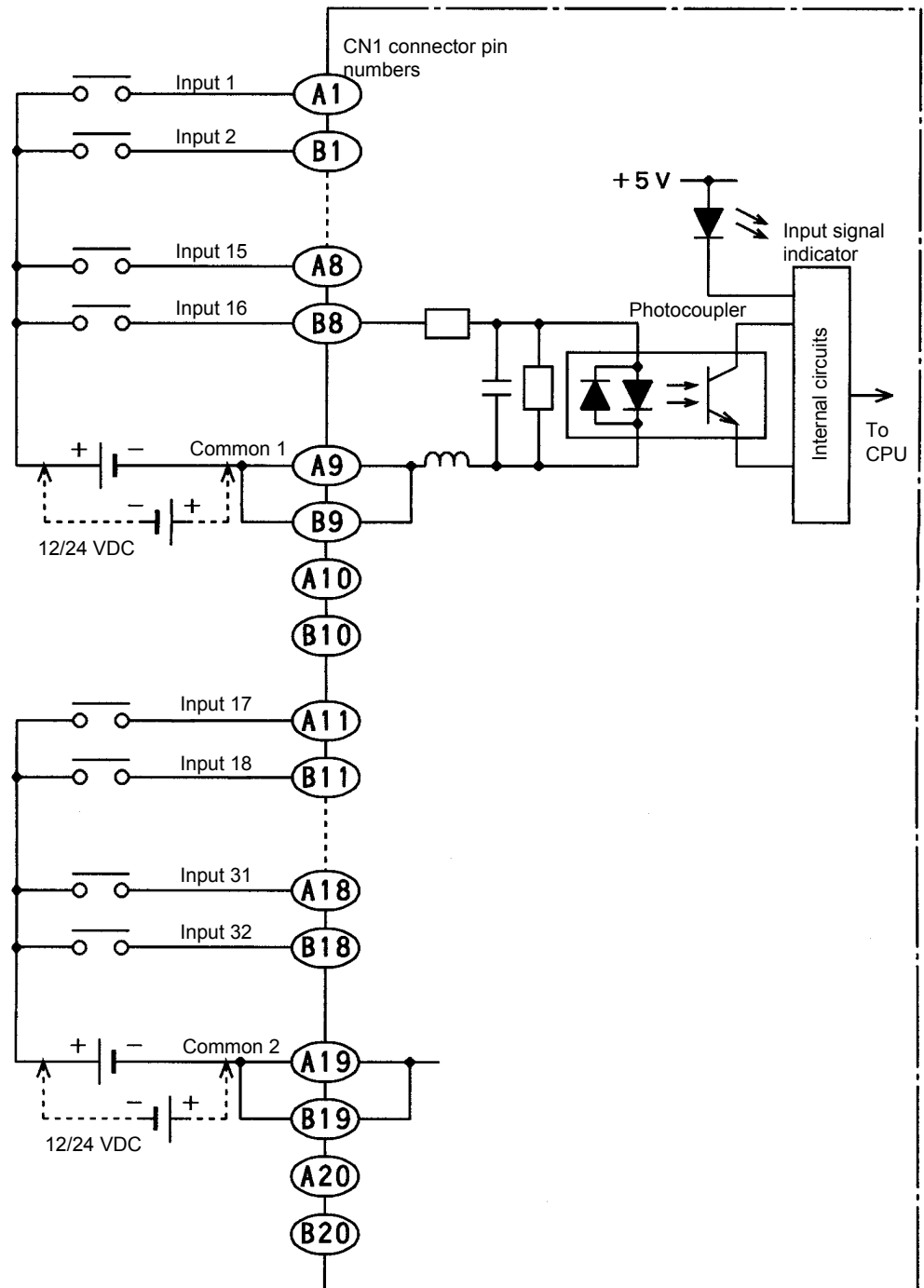
1) Performance Specifications

The Module does not conform to JIS B3502 when used as a 12-VDC Module.

Item	Specification	
	At 12 VDC	At 24 VDC
Name	12/24-VDC 64-point Input Module	
Model Name	DC24IN-64P	
Model No.	JAMSC-120DDI36400	
Rated Voltage	12/24 VDC	
Maximum Allowable Voltage	30 VDC	
Input Form	Sourcing or sinking	
Rated Current	2 mA	4 mA
Input Impedance	5.6 kΩ	
Standard Operating Ranges	Minimum ON voltage: 9 VDC Maximum OFF voltage: 5 VDC	
Input Type	Does not conform to JIS B3502.	DC type 2 (according to JIS B3502)
Input Delay Times	OFF to ON: 5 ms max. ON to OFF: 5 ms max.	
Number of Commons	4	
Number of Inputs per Common	16 points/common	
External Connections	40-pin connector: 2 pieces Connector type: FCN-365P040 (made by Fujitsu)	
Number of Inputs	64	
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic. 32 indicators controlled by toggle switches	
Status Indication	ACTIVE: Lights during input processing	
Insulation Method	Photocoupler	
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons	
Insulation Resistance	100 MΩ min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).	
External Power Supply	12 VDC supplied to signals	24 VDC supplied to signals
Derating Conditions	None	
Internal Current Consumption	100 mA max. at 5 VDC (with all points ON)	
Maximum Heating Value	7.0 W	

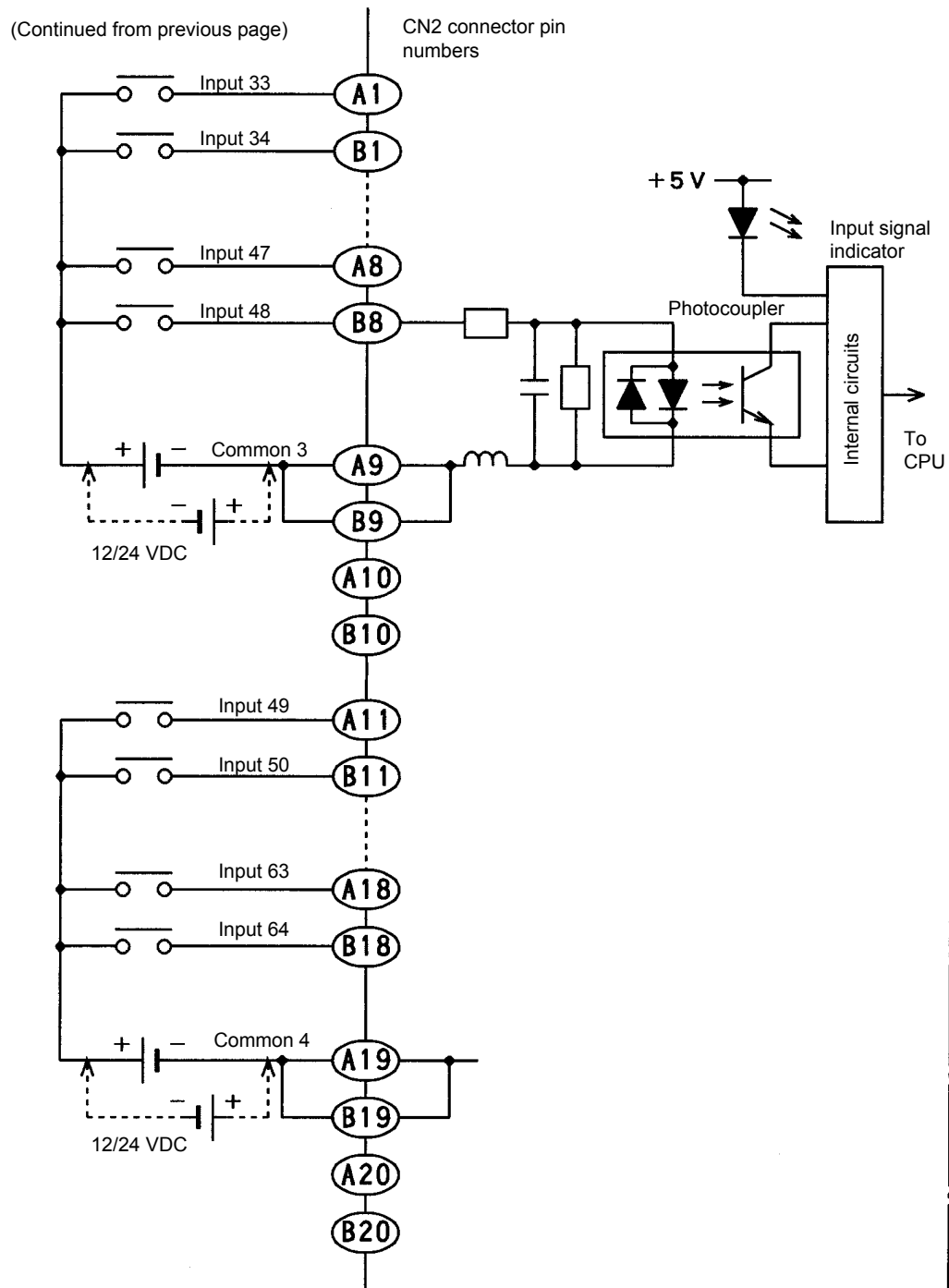
Item	Specification	
	At 12 VDC	At 24 VDC
Hot Swapping (Removal/insertion under power)	Permitted	
Approximate Mass	300 g	
External Dimensions	40.3×130×103.9 mm (W×H×D)	

2) The following diagram shows the circuit configuration.



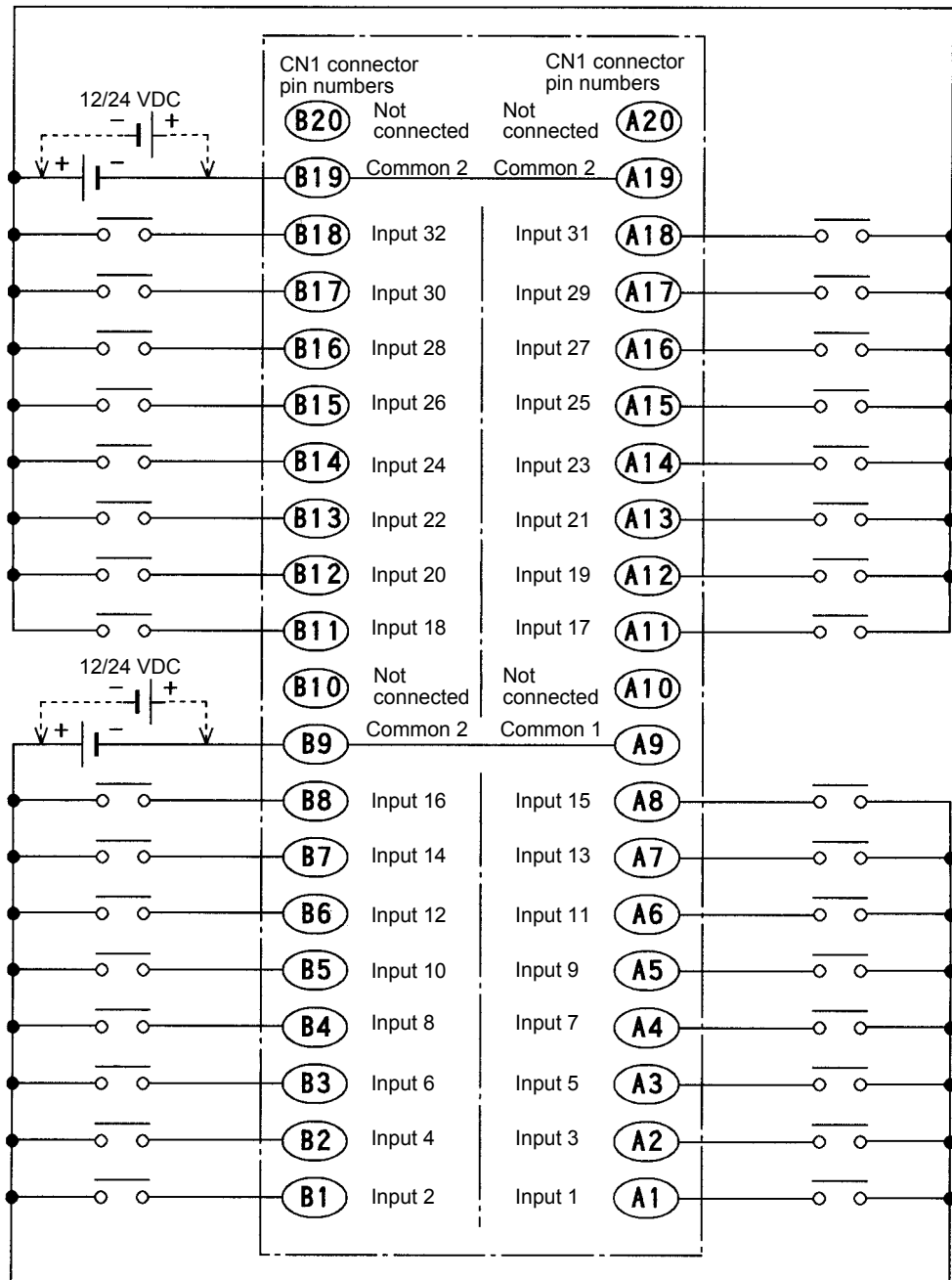
(Continued on next page)

3.1.5 12/24-VDC 64-point Input Module



3) The following diagram shows an example of terminal connections.

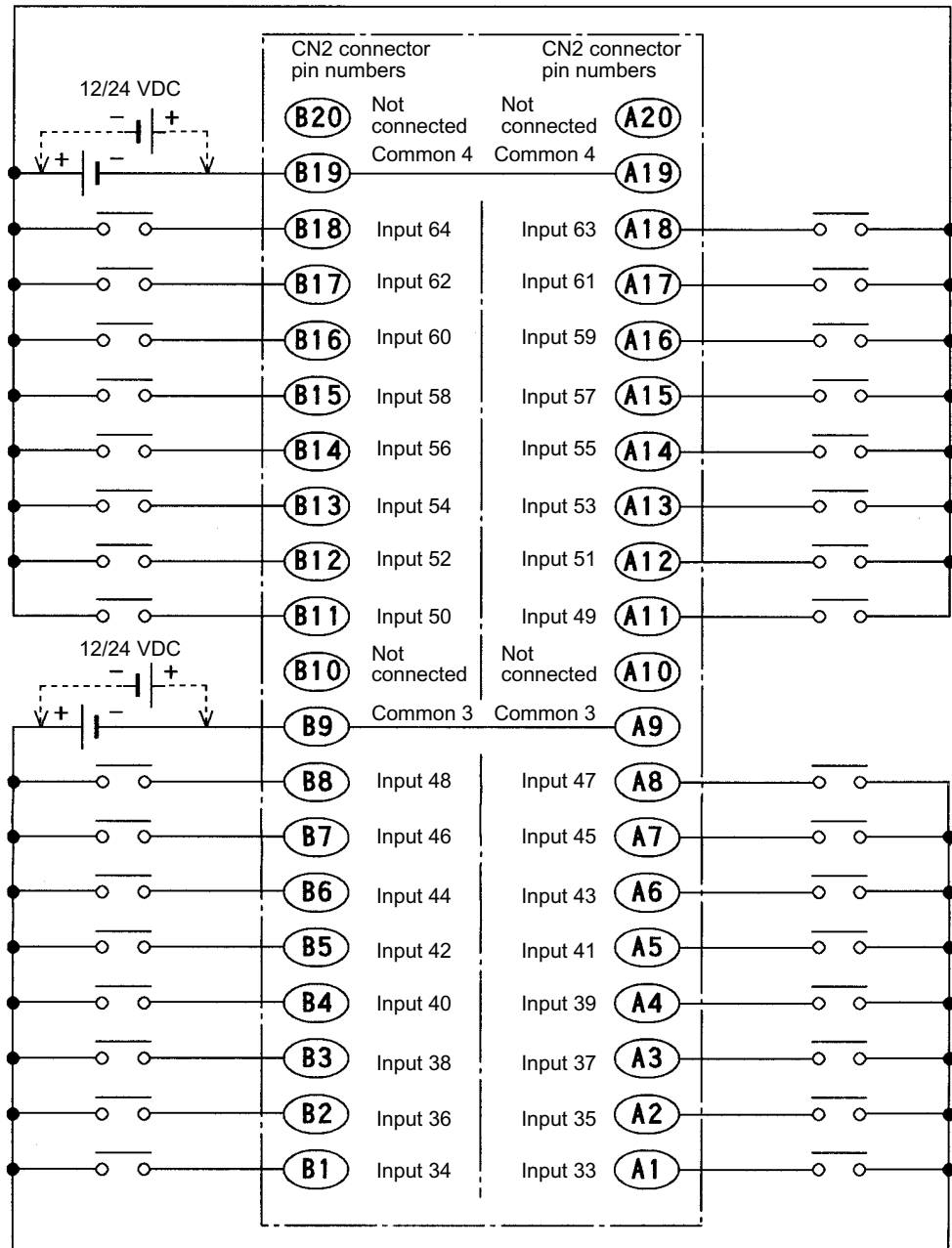
◀ EXAMPLE ▶



(Continued on next page)

- Note:** (1) CN1 pins A9 and B9 and pins A19 and B19 are internally connected. Connect these pins externally as well. Not connecting them can cause malfunction.
 (2) Pins A10, A20, B10, and B20 are not connected.
 (3) The polarity of the external power supply for signals can be either positive or negative.
 (4) **Connector for External Connections (included)**
 Connector: FCN-361J040-AU (soldered) (manufactured by Fujitsu Ltd.)
 Cover: FCN-360C040-B (manufactured by Fujitsu Ltd.)
 (5) **Recommended Wires**
 Use wires of 0.26 mm² (AWG23) to connect to each connector pin.

(Continued from previous page)



Note: (1) CN2 pins A9 and B9 and pins A19 and B19 are internally connected. Connect these pins externally as well. Not connecting them can cause malfunction.

(2) Pins A10, A20, B10, and B20 are not connected.

(3) The polarity of the external power supply for signals can be either positive or negative.

(4) Connector for External Connections (included)

Connector: FCN-361J040-AU (soldered) (manufactured by Fujitsu Ltd.)

Cover: FCN-360C040-B (manufactured by Fujitsu Ltd.)

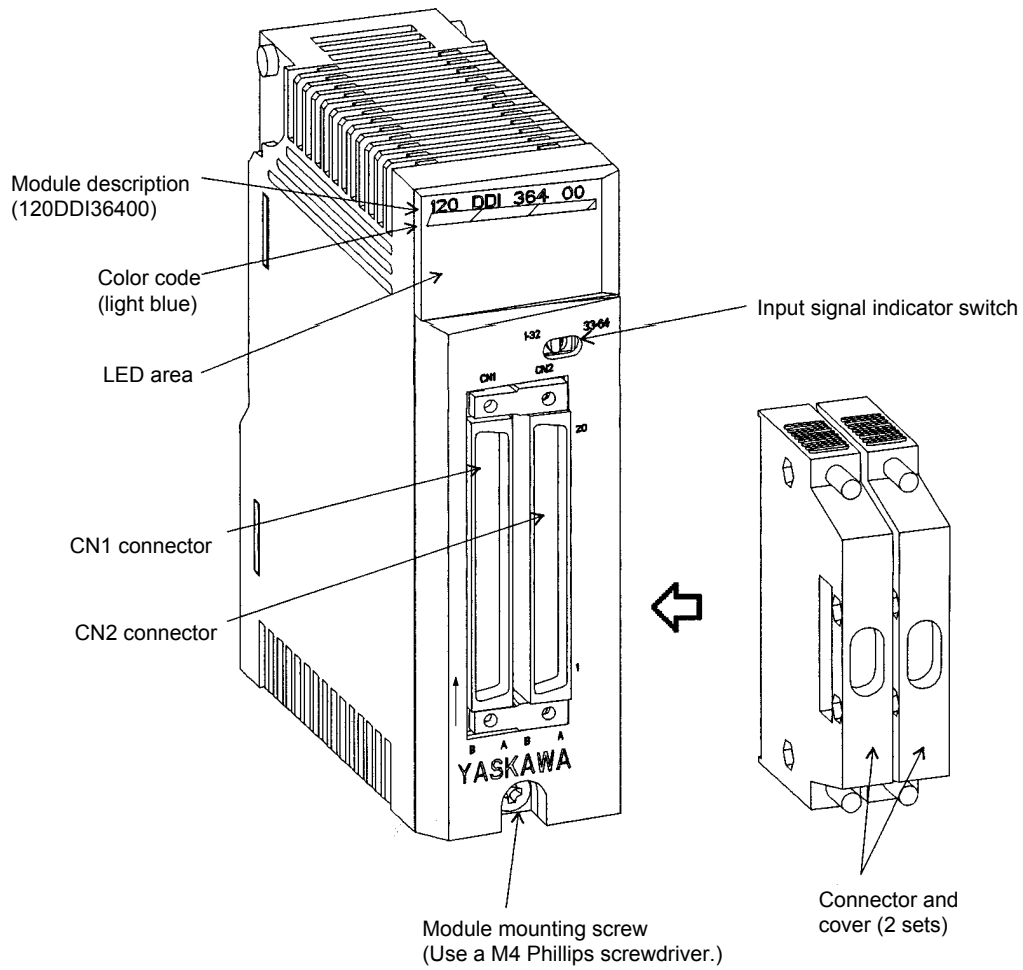
(5) Recommended Wires

Use wires of 0.26 mm² (AWG23) to connect to each connector pin.

(6) External Connection Cable

Two pairs of connectors to connect the external input signal and a 64-point I/O Module Cable to connect to field devices are provided. For details, refer to 3.3 I/O Module Cables.

4) External Appearance



3

LED Area			
120 DDI 364 00			
ACTIVE			
1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

LED	Color	Indication when ON	Input Signal Indicator Switch
ACTIVE	Green	Processing I/O.	–
1 to 32	Green	Input signal (1 to 32) is ON.	Left side (1 to 32)
		Input signal (33 to 64) is ON.	Right side (33 to 64)

5) Accessories

The following items are included in the accessories.

- Connector for External Connections
 Connector: FCN-361J040-AU (soldered) (manufactured by Fujitsu Ltd.)
 Cover: FCN-360C040-B (manufactured by Fujitsu Ltd.)

3.2 Digital Output Module Specifications

This section describes the performance specifications, circuit configuration, external connections, and external appearance of the 120-series Digital Output Modules.

3.2.1	100/200-VAC 8-point Output Module	3-24
3.2.2	100/200-VAC 16-point Output Module	3-28
3.2.3	12/24-VDC 8-point Output Module	3-32
3.2.4	12/24-VDC 16-point Output Module (Sinking)	3-36
3.2.5	12/24-VDC 16-point Output Module (Sourcing)	3-40
3.2.6	12/24-VDC 32-point Output Module	3-44
3.2.7	12/24-VDC 64-point Output Module	3-49
3.2.8	Relay Contact 16-point Output Module	3-55

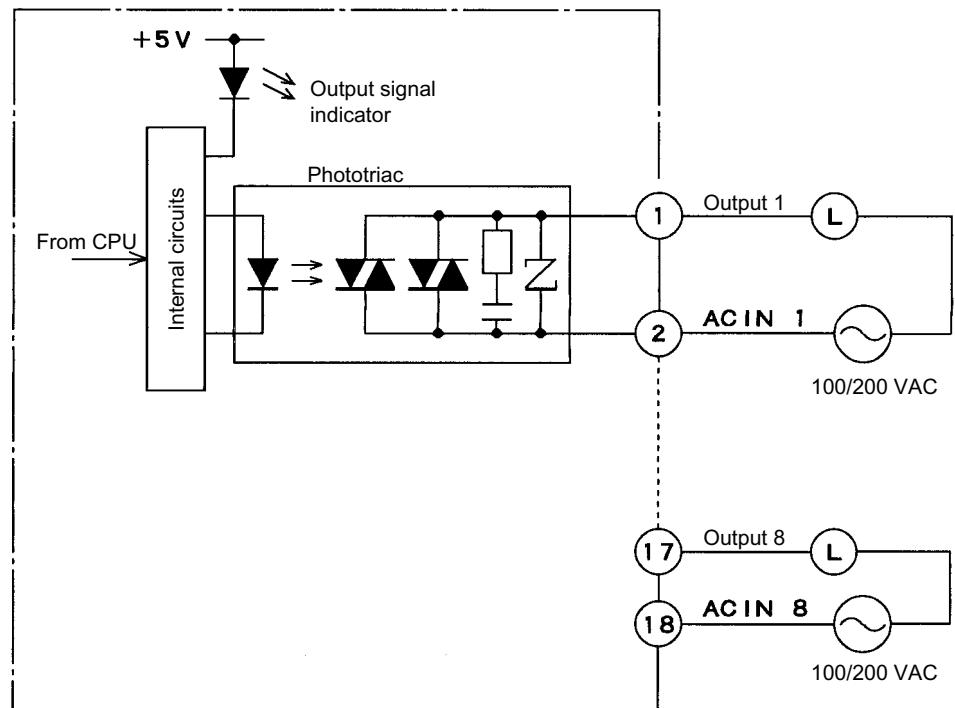
3.2.1 100/200-VAC 8-point Output Module

1) Performance Specifications

Item	Specifications
Name	100/200-VAC 8-point Output Module
Model Name	ACOUT-8P
Model No.	JAMSC-120DAO83000
Rated Voltage	100/200 VAC
Allowable Voltage Range	80 to 264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Maximum Load Current	1.0 Arms/point
Output Voltage Drop	1.0 Vrms
Output Delay Times	OFF to ON: 5 ms max. ON to OFF: 1/2 cycle + 5 ms max.
OFF Leakage Current	3 mA max. at 240 VAC, 50 Hz
Minimum Load Current	10 mArms
Output Type	Triac outputs
Number of Commons	8 (Each output circuit is independent.)
Output Power Supply per Common	Possible to connect different power supply phases to the commons.
External Connections	Removable terminal block with M3 screw terminals
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	None
Surge Suppressor	Varistor
Other Output Protection	None
Number of Outputs	8
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during input processing.
Insulation Method	Phototriac
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output circuits.

Item	Specifications
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	100/200 VAC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	50 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	9.0 W
Hot Swapping (Removal/insertion under power)	Permitted
Approx. Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

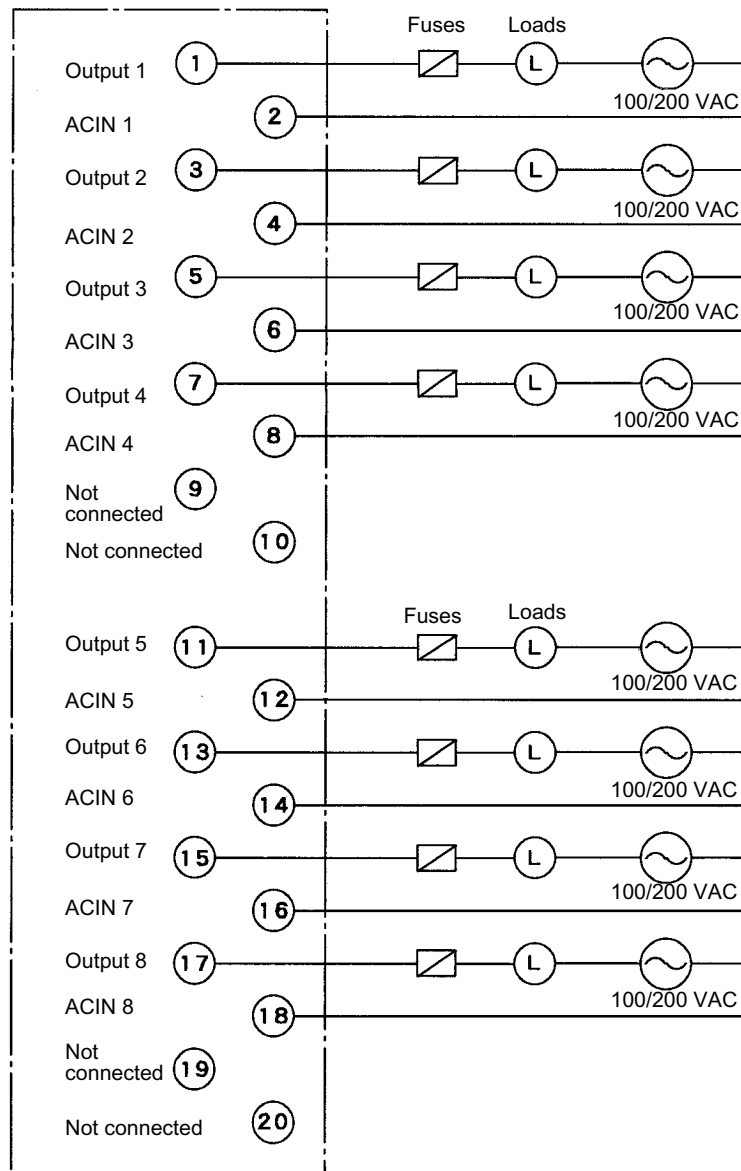


CAUTION If using a 100/200-VAC 8-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse does not built into the following 100/200-VAC 8-point Output Modules. If a fuse is not connected, fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



⚠ CAUTION If using a 100/200-VAC 8-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse does not built into the following 100/200-VAC 8-point Output Modules. If a fuse is not connected, fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

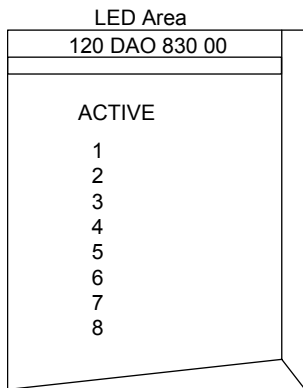
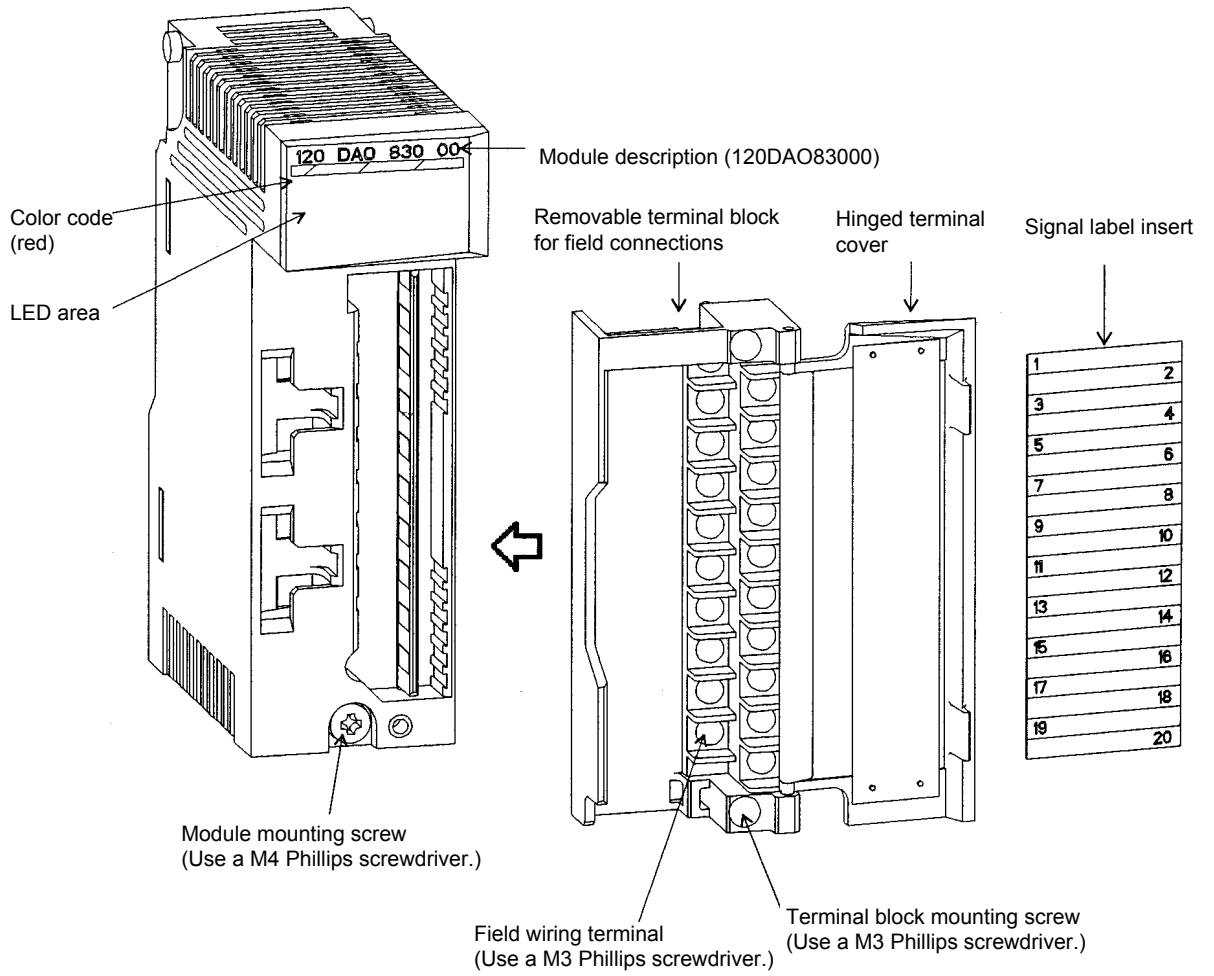
Note: (1) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

(2) Recommended Wires

Use wires of 1.3mm² (AWG16) to 0.5mm² (AWG20) to connect to the terminal block.

4) External Appearance



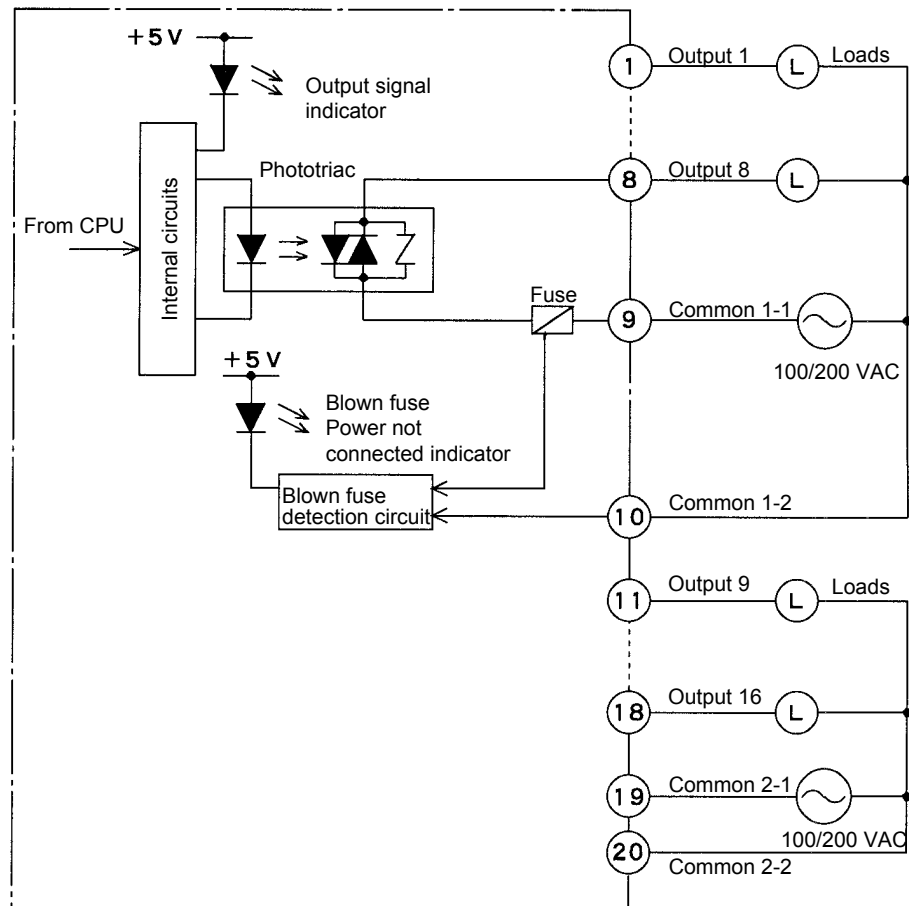
LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
1 to 8	Green	The corresponding LED is lit when the output signal is ON.

3.2.2 100/200-VAC 16-point Output Module

1) Performance Specifications

Item	Specifications
Name	100/200-VAC 16-point Output Module
Model Name	ACOUT-16P
Model No.	JAMSC-120DAO84300
Rated Voltage	100/200 VAC
Allowable Voltage Range	80 to 264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Maximum Load Current	0.6 Arms/point, 2.4 A/common
Output Voltage Drop	1.0 Vrms
Output Delay Times	OFF to ON: 5 ms max. ON to OFF: 1/2 cycle + 5 ms max.
OFF Leakage Current	3 mA max. at 240 VAC, 50 Hz
Minimum Load Current	7 mArms
Output Type	Triac outputs
Number of Commons	2
Number of Outputs per Common	8 points/common
Output Power Supply per Common	Connect power supplies of the same phase to the Common 1 and Common 2.
External Connections	Removable terminal block with M3 screw terminals
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	Two, 5-A fuses (one per common) (Burnout time: 2 min max. at 200 % of rated current)
Surge Suppressor	Varistor
Other Output Protection	None
Number of Outputs	16
Output Signal Indication	Indicator for each point; lit when the output the is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during output processing F: Lights when fuse is burnt out or output power supply is not connected
Insulation Method	Phototriac
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. (room temperature and humidity) between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	100/200 VAC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	300 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	5.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.



CAUTION Do not replace the built-in fuse of the 100/200-VAC 16-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, failure or malfunction may occur in the Modules.

CAUTION Connect power supplies of the same phase to the Common 1 and Common 2 of the AC I/O Module.

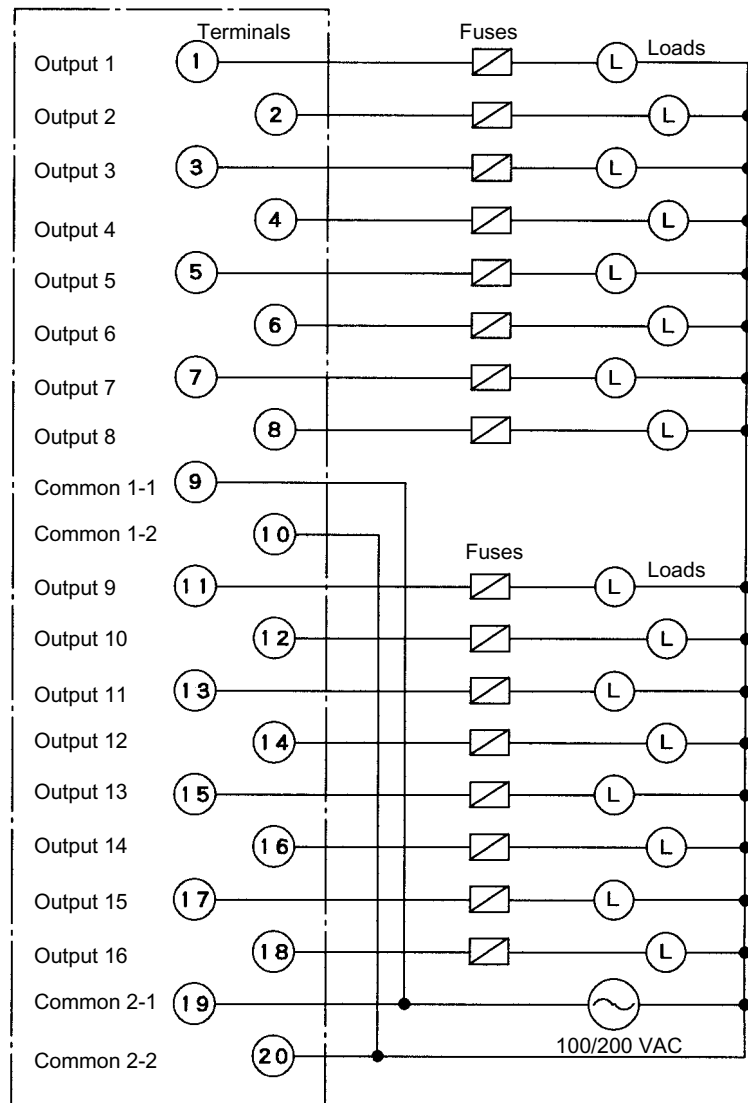
If power supplies of different phases are connected, overheating or fire may occur.

CAUTION If using a 100/200-VAC 16-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 100/200-VAC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



CAUTION Connect power supplies of the same phase to the Common 1 and Common 2 of the AC I/O Module.

If power supplies of different phase are connected, overheating or fire may occur.

CAUTION If using a 100/200-VAC 16-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 100/200-VAC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

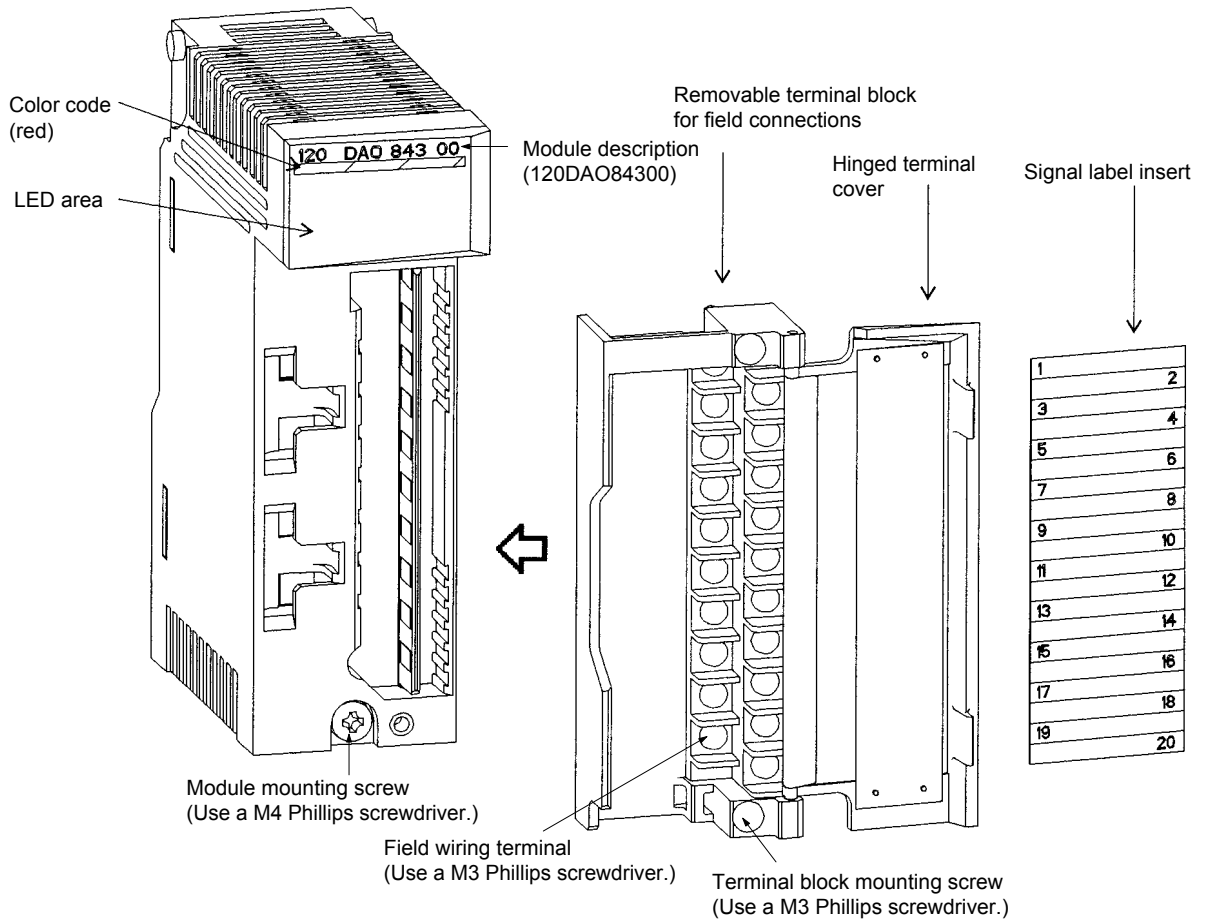
Note: (1) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

(2) Recommended Wires

User wires of 1.3mm² (AWG16) to 0.5mm² (AWG20) to connect to the terminal block. Use wires of the size more than 1.3 mm² (AWG16) for common lines.

4) External Appearance



3

LED Area	
120 DAO 843 00	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

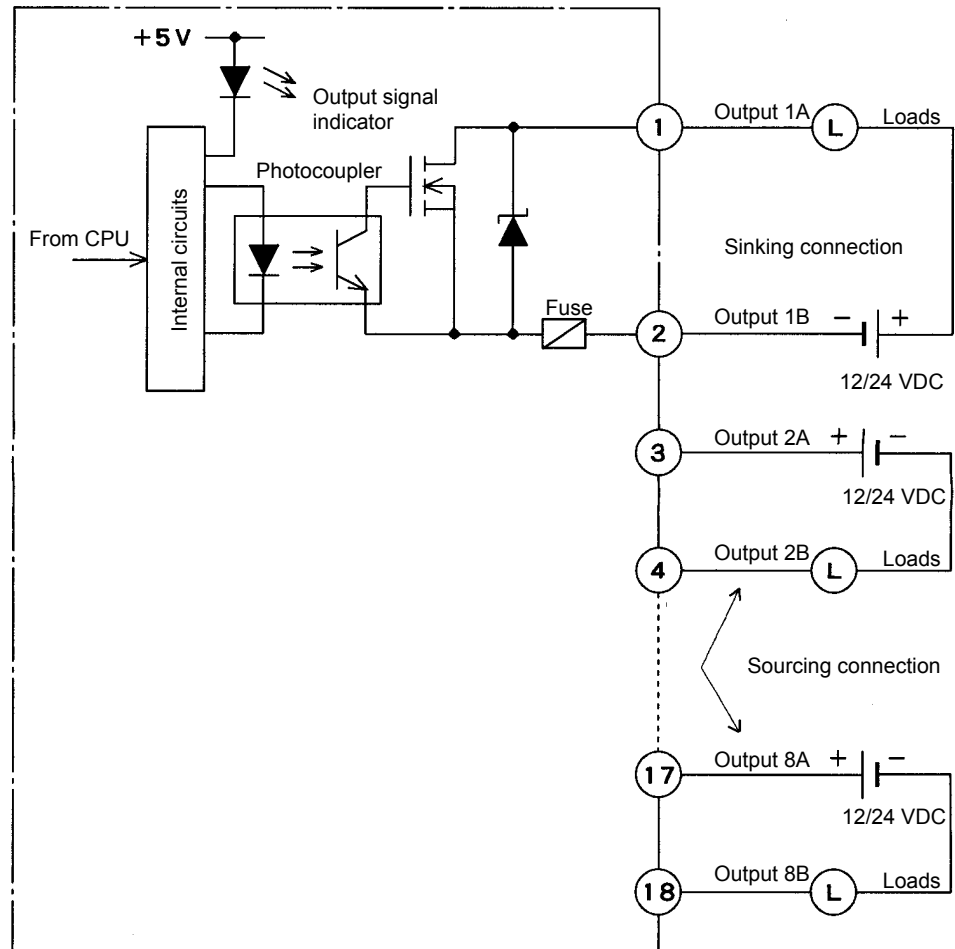
LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Fuse blown out, or external power supply not connected.
1 to 16	Green	The corresponding LED is lit when the output signal is ON.

3.2.3 12/24-VDC 8-point Output Module

1) Performance Specifications

Item	Specifications
Name	12/24-VDC 8-point Output Module
Model Name	DC24OUT-8P
Model No.	JAMSC-120DDO33000
Rated Voltage	12/24 VDC
Allowable Voltage Range	10.2 to 30.0 VDC
Output Form	Sourcing or sinking
Maximum Load Current	2.0 A/point
Output Voltage Drop	0.1 V max (2.0 A)
Output Delay Times	OFF to ON: 3 ms max. ON to OFF: 5 ms max.
OFF Leakage Current	1 mA max. at 24 VDC
Output Type	Transistor (FET) outputs
Number of Commons	8 (Each output circuit is independent.)
External Connections	Removable terminal block with M3 screw terminals
Output Protection Type	Protected outputs (according to JIS B3502)
Built-in Fuse	Eight, 3.5-A fuses (one per circuit) (Burnout time: 1 s max. at 200% of rated current)
Surge Suppressor	Zener diode
Other Output Protection	None
Number of Outputs	8
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during output processing.
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits
Insulation Resistance	100 MΩ min. at room temperature and humidity between output terminals (connected together) and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	12/24 VDC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	220 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	1.6 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.



CAUTION Do not replace the built-in fuses of the DC 8-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 8-point Output Modules, and the guarantee is void.

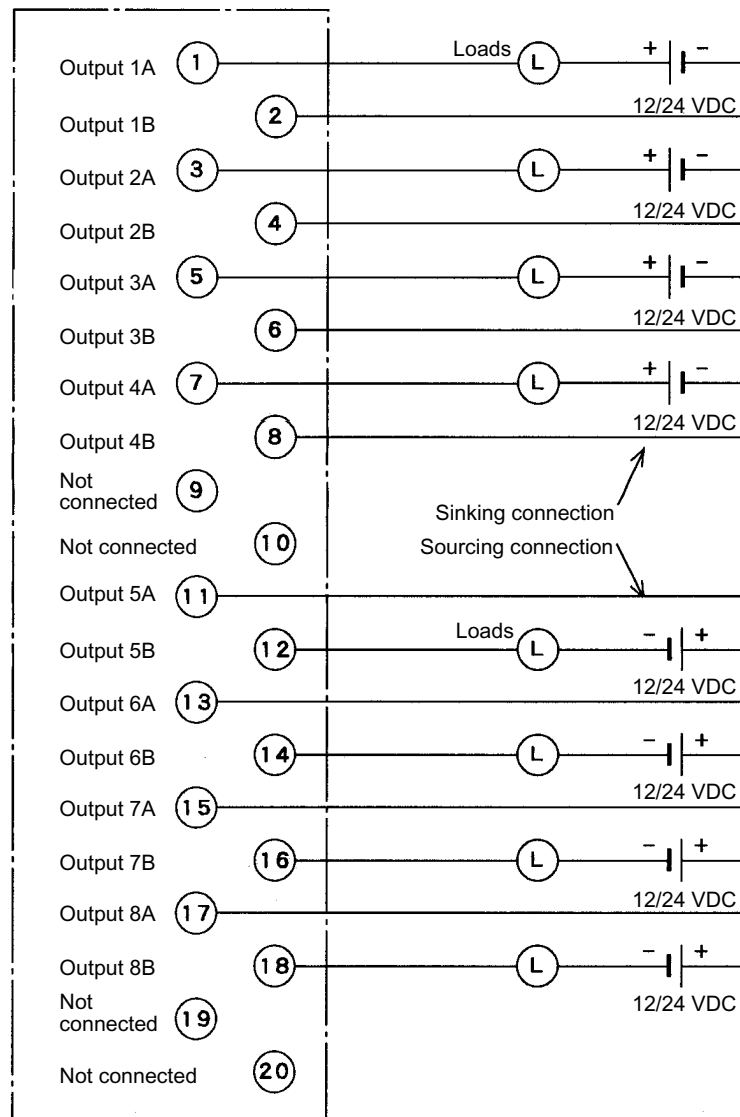
CAUTION If using a 12/24-VDC 8-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 8-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: A blown-fuse detection circuit is not built into the circuit. If no output current flows while the output signal indicator is lit under the rated voltage, the built-in fuse may be blown. The built-in fuse must be replaced by a Yaskawa service representative.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



CAUTION If using a 12/24-VDC 8-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 8-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) Crimp Terminals

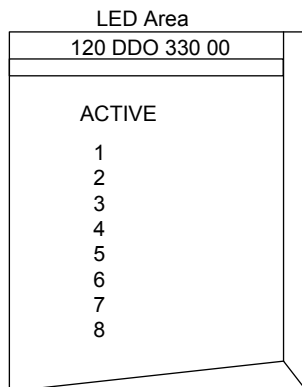
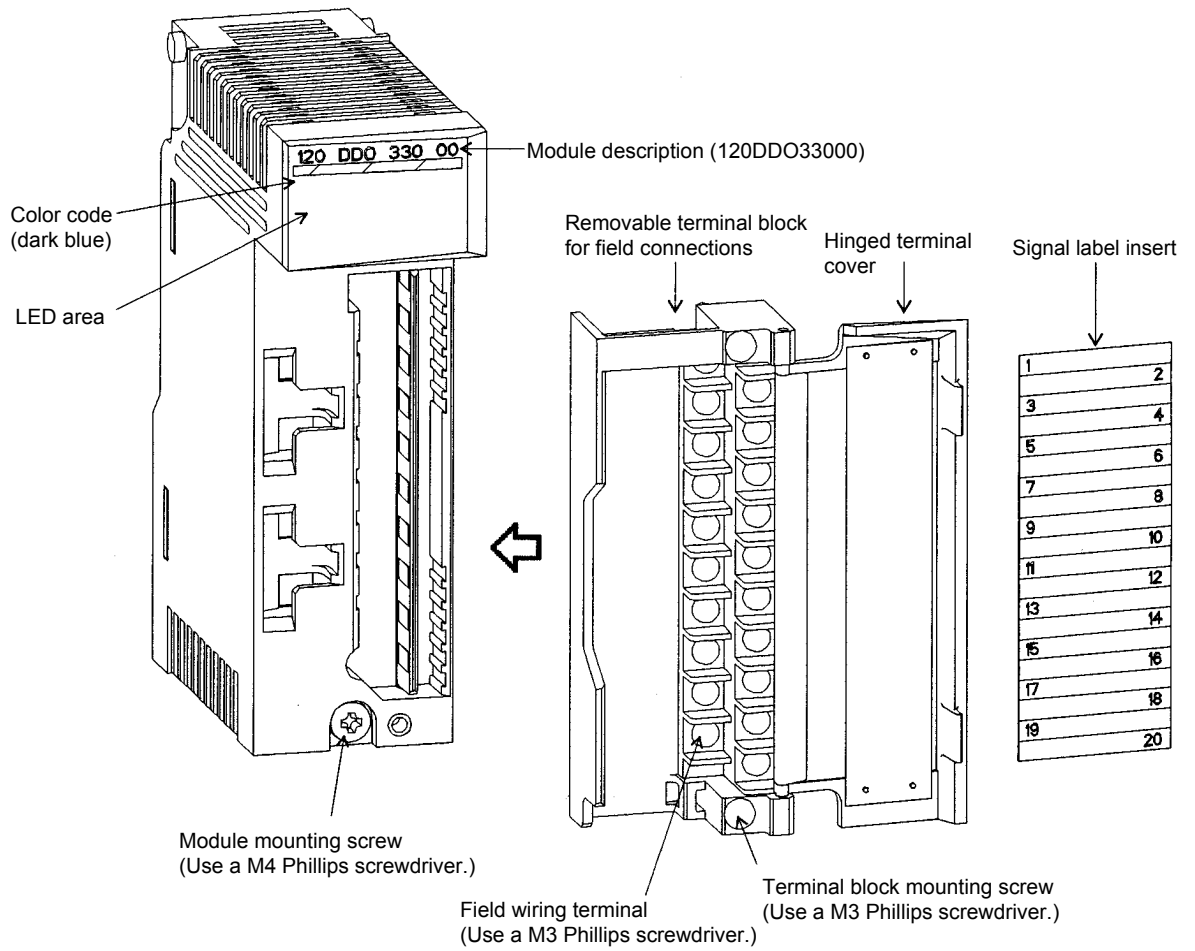
Use M3 crimp terminals for the terminal block.

(2) Recommended Wires

Use wires of 0.8 mm² (AWG18) to 0.2 mm² (AWG24) to connect to the terminal block.

(3) A blown-fuse detection circuit is not built into the circuit. If no output current flows while the output signal indicator is lit under the rated voltage, the built-in fuse may be blown. The built-in fuse must be replaced by a Yaskawa service representative.

4) External Appearance



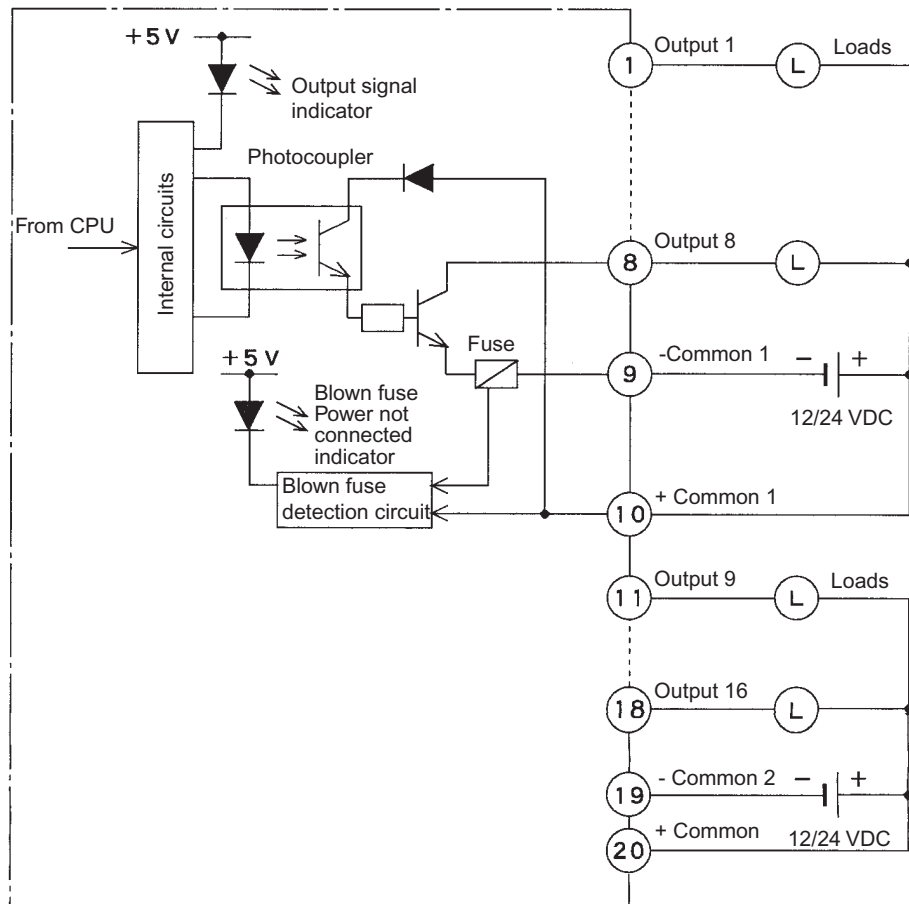
LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
1 to 8	Green	The corresponding LED is lit when the output signal is ON.

3.2.4 12/24-VDC 16-point Output Module (Sinking)

1) Performance Specifications

Item	Specifications
Name	12/24 VDC 16-point Output Module
Model Name	DC24OUT-16PSN
Model No.	JAMSC-120DDO34310
Rated Voltage	12/24 VDC
Allowable Voltage Range	10.2 to 30.0 VDC
Output Form	Sinking
Maximum Load Current	0.5 A/point, 1.0 A/4 points
Output Voltage Drop	1.5 V max (0.5 A)
Output Delay Times	OFF to ON: 1 ms max. ON to OFF: 1 ms max.
OFF Leakage Current	1 mA max. at 24 VDC
Output Type	Transistor outputs
Number of Commons	2
Number of Outputs per Common	8 points/common
External Connections	Removable terminal block with M3 screw terminals
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	Two, 4-A fuses (one per common) (Burnout time: 5 s max. at 200% of rated current)
Surge Suppressor	None
Other Output Protection	None
Number of Outputs	16
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during output processing F: Lights when fuse is burnt out or output power supply is not connected
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	12/24 VDC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	220 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	7.1 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

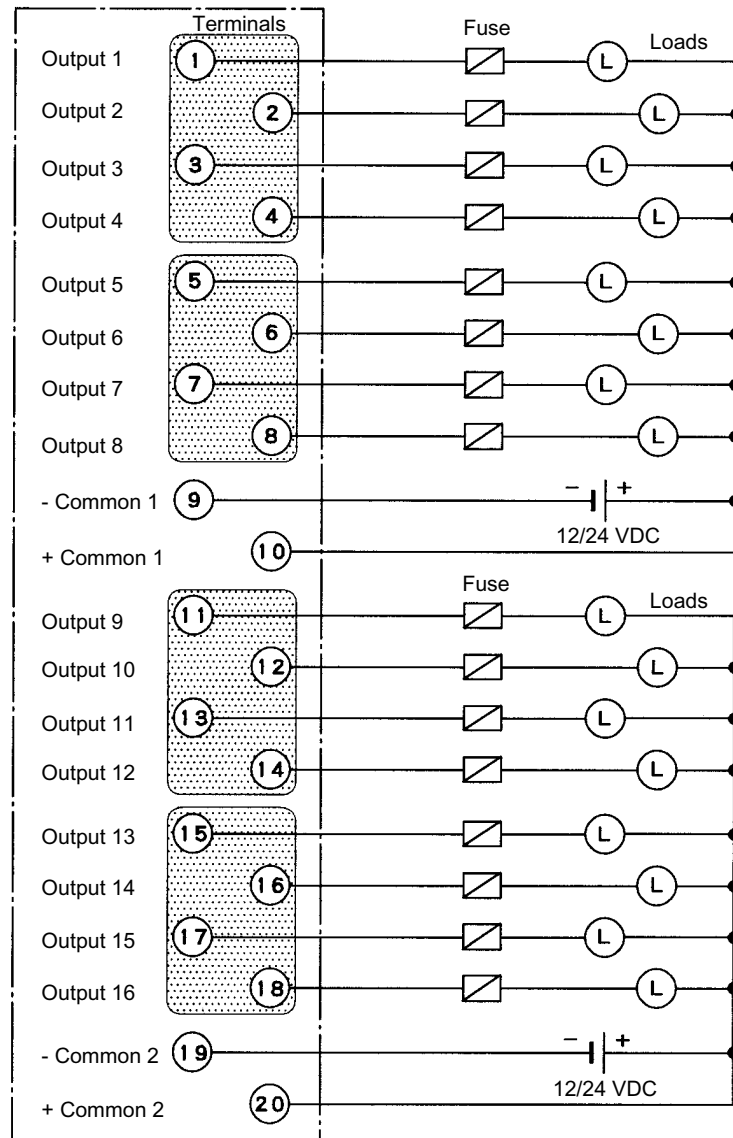


CAUTION If using a 12/24-VDC 16-point Output Module (sinking), connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



CAUTION Although a 0.5 A load can be connected to each output point of the 12/24-VDC 16-point Output Module (sinking), the total load must be 1.0A or less for each of the four output points shown in the shaded areas. Keep the load distribution within the 1.0A limit.

If this limit is exceeded, damage may occur to the output circuit.

CAUTION If using a 12/24-VDC 16-point Output Module (sinking), connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

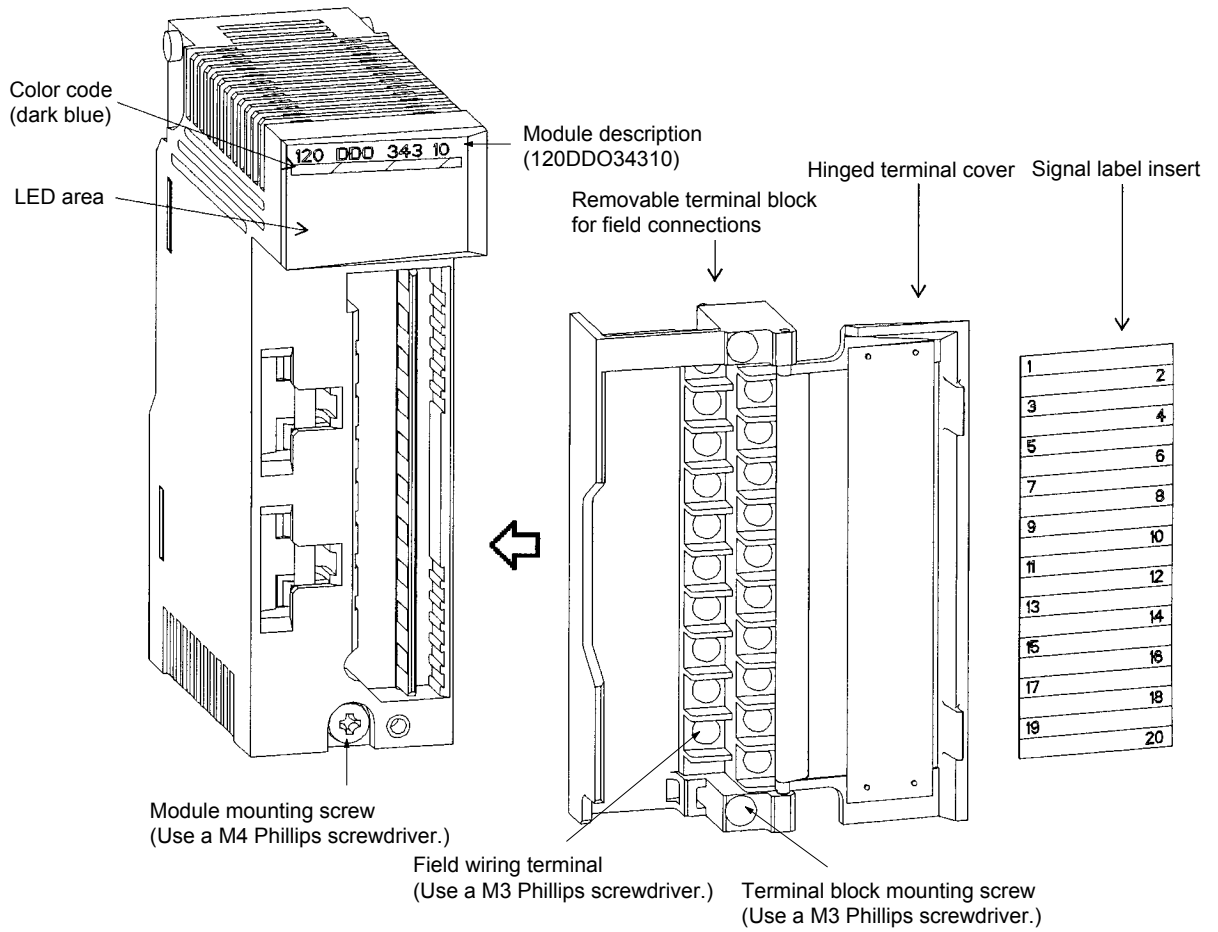
Note: (1) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

(2) Recommended Wires

Use wires of 0.8mm² (AWG18) to 0.2mm² (AWG24) to connect to the terminal block.

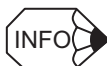
4) External Appearance



LED Area

120 DDO 343 10	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Fuse blown out, or external power supply not connected.
1 to 16	Green	The corresponding LED is lit when the output signal is ON.



- Users can replace the fuses.

5) Spare Parts

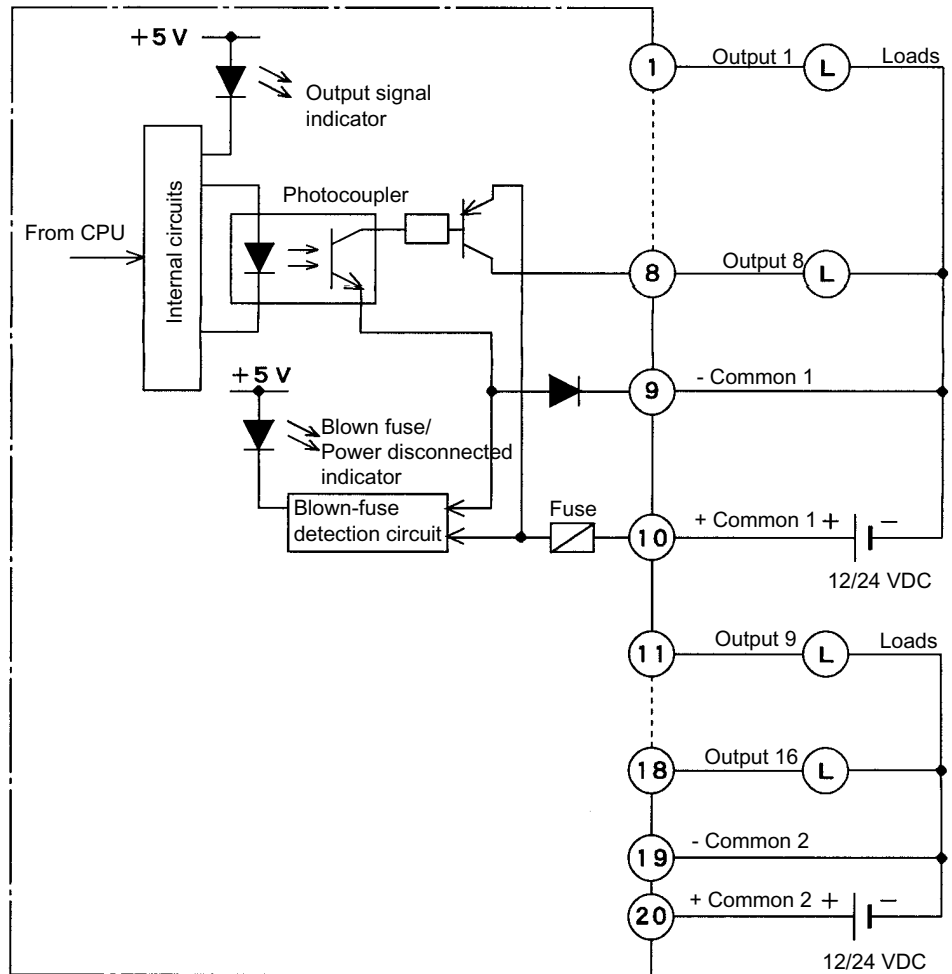
Reserve the following spare part for maintenance.
 Fuse Type: 235004 (LITTEL FUSE)

3.2.5 12/24-VDC 16-point Output Module (Sourcing)

1) Performance Specifications

Item	Specifications
Name	12/24-VDC 16-point Output Module (Sourcing)
Model Name	DC24OUT-16PSR
Model No.	JAMSC-120DDO34320
Rated Voltage	12/24 VDC
Allowable Voltage Range	10.2 to 30.0 VDC
Output Form	Sourcing
Maximum Load Current	0.5 A/point, 1.0 A/4 points
Output Voltage Drop	1.5 V max (0.5 A)
Output Delay Times	OFF to ON: 1 ms max. ON to OFF: 1 ms max.
OFF Leakage Current	1 mA max. at 24 VDC
Output Type	Transistor outputs
Number of Commons	2
Number of Outputs per Common	8 points/common
External Connections	Removable terminal block with M3 screw terminals
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	Two, 4-A fuses (one per common) (Burnout time: 5 s max. at 200% of rated current)
Surge Suppressor	None
Other Output Protection	None
Number of Outputs	16
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during output processing F: Lights when fuse is burnt out or output power supply is not connected
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	12/24 VDC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	300 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	7.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

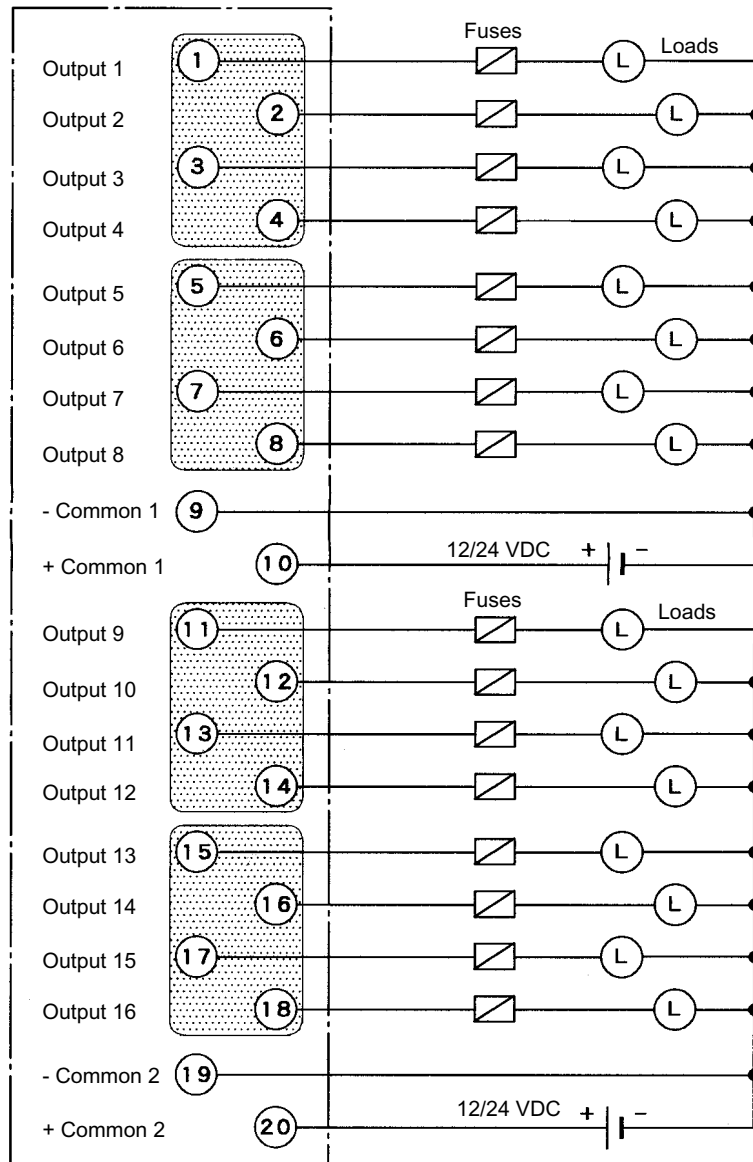


CAUTION If using a 12/24-VDC 16-point Output Module (sourcing), connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



CAUTION Although a 0.5 A load can be connected to each output point of the 12/24-VDC 16-point Output Module (sourcing), the total load must be 1.0 A or less for each of the four output points shown in the shaded area. Keep the load distribution within the 1.0 A limit.

If this limit is exceeded, damage may occur to the output circuit.

CAUTION If using a 12/24-VDC 16-point Output Module (sourcing), connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 16-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

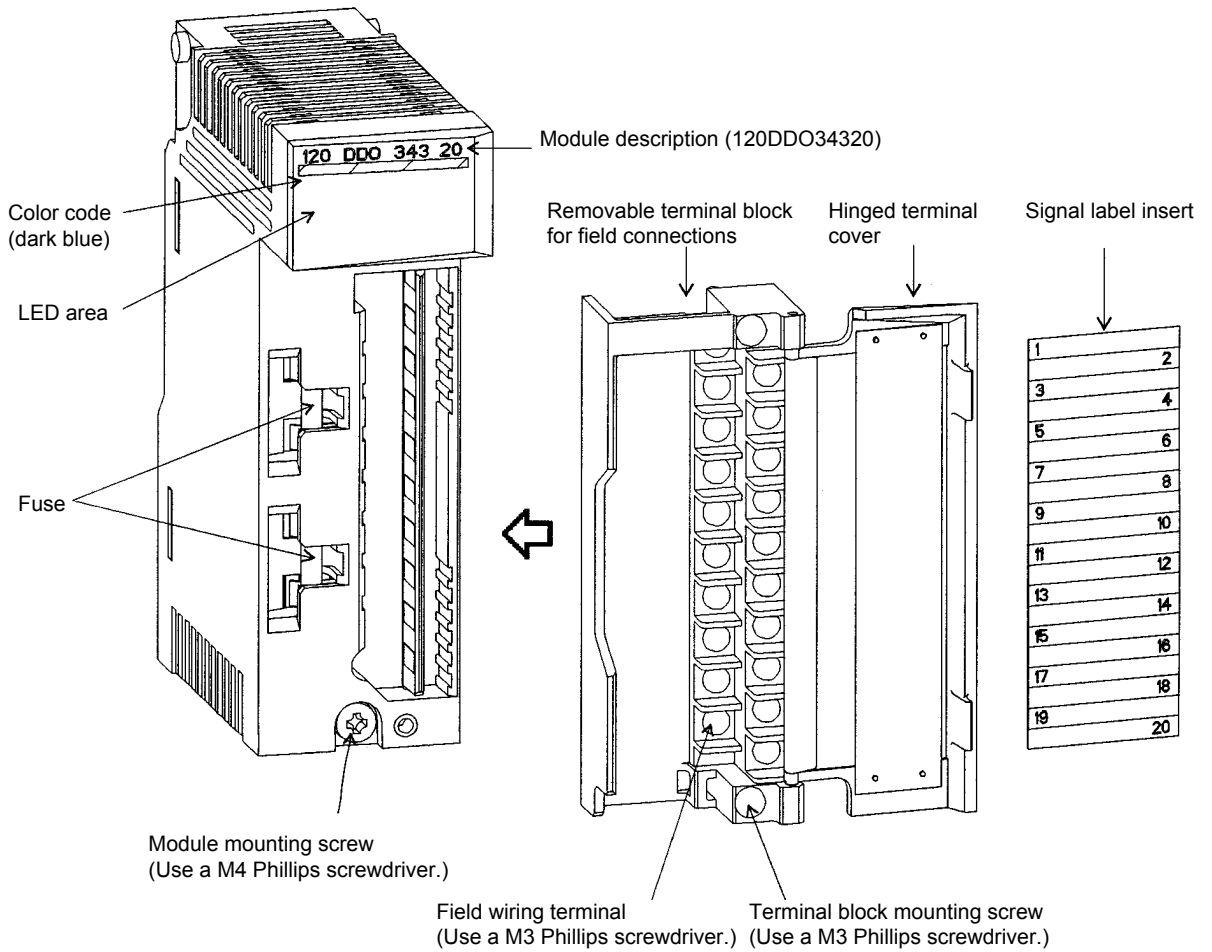
Note: (1) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

(2) Recommended Wires

Use wires of 0.8mm² (AWG18) to 0.2mm² f(AWG24) to connect to the terminal block.

4) External Appearance



LED Area	
120 DDO 343 20	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Fuse blown out, or external power supply not connected.
1 to 16	Green	The corresponding LED is lit when the output signal is ON.



- Users can replace the fuses.

5) Spare Parts

Reserve the following spare part for maintenance.

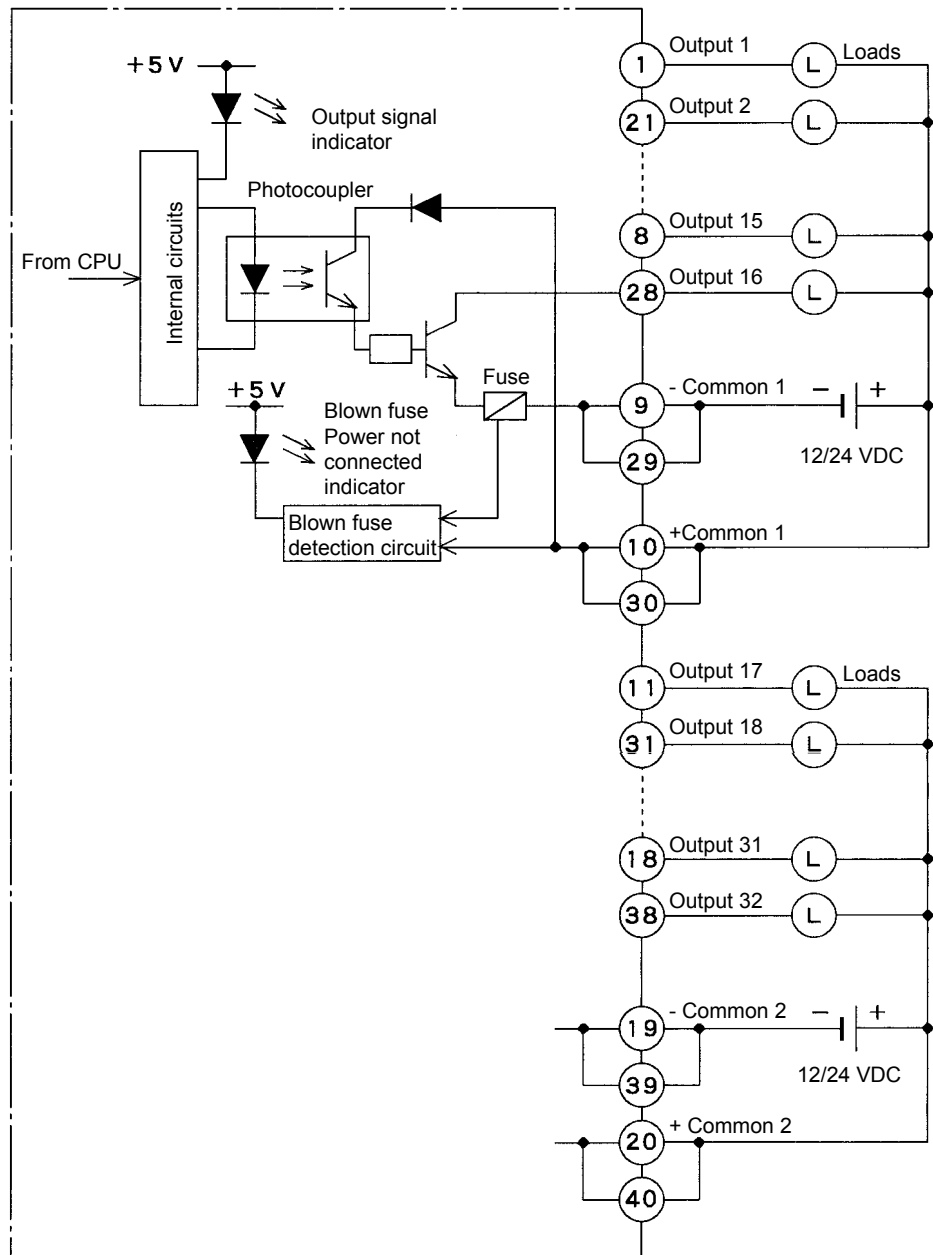
Fuse Type: 235004 (LITTEL FUSE)

3.2.6 12/24-VDC 32-point Output Module

1) Performance Specifications

Item	Specifications
Name	12/24 VDC 32-point Output Module
Model Name	DC24OUT-32P
Model No.	JAMSC-120DDO35410
Rated Voltage	12/24 VDC
Allowable Voltage Range	10.2 to 30.0 VDC
Output Form	Sinking
Maximum Load Current	0.3 A/point, 0.4 A/4 points
Output Voltage Drop	1.5 V max (0.3 A)
Output Delay Times	OFF to ON: 1 ms max. ON to OFF: 1 ms max.
OFF Leakage Current	1 mA max. at 24 VDC
Output Type	Transistor outputs
Number of Commons	2
Number of Outputs per Common	16 points/common
External Connections	40-pin connector: one piece Connector: 10340-52A2JL (manufactured by 3M)
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	Two, 3.5-A fuses (one per common) (Burnout time: 1 s max. at 200 % of rated current)
Surge Suppressor	None
Other Output Protection	None
Number of Outputs	32
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic.
Status Indication	ACTIVE: Lights during output processing F: Lights when fuse is burnt out or output power supply is not connected
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals (connected together) and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	12/24 VDC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	330 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	6.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.



CAUTION Do not replace the built-in fuse of the 12/24-VDC 32-point Output Modules.

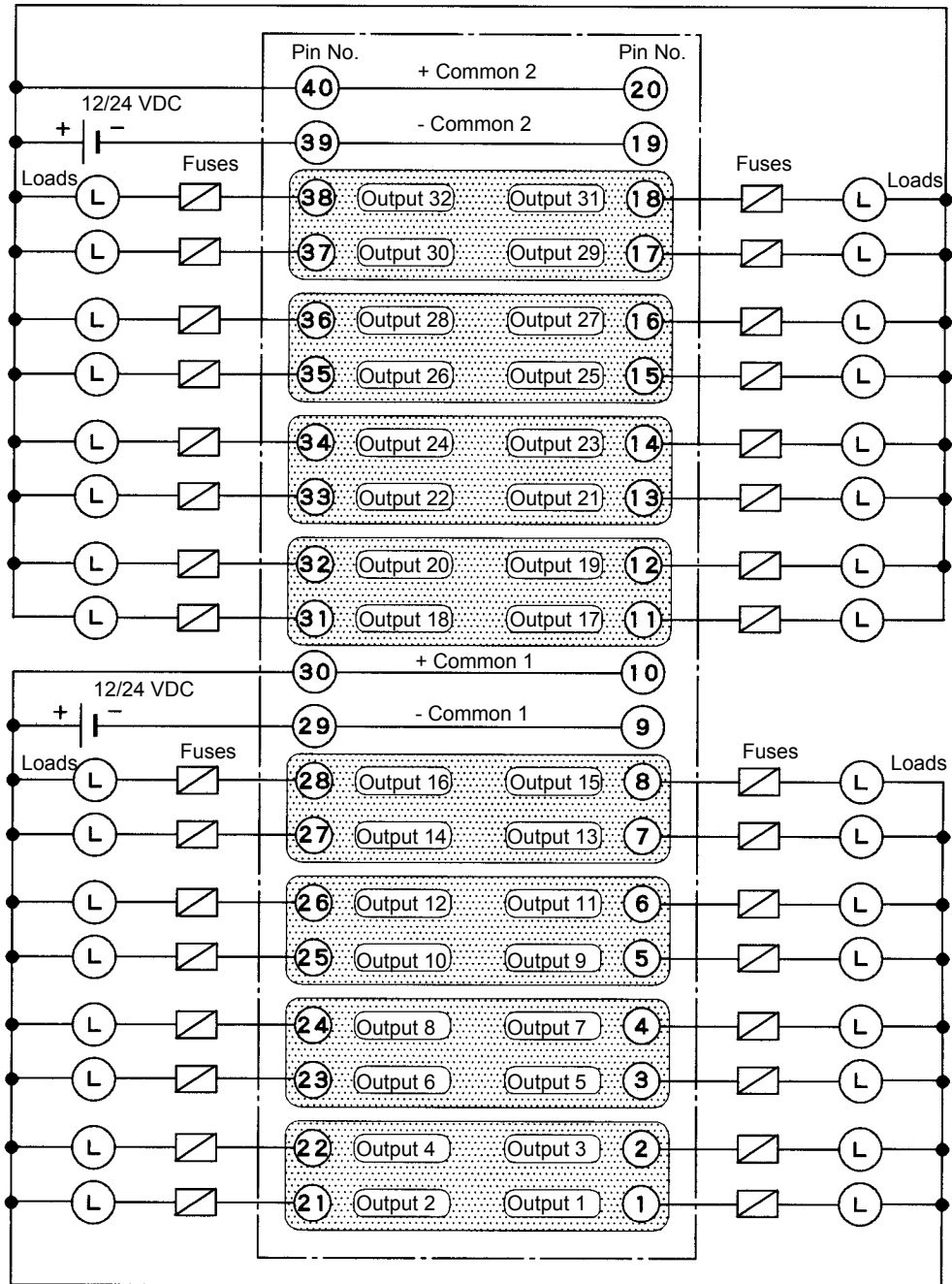
If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, failure or malfunction may occur in the Modules.

CAUTION If using a 12/24-VDC 32-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 32-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



CAUTION Although a 0.3 A load can be connected to each output point of 12/24-VDC 32-point Output Module, the total load must be 0.4 A or less for each of the four output points shown in the shaded area. Keep the load distribution within the 0.4 A limit.

If this limit is exceeded, damage may occur to the output circuit.

CAUTION If using a 12/24-VDC 32-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 32-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) Pins 9 and 29, pins 19 and 39, pins 10 and 30, pins 20 and 40 are internally connected. Connect these pins externally as well, otherwise, malfunction may occur.

(2) Connector for External Connections

On the Module: 10240-52A2JL (made by 3M)

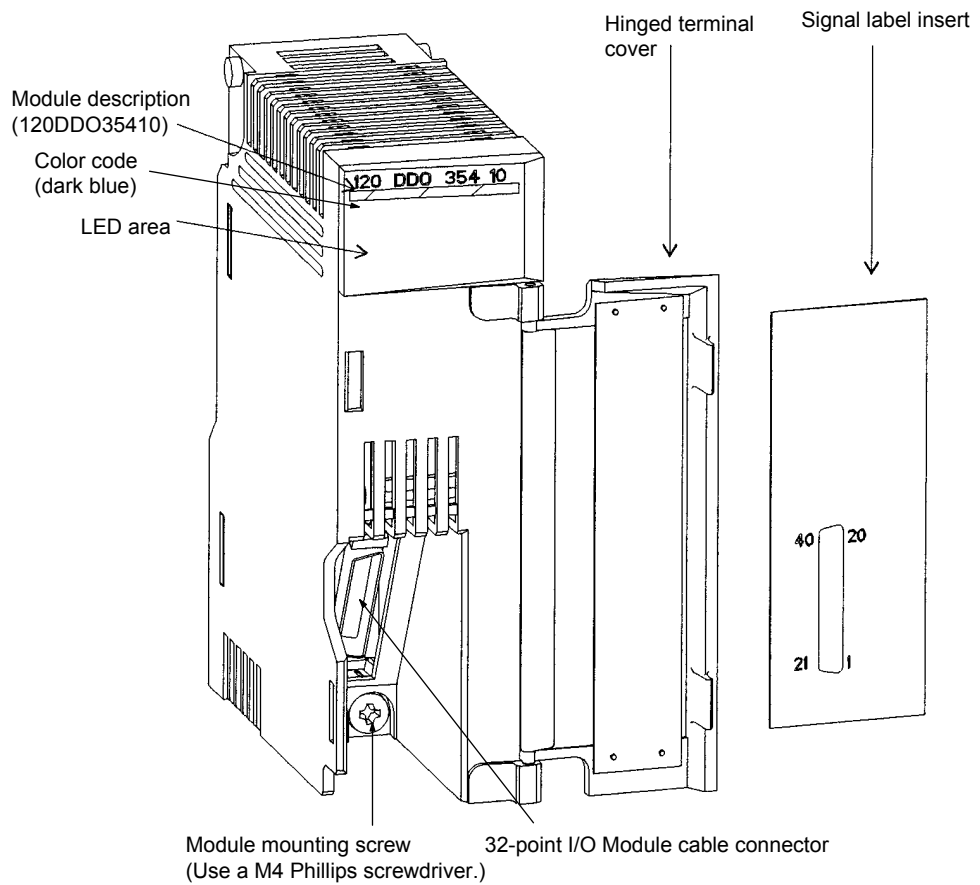
(3) Recommended Wires

Use wires of 0.08mm² (AWG28) to connect to each connector pin.

(4) External Connection Cable

Use a 32-point I/O Module Cable to connect to field devices. Refer to 3.3 I/O Module Cables for details.

4) External Appearance



3

LED Area			
120 DDO 354 10			
	ACTIVE		F
1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Fuse blown out, or external power supply not connected.
1 to 32	Green	The corresponding LED is lit when the output signal is ON.

5) Special Purchase Components

The following components must be purchased separately.

- 32-point I/O Module Cable Type: JZMSZ-120W0300-□□
or
- 32-point I/O Module Cable Type: JZMSZ-120W0302-□□
or
- 32-point I/O Module Cable Type: JZMSZ-120W0301-□□
Terminal Block for 32-point I/O connector Type: XW2B-40F5-P
(manufactured by OMRON)

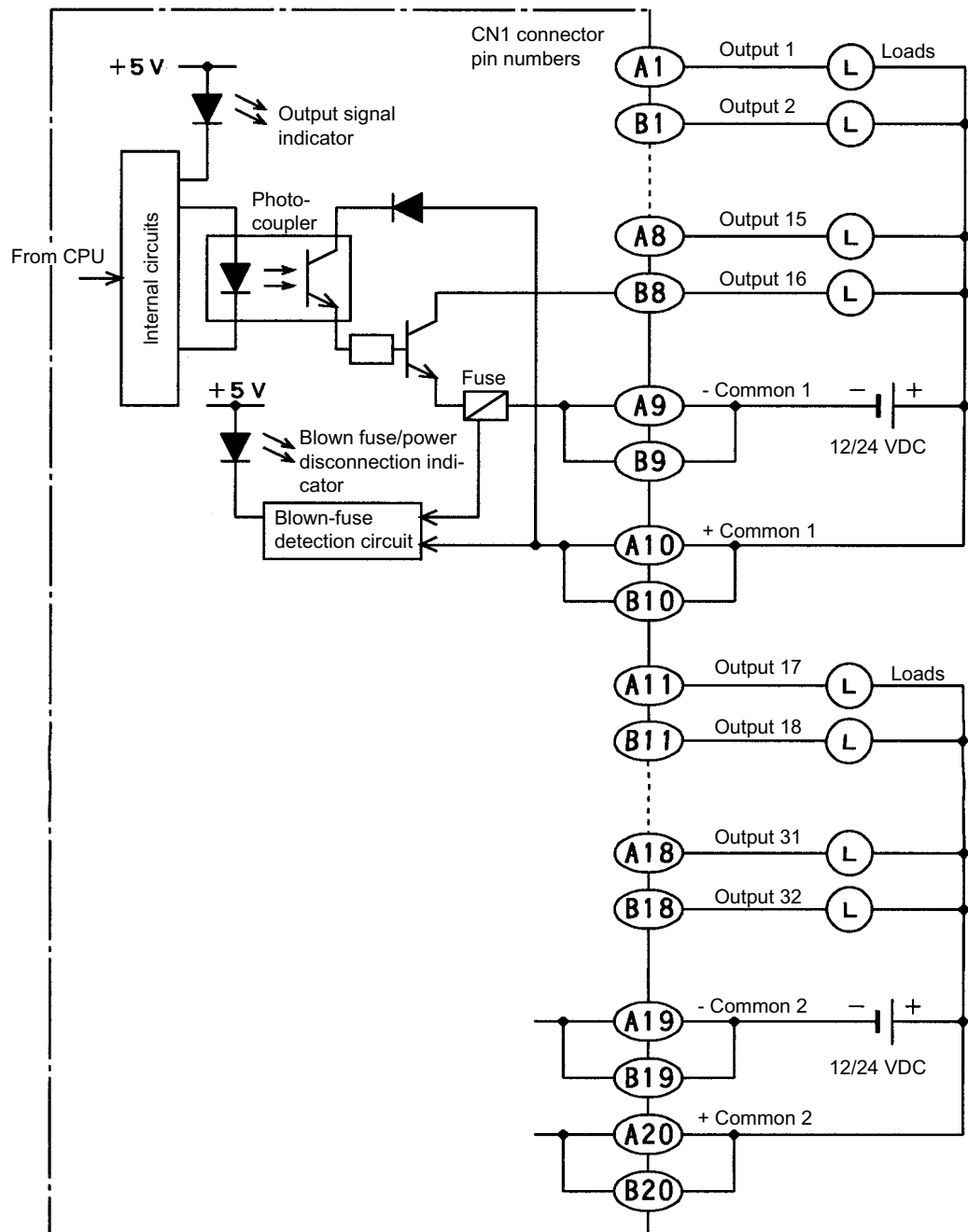
- Note:** (1) The symbol “-□□” in the type stands for the length of the cable. See section 3.3 *I/O Module Cables* for details.
- (2) The terminal block number for the 32-point I/O connector type (made by OMRON) is not that same as that for the 12/24-VDC 32-point Output Module. Refer to 3.3 *I/O Module Cables*.

3.2.7 12/24-VDC 64-point Output Module

1) Performance Specifications

Item	Specifications
Name	12/24-VDC 64-point Output Module (Sinking)
Model Name	DC24OUT-64PSN
Model No.	JAMSC-120DDO36410
Rated Voltage	12/24 VDC
Allowable Voltage Range	10.2 to 30.0 VDC
Output Form	Sinking
Maximum Load Current	0.1 A/points
Output Voltage Drop	1.5 V max (0.1 A)
Output Delay Times	OFF to ON: 1 ms max. ON to OFF: 1 ms max.
OFF Leakage Current	1 mA max. at 24 VDC
Output Type	Transistor outputs
Number of Commons	4
Number of Outputs per Common	16 points/common
External Connections	40-pin connector: 2 pieces Connector: FCN-365P040 (manufactured by Fujitsu)
Output Protection Type	Unprotected outputs (according to JIS B3502)
Built-in Fuse	Four, 2-A fuses (one per common) (Burnout time: 1 s max. at 200 % of rated current)
Surge Suppressor	None
Other Output Protection	None
Number of Outputs	64
Output Signal Indication	Indicator for each point; lit when output is ON. Status saved in internal logic. 32 indicators controlled by toggle switches
Status Indication	ACTIVE: Lights during output processing F: Lights when fuse is burnt out or output power supply is not connected
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	12/24 VDC supplied to drive loads
Derating Conditions	None
Internal Current Consumption	650 mA max. at 5 VDC (with all points ON)
Maximum Heating Value	13 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.

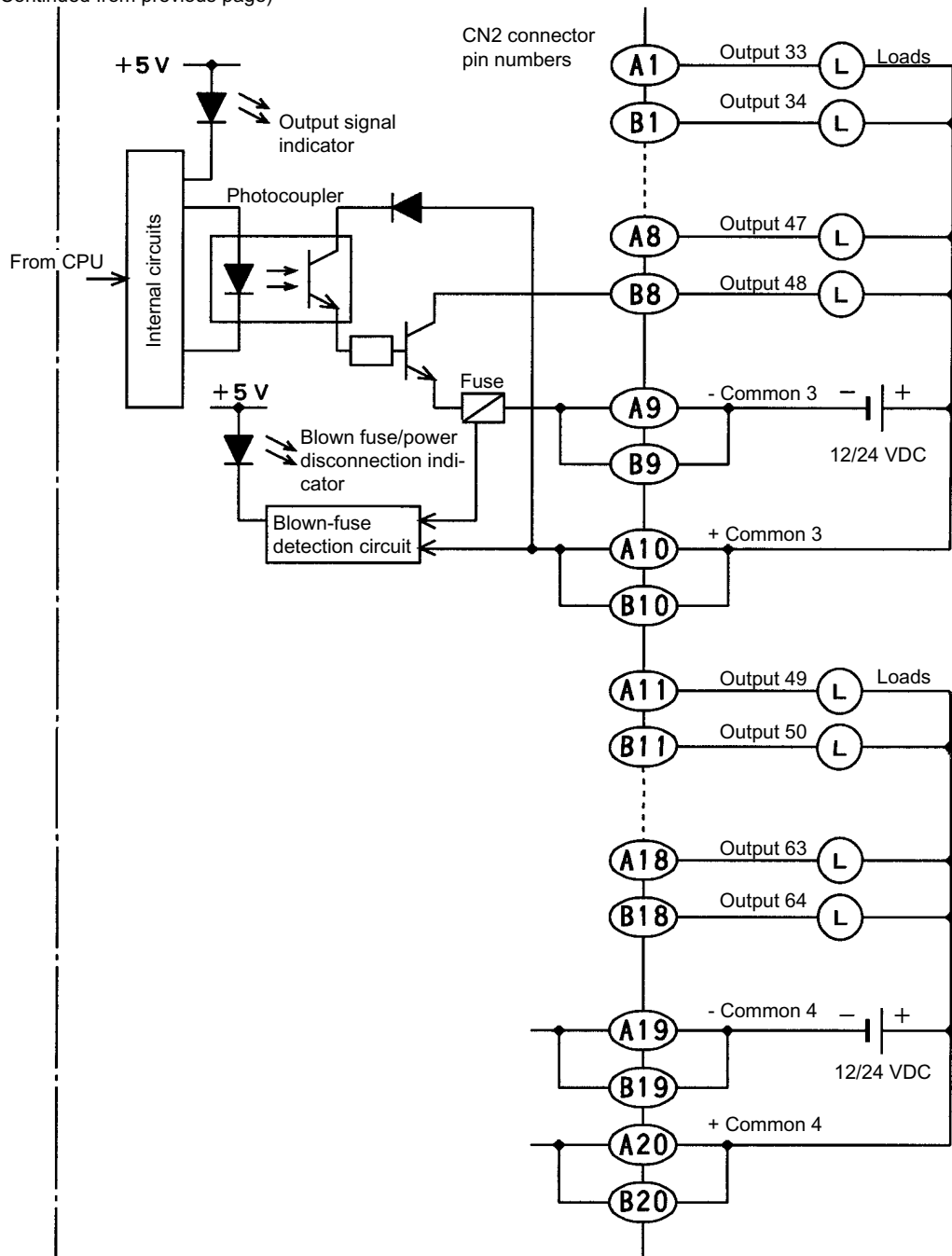


(Continued on next page)

⚠ CAUTION Do not replace the built-in fuse of the 12/24-VDC 64-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, failure or malfunction may occur in the Modules.

(Continued from previous page)

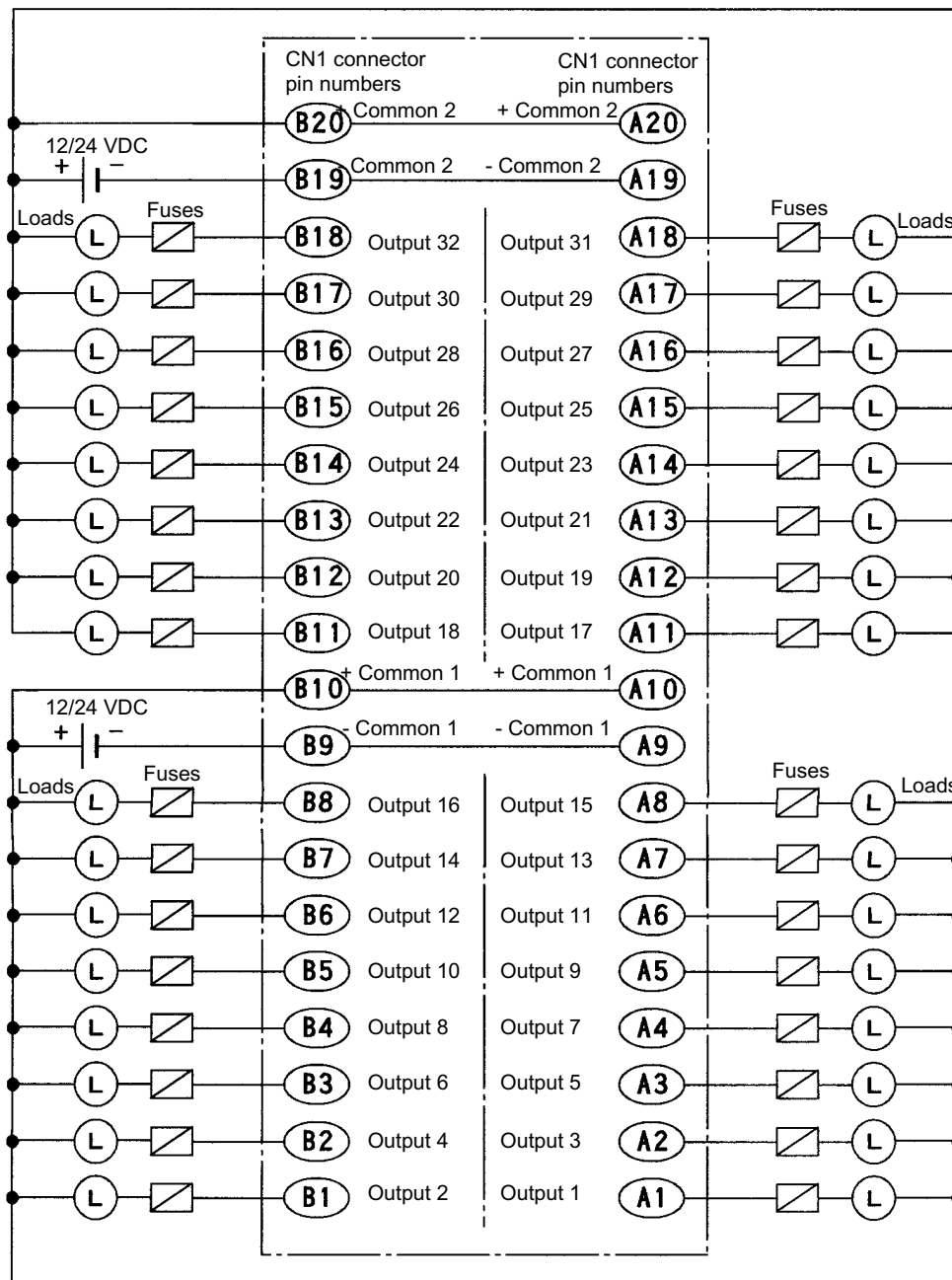


CAUTION If using a 12/24-VDC 64-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 64-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following diagram shows an example of terminal connections.

◀ EXAMPLE ▶



(Continued on next page)

CAUTION If using a 12/24-VDC 64-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse built into the following 12/24-VDC 64-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) CN1 pins A9 and B9, pins A10 and B10, pins A19 and B19, and pins A20 and B20 are internally connected. Connect these pins externally as well. Not connecting them can cause malfunction.

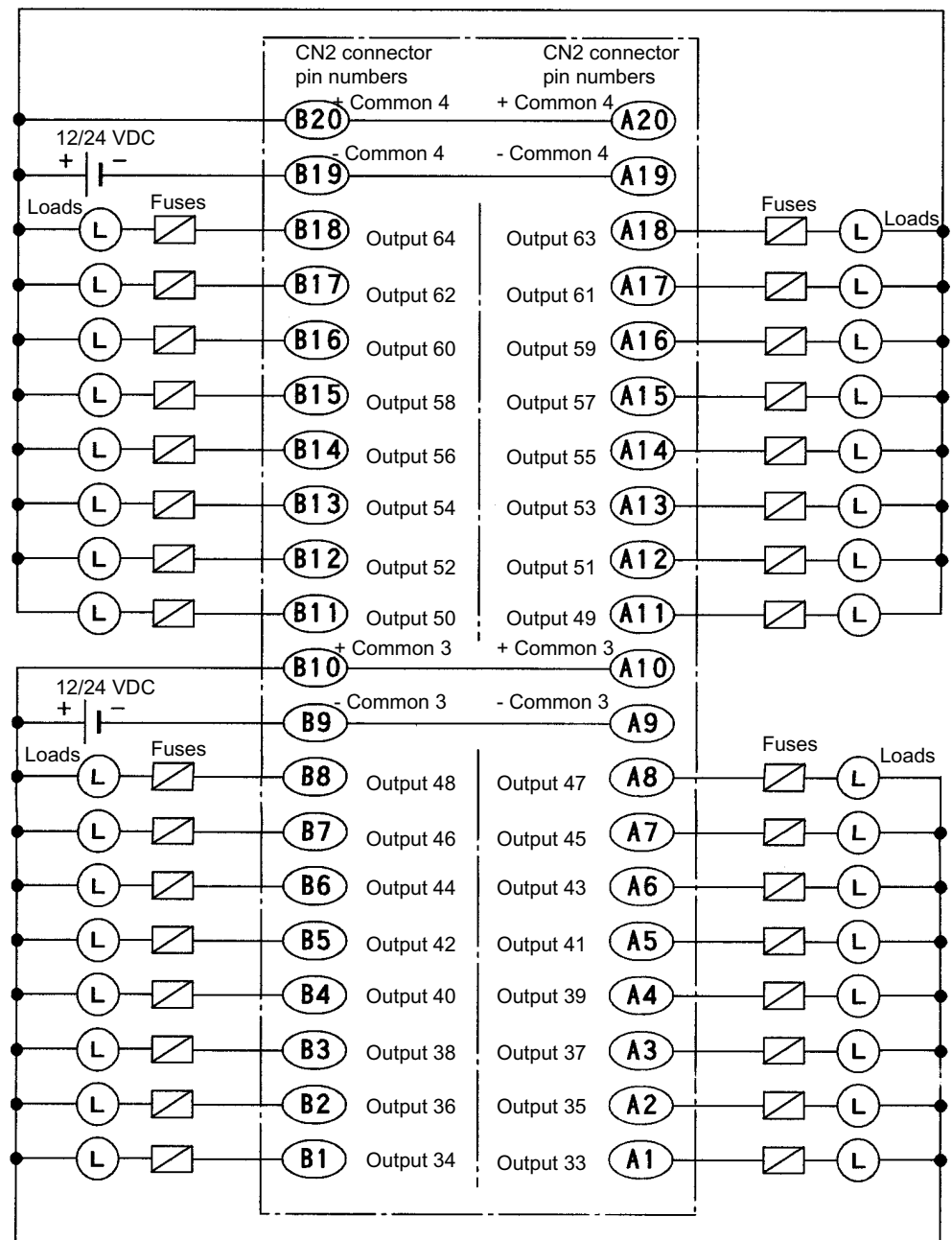
(2) Connector for External Connections (included)

Connector: FCN-361J040-AU (soldered) (manufactured by Fujitsu Ltd.)

Cover: FCN-360C040-B (manufactured by Fujitsu Ltd.)

(3) Recommended Wires

Use wires of 0.26 mm² (AWG23) to connect to each connector pin.



CAUTION If using a 12/24-VDC 64-point Output Module, connect a fuse, which complies with the load specifications, in series with the load.

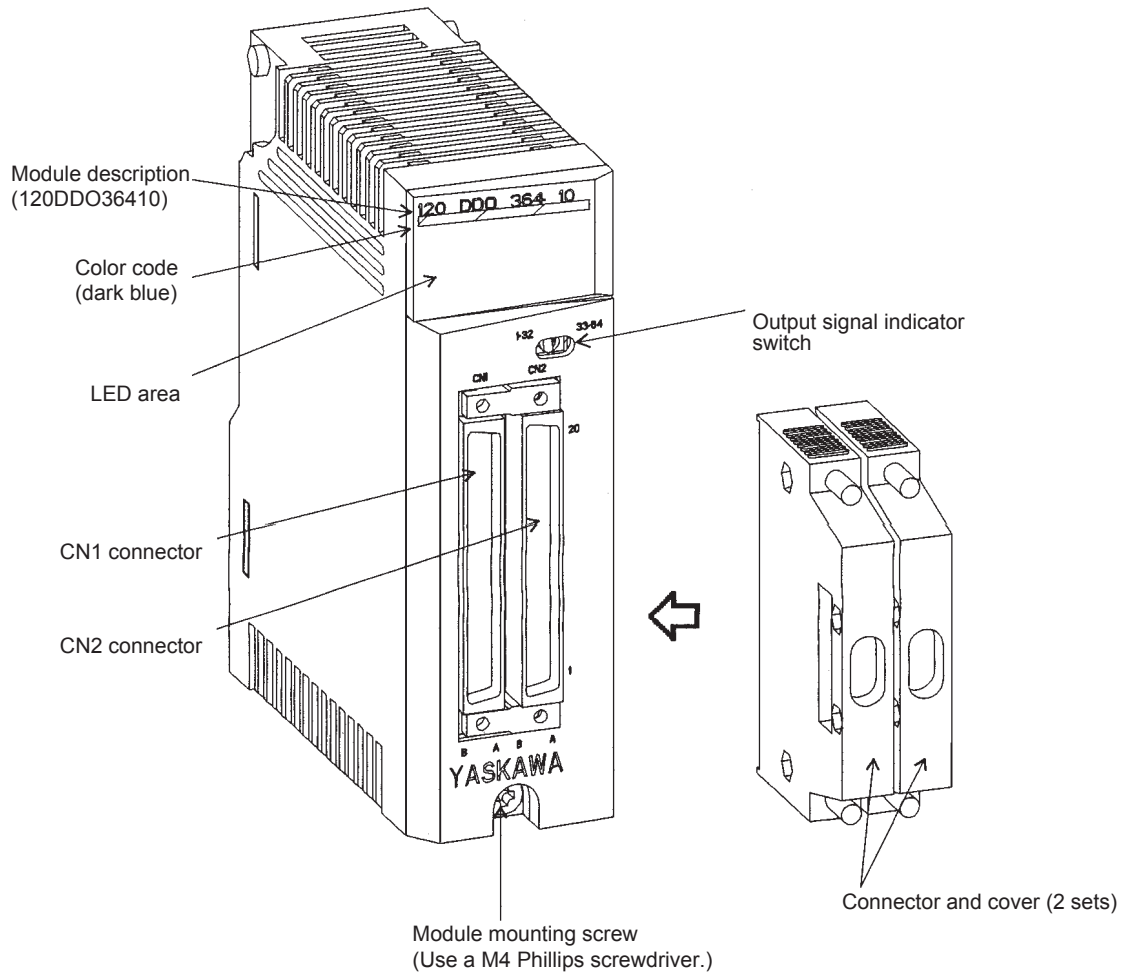
A protective fuse built into the following 12/24-VDC 64-point Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) CN2 pins A9 and B9, pins A10 and B10, pins A19 and B19, and pins A20 and B20 are internally connected. Connect these pins externally as well. Not connecting them can cause malfunction.

(2) External Connection Cable

Two pairs of connectors to connect the external output signal and a 64-point I/O Module Cable to connect to field devices are provided. For details, refer to 3.3 *I/O Module Cables*.

4) External Appearance



LED Area			
120 DDO 364 10			
	ACTIVE		F
1	9	17	25
2	10	18	26
3	11	19	27
4	12	20	28
5	13	21	29
6	14	22	30
7	15	23	31
8	16	24	32

LED	Color	Indication when ON	Output Signal Indicator Switch
ACTIVE	Green	Processing I/O.	—
F	Red	Fuse blown out, or external power supply not connected.	—
1 to 32	Green	Output signal (1 to 32) is ON.	Left side (1 to 32)
		Output signal (33 to 64) is ON.	Right side (33 to 64)

5) Accessories

The following items are included in the accessories.

- Connector for External Connections
 Connector: FCN-361J040-AU (soldered) (made by Fujitsu Ltd.)
 Cover: FCN-360C040-B (made by Fujitsu Ltd.)

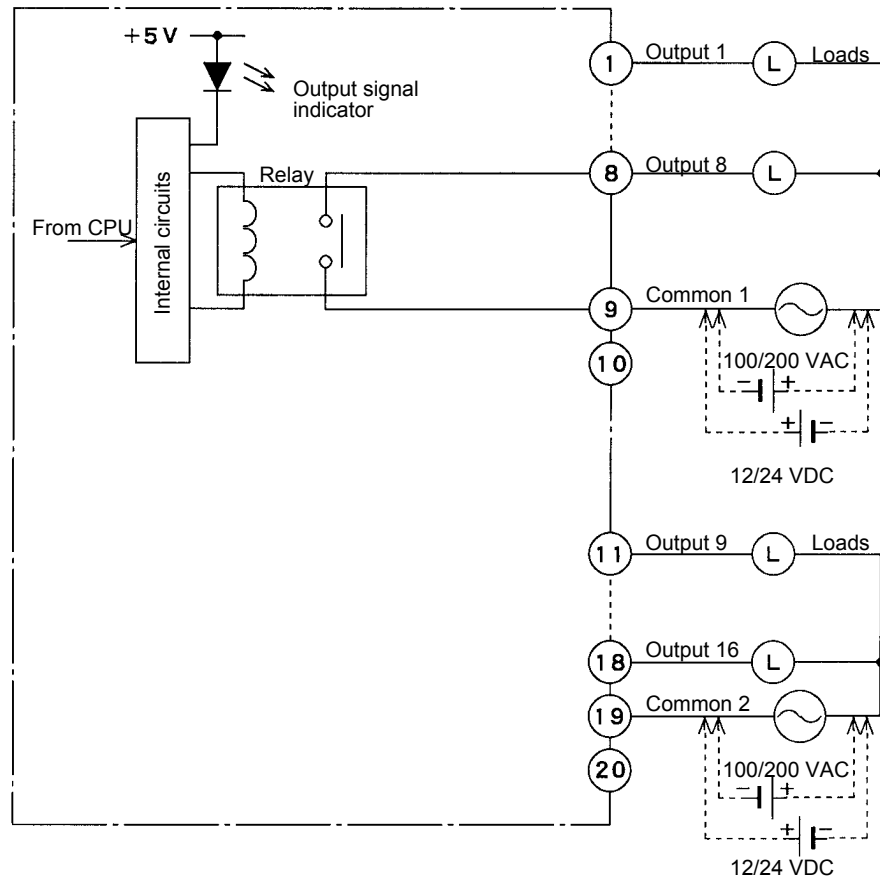
3.2.8 Relay Contact 16-point Output Module

1) Performance Specifications

Item		Specifications	
Name		Relay Contact 16-point Output Module	
Model Name		RELAY-16P	
Model No.		JAMSC-120DRA84300	
Contact Specifications	Rated Voltage/Current	200 VAC, 1 A, resistive load 24 VDC, 1 A, resistive load	
	Maximum Load Power	750 VA (AC loads) 90W (DC loads)	
	Maximum Load Voltage	264 VAC/125 VDC	
	Minimum Load Voltage/Current	100 mVDC, 0.1 mA	
	Contact Resistance	100 mΩ max.	
	Contact Life	Electrical	3 A at 30 VDC, resistive load: 100,000 operations min.
			1 A at 30 VDC, resistive load: 300,000 operations min. $\tau = 7$ ms: 150,000 operations min. $\tau = 40$ ms: 40,000 operations min.
			1 A at 120 VAC, $\cos\phi = 1.0$: 400,000 operations min. $\cos\phi = 0.4$: 250,000 operations min.
			1 A at 240 VAC, $\cos\phi = 1.0$: 300,000 operations min. $\cos\phi = 0.4$: 200,000 operations min.
		Mechanical	20 million operations min.
Output Delay Times		OFF to ON: 10 ms max. ON to OFF: 15 ms max.	
Output Type		Relay contact outputs	
Number of Commons		2	
Number of Outputs per Common		8 points/common	
Output Power Supply per Common		Connect power supplies of the same phase to the Common 1 and Common 2 for 100/200VAC.	
External Connections		Removable terminal block with M3 screw terminals	
Output Protection Type		Unprotected outputs (according to JIS B3502)	
Built-in Fuse		None	
Surge Suppressor		None	
Other Output Protection		None	
Number of Outputs		16	
Output Signal Indication		Indicator for each point; lit when the output is ON. Status saved in internal logic.	
Status Indication		ACTIVE: Lights during output processing	
Insulation Method		Relay	
Dielectric Strength		1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons	
Insulation Resistance		100 MΩ min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).	
External Power Supply		100/200 VAC or 24 VDC supplied to drive loads	
Derating Conditions		None	
Internal Current Consumption		610 mA max. at 5 VDC (with all points ON)	

Item	Specifications
Maximum Heating Value	3.1 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.



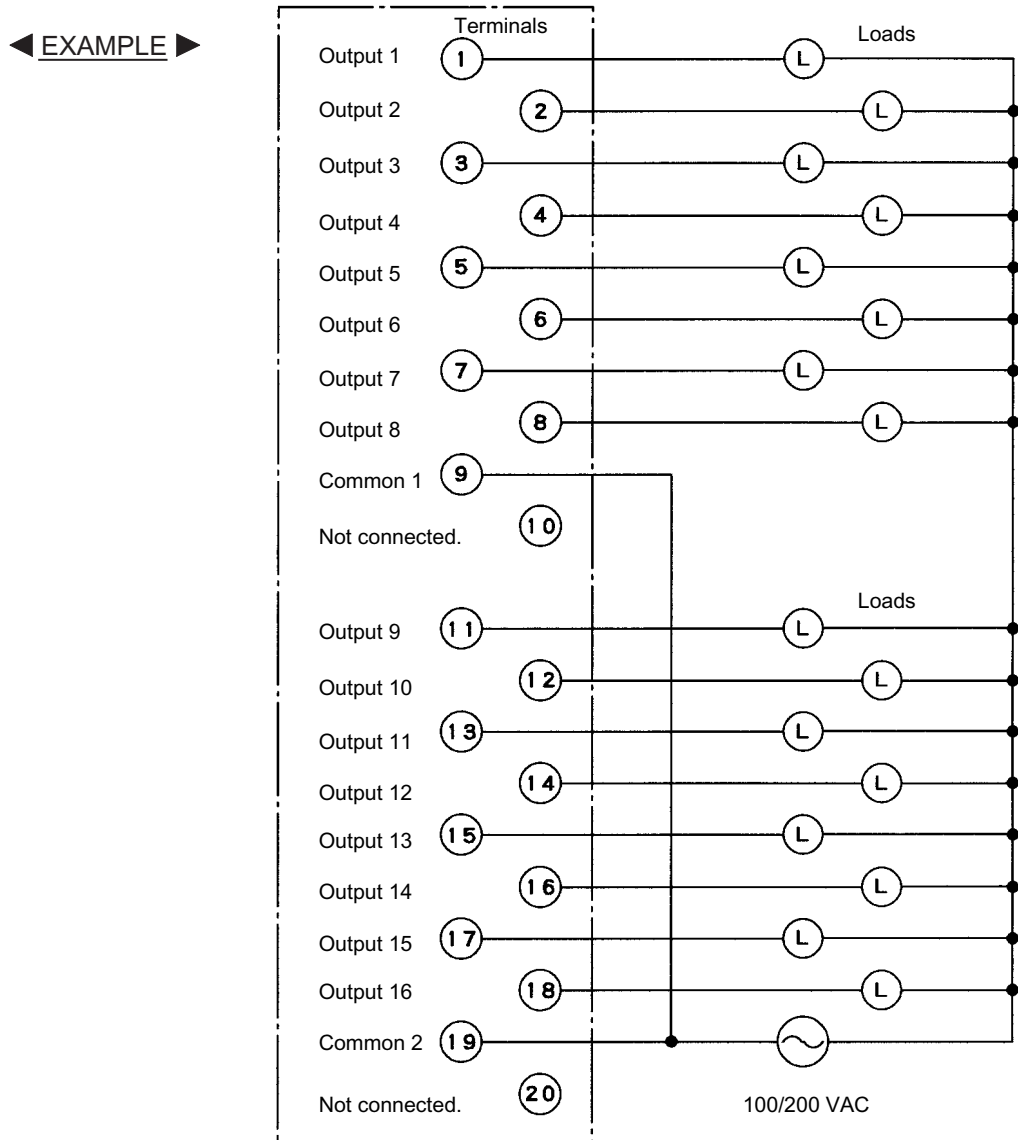
CAUTION If using a single-phase 100/200-VAC power supply for driving loads of the Relay Contact Output Module, connect a power supply of the same phase to the Common 1 and Common 2 of the Relay Contact Output Module.

If power supplies of different phases are connected, overheating or fire may occur.

CAUTION If using a Relay Contact Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse does not built into the following Relay Contact Output Modules. If a fuse is not connected, fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

3) The following illustration shows an example of terminal connections with AC loads.



CAUTION If using a single-phase 100/200-VAC power supply for driving loads of the Relay Contact Output Module, connect a power supply of the same phase to the Common 1 and Common 2 of the Relay Contact Output Module.

If power supplies of different phases are connected, overheating or fire may result.

CAUTION If using a Relay Contact Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse does not built into the following Relay Contact Output Modules. If a fuse is not connected, fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

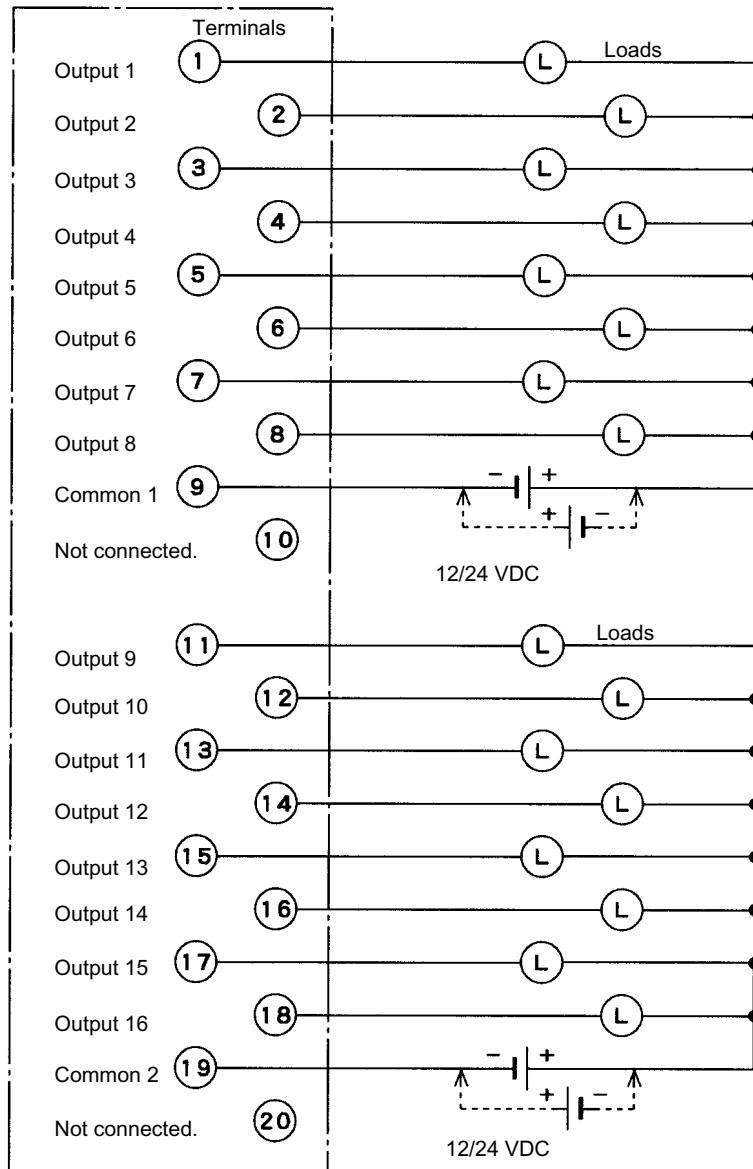
(2) Recommended Wires

Use wires of 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block. Use cables of the size more than 1.3 mm² (AWG16) for common lines.

(3) Terminal 10 and terminal 20 are not connected.

4) The following diagram shows an example of terminal connections with DC loads.

◀ EXAMPLE ▶



⚠ CAUTION If using a Relay Contact Output Module, connect a fuse, which complies with the load specifications, in series with the load.

A protective fuse does not built into the following Relay Contact Output Modules. If a fuse is not connected, fire or damage to the devices or output circuits may occur if the load is short-circuited or the circuit overloaded.

Note: (1) Crimp Terminals

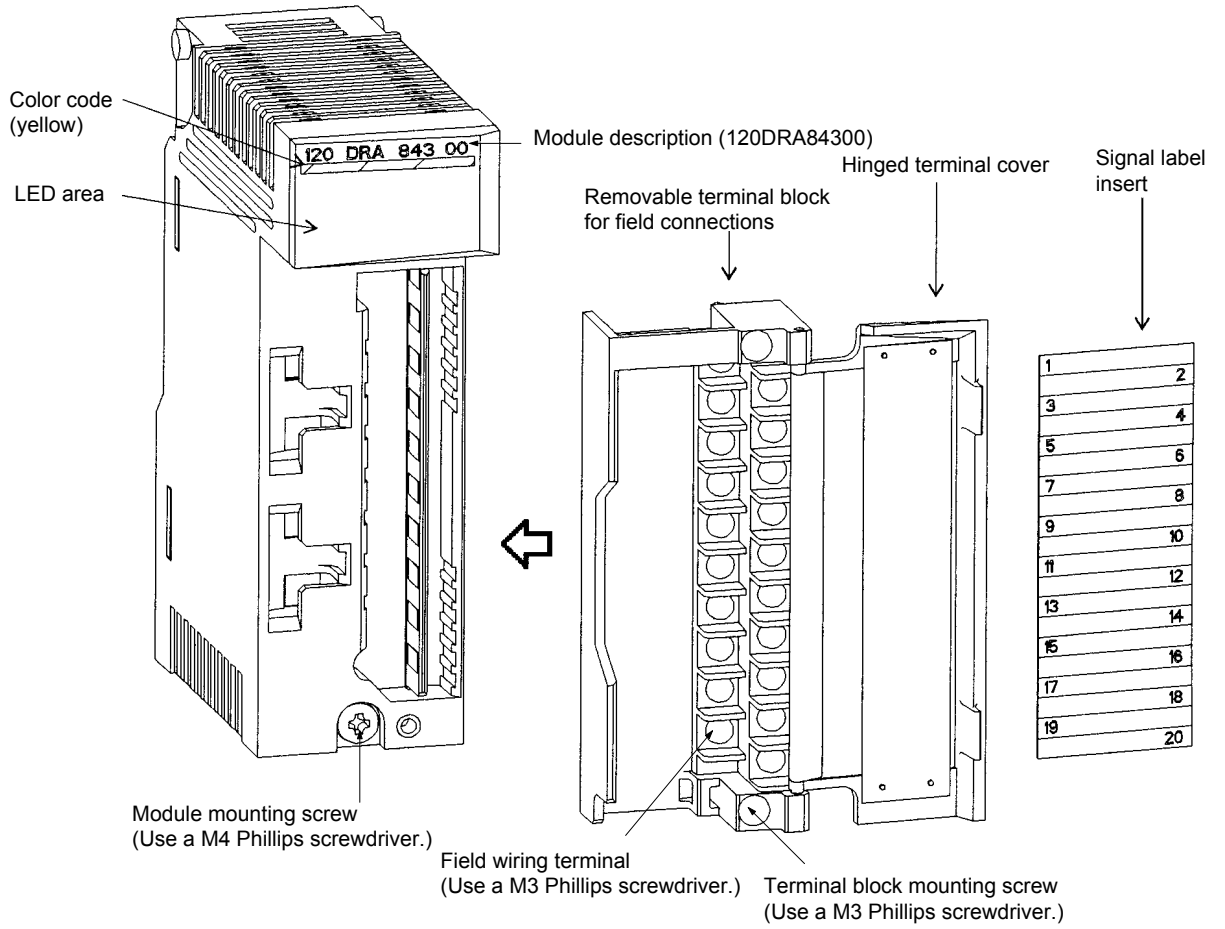
Use M3 terminals for crimping to the terminal block.

(2) Recommended Wires

Use wires of 0.8 mm² (AWG18) to 0.2 mm² (AWG24) to connect to the terminal block.

(3) Terminal 10 and terminal 20 are not connected.

5) External Appearance



LED Area

120 DRA 843 00	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O.
F	Red	Always not lit.
1 to 16	Green	The corresponding LED is lit when the output signal is ON.

3.3 I/O Module Cables

This section describes the use and types together with the specifications of the I/O Module Cables.

3.3.1 I/O Module Cable Types	3-60
3.3.2 W0300 Cables (Model No. JZMSZ-120W0300-□□)	3-62
3.3.3 W0302 Cables (Model No. JZMSZ-120W0302-□□)	3-65
3.3.4 W0301 Cables (Model No. JZMSZ-120W0301-□□)	3-68
3.3.5 32-point I/O Connector Terminal Block	3-71
3.3.6 W5410 Cables (Model No. JEPMC-W5410-□□)	3-74

3.3.1 I/O Module Cable Types

1) 32-point I/O Module Cables

a) Use

The 32-point I/O Module Cables are used to connect external devices to the Modules listed below.

- 12/24-VDC 32-point Input Module (Model No. JAMSC-120DDI35400)
- 12/24-VDC 32-point Output Module (Model No. JAMSC-120DDO35410)
- One-axis Motion Module (Model No. JAMSC-120MMB10100)
- Two-axis Motion Module (Model No. JAMSC-120MMB20200)

b) Types

There are nine types of 32-point I/O Module Cables, as shown in the following table.

Table 3.1 32-point I/O Module Cables

Product	Name	Model Name	Model Number	Features	Cable Length
32-point I/O Module Cables	W0300 Cable	W0300-01	JZMSZ-120W0300-01	1) Used to connect external devices to 32-point Input Modules, 32-point Output Modules, and Motion Control Modules (MC10 and MC15). 2) Cables provide connector on Module end and with loose wires (AWG28: 0.08 mm ²) on external device end.	1.0 m
		W0300-03	JZMSZ-120W0300-03		3.0 m
		W0300-05	JZMSZ-120W0300-05		5.0 m
	W0302 Cable	W0302-01	JZMSZ-120W0302-01	1) Used to connect external devices to 32-point Input Modules, 32-point Output Modules, and Motion Control Modules (MC10 and MC15). 2) Cables provide connector on Module end and with loose wires (AWG24: 0.2 mm ²) on external device end.	1.0 m
		W0302-03	JZMSZ-120W0302-03		3.0 m
		W0302-05	JZMSZ-120W0302-05		5.0 m
	W0301 Cable	W0301-01	JZMSZ-120W0301-01	1) Used to connect external devices to 32-point Input Modules, 32-point Output Modules, and Motion Control Modules (MC10 and MC15). 2) Cables provide connector on both Module and external device ends 3) Used in combination with a connector terminal block for 32-point I/O Modules.	1.0 m
		W0301-03	JZMSZ-120W0301-03		3.0 m
		W0301-05	JZMSZ-120W0301-05		5.0 m



The difference between the W0300 Cable and the W0302 Cable is the size of the end which connects to the Module Connector.

2) 64-point I/O Module Cables

a) Use

The 64-point I/O Module Cables are used to connect external devices to the following Modules.

- 12/24-VDC 64-point Input Module (Model No. JAMSC-120DDI36400)
- 12/24-VDC 64-point Output Module (Model No. JAMSC-120DDO36410)
- Register Input Module (Model No. JAMSC-120RDI34410)
- Register Output Module (Model No. JAMSC-120RDO34410)

b) Types

Three types of 64-point I/O Module Cables are available.

Table 3.2 64-point I/O Module Cables

Product	Name	Model Name	Model Number	Features	Cable Length
64-point I/O Module Cables	W5410 Cable	W5410-05	JEPMC-W5410-05	1) Used to connect external devices to 64-point I/O Modules. 2) Cables have a connector on the Module end and loose wires on the end for external device.	0.5 m
		W5410-10	JEPMC-W5410-10		1.0 m
		W5410-30	JEPMC-W5410-30		3.0 m

3.3.2 W0300 Cables (Model No. JZMSZ-120W0300-□□)

1) Use

- (1) This Cable is used to connect external devices to the Modules listed below.
 - (a) 12/24-VDC 32-point Input Module (Model No. JAMSC-120DDI35400)
 - (b) 12/24-VDC 32-point Output Module (Model No. JAMSC-120DDO35410)
- (2) The end of the Cable to the external device is loose wires.

2) Specifications

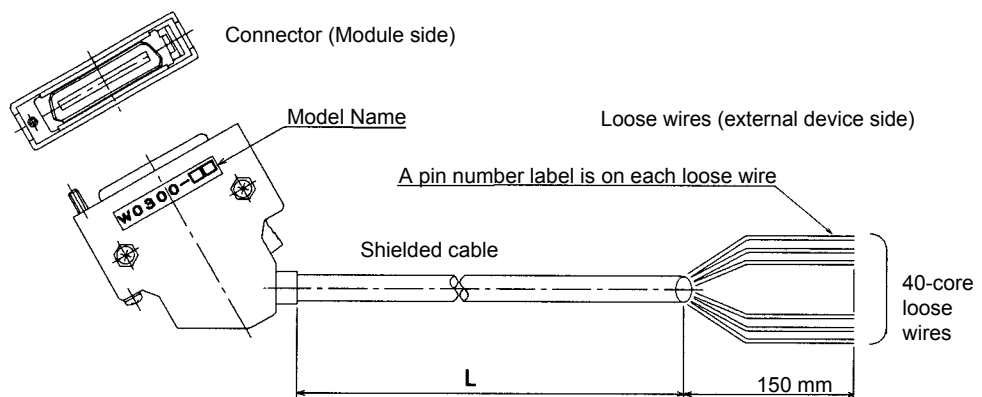
The following table shows specifications of W0300 Cables.

Table 3.3 Specifications of W0300 Cable

Item	Specifications		
Model Name	W0300-01	W0300-03	W0300-05
Model No.	JZMSZ-120W0300-01	JZMSZ-120W0300-03	JZMSZ-120W0300-05
Length L	1.0 m	3.0 m	5.0 m
Cable Specifications	Shielded cable, 40 cores, equivalent to UL20276, AWG28 (0.08 mm ²)		
Cable Termination	Module side	Connector: Connector 10140-6000EL (3M) Shell 10640-5500-008 (3M) Screw 3342-26 (3M) Latch 10600-LOF0-8 (3M)	
	External device side	Loose wires: Wire length 150 mm with pin number label on each wire.	
Insulation Resistance	100 MΩ min. at room temperature and humidity between core wires (connected together) and shielding wire, and between core wires (measured with a 500-VDC test voltage megohmmeter).		

3) Appearance

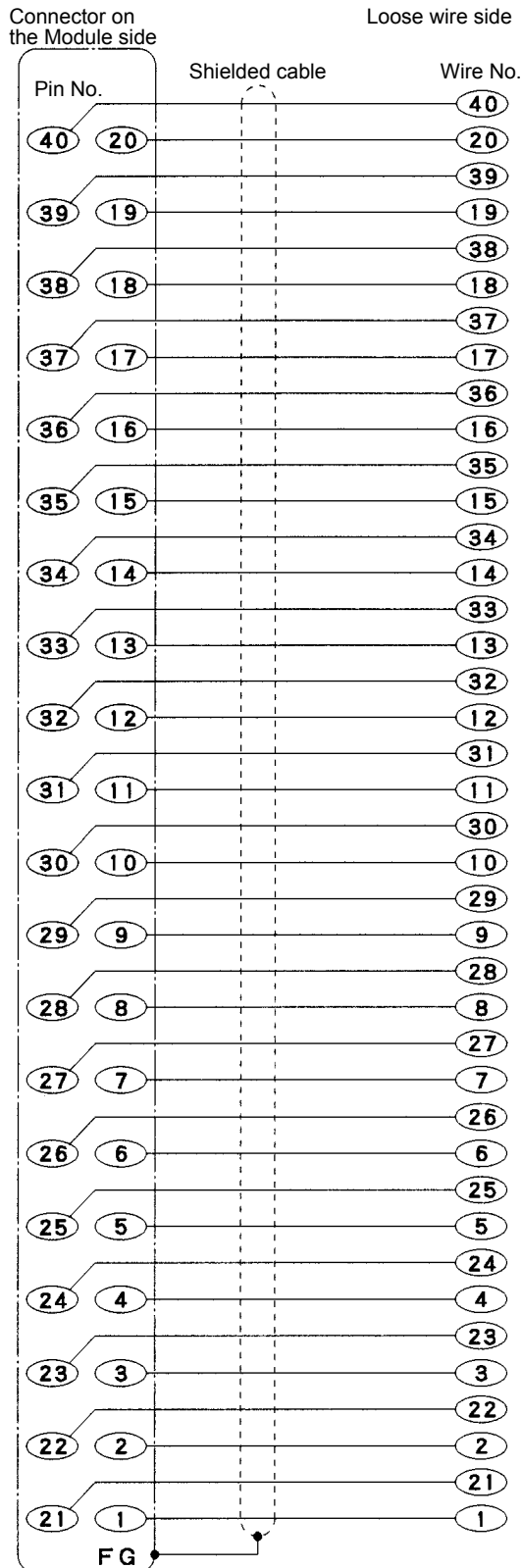
The following illustration shows the appearance of a W0300 Cable.



The difference between the W0300 Cable and the W0302 Cable is the size of the end which connects to the Module Connector.

4) Connecting to External Input Device with Cable W0300

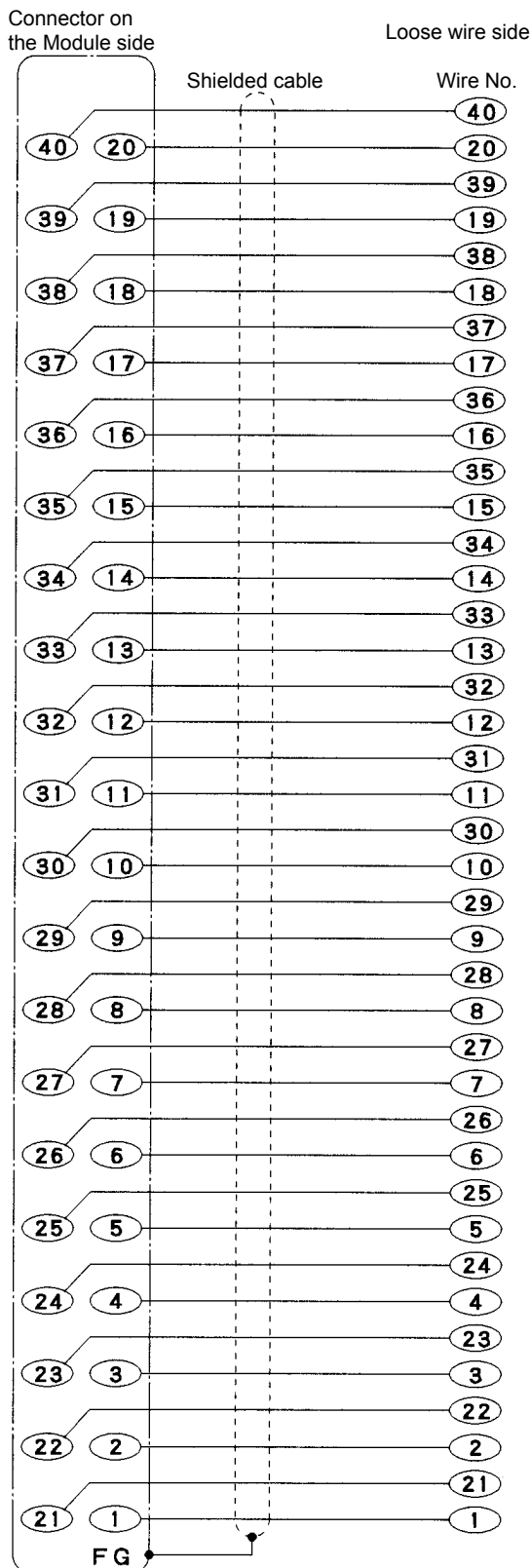
The following diagram shows signal names of wires when the W0300 Cable connects the 12/24-VDC 32-point Input Module to an external input device. Connector pin numbers and dot marks are on each loose wire to identify the wire number and its signal name.



Signal Name	Covering Color	Dot Mark	Dot: approx. 1 mm	Dash: approx. 3 mm	Space: approx. 2 mm
Not connected	Pink	---	---	---	---
Not connected	Pink	---	---	---	---
Common 2	Yellow	---	---	---	---
Common 2	Yellow	---	---	---	---
Input 32	White	---	---	---	---
Input 31	White	---	---	---	---
Input 30	Light gray	---	---	---	---
Input 29	Light gray	---	---	---	---
Input 28	Orange	---	---	---	---
Input 27	Orange	---	---	---	---
Input 26	Pink	---	---	---	---
Input 25	Pink	---	---	---	---
Input 24	Yellow	---	---	---	---
Input 23	Yellow	---	---	---	---
Input 22	White	---	---	---	---
Input 21	White	---	---	---	---
Input 20	Light gray	---	---	---	---
Input 19	Light gray	---	---	---	---
Input 18	Orange	---	---	---	---
Input 17	Orange	---	---	---	---
Not connected	Pink	---	---	---	---
Not connected	Pink	---	---	---	---
Common 1	Yellow	---	---	---	---
Common 1	Yellow	---	---	---	---
Input 16	White	---	---	---	---
Input 15	White	---	---	---	---
Input 14	Light gray	---	---	---	---
Input 13	Light gray	---	---	---	---
Input 12	Orange	---	---	---	---
Input 11	Orange	---	---	---	---
Input 10	Pink	---	---	---	---
Input 9	Pink	---	---	---	---
Input 8	Yellow	---	---	---	---
Input 7	Yellow	---	---	---	---
Input 6	White	---	---	---	---
Input 5	White	---	---	---	---
Input 4	Light gray	---	---	---	---
Input 3	Light gray	---	---	---	---
Input 2	Orange	---	---	---	---
Input 1	Orange	---	---	---	---

5) Connecting to External Output Device with Cable W0300

The following diagram shows signal names of wires when the W0300 Cable connects the 12/24-VDC 32-point Output Module to an external output device. Connector pin numbers and dot marks are on each loose wire to identify the wire number and its signal name.



Signal Name	Covering Color	Dot Mark	Dot: approx. 1 mm	Dash: approx. 3 mm	Space: approx. 2 mm
+Common 2	Pink	— — — —	— — — —		
+Common 2	Pink	— — — —	— — — —		
-Common 2	Yellow	— — — —	— — — —		
-Common 2	Yellow	— — — —	— — — —		
Output 32	White	— — — —	— — — —		
Output 31	White	— — — —	— — — —		
Output 30	Light gray	— — — —	— — — —		
Output 29	Light gray	— — — —	— — — —		
Output 28	Orange	— — — —	— — — —		
Output 27	Orange	— — — —	— — — —		
Output 26	Pink	— — — —	— — — —		
Output 25	Pink	— — — —	— — — —		
Output 24	Yellow	— — — —	— — — —		
Output 23	Yellow	— — — —	— — — —		
Output 22	White	— — — —	— — — —		
Output 21	White	— — — —	— — — —		
Output 20	Light gray	— — — —	— — — —		
Output 19	Light gray	— — — —	— — — —		
Output 18	Orange	— — — —	— — — —		
Output 17	Orange	— — — —	— — — —		
+Common 2	Pink	— — — —	— — — —		
+Common 2	Pink	— — — —	— — — —		
-Common 1	Yellow	— — — —	— — — —		
-Common 1	Yellow	— — — —	— — — —		
Output 16	White	— — — —	— — — —		
Output 15	White	— — — —	— — — —		
Output 14	Light gray	— — — —	— — — —		
Output 13	Light gray	— — — —	— — — —		
Output 12	Orange	— — — —	— — — —		
Output 11	Orange	— — — —	— — — —		
Output 10	Pink	— — — —	— — — —		
Output 9	Pink	— — — —	— — — —		
Output 8	Yellow	— — — —	— — — —		
Output 7	Yellow	— — — —	— — — —		
Output 6	White	— — — —	— — — —		
Output 5	White	— — — —	— — — —		
Output 4	Light gray	— — — —	— — — —		
Output 3	Light gray	— — — —	— — — —		
Output 2	Orange	— — — —	— — — —		
Output 1	Orange	— — — —	— — — —		

3.3.3 W0302 Cables (Model No. JZMSZ-120W0302-□□)

1) Use

- (1) This Cable is used to connect external devices to the Modules listed below.
 - (a) 12/24-VDC 32-point Input Module (Model No. JAMSC-120DDI35400)
 - (b) 12/24-VDC 32-point Output Module (Model No. JAMSC-120DDO35410)
- (2) The end of the Cable to the external device is loose wires.

2) Specifications

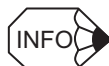
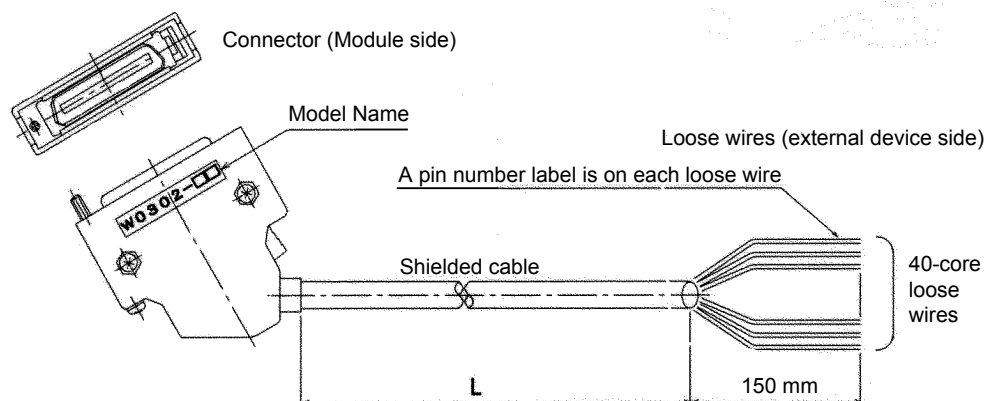
The following table shows specifications of W0302 Cables.

Table 3.4 Specifications of W0302 Cable

Item	Specifications		
Model Name	W0302-01	W0302-03	W0302-05
Model No.	JZMSZ-120W0302-01	JZMSZ-120W0302-03	JZMSZ-120W0302-05
Length L	1.0 m	3.0 m	5.0 m
Cable Specifications	Shielded cable, 40 cores, equivalent to UL20276, AWG24 (0.20 mm ²)		
Cable Termination	Module side	Connector: Connector 10140-6000EL (3M) Shell 10640-5500-008 (3M) Screw 3342-26 (3M) Latch 10600-L0F0-8 (3M)	
	External device side	Loose wires: Wire length 150 mm with pin number label on each wire.	
Insulation Resistance	100 MΩ min. at room temperature and humidity between core wires (connected together) and shielding wire, and between core wires (measured with a 500-VDC test voltage megohmmeter).		

3) Appearance

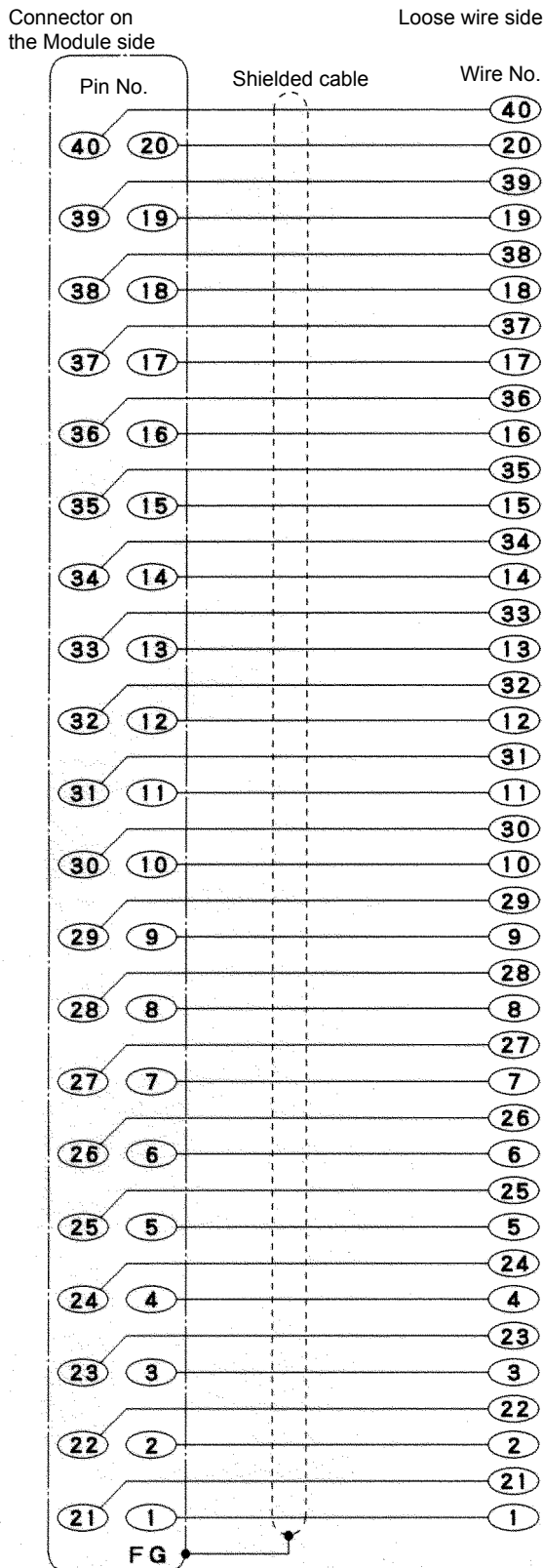
The following illustration shows the appearance of a W0302 Cable.



The difference between the W0300 Cable and the W0302 Cable is the size of the end which connects to the Module Connector.

4) Connecting to External Input Device with Cable W0302

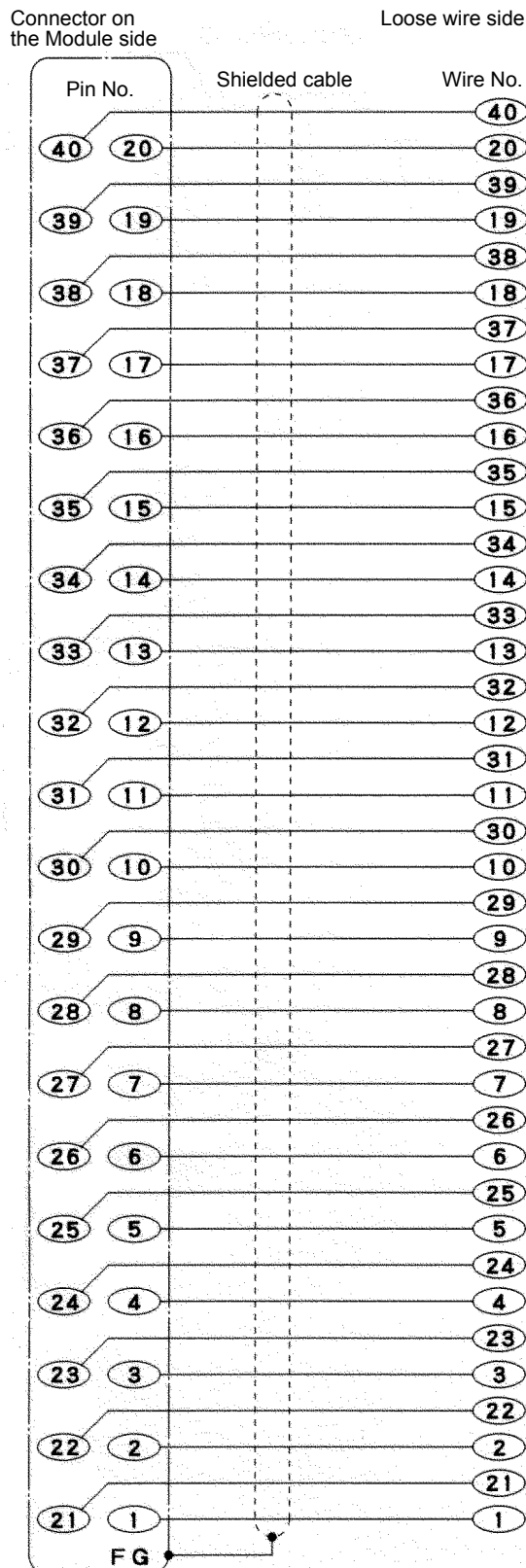
The following diagram shows signal names of wires when the W0302 Cable connects the 12/24-VDC 32-point Input Module to an external input device. Connector pin numbers and dot marks are on each loose wire to identify the wire number and its signal name.



Signal Name	Covering Color	Dot Mark	Dot: approx. 1 mm	Dash: approx. 3 mm	Space: approx. 2 mm
Not connected	Gray	— — — —	— — — —		
Not connected	Gray	— — — —	— — — —		
Common 2	Orange	— — — —	— — — —		
Common 2	Orange	— — — —	— — — —		
Input 32	Green	— — — —	— — — —		
Input 31	Green	— — — —	— — — —		
Input 30	Pink	— — — —	— — — —		
Input 29	Pink	— — — —	— — — —		
Input 28	Light blue	— — — —	— — — —		
Input 27	Light blue	— — — —	— — — —		
Input 26	Gray	— — — —	— — — —		
Input 25	Gray	— — — —	— — — —		
Input 24	Orange	— — — —	— — — —		
Input 23	Orange	— — — —	— — — —		
Input 22	Green	— — — —	— — — —		
Input 21	Green	— — — —	— — — —		
Input 20	Pink	— — — —	— — — —		
Input 19	Pink	— — — —	— — — —		
Input 18	Light blue	— — — —	— — — —		
Input 17	Light blue	— — — —	— — — —		
Not connected	Gray	— — — —	— — — —		
Not connected	Gray	— — — —	— — — —		
Common 1	Orange	— — — —	— — — —		
Common 1	Orange	— — — —	— — — —		
Input 16	Green	— — — —	— — — —		
Input 15	Green	— — — —	— — — —		
Input 14	Pink	— — — —	— — — —		
Input 13	Pink	— — — —	— — — —		
Input 12	Light blue	— — — —	— — — —		
Input 11	Light blue	— — — —	— — — —		
Input 10	Gray	— — — —	— — — —		
Input 9	Gray	— — — —	— — — —		
Input 8	Orange	— — — —	— — — —		
Input 7	Orange	— — — —	— — — —		
Input 6	Green	— — — —	— — — —		
Input 5	Green	— — — —	— — — —		
Input 4	Pink	— — — —	— — — —		
Input 3	Pink	— — — —	— — — —		
Input 2	Light blue	— — — —	— — — —		
Input 1	Light blue	— — — —	— — — —		

5) Connecting to External Output Device with Cable W0302

The following diagram shows signal names of wires when the W0302 Cable connects the 12/24-VDC 32-point Output Module to an external output device. Connector pin numbers and dot marks are on each loose wire to identify the wire number and its signal name.



Signal Name	Covering Color	Dot Mark	Dot: approx. 1 mm	Dash: approx. 3 mm	Space: approx. 2 mm
+Common 2	Gray	---	---	---	---
+Common 2	Gray	---	---	---	---
-Common 2	Orange	---	---	---	---
-Common 2	Orange	---	---	---	---
Output 32	Green	---	---	---	---
Output 31	Green	---	---	---	---
Output 30	Pink	---	---	---	---
Output 29	Pink	---	---	---	---
Output 28	Light blue	---	---	---	---
Output 27	Light blue	---	---	---	---
Output 26	Gray	---	---	---	---
Output 25	Gray	---	---	---	---
Output 24	Orange	---	---	---	---
Output 23	Orange	---	---	---	---
Output 22	Green	---	---	---	---
Output 21	Green	---	---	---	---
Output 20	Pink	---	---	---	---
Output 19	Pink	---	---	---	---
Output 18	Light blue	---	---	---	---
Output 17	Light blue	---	---	---	---
+Common 1	Gray	---	---	---	---
+Common 1	Gray	---	---	---	---
-Common 1	Orange	---	---	---	---
-Common 1	Orange	---	---	---	---
Output 16	Green	---	---	---	---
Output 15	Green	---	---	---	---
Output 14	Pink	---	---	---	---
Output 13	Pink	---	---	---	---
Output 12	Light blue	---	---	---	---
Output 11	Light blue	---	---	---	---
Output 10	Gray	---	---	---	---
Output 9	Gray	---	---	---	---
Output 8	Orange	---	---	---	---
Output 7	Orange	---	---	---	---
Output 6	Green	---	---	---	---
Output 5	Green	---	---	---	---
Output 4	Pink	---	---	---	---
Output 3	Pink	---	---	---	---
Output 2	Light blue	---	---	---	---
Output 1	Light blue	---	---	---	---

3.3.4 W0301 Cables (Model No. JZMSZ-120W0301-□□)

1) Use

(1) This Cable is used to connect external devices to the Modules listed below.

(a) 12/24VDC 32-point Input Module (Model No. JAMSC-120DDI35400)

(b) 12/24VDC 32-point Output Module (Model No. JAMSC-120DDO35410)

(2) The end of the Cable on the external device is fitted with a connector.

Use the Cable in combination with a 32-point I/O connector Terminal Block.

See 3.3.5 *32-point I/O Connector Terminal Block* for information about the 32-point I/O connector Terminal Block.

2) Specifications

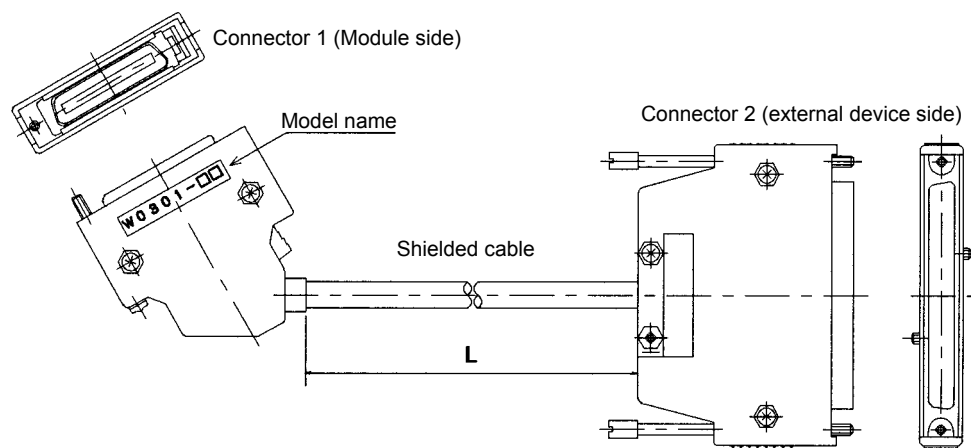
The following table shows specifications of W0301 Cables.

Table 3.5 Specifications of W0301 Cable

Item	Specifications		
Model Name	W0301-01	W0301-03	W0301-05
Model No.	JZMSZ-120W0301-01	JZMSZ-120W0301-03	JZMSZ-120W0301-05
Length L	1.0 m	3.0 m	5.0 m
Cable Specifications	Shielded cable, 40 cores, equivalent to UL20276, AWG28 (0.08 mm ²)		
Cable Termination	Module side	Connector: Connector 10140-6000EL (3M) Shell 10640-5500-008 (3M) Screw 3342-26 (3M) Latch 10600-L0F0-8 (3M)	
	External device side	Connector fitted: FCN-361J040-AU + FCN-360C040-E (made by Fujitsu Ltd.).	
Insulation Resistance	100 MΩ min. at room temperature and humidity between core wires (connected together) and shielding wire, and between core wires (measured with a 500-VDC test voltage megohmmeter).		

3) Appearance

The following illustration shows the appearance of a W0301 Cable.

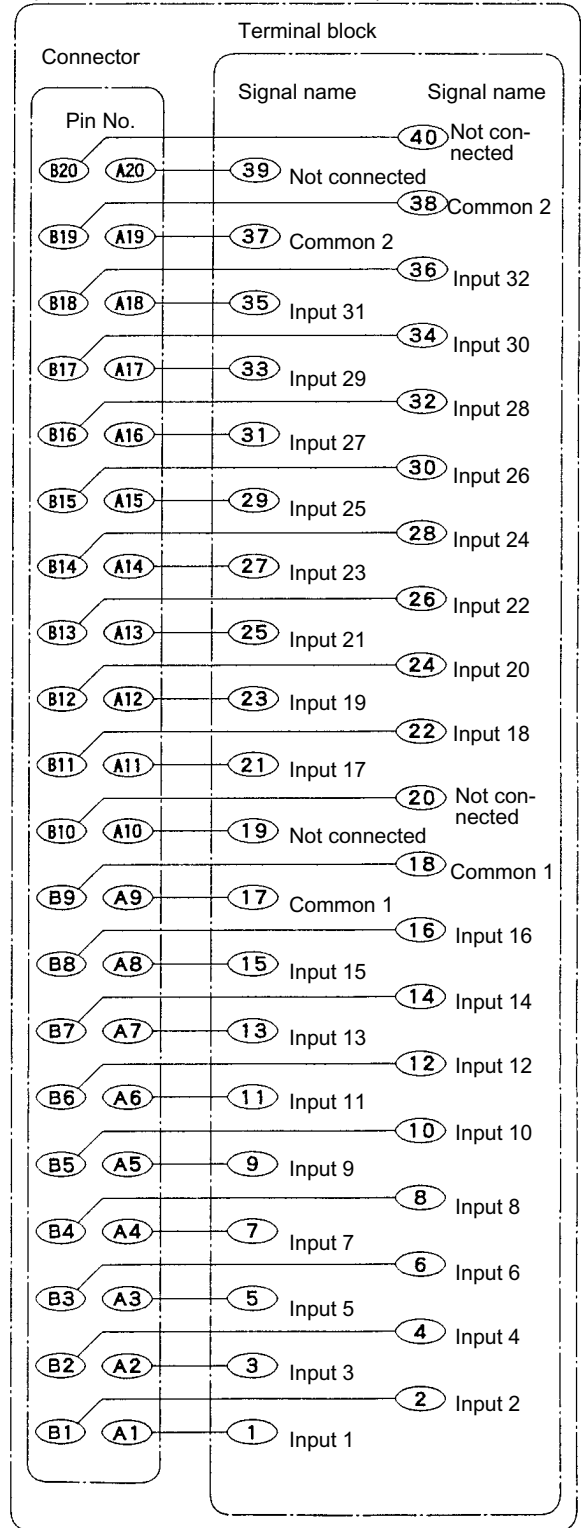
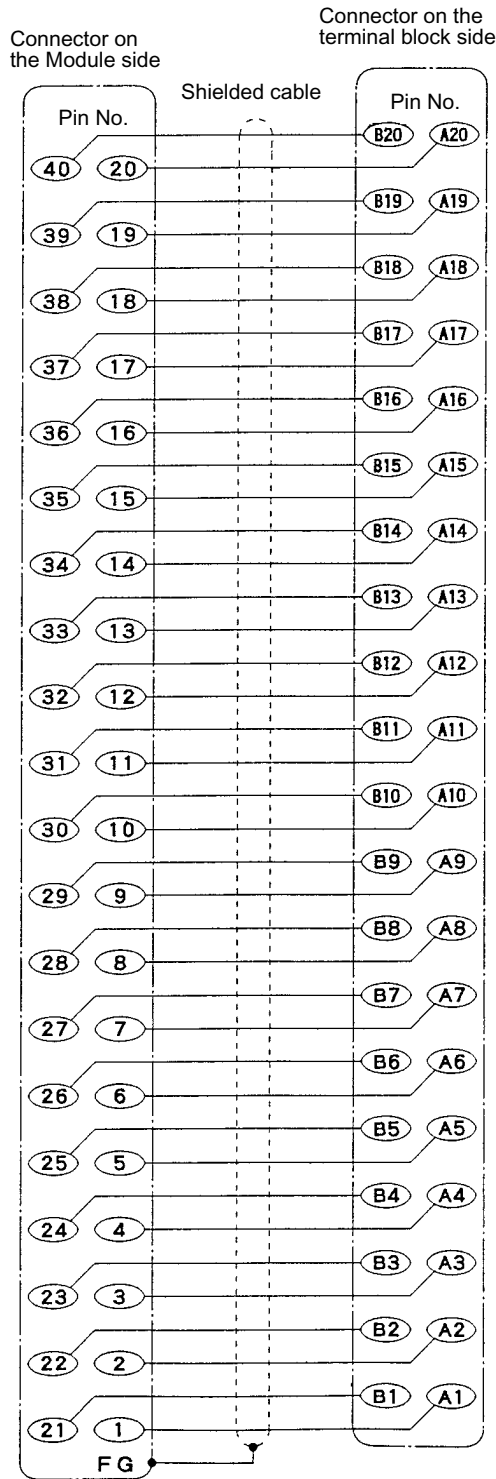


4) Connecting to External Input Device with Cable W0301

The following diagram shows the signal names of terminals when the W0301 Cable and 32-point terminal I/O terminal connector block are used to connect the 12/24 VDC 32-point Input Module to an external input device.

32-point I/O Module Cable (W0301)

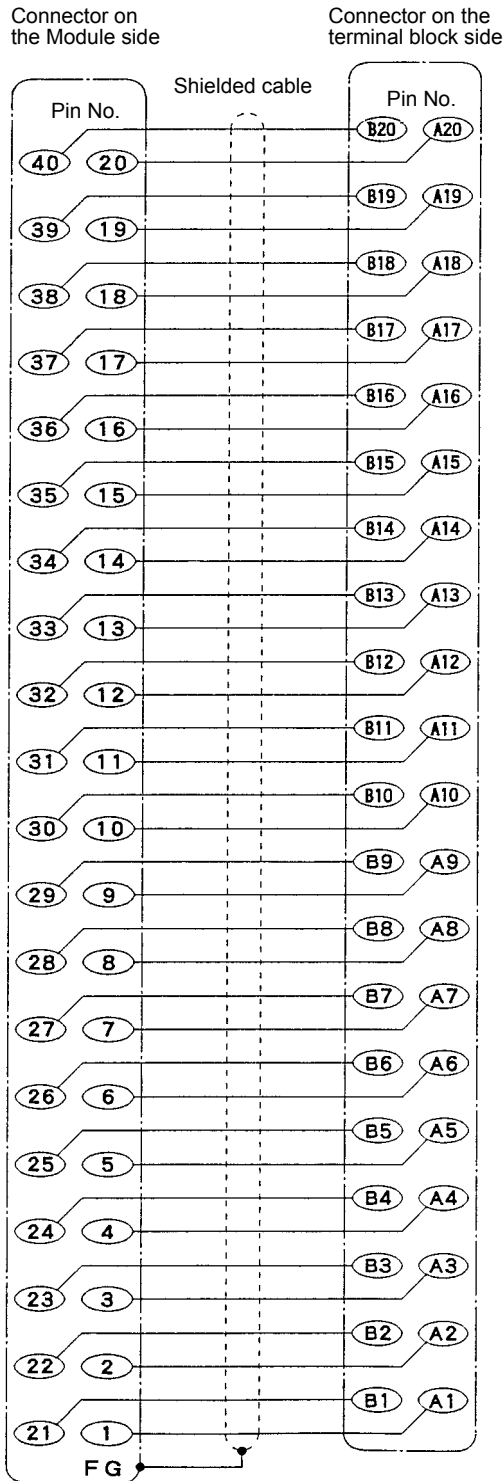
32-point I/O Connector Terminal Block (XW2B-40F5-P)



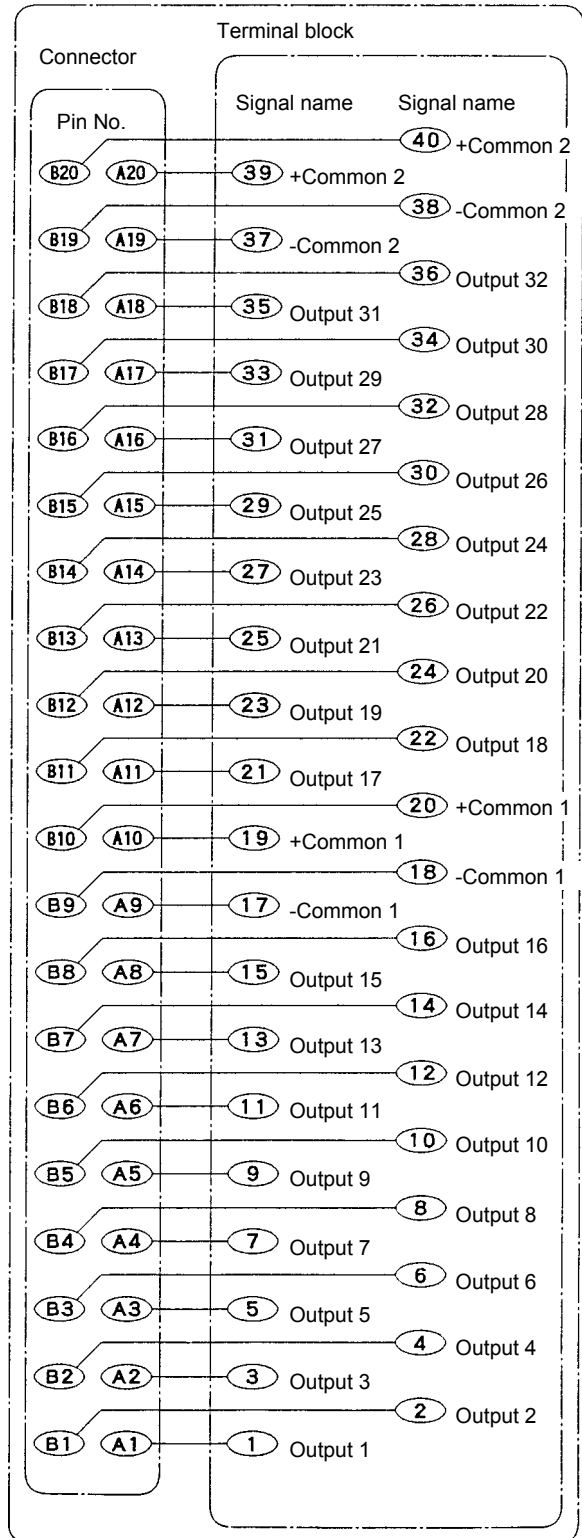
5) Connecting to External Output Device with Cable W0301

The following diagram shows the signal names of wires when the W0301 Cable and 32-point I/O connector Terminal Block are used to connect the 12/24 VDC 32-point Output Module to an external output device.

32-point I/O Module Cable (W0301)

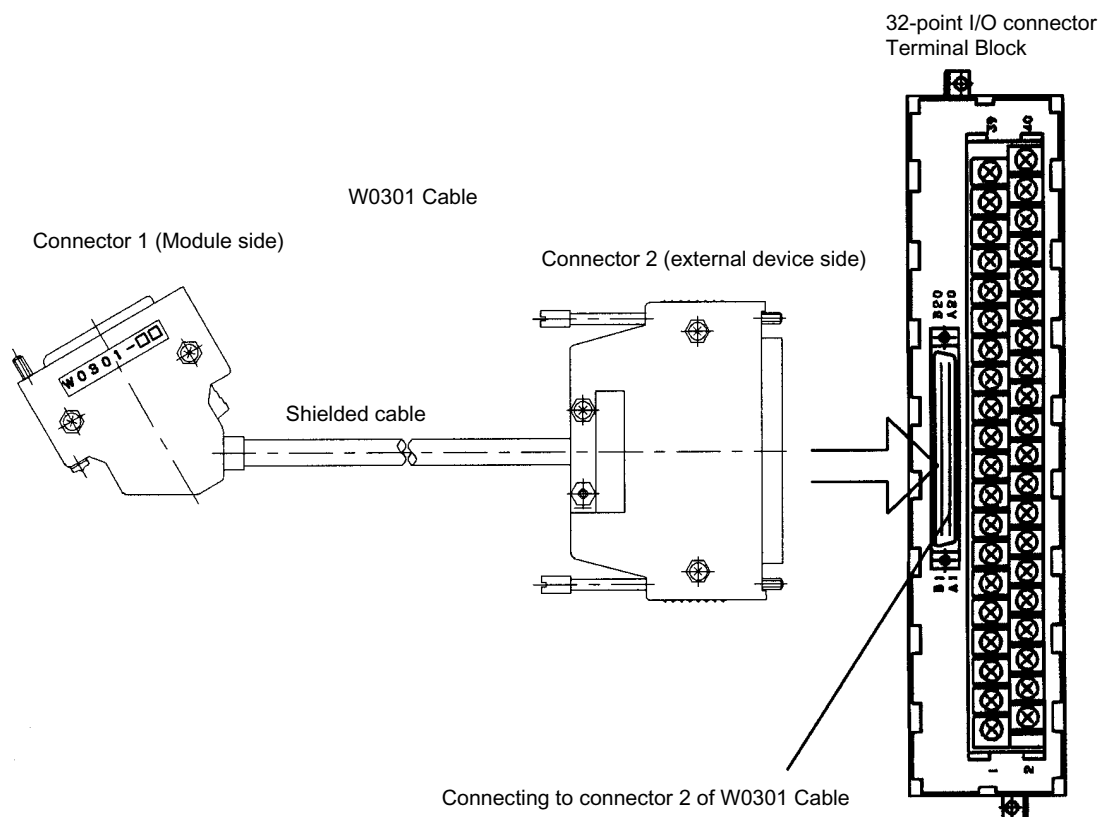


32-point I/O Connector Terminal Block (XW2B-40F5-P)



6) Connecting to 32-point I/O Connector Terminal Block

For the combination of W0301 Cable and 32-point I/O connector Terminal Block



3

3.3.5 32-point I/O Connector Terminal Block

1) Use

- (1) This terminal block is used to connect external devices to the Modules listed below.
 - (a) 12/24-VDC 32-point Input Module (Model No. JAMSC-120DDI35400)
 - (b) 12/24-VDC 32-point Output Module (Model No. JAMSC-120DDO35410)
- (2) Use this terminal block in combination with a W0301 Cable.
- (3) Use the 32-point I/O Connector Terminal Block manufactured by OMRON Corporation (Model No. XW2B-40F5-P).

2) Approximate Specifications

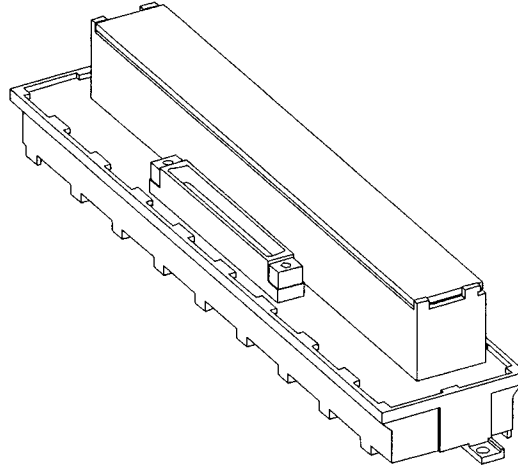
The following table shows approximate specifications of an OMRON-manufactured XW2B-40F5-P Terminal Block.

Table 3.6 Specifications of 32-point I/O Connector Terminal Block XW2B-40F5-P

Item	Specifications
Model No.	XW2B-40F5-P
Connector	FCN-364P040-AU (Fujitsu Ltd.)
External Connections	Terminal block with M3.5 screw terminals
Structure	Wall mounting
Approximate Mass	200 g
External Dimensions	216.5×45×43 mm (W×H×D)

3) External Appearance

The following illustration shows the appearance of the OMRON-manufactured XW2B-40F5-P Terminal Block.



4) Connecting to 32-point I/O Connector Terminal Block (Inputs)

The following table shows the signal names of wires when the W0301 Cable and 32-point I/O Connector Terminal Block (OMRON: XW2B-40F5-P) are used to connect the 12/24-VDC 32-point Input Module.

Table 3.7 Terminal Numbers and Signal Names for the Terminal Block

Terminal No.	Signal Name	Terminal No.	Signal Name
2	Input 2	1	Input 1
4	Input 4	3	Input 3
6	Input 6	5	Input 5
8	Input 8	7	Input 7
10	Input 10	9	Input 9
12	Input 12	11	Input 11
14	Input 14	13	Input 13
16	Input 16	15	Input 15
18	Common 1	17	Common 1
20	Not connected	19	Not connected
22	Input 18	21	Input 17
24	Input 20	23	Input 19
26	Input 22	25	Input 21
28	Input 24	27	Input 23
30	Input 26	29	Input 25
32	Input 28	31	Input 27
34	Input 30	33	Input 29
36	Input 32	35	Input 31
38	Common 2	37	Common 2
40	Not connected	39	Not connected

5) Connecting to 32-point I/O Connector Terminal Block (Outputs)

The following table shows the signal names of wires when the W0301 Cable and 32-point I/O Connector Terminal Block (OMRON: XW2B-40F5-P) are used to connect the 12/24-VDC Output Module.

Table 3.8 Terminal Numbers and Signal Names for the Terminal Block

Terminal No.	Signal Name	Terminal No.	Signal Name
2	Output 2	1	Output 1
4	Output 4	3	Output 3
6	Output 6	5	Output 5
8	Output 8	7	Output 7
10	Output 10	9	Output 9
12	Output 12	11	Output 11
14	Output 14	13	Output 13
16	Output 16	15	Output 15
18	-Common 1	17	-Common 1
20	+Common 1	19	+Common 1
22	Output 18	21	Output 17
24	Output 20	23	Output 19
26	Output 22	25	Output 21
28	Output 24	27	Output 23
30	Output 26	29	Output 25
32	Output 28	31	Output 27
34	Output 30	33	Output 29
36	Output 32	35	Output 31
38	-Common 2	37	-Common 2
40	+Common 2	39	+Common 2

3.3.6 W5410 Cables (Model No. JEPMC-W5410-□□)

1) Use

- (1) This Cable is used to connect external devices to the Modules listed below.
- (a) 12/24-VDC 64-point Input Module (Model No. JAMSC-120DDI36400)
 - (b) 12/24-VDC 64-point Output Module (Model No. JAMSC-120DDO36410)
 - (c) Register Input Module (Model No. JAMSC-120RDI34410)
 - (d) Register Output Module (Model No. JAMSC-120RDO34410)
- (2) The end of the Cable to the external device is loose wires.

2) Specifications

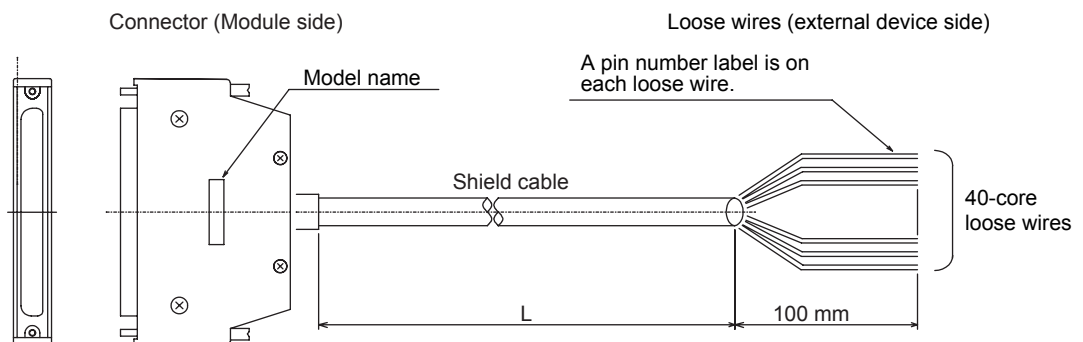
The following table shows specifications of W5410 Cables.

Table 3.9 Specifications of W5410 Cable

Item	Specifications		
Model Name	W5410-05	W5410-10	W5410-30
Model No.	JEPMC-W5410-05	JEPMC-W5410-10	JEPMC-W5410-30
Length L	0.5 m	1.0 m	3.0 m
Cable Specifications	Shielded cable, 40 cores, AWG24 (0.20 mm ²)		
Cable Termination	Module side	Connector: FCN-363J-040 (Fujitsu Ltd.) FCN-360C040-B (Fujitsu Ltd.) FCN-363J-AU/R (Fujitsu Ltd.)	
	External device side	Loose wires: Wire length 100 mm with pin number label on each wire.	
Insulation Resistance	100 MΩ min. at room temperature and humidity between core wires (connected together) and shielding wire, and between core wires (measured with a 500-VDC test voltage megohmmeter).		

3) Appearance

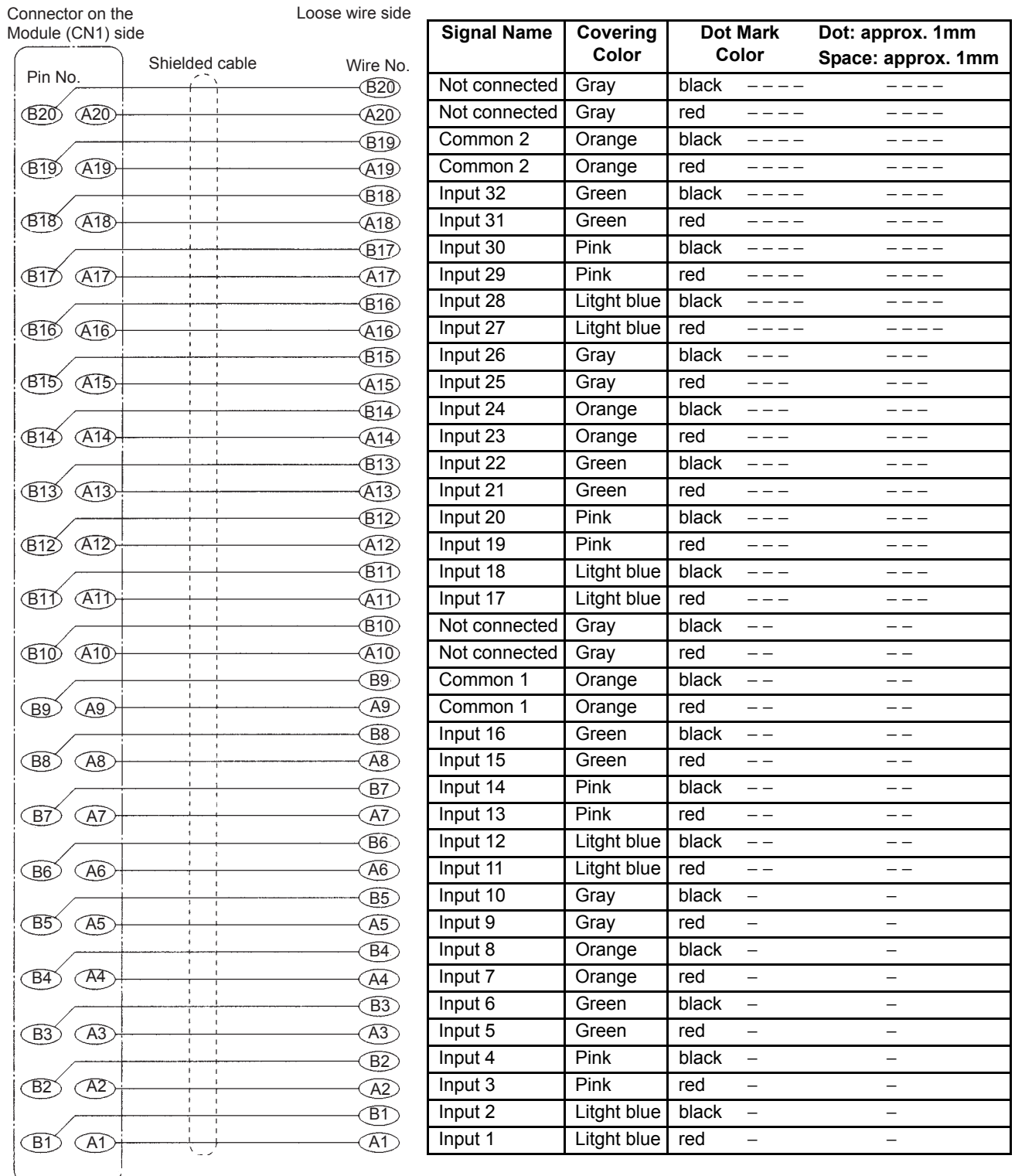
The following illustration shows the appearance of a W5410 Cable.



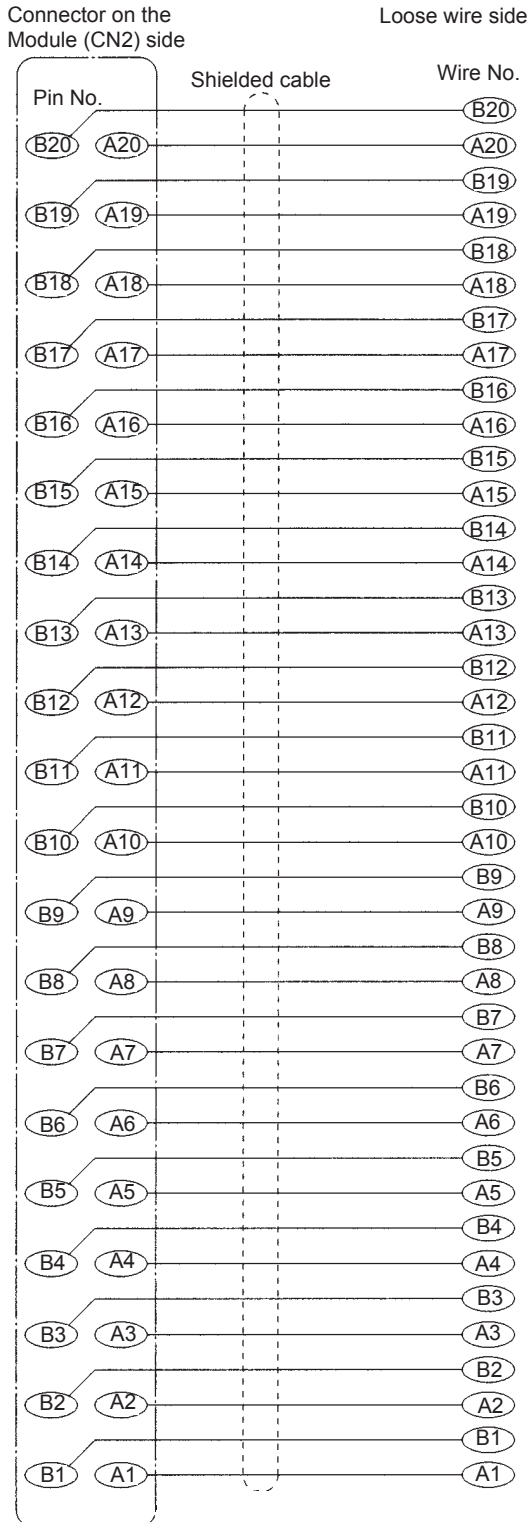
4) Connecting External Input Device with Cable W5410

The following table and diagram show the signal names for the wires when the W5410 Cable connects the 12/24-VDC 64-point Input Module to an external input device. Connector pin numbers and dots are on each loose wire to identify the wire number and signal name.

a) Module connector CN1 side



b) Module connector CN2 side

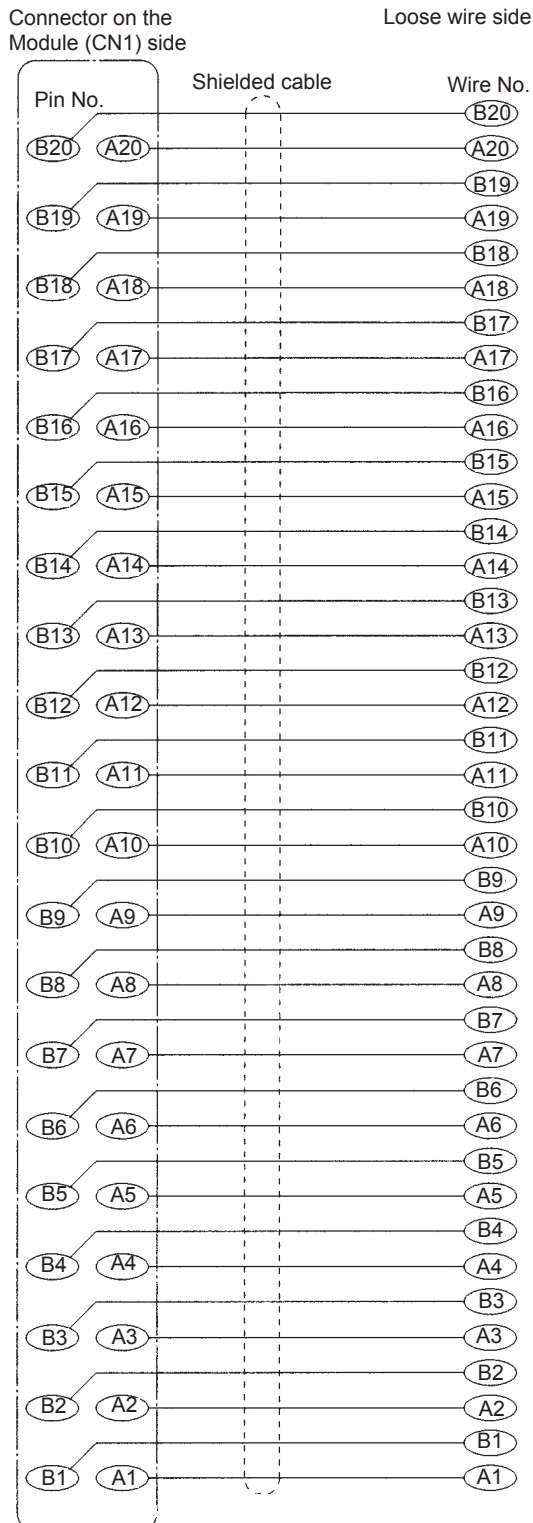


Signal Name	Covering Color	Dot Mark Color	Dot: approx. 1mm	Space: approx. 1mm
Not connected	Gray	black	-----	-----
Not connected	Gray	red	-----	-----
Common 4	Orange	black	-----	-----
Common 4	Orange	red	-----	-----
Input 64	Green	black	-----	-----
Input 63	Green	red	-----	-----
Input 62	Pink	black	-----	-----
Input 61	Pink	red	-----	-----
Input 60	Litght blue	black	-----	-----
Input 59	Litght blue	red	-----	-----
Input 58	Gray	black	----	----
Input 57	Gray	red	----	----
Input 56	Orange	black	----	----
Input 55	Orange	red	----	----
Input 54	Green	black	----	----
Input 53	Green	red	----	----
Input 52	Pink	black	----	----
Input 51	Pink	red	----	----
Input 50	Litght blue	black	----	----
Input 49	Litght blue	red	----	----
Not connected	Gray	black	--	--
Not connected	Gray	red	--	--
Common 3	Orange	black	--	--
Common 3	Orange	red	--	--
Input 48	Green	black	--	--
Input 47	Green	red	--	--
Input 46	Pink	black	--	--
Input 45	Pink	red	--	--
Input 44	Litght blue	black	--	--
Input 43	Litght blue	red	--	--
Input 42	Gray	black	-	-
Input 41	Gray	red	-	-
Input 40	Orange	black	-	-
Input 39	Orange	red	-	-
Input 38	Green	black	-	-
Input 37	Green	red	-	-
Input 36	Pink	black	-	-
Input 35	Pink	red	-	-
Input 34	Litght blue	black	-	-
Input 33	Litght blue	red	-	-

5) Connecting External Output Device with Cable W5410

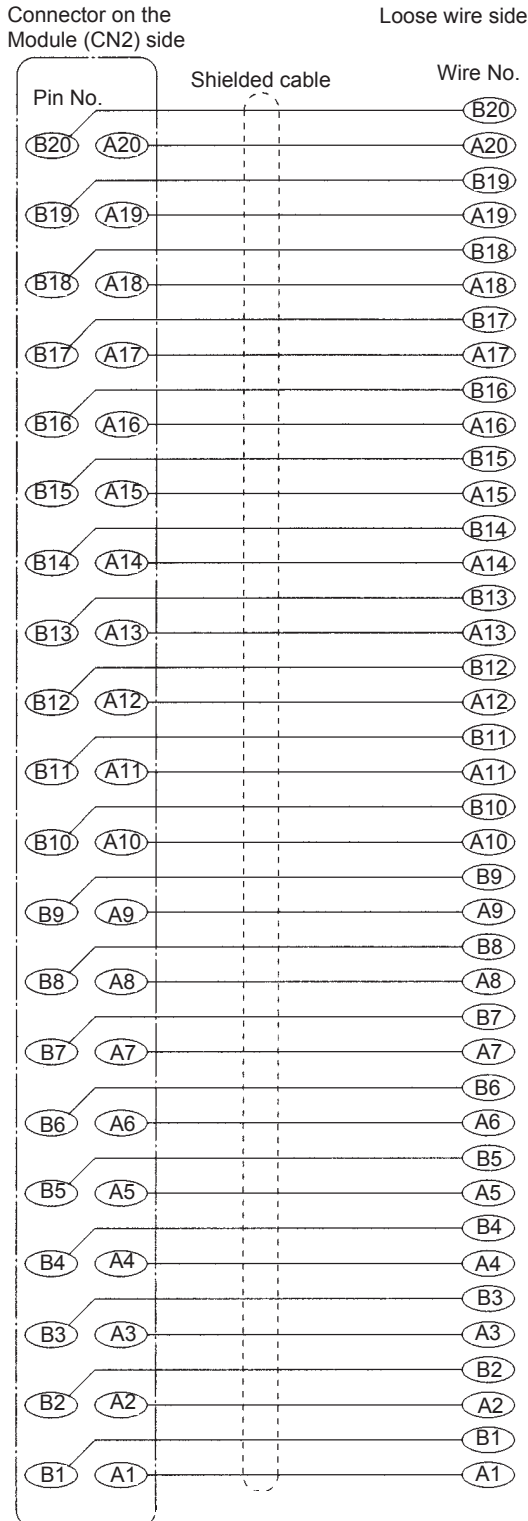
The following table and diagram show the signal names for the wires when the W5410 Cable connects the 12/24-VDC 64-point Output Module to an external output device. Connector pin numbers and dots are on each loose wire to identify the wire number and signal name.

a) Module connector CN1 side



Signal Name	Covering Color	Dot Mark Color	Dot: approx. 1mm	Space: approx. 1mm
+ Common 2	Gray	black	-----	-----
+ Common 2	Gray	red	-----	-----
- Common 2	Orange	black	-----	-----
- Common 2	Orange	red	-----	-----
Input 32	Green	black	-----	-----
Input 31	Green	red	-----	-----
Input 30	Pink	black	-----	-----
Input 29	Pink	red	-----	-----
Input 28	Litght blue	black	-----	-----
Input 27	Litght blue	red	-----	-----
Input 26	Gray	black	----	----
Input 25	Gray	red	----	----
Input 24	Orange	black	----	----
Input 23	Orange	red	----	----
Input 22	Green	black	----	----
Input 21	Green	red	----	----
Input 20	Pink	black	----	----
Input 19	Pink	red	----	----
Input 18	Litght blue	black	----	----
Input 17	Litght blue	red	----	----
+ Common 1	Gray	black	--	--
+ Common 1	Gray	red	--	--
- Common 1	Orange	black	--	--
- Common 1	Orange	red	--	--
Input 16	Green	black	--	--
Input 15	Green	red	--	--
Input 14	Pink	black	--	--
Input 13	Pink	red	--	--
Input 12	Litght blue	black	--	--
Input 11	Litght blue	red	--	--
Input 10	Gray	black	-	-
Input 9	Gray	red	-	-
Input 8	Orange	black	-	-
Input 7	Orange	red	-	-
Input 6	Green	black	-	-
Input 5	Green	red	-	-
Input 4	Pink	black	-	-
Input 3	Pink	red	-	-
Input 2	Litght blue	black	-	-
Input 1	Litght blue	red	-	-

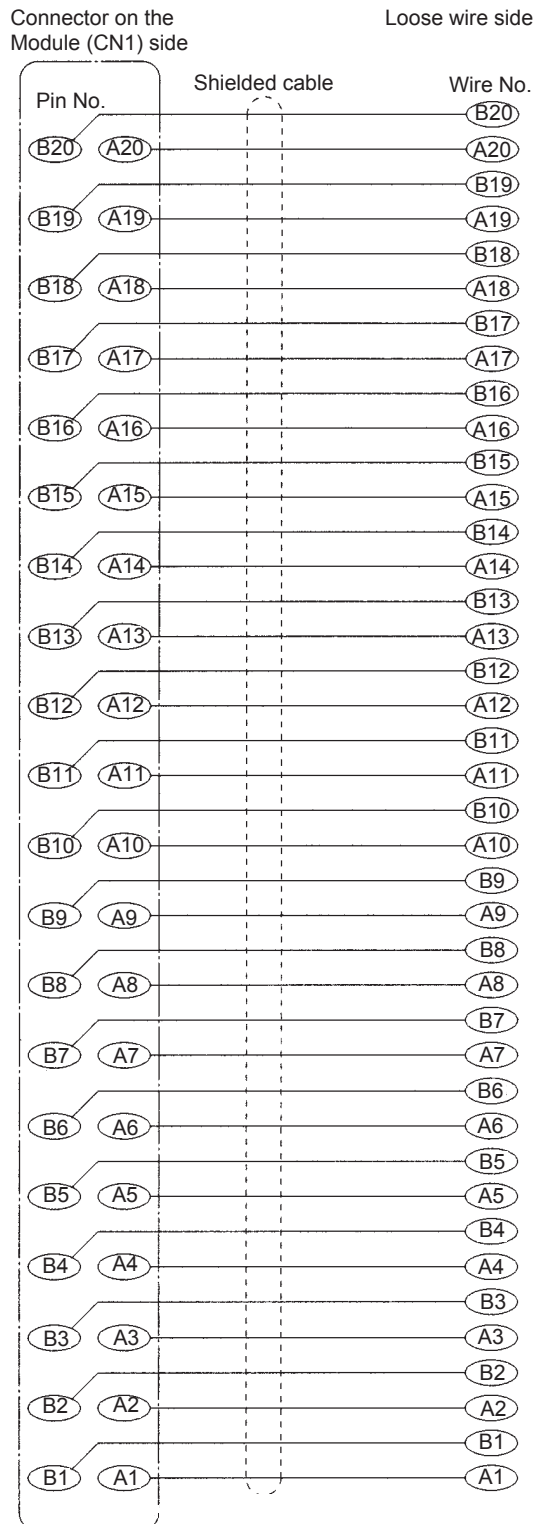
b) Module connector CN2 side



Signal Name	Covering Color	Dot Mark Color	Dot: approx. 1mm	Space: approx. 1mm
+ Common 4	Gray	black	-----	-----
+ Common 4	Gray	red	-----	-----
- Common 4	Orange	black	-----	-----
- Common 4	Orange	red	-----	-----
Input 64	Green	black	-----	-----
Input 63	Green	red	-----	-----
Input 62	Pink	black	-----	-----
Input 61	Pink	red	-----	-----
Input 60	Litght blue	black	-----	-----
Input 59	Litght blue	red	-----	-----
Input 58	Gray	black	----	----
Input 57	Gray	red	----	----
Input 56	Orange	black	----	----
Input 55	Orange	red	----	----
Input 54	Green	black	----	----
Input 53	Green	red	----	----
Input 52	Pink	black	----	----
Input 51	Pink	red	----	----
Input 50	Litght blue	black	----	----
Input 49	Litght blue	red	----	----
+ Common 3	Gray	black	--	--
+ Common 3	Gray	red	--	--
- Common 3	Orange	black	--	--
- Common 3	Orange	red	--	--
Input 48	Green	black	--	--
Input 47	Green	red	--	--
Input 46	Pink	black	--	--
Input 45	Pink	red	--	--
Input 44	Litght blue	black	--	--
Input 43	Litght blue	red	--	--
Input 42	Gray	black	-	-
Input 41	Gray	red	-	-
Input 40	Orange	black	-	-
Input 39	Orange	red	-	-
Input 38	Green	black	-	-
Input 37	Green	red	-	-
Input 36	Pink	black	-	-
Input 35	Pink	red	-	-
Input 34	Litght blue	black	-	-
Input 33	Litght blue	red	-	-

6) Connecting Register Input Modules with Cable W5410

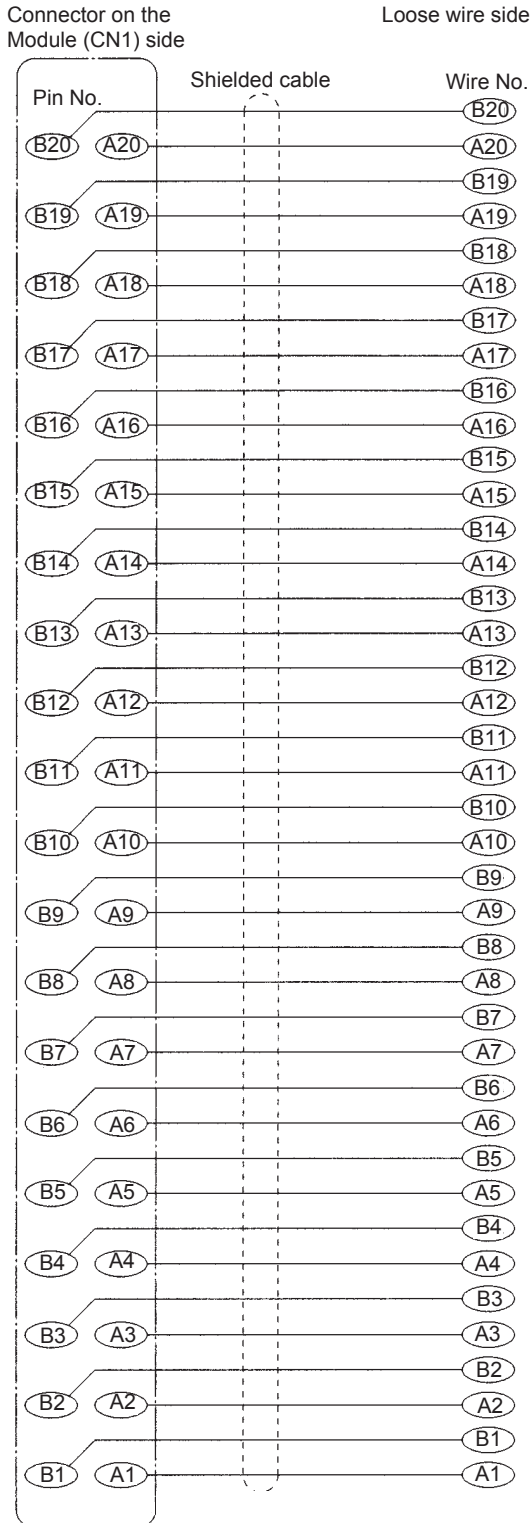
The following table and diagram show the signal names for the wires when the W5410 Cable connects the Register Input Module to an external input device. Connector pin numbers and dots are on each loose wire to identify the wire number and signal name.



Signal Name	Covering Color	Dot Mark Color	Dot: approx. 1mm	Space: approx. 1mm
DATA 1	Gray	black	----	----
DATA 2	Gray	red	----	----
DATA 3	Orange	black	----	----
DATA 4	Orange	red	----	----
DATA 5	Green	black	----	----
DATA 6	Green	red	----	----
DATA 7	Pink	black	----	----
DATA 8	Pink	red	----	----
DATA 9	Litght blue	black	----	----
DATA 10	Litght blue	red	----	----
DATA 11	Gray	black	----	----
DATA 12	Gray	red	----	----
DATA 13	Orange	black	----	----
DATA 14	Orange	red	----	----
DATA 15	Green	black	----	----
DATA 16	Green	red	----	----
Not connected	Pink	black	----	----
Not connected	Pink	red	----	----
+12/24 V	Litght blue	black	----	----
+12/24 V	Litght blue	red	----	----
SEL 1	Gray	black	---	--
SEL 2	Gray	red	---	--
SEL 3	Orange	black	--	--
SEL 4	Orange	red	--	--
SEL 5	Green	black	--	--
SEL 6	Green	red	--	--
SEL 7	Pink	black	--	--
SEL 8	Pink	red	--	--
SEL 9	Litght blue	black	--	--
SEL 10	Litght blue	red	--	--
SEL 11	Gray	black	-	-
SEL 12	Gray	red	-	-
SEL 13	Orange	black	-	-
SEL 14	Orange	red	-	-
SEL 15	Green	black	-	-
SEL 16	Green	red	-	-
0 V	Pink	black	-	-
0 V	Pink	red	-	-
+12/24 V	Litght blue	black	-	-
+12/24 V	Litght blue	red	-	-

7) Connecting Register Output Modules with Cable W5410

The following table and diagram show the signal names of wires when the W5410 Cable connects the Register Output Module to an external output device. Connector pin numbers and dots are on each loose wire to identify the wire number and signal name.



Signal Name	Covering Color	Dot Mark Color	Dot: approx. 1mm	Space: approx. 1mm
DATA 1	Gray	black	----	----
DATA 2	Gray	red	----	----
DATA 3	Orange	black	----	----
DATA 4	Orange	red	----	----
DATA 5	Green	black	----	----
DATA 6	Green	red	----	----
DATA 7	Pink	black	----	----
DATA 8	Pink	red	----	----
DATA 9	Litght blue	black	----	----
DATA 10	Litght blue	red	----	----
DATA 11	Gray	black	----	----
DATA 12	Gray	red	----	----
DATA 13	Orange	black	----	----
DATA 14	Orange	red	----	----
DATA 15	Green	black	----	----
DATA 16	Green	red	----	----
0 V	Pink	black	----	----
0 V	Pink	red	----	----
+12/24 V	Litght blue	black	----	----
+12/24 V	Litght blue	red	----	----
SEL 1	Gray	black	--	--
SEL 2	Gray	red	--	--
SEL 3	Orange	black	--	--
SEL 4	Orange	red	--	--
SEL 5	Green	black	--	--
SEL 6	Green	red	--	--
SEL 7	Pink	black	--	--
SEL 8	Pink	red	--	--
SEL 9	Litght blue	black	--	--
SEL 10	Litght blue	red	--	--
SEL 11	Gray	black	-	-
SEL 12	Gray	red	-	-
SEL 13	Orange	black	-	-
SEL 14	Orange	red	-	-
SEL 15	Green	black	-	-
SEL 16	Green	red	-	-
0 V	Pink	black	-	-
0 V	Pink	red	-	-
+12/24 V	Litght blue	black	-	-
+12/24 V	Litght blue	red	-	-

3.4 I/O Allocation

This section describes the methods used to allocate I/O to the 120-series Digital I/O Modules.

3.4.1	16-point Input Modules	-----	3-81
3.4.2	32-point Input Modules	-----	3-84
3.4.3	64-point Input Modules	-----	3-87
3.4.4	8-point Output Modules	-----	3-92
3.4.5	16-point Output Modules	-----	3-94
3.4.6	32-point Output Modules	-----	3-97
3.4.7	64-point Output Modules	-----	3-101

3.4.1 16-point Input Modules

1) Purpose of I/O Allocation

The relationship between I/O signal and I/O reference must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Input Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Input Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DAI54300 is the Module type for the JAMSC-120DAI54300.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Input Module is set.
- (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Input	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Input Relays	100001 to 101024	100001 to 104096	16 points
Input Registers	300001 to 300512	300001 to 300512	One register

- (c) When an input relay is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O relay} = 100001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 100001 can be set as the leading reference number, but 100002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both input relays and input registers.

- (1) When 16-point input relays are allocated from 100001, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it.

Input Relay MSB Setting	The leading input reference number (100001) is allocated to the smallest input number (input 1) on the Input Module.
Input Relay LSB Setting	The leading input reference number (100001) is allocated to the largest input number (input 16) on the Input Module.

Refer to Fig. 3.1 Allocation of Input Relays for details.

Terminal number		MSB Setting	LSB Setting
①	Input 1	1 0 0 0 0 1	1 0 0 0 1 6
②	Input 2	1 0 0 0 0 2	1 0 0 0 1 5
③	Input 3	1 0 0 0 0 3	1 0 0 0 1 4
④	Input 4	1 0 0 0 0 4	1 0 0 0 1 3
⑤	Input 5	1 0 0 0 0 5	1 0 0 0 1 2
⑥	Input 6	1 0 0 0 0 6	1 0 0 0 1 1
⑦	Input 7	1 0 0 0 0 7	1 0 0 0 1 0
⑧	Input 8	1 0 0 0 0 8	1 0 0 0 0 9
⑪	Input 9	1 0 0 0 0 9	1 0 0 0 0 8
⑫	Input 10	1 0 0 0 1 0	1 0 0 0 0 7
⑬	Input 11	1 0 0 0 1 1	1 0 0 0 0 6
⑭	Input 12	1 0 0 0 1 2	1 0 0 0 0 5
⑮	Input 13	1 0 0 0 1 3	1 0 0 0 0 4
⑯	Input 14	1 0 0 0 1 4	1 0 0 0 0 3
⑰	Input 15	1 0 0 0 1 5	1 0 0 0 0 2
⑱	Input 16	1 0 0 0 1 6	1 0 0 0 0 1

Fig. 3.1 Allocation of Input Relays

When allocating input relays, the MEMOSOFT is set by default to “MSB.”

IMPORTANT

When input relay allocation is set to “MSB,” the leading reference number is allocated to the smallest input number (input 1) on the Input Module.

- (2) When input register 300001 is allocated, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it.

Input Register LSB Setting	Bit 15 (MSB) of the input register (300001) is allocated to the smallest input number (input 1) on the Input Module.
Input Register MSB Setting	Bit 15 (MSB) of the input register (300001) is allocated to the largest input number (input 16) on the Input Module.

Refer to Fig. 3.2 Allocation of Input Registers for details.

Terminal number		LSB Setting	MSB Setting
①	Input 1	300001 bit15 (MSB)	300001 bit 0 (LSB)
②	Input 2	300001 bit14	300001 bit 1
③	Input 3	300001 bit13	300001 bit 2
④	Input 4	300001 bit12	300001 bit 3
⑤	Input 5	300001 bit11	300001 bit 4
⑥	Input 6	300001 bit10	300001 bit 5
⑦	Input 7	300001 bit 9	300001 bit 6
⑧	Input 8	300001 bit 8	300001 bit 7
⑪	Input 9	300001 bit 7	300001 bit 8
⑫	Input 10	300001 bit 6	300001 bit 9
⑬	Input 11	300001 bit 5	300001 bit10
⑭	Input 12	300001 bit 4	300001 bit11
⑮	Input 13	300001 bit 3	300001 bit12
⑯	Input 14	300001 bit 2	300001 bit13
⑰	Input 15	300001 bit 1	300001 bit14
⑱	Input 16	300001 bit 0 (LSB)	300001 bit15 (MSB)

Fig. 3.2 Allocation of Input Registers

When allocating input registers, the MEMOSOFT is set by default to “LSB.”

IMPORTANT

When input register allocation is set to “LSB,” bit 15 (MSB) of the input register is allocated to the smallest input number (input 1) on the Input Module.

b) Input Data Type

If an input register is set as the I/O reference number, data input can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN**.”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL**.”

3.4.2 32-point Input Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Input Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Input Module mounted in the slot is set as the module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DDI35400 is the Module type for the JAMSC-120DDI35400.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Input Module is set.
- (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Input	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Input Relays	100001 to 101024	100001 to 104096	32 points
Input Registers	300001 to 300512	300001 to 300512	2 registers

- (c) When an input relay is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O relay} = 100001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 100001 can be set as the leading reference number, but 100002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both input relays and input registers.

- (1) When 32-point input relays are allocated from 100001, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Input Relay MSB Setting	The leading input reference number (100001) is allocated to the smallest input number of the first 16 input points (input 1) on the Input Module. The next input reference number (100017) is allocated to the smallest input number of the second 16 input points (input 17) on the Input Module.
Input Relay LSB Setting	The leading input reference number (100001) is allocated to the largest input number of the first 16 input points (input 16) on the Input Module. The next input reference number (100017) is allocated to the largest input number of the second 16 input points (input 32) on the Input Module.

Refer to *Fig. 3.3 Allocation of Input Relays* for details.

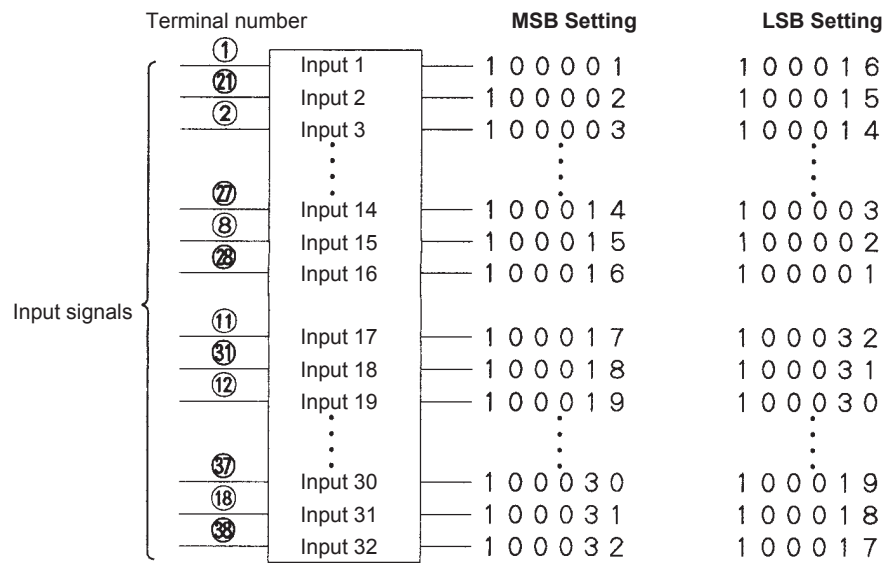


Fig. 3.3 Allocation of Input Relays

When allocating input relays, the MEMOSOFT is set by default to “MSB.”

IMPORTANT

When input relay allocation is set to “MSB,” the leading reference number is allocated to the smallest input number (input 1) on the Input Module.

- (2) When two input registers beginning with input register 300001 are allocated, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Input Register LSB Setting	Bit 15 (MSB) of the leading input reference number (300001) is allocated to the smallest input number of the first 16 input points (input 1) on the Input Module. Bit 15 (MSB) of the second input reference number (300002) is allocated to the smallest input number of the second 16 input points (input 17) on the Input Module.
Input Register MSB Setting	Bit 15 (MSB) of the leading input reference number (300001) is allocated to the largest input number of the first 16 input points (input 16) on the Input Module. Bit 15 (MSB) of the second input reference number (300002) is allocated to the largest input number of the second 16 input points (input 32) on the Input Module.

Refer to Fig. 3.4 Allocation of Input Registers for details.

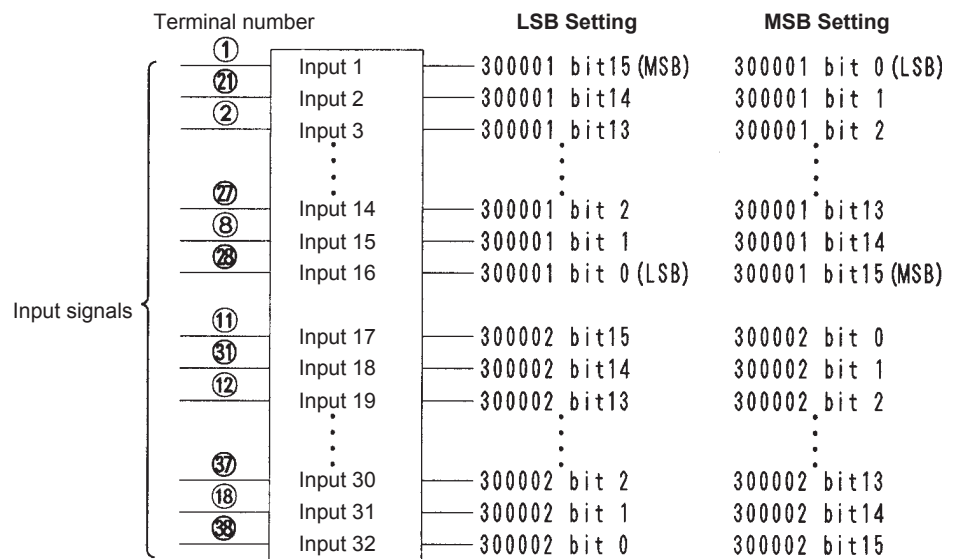


Fig. 3.4 Allocation of Input Registers

When allocating input registers, the MEMOSOFT is set by default to “**LSB**.”

IMPORTANT

When input register allocation is set to “**LSB**,” bit 15 (MSB) of the input register is allocated to the smallest input number (input 1) on the Input Module.

b) Input Data Type

If an input register is set as the I/O reference number, data input can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN**.”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL**.”

3.4.3 64-point Input Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Input Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Input Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DDI36400 is the Module type for the JAMSC-120DDI36400.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Input Module is set.
- (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Input	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Input Relays	100001 to 101024	100001 to 104096	64 points
Input Registers	300001 to 300512	300001 to 300512	4 registers

- (c) When an input relay is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O relay} = 100001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 100001 can be set as the leading reference number, but 100002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both input relays and input registers.

- (1) When 64-point input relays are allocated from 100001, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Input Relay MSB Setting	The leading input reference number (100001) is allocated to the smallest input number (input 1) of the first 16 points on the Input Module, and then the next input reference number (100017) is allocated to the smallest input number (input 17) of the next 16 points.
Input Relay LSB Setting	The leading input reference number (100001) is allocated to the largest input number (input 16) of the first 16 points on the Input Module, and then the next input reference number (100017) is allocated to the largest input number (input 32) of the next 16 points.

Refer to *Fig. 3.5 Allocation of Input Relays* for details.

- (2) When four input registers starting from 300001 are allocated, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Input Register LSB Setting	Bit 15 (MSB) of the leading input register (300001) is allocated to the smallest input number (input 1) of the first 16 points on the Input Module, and then bit 15 (MSB) of the next input register (300002) is allocated to the smallest input number (input 17) of the next 16 points.
Input Register MSB Setting	Bit 15 (MSB) of the leading input register (300001) is allocated to the largest input number (input 16) on the Input Module, and then the bit 15 (MSB) of the next input register (300002) is allocated to the largest input number (input 32) of the next 16 points.

Refer to *Fig. 3.6 Allocation of Input Registers* for details.

CN1 pin number		MSB Setting	LSB Setting	
Input signals	(A1) Input 1	1 0 0 0 0 1	1 0 0 0 1 6	
	(B1) Input 2	1 0 0 0 0 2	1 0 0 0 1 5	
	(A2) Input 3	1 0 0 0 0 3	1 0 0 0 1 4	
	⋮	⋮	⋮	
	(B7) Input 14	1 0 0 0 1 4	1 0 0 0 0 3	
	(A8) Input 15	1 0 0 0 1 5	1 0 0 0 0 2	
	(B8) Input 16	1 0 0 0 1 6	1 0 0 0 0 1	
	(A11) Input 17	1 0 0 0 1 7	1 0 0 0 3 2	
	(B11) Input 18	1 0 0 0 1 8	1 0 0 0 3 1	
	(A12) Input 19	1 0 0 0 1 9	1 0 0 0 3 0	
	⋮	⋮	⋮	
	(B17) Input 30	1 0 0 0 3 0	1 0 0 0 1 9	
	(A18) Input 31	1 0 0 0 3 1	1 0 0 0 1 8	
	(B18) Input 32	1 0 0 0 3 2	1 0 0 0 1 7	
	CN2 pin number			
	Input signals	(A1) Input 33	1 0 0 0 3 3	1 0 0 0 4 8
(B1) Input 34		1 0 0 0 3 4	1 0 0 0 4 7	
(A2) Input 35		1 0 0 0 3 5	1 0 0 0 4 6	
⋮		⋮	⋮	
(B7) Input 46		1 0 0 0 4 6	1 0 0 0 3 5	
(A8) Input 47		1 0 0 0 4 7	1 0 0 0 3 4	
(B8) Input 48		1 0 0 0 4 8	1 0 0 0 3 3	
(A11) Input 49		1 0 0 0 4 9	1 0 0 0 6 4	
(B11) Input 50		1 0 0 0 5 0	1 0 0 0 6 3	
(A12) Input 51		1 0 0 0 5 1	1 0 0 0 6 2	
⋮		⋮	⋮	
(B17) Input 62		1 0 0 0 6 2	1 0 0 0 5 1	
(A18) Input 63		1 0 0 0 6 3	1 0 0 0 5 0	
(B18) Input 64		1 0 0 0 6 4	1 0 0 0 4 9	

Fig. 3.5 Allocation of Input Relays

When allocating input relays, the MEMOSOFT is set by default to “MSB.”

IMPORTANT

When input relay allocation is set to “MSB,” the leading reference number is allocated to the smallest input number (input 1) on the Input Module.

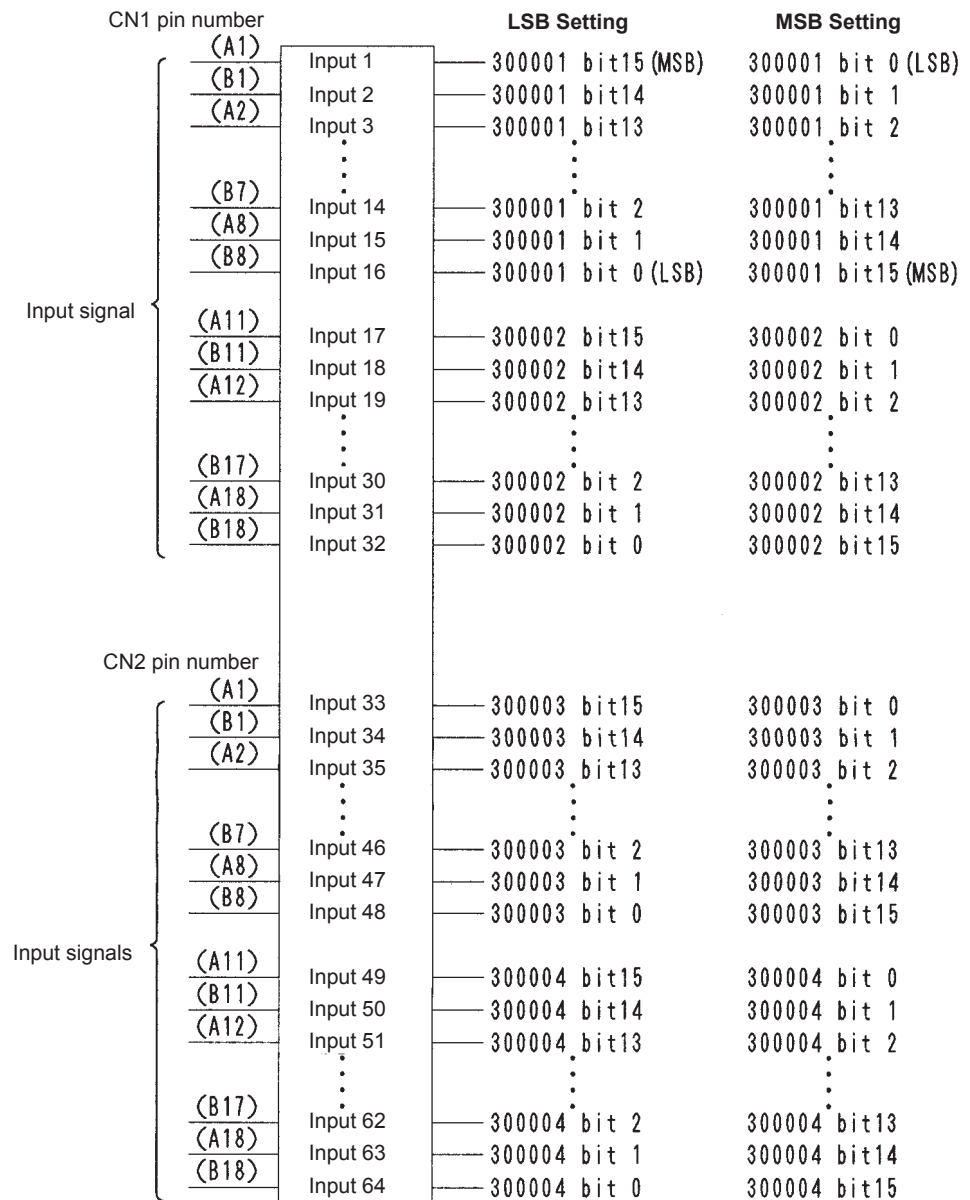


Fig. 3.6 Allocation of Input Registers

When allocating input registers, the MEMOSOFT is set by default to “**LSB.**”

IMPORTANT

When input register allocation is set to “**LSB,**” bit 15 (MSB) of the input register is allocated to the smallest input number (input 1) on the Input Module.

b) Input Data Type

If an input register is set as the I/O reference number, data input can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN.**”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O Module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL.**”

3.4.4 8-point Output Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Output Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DAO83000 is the Module type for the JAMSC-120DAO83000.

3) I/O Reference Number Setting

- The leading I/O reference number used by the Output Module is set.
- Any one of the I/O reference numbers and points listed in the following table can be set. Output coils can be allocated for the 8-point Output Modules.

Type of Output	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output coils	000001 to 001024	000001 to 004096	8 points

- (c) When an output coil is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O coil} = 000001 + 8n$$

where $n = 0$ to 127 for the CPU20 and

$n = 0$ to 511 for the CPU30

For example, 000001 can be set as the leading reference number, but 000002 cannot.

Note: Output registers cannot be allocated for the 8-point Output Modules.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocating from the reference number 000001 and also from the reference number 000009.

The bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it.

Output Coil MSB Setting	The leading output reference number (000001 or 000009) is allocated to the smallest output number (output 1) on the Output Module.
Output Coil LSB Setting	The leading output reference number (000001 or 000009) is allocated to the largest output number (output 8) on the Output Module.

Refer to *Fig. 3.7* and *Fig. 3.8* for details.

- (1) When allocating the output coils to eight output points from 000001

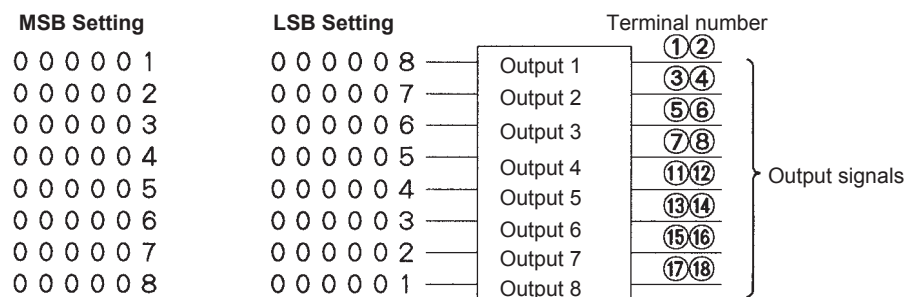


Fig. 3.7 Allocation Output Coils from 000001

- (2) When allocating the output coils to eight output points from 000009

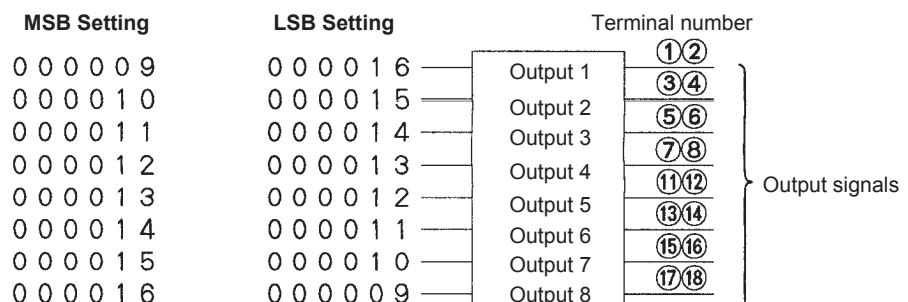


Fig. 3.8 Allocation Output Coils from 000009

IMPORTANT

When allocating output coils, the MEMOSOFT is set by default to “**MSB.**”
When output coil allocation is set to “MSB,” the leading reference number is allocated to the smallest output number (output 1) on the Output Module.

b) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O Module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL.**”

c) Timeout Output

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either of the following settings is possible.

- (1) Final Data: The data that existed just before the CPU Module stopped.
- (2) Set Data: Preset data.

The MEMOSOFT is set by default to **SET DATA**.

d) Timeout Output Data

The data that is output when the CPU Module stops (when set data is specified for the timeout output) can be set. The data set here is an image of the PC reference data. The data set here is converted and output in the order bits are set. The MEMOSOFT is set by default to all zeros.

3.4.5 16-point Output Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Output Modules.

- (1) Module Type
- (2) I/O Reference Numbers
- (3) I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DAO84300 is the Module type for the JAMSC-120DAO84300.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Output Module is set.
 (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Output	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output coils	000001 to 001024	000001 to 004096	16 points
Output registers	400001 to 400512	400001 to 400512	1 register

- (c) When an output coil is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O coil} = 000001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 000001 can be set as the leading reference number, but 000002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both output coils and output registers.

- (1) When 16-point output coils are allocated from 000001, the bit order can be set to either "MSB" or "LSB," as described in the following table and shown in the illustration below it.

Output Coil MSB Setting	The leading output reference number (000001) is allocated to the smallest output number (output 1) on the Output Module.
Output Coil LSB Setting	The leading output reference number (000001) is allocated to the largest output number (output 16) on the Output Module.

Refer to *Fig. 3.9 Allocation of Output Coils* for details.

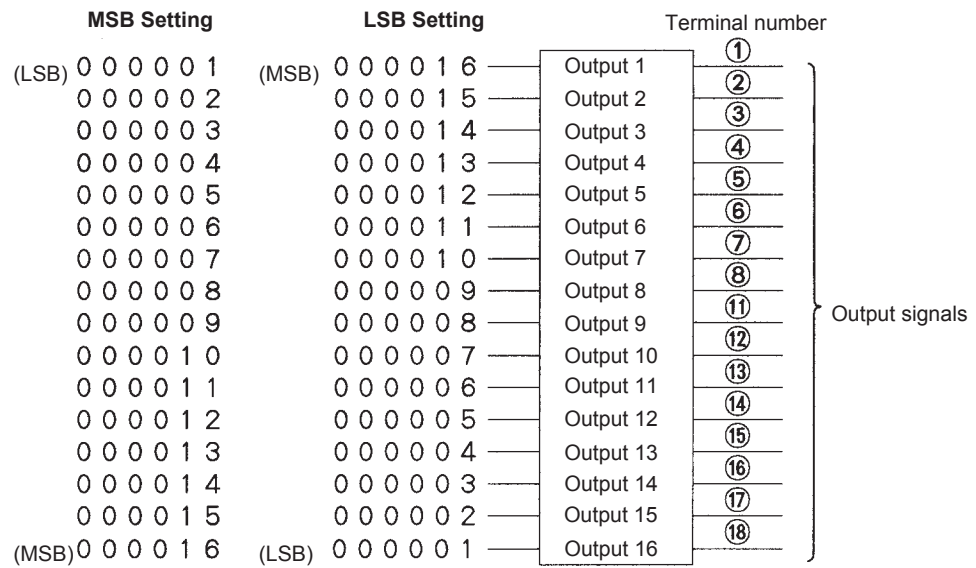


Fig. 3.9 Allocation of Output Coils

When allocating output coils, the MEMOSOFT is set by default to “MSB.”

IMPORTANT

When output coil allocation is set to “MSB,” the leading reference number is allocated to the smallest output number (output 1) on the Output Module.

- (2) When output register 400001 is allocated, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it.

Output Register LSB Setting	Bit 15 (MSB) of the output register (400001) is allocated to the smallest output number (output 1) on the Output Module.
Output Register MSB Setting	Bit 15 (MSB) of the output register (400001) is allocated to the largest output number (output 16) on the Output Module.

Refer to Fig. 3.10 Allocation Output Registers for details.

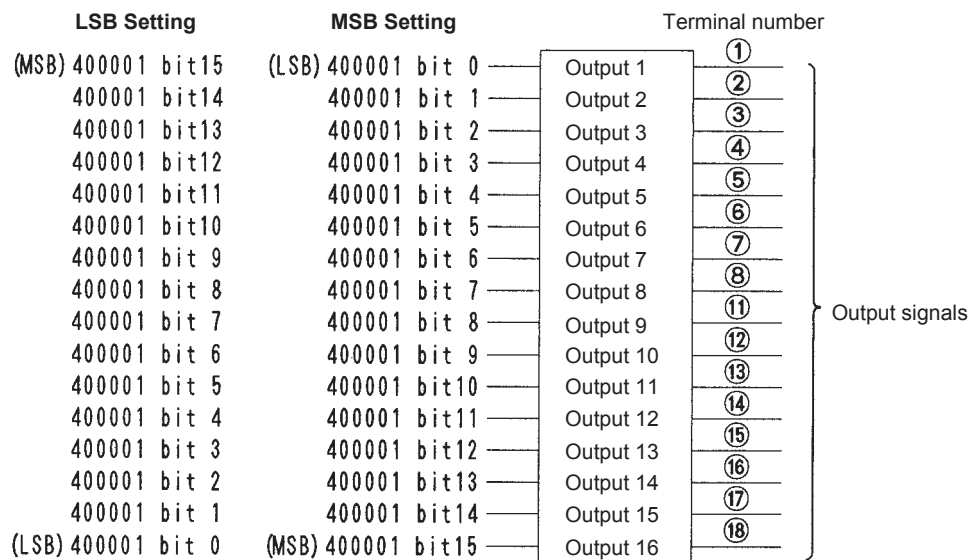


Fig. 3.10 Allocation Output Registers

When allocating output registers, the MEMOSOFT is set by default to “LSB.”

IMPORTANT

When output register allocation is set to “LSB,” bit 15 (MSB) of the output register is allocated to the smallest output number (output 1) on the Output Module.

b) Output Data Type

If an output register is set as the I/O reference number, data output can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN.**”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL.**”

d) Timeout Output

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either of the following settings is possible.

- (1) Final Data: The data that existed just prior to stopping.
- (2) Set Data: Preset data.

The MEMOSOFT is set by default to **SET DATA**.

e) Timeout Output Data

The data that is output when the CPU Module stops (when set data is specified for the timeout output) can be set. The data set here is an image of the PC reference data. The data set here is converted and output in the order bits are set. The MEMOSOFT is set by default to all **zeros**.

3.4.6 32-point Output Modules**1) Purpose of I/O Allocation**

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Output Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DDO35410 is the Module type for the JAMSC-120DDO35410.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Output Module is set.
- (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Output	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output coils	000001 to 001024	000001 to 004096	32 points
Output registers	400001 to 400512	400001 to 400512	2 registers

- (c) When an output coil is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O coil} = 000001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 000001 can be set as the leading reference number, but 000002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both output coils and output registers.

- (1) When 32-point output coils are allocated from 000001, the bit order can be set to either "MSB" or "LSB," as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 output points.

Output Coil MSB Setting	The leading output reference number (000001) is allocated to the smallest output number of the first 16 output points (output 1) on the Output Module. The next output reference number (000017) is allocated to the smallest output number of the second 16 output points (output 17) on the Output Module.
Output Coil LSB Setting	The leading output reference number (000001) is allocated to the largest output number of the first 16 output points (output 16) on the Output Module. The next output reference number (000017) is allocated to the largest output number of the second 16 output points (output 32) on the Output Module.

Refer to *Fig. 3.11 Allocation of Output Coils* for details.

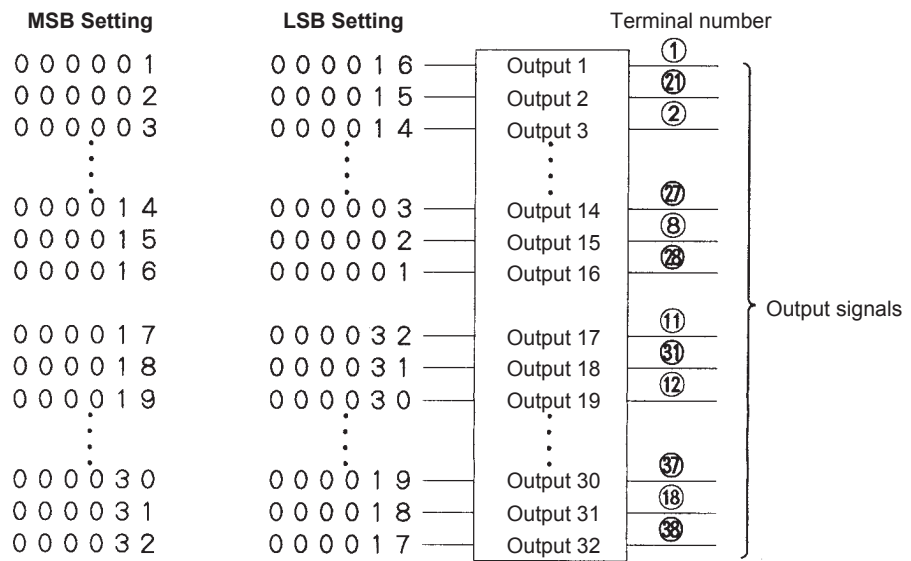


Fig. 3.11 Allocation of Output Coils

When allocating output coils, the MEMOSOFT is set by default to “MSB.”

IMPORTANT

When output coil allocation is set to “MSB,” the leading reference number is allocated to the smallest output number (output 1) on the Output Module.

- (2) When two output registers beginning with output register 400001 are allocated, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 output points.

Output Register LSB Setting	Bit 15 (MSB) of the leading output reference number (400001) is allocated to the smallest output number of the first 16 output points (output 1) on the Output Module. Bit 15 (MSB) of the second output reference number (400002) is allocated to the smallest output number of the second 16 output points (output 17) on the Output Module.
Output Register MSB Setting	Bit 15 (MSB) of the leading output reference number (400001) is allocated to the largest output number of the first 16 output points (output 16) on the Output Module. Bit 15 (MSB) of the second output reference number (400002) is allocated to the largest output number of the second 16 output points (output 32) on the Output Module.

Refer to Fig. 3.12 Allocation of Output Registers for details.

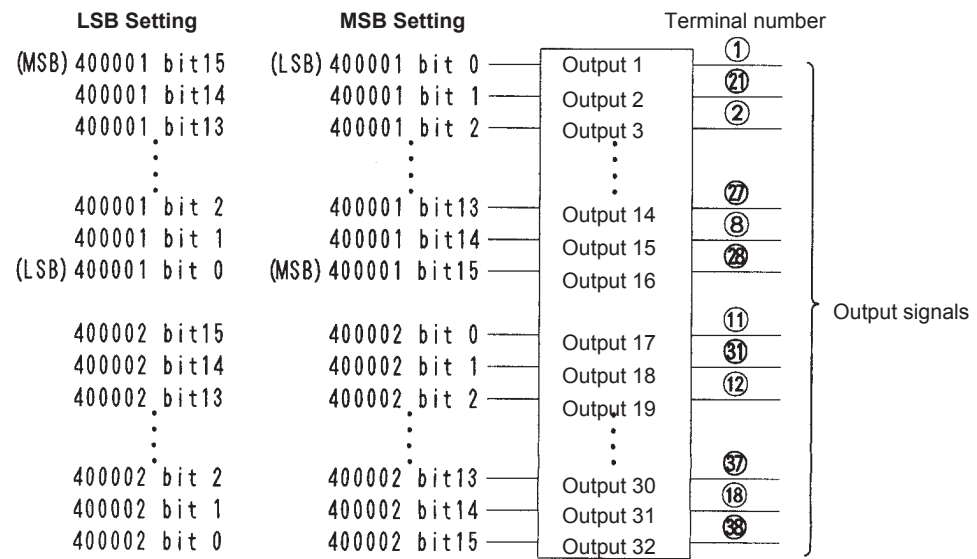


Fig. 3.12 Allocation of Output Registers

When allocating output registers, the MEMOSOFT is set by default to “**LSB**.”

IMPORTANT

When output register allocation is set to “**LSB**,” bit 15 (MSB) of the output register is allocated to the smallest output number (output 1) on the Output Module.

b) Output Data Type

If an output register is set as the I/O reference number, data output can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN**.”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL**.”

d) Timeout Output

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either of the following settings is possible.

- (1) Final Data: The data that existed just prior to stopping.
- (2) Set Data: Preset data.

The MEMOSOFT is set by default to **SET DATA**.

e) Timeout Output Data

The data that is output when the CPU Module stops (when set data is specified for the timeout output) can be set. The data set here is an image of the PC reference data. The data set here is converted and output in the order bits are set. The MEMOSOFT is set by default to all **zeros**.

3.4.7 64-point Output Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Digital Output Modules.

- (1) Module Type
- (2) I/O Reference Numbers
- (3) I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

2) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120DDO36410 is the Module type for the JAMSC-120DDO36410.

3) I/O Reference Number Setting

- (a) The leading I/O reference number used by the Output Module is set.
- (b) Any one of the I/O reference numbers and points listed in the following table can be set.

Type of Input	References for I/O Allocation		Points/Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output coils	000001 to 001024	000001 to 004096	64 points
Output registers	400001 to 400512	400001 to 400512	4 registers

- (c) When an output coil is set, the leading I/O reference number must satisfy the following equation:

$$\text{Leading reference number of I/O coil} = 000001 + 16n$$

where $n = 0$ to 63 for the CPU20 and

$n = 0$ to 255 for the CPU30

For example, 000001 can be set as the leading reference number, but 000002 cannot.

4) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings because the default settings can be used for most normal applications.

a) Bit Order

I/O can be processed by handling data either in ascending or descending order of the bits. This is explained next for allocation of both output coils and output registers.

- (1) When 64-point output coils are allocated from 000001, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Output Coil MSB Setting	The leading output reference number (000001) is allocated to the smallest output number (output 1) of the first 16 points on the Output Module, and then the next output reference number (000017) is allocated to the smallest output number (output 17) of the next 16 points.
Output Coil LSB Setting	The leading output reference number (000001) is allocated to the largest output number (output 16) of the first 16 points on the Output Module, and then the next output reference number (000017) is allocated to the largest output number (output 32) of the next 16 points.

Refer to *Fig 2.13 Allocation of Output Coils* for details.

- (2) When four output registers are allocated from 400001, the bit order can be set to either “MSB” or “LSB,” as described in the following table and shown in the illustration below it. Allocation is performed in units of 16 input points.

Output Register LSB Setting	Bit 15 (MSB) of the leading output register (400001) is allocated to the smallest output number (output 1) of the first 16 points on the Output Module, and then the bit 15 (MSB) of the next output register (400002) is allocated to the smallest output number (output 17) of the next 16 points.
Output Register MSB Setting	Bit 15 (MSB) of the leading output register (400001) is allocated to the largest output number (output 16) on the Output Module, and then the bit 15 (MSB) of the next output register (400002) is allocated to the largest input number (output 32) of the next 16 points.

Refer to *Fig. 3.14 Allocation of Output Registers* for details.

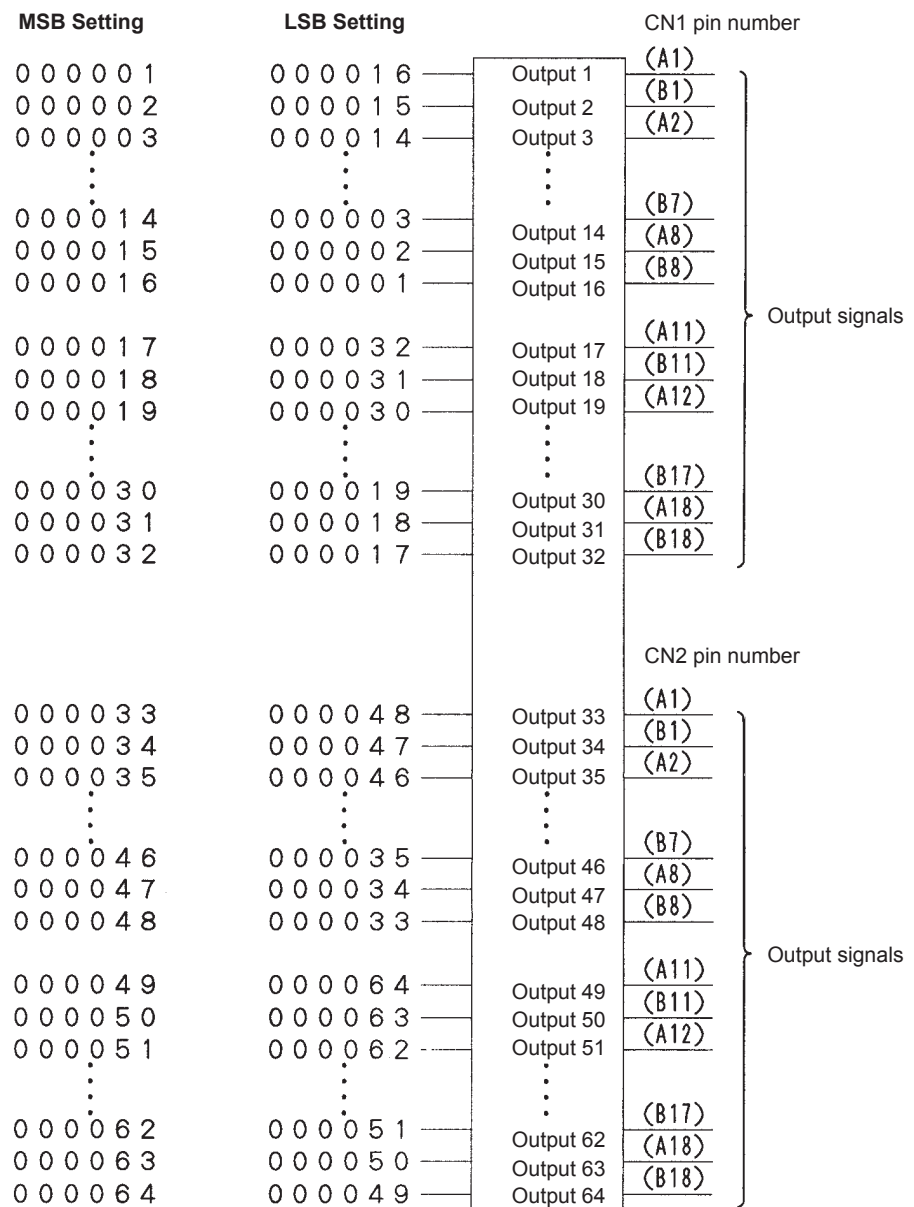


Fig. 3.13 Allocation of Output Coils

When allocating output coils, the MEMOSOFT is set by default to "MSB."

IMPORTANT

When output coil allocation is set to "MSB," the leading reference number is allocated to the smallest output number (output 1) on the Output Module.

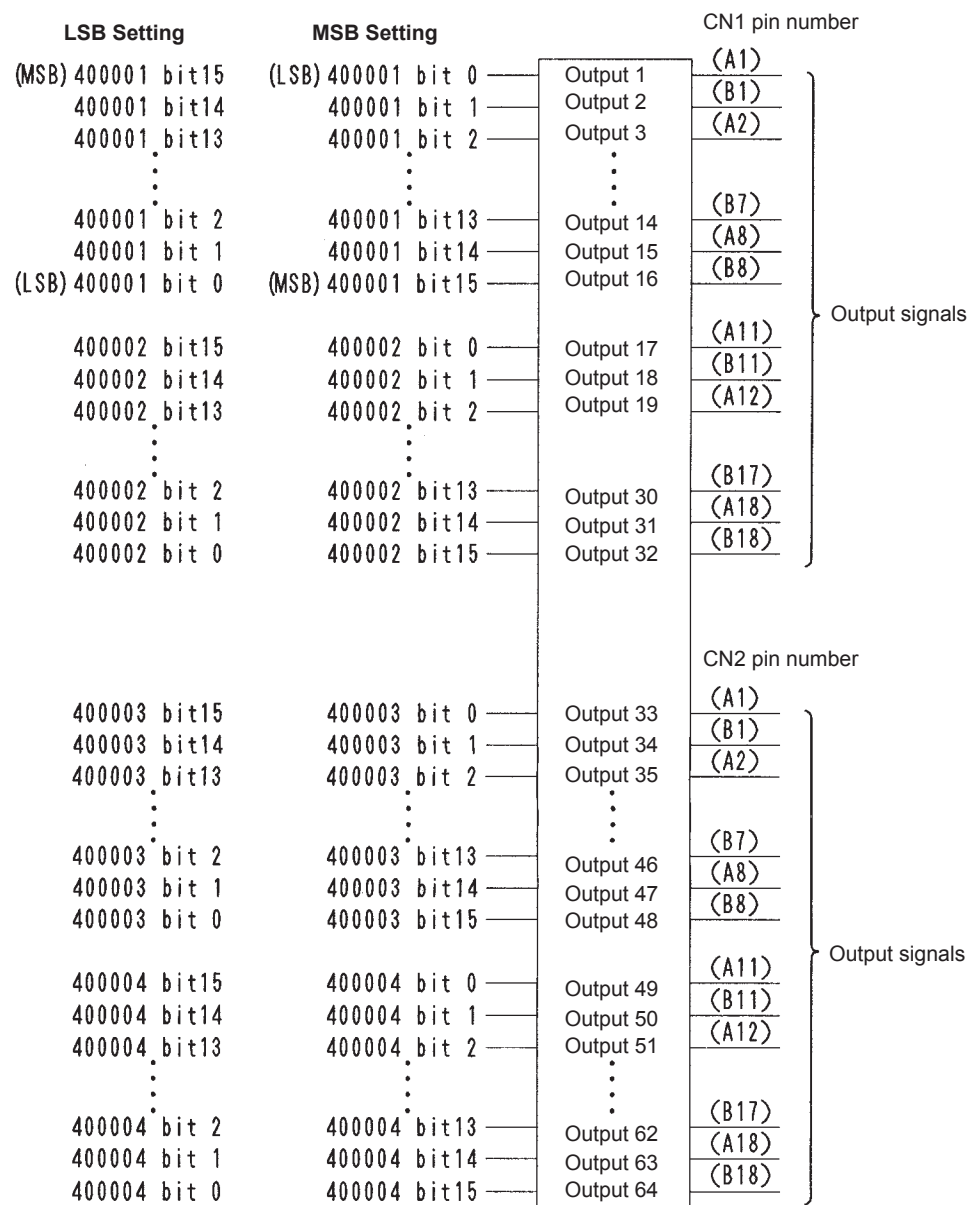


Fig. 3.14 Allocation of Output Registers

When allocating output registers, the MEMOSOFT is set by default to “**LSB**.”

IMPORTANT

When output register allocation is set to “**LSB**,” bit 15 (MSB) of the output register is allocated to the smallest output number (output 1) on the Output Module.

b) Output Data Type

If an output register is set as the I/O reference number, data output can be set to binary (BIN) or BCD. The MEMOSOFT is set by default to “**BIN**.”

c) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to “**NORMAL**.”

d) Timeout Output

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either of the following settings is possible.

(1) Final Data: The data that existed just prior to stopping.

(2) Set Data: Preset data.

The MEMOSOFT is set by default to **SET DATA**.

e) Timeout Output Data

The data that is output when the CPU Module stops (when set data is specified for the timeout output) can be set. The data set here is an image of the PC reference data. The data set here is converted and output in the order bits are set. The MEMOSOFT is set by default to all **zeros**.

3.5 Operations Using MEMOSOFT

This section describes the I/O allocations (maps) using the MEMOSOFT.

3.5.1 MEMOSOFT Versions Supporting 64-point I/O Modules ----- 3-106
 3.5.2 Digital Input Module I/O Allocation Screen ----- 3-107
 3.5.3 Digital Output Module I/O Allocation Screen ----- 3-108
 3.5.4 I/O Allocations ----- 3-109

3.5.1 MEMOSOFT Versions Supporting 64-point I/O Modules

The following MEMOSOFT versions are required to use 64-point I/O Modules in MEMOCON GL120 or GL130.

CAUTION The following CPU Module, Remote I/O Receiver Module, and MEMOSOFT versions are necessary to use 64-point I/O Modules.

Using an inappropriate version may cause failure and malfunction.

Table 3.10 Versions Supporting 64-point I/O Modules

Name	Model Name	Model No.	Version Number	Location of Version Number
CPU Module (8 kW)	CPU10	DDSCR-120CPU14200	□□A01 and later	Module nameplate
CPU Module (16 kW)	CPU20	DDSCR-120CPU34100	□□B05 and later	Module nameplate
CPU Module (16 kW)	CPU21	DDSCR-120CPU34110	□□A01 and later	Module nameplate
CPU Module (32 kW)	CPU30	DDSCR-120CPU54100	□□B05 and later	Module nameplate
CPU Module (40 kW)	CPU35	DDSCR-120CPU154110	□□A01 and later	Module nameplate
Remote I/O Receiver Module	RIOR-COAX	JAMSC-120CRR13100	□□A10 and later	Module nameplate
MEMOSOFT		FMSGGL-AT3 (for English DOS) FMSGGL-PP3E (for P120 English version)	1.21□ and later	In the middle at the bottom of the MEMOSOFT start-up screen.

* The nameplate is on the right side of the Module.

3.5.2 Digital Input Module I/O Allocation Screen

This section provides information on the MEMOSOFT I/O Traffic Cop Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i.e., I/O Allocation) Screen

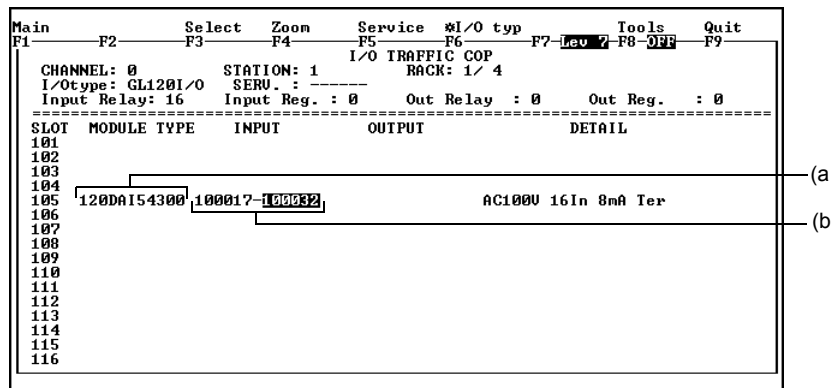


Fig. 3.15 I/O Traffic Cop Screen

a) Module Type

Enter the Digital Input Module type, for example, 120DAI54300.

b) Set the I/O references to be used by the Digital Input Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press **Enter** Key to accept the value, or change it to the desired value, if required.

2) The Parameter Setting Screen (Zoom)

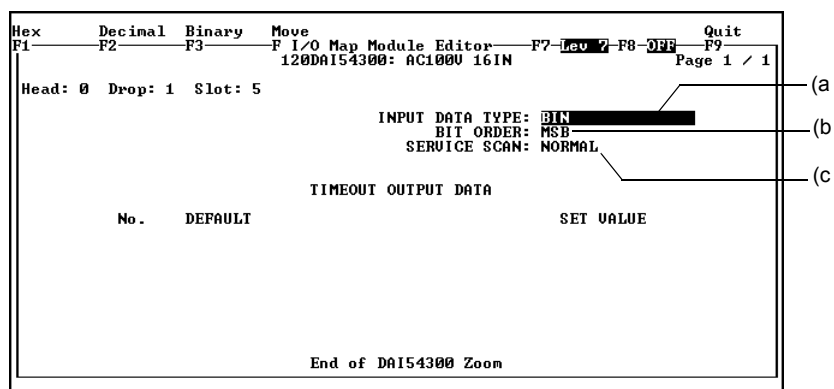


Fig. 3.16 Parameter Setting Screen

a) Data Type

If an input register is set as the I/O reference number, data input can be set to BIN (binary) or BCD (binary coded decimal notation).

b) Bit Order (LSB/MSB)

I/Os can be processed by handling data either in ascending or descending order of the bit.

c) Service Scan (Normal/High-Speed)

Set either Normal or High-speed scan for I/O data refresh cycle.

3.5.3 Digital Output Module I/O Allocation Screen

This section provides information on the MEMOSOFT I/O Traffic Cop Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i.e., I/O Allocation) Screen

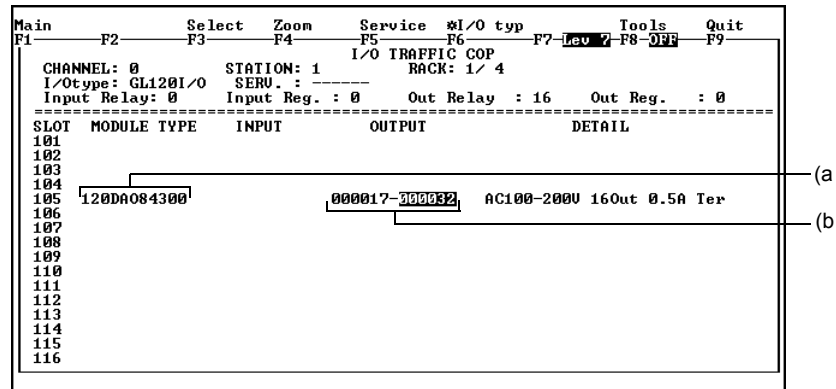


Fig. 3.17 I/O Traffic Cop Screen

a) Module Type

Enter the Digital Output Module type, for example, 120DA084300.

b) Set the I/O references to be used by the Digital Output Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press **Enter** Key to accept the value, or change it to the desired value, if required.

2) The Parameter Setting Screen (Zoom)

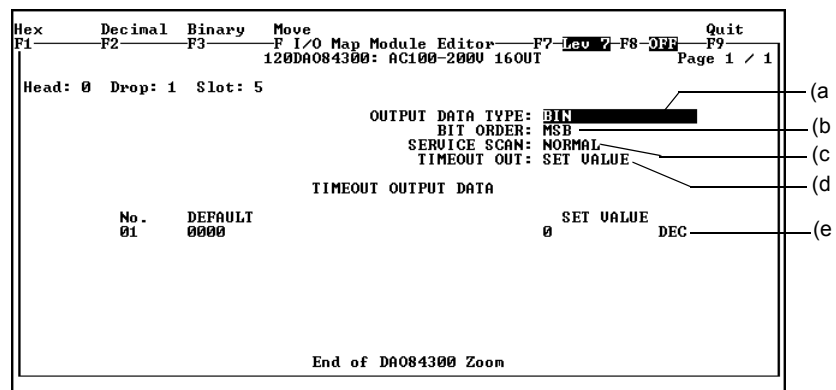


Fig. 3.18 Parameter Setting Screen

a) Data Type

If an output register is set as the I/O reference number, data output can be set to BIN (binary) or BCD (binary coded decimal notation).

b) Bit Order (LSB/MSB)

I/O can be processed by handling data either in ascending or descending order of the bits.

c) Service Scan (Normal/High-Speed)

Set either Normal or High-speed scan for I/O data refresh cycle.

d) Timeout Output (Final Data/Set Data)

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either "Final Data" or "Set Data" can be set.

e) Timeout Output Data

If "Set Data" is specified for d) Timeout Output, set the data output when the CPU Module stops.

3.5.4 I/O Allocations

This section explains the operation method of I/O Allocation taking the example of Digital Output Modules. The operation method for Digital Input Modules is the same as for Analog Input Modules.

3**1) I/O Allocation Items**

I/Os must be allocated to use the Digital Input and Output Modules. I/O allocations are made using the MEMOSOFT and the results are recorded in the I/O allocation tables stored in memory of the CPU Module.

The following items must be set for I/O allocations.

- Module Type
- I/O References
- Data Type (BIN/BCD)
- Bit Order (LSB/MSB)
- Service Scan (Normal/High-speed scan)
- Timeout Output (Final Data/Set Data)

Note: This item is to be set only for Digital Output Modules.

2) Setting the Module Type

Set the Module Type in the following procedure.

- (1) Start the MEMOSOFT and select *Online* from the **Mode** Menu.

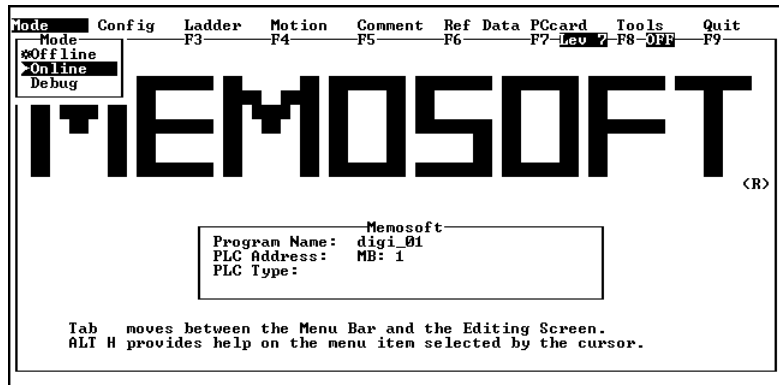


Fig. 3.19 Mode Selection: Online

I/O allocations cannot be performed while the CPU Module is in RUN status. If necessary, stop the CPU Module. Refer to 6.1 *PLC Operations in the MEMOSOFT User's Manual (Manual No. SIEZ-C825-60.10)* for the procedure to stop the CPU Module.

- (2) Press the **F2 (Config)** Key to access the PLC System Configuration Screen.

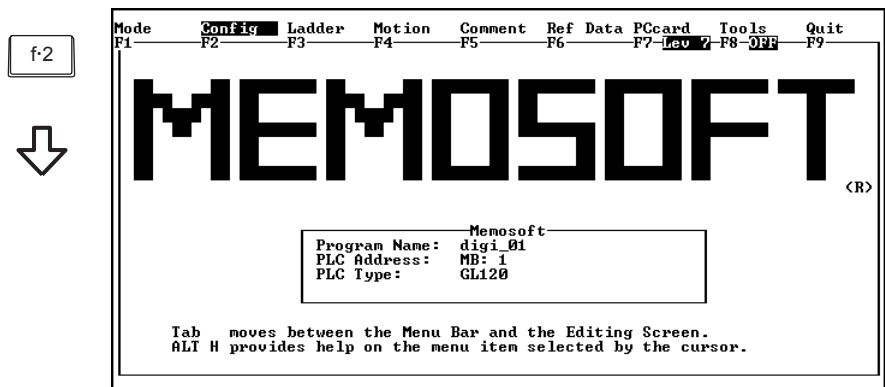


Fig. 3.20 PLC System Configuration Screen

- (3) Select **I/O Map** from the Map Menu using the Cursor Keys and press the **Enter** Key.

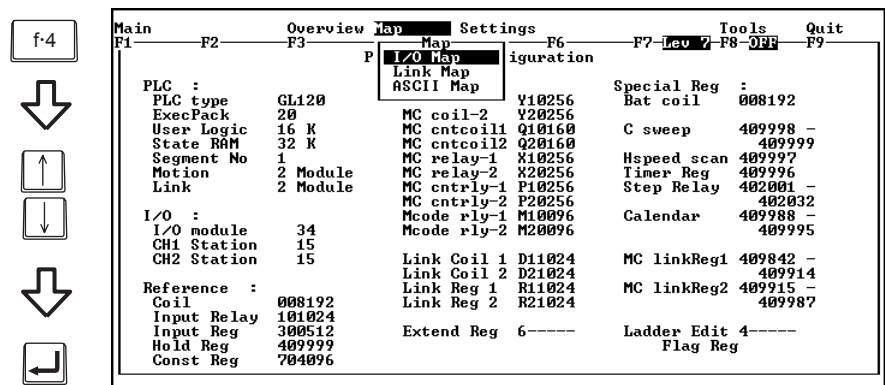


Fig. 3.21 Selecting the I/O Map

- (4) The I/O Map Screen will be displayed. Move the cursor to the slot to which the allocations are to be made.

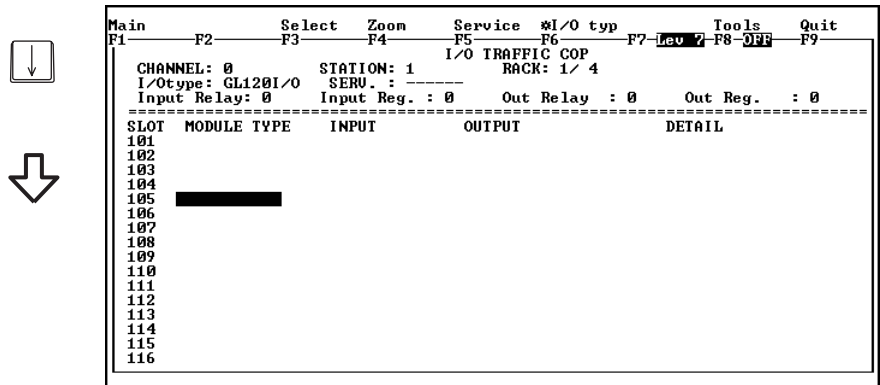


Fig. 3.22 I/O Map

If the Digital Output (or Input) Module is already mounted, the Module model description will be displayed on the right.

- (5) Press the **Shift + ?** Keys. A list of Module types will be displayed. Move the cursor to **120DAO84300** and press the **Enter** Key to select the Digital Output Module.

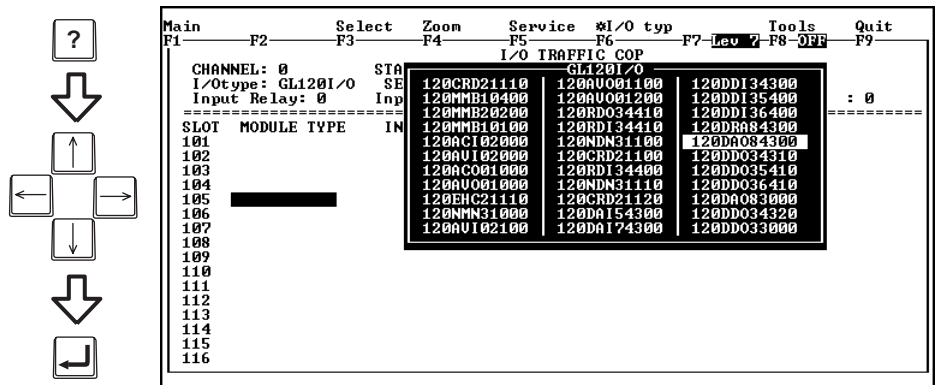


Fig. 3.23 Module Selection

3) Setting I/O References

A screen to allocate I/O (I/O Traffic Cop Screen) will be displayed.

- (1) Input the reference number of the first output coil:
Move the cursor to the field for the reference number of the first output coil and input the reference number. Press the **Enter** Key.

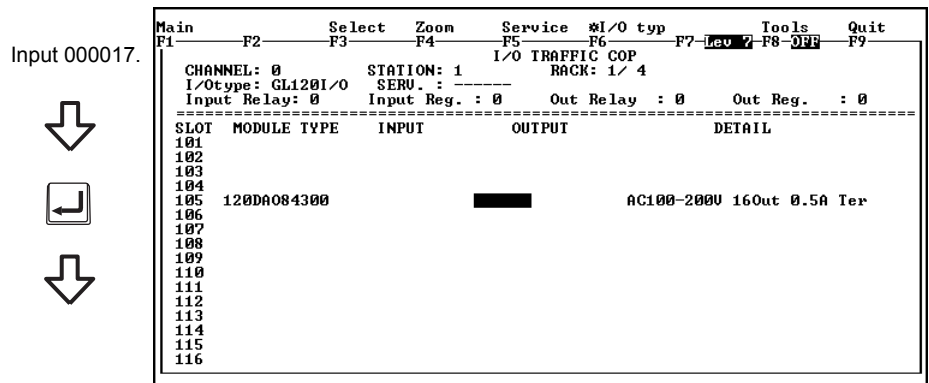


Fig. 3.24 I/O Traffic Cop Screen

The leading I/O reference number of output coil must satisfy the following equation:

<For 16-point, 32-point, and 64-point Output Modules>

Leading reference number of output coil = $000001+16n$

where $n = 0$ to 63 for the CPU 20 and

$n = 0$ to 255 for the CPU30

<For 8-point Output Modules>

Leading reference number of output coil = $000001+8n$

where $n = 0$ to 127 for the CPU20 and

$n = 0$ to 511 for the CPU30

- (2) When the reference number of the first output coil is input, the cursor will move to the field for the reference number of the last output coil and the reference number will be displayed automatically, indicating the reference number that can be input. Press the **Enter** Key to accept the value or change it to the desired value if necessary.



Main	F2	Select	Zoom	Service	*I/O typ	Tools	Quit
F1	F3	F4	F5	F6	F7	F8	F9
CHANNEL: 0		STATION: 1		I/O TRAFFIC COP		RACK: 1/ 4	
I/O type: GL120I/O		SERU. :-----		Out Relay : 16		Out Reg. : 0	
Input Relay: 0		Input Reg. : 0		Out Relay : 16		Out Reg. : 0	
=====							
SLOT	MODULE TYPE	INPUT	OUTPUT	DETAIL			
101							
102							
103							
104							
105	120DA084300		000017-000032	AC100-200U	16Out	0.5A Ter	
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							

Fig. 3.25 Reference Number of First Output Coil

The last I/O reference number of output coil must satisfy the following equation:

<For 16-point, 32-point, and 64-point Output Modules>

Leading reference number of output coil = $000000+16n$

where $n = 1$ to 63 for the CPU 20 and

$n = 1$ to 255 for the CPU30

<For 8-point Output Modules>

Leading reference number of output coil = $000000+8n$

where $n = 1$ to 127 for the CPU20 and

$n = 1$ to 511 for the CPU30

- (3) The reference number of the last output coil will be displayed.

```

Main      Select  Zoom   Service #I/O typ  Tools  Quit
F1        F2      F3      F4      F5      F6      F7-Lco 7- F8-000 F9-
-----
CHANNEL: 0      STATION: 1      I/O TRAFFIC COP      RACK: 1 / 4
I/Otype: GL1201/O  SERU. : -----
Input Relay: 0   Input Reg. : 0      Out Relay : 16      Out Reg. : 0
-----
SLOT  MODULE TYPE  INPUT      OUTPUT      DETAIL
101
102
103
104
105  120DA084300      000017-000032  AC100-200U 16Out 0.5A Ter
106
107
108
109
110
111
112
113
114
115
116

```

Fig. 3.26 Reference Number of Last Output Coil

- (4) This completes the setting of I/O references.



I/O references for the Digital Input Module can be set in the same way as the Digital Output Module.

3

4) Setting the Data Type

Press the **F4 (Zoom)** Key to access to the Parameter Setting Screen (I/O Map Module Editor).

- (1) Move the cursor to **OUTPUT DATA TYPE** and press the **Enter** Key to access the mode setting.



```

Hex      Decimal  Binary  Move      Quit
F1        F2      F3      F4      F5      F6      F7-Lco 7- F8-000 F9-
-----
120DA084300: AC100-200U 16OUT      Page 1 / 1
Head: 0 Drop: 1 Slot: 5
      OUTPUT DATA TYPE: BIN
      BIT ORDER: MSB
      SERVICE SCAN: NORMAL
      TIMEOUT OUT: SET VALUE
      TIMEOUT OUTPUT DATA
      No.  DEFAULTI  SET VALUE  DEC
      01  0000      0
End of DA084300 Zoom

```

Fig. 3.27 Parameter Setting Screen: Data Type

- (2) A screen will appear so that the data type setting can be selected. Move the cursor to either **BIN** or **BCD** and press the **Enter** Key to select the desired mode.

The MEMOSOFT is set by default to BIN.

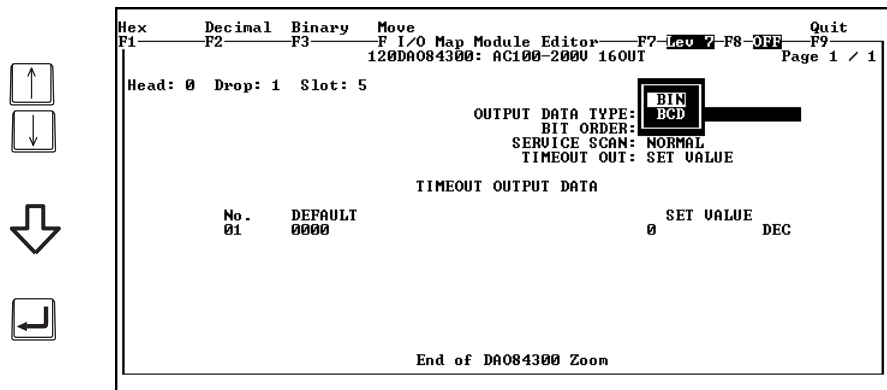


Fig. 3.28 Mode Selection

5) Setting the Bit Order

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **BIT ORDER** and press the **Enter** Key to access the bit order setting.

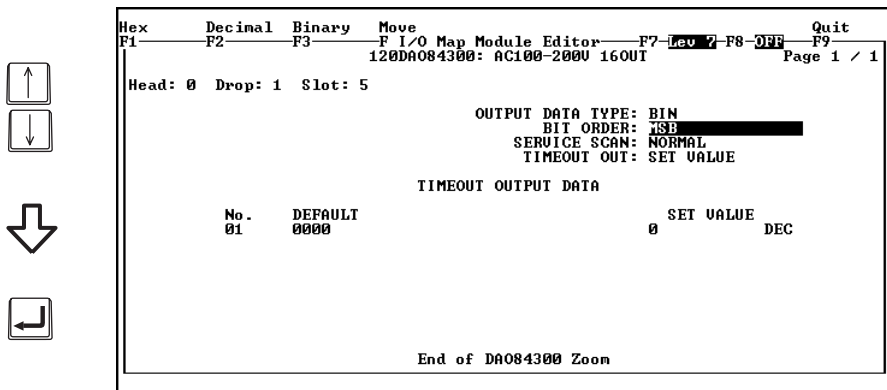


Fig. 3.29 Parameter Setting Screen: Bit Order

- (2) A screen will appear so that the bit order setting can be selected. Move the cursor to either **LSB** or **MSB** and press the **Enter** Key to select the desired bit order.

The MEMOSOFT is set by default as follows:

- Input relays and output coils: MSB
- Input registers and output registers: LSB

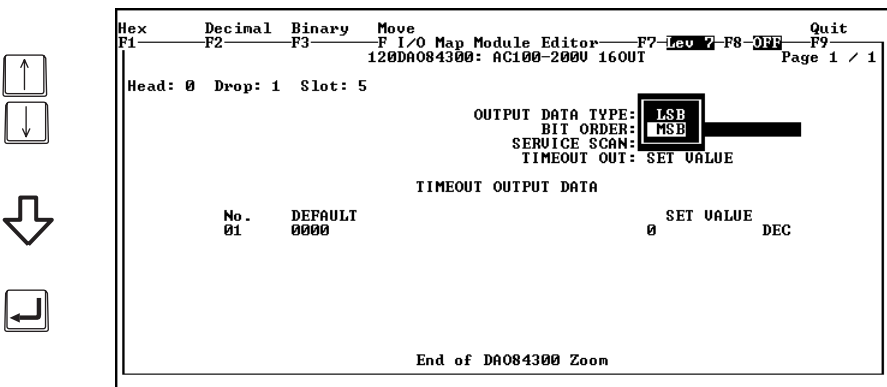


Fig. 3.30 Bit Order Selection

6) Setting the Service Scan

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **SERVICE SCAN** and press the **Enter** Key to access the service scan setting.

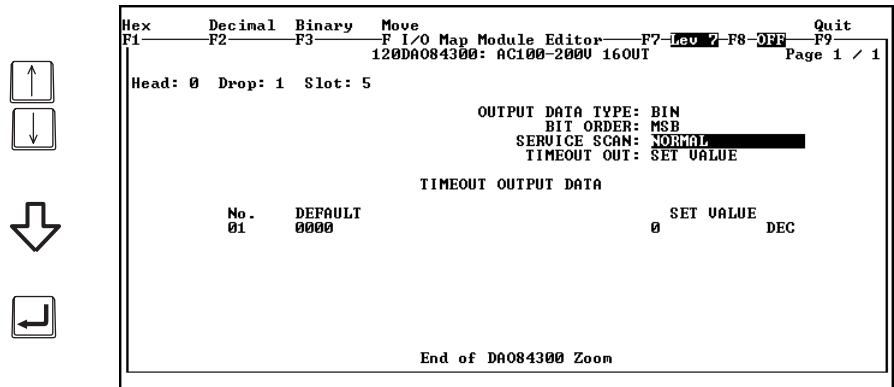


Fig. 3.31 Parameter Setting Screen: Service scan

- (2) A screen will appear so that the service scan setting can be selected. Move the cursor to either **NORMAL** or **HIGH** and press the **Enter** Key to select the desired scan service.

The MEMOSOFT is set by default to **NORMAL**.

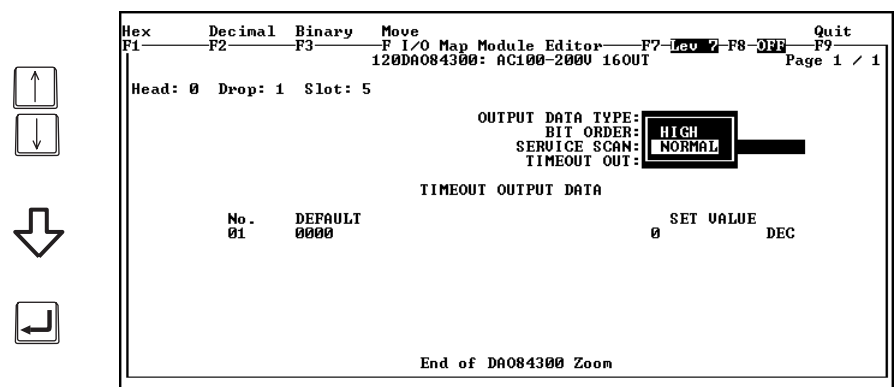


Fig. 3.32 Service Scan Selection

7) Setting the Timeout Output (Only for Digital Output Modules)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **TIMEOUT OUT** and press the **Enter** Key to access the timeout output setting.

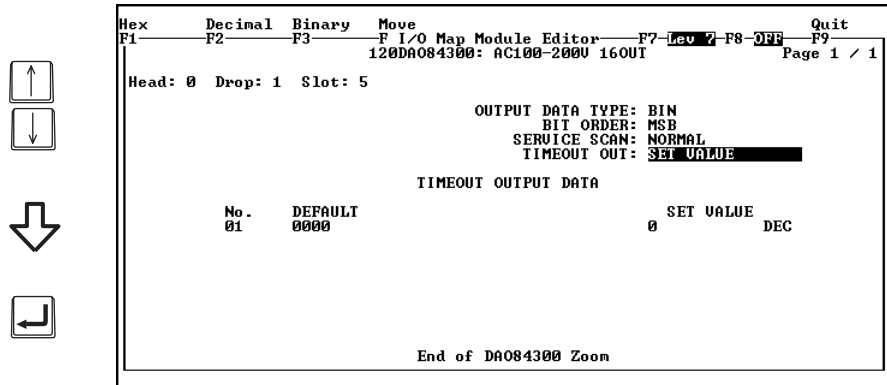


Fig. 3.33 Parameter Setting Screen: Time out Output

- (2) A screen will appear so that the timeout output setting can be selected.

Move the cursor to either **FINAL DATA** or **SET VALUE** and press the **Enter** Key to select the desired timeout output status. If **FINAL DATA** is selected, the data just before the CPU Module entered STOP status will be sent for all outputs until the CPU Module returns to RUN status.

The MEMOSOFT is set by default to **SET VALUE**.

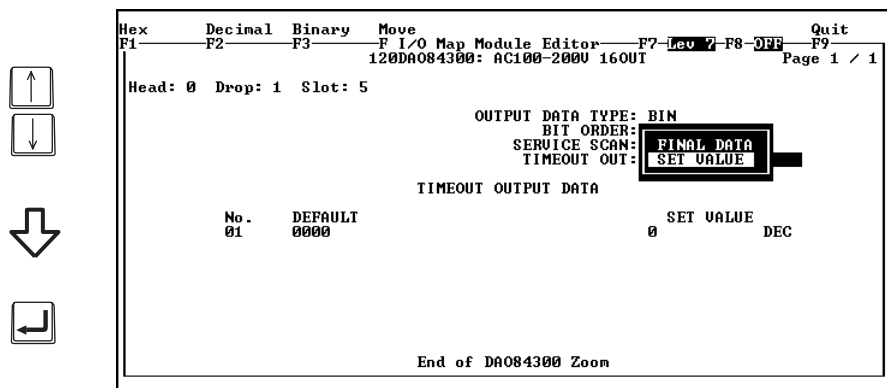


Fig. 3.34 Timeout Output Status Selection



The timeout output setting is only for Digital Output Modules, but not for Digital Input Modules.

8) Setting the Timeout Output Data (Only for Digital Output Modules)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to the input field for **SET VALUE** and input a value. Then, press the **Enter** Key.

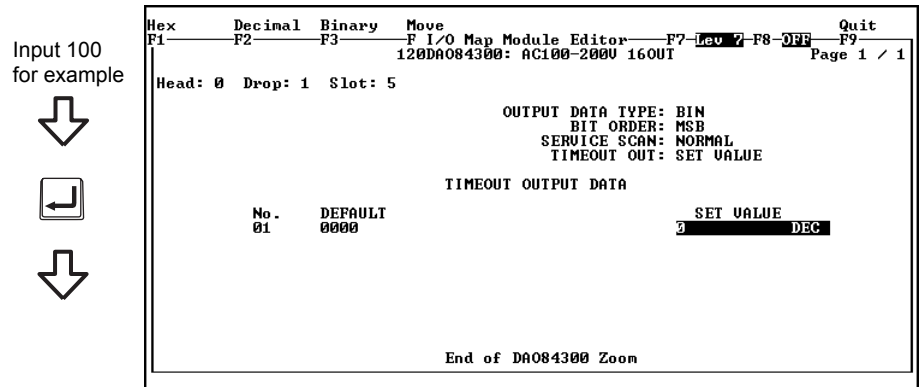


Fig. 3.35 Parameter Setting Screen: Timeout Output Data

The MEMOSOFT is set by default to 0.

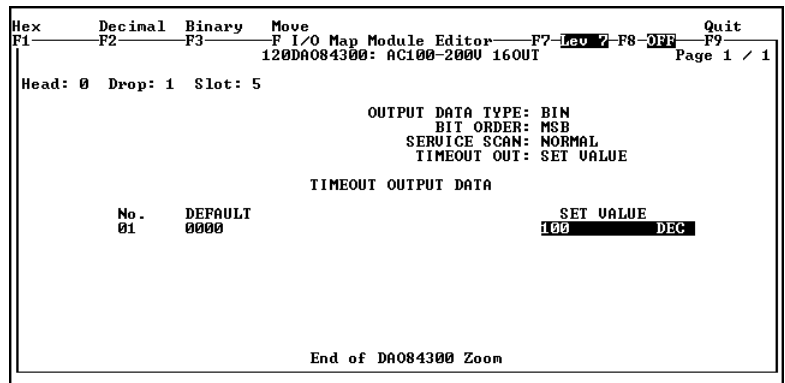
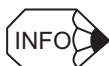


Fig. 3.36 Timeout Output Data Setting



The timeout output data setting is only for Digital Output Modules and not for Digital Input Modules.

9) This completes the I/O allocations.

Press the **F9 (Quit)** Key to end the procedure.

Analog I/O Specifications

4



This chapter gives the specifications of Analog Input Modules and Analog Output Modules.

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4.1 Analog Input Specifications

This section describes performance specifications, circuit configuration, external connections, and appearance of the 120-series Analog Input Modules.

4.1.1 Analog Input Modules (± 10 V, 4 channels) ----- 4-2

4.1.2 Analog Input Modules (0 to 10 V, 4 channels) ----- 4-8

4.1.3 Analog Input Modules (4 to 20-mA, 4 channels) ----- 4-14

4.1.1 Analog Input Modules (± 10 V, 4 channels)

1) Performance Specifications

Item	Specification
Name	Analog Input Module (± 10 V, 4 channels)
Model Name	A/D-VOL-4CH
Model No.	JAMSC-120AVI02000
Input Signal Range	-10 to 10 V
Special Input	None
Number of Input Channels	4 channels, isolated in common
Input Impedance	1 M Ω min
Maximum Allowable Overload	-25 to 25 V
Digital Resolution	12 bits
Data Format	1) Two modes available, set by allocation 0-4000 mode/ ± 2000 mode 2) Range of numerical values for each mode is as follows: 0-4000 mode: Binary, 0 to +4000 ± 2000 mode: 2's complement, -2000 to +2000
Errors	$\pm 0.5\%$ F.S. (25 °C) $\pm 1.0\%$ F.S. (0 to 60 °C)
Input Delay Time	4 ms max.
Sampling Interval	Input data is renewed for every scan by CPU
Input Filter Characteristics	3 ms max.
Number of Allocated Words	5 words/Module
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms)
External Connections	Removable terminal block with M3 screw terminals
Status Indication	RDY: Lights when Module is normal ACT: Lights during input processing ERR: Lights when overrange is detected CH1 to CH4: The corresponding LED is lit when overrange is detected for the channel.*
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for one minute between input terminals (connected together) and internal circuits No insulation between input channels
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	Not needed
Internal Current Consumption	450 mA max. at 5 VDC

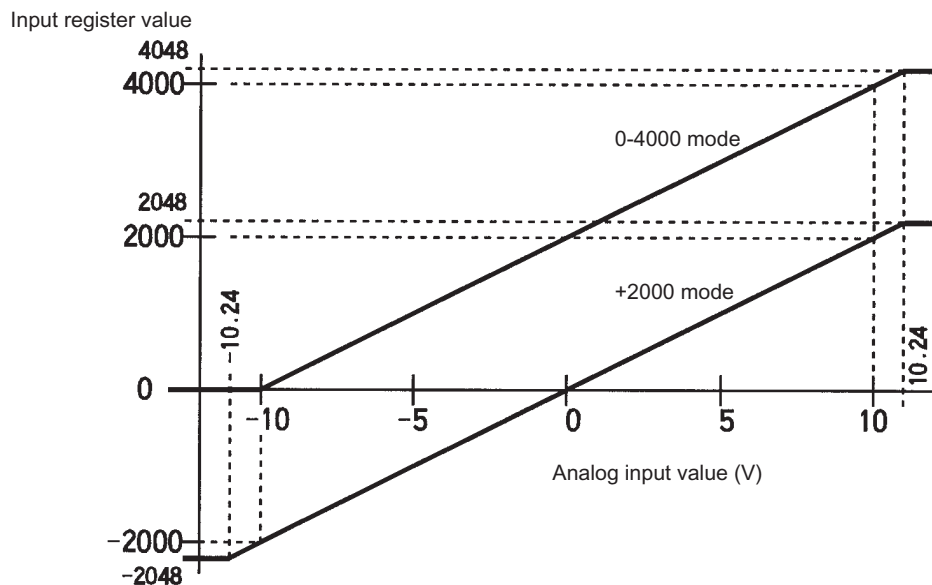
Item	Specification
Maximum Heating Value	2.3 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	300g
External Dimensions	40.3×130×103.9 mm (W×H×D)
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)

* Overrange is detected when $+10.24 \text{ V} < \text{Channel input signal}$ or $\text{Channel input signal} < -10.24 \text{ V}$

2) Input Characteristics

The following diagram show the input characteristics. Two modes are available: ± 2000 mode and 0-4000 mode. The mode is selected by I/O allocation.

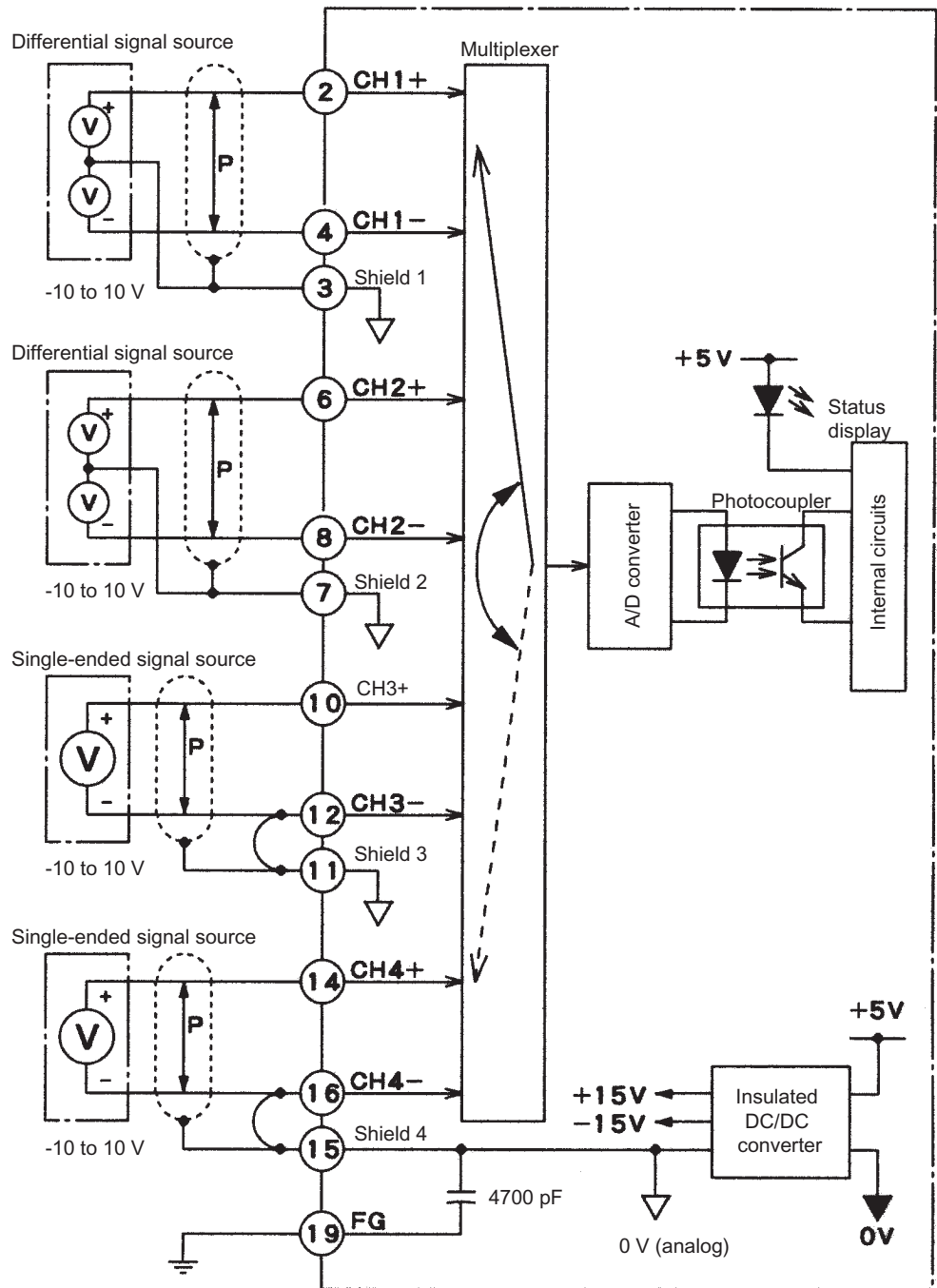
Analog input value	Input register value	
	± 2000 mode	0-4000 mode
$\leq -10.24 \text{ V}$	-2048	0000
-10.00 V	-2000	0000
-5.00 V	-1000	1000
0.00 V	0000	2000
+5.00 V	+1000	3000
+10.00 V	+2000	4000
$\geq +10.24 \text{ V}$	+2048	4048



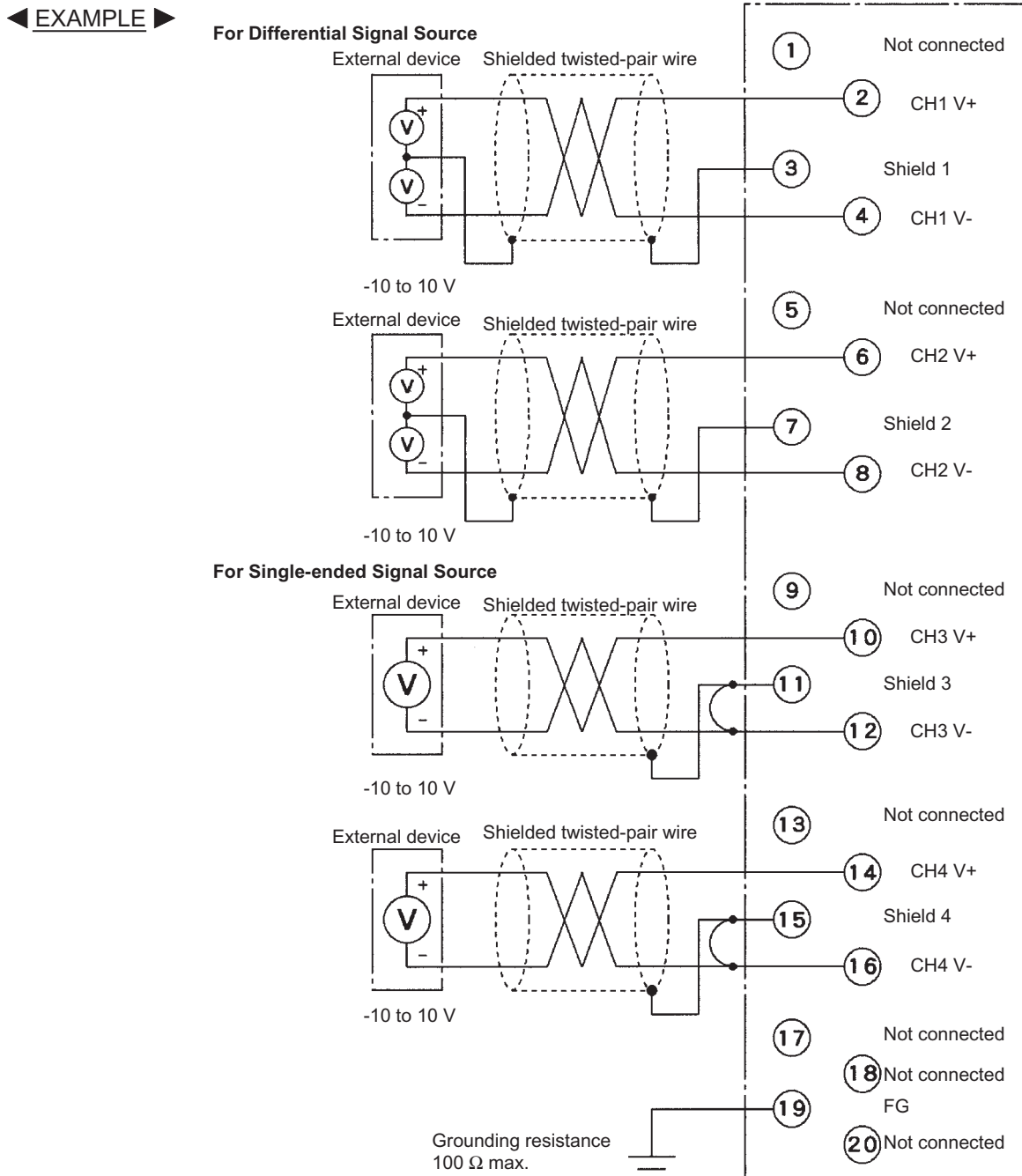
Note: (1) For ± 2000 mode, if input register value exceeds the range from -10.24 V to $+10.24 \text{ V}$, the analog input value will be clamped at -2048 or $+2048$.

(2) For 0-4000 mode, if input register value exceeds the range from -10.00 V to $+10.24 \text{ V}$, the analog input value will be clamped at 0 or 4048.

3) The following diagram shows the circuit configuration.



4) The following diagram shows an example of terminal connections.



Note: (1) Isolation between Input Channels

There is no insulation provided between the input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

(2) Recommended Cables

Use shielded twisted-pair wires 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block.

(3) Connecting Differential Signal Sources

- a) Connect + side of a differential signal to “V+” terminal of the Module.
- b) Connect - side of a differential signal to “V-” terminal of the Module.
- c) Connect the shield of a shielded twisted-pair wire to “Shield” terminal of the Module.
- d) Connect the shield of a shielded twisted-pair wire on the signal source side to 0 V of the differential signal source. An incorrect connection will make the input signal unstable and cause malfunction.

(4) Connecting Single-ended Signal Sources

- a) Connect + side of a single-ended signal to “V+” terminal of the Module.
- b) Connect - side of a single-ended signal to “V-” terminal of the Module.
- c) Connect the shield of a shielded twisted-pair wire to “Shield” terminal of the Module and short “Shield” terminal to “V-” terminal. An incorrect connection will make input signal unstable and cause malfunction.

(5) Unused Input Circuits

For a unused input circuit, short its “V+” terminal to “V-” terminal and also short one of these terminals to its “Shield” terminal.

(6) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

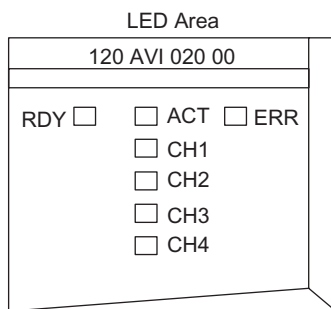
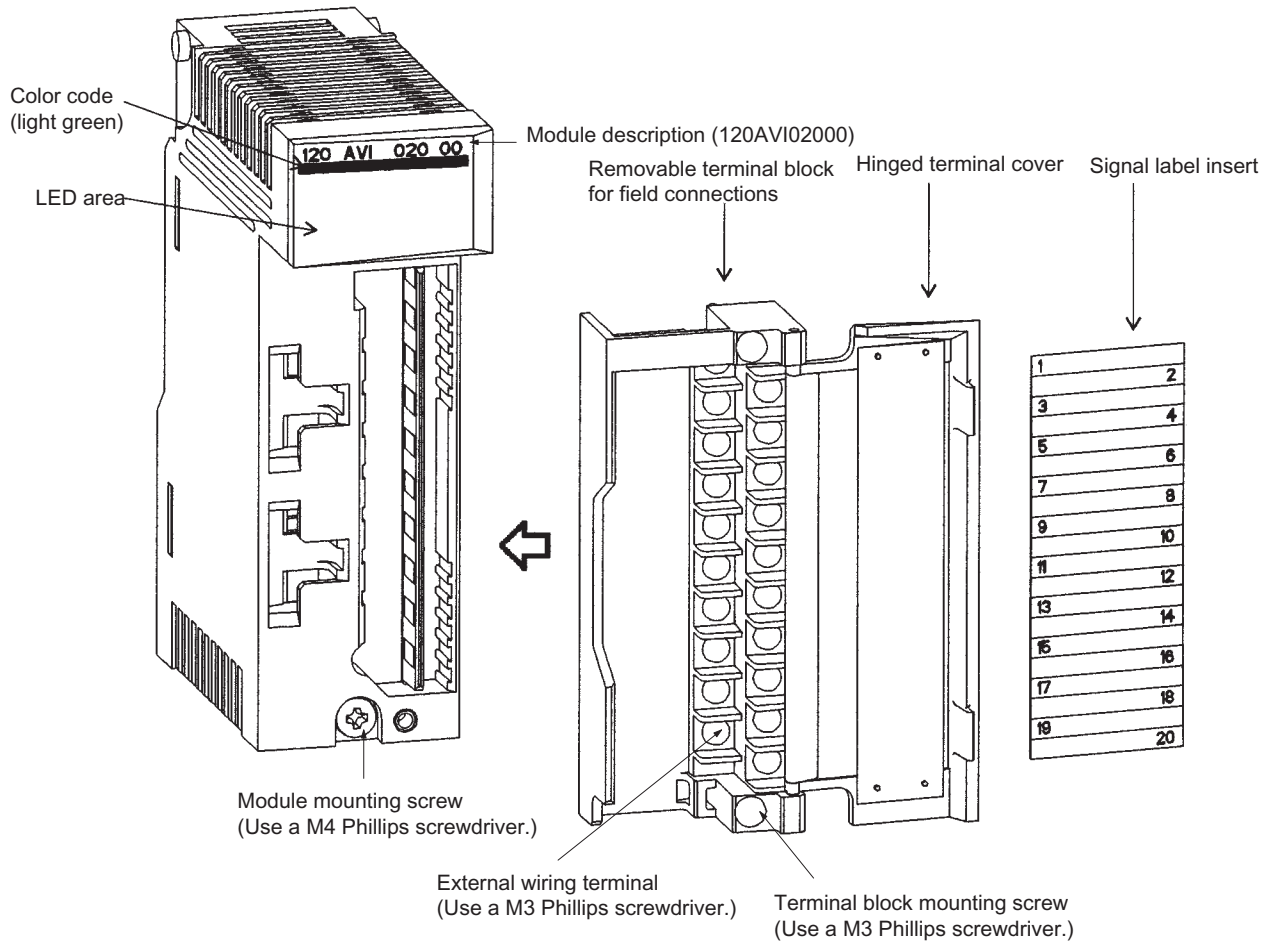
(7) Unconnected Terminals

Terminals 1, 5, 9, 13, 17, 18, and 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Input Module (± 10 V, 4 CH). For further details on I/O allocation, refer to *4.3 I/O Allocation*.

6) External Appearance



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Lit	Overrange was detected at one of the channels, CH1 to CH4.
		Flashing	Parameter check sum error has occurred.
		Not lit	Module is normal.
CH 1 to CH 4	Green	Lit	Input signal of indicated channel exceeds the input signal range shown below. • +10.12 V < Input signal • Input signal < -10.12 V
		Flashing	Input signal of indicated channel exceeds the input signal range shown below. • +10.00 V < Input signal < +10.12 V. • -10.24 V < Input signal < -10.00 V.

4.1.2 Analog Input Modules (0 to 10 V, 4 channels)

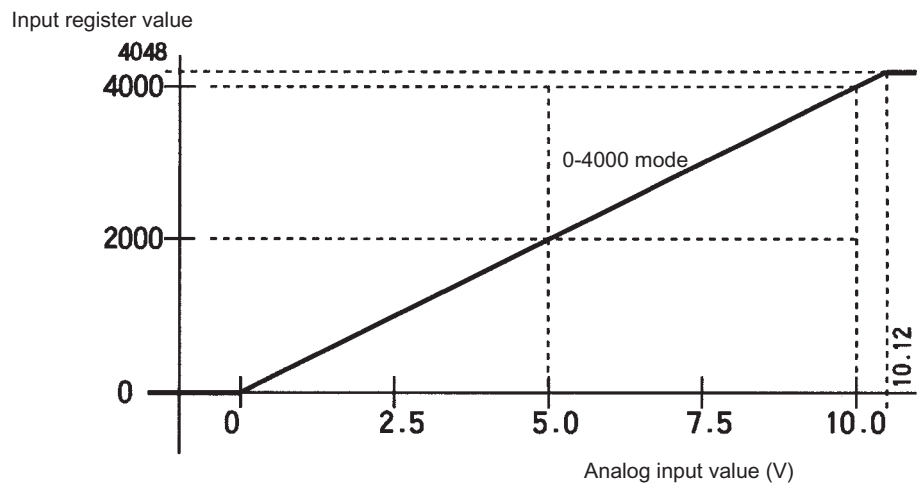
1) Performance Specifications

Item	Specification
Name	Analog Input Module (0 to 10 V, 4 CH)
Model Name	A/D 0-10 V 4CH
Model No.	JAMSC-120AVI02100
Input Signal Range	0 to 10 V
Number of Input Channels	4 channels, isolated in common
Input Impedance	1 M Ω min
Maximum Allowable Overload	-25 to 25 V
Digital Resolution	12 bits
Data Format	Binary: 0 to +4000
Error	$\pm 0.5\%$ F.S. (25 °C) $\pm 1.0\%$ F.S. (0 to 60 °C)
Input Delay Time	4 ms max.
Sampling Interval	Input data is renewed for every scan by CPU
Input Filter Characteristics	3 ms max.
Number of Allocated Words	5 words/Module
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms)
External Connections	Removable terminal block with M3 screw terminals
Status Indication	RDY: Lights when Module is normal ACT: Lights during input processing ERR: Lights when overrange is detected CH1 to CH4: The corresponding LED is lit when overrange is detected for the channel. Overrange: +10.12 V < channel input signal
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for one minute between input terminals (connected together) and internal circuits No insulation between input channels
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	Not needed
Internal Current Consumption	450 mA max. at 5 VDC
Maximum Heating Value	2.3 W
Hot Swapping	Permitted
Approximate Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)

2) Input Characteristics

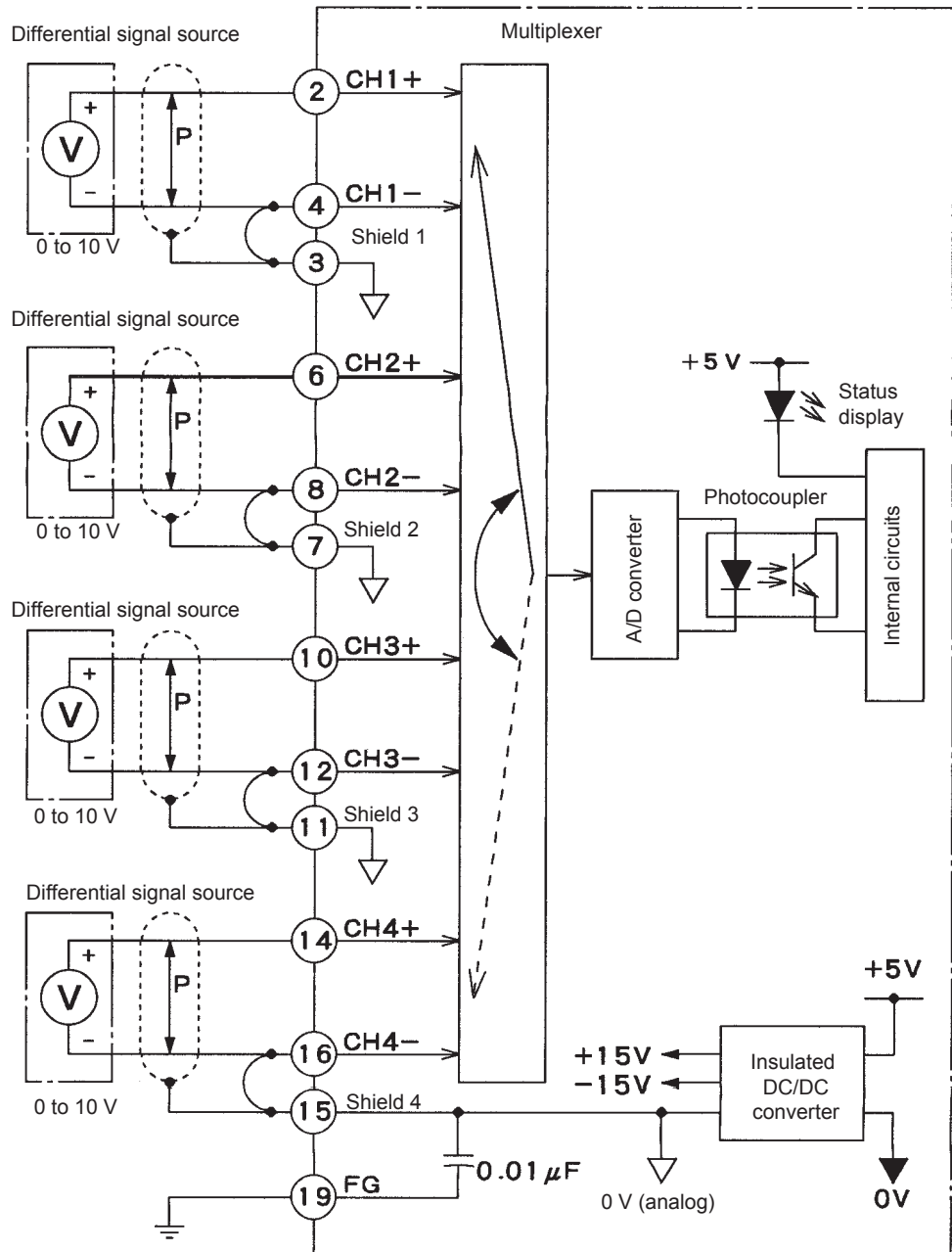
The following diagram show the input characteristics.

Analog Input Value	Input Register Value
≤ 0.00 V	0000
2.50 V	1000
5.00 V	2000
7.50 V	3000
10.00 V	4000
≥ 10.12 V	4048

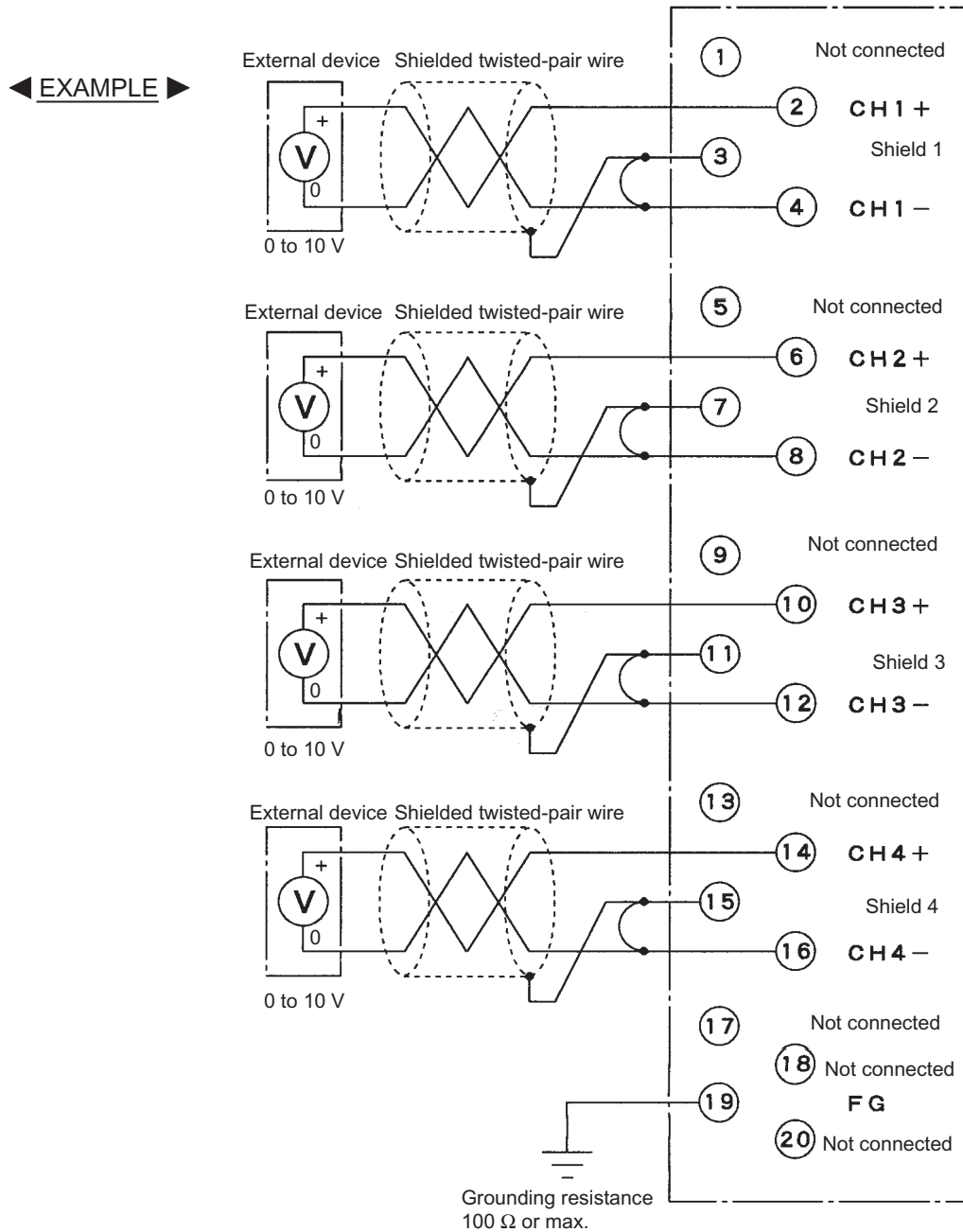


Note: Input values exceeding the range of 0.00 V to 10.12 V will be clamped at 0 or 4048.

3) The following diagram shows the circuit configuration.



4) The following diagram shows an example of terminal connections.



Note: (1) Isolation between Input Channels

There is no isolation provided between the input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

(2) Recommended Wires

Use shielded twisted-pair wires of 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block.

(3) Connecting Single-ended Signal Sources

- Connect + side of a single-ended signal to "+" terminal of the Module.
- Connect - side of a single-ended signal to "-" terminal of the Module.
- Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module and short "Shield" terminal to "V-" terminal. An incorrect connection will make input signal unstable and cause malfunction.

(4) Unused Input Circuits

For a unused input circuit, short its “+” terminal to “-” terminal and also short one of these terminals to its “Shield” terminal. An incorrect connection will make input signal unstable and cause malfunction.

(5) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

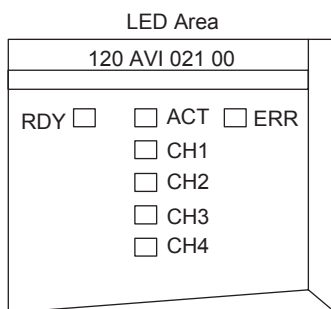
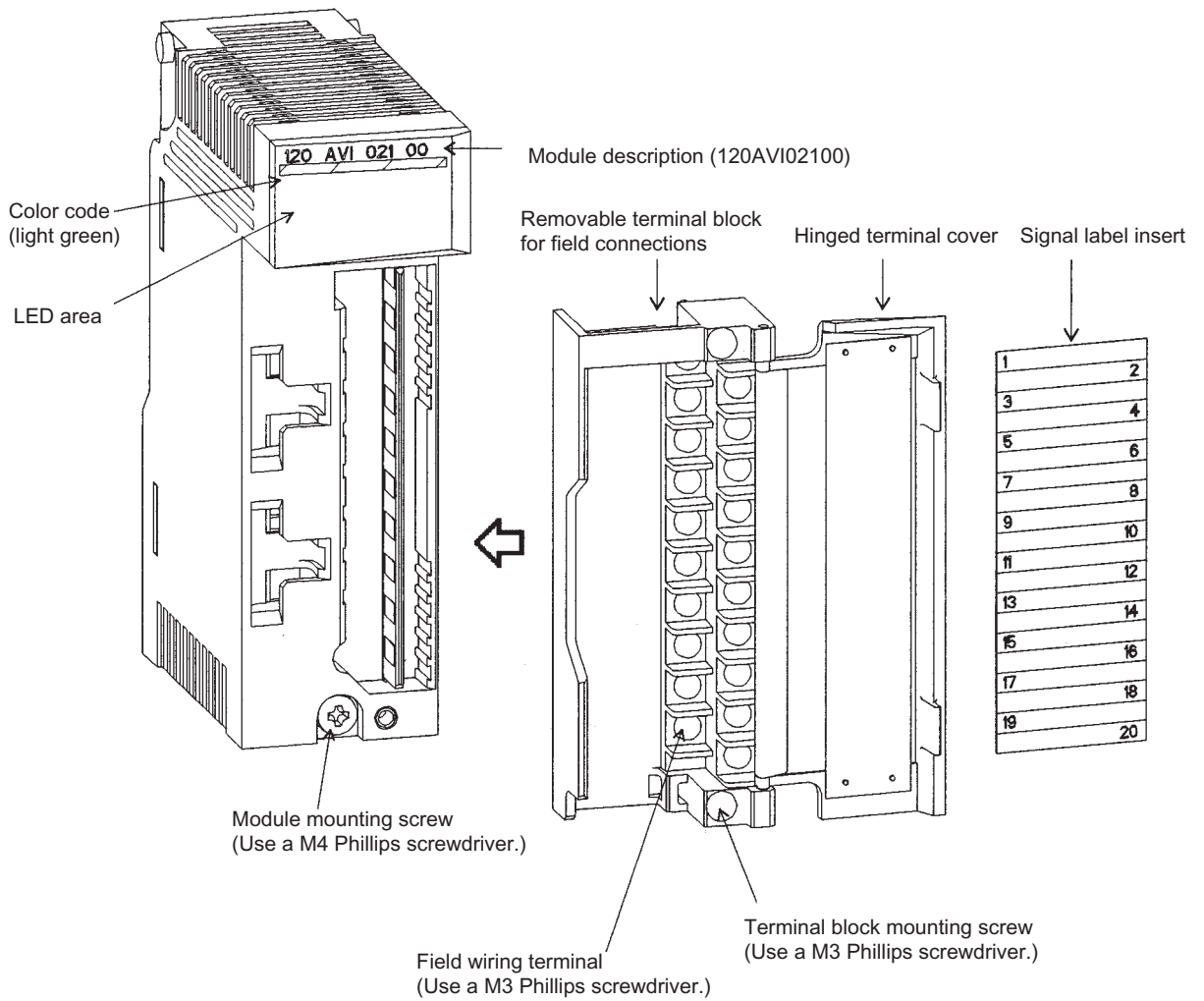
(6) Unconnected Terminals

Terminals 1, 5, 9, 13, 17, 18, and 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Input Module (± 10 V, 4 CH). For further details on I/O allocation, refer to *4.3 I/O Allocation*.

6) External Appearance



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Lit	Overrange was detected at one of the channels, CH1 to CH4.
		Flashing	Parameter check sum error has occurred.
		Not lit	Module is normal.
CH 1 to CH 4	Green	Lit	Input signal of indicated channel exceeds the input signal range shown below. • +10.12 V < Input signal
		Flashing	Input signal of indicated channel exceeds the input signal range shown below. • +10.00 V < Input signal < +10.12 V.

4.1.3 Analog Input Modules (4 to 20-mA, 4 channels)

1) Performance Specifications

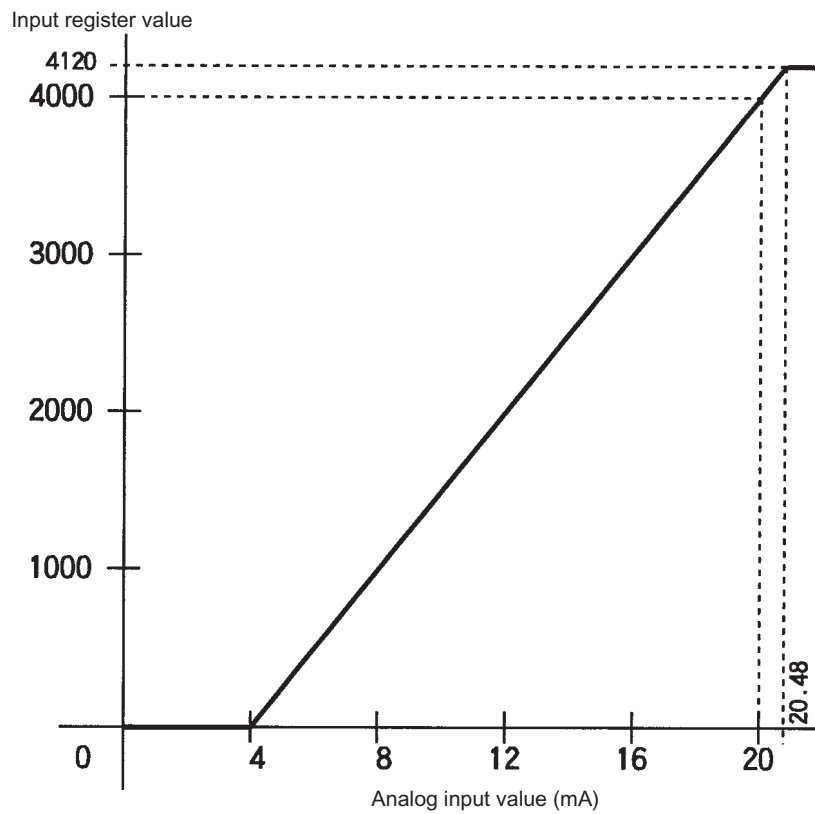
Item	Specification
Name	Analog Input Module (4 to 20-mA, 4 CH)
Model Name	A/D-CUR-4CH
Model No.	JAMSC-120AC102000
input Signal Range	Using either Current Input or Voltage Input by changing terminal connections. 1) Current Input: 4 to 20 mA 2) Voltage Input: 1 to 5 V
Special Input	None
Number of Input Channels	4 channels, isolated in common
Input Impedance	Current Input: 250 Ω Voltage Input: 1 M Ω min.
Maximum Allowable Overload	Current Input: -100 to +100 mA Voltage Input: -25 to +25 V
Digital Resolution	12 bits
Data Format	Binary, 0 to 4000
Errors	$\pm 0.5\%$ F.S. (25 °C) $\pm 1.0\%$ F.S. (0 to 60 °C)
Input Delay Time	4 ms max.
Sampling Interval	Input data are renewed for every scan by CPU
Input Filter Characteristics	3 ms max.
Number of Allocated Words	5 words/Module
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms)
External Connections	Removable terminal block with M3 screw terminals
Status Indication	RDY: Lights when Module is normal ACT: Lights during input processing ERR: Lights when an overrange is detected CH1 to CH4: The corresponding LED is lit when an overrange is detected for the channel.*
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for one minute between input terminals (connected together) and internal circuits. No insulation between input channels
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	Not needed
Internal Current Consumption	450 max. at 5 VDC
Maximum Heating Value	2.3 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	300 g
External Dimensions	40.3×130×103.9 mm (W×H×D)
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)

* Overrange is detected when 20.48 mA < Channel input signal or
Channel input signal < 2.0 mA

2) Input Characteristics

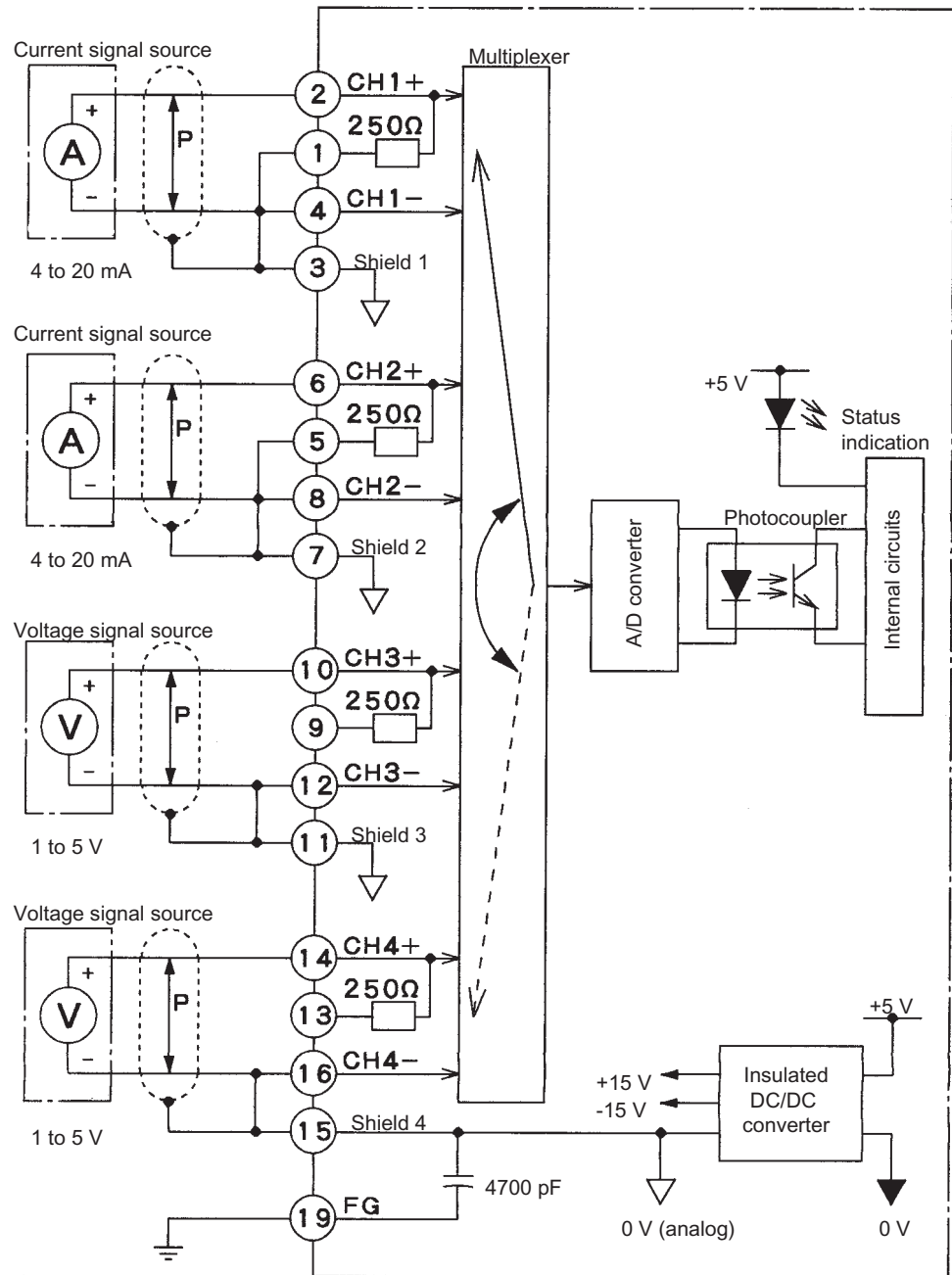
The following diagram shows the input characteristics.

Analog input value	Input register value
≤ 4.00 mA (1.00 V)	0000
8.00 mA (2.00 V)	1000
12.00 mA (3.00 V)	2000
16.00 mA (4.00 V)	3000
20.00 mA (5.00 V)	4000
≥ 20.48 mA (5.12 V)	4120

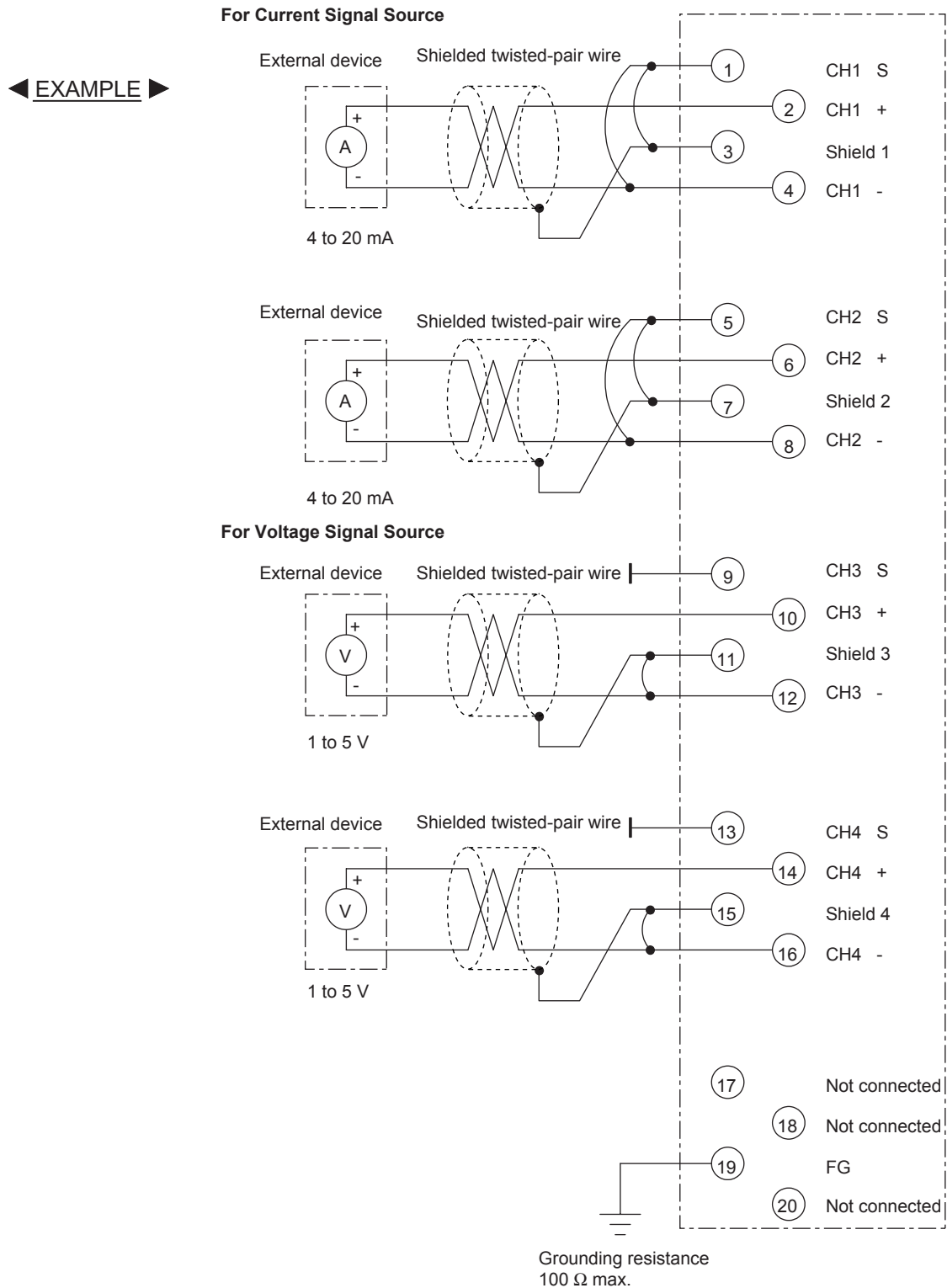


Note: If input register value exceeds the range from 4 mA to 20.48 mA, the analog input value will be clamped at 0 or 4120.

3) The following diagram shows the circuit configuration.



4) The following diagram shows an example for terminal connections.



Note: (1) Isolation between Input Channels

There is no insulation provided between the input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

(2) Recommended Cables

Use shielded twisted-pair wire 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block.

(3) Connecting Current Signal Sources

- a) Connect + side of a current signal to “+” terminal of the Module.
- b) Connect - side of a current signal to “-” terminal of the Module.
- c) Connect the shield of a shielded twisted-pair wire to “Shield” terminal of the Module and short “Shield” terminal, “S” terminal, and “-” terminal. An incorrect connection will make the input signal unstable and cause malfunction.

(4) Connecting Voltage Signal Sources

- a) Connect + side of a voltage signal to “+” terminal of the Module.
- b) Connect - side of a voltage signal to “-” terminal of the Module.
- c) Connect the shield of a shielded twisted-pair wire to “Shield” terminal of the Module, and short the “Shield” terminal to “-” terminal.
- d) Leave the “S” terminal open, or the input signal will become unstable and cause malfunction.

(5) Unused Input Circuits

Unused inputs have the “S” terminal shorted to the “+” terminal and to the “-” terminal, as well, one of these terminals must be shorted to the appropriate “Shield” terminal.

(6) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

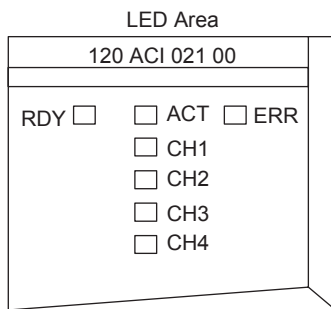
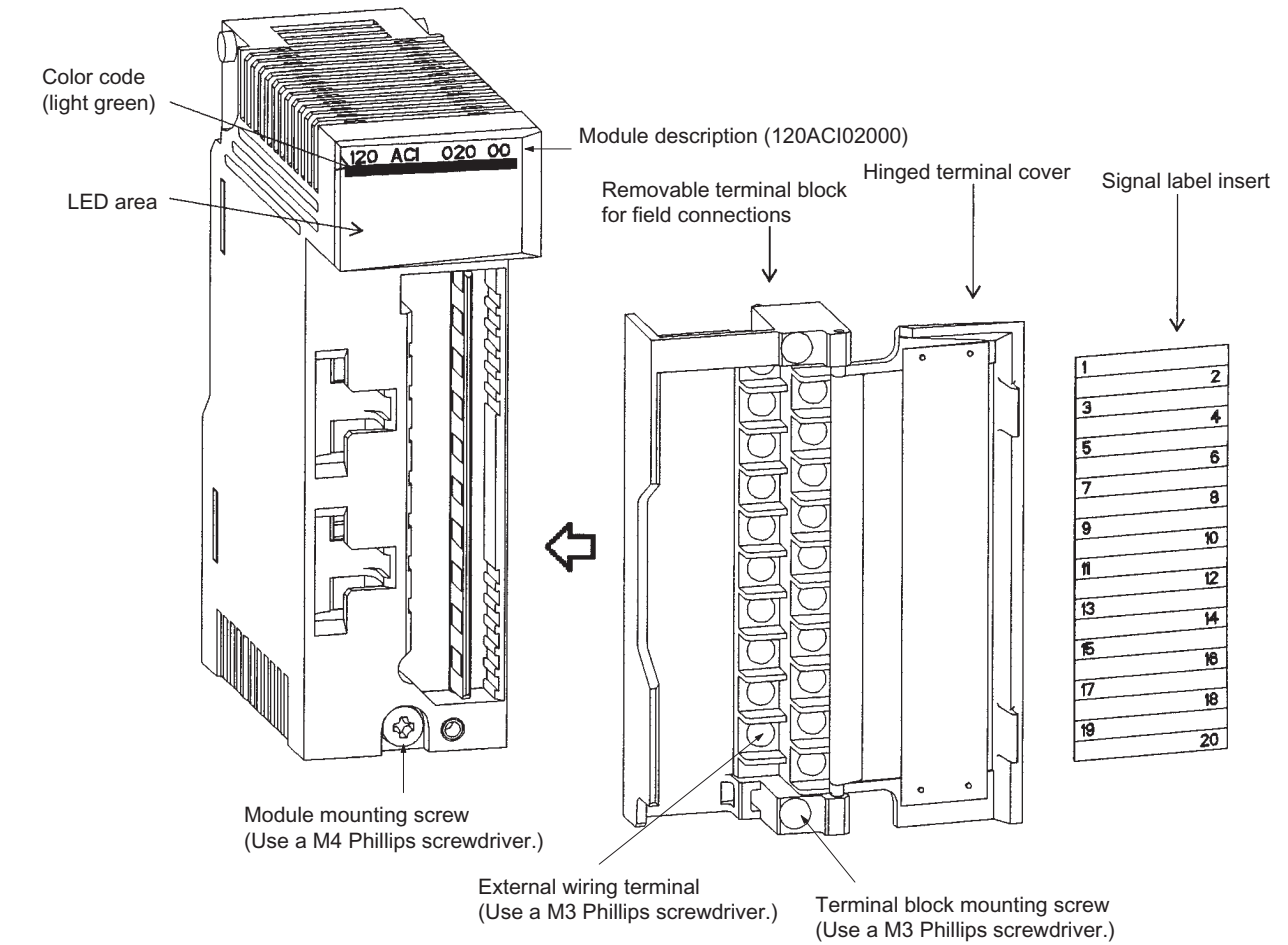
(7) Unconnected Terminals

Terminals 17, 18, and 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Input Module (4 to 20-mA, 4 channels). For further details on I/O allocation, refer to *4.3 I/O Allocation*.

6) External Appearance



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Lit	Overrange is detected at one of the channels, CH1 to CH4.
		Flashing	Parameter check sum error has occurred.
		Not lit	Module is normal.
CH 1 to CH 4	Green	Lit	Input signal of indicated channel exceeds the input signal range shown below. • 20.48 mA < Input signal • Input signal < 2.0 mA
		Flashing	Input signal of indicated channel exceeds the input signal range shown below. • 20.0 mA < Input signal < 20.48 mA. • 2.0 mA < Input signal < 4.0 mA.

4.2 Analog Output Specifications

This section describes the performance specifications, circuit configuration, external connections and appearance of the 120-series Analog Output Modules.

4.2.1 Analog Output Modules (± 10 V, 2 channels) ----- 4-20

4.2.2 Analog Output Modules (0 to 10 V, 2 channels) (0 to 5 V, 2 channels) 4-25

4.2.3 Analog Output Modules (4 to 20-mA, 2 channels) ----- 4-30

4.2.1 Analog Output Modules (± 10 V, 2 channels)

1) Performance Specifications

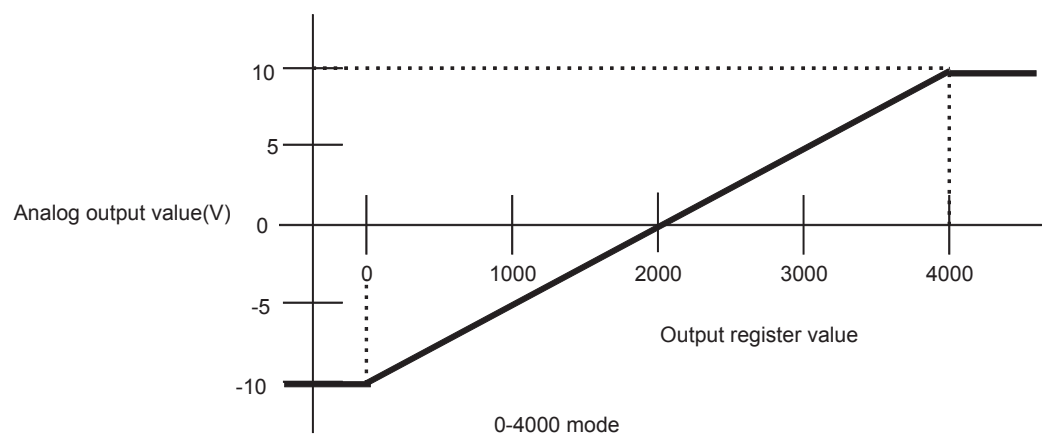
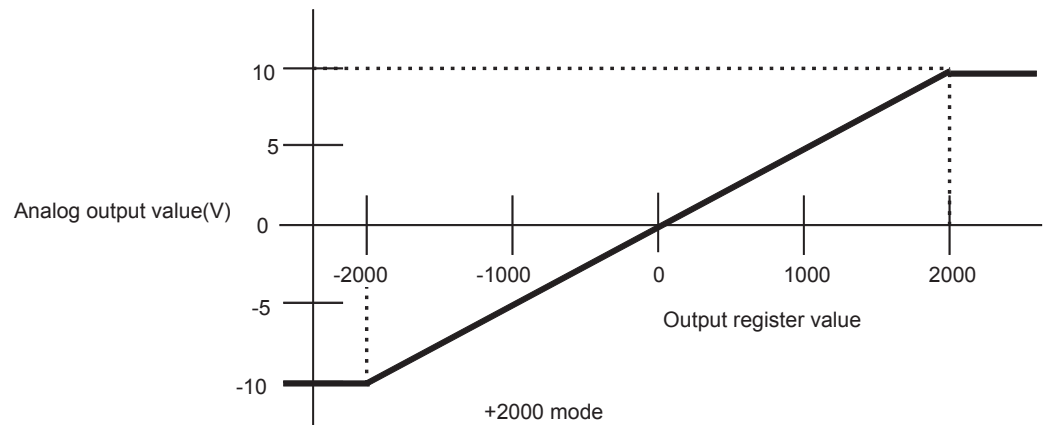
Item	Specification
Name	Analog Output Module (± 10 V, 2 channels)
Model Name	D/A-VOL-2CH
Model No.	JAMSC-120AVO01000
Output Signal Range	-10 to +10 V
Number of Output Channels	2 channels, isolated individually
Maximum Allowable Load Current	± 5 mA (2 k Ω)
Digital Resolution	12 bits
Data Format	1) Two modes available, set by allocation 0-4000 mode/ ± 2000 mode 2) Range of numerical values for each mode is as follows: 0-4000 mode: Binary, 0 to 4000 ± 2000 mode: 2's complement, -2000 to +2000
Errors	± 0.2 % F.S. (25 °C) ± 0.5 % F.S. (0 to 60 °C)
Output Delay Time	5 ms max.
Number of Allocated Words	2 words/Module
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms) Maximum voltage at abnormal output: ± 12 V limit
Outputs when CPU stops	Select one of the following modes by I/O allocation 1) Outputs open 2) Maintains output data just before the CPU stopped 3) Outputs user set value
External Connections	Removable terminal block with M3 screw terminals
Status Indication	RDY: Lights when Module is normal ACT: Lights during output processing ERR: Lights when Module is abnormal
Insulation Method	Pulse transformer
Dielectric Strength	1,500 VAC for one minute between output terminals (connected together) and internal circuits 1,500 VAC for one minute between channels
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	Not needed
Internal Current Consumption	400 max. at 5 VDC
Maximum Heating Value	2.0 W
Hot Swapping (Removal/insertion under power)	Permitted

Item	Specification
Approximate Mass	350 g
External Dimensions	40.3×130×103.9 mm (W×H×D)
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)

2) Output Characteristics

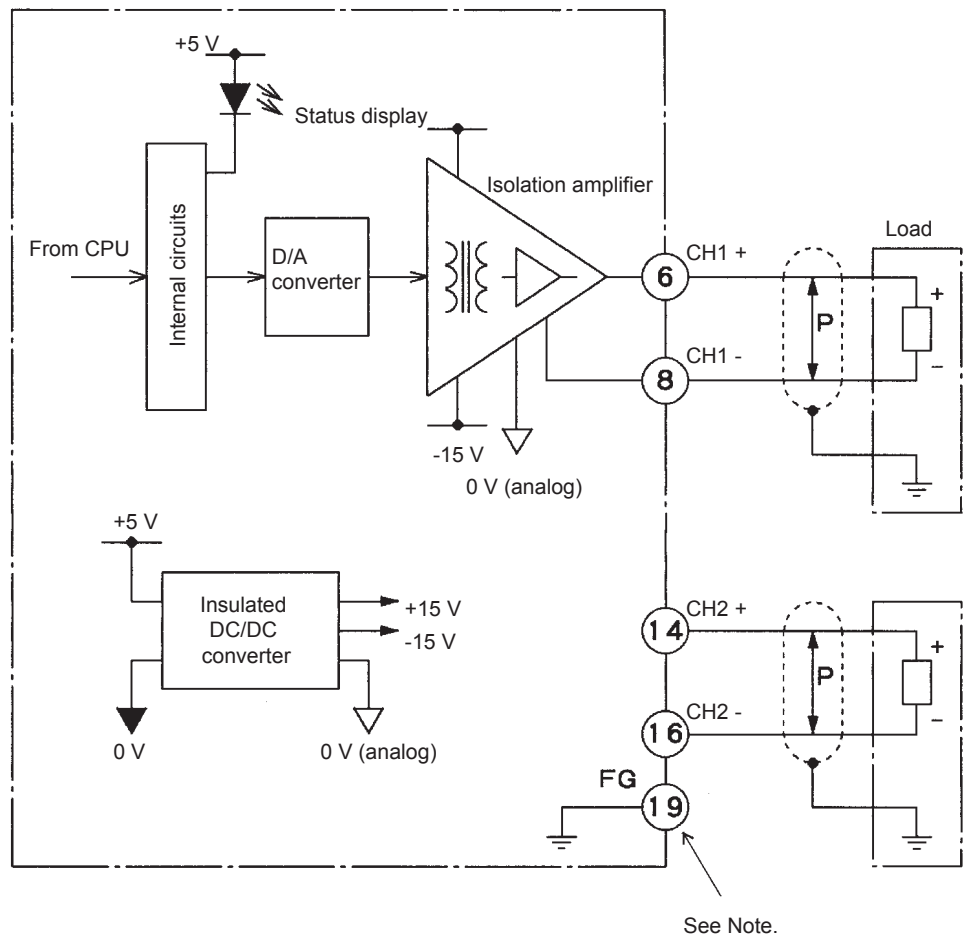
The following diagram show the output characteristics. Two modes are available: ± 2000 mode and 0-4000 mode. The mode is selected by I/O allocation.

Output register value	Analog output value	
	± 2000 mode	0-4000 mode
≤ -2000	-10.00 V	-10.00 V
-1000	-5.00 V	-10.00 V
0000	0.00 V	-10.00 V
+1000	+5.00 V	-5.00 V
+2000	+10.00 V	0.00 V
+3000	+10.00 V	+5.00 V
$\geq +4000$	+10.00 V	+10.00 V



- Note:** (1) For ± 2000 mode, if output register value exceeds the range from -2000 to +2000, the analog output value will be clamped at -10.00 or +10.00 V.
- (2) For 0-4000 mode, if output register value exceeds the range from 0 to 4000, the analog output value will be clamped at -10.00 or +10.00 V.

3) The following diagram shows the circuit configuration.



The above circuit configuration is for Modules with a version number of VER. C□□□□ or later.

Note: Field Wiring Terminal 19

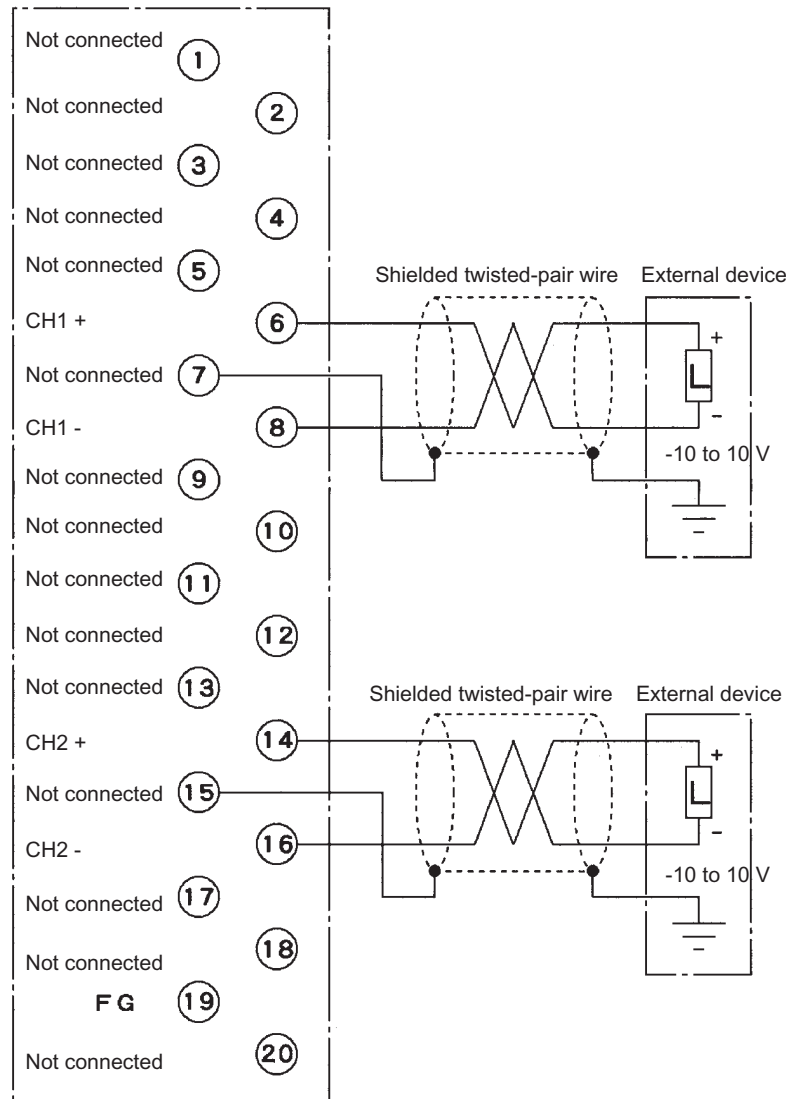
Connections to field wiring terminal 19 depended on the version of the Module. Be sure to connect terminal 19 correctly according to the version.

- If the Module is VER. B□□□□, terminal 19 is not connected to anything internally.
- If the Module is VER. C□□□□ or later, terminal 19 is connected through the Module to the Mounting Base. It can thus be used to connect the shield of the shielded twisted-pair wire when grounding at the Module.

The version number of the Module is written on the nameplate on the right side of the Module.

4) The following diagram shows an example for terminal connections.

◀ EXAMPLE ▶



Note: (1) All the channels of the output circuit are isolated each other.

(2) Recommended Cables

Use shielded twisted-pair wires of 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block.

(3) One-point Shield Connection

As a rule, connect the shield at one point on the load side. However, better output characteristics may be obtained by connecting it at one point on the Module side rather than on the load side, so consider which way is better depending on the actual situation. An incorrect connection will make output signal unstable and cause malfunction.

(4) Grounding the Module

The "Not connected" terminals of the Module are not connected inside the Module. Use them as relay terminals, if necessary.

(5) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

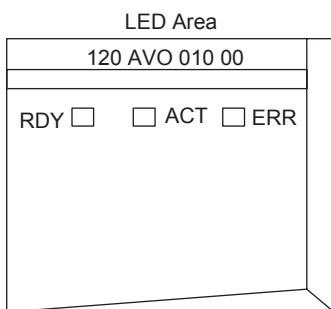
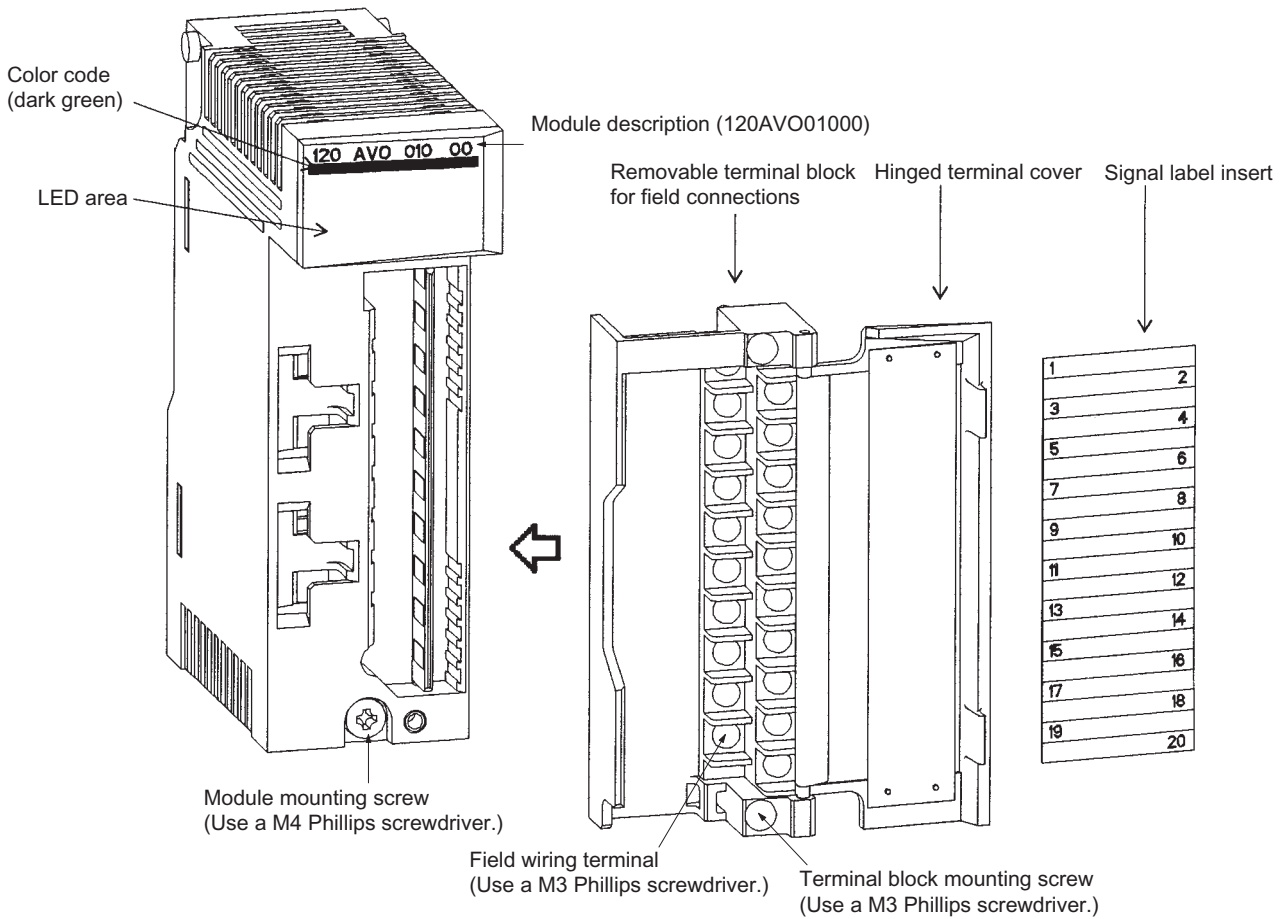
(6) Unconnected Terminals

Terminals 1 to 5, 7, 9 to 13, 15, and 17 to 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Output Module (± 10 V, 4 channels). For further details on I/O allocation, refer to 4.3 I/O Allocation.

6) External Appearance



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Flashing	Parameter checksum error has occurred.
		Not lit	Module is normal.

4.2.2 Analog Output Modules (0 to 10 V, 2 channels) (0 to 5 V, 2 channels)

1) Performance Specifications

Item	Specification	
	Analog Output Module (0 to 10 V, 2 channels)	Analog Output Module (0 to 5 V, 2 channels)
Name	Analog Output Module (0 to 10 V, 2 channels)	Analog Output Module (0 to 5 V, 2 channels)
Model Name	D/A 0-10 V 2CH	D/A 0-5 V 2CH
Model No.	JAMSC-120AVO01100	JAMSC-120AVO01200
Output Signal Range	0 to 10 V	0 to 5 V
Maximum Allowable Load Current	5 mA (2 k Ω)	2.5 mA (2 k Ω)
Number of Output Channels	2 channels, isolated individually	
Digital Resolution	12 bits	
Data Format	Binary: 0 to +4000	
Error	± 0.2 % F.S. (25 °C) ± 0.5 % F.S. (0 to 60 °C)	
Maximum Instantaneous Noise Error	± 1.0 % (25 °C) when static noise of 400 V is applied	
Output Delay Time	5 ms max.	
Number of Allocated Words	2 words/Module	
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms) Maximum voltage for abnormal output: ± 12 V limit	
Outputs when CPU Stops	Select one of the following modes by I/O allocation 1) Open outputs 2) Maintains output data just before the CPU stopped. 3) Outputs user set value.	
External Connections	Removable terminal block with M3 screw terminals	
Status Indication	RDY: Lights when Module is normal. ACT: Lights during output processing. ERR: Lights when parameter checksum error occurs.	
Insulation Method	Pulse transformer	
Dielectric Strength	1,500 VAC for one minute between output terminals (connected together) and internal circuits 1500VAC for one minute between channels	
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).	
External Power Supply	Not needed	
Internal Current Consumption	400 mA max. at 5 VDC	
Maximum Heating Value	2.0 W	
Hot Swapping	Permitted	
Approximate Mass	350 g	
External Dimensions	40.3×130×103.9 mm (W×H×D)	
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)	

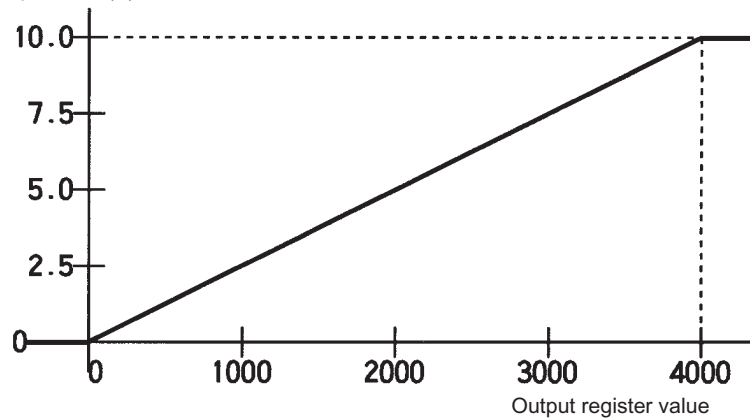
2) Output Characteristics

The following diagram shows the output characteristics.

Output register value	Analog output value	
	± 2000 mode	0-4000 mode
≤ 0000	0.00 V	0.00 V
+1000	+2.50 V	+1.25 V
+2000	+5.00 V	+2.50 V
+3000	+7.50 V	+3.75 V
$\geq +4000$	+10.00 V	+5.00 V

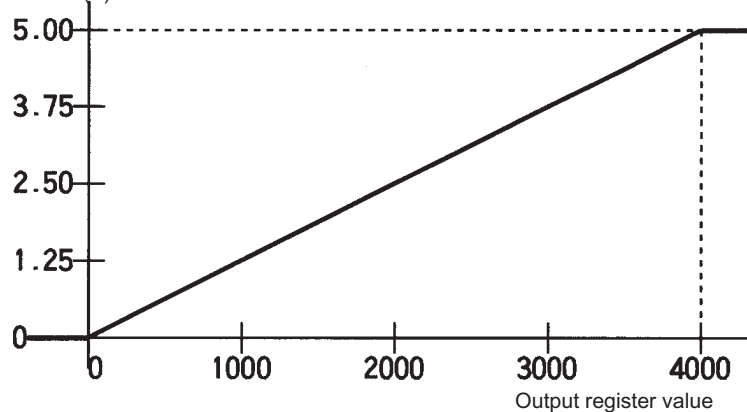
a) Output characteristics for 0 to 10 V, 2CH

Analog output value(V)



b) Output characteristics for 0 to 5 V, 2CH

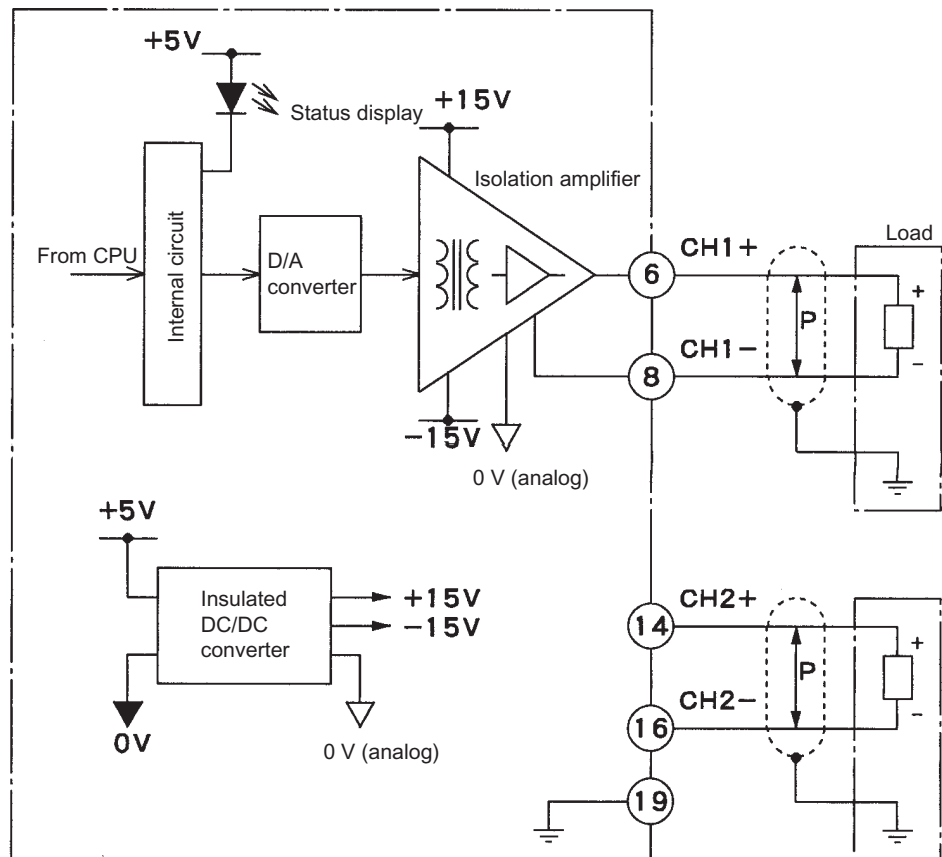
Analog output value(V)



Note: (1) For 0 to 10 V (2 channels), an output register value exceeding the range of 0 to 4000 will be clamped at 0 or 10.0 V.

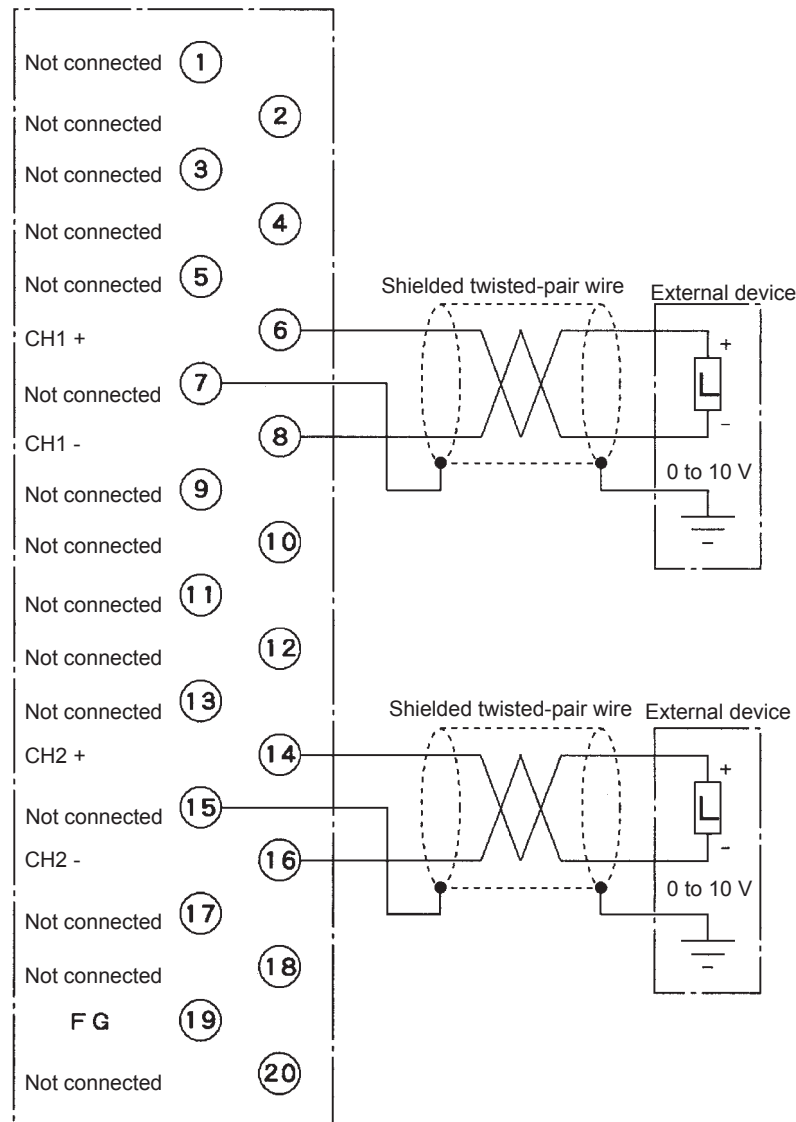
(2) For 0 to 5 V (2 channels), an output register value exceeding the range of 0 to 4000 will be clamped at 0 or 5.0 V.

3) The following diagram shows the circuit configuration.



4) The following diagram shows an example for terminal connections.

◀ EXAMPLE ▶



Note: (1) Isolation between Output Channels

All the channels of the output circuit are isolated each other.

(2) Recommended Cables

Use shielded twisted-pair wires of 1.3 mm^2 (AWG16) to 0.5 mm^2 (AWG20) to connect to the terminal block.

(3) One-point Shield Connection

As a rule, connect the shield at one point on the load side. However, better output characteristics may be obtained by connecting it at one point on the Module side rather than on the load side, so consider which way is better depending on the actual situation. An incorrect connection will make input signal unstable and cause malfunction.

(4) Grounding the Module

The FG terminal of the Module is connected to the Mounting Base via the Module. When grounding on the Module side, use the FG terminal. The "Not connected" terminals are not connected inside the Module. Use them as relay terminals.

(5) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

(6) Unconnected Terminals

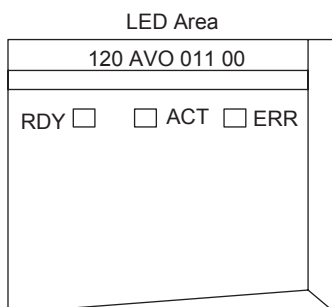
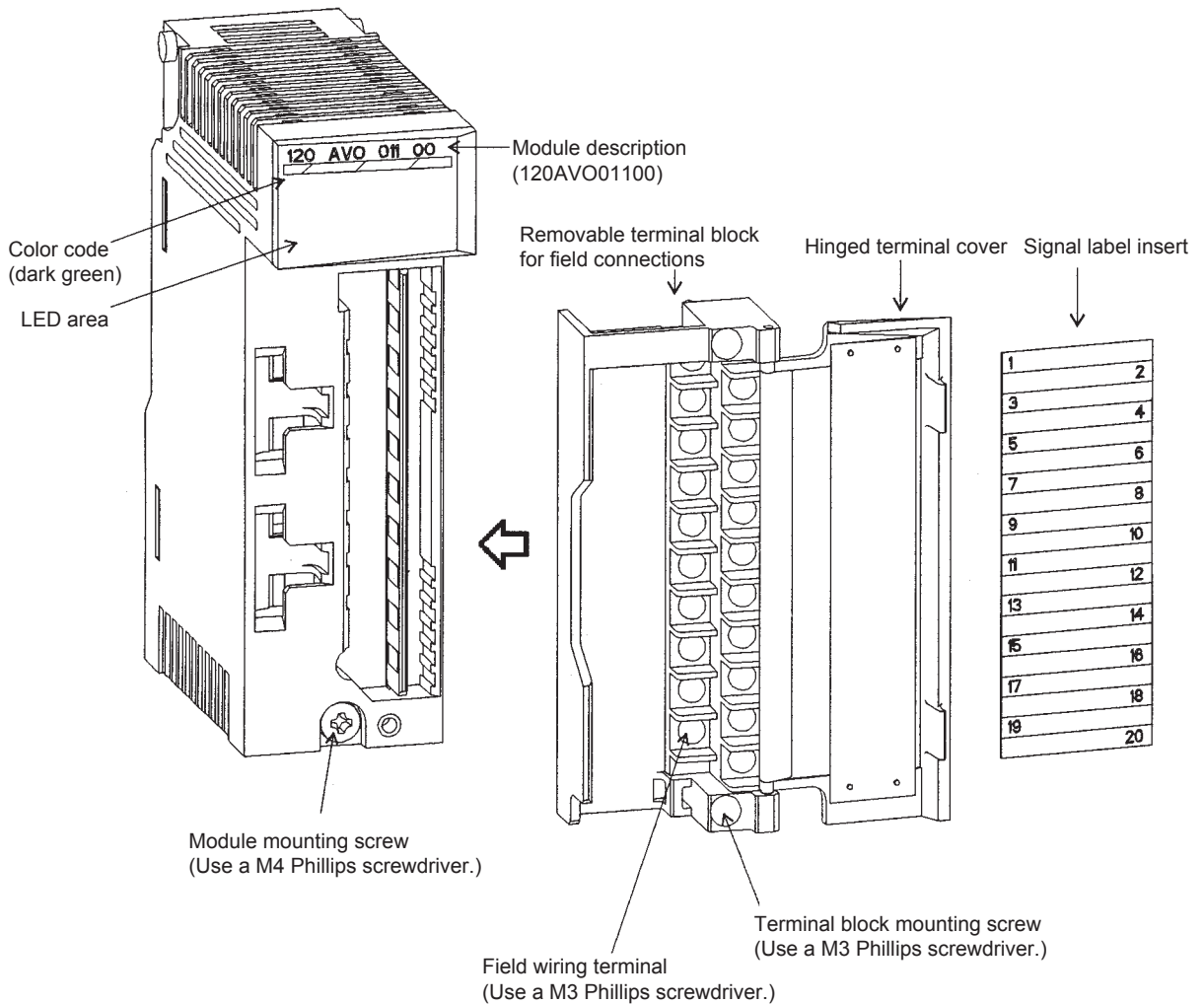
Terminals 1 to 5, 7, 9 to 13, 15, 17, 18 and 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Output Module (± 10 V, 4 channels) or Analog Output Module (0 to 5 V, 2 channels). For further details on I/O allocation, refer to 4.3 I/O Allocation.

6) External Appearance

The appearance and configuration of the Analog Output Module (0 to 10 V, 2 channels) are shown below. The appearance and configuration of the Analog Output Module (0 to 5 V, 2CH) are the same as the following illustration except for the model description.



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Flashing	Parameter checksum error has occurred.
		Not lit	Module is normal.

4.2.3 Analog Output Modules (4 to 20-mA, 2 channels)

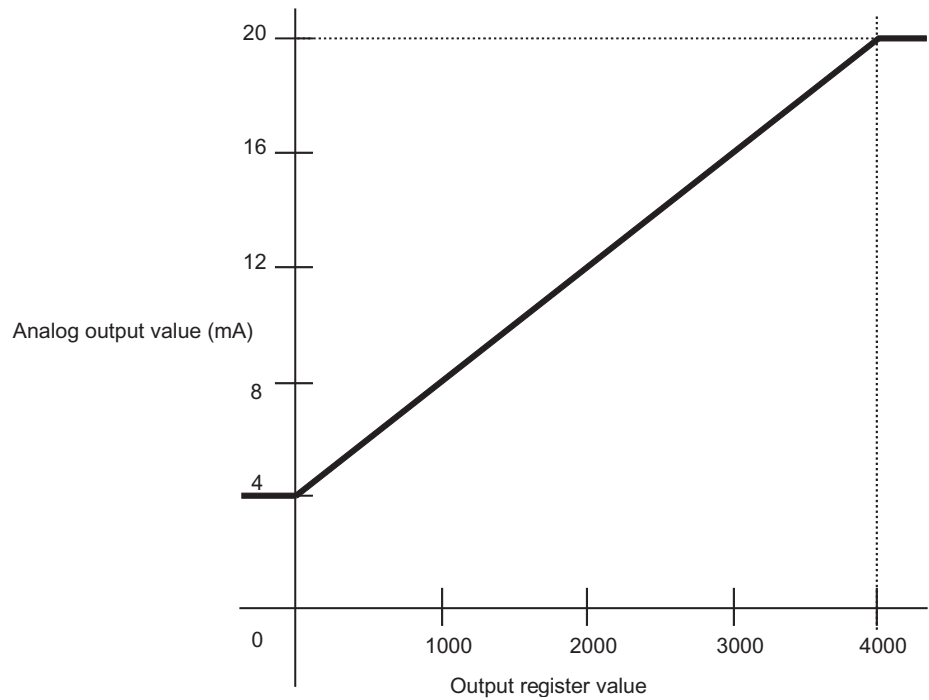
1) Performance Specifications

Item	Specification
Name	Analog Output Module (4 to 20-mA, 2 channels)
Model Name	D/A-CUR-2CH
Model No.	JAMSC-120ACO01000
Output Signal Range	4 to 20 mA
Number of Output Channels	2 channels, isolated individually
Maximum Allowable Load Resistance	550 Ω
Digital Resolution	12 bits
Data Format	Binary, 0 to +4000
Errors	± 0.2 % F.S. (25 °C) ± 0.5 % F.S. (0 to 60 °C)
Output Delay Time	5 ms max.
Number of Allocated Words	2 words/Module
Maintenance/Diagnosis Functions	Watchdog timer (timeout: 262 ms)
Outputs when CPU Stops	Select one of the following modes by I/O allocation 1) Outputs open 2) Maintains output data just before the CPU stopped. 3) Outputs user set value.
External Connections	Removable terminal block with M3 screw terminals
Status indication	RDY: Lights when Module is normal ACT: Lights during output processing ERR: Lights when Module is abnormal
Insulation Method	Pulse transformer
Dielectric Strength	1,500 VAC for one minute between output terminals (connected together) and internal circuits 1,500 VAC for one minute between output channels
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measured with a 500-VDC test voltage megohmmeter).
External Power Supply	Not needed
Internal Current Consumption	500 mA max. at 5 VDC
Maximum Heating Value	2.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approximate Mass	350 g
External Dimensions	40.3×130×103.9 mm (W×H×D)
Recommended Cable	Shielded twisted-pair wires 1.3 mm ² (AWG16) to 0.5 mm ² (AWG20)

2) Output Characteristics

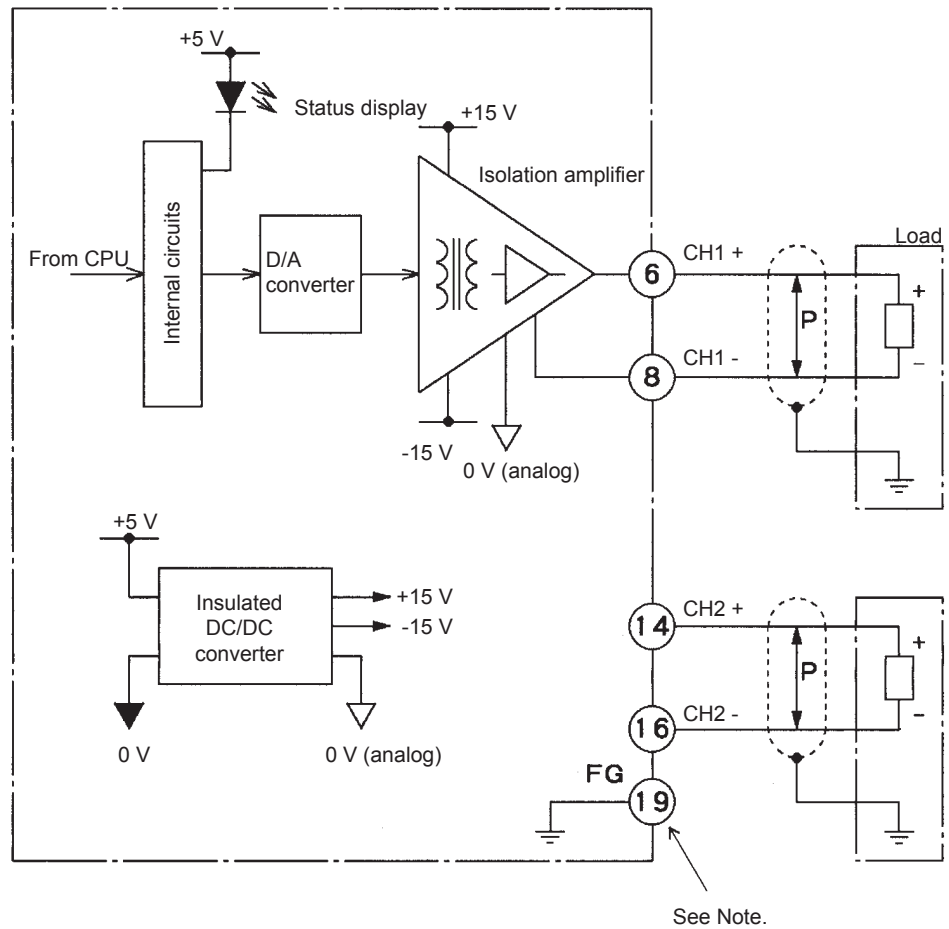
The following diagram show the output characteristics.

Output register value	Analog output value
≤ 0000	4.00 mA
1000	8.00 mA
2000	12.00 mA
3000	16.00 mA
≥ 4000	20.00 mA



Note: If output register value exceeds the range from 0 to +4000, the analog output value will be clamped at 4 mA or 20 mA.

3) The following diagram shows the circuit configuration.



The above circuit configuration is for Modules with a version number of VER. C□□□□ or later.

Note: Field Wiring Terminal 19

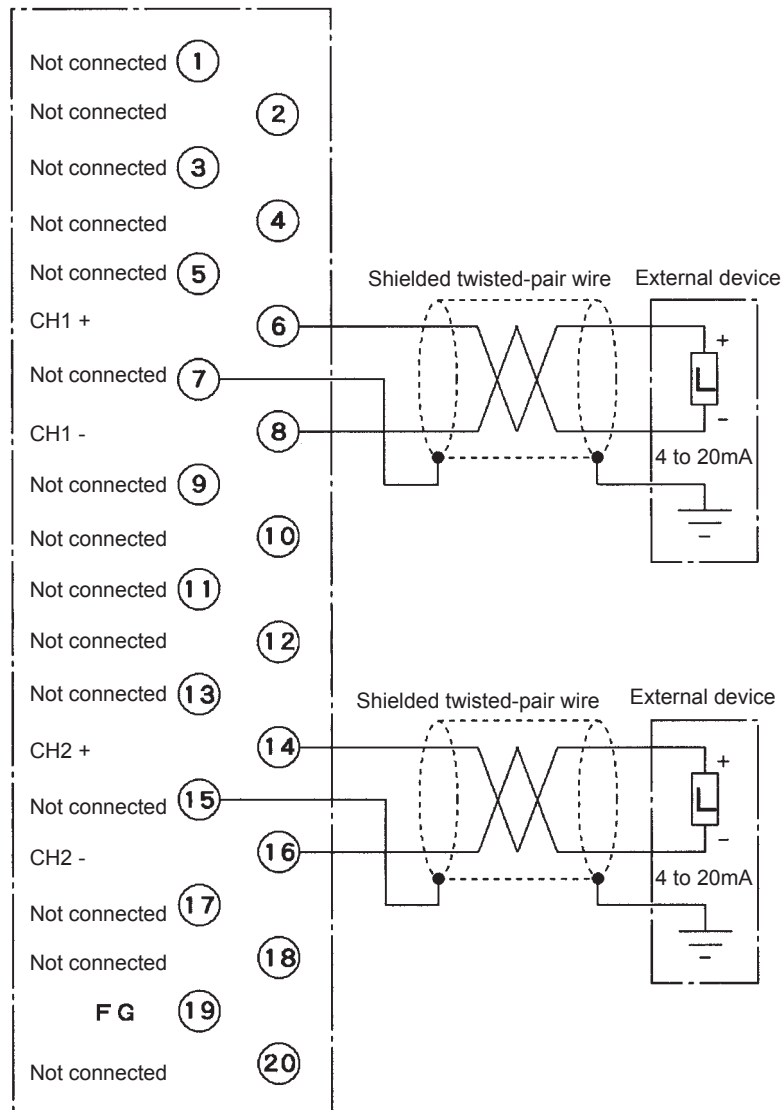
Connections to field wiring terminal 19 depended on the version of the Module. Be sure to connect terminal 19 correctly according to the version.

- If the Module is VER. B□□□□, terminal 19 is not connected to anything internally.
- If the Module is VER. C□□□□ or later, terminal 19 is connected through the Module to the Mounting Base. It can thus be used to connect the shield of the shielded twisted-pair wire when grounding at the Module.

The version number of the Module is written on the nameplate on the right side of the Module.

4) The following diagram shows an example for terminal connections.

◀ EXAMPLE ▶



Note: (1) All the channels of the output circuit are isolated each other.

(2) Recommended Cables

Use shielded twisted-pair wires of 1.3 mm² (AWG16) to 0.5 mm² (AWG20) to connect to the terminal block.

(3) One-point Shield Connection

As a rule, connect the shield at one point on the load side. However, better output characteristics may be obtained by connecting it at one point on the Module side rather than on the load side, so consider which way is better depending on the actual situation. An incorrect connection will make input signal unstable and cause malfunction.

(4) Grounding the Module

The "Not connected" terminals of the Module are not connected inside the Module. Use them as relay terminals, if necessary.

(5) Crimp Terminals

Use M3 terminals for crimping to the terminal block.

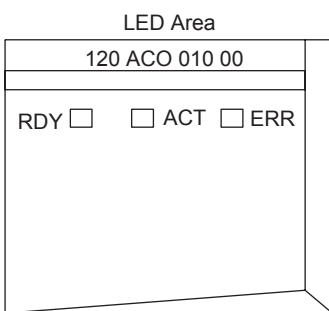
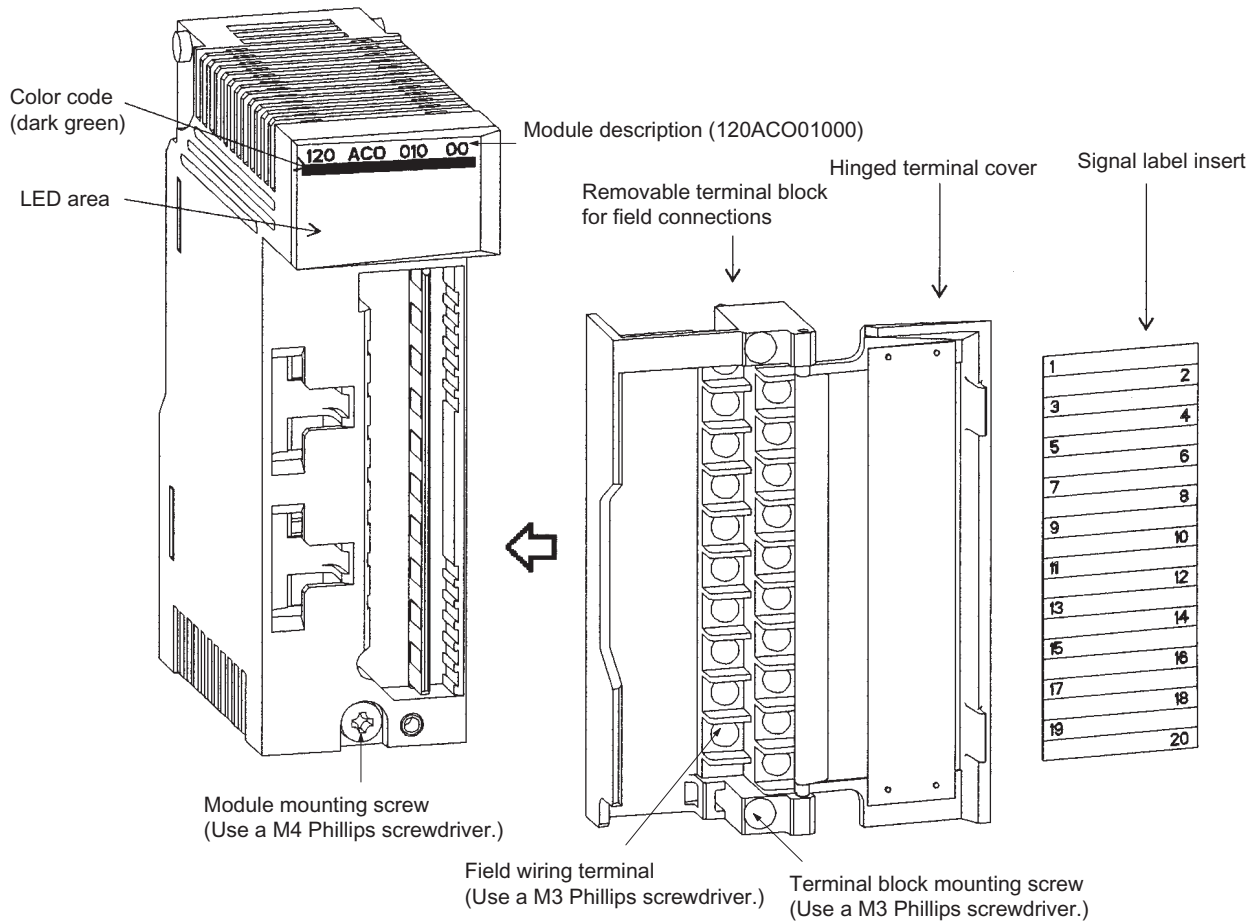
(6) Unconnected Terminals

Terminals 1 to 5, 7, 9 to 13, 15 and 17 to 20 are not connected.

5) I/O Allocation

I/O allocation is necessary when using the Analog Output Module (4 to 20-mA, 2 channels). For further details on I/O allocation, refer to 4.3 I/O Allocation.

6) External Appearance



LED	Color	State	Indication when ON
RDY	Green	Lit	Module is normal.
		Flashing	Initial check error has occurred.
		Not lit	WDT timeout error has occurred.
ACT	Green	Lit	Module is processing I/O.
		Not lit	CPU Module is in the STOP state or I/O processing error has occurred.
ERR	Red	Flashing	Parameter checksum error has occurred.
		Not lit	Module is normal.

4.3 I/O Allocation

This section describes I/O allocation for the 120-series Analog I/O Modules.

4.3.1 Analog Input Modules	-----4-35
4.3.2 Analog Output Modules	-----4-39

4.3.1 Analog Input Modules

1) I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Analog Input Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

a) Module Type Setting

The type of Input Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120AVI02000 is the Module type for the JAMSC-120AVI02000.

b) I/O Reference Number Setting

- (1) The leading I/O reference number used by the Input Module is set.
- (2) Five continuous I/O registers are allocated. The I/O reference numbers and points that can be allocated are listed in the following table.

Type of Input	References for I/O Allocation		Number of Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Input registers	300001 to 300512	300001 to 300512	5 registers

- (3) The five input registers that are allocated are used as shown in the following table. Here, n is between 0 and 507.

Input Register Reference Number	Application
300001 + n	Analog input signal for channel 1
300002 + n	Analog input signal for channel 2
300003 + n	Analog input signal for channel 3
300004 + n	Analog input signal for channel 4
300005 + n	Analog input signal status for channels 1 to 4. Refer to <i>d) Input Signal Status</i> for details.

c) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings, except for the mode setting, because the default settings can be used for most normal applications.

(1) Mode Setting

- (a) Analog Input Module ($\pm 10V$, 4 CH)

The data format can be set to either of the following formats.

- ± 2000 mode: $\pm 10 V / -2000$ to $+2000$
- 0 to 4000 mode: $\pm 10 V / 0$ to 4000

The MEMOSOFT is set by default to the **± 2000 mode**.

- (b) Analog Input Module (0-10V, 4 CH)

Only the 0 to 4000 mode can be used as the data format.

- 0 to 4000 mode: 0 to 10 V / 0 to +4000

The MEMOSOFT is set by default to the **0 to 4000 mode**.

- (c) Analog Input Module (4 to 20 mA, 4 CH)

Only the 0 to 4000 mode can be used as the data format.

- 0 to 4000 mode: 4 to 20 mA / 0 to +4000

The MEMOSOFT is set by default to the **0 to 4000 mode**.

(2) Software Filter Setting

Software filters can be set. The following three settings are available.

- No filter: The input signal read by the Module is input by the CPU Module at each scan.
- 3 input average: The average of three input signals read by the Module is input by the CPU Module at each scan.
- 5 input average: The average of five input signals read by the Module is input by the CPU Module at each scan.

The MEMOSOFT is set by default to use **no filter**.

Note: (1) The sampling interval for signals read by Input Modules is **4 ms**.

(2) The data read by the CPU Module each scan is the most recent signal or average read by the Input Module.

(3) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to **“NORMAL.”**

d) Input Signal Status

Error signals are generated by the Analog Input Module when an input signal exceeds the input signal range.

(1) Analog Input Module (± 10 V, 4 channels)

Input Register	Application
300005 + n	Analog input signal status for channels 1 to 4
Bit 15	1 when +10.24 V < channel 4 input signal
Bit 14	1 when +10.24 V < channel 3 input signal
Bit 13	1 when +10.24 V < channel 2 input signal
Bit 12	1 when +10.24 V < channel 1 input signal
Bit 11	1 when +10.0 V < channel 4 input signal < +10.24 V
Bit 10	1 when +10.0 V < channel 3 input signal < +10.24 V
Bit 9	1 when +10.0 V < channel 2 input signal < +10.24 V
Bit 8	1 when +10.0 V < channel 1 input signal < +10.24 V
Bit 7	1 when -10.24 V < channel 4 input signal < -10.0 V
Bit 6	1 when -10.24 V < channel 3 input signal < -10.0 V
Bit 5	1 when -10.24 V < channel 2 input signal < -10.0 V
Bit 4	1 when -10.24 V < channel 1 input signal < -10.0 V
Bit 3	1 when channel 4 input signal < -10.24 V
Bit 2	1 when channel 3 input signal < -10.24 V
Bit 1	1 when channel 2 input signal < -10.24 V
Bit 0	1 when channel 1 input signal < -10.24 V

(2) Analog Input Module (0 to 10 V, 4 channels)

Input Register	Application
300005 + n	Analog input signal status for channels 1 to 4
Bit 15	1 when +10.12 V < channel 4 input signal
Bit 14	1 when +10.12 V < channel 3 input signal
Bit 13	1 when +10.12 V < channel 2 input signal
Bit 12	1 when +10.12 V < channel 1 input signal
Bit 11	1 when +10.0 V < channel 4 input signal < +10.12 V
Bit 10	1 when +10.0 V < channel 3 input signal < +10.12 V
Bit 9	1 when +10.0 V < channel 2 input signal < +10.12 V
Bit 8	1 when +10.0 V < channel 1 input signal < +10.12 V
Bit 7	Not used.
Bit 6	
Bit 5	
Bit 4	
Bit 3	
Bit 2	
Bit 1	
Bit 0	

(3) Analog Input Module (4 to 20 mA, 4 channels)

Input Register	Application
300005 + n	Analog input signal status for channels 1 to 4
Bit 15	1 when 20.48 mA < channel 4 input signal
Bit 14	1 when 20.48 mA < channel 3 input signal
Bit 13	1 when 20.48 mA < channel 2 input signal
Bit 12	1 when 20.48 mA < channel 1 input signal
Bit 11	1 when 20.0 mA < channel 4 input signal < 20.48 mA
Bit 10	1 when 20.0 mA < channel 3 input signal < 20.48 mA
Bit 9	1 when 20.0 mA < channel 2 input signal < 20.48 mA
Bit 8	1 when 20.0 mA < channel 1 input signal < 20.48 mA
Bit 7	1 when 2.0 mA < channel 4 input signal < 4.0 mA
Bit 6	1 when 2.0 mA < channel 3 input signal < 4.0 mA
Bit 5	1 when 2.0 mA < channel 2 input signal < 4.0 mA
Bit 4	1 when 2.0 mA < channel 1 input signal < 4.0 mA
Bit 3	1 when channel 4 input signal < 2.0 mA
Bit 2	1 when channel 3 input signal < 2.0 mA
Bit 1	1 when channel 2 input signal < 2.0 mA
Bit 0	1 when channel 1 input signal < 2.0 mA

4.3.2 Analog Output Modules

1) I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Analog Output Modules.

- Module Type
- I/O Reference Numbers
- I/O Data Format

Setting these items is performed in a process called **I/O allocation**. I/O allocation is performed using the MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

Refer to the following manuals for specific setting procedures.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10), Chapter 7 *Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25), Chapter 6 *Setting the Module Configuration*.

a) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example 120AVO01000 is the Module type for the JAMSC-120AVO01000.

b) I/O Reference Number Setting

- (1) The leading I/O reference number used by the Output Module is set.
- (2) Two continuous output registers are allocated. The I/O reference numbers and points that can be allocated are listed in the following table.

Type of Input	References for I/O Allocation		Number of Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output registers	400001 to 400512	400001 to 400512	2 registers

- (3) The two output registers that are allocated are used as shown in the following table. Here, n is between 0 and 510.

Output Register Reference Number	Application
400001 + n	Analog output signal for channel 1
400002 + n	Analog output signal for channel 2

c) I/O Data Format

The following items can be set to define the I/O data format. There is, however, generally no need to change these settings, except for the mode setting, because the default settings can be used for most normal applications.

(1) Mode Setting

(a) Analog Output Module (± 10 V, 4 channels)

The data format can be set to either of the following formats.

- ± 2000 mode: ± 10 V / -2000 to +2000
- 0 to 4000 mode: ± 10 V / 0 to +4000

The MEMOSOFT is set by default to the **± 2000 mode**.

(b) Analog Output Module (0 -10 V, 4 channels)

Only the 0 to 4000 mode can be used as the data format.

- 0 to 4000 mode: 0 to 10 V / 0 to +4000

The MEMOSOFT is set by default to the **0 to 4000 mode**.

(c) Analog Output Module (0 -5 V, 4 channels)

Only the 0 to 4000 mode can be used as the data format.

- 0 to 4000 mode: 0 to 5 V / 0 to +4000

The MEMOSOFT is set by default to the **0 to 4000 mode**.

(d) Analog Output Module (4 to 20 mA, 4 channels)

Only the 0 to 4000 mode can be used as the data format.

- 0 to 4000 mode: 4 to 20 mA / 0 to +4000

The MEMOSOFT is set by default to the **0 to 4000 mode**.

(2) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**.

The MEMOSOFT is set by default to "**NORMAL**."

(3) Output Status When CPU Stops

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Any of the following settings is possible.

Open Output: All output terminals are opened.

Hold Output: The output values just prior to stopping.

Set by User: Preset values are output.

The MEMOSOFT is set by default to "**OPEN OUTPUT**."

d) User Set Value

The data that is output when the CPU Module stops (when "SET BY USER" is specified for the timeout output) can be set. The MEMOSOFT is set by default to all **zeros**.

4.4 Operations Using MEMOSOFT

This section describes the I/O allocations (maps) using the MEMOSOFT.

- 4.4.1 Analog Input Module I/O Allocation Screen -----4-41
- 4.4.2 Analog Output Module I/O Allocation Screen -----4-42
- 4.4.3 I/O Allocations -----4-43

4.4.1 Analog Input Module I/O Allocation Screen

This section gives information on the MEMOSOFT I/O Traffic Cop Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i.e., I/O Allocation) Screen

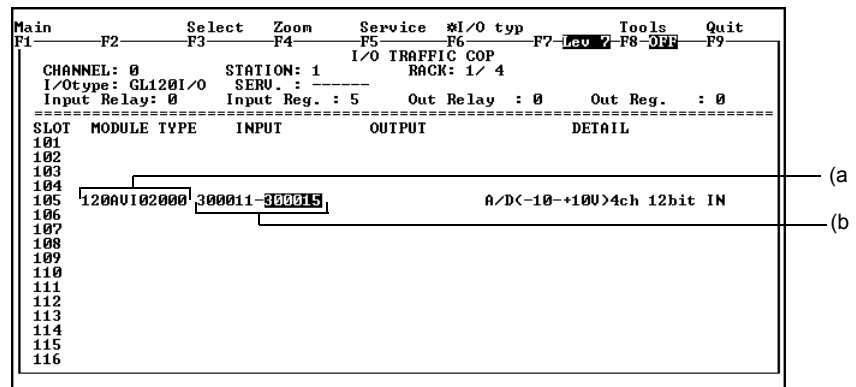


Fig. 4.1 I/O Traffic Cop Screen

a) Module Type

Enter the Analog Input Module type, for example, 120AVI02000.

b) Set the I/O references to be used by the Analog Input Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press **Enter** Key to accept the value, or change it to the desired value, if required.

2) The Parameter Setting Screen (Zoom)

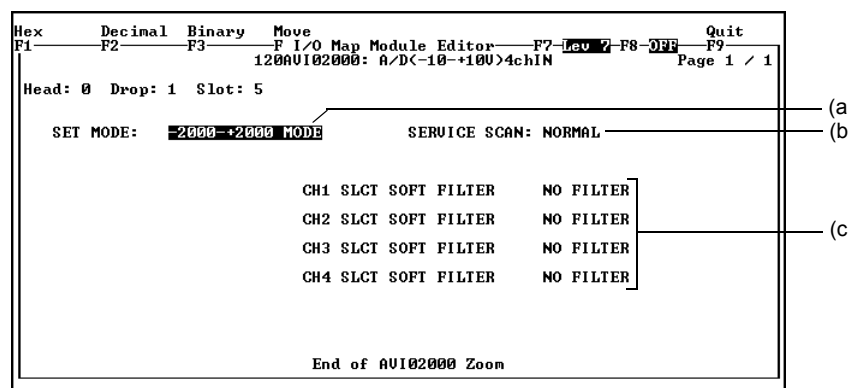


Fig. 4.2 Parameter Setting Screen

a) Mode Set

Select the data format input from the Analog Input Module.
 For some Analog Input Modules, no selection of data format is required.

b) Service Scan (Normal/High-speed)

Set either Normal or High-speed scan for I/O data refresh cycle.

c) Soft Filter

Select one of the following types of software filter.

- NO FILTER
- AVE 3 TIMES
- AVE 5 TIMES

4.4.2 Analog Output Module I/O Allocation Screen

This section gives information on the MEMOSOFT I/O Traffic Cop Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i.e., I/O Allocation) Screen

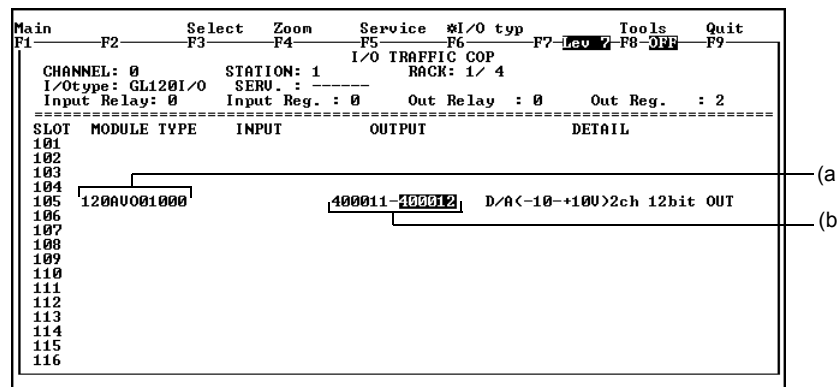


Fig. 4.3 I/O Traffic Cop Screen

a) Module Type

Enter the Analog Output Module type, for example, 120AV001000.

b) Set the I/O references to be used by the Analog Output Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press **Enter** Key to accept the value, or change it to the desired value, if required.

2) The Parameter Setting Screen (Zoom)

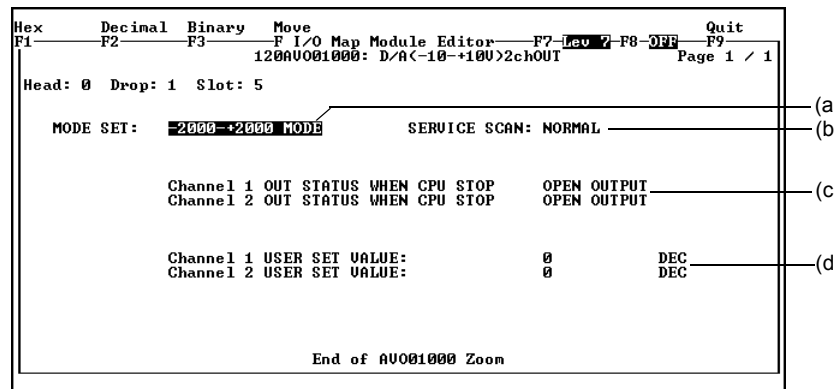


Fig. 4.4 Parameter Setting Screen

a) Mode Set

Select the data format output from the Analog Output Module.

For some Analog Output Modules, no selection of data format is required.

b) Service Scan (Normal/High-speed)

Set either Normal or High-speed scan for I/O data refresh cycle.

c) Timeout Output (Open/Hold/Set by user)

The data that is output when the CPU Module changes from a running status to a stopped status can be specified:

OOPEN OUTPUT
HOLD OUTPUT
SET BY USER

d) Timeout Output Data

If "Timeout Output Data" is specified for c) Output Status When CPU Stops, set the data output when the CPU Module stops.

4.4.3 I/O Allocations

This section explains the operation method of I/O Allocation taking the example of Analog Input Modules. The operation method for Analog Output Modules is the same as for Analog Input Modules.

1) I/O Allocation Items

I/Os must be allocated to use the Analog Input and Output Modules. I/O allocations are made using the MEMOSOFT and the results are recorded in the I/O allocation tables stored in memory of the CPU Module.

The following items must be set for I/O allocations.

- Module Type
- I/O References
- Mode
- Service Scan (Normal/High-speed scan)

- Software Filter (No filter/Ave 3 times/Ave 5 times)
Note: This item is to be set only for Analog Input Modules.
- Timeout Output (Open/Hold/Set by user)
Note: This item is to be set only for Analog Output Modules.

2) Setting the Module Type

Set the Module Type in the following procedure.

- (1) Start the MEMOSOFT and select *Online* from the **Mode** Menu.

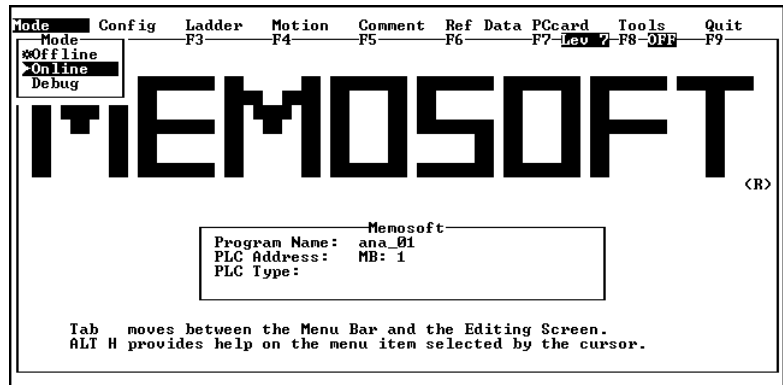


Fig. 4.5 Mode Selection: Online

I/O allocations cannot be performed while the CPU Module is in RUN status. If necessary, stop the CPU Module. Refer to 6.1 PLC Operations in the *MEMOSOFT User's Manual (Manual number SIEZ-C825-60.10)* for the procedure to stop the CPU Module.

- (2) Press the **F2 (Config)** Key to access the PLC System Configuration Screen.

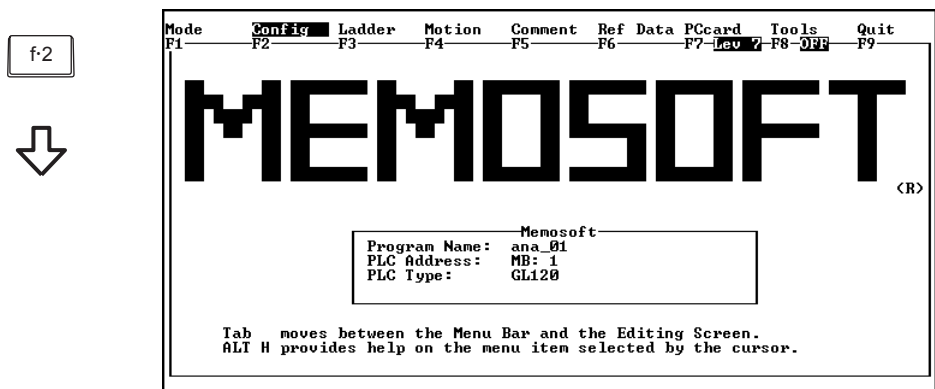


Fig. 4.6 PLC System Configuration Screen

- Select **I/O Map** from the Map Menu using the Cursor Keys and press the **Enter** Key.

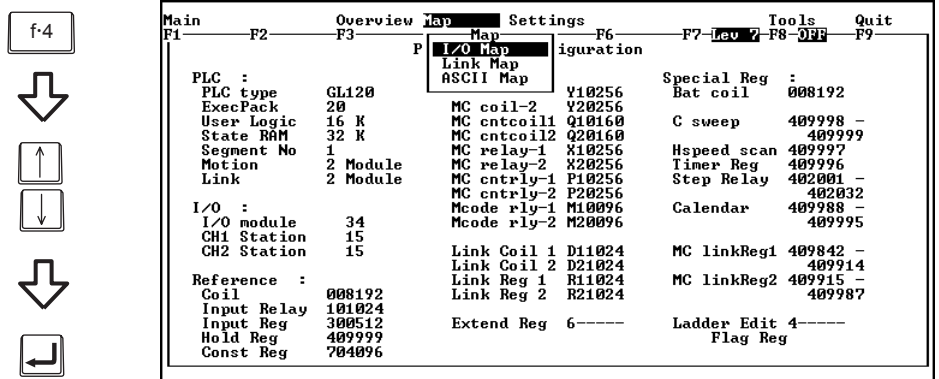


Fig. 4.7 Selecting the I/O Map

- The I/O Map Screen will be displayed. Move the cursor to the slot to which the allocations are to be made.

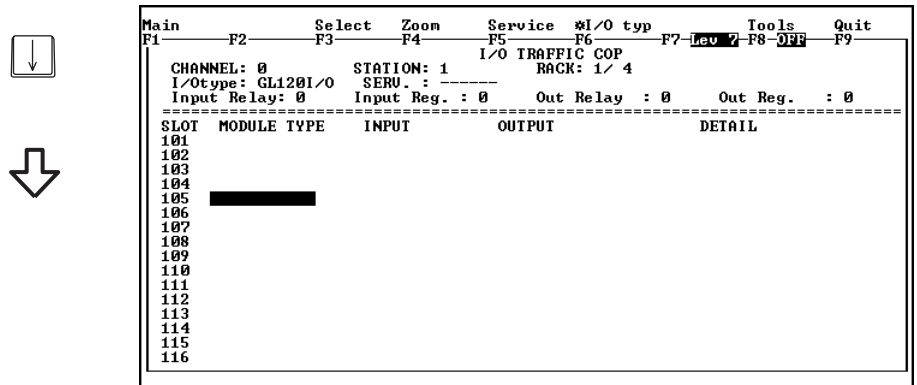


Fig. 4.8 I/O Map

If the Analog Input (or Output) Module is already mounted, the Module model description will be displayed on the right.

- Press the **Shift + ?** Keys. A list of Module types will be displayed. Move the cursor to **120AVI0200** and press the **Enter** Key to select the Analog Input Module.

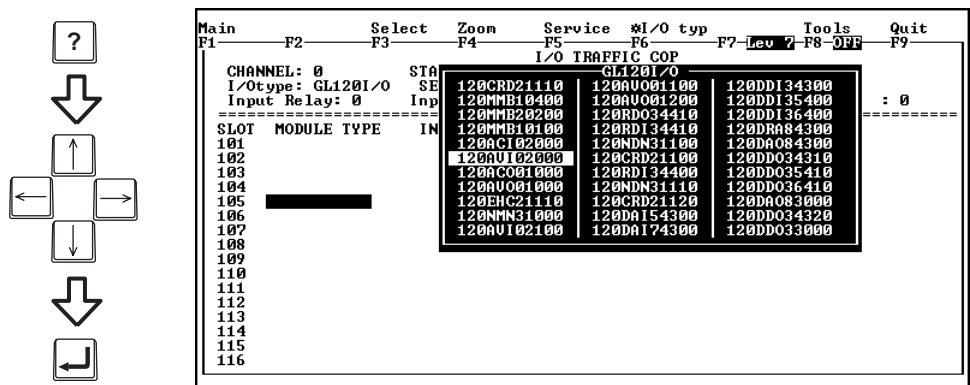


Fig. 4.9 Module Selection

3) Setting I/O References

A screen to allocate I/O (I/O Traffic Cop Screen) will be displayed.

- (1) Input the reference number of the first input register:

Move the cursor to the field for the reference number of the first input register and input the reference number. Press the **Enter** Key.

Input 300011



```

Main      Select  Zoom  Service #I/O typ  Tools  Quit
F1        F2      F3    F4      F5      F6      F7-Lev 7- F8-0FF  F9
I/O TRAFFIC COP
CHANNEL: 0 STATION: 1 RACK: 1/ 4
I/Otype: GL1201/0 SERU. : -----
Input Relay: 0 Input Reg. : 0 Out Relay : 0 Out Reg. : 0
-----
SLOT  MODULE TYPE  INPUT  OUTPUT  DETAIL
101
102
103
104
105  120AV102000  A/D<-10--+10U>4ch 12bit IN
106
107
108
109
110
111
112
113
114
115
116
    
```

Fig. 4.10 I/O Traffic Cop Screen

- (2) When the reference number of the first input register is input, the cursor will move to the field for the reference number of the last input register and the reference number will be displayed automatically, indicating the reference number that can be input. Press the **Enter** Key to accept the value or change it to the desired value if necessary.

Input 300012 if you want to change the number



```

Main      Select  Zoom  Service #I/O typ  Tools  Quit
F1        F2      F3    F4      F5      F6      F7-Lev 7- F8-0FF  F9
I/O TRAFFIC COP
CHANNEL: 0 STATION: 1 RACK: 1/ 4
I/Otype: GL1201/0 SERU. : -----
Input Relay: 0 Input Reg. : 5 Out Relay : 0 Out Reg. : 0
-----
SLOT  MODULE TYPE  INPUT  OUTPUT  DETAIL
101
102
103
104
105  120AV102000  300011-300015  A/D<-10--+10U>4ch 12bit IN
106
107
108
109
110
111
112
113
114
115
116
    
```

Fig. 4.11 Reference Number of First Input Register

- (3) The reference number of the last input register will be displayed.

```

Main      Select  Zoom  Service #I/O typ  Tools  Quit
F1        F2      F3    F4      F5      F6      F7-Lev 7- F8-0FF  F9
I/O TRAFFIC COP
CHANNEL: 0 STATION: 1 RACK: 1/ 4
I/Otype: GL1201/0 SERU. : -----
Input Relay: 0 Input Reg. : 2 Out Relay : 0 Out Reg. : 0
-----
SLOT  MODULE TYPE  INPUT  OUTPUT  DETAIL
101
102
103
104
105  120AV102000  300011-300012  A/D<-10--+10U>4ch 12bit IN
106
107
108
109
110
111
112
113
114
115
116
    
```

Fig. 4.12 Reference Number of Last Input Register

- (4) This completes the setting of I/O references.



I/O references for the Analog Output Module can be set in the same way as for the Analog Input Module.

4) Setting the Mode

Press the **F4 (Zoom)** Key to access to the Parameter Setting Screen (I/O Map Module Editor).

(1) Move the cursor to **Mode** and press the **Enter** Key to access the mode setting.

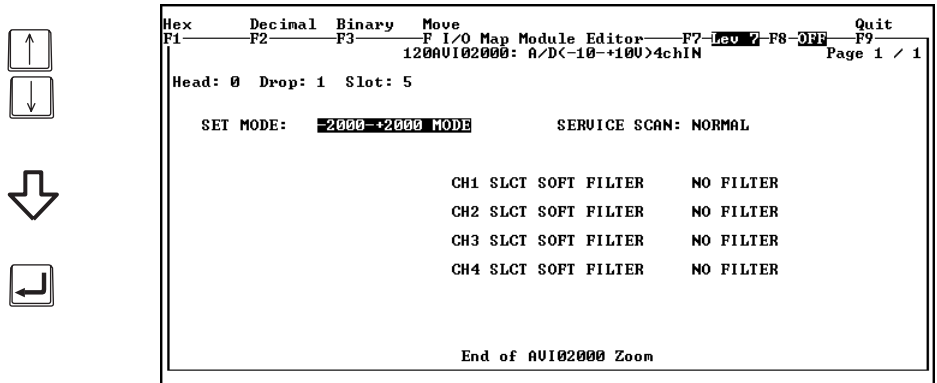


Fig. 4.13 Parameter Setting Screen: Mode

(2) A screen will appear so that the mode setting can be selected.

Move the cursor to either **0 - 4000 MODE** or **-2000-+2000 MODE** and press the **Enter** Key to select the desired mode.

The MEMOSOFT is set by default as follows:

- Modules of the signal range $\pm 10V$: **-2000-+2000 MODE**
- Modules of the signal range 0 to 10V: **0 - 4000 MODE**
- Modules of the signal range 0 to 5V: **0 - 4000 MODE**
- Modules of the signal range 4 to 20-mA: **0 - 4000 MODE**

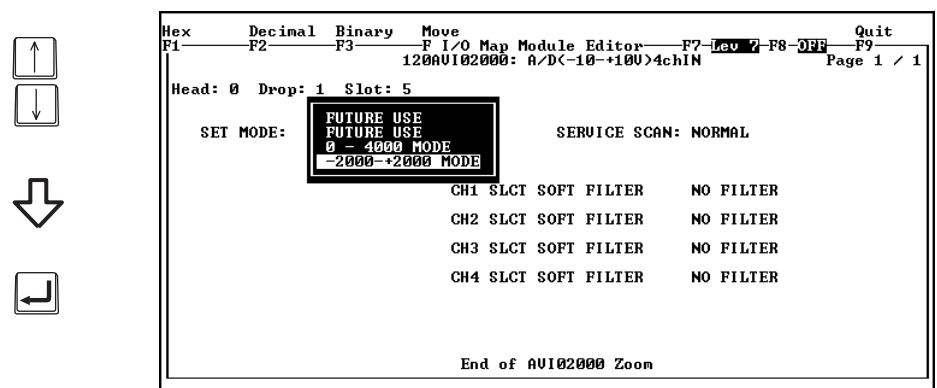


Fig. 4.14 Mode Selection

5) Setting the Service Scan

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **Service scan** and press the **Enter** Key to access the service scan setting.

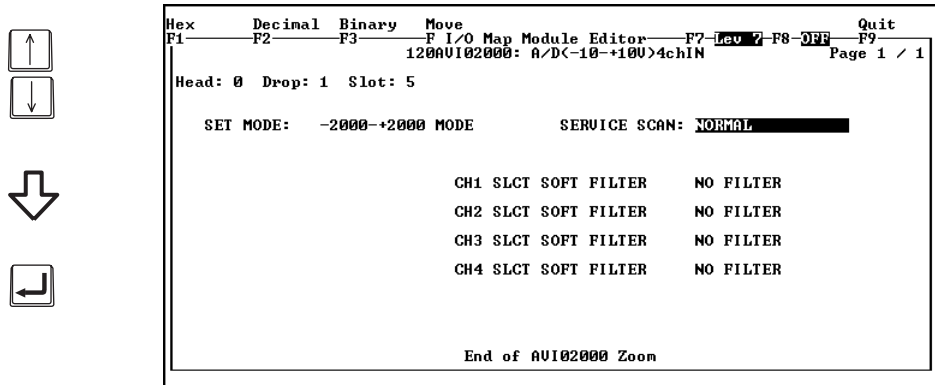


Fig. 4.15 Parameter Setting Screen: Service scan

- (2) A screen will appear so that the service scan setting can be selected. Move the cursor to either **NORMAL** or **HIGH** and press the **Enter** Key to select the desired scan service.

The MEMOSOFT is set by default to **NORMAL**.

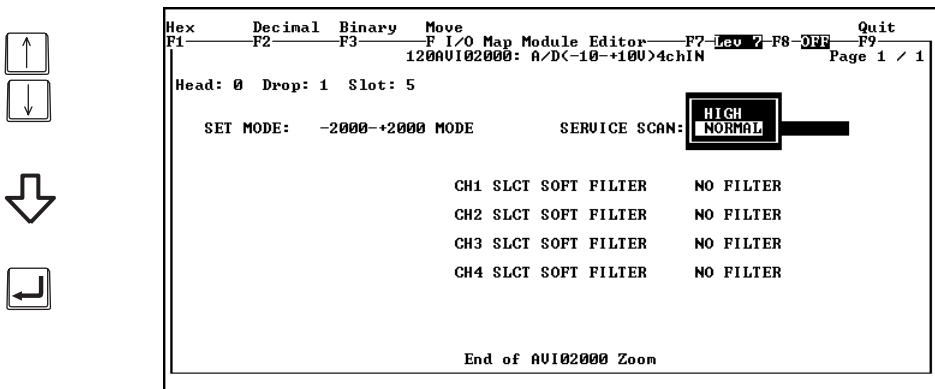


Fig. 4.16 Service Scan Selection

6) Setting the Software Filter (Only for Analog Input Modules)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **Soft Filter** and press the **Enter** Key to access the software filter setting.

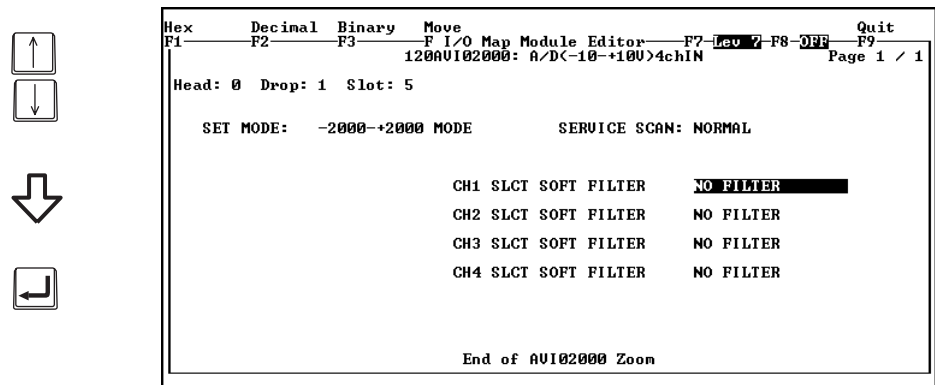


Fig. 4.17 Parameter Setting Screen: Software Filter

- (2) A screen will appear so that the software filter setting can be selected. Move the cursor to **NO FILTER, AVE 3 TIMES** or **AVE 5 TIMES** and press the **Enter** Key to select the desired software filter.

The MEMOSOFT is set by default to **NO FILTER**.

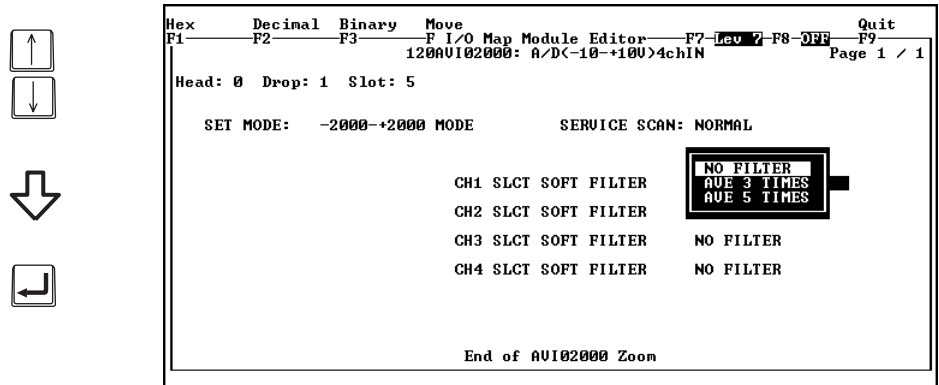


Fig. 4.18 Software Filter Selection



The software filter selection is only for Analog Input Modules, but not for Analog Output Modules.

4

7) Setting the Timeout Output (Only for Analog Output Modules)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **OUT STATUS WHEN CPU STOP** and press the **Enter** Key to access the timeout output setting.

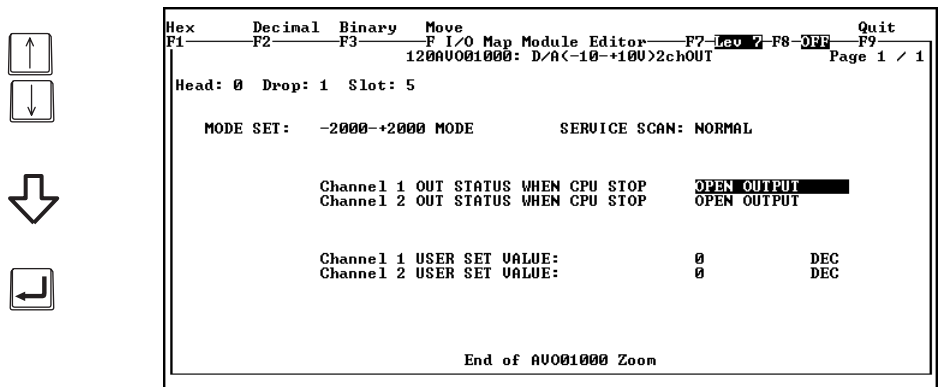


Fig. 4.19 Parameter Setting Screen: Timeout Output

- (2) A screen will appear so that the timeout output setting can be selected. Move the cursor to **OPEN OUTPUT, HOLD OUTPUT** or **SET BY USER** and press the **Enter** Key to select the desired timeout output status. If **HOLD OUTPUT** is selected, the data just before the CPU Module entered STOP status will be sent for all outputs until the CPU Module returns to RUN status.

The MEMOSOFT is set by default to **OPEN OUTPUT**.

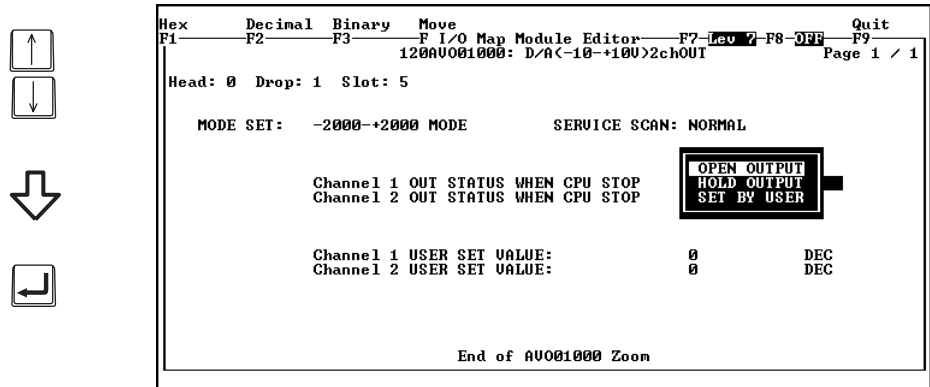


Fig. 4.20 Timeout Output Status Selection

Note: The timeout output setting is only for Analog Output Modules, but not for Analog Input Modules.

8) Setting the Timeout Output Data (Only for Analog Output Modules)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to the input field for **USER SET VAUE** and input a value. Then, press the **Enter** Key.

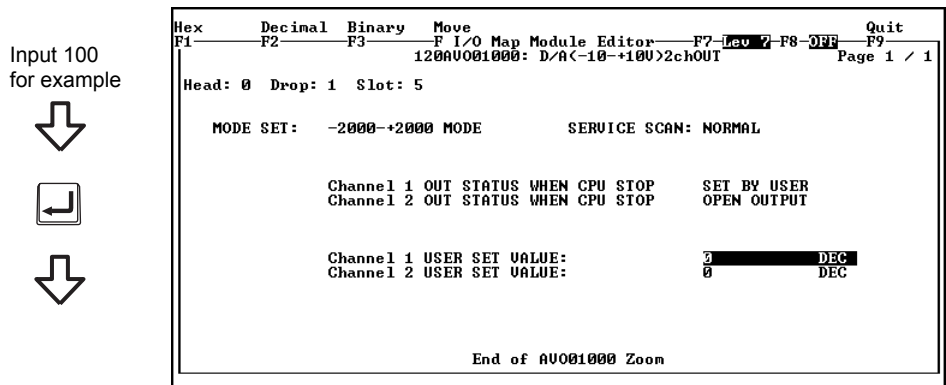


Fig. 4.21 Parameter Setting Screen: Timeout Output Data

The MEMOSOFT is set by default to **0**.

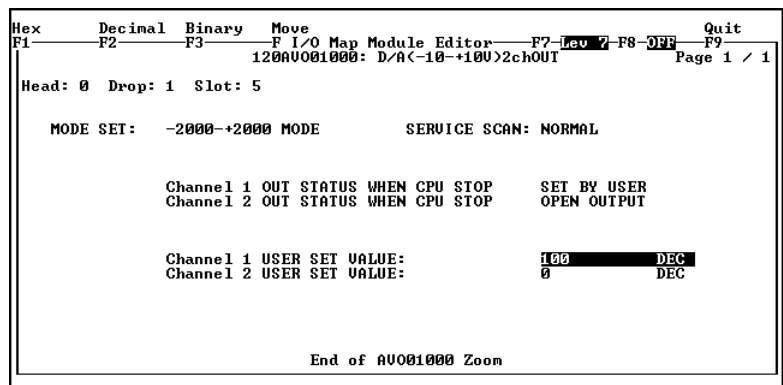


Fig. 4.22 Timeout Output Data Setting

Note: The timeout output data setting is only for Analog Output Modules, but not for Analog Input Modules.

9) This completes the I/O allocations.

Press the **F9 (Quit)** Key to end the procedure.

Register I/O Specifications

5



This chapter gives the specifications of Register I/O Modules.

5.1 Register Input Specifications	5-2
5.1.1 Register Input Modules	5-2
5.2 Register Output Specifications	5-6
5.2.1 Register Output Modules	5-6
5.3 I/O Allocation	5-10
5.3.1 Register Input Modules	5-10
5.3.2 Register Output Modules	5-13
5.4 Operations Using MEMOSOFT	5-17
5.4.1 Register Input Module I/O Allocation Screen	5-17
5.4.2 Register Output Module I/O Allocation Screen	5-18
5.4.3 I/O Allocations	5-20

5.1 Register Input Specifications

This section describes performance specifications, circuit configuration, external connections, and appearance of the 120-series Register Input Modules.

5.1.1 Register Input Modules ----- 5-2

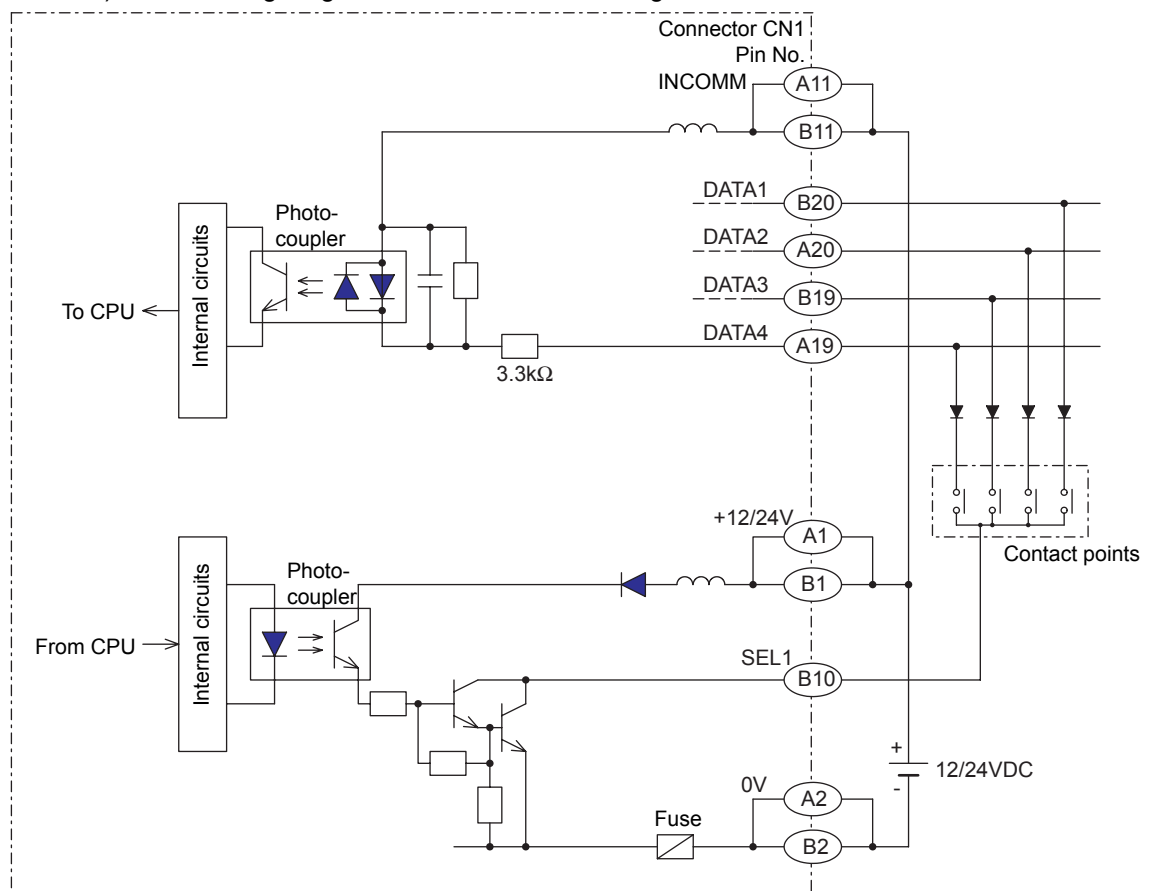
5.1.1 Register Input Modules

1) Performance Specifications

Item		Specifications	
		At 12 VDC	At 24 VDC
Name		Register Input Module	
Model Name		REGISTER-IN	
Model No.		JAMSC-120RDI34410	
Data Input Circuit	Rated Voltage	12 VDC	24 VDC
	Maximum Allowable Voltage	30 VDC	
	Input Form	Sourcing or sinking	
	Rated Current	3.5 mA	7.0 mA
	Input Impedance	3.4 kΩ	
	Standard Operating Ranges	ON voltage range: 9 VDC OFF voltage range: 5 VDC	
	Input Type	Not compliant with JIS B3502	DC type 2 (according to JIS B 3502)
	Input Delay Time	OFF to ON: 5 ms max. ON to OFF: 5ms max.	
	Number of Inputs	16 points	
	Input Signal Indication	None	
Select Output Circuit	Rated Voltage	12 VDC	24 VDC
	Allowable Voltage Range	10.2 to 30.0 VDC	
	Output Form	Sinking output	
	Maximum Load Current	160 mA/point	
	Output Voltage Drop	1.5 V (0.1A) max.	
	OFF Leakage Current	1 mA max. (24 VDC)	
	Output Type	Transistor outputs	
	Output Protection Type	Unprotected outputs (according to JIS B 3502)	
	Built-in Fuse	One 0.5-A fuse (Blowout time: Five seconds max. at 200 % of rated current)	
	Surge suppressor	None	
	Other Output Protection	None	
	Number of Outputs	16 points	
	Output Signal Indication	None	
External Connections		40-pin connector: one piece Connector type: FCN-365P040 (made by Fujitsu Ltd.)	

Item	Specifications	
	At 12 VDC	At 24 VDC
Status Indication	R: Lights while the Module is operating normally. ACTIVE: Lights during input output processing. F: Lights when the fuse is blown out or the output power supply is disconnected.	
Insulation Method	Photocoupler	
Dielectric Strength	1,500 VAC for 1 min or 1,800 VAC for 1 s between the input output terminals and the internal circuits.	
Insulation Resistance	100 MΩ min. at room temperature and humidity between the input output terminals and the ground (measured with a 500 VDC test voltage megohmmeter).	
External Power Supply	12 VDC supplied to signals	24 VDC supplied to signals
Derating Conditions	None	
Internal Current Consumption	150 mA max. at 5 VDC	
Maximum Heat Value	3.5 W	
Hot Swapping (Removal/insertion under power)	Permitted	
Approx. Mass	300 g	
External Dimensions	40.3×130×103.9 mm (W×H×D)	

2) The following diagram shows the circuit configuration.

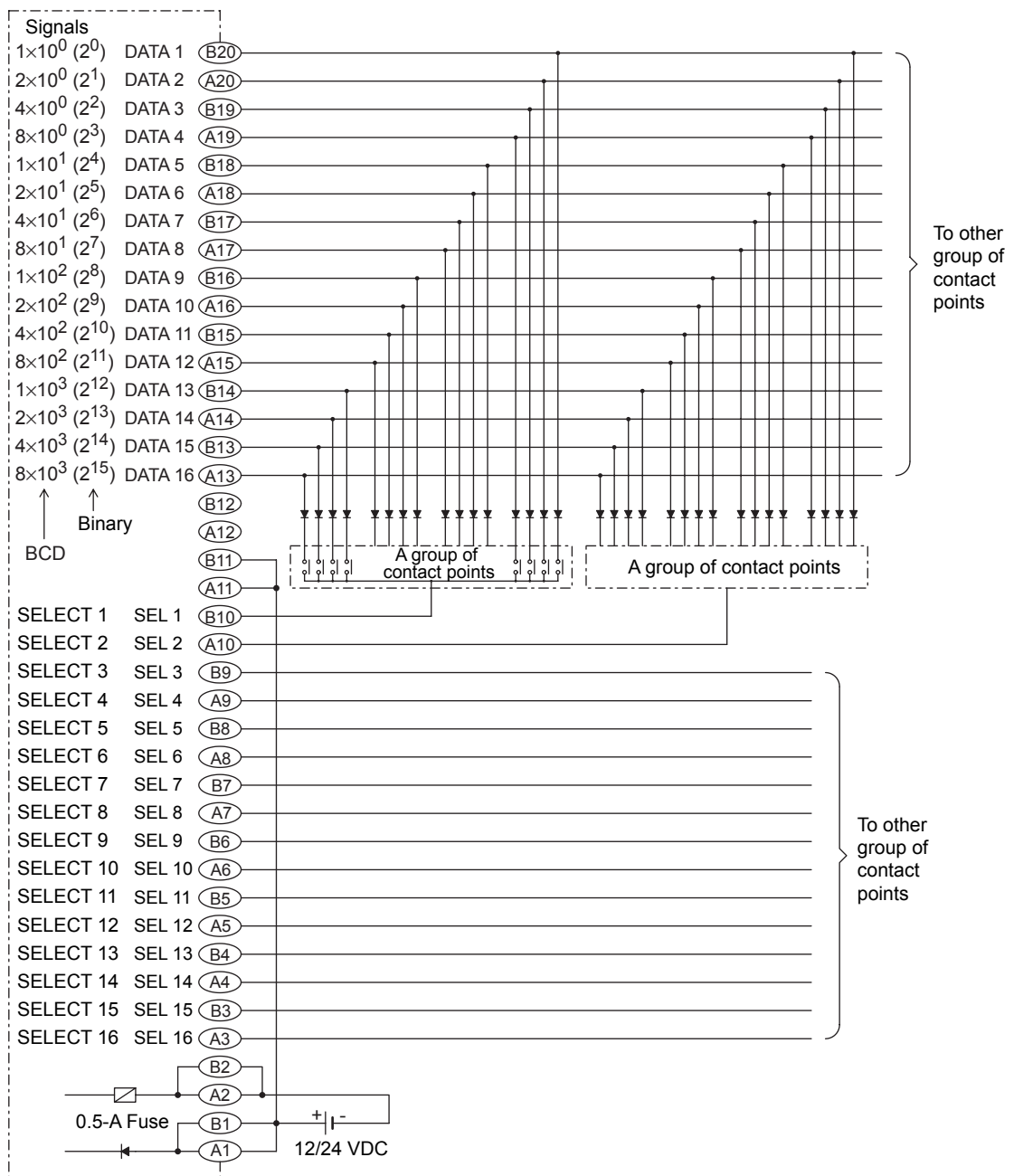


CAUTION Do not replace the built-in fuses of the Register I/O Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the Register I/O Modules, and the guarantee is void.

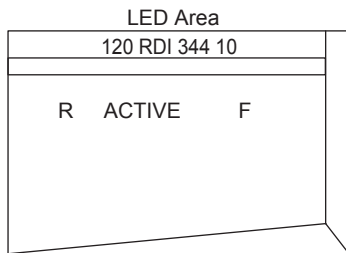
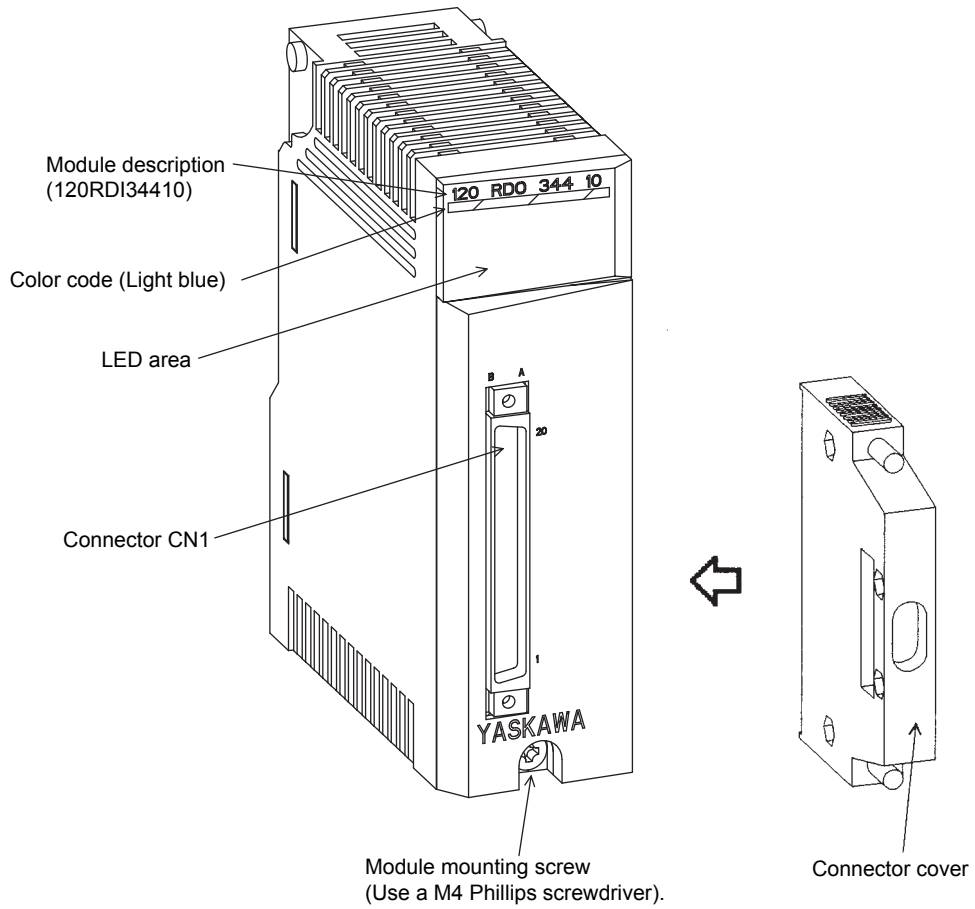
- Note: (1)** The following pins of CN1 are internally connected:
 A1 and B1, A2 and B2, A11 and B11
 Also, connect them externally. Not connecting these pins externally may cause malfunction of GL120 and GL130.
- (2)** The pin A12 and B12 are not connected.
- (3) External connection connector (included)**
 Connector: FCN-361J040-AU (soldered) (made by Fujitsu Ltd.)
 Cover: FCN-360C040-B (made by Fujitsu Ltd.)
- (4) Recommended wires**
 Use 0.26 mm² (AWG23) wires for connections between the connector pins.

3) The following diagram shows an example of external connections.



Note: External connection cable
 The cable type W5410 for 64-point I/O Modules are available for external connection cables. For the details, refer to 3.3 I/O Module Cables.

4) External Appearance



LED	Color	Indication when ON
R	Green	Module is operating normally.
ACTIVE	Green	Module is in service with CPU Module.
F	Red	Fuse blown out, or external power supply not connected.

5) Accessories

The followings are provided with the Module.

- External connection connector
 Connector: FCN-361J040-AU (soldered) (made by Fujitsu Ltd.)
 Cover: FCN-360C040-B (made by Fujitsu Ltd.)

5.2 Register Output Specifications

This section describes performance specifications, circuit configuration, external connections, and appearance of the 120-series Register Output Modules.

5.2.1 Register Output Modules ----- 5-6

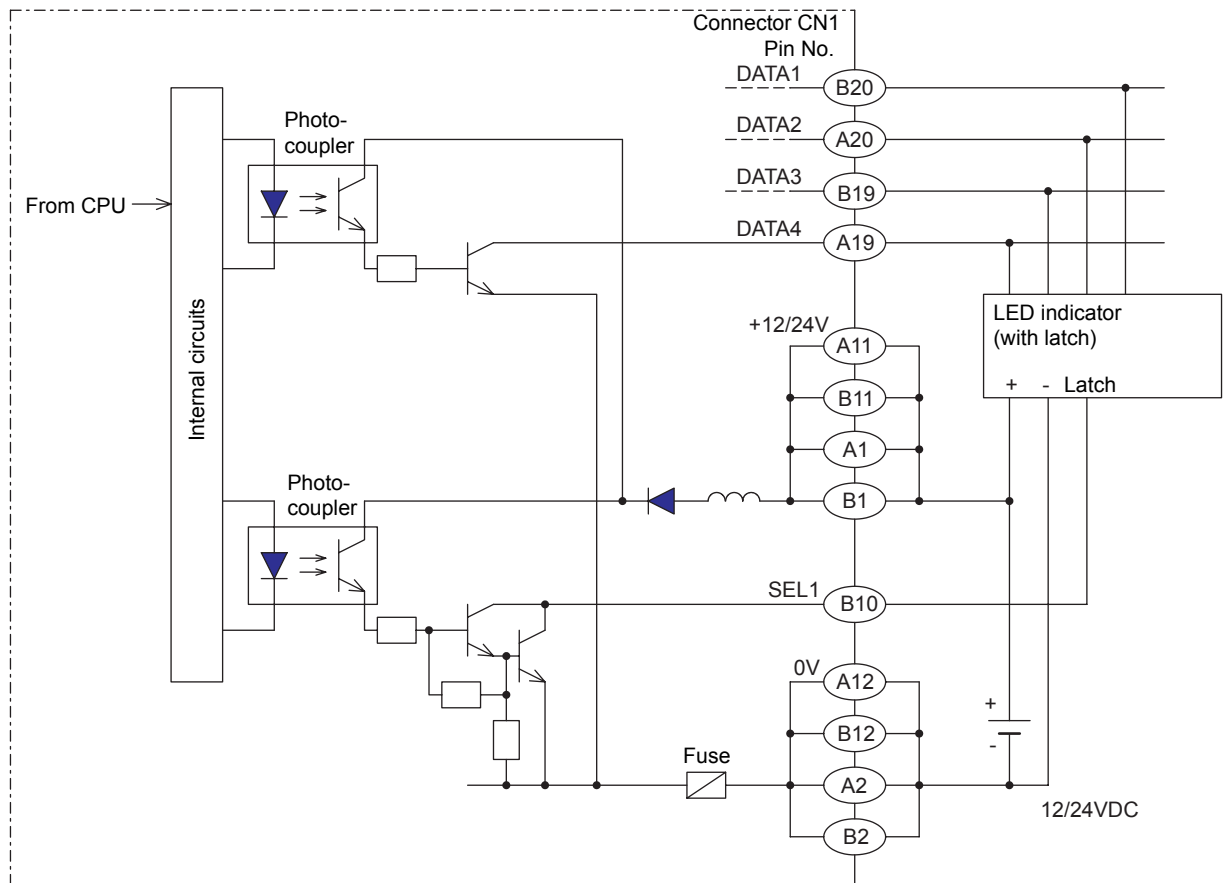
5.2.1 Register Output Modules

1) Performance Specifications

Item		Specifications
Name		Register Output Module
Model Name		REGISTER-OUT
Model No.		JAMSC-120RDO34410
Output Circuits	Rated Voltage	12/24 VDC
	Allowable Voltage Range	10.2 to 30.0 VDC
	Output Form	Sinking output
	Maximum Load Current	Data output circuit: 100 mA per point, 800 mA per 16 points Select output circuit: 100 mA per point
	Output Voltage Drop	1.5V (0.1A) max.
	Output Delay Time	OFF to ON: 1 ms max. ON to OFF: 1 ms max.
	OFF Leakage Current	1 mA max. (24 VDC)
	Output Type	Transistor output
	Output Protection Type	Data output circuit: Protected output (according to JIS B 3502) Select output circuit: Unprotected output (according to JIS B 3502)
	Built-in Fuse	One 1-A fuse (Blowout time: Two minute max. at 200 % of rated current)
	Surge suppressor	None
	Other Output Protections	None
	Number of Outputs	Data output circuit: 16 points Select output circuit: 16 points
Output Signal Indication	None	
External Connections		40-pin connector: one piece Connector type: FCN-365P040 (made by Fujitsu Ltd.)
Status Indication		R: Lights while the Module is operating normally. ACTIVE: Lights during output processing F: Lights when the fuse is blown out or the output power supply is disconnected.
Insulation Method		Photocoupler
Dielectric Strength		1,500 VAC for 1 min or 1,800 VAC for 1 s between the output terminals (connected together) and the internal circuits.
Insulation Resistance		100 MΩ min. at room temperature and humidity between the output terminals and the ground (measured with a 500 VDC test voltage megohmmeter).
External Power Supply		12/24 VDC supplied to drive loads
Derating Conditions		None
Internal Current Consumption		400 mA max. at 5 VDC

Item	Specifications
Maximum Heat Value	3.5 W
Hot Swapping (Removal/insertion under power)	Permitted
Approx. Mass	300g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) The following diagram shows the circuit configuration.



CAUTION Do not replace the built-in fuses of the Register I/O Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the Register I/O Modules, and the guarantee is void.

Note: (1) The following pins of CN1 are internally connected: The pins A1, B1, A11, and B11, and the pins A2, B2, A12, and B12.

Also connect these pins externally. Not connecting these pins externally may cause malfunction of GL120 and GL130.

(2) External connection connector (included)

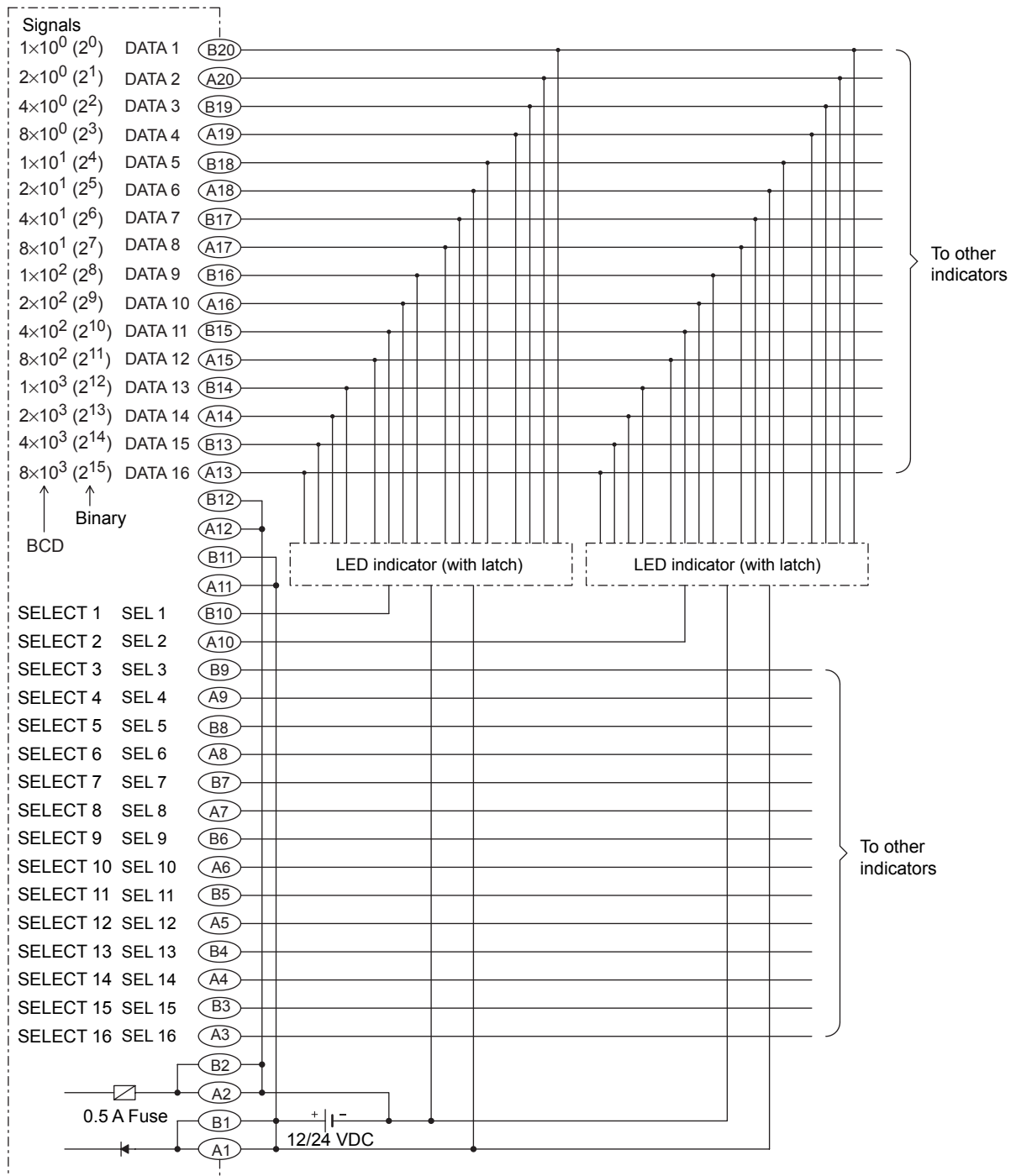
Connector: FCN-361J040-AU (soldered) (made by Fujitsu Ltd.)

Cover: FCN-360C040-B (made by Fujitsu Ltd.)

(3) Recommended wires

Use 0.26 mm² (AWG23) wires for connections between the connector pins.

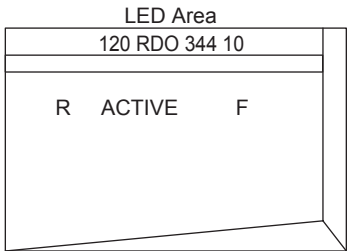
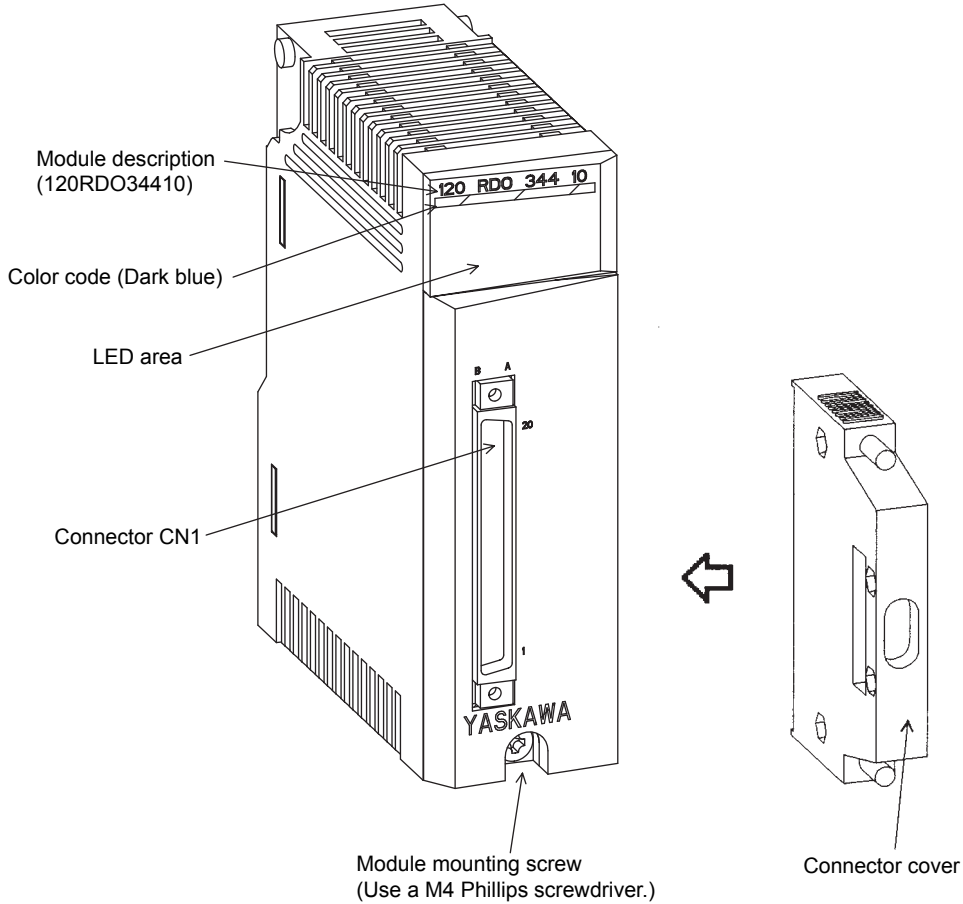
3) The following diagram shows an example of external connections.



Note: External connection cable

The cable type W5410 for 64-point I/O Modules are available for external connection cables. For the details, refer to 3.3 I/O Module Cables.

4) External Appearance



LED	Color	Indication when ON
R	Green	Module is operating normally.
ACTIVE	Green	Module is in service with CPU Module.
F	Red	Fuse blown out, or external power supply not connected.

5) Accessories

The followings are provided with the Module.

- External connection connector
 Connector: FCN-361J040-AU (soldered) (made by Fujitsu Ltd.)
 Cover: FCN-360C040-B (made by Fujitsu Ltd.)

5.3 I/O Allocation

This section explains the I/O Allocation of 120-series Register I/O Modules.

5.3.1 Register Input Modules	-----	5-10
5.3.2 Register Output Modules	-----	5-13

5.3.1 Register Input Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Register Input Modules.

- Module Type
- I/O Reference Numbers

Also, the following parameter settings are necessary to control Register Input Modules.

- Service Scan (Normal/High-speed scan)
- Mode
- Cycle
- Select Timing

Setting these items is called **I/O allocation**. I/O allocation is performed by using MEMOSOFT, and the settings are recorded as the I/O allocation tables and stored in memory in the CPU Module.

For specific setting procedures, refer to the following manuals.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7): *Chapter 7 Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10): *Chapter 7 Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25): *Chapter 6 Setting the Module Configuration*.

2) Module Type Setting

The type of Input Module mounted in the slot is set as the Module type.

Only the last 11 alphanumeric characters of the model number are necessary. For example, 120RDI34410 is the Module type for the JAMSC-120RDI34410.

3) I/O Reference Number Setting

The following table shows the I/O reference numbers and points that can be allocated.

Type of Input	References for I/O Allocation		Number of Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Input registers	30001 to 300512	300001 to 300512	1 to 16 registers

4) Parameter Setting

a) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to **"NORMAL."**

b) Mode

The number of data input from the Register Input Module can be set. Either **8CH** or **16CH** can be set.

The MEMOSOFT is set by default to **"16CH."**

c) Cycle

The reading cycle of input data can be set.

Any of six cycles listed in the following table can be set according to the set mode.

Table 5.1 Cycles

Mode	8CH	16CH
Cycle	10 ms	20 ms
	32 ms	64 ms
	64 ms	128 ms
	192 ms	384 ms
	320 ms	640 ms
	User set	User set

The MEMOSOFT is set by default to **32/64 ms**.

When a specified value is set for the cycle, the values of Timing T1 and T2 are set according to the set cycle.

The following table shows the values of Select Timings when a specified value is selected for the cycle.

Table 5.2 Select Timing When a Specified Value is Selected for Cycle

Mode		Timing	
8CH	16CH	T1	T2
10 ms	20 ms	0.9 ms	0.4 ms
32 ms	64 ms	3.5 ms	0.5 ms
64 ms	128 ms	7.0 ms	1.0 ms
192 ms	384 ms	21.0 ms	3.0 ms
320 ms	640 ms	35.0 ms	5.0 ms

d) Select Timings (T₁, T₂)

(1) Select Timing T₁

Any of the values listed in the following tables can be selected for Select Timing T₁ when the cycle is set to “USER SET.”

Table 5.3 Select Timing T₁

Select Timing T ₁				
0.9 ms	7.5 ms	14.5 ms	21.5 ms	28.5 ms
1.0 ms	8.0 ms	15.0 ms	22.0 ms	29.0 ms
1.5 ms	8.5 ms	15.5 ms	22.5 ms	29.5 ms
2.0 ms	9.0 ms	16.0 ms	23.0 ms	30.0 ms
2.5 ms	9.5 ms	16.5 ms	23.5 ms	30.5 ms
3.0 ms	10.0 ms	17.0 ms	24.0 ms	31.0 ms
3.5 ms	10.5 ms	17.5 ms	24.5 ms	31.5 ms
4.0 ms	11.0 ms	18.0 ms	25.0 ms	32.0 ms
4.5 ms	11.5 ms	18.5 ms	25.5 ms	32.5 ms
5.0 ms	12.0 ms	19.0 ms	26.0 ms	33.0 ms
5.5 ms	12.5 ms	19.5 ms	26.5 ms	33.5 ms
6.0 ms	13.0 ms	20.0 ms	27.0 ms	34.0 ms
6.5 ms	13.5 ms	20.5 ms	27.5 ms	34.5 ms
7.0 ms	14.0 ms	21.0 ms	28.0 ms	35.0 ms

The MEMOSOFT is set by default to **3.5 ms**.

(2) Select Timing T₂

Any of the values listed in the following tables can be selected for Select Timing T₂ when the cycle is set to “USER SET.”

Table 5.4 Select Timing T₂

Select Timing T ₂			
0.4 ms	1.5 ms	3.0 ms	4.5 ms
0.5 ms	2.0 ms	3.5 ms	5.0 ms
1.0 ms	2.5 ms	4.0 ms	–

The MEMOSOFT is set by default to **0.5 ms**.

e) Data Reading Timing

The data reading timing is shown in the following diagram.

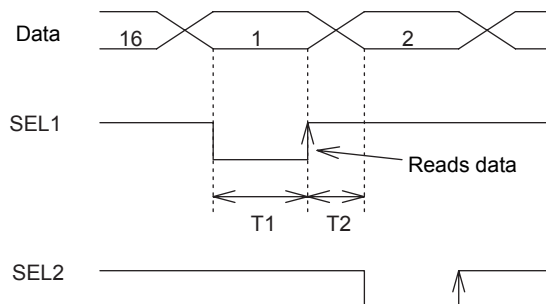


Fig. 5.1 Data Reading Timing

5.3.2 Register Output Modules

1) Purpose of I/O Allocation

The relationship between I/O signals and I/O references must be defined so that the CPU Module can input signals from input devices and output signals to output devices. The following settings are necessary to define this relationship for Register Output Modules.

- Module Type
- I/O Reference Numbers

Also, the following parameter settings are necessary to control Register Output Modules.

- Service Scan (Normal/High-speed Scan)
- Timeout Output (Clear/Hold)
- Mode
- Cycle
- Select Timing

Setting these items is called **I/O allocation**. I/O allocation is performed using MEMOSOFT and the settings are recorded in the I/O allocation tables stored in memory in the CPU Module.

For specific setting procedures, refer to the following manuals.

- MEOCON GL120, GL130 MEMOSOFT for P120 Programming Panel User's Manual (Manual No. SIEZ-C825-60.7): *Chapter 7 Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for DOS User's Manual (Manual No. SIEZ-C825-60.10): *Chapter 7 Setting System Configuration*.
- MEMOCON GL120, GL130 MEMOSOFT for Windows User's Manual (Manual No. SIEZ-C825-60.25): *Chapter 6 Setting the Module Configuration*.

2) Module Type Setting

The type of Output Module mounted in the slot is set as the Module type. Only the last 11 alphanumeric characters of the model number are necessary. For example, 120RDO34410 is the Module type for the JAMSC-120RDO34410.

3) I/O Reference Number Setting

The following table shows the I/O reference numbers and points that can be allocated.

Type of Output	References for I/O Allocation		Number of Registers
	CPU10, CPU20, CPU21	CPU30, CPU35	
Output registers	400001 to 400512	400001 to 400512	1 to 16 registers

4) Parameter Setting

a) Service Scan: Normal/High-speed

Two types of service scans are available: **normal** and **high-speed**. A service scan is recommended when using the high-speed segment function. The I/O module is activated before the ladder decoding of the high-speed segments. The I/Os that are processed in synchronization with the high-speed scan are called **High-speed Segment I/Os**. The MEMOSOFT is set by default to **"NORMAL."**

b) Timeout Output (Clear/Hold)

The data that is output when the CPU Module changes from a running status to a stopped status can be specified. Either of the following settings is possible.

- Clear: "0" is output.
- Hold: The data just before entering stopped status is output.

c) Mode

The number of data output from the Register Output Module can be set. Either **8CH** or **16CH** can be specified.

The MEMOSOFT is set by default to **"16CH."**

d) Cycle

The cycle to read the output data can be set.

Any of five cycles listed in the following table can be set.

Table 5.5 Cycle

Mode	8CH	16CH
Cycle	32 ms	64 ms
	64 ms	128 ms
	192 ms	384 ms
	320 ms	640 ms
	User set	User set

The MEMOSOFT is set by default to **32/64 ms**.

When a specified value is set for the cycle, the values of select Timing T1, T2, T3, and T4 are set according to the set cycle.

The following table shows the values of Select Timing when the cycle is set to a specified value.

Table 5.6 Select Timing When a Specified Value is Set for Cycle

Mode		Select Timing			
8CH	16CH	T1	T2	T3	T4
32 ms	64 ms	1.0 ms	1.5 ms	1.0 ms	0.5 ms
64 ms	128 ms	2.0 ms	3.0 ms	2.0 ms	1.0 ms
192 ms	384 ms	6.0 ms	9.0 ms	6.0 ms	3.0 ms
320 ms	640 ms	10.0 ms	15.0 ms	10.0 ms	5.0 ms

e) Select Timing (T_1 , T_2 , T_3 , and T_4)**(1) Select Timing T1**

Any of the values listed in the following tables can be selected for Select Timing T1 when the cycle is set to "USER SET."

Table 5.7 Select Timing T1

Select Timing T1 When "UESR SET" is Set for Cycle				
1.0 ms	3.0 ms	5.0 ms	7.0 ms	9.0 ms
1.5 ms	3.5 ms	5.5 ms	7.5 ms	9.5 ms
2.0 ms	4.0 ms	6.0 ms	8.0 ms	10.0 ms
2.5 ms	4.5 ms	6.5 ms	8.5 ms	–

The MEMOSOFT is set by default to **1.0 ms**.

(2) Select Timing T2

Any of the values listed in the following tables canbe selected for Select Timing T2 when the cycle is set to "USER SET."

Table 5.8 Select Timing T2

Select Timing T2 When "USER SET" is Set for Cycle				
1.0 ms	3.0 ms	5.0 ms	7.0 ms	9.0 ms
1.5 ms	3.5 ms	5.5 ms	7.5 ms	9.5 ms
2.0 ms	4.0 ms	6.0 ms	8.0 ms	10.0 ms
2.5 ms	4.5 ms	6.5 ms	8.5 ms	–

The MEMOSOFT is set by default to **1.0 ms**.

(3) Select Timing T3

Any of the values listed in the following tables canbe selected for Select Timing T3 when the cycle is set to "UESR SET."

Table 5.9 Select Timing T3

Select Timing T3 When "USER SET" is Set for Cycle				
1.0 ms	3.0 ms	5.0 ms	7.0 ms	9.0 ms
1.5 ms	3.5 ms	5.5 ms	7.5 ms	9.5 ms
2.0 ms	4.0 ms	6.0 ms	8.0 ms	10.0 ms
2.5 ms	4.5 ms	6.5 ms	8.5 ms	–

The MEMOSOFT is set by default to **1.0 ms**.

(4) Select Timing T4

Any of the values listed in the following tables canbe selected for Select Timing T4 when the cycle is set to "USER SET."

Table 5.10 Select Timing T4

Select Timing T4 When "UESR SET" is Set for Cycle				
0.5 ms	1.5 ms	2.5 ms	3.5 ms	4.5 ms
1.0 ms	2.0 ms	3.0 ms	4.0 ms	5.0 ms

The MEMOSOFT is set by default to **0.5 ms**.

f) Data Output Timing

The data output timing is shown in the following diagram.

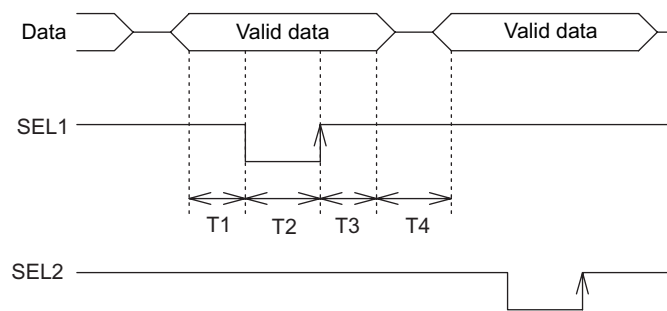


Fig. 5.2 Data Output Timing

5.4 Operations Using MEMOSOFT

This section describes the I/O allocations using the MEMOSOFT.

- 5.4.1 Register Input Module I/O Allocation Screen -----5-17
- 5.4.2 Register Output Module I/O Allocation Screen -----5-18
- 5.4.3 I/O Allocations -----5-20

5.4.1 Register Input Module I/O Allocation Screen

This section describes the MEMOSOFT I/O Allocation Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i. e., I/O Allocation) Screen

In this screen, set the following items.

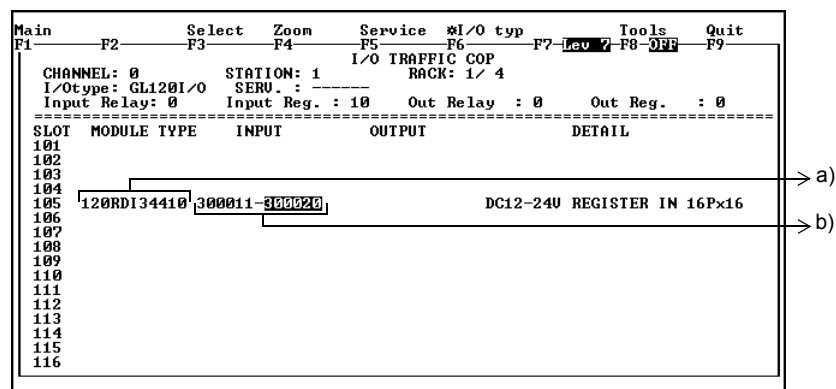


Fig. 5.3 I/O Traffic Cop Screen

a) Module Type

Enter 120RDI34410 for the Register Input Module.

b) Set the I/O references to be used by the Register Input Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press Enter Key to accept the value, or change it to the desired value, if required.

2) The Parameter Setting Screen (Zoom)

In this screen, set the following items.

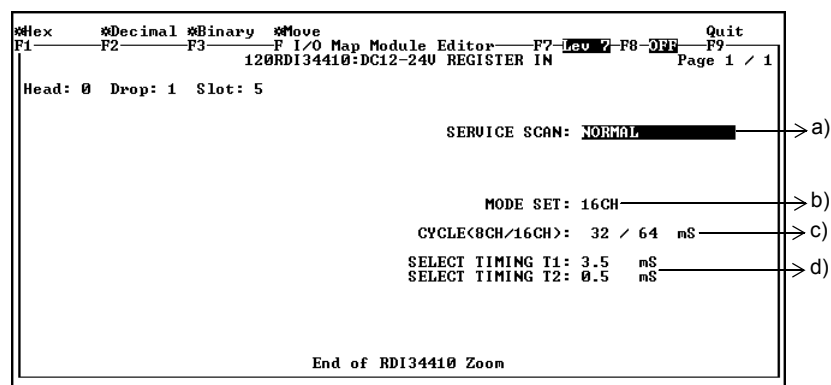


Fig. 5.4 Parameter Setting Screen

a) Service Scan (Normal/High-speed)

Set either Normal or High-speed scan for I/O processing.

b) Mode (8CH/16CH)

Select the number of data input from the Register Input Module.

Set either 8CH or 16CH.

c) Cycle

Select a cycle to read the input data. Each mode has six cycles.

d) Select Timing

If the cycle is set to "UESR SET," the timing to read the input data can be selected.

5.4.2 Register Output Module I/O Allocation Screen

This section describes the MEMOSOFT I/O Allocation Screen and the Parameter Setting Screen.

1) The I/O Traffic Cop (i. e., I/O Allocation) Screen

In this screen, set the following items.

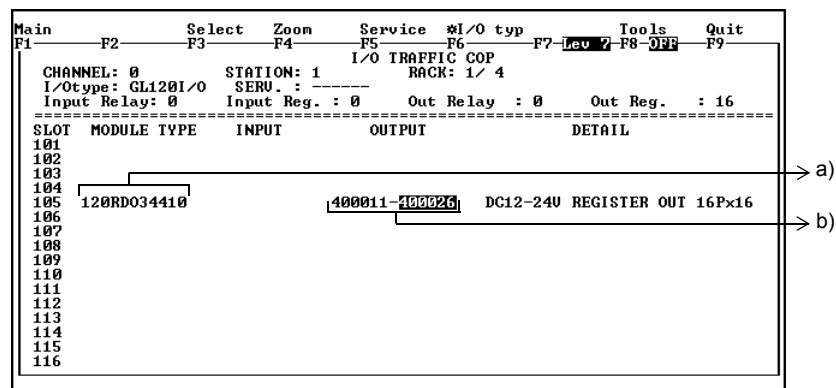


Fig. 5.5 I/O Traffic Cop Screen

a) Module Type

Enter 120RDO34410 for the Register Output Module.

b) Set the I/O references to be used by the Register Output Module.

When the first reference number is input, the cursor will move to the field for the last reference number and the last reference number will be displayed automatically, indicating the reference number that can be input. Press Enter Key to accept the value, or change it to the desired value, if necessary.

2) The Parameter Setting Screen (Zoom)

In this screen, set the following items.

```

Hex      *Decimal *Binary *Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-DEF-----F9-----
120RD034410:DC12-24U REGISTER OUT Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET: 16CH
CYCLE(8CH/16CH): 32 / 64 mS
SELECT TIMING T1: 1.0 mS
SELECT TIMING T2: 1.5 mS
SELECT TIMING T3: 1.0 mS
SELECT TIMING T4: 0.5 mS

End of RD034410 Zoom

```

Fig. 5.6 Parameter Setting Screen

a) Service Scan (Normal/High-speed)

Set either Normal or High-speed scan for I/O processing.

b) Timeout Output (Clear/Hold)

The data that is output when the CPU Module changes from a running status to a stopped status can be specified:

Clear: "0" is output.

Hold: The data just before entering stopped status is output.

c) Mode (8CH/16CH)

To set the number of data output from the Register Output Module.

Set either 8CH or 16CH mode.

d) Cycle

The cycle to switch the output data can be selected.

Select one among five cycles for the set mode.

e) Select Timing

If the cycle is set to "USER SET", the timing to switch the output data can be selected.

5.4.3 I/O Allocations

1) I/O Allocation Items

I/O Modules must be allocated to use the Register Input and Output Modules. I/O allocations are made using the MEMOSOFT and the results are recorded in the I/O allocation tables stored in memory of the CPU Module.

The following items must be set for I/O allocations.

- Module Type
- I/O References
- Service Scan (Normal/High-speed scan)
- Timeout Output (Clear/Hold)*
 - Note:** This item is to be set only for Register Output Module.
- Mode (8CH/16CH)
- Cycle
- Select Timing



This section describes the operation method of I/O Allocation taking the example of Register Output Modules. The operation method for Register Input Modules is the same as for Register Output Modules.

2) Module Type Setting

Set the Module Type in the following procedure.

- (1) Start the MEMOSOFT and select *Online* from the **Mode** Menu.

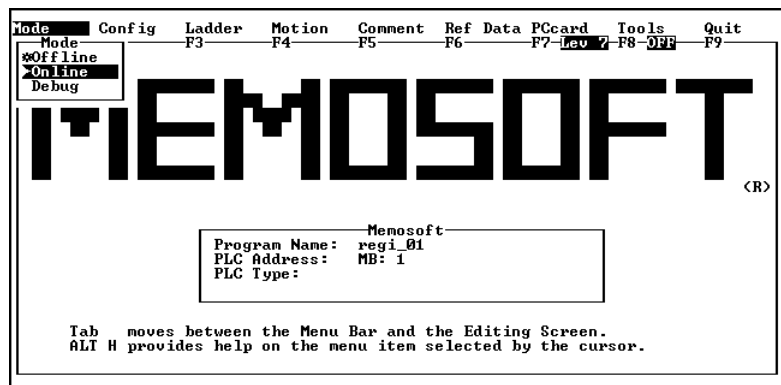


Fig. 5.7 Mode Selection: Online

I/O allocations cannot be performed while the CPU Module is in RUN status. If necessary, stop the CPU Module. For the procedure to stop the CPU Module, refer to 6.1 *PLC Operations in the MEMOSOFT User's Manual (Manual No. SIEZ-C825-60.10)*.

- (2) Press the **F2 (Config)** Key to access the PLC System Configuration Screen.

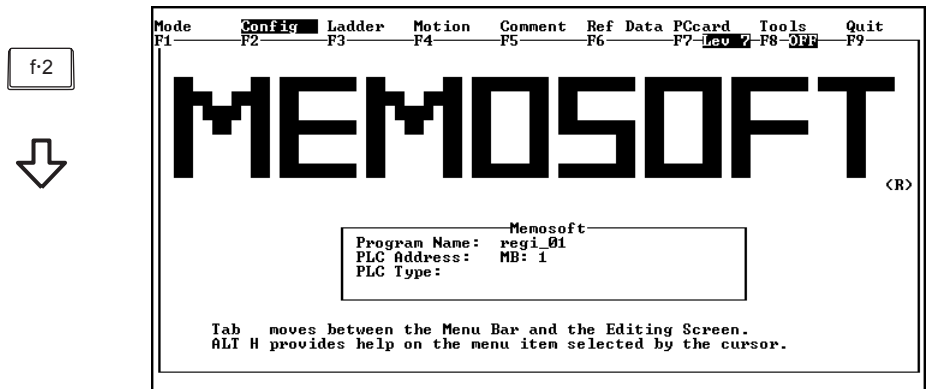


Fig. 5.8 PLC System Configuration Screen

- (3) Select **I/O Map** from the Map Menu using the Cursor Keys and press the **Enter** Key.

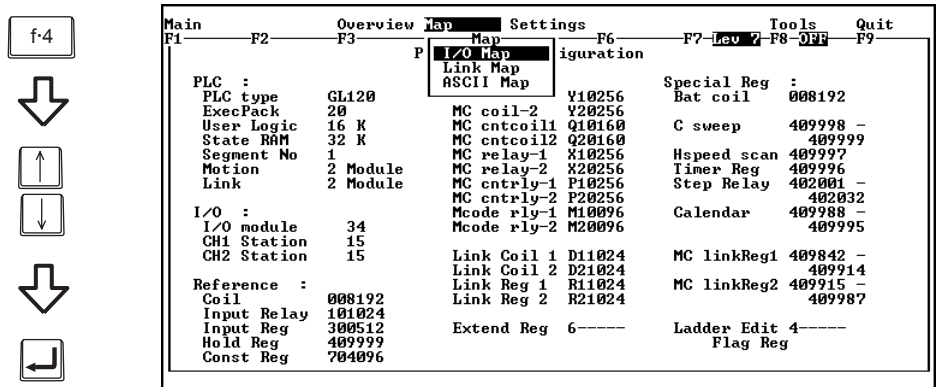


Fig. 5.9 I/O Map Selection

- (4) The I/O Map Screen is displayed. Move the cursor to the slot to which the allocations are to be made.

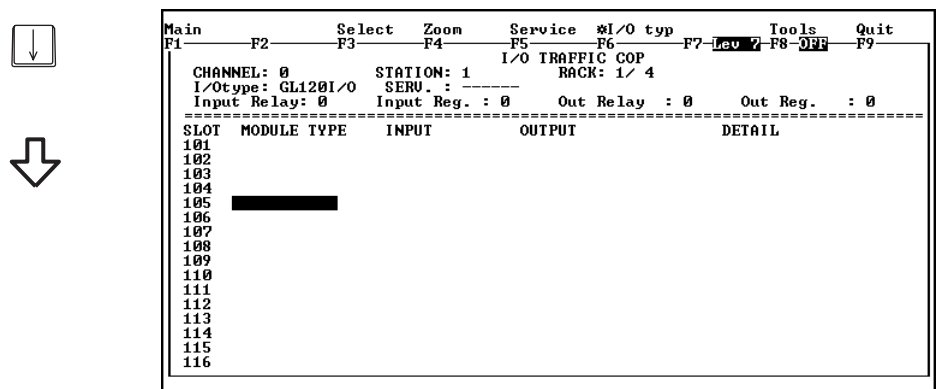


Fig. 5.10 I/O Map

If the Register I/O Module is already mounted, the Module name will be displayed on the right.

- (5) Press the **Shift + ?** Keys. A list of Module types appears. Move the cursor to **120RDO34410** and press the **Enter** Key to select the Register Output Module.

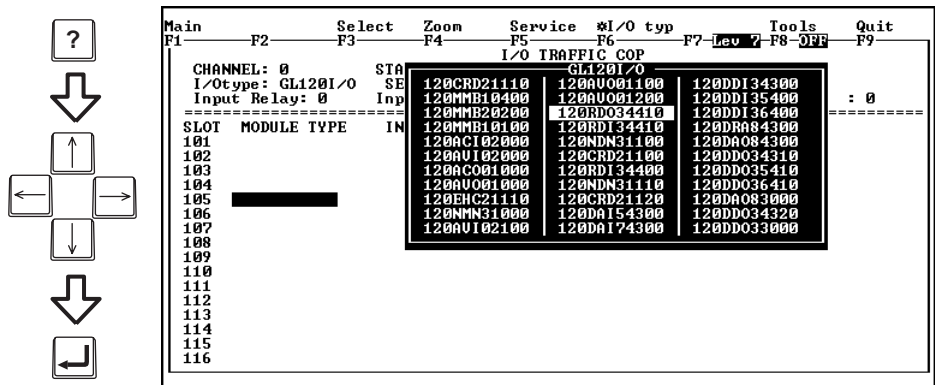


Fig. 5.11 Module Selection

3) I/O References Setting

The I/O Traffic Cop Screen is displayed.

Set the I/O reference in the following procedure.

- (1) Input the reference number of the first output register:
Move the cursor to the field for the reference number of the first output register and input the reference number. Press the **Enter** Key.

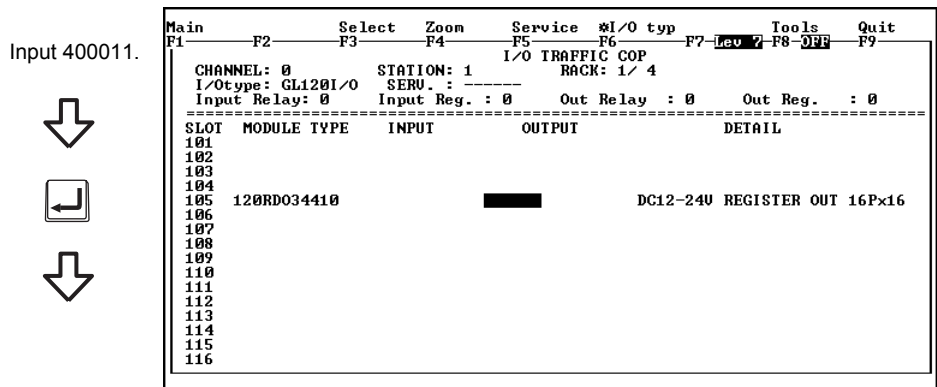



Fig. 5.12 I/O Traffic Cop Screen

- (2) When the reference number of the first output register is input, the cursor moves to the field for the reference number of the last output register and the reference number will be displayed automatically, indicating the reference number that can be input. Press the **Enter** Key to accept the value or change it to the desired value if necessary.

Input 400020.



```

Main      Select  Zoom  Service #I/O typ  Tools  Quit
F1        F2      F3    F4      F5      F6      F7-Rev 2 F8-033 F9
-----
CHANNEL: 0  STATION: 1  I/O TRAFFIC COP  RACK: 1 / 4
I/Otype: GL120I/O  SERU. : -----
Input Relay: 0  Input Reg. : 0  Out Relay : 0  Out Reg. : 16
-----
SLOT  MODULE TYPE  INPUT  OUTPUT  DETAIL
101
102
103
104
105  120RD034410  400011-400020  DC12-24U REGISTER OUT 16Px16
106
107
108
109
110
111
112
113
114
115
116

```

Fig. 5.13 Reference Number of First Output Register

- (3) The last reference number of the output register will be displayed.

```

Main      Select  Zoom  Service #I/O typ  Tools  Quit
F1        F2      F3    F4      F5      F6      F7-Rev 2 F8-033 F9
-----
CHANNEL: 0  STATION: 1  I/O TRAFFIC COP  RACK: 1 / 4
I/Otype: GL120I/O  SERU. : -----
Input Relay: 0  Input Reg. : 0  Out Relay : 0  Out Reg. : 16
-----
SLOT  MODULE TYPE  INPUT  OUTPUT  DETAIL
101
102
103
104
105  120RD034410  400011-400020  DC12-24U REGISTER OUT 16Px16
106
107
108
109
110
111
112
113
114
115
116

```

Fig. 5.14 Reference Number of Last Output Register

- (4) This completes the setting of I/O references.



I/O references for the Register Input Module can be set in the same way as the Register Output Module.

4) Service Scan Setting

Use the following procedure to set the Register Input/Output Module parameters. Press the **F4 (Zoom)** Key to access the Parameter Setting Screen (I/O Map Module Editor).

- (1) Move the cursor to **Service scan** and press the **Enter** Key to access the service scan setting.

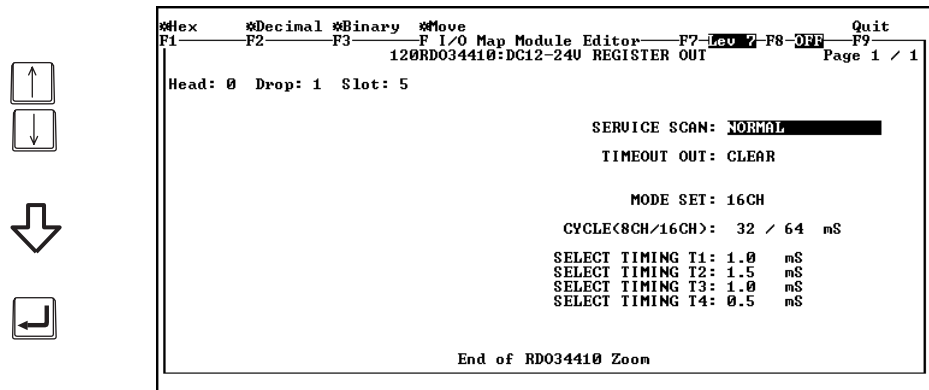


Fig. 5.15 Parameter Setting Screen: Service scan

- (2) A screen appears so that the service scan setting can be selected. Move the cursor to either **Normal** or **High Speed** and press the **Enter** Key to select the desired scan service.

The MEMOSOFT is set by default to **Normal**.

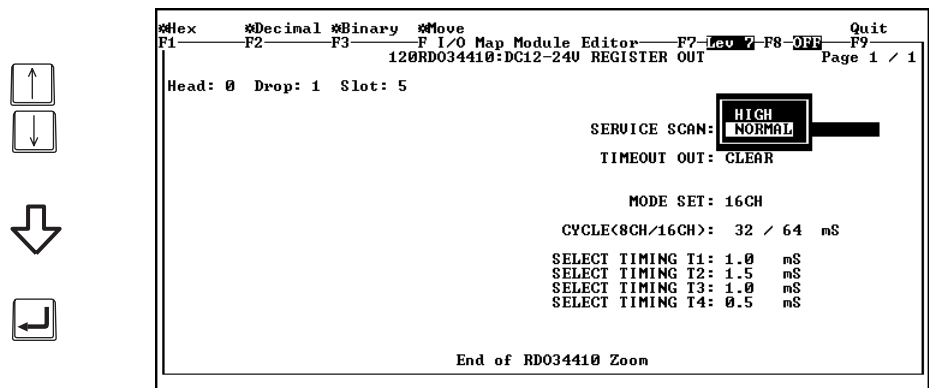


Fig. 5.16 Service Scan Selection

5) Timeout Output Status Setting (Only for Register Output Module)

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **Time out** and press the **Enter** Key to access the timeout output setting.

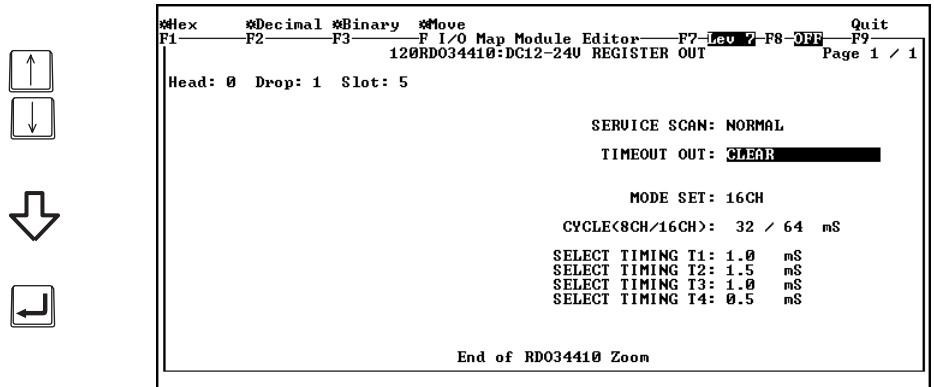


Fig. 5.17 Parameter Setting Screen: Timeout Output

- (2) A screen appears so that the timeout output setting can be selected. Move the cursor to either **Clear** or **Retain** and press the **Enter** Key to select the desired timeout output status. If **Retain** is selected, the data just before the CPU Module entered STOP status will be sent for all outputs until the CPU Module returns to RUN status.

The MEMOSOFT is set by default to **Clear**.

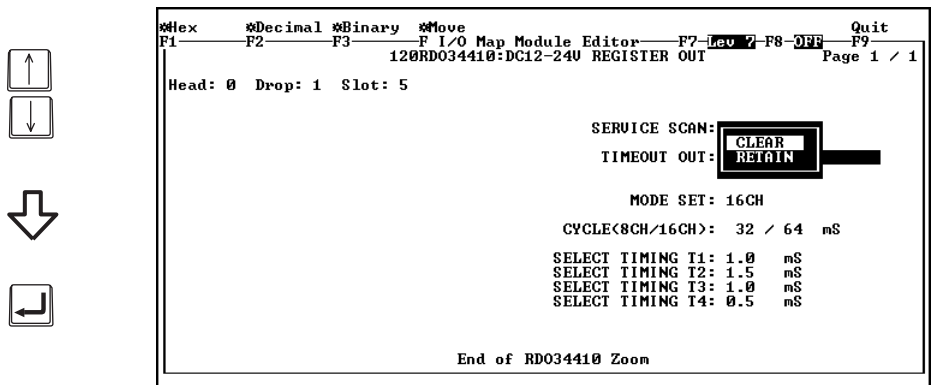


Fig. 5.18 Timeout Output Status Selection



This Timeout output setting is only for Register Output Modules, but not for Register Input Module.

6) Mode Setting

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **Mode** and press the **Enter** Key to access the mode setting.

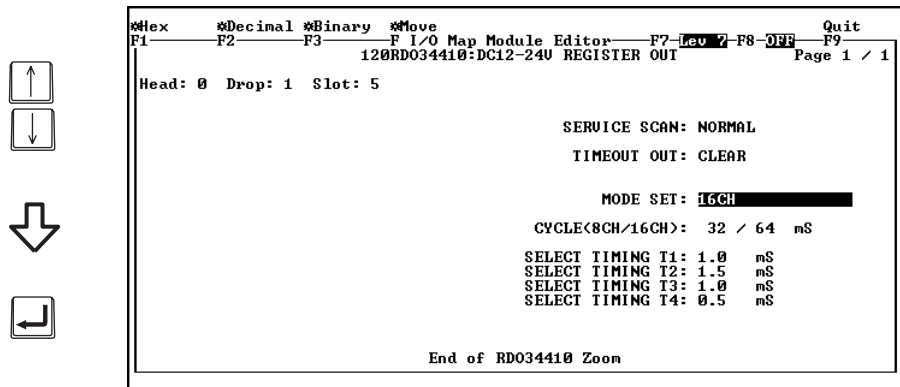


Fig. 5.19 Parameter Setting Screen: Mode

- (2) A screen appears so that the mode setting can be selected.

Move the cursor to either **8CH** or **16CH** and press the **Enter** Key to select the desired mode.

The MEMOSOFT is set by default to **16CH**.

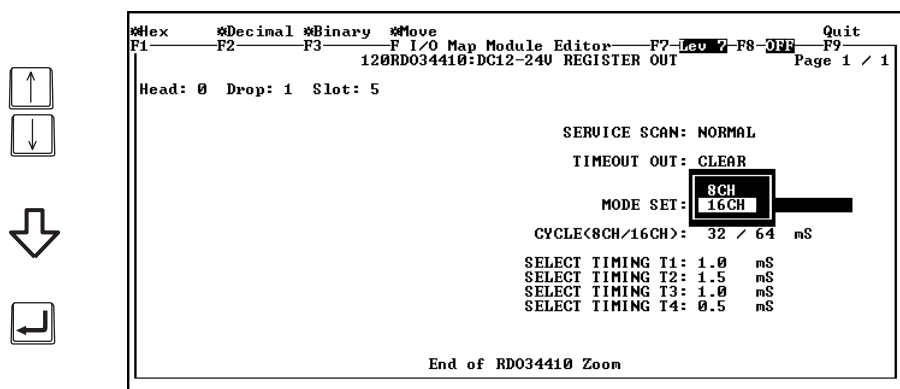


Fig. 5.20 Mode Selection

7) Cycle Setting

Make sure that the Parameter Setting Screen (I/O Map Module Editor) is being displayed.

- (1) Move the cursor to **Cycle** and press the **Enter** Key to access the cycle setting.



```

Hex      *Decimal *Binary *Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-OFF-----F9-----
120RD034410:DC12-24U REGISTER OUT                               Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET: 16CH
CYCLE<8CH/16CH>: 32 / 64 mS
SELECT TIMING T1: 1.0 mS
SELECT TIMING T2: 1.5 mS
SELECT TIMING T3: 1.0 mS
SELECT TIMING T4: 0.5 mS

End of RD034410 Zoom

```

Fig. 5.21 Parameter Setting Screen: Cycle

- (2) A screen appears so that the cycle setting can be selected.

Move the cursor to the desired cycle or **“USER SET”** and press the **Enter** Key to select the desired cycle.

The MEMOSOFT is set by default to **32/64 ms**.



```

Hex      *Decimal *Binary *Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-OFF-----F9-----
120RD034410:DC12-24U REGISTER OUT                               Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET:
CYCLE<8CH/16CH>: 32 / 64 mS
                  64 / 128 mS
                  192 / 384 mS
                  320 / 640 mS
                  USER SET
SELECT TIMING T1: 1.0 mS
SELECT TIMING T2: 1.5 mS
SELECT TIMING T3: 1.0 mS
SELECT TIMING T4: 0.5 mS

End of RD034410 Zoom

```

Fig. 5.22 Cycle Selection

8) Setting the Select Timings T1, T2, T3, and T4

If the cycle is set to **USER SET**, the cursor can be moved to the field of select timing.

- (1) Move the cursor to **Timing T1** and press the **Enter Key**.



```

#Hex      #Decimal #Binary #Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-OFF-F9
120RD034410:DC12-24U REGISTER OUT Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET: 16CH
CYCLE<8CH/16CH>: USER SET
SELECT TIMING T1: 1.0 mS
SELECT TIMING T2: 1.5 mS
SELECT TIMING T3: 1.0 mS
SELECT TIMING T4: 0.5 mS

End of RD034410 Zoom
    
```

Fig. 5.23 Parameter Setting Screen

- (2) A screen appears so that the timing T1 setting can be selected. For example, to select 5.0 ms, move the cursor to **5.0** and press the **Enter Key**.

The MEMOSOFT is set by default: 3.5 ms for Register Input Module and 1.0 ms for Register Output Module.



```

#Hex      #Decimal #Binary #Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-OFF-F9
120RD034410:DC12-24U REGISTER OUT Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET: 16CH
CYCLE<8CH/16CH>: USER SET
SELECT TIMI 1.0 4.5 8.0
SELECT TIMI 1.5 5.0 8.5
SELECT TIMI 2.0 5.5 9.0
SELECT TIMI 2.5 6.0 9.5
SELECT TIMI 3.0 6.5 10.0
SELECT TIMI 3.5 7.0
SELECT TIMI 4.0 7.5

End of RD034410 Zoom
    
```

Fig. 5.24 Timing T1 Selection

- (3) 5.0 ms is set for the timing T1.

```

#Hex      #Decimal #Binary #Move      Quit
F1-----F2-----F3-----F I/O Map Module Editor-----F7-Lev 7-F8-OFF-F9
120RD034410:DC12-24U REGISTER OUT Page 1 / 1

Head: 0 Drop: 1 Slot: 5

SERVICE SCAN: NORMAL
TIMEOUT OUT: CLEAR

MODE SET: 16CH
CYCLE<8CH/16CH>: USER SET
SELECT TIMING T1: 5.0 mS
SELECT TIMING T2: 1.5 mS
SELECT TIMING T3: 1.0 mS
SELECT TIMING T4: 0.5 mS

End of RD034410 Zoom
    
```

Fig. 5.25 Timing T1 Setting

- (4) Repeat the above procedure to set the timings T2, T3, and T4.
- (5) Press **F9 (End)** Key after completes the all parameter settings.

9) This completes the I/O allocations

Press the F9 (Quit) Key to end the procedure.



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6.1 Installing Modules

This section describes how to install Modules on a Mounting Base in the control panel.

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6.1.1 Module Installation Location

1) Module Installation Location

Install the following Modules on a Mounting Base. The mounting procedures for installing I/O Modules and Special Purpose Modules on the Mounting Base are described in *6.1.2 Installing I/O Modules with Terminal Blocks* and *6.1.3 Installing I/O Modules with Connectors*.

- Power Supply Modules
- CPU Modules
- Communication Modules
- I/O Modules
- Special Purpose Modules
- Motion Modules
- Expander Modules

2) Module Installation Location on Mounting Base

The following table shows the Module installation location on the Mounting Base.

Table 6.1 Module Installation Location on Mounting Base

Product	Name	Model No.	Installation Location
Digital Input Modules	100-VAC 16-point Input Module	JAMSC-120DAI54300	Any rack on the Mounting Base
	200-VAC 16-point Input Module	JAMSC-120DAI74300	
	12/24-VDC 16-point Input Module	JAMSC-120DDI34300	
	12/24-VDC 32-point Input Module	JAMSC-120DDI35400	
	12/24-VDC 64-point Input Module	JAMSC-120DDI36400	
Analog Input Modules	Analog Input Module ($\pm 10V$, 4 channels)	JAMSC-120AVI02000	Any rack on the Mounting Base
	Analog Input Module (0 to 10V, 4 channels)	JAMSC-120AVI02100	
	Analog Input Module (0 to 20 mA, 4 channels)	JAMSC-120ACI02000	

Table 6.1 Module Installation Location on Mounting Base

Product	Name	Model No.	Installation Location
Digital Output Modules	100/200-VAC 8-point Output Module	JAMSC-120DAO83000	Any rack on the Mounting Base
	100/200-VAC 16-point Output Module	JAMSC-120DAO84300	
	12/24-VDC 8-point Output Module	JAMSC-120DDO33000	
	12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	
	12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	
	12/24-VDC 32-point Output Module (sinking)	JAMSC-120DDO35410	
	12/24-VDC 64-point Output Module (sinking)	JAMSC-120DDO36410	
	Relay Contact 16-point Output Module	JAMSC-120DRA84300	
Analog Output Modules	Analog Output Module ($\pm 10V$, 2 channels)	JAMSC-120AVO01000	Any rack on the Mounting Base
	Analog Output Module (0 to 10V, 2 channels)	JAMSC-120AVO01100	
	Analog Output Module (0 to 5V, 2 channels)	JAMSC-120AVO01200	
	Analog Output Module (4 to 20 mA, 2 channels)	JAMSC-120ACO01000	
Special Purpose Modules	Register Input Module	JAMSC-120RDI34410	Any rack on the Mounting Base
	Register Output Module	JAMSC-120RDO34410	

3) Module Installation and Removal Methods

For the Module installation and removal methods, refer to the section number in the following table.

Table 6.2 Module Installation and Removal Methods

Product	Name	Model No.	Reference Section
Digital Input Modules	100-VAC 16-point Input Module	JAMSC-120DAI54300	6.1.2 Installing I/O Modules with Terminal Blocks
	200-VAC 16-point Input Module	JAMSC-120DAI74300	
	12/24-VDC 16-point Input Module	JAMSC-120DDI34300	
	12/24-VDC 32-point Input Module	JAMSC-120DDI35400	6.1.3 Installing I/O Modules with Connectors
	12/24-VDC 64-point Input Module	JAMSC-120DDI36400	
Analog Input Modules	Analog Input Module ($\pm 10V$, 4 channels)	JAMSC-120AVI02000	6.1.2 Installing I/O Modules with Terminal Blocks
	Analog Input Module (0 to 10V, 4 channels)	JAMSC-120AVI02100	
	Analog Input Module (0 to 20 mA, 4 channels)	JAMSC-120ACI02000	

Table 6.2 Module Installation and Removal Methods


Product	Name	Model No.	Reference Section
Digital Output Modules	100/200-VAC 8-point Output Module	JAMSC-120DAO83000	6.1.2 Installing I/O Modules with Terminal Blocks
	100/200-VAC 16-point Output Module	JAMSC-120DAO84300	
	12/24-VDC 8-point Output Module	JAMSC-120DDO33000	
	12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	
	12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	
	Relay Contact 16-point Output Modules	JAMSC-120DDO35410	
	12/24-VDC 32-point Output Module (sinking)	JAMSC-120DDO36410	6.1.3 Installing I/O Modules with Connectors
	12/24-VDC 64-point Output Module (sinking)	JAMSC-120DRA84300	
Analog Output Modules	Analog Output Module ($\pm 10V$, 2 channels)	JAMSC-120AVO01000	6.1.2 Installing I/O Modules with Terminal Blocks
	Analog Output Module (0 to 10V, 2 channels)	JAMSC-120AVO01100	
	Analog Output Module (0 to 5V, 2 channels)	JAMSC-120AVO01200	
	Analog Output Module (4 to 20 mA, 2 channels)	JAMSC-120ACO01000	
Special Purpose Modules	Register Input Module	JAMSC-120RDI34410	6.1.3 Installing I/O Modules with Connectors
	Register Output Module	JAMSC-120RDO34410	

6.1.2 Installing I/O Modules with Terminal Blocks


This section describes the installation and removal procedures for the following I/O Modules with Terminal Blocks

- I/O Modules with terminal blocks
- Special Purpose Modules with terminal blocks
- M-NET Module

1) Installing the Module on the Mounting Base

 **CAUTION** Do not remove the connector covers from the Module connectors on the Mounting Base slots where no Modules are installed.

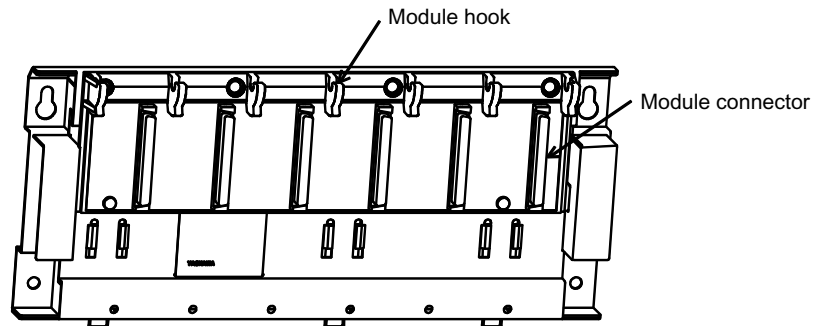
The presence of any foreign matter in a Module connector may cause the GL120 and GL130 to malfunction.

 **CAUTION** Make sure that all mounting screws for the Modules are securely tightened.

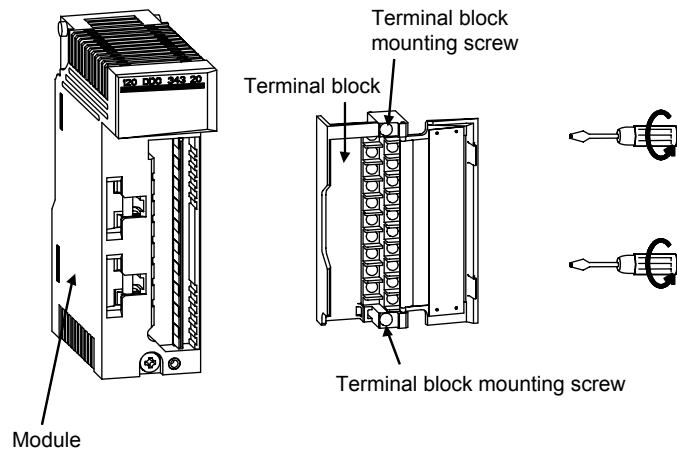
Loose screws may cause malfunction of the GL120 and GL130.

Install the Module with Terminal Blocks on the Mounting Base in the following manner.

- a) Remove the cover from the Module connector on the Mounting Base.

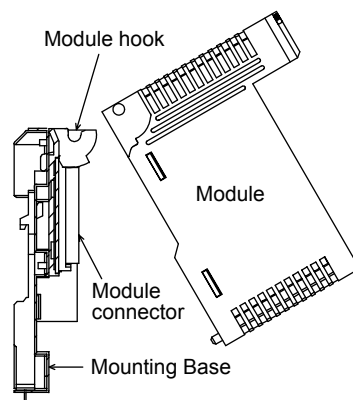


- b) Loosen the terminal block mounting screws, then remove the terminal block from the Module.

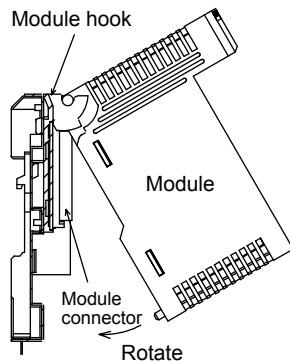


- c) Install the Module on the Mounting Base as shown below.

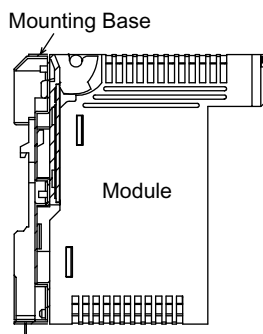
- (1) Hook the Module to the Module hook on the Mounting Base.



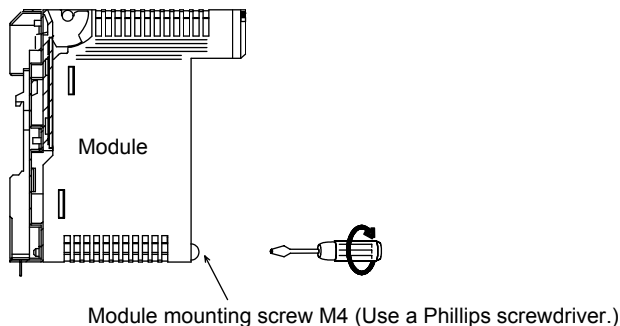
- (2) Rotate the Module until it comes into contact with the Mounting Base.



- (3) Fit the Module to make an electrical connection with the Module connector.



- (4) Tighten the Module mounting screw on the Module.



2) Installing the Terminal Block on the Module

- CAUTION** When installing the terminal block for the AC I/O Modules, turn OFF the AC power supply to the I/O Modules for inputting signals and for driving load.

Installing a terminal block with the AC power being supplied to the terminal of the external power supply for the AC I/O Modules may cause an electric shock if the power supply terminals are touched.

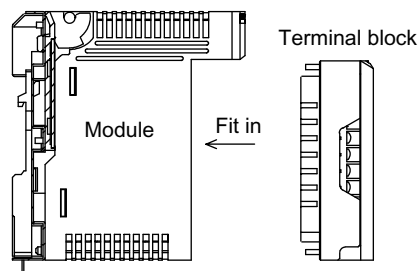
- CAUTION** When using a single-phase AC power supply (100/200 VAC) for driving loads of the Relay Contact Output Module, turn OFF the AC power to the Modules for driving loads before installing the terminal block for the Modules.

Installing a terminal block with the AC power being supplied to the external power supply terminal of the Relay Contact Output Module may cause an electric shock if the power supply terminals are touched.

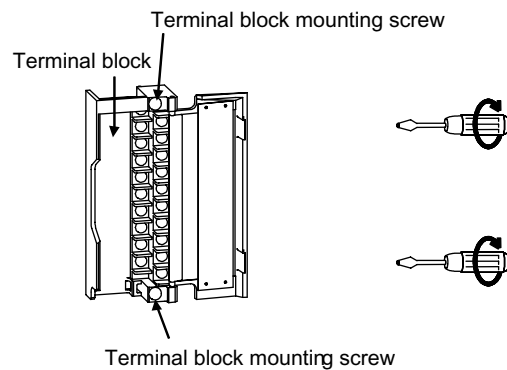
- CAUTION** Make sure that all mounting screws for the terminal block are securely tightened.
Loose screws may cause malfunction of the GL120 and GL130.

Use the following procedures to install the terminal block for the Module.

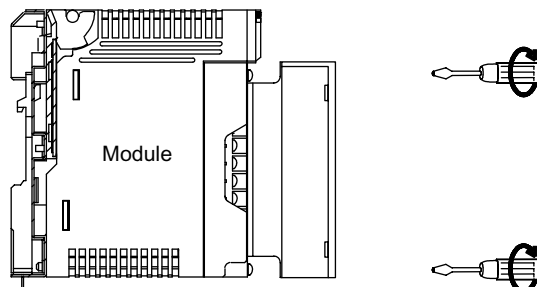
- a) Make sure that the Module is correctly installed on the Mounting Base.
- b) Turn OFF the power (power supply for input signals and power supply for driving loads) to the Module.
- c) Install the terminal block on the Module as shown below.
 - (1) Fit the terminal block onto the Module.



- (2) Tighten two terminal-block mounting screws alternately.



- (3) Tighten the terminal block mounting screws until the terminal block closely attaches to the Module as shown in the following figure.



- (4) Close the terminal block cover.

3) Removing the Terminal Block from the Module

⚠ CAUTION Always turn OFF the AC power supply to the AC I/O Modules that are used for inputting signals and driving loads before removing the terminal block from the AC I/O Modules.

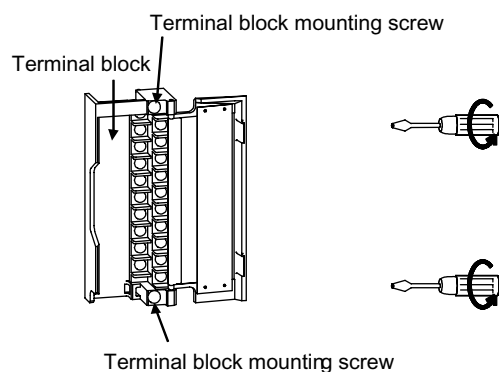
Removing a terminal block with AC power to the external power supply terminal of the AC I/O Modules may cause an electric shock at touching the power supply terminals.

⚠ CAUTION When using a single-phase AC power supply (100/200 VAC) for driving loads of the Relay Contact Output Module, turn OFF the AC power to the Modules for driving loads before removing the terminal block for the Modules.

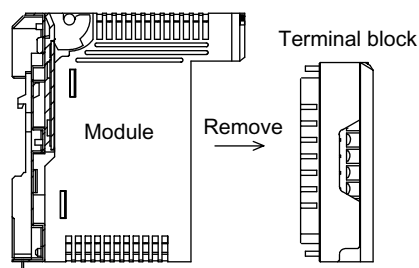
Removing a terminal block with the AC power being supplied to the external power supply terminal of the Relay Contact Output Module may cause an electric shock if the power supply terminals are touched.

Use the following procedures to remove the terminal block from the Module.

- a) Turn OFF the power to the Module.
- b) Remove the terminal block from the Module as shown below.
 - (1) Loosen two terminal-block mounting screws alternately.



- (2) Remove the terminal block from the Module



4) Removing Modules

⚠ CAUTION When inserting or removing an AC I/O Module while the AC power supply is turned ON, install a safety switch for each Module and always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing an AC I/O Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

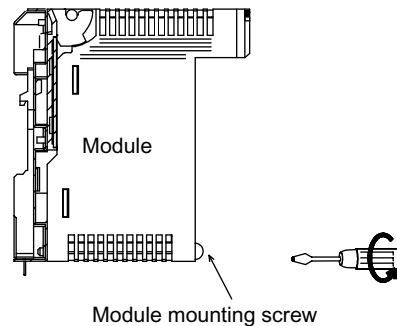


CAUTION When using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, install a safety switch for each Module. Before inserting or removing the Relay Contact Output Module, always turn this safety switch OFF to turn OFF the AC power supply to the Module.

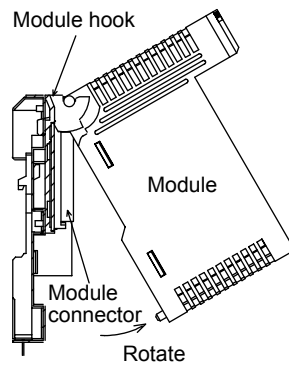
Inserting or removing a Relay Contact Output Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

Use the following procedures to remove the Module from the Mounting Base.

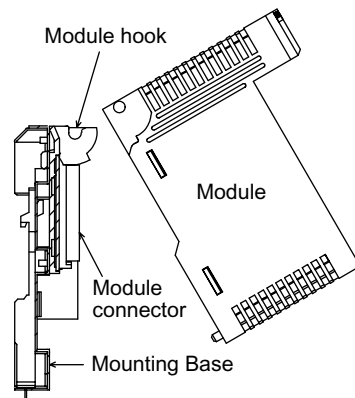
- a) Make sure that the terminal block is removed from the Module.
- b) Remove the Module from the Mounting Base as shown below.
 - (1) Loosen the Module mounting screw.



- (2) Rotate the Module until it disconnects from the Mounting Base.



- c) Remove the Module from the Module hook on the Mounting Base.



6.1.3 Installing I/O Modules with Connectors

This section describes the installation and removal procedures for the following I/O Modules with connectors.

- 12/24 VDC 32-point I/O Modules
- 12/24 VDC 64-point I/O Modules
- Special Purpose Modules with Connectors

1) Installing the Module on the Mounting Base

CAUTION Do not remove the connector covers from the Module connectors on the Mounting Base slots where no Modules are installed.

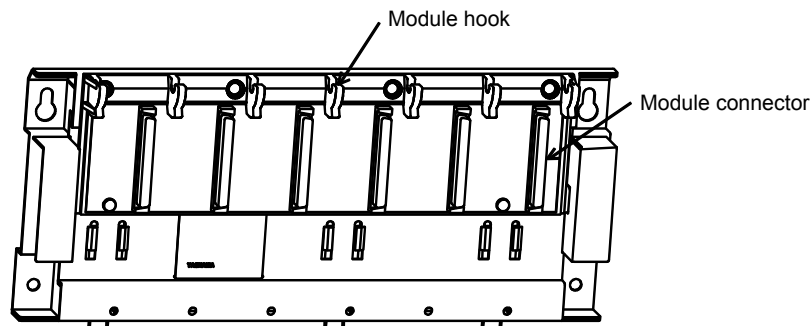
The presence of any foreign matter in a Module connector may cause the GL120 and GL130 to malfunction.

CAUTION Make sure that all mounting screws for the Modules are securely tightened.

Loose screws may cause malfunction of the GL120 and GL130.

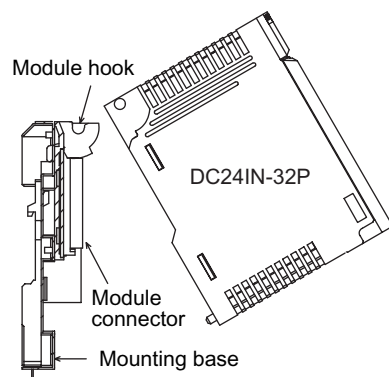
Install the Module with Connectors on the Mounting Base in the following manner.

- a) Remove the cover from the module connector on the Mounting Base.

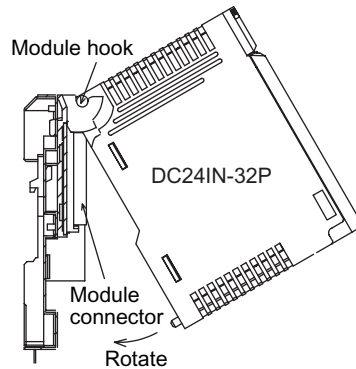


- b) Install the Module on the Mounting Base as shown below.

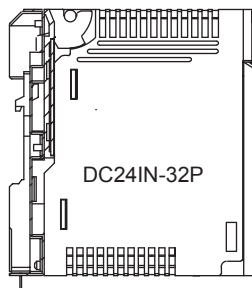
- (1) Hook the Module to the Module hook on the Mounting Base.



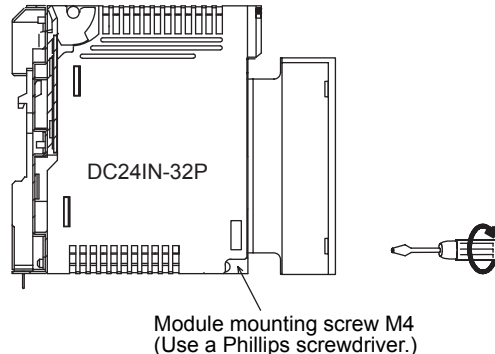
- (2) Rotate the Module until it comes into contact with the Mounting Base.



- (3) Fit the Module into the Mounting Base to make an electrical connection with the Module connector.



- (4) Tighten the Module mounting screw on the Module.



2) Connecting the Cable to the Module

CAUTION Make sure that all cable connectors for the Modules are securely inserted and tightened.

Incorrect connections may cause malfunction of the GL120 or GL130.

Use the following procedures to connect the cable to the Module.

- (1) Make sure that the Module is correctly installed on the Mounting Base.
- (2) Insert the cable into the connector mounted on the Module.
- (3) Tighten the connector fixing screw.

Note: Inserting or removing a connector to/from the Module may cause chattering in input signals. If this causes a problem, install a chattering prevention switch for each Module and always turn the chattering prevention switch OFF to turn OFF the input power supply before inserting or removing the connector to/from the Module.

3) Disconnecting the Cable from the Module

Use the following procedure to disconnect the cable from the Module.

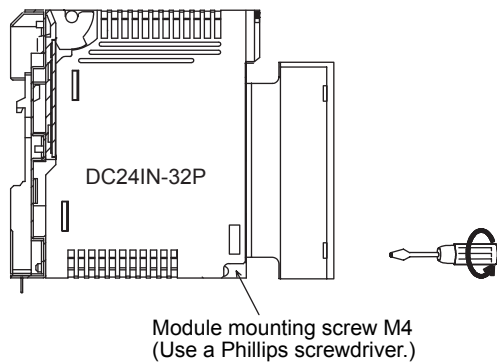
- (1) Loosen the connector fixing screw.
- (2) Remove the connector from the Module.

Note: Inserting or removing a connector to/from the Module may cause chattering in input signals. If this causes a problem, install a chattering prevention switch for each Module and always turn the chattering prevention switch OFF to turn OFF the input power supply before inserting or removing the connector to/from the Module.

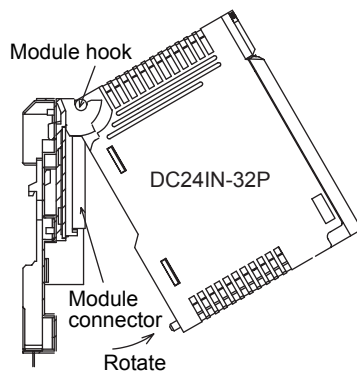
4) Removing the Module from the Mounting Base

Use the following procedure to remove the Module from the Mounting Base.

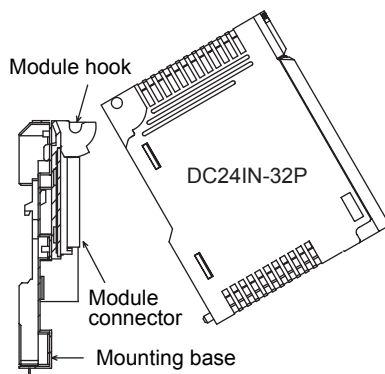
- (1) Loosen the Module mounting screw on the Module.



- (2) Rotate the Module until it disconnects from the Mounting Base.



- (3) Remove the Module from the Module hook on the Mounting Base.



6.2 Panel Wiring

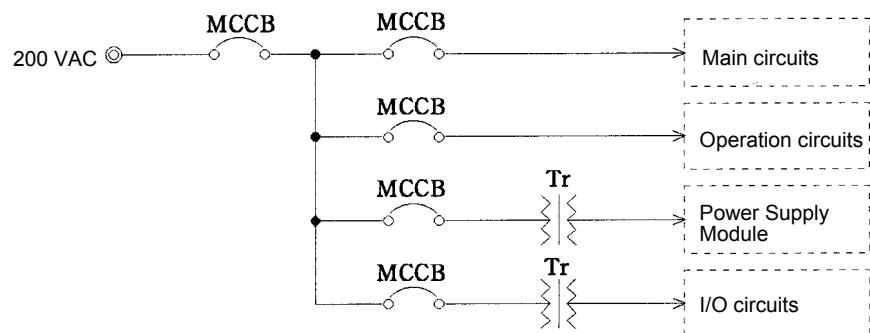
This section explains basic wiring procedures and precautions for I/O Modules. It also explains grounding of Modules.

6.2.1 Separation of Power Supply Systems	-----6-13
6.2.2 Wiring AC I/O Modules	-----6-14
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6.2.4 Wiring Analog I/O Modules	-----6-25
6.2.5 Grounding	-----6-28

6.2.1 Separation of Power Supply Systems

- 1) The power supply circuits for the GL120 and GL130 can be divided into the following four systems:
 - a) Power supply for the Power Supply Module
 - b) Power supply for I/O circuits
 - c) Power supply for operation circuits
 - d) Power supply for main circuits
- 2) Wire these circuits so that are separated from each other as shown in the following figure.

◀ EXAMPLE ▶



MCCB : Wiring circuit-breaker **Tr** : Insulation transformer

6.2.2 Wiring AC I/O Modules

This section explains how to connect a power supply cable and an I/O signal cable to an AC I/O Module.


1) AC Power Supply Specifications

- a) As shown in Examples 1 and 2 later in this section, it is necessary to supply external single-phase AC power (100 or 200VAC) to the AC I/O Modules listed in the following table to power input signals and drive loads.

Table 6.3 AC I/O Modules Requiring External AC Power Supply


Name	Model No.	External Power Supply Specifications	
		Rated Voltage	Rated Frequency
100-VAC 16-point Input Module	JAMSC-120DAI54300	100 VAC	50/60 Hz
200-VAC 16-point Input Module	JAMSC-120DAI74300	200 VAC	
100/200-VAC 8-point Output Module	JAMSC-120DAO83000	100/200 VAC	
100/200-VAC 16-point Output Module	JAMSC-120DAO84300	100/200 VAC	
Relay Contact 16-point Output Module (AC loads)	JAMSC-120DRA84300	100/200 VAC	

- b) Use a low-noise AC power supply. If noise is a problem, use an insulation transformer or a noise filter.
- c) Heed the following precautions when supplying AC power.

 **CAUTION** Connect power supplies of the same phases to the common 1 and common 2 of the AC I/O Module.

If power supplies of different phases are connected, overheating or fire may occur.

- d) Heed the following precautions when mounting or removing Modules while the power is being supplied. For a description of hot swapping and for an example of safety switch settings, refer to 7.2 *Hot Swapping*.

 **CAUTION** When inserting or removing an AC I/O Module while the AC power supply is turned ON, install a safety switch for each Module and always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing an AC I/O Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

⚠ CAUTION When using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, install a safety switch for each Module. Before inserting or removing the Relay Contact Output Module, always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing a Relay Contact Output Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

◀ **EXAMPLE** ▶

Example 1: Input Signal Power Supply for 100-VAC 16-point Input Module

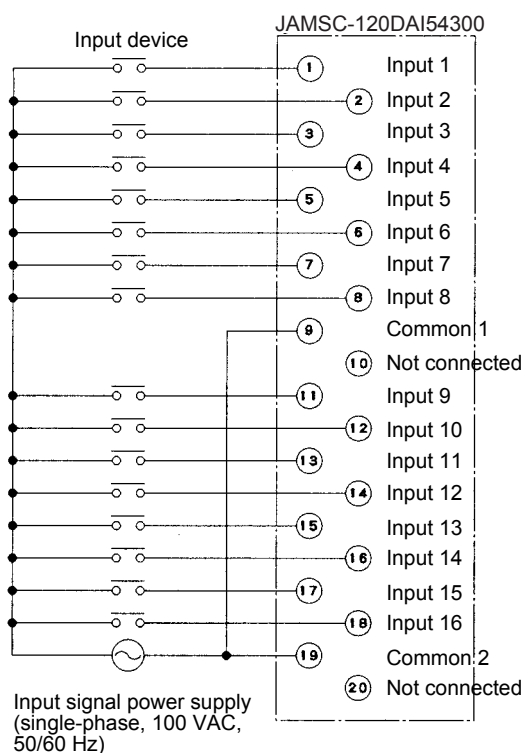


Fig. 6.1 Input Signal Power Supply

Example 2: Load Driving Power Supply for 100/200 VAC 16-point Output Module

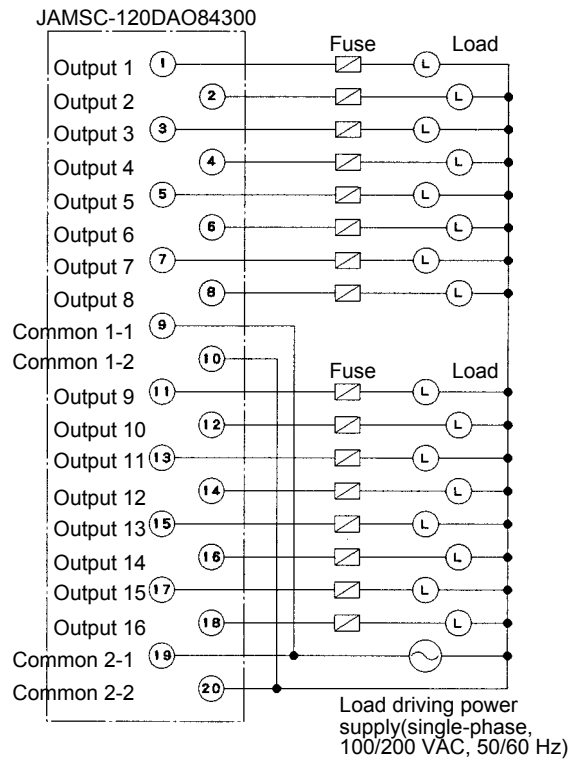


Fig. 6.2 Load Driving Power Supply

2) AC Power Supply Cables

CAUTION Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.

Foreign matter in the Modules or Mounting Bases may cause fire, failures and/or malfunctions.

a) Five types of AC I/O Modules are available. See *Table 6.4*.


To connect these I/O Modules to an AC power supply, use recommended size of cable listed in *Table 6.4*. The cables differ in their allowable current capacity depending on the conditions of use, such as the ambient operating temperature, so check the conditions of use and select a cable of appropriate size.

Table 6.4 Power Supply Cable Size

Name	Model No.	Power Supply Cable Size
100-VAC 16-point Input Module	JAMSC-120DAI54300	0.5 mm ² (AWG20) to 1.3 mm ² (AWG16)
200-VAC 16-point Input Module	JAMSC-120DAI74300	
100/200-VAC 8-point Output Module	JAMSC-120DAO83000	1.3 mm ² (AWG16) or larger
100/200-VAC 16-point Output Module	JAMSC-120DAO84300	
Relay Contact 16-point Output Module	JAMSC-120DRA84300	AC loads: 1.3 mm ² (AWG16) or larger

b) M3 Phillips screws are used in the external connection terminals. Use crimp terminals that are specially designed for M3 Phillips screws for the Module end of the power supply cable.

3) I/O Signal Cables

 **CAUTION** Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.

Foreign matter in the Modules or Mounting Bases may cause fire, failures and/or malfunctions.

a) There are five types of AC I/O Modules. See *Table 6.5*.


To connect these I/O Modules to signal line, use I/O signal cable of the size listed in *Table 6.5*. The cables differ in their permissible current capacity depending on the conditions of use, such as the ambient operating temperature, so check the conditions of use and select a cable of appropriate size.

Table 6.5 I/O Signal Cable Size

Name	Model No.	I/O Signal Cable Size
100-VAC 16-point Input Module	JAMSC-120DAI54300	0.5 mm ² (AWG20) to 1.3 mm ² (AWG16)
200-VAC 16-point Input Module	JAMSC-120DAI74300	
100/200-VAC 8-point Output Module	JAMSC-120DAO83000	
100/200-VAC 16-point Output Module	JAMSC-120DAO84300	0.5 mm ² (AWG20) to 1.3 mm ² (AWG16) Common cable: 1.3 mm ² (AWG16) or larger
Relay Contact 16-point Output Module	JAMSC-120DRA84300	AC loads: 0.5 mm ² (AWG20) to 1.3 mm ² (AWG16) Common cable: 1.3 mm ² (AWG16) or larger

b) M3 Phillips screws are used in the external connection terminals. Accordingly, use crimp terminals for M3 Phillips screws for the Module-end of I/O signal cable.

4) Protective Fuses

 **CAUTION** If using an Output Module, connect a fuse that complies with the load specifications in series with the load.

- 100/200-VAC 8-point Output Module: Model No. JAMSC-120DAO83000
- 100/200-VAC 16-point Output Module: Model No. JAMSC-120DAO84300
- Relay Contact 16-point Output Module: Model No. JAMSC-120DRA84300

If a fuse is not connected, a fire or damage to the device or output circuit may occur if the load is short-circuited or the circuit overloaded.

6.2.3 Wiring DC I/O Modules

This section explains how to connect a power supply cable and an I/O signal cable to a DC I/O Module.

1) DC Power Supply Specifications

a) As shown in Examples 1 and 2 later in this section, it is necessary to supply external DC power (12/24VDC) to the DC I/O Modules listed in the following table to power input signals and drive loads.

Table 6.6 DC I/O Modules Requiring External DC Power Supply

Name	Model No.	External Power Supply Specifications
12/24-VDC 16-point Input Module	JAMSC-120DDI34300	Rated voltage: 12/24 VDC Maximum allowable voltage: 30 VDC Standard operating range: ON voltage range: 9 VDC OFF voltage range: 5 VDC
12/24-VDC 32-point Input Module	JAMSC-120DDI35400	
12/24-VDC 64-point Input Module	JAMSC-120DDI36400	
12/24-VDC 8-point Output Module	JAMSC-120DDO33000	Rated voltage: 12/24 VDC Allowable voltage range: 10.2 to 30.0 VDC
12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	
12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	
12/24-VDC 32-point Output Module (sinking)	JAMSC-120DDO35410	
12/24-VDC 64-point Output Module (sinking)	JAMSC-120DDO36410	
Relay Contact 16-point Output Module (DC loads)	JAMSC-120DRA84300	

b) Use a regulated DC power supply for DC power. When a simple direct current such as full wave rectification must be used, attach a smoothing capacitor to reduce ripple as much as possible and heed the following:

- (1) Instantaneous output voltage including ripple must always be within the following ranges:
 - DC Input Modules: 9 to 30 VDC
 - DC Output Modules: 10.2 to 30 VDC
 - Relay Contact Output Modules: 100 mV to 125 VDC
- (2) Output voltage must not exceed the following voltages, even momentarily, including when the power is turned ON or OFF.
 - DC Input Modules: 30 VDC
 - DC Output Modules: 30 VDC
 - Relay Contact Output Modules: 125 VDC
- (3) Attach a noise filter in front of the rectifying element to prevent surge voltage from rushing inside.
- (4) When connecting electromagnetic contactors to the output of full wave rectifier circuits, prevent surge voltage by attaching a surge suppressor between the outputs on the I/O Module side of the electromagnetic connectors.

◀ EXAMPLE ▶

Example 1: Input Signal Power Supply for 12/24-VDC 16-point Input Module

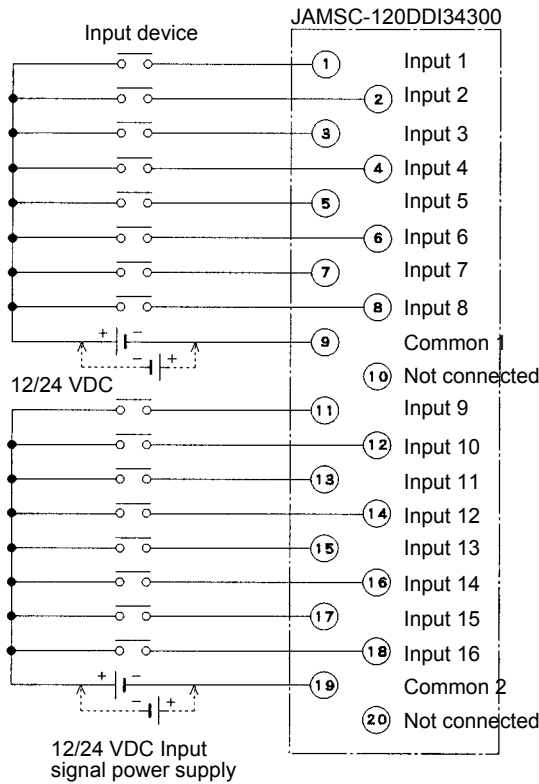


Fig. 6.3 Input Signal Power Supply

Example 2: Load Driving Power Supply for 12/24-VDC 16-point Input Module (sink)

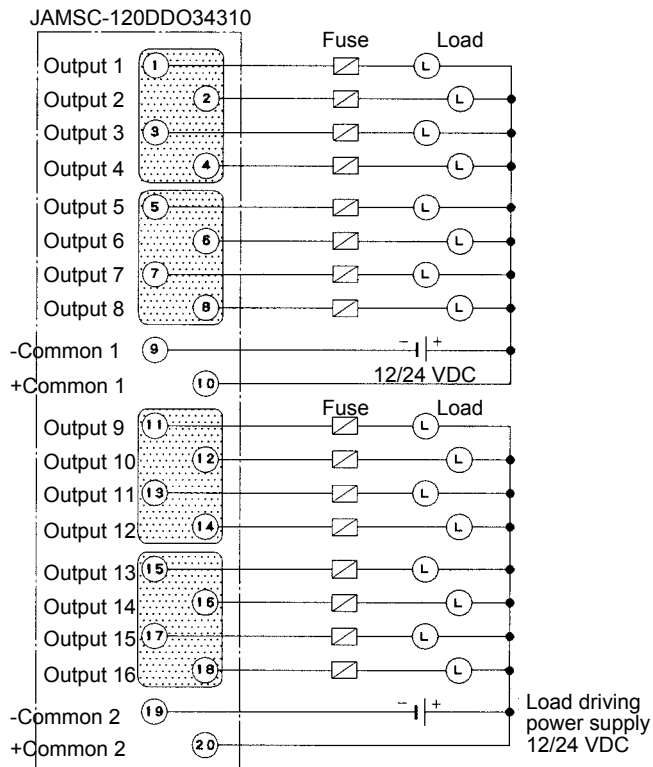



Fig. 6.4 Load Driving Power Supply

2) Power Supply Cables and I/O Signal Cables for DC I/O Modules with Terminal Blocks

 **CAUTION** Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.

Foreign matter in the Modules or Mounting Bases may cause fire, failures and/or malfunctions.

- a) There are five DC I/O Modules with terminal blocks for external connections. See *Table 6.7*.
- b) To connect these DC I/O Modules, use power supply cable and I/O signal cable of the size listed in *Table 6.7*. The cables differ in their permissible current capacity depending on the conditions of use, such as the ambient operating temperature, so check the conditions of use and select a cable of appropriate size.

Table 6.7 I/O Signal Cable Size

Name	Model No.	I/O Signal Cable Size
12/24-VDC 16-point Input Module	JAMSC-120DDI34300	0.2mm ² (AWG24) to 0.8mm ² (AWG18)
12/24-VDC 8-point Output Module	JAMSC-120DDO33000	
12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	
12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	
Relay Contact 16-point Output Module (DC loads)	JAMSC-120DRA84300	DC loads: 0.2mm ² (AWG24) to 0.8mm ² (AWG18)

- c) M3 Phillips screws are used in the external connection terminals. Accordingly, crimp terminals for M3 Phillips screws may be used for terminals on the I/O Module end of power supply cable and I/O signal cable.
- d) When using an insulation transformer, always make sure to separate the primary and the secondary coils. When using a noise filter, also be sure to separate the primary and the secondary coils.

3) Power Supply Cables and I/O Signal Cable for DC 32-point I/O Module

- a) There are two 32-point DC I/O Modules with connectors for external connections.
 - 12/24-VDC 32-point Input Module: Model No. JAMSC-120DDI35400
 - 12/24-VDC 32-point Output Module: Model No. JAMSC-120DDO35410
- b) To connect to these I/O Modules, use of the following I/O signal cables.
 - I/O Module cables assembled by the user.
 - Yaskawa W0300 32-point I/O Module Cables
 - Yaskawa W0302 32-point I/O Module Cables
 - Yaskawa W0301 32-point I/O Module Cables

c) If I/O signal cables are assembled by the user, use the following electric cables and connectors:

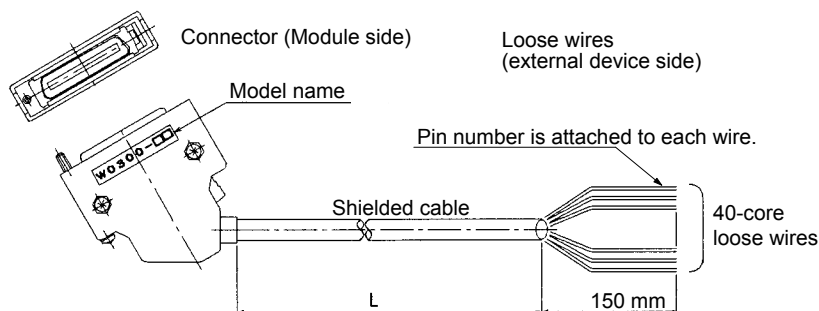
- Cable size: 0.08 mm² (AWG28)
- Module side connector: 10140-6000EL+10340-55S0-008-F (3M)

d) When an W0300 32-point I/O Module Cable is used, select the appropriate cable from the three cables shown in the following table:

Table 6.8 W0300 32-point I/O Module Cables

Item		Specifications		
Name		W0300 Cable		
Model Name		W0300-01	W0300-03	W0300-05
Model No.		JZMSZ-120W0300-01	JZMSZ-120W0300-03	JZMSZ-120W0300-05
Length (L)		1.0 m	3.0 m	5.0 m
Cable Specifications		Shielded cable of 40 conductors, corresponding to UL20276, AWG28 (0.08mm ²)		
Terminals	Module Side	Connector: 10140-6000EL+10340-55S0-008-F (3M)		
	External Device Side	Loose wires; Cable length: 150mm, pin number labeled on each wire		

As shown in the following figure, the external device side of the W0300 cable is divided into individual wires. The cable size is 0.08mm².

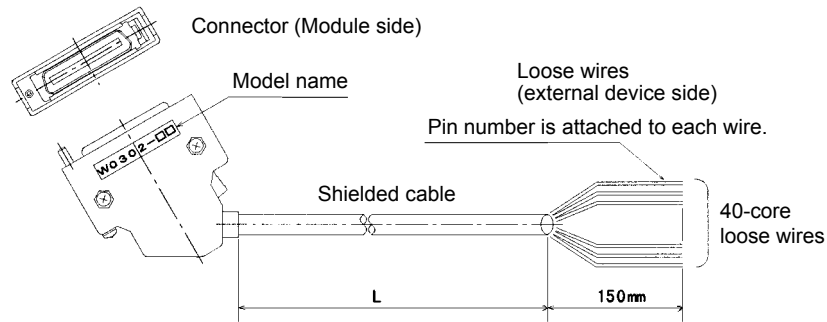


e) When a W0302 32-point I/O Module cable is used, select the appropriate cable from the three cables shown in the following table:

Table 6.9 W0302 32-point I/O Module Cables

Item		Specifications		
Name		W0302 Cable		
Model Name		W0302-01	W0302-03	W0302-05
Model No.		JZMSZ-120W0302-01	JZMSZ-120W0302-03	JZMSZ-120W0302-05
Length (L)		1.0 m	3.0 m	5.0 m
Cable Specifications		Shielded cable of 40 conductors, corresponding to UL20276, AWG28 (0.2mm ²)		
Terminals	Module Side	Connector: 10140-6000EL+10640-5500-008 (3M)		
	External Device Side	Loose wires; Cable length: 150mm, pin number labeled on each wire		

As shown in the following figure, the external device side of the W0302 cable is divided into individual wires. The cable size is 0.2mm².

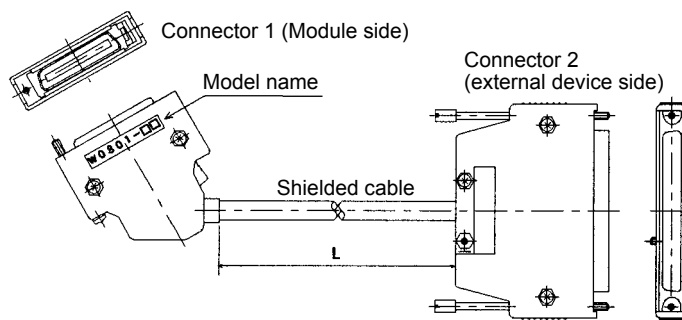


f) When a W0301 32-point I/O Module cable is used, select the appropriate cable from the three cables shown in the following table:

Table 6.10 W0301 32-point I/O Module Cables

Item		Specifications		
Name		W0301 Cable		
Model Name		W0301-01	W0301-03	W0301-05
Model No.		JZMSZ-120W0301-01	JZMSZ-120W0301-03	JZMSZ-120W0301-05
Length (L)		1.0 m	3.0 m	5.0 m
Cable Specifications		Shielded cable of 40 conductors, corresponding to UL20276, AWG28 (0.08mm ²)		
Terminals	Module Side	Connector: 10140-6000EL+10640-5500-008 (manufactured by SUMIT-OMO 3M Ltd.)		
	External Device Side	Connector: FCN-361J040-AU+FCN-360C040-E (manufactured by Fujitsu Ltd.)		

As shown in the following figure, the external device side of the W0301 cable is equipped with a connector.



As shown in Fig. 6.5, W0301 is to be connected to a Connector Terminal Block. One of the Connector Terminal Blocks that can be used is the OMRON XW2B-40F5-P. The following table shows the specifications of the XW2B-40F5-P.

Table 6.11 Specifications of XW2B-40F5-P

Item	Specifications
Model No.	XW2B-40F5-P
Connector	FCN-364P040-AU (manufactured by Fujitsu Ltd.)
External Connection	Terminal block with M3.5 screw terminals
Structure	Wall mounting type
Approx. Mass	200 g
External Dimensions	216.5 × 45 × 43mm (W × H × D)

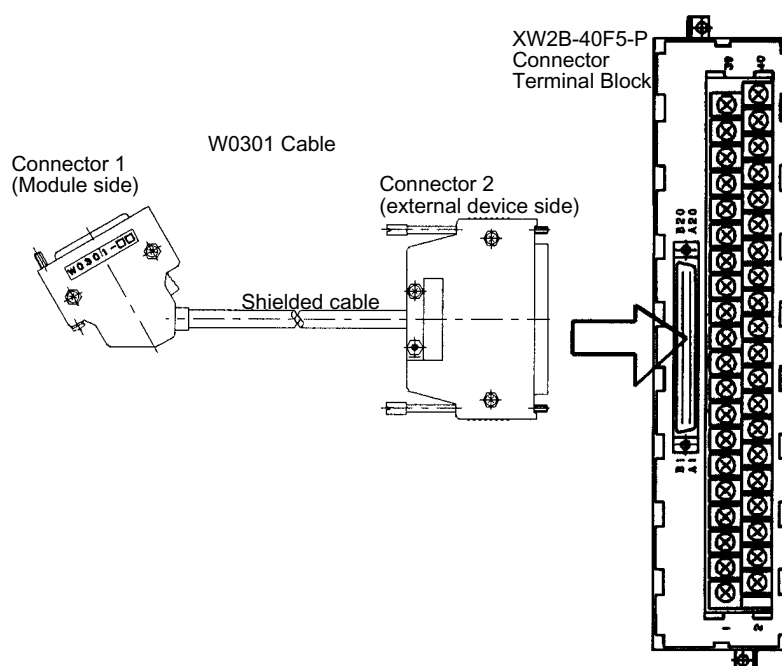


Fig. 6.5 Connecting W0301 Cable to XW2B-40F5-P Connector Terminal Block

- g) When using an insulation transformer for the primary side of DC voltage stabilizing power supply, always make sure to separate the primary and the secondary coils. When using a noise filter, also be sure to separate the primary and the secondary coils.

4) Power Supply Cables and I/O Signal Cable for DC 64-point I/O Modules

- a) Two 64-point DC I/O Modules with connectors for external connections are available.
- 12/24VDC 64-point Input Module: Model No. JAMSC-120DDI36400
 - 12/54VDC 64-point Output Module: Model No. JAMSC-120DDO36410
- b) Use one of the following cables for the I/O signal line to be connected to the I/O Modules.
- I/O Module cable assembled by the user
 - Yaskawa 64-point I/O Module Cable W5410

c) Use the following electric wires and connectors to assemble I/O signal cables to connect to these Digital I/O Modules:

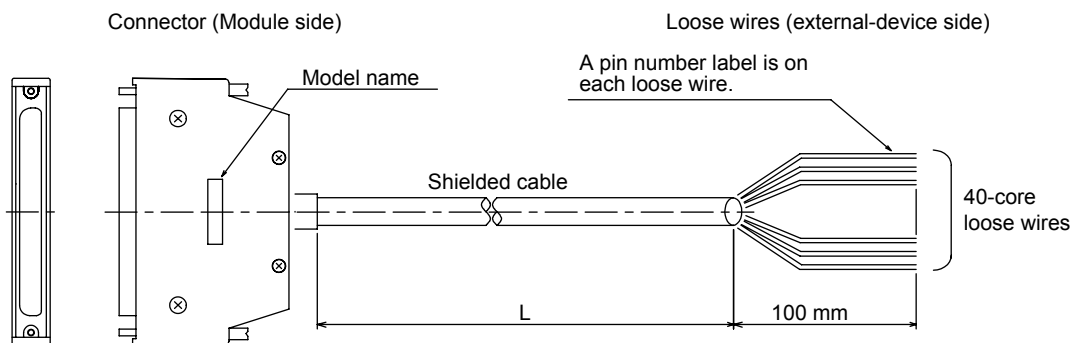
- Cable size: 0.26mm² (AWG23)
- Module side connector (provided as accessory):
Connector: FCN-361J040-AU (soldered) (manufactured by Fujitsu Ltd.)
Cover: FCN-360C040-B (manufactured by Fujitsu Ltd.)

d) If a W5410 64-point I/O Module Cable is used, select the appropriate cable from the following table.

Table 6.12 W5410 64-point I/O Module Cables


Item		Specifications		
Name		W5410 Cable		
Model Name		W5410-05	W5410-10	W5410-30
Model No.		JEPMC-W5410-05	JEPMC-W5410-10	JEPMC-W5410-30
Length (L)		0.5m	1.0m	3.0m
Cable Specifications		Shielded cable of 40 conductors, AWG24 (0.20 mm ²)		
Terminals	Module Side	Connector: FCN-363J-040 (manufactured by Fujitsu Ltd.) FCN-360C040-B (manufactured by Fujitsu Ltd.) FCN-363J-AU/R (manufactured by Fujitsu Ltd.)		
	External device Side	Loose wires; Cable length: 100 mm, pin number labeled on each wire		

As shown in the following figure, the external-device end of the W5410 cable has loose wires. The size of each wire is 0.20 mm².



e) If using an insulation transformer for the primary side of the DC-voltage stabilizing power supply, make sure to separate the primary and the secondary coils. If using a noise filter, also be sure to separate the primary and the secondary coils.

5) Protective Fuses

 **CAUTION** If using an Output Module, connect a fuse that complies with the load specifications in series with the load.


- 12/24-VDC 16-point Output Module (sink): Model No. JAMSC-120DDO34310
- 12/24-VDC 16-point Output Module (source): Model No. JAMSC-120DDO34320
- 12/24-VDC 32-point Output Module (sink): Model No. JAMSC-120DDO35410
- 12/24-VDC 64-point Output Module (sink): Model No. JAMSC-120DDO36410
- Relay Contact 16-point Output Module: Model No. JAMSC-120DRA84300

If a fuse is not connected, a fire or damage to the device or output circuit may occur if the load is short-circuited or the circuit overloaded.


6.2.4 Wiring Analog I/O Modules

This section explains the connection of an I/O signal cable to an Analog I/O Module.

1) I/O Signal Cables

 **CAUTION** Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.

Foreign matter in the Modules or Mounting Bases may cause fire, failures and/or malfunctions.

 **CAUTION** Ground the shield of the shielded twisted-pair wire that connects to the Analog I/O Module to one point (a resistance of 100 Ω max.).

Not grounding the shield of the shielded twisted-pair wire may result in malfunction of the GL120 and GL130.

- a) There are seven types of Analog I/O Modules. See *Table 6.13*.
- b) To connect these I/O Modules to signal line, use I/O signal cables of the size listed in *Table 6.13*. The cables differ in their allowable current capacity depending on the conditions of use, such as the ambient operating temperature, so check the conditions of use and select a cable of appropriate size.

Table 6.13 I/O Signal Cable Size

Name	Model No.	I/O Signal Cable Size
Analog Input Modules ($\pm 10V$, 4 channel)	JAMSC-120AVI02000	Shielded twisted-pair wires 0.5 mm ² (AWG20) to 1.3 mm ² (AWG16)
Analog Input Modules (0 to 10V, 4 channel)	JAMSC-120AVI02100	
Analog Input Modules (4 to 20 mA, 4 channel)	JAMSC-120ACI02000	
Analog Output Modules ($\pm 10V$, 2 channel)	JAMSC-120AVO01000	
Analog Output Modules (0 to 10V, 2 channel)	JAMSC-120AVO01100	
Analog Output Modules (0 to 5V, 2 channel)	JAMSC-120AVO01200	
Analog Output Modules (4 to 20 mA, 2 channel)	JAMSC-120ACO01000	

- c) M3 Phillips screws are used in the external connection terminals. Use crimp terminals that are specially designed for M3 Phillips screws for the Module end of the I/O signal cable.

2) Wiring the Analog Input Module ($\pm 10V$, 4 channel)

a) Connecting Differential Signal Source

- (1) Connect + side of a differential signal to "+" terminal of the Module.
- (2) Connect - side of a differential signal to "-" terminal of the Module.
- (3) Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module.
- (4) Connect the shield of a shielded twisted-pair wire on the signal source side to 0V of the differential signal source.

Incorrect connection will make the input signal unstable and cause malfunction.

b) Connecting Single-ended Signal Source

- (1) Connect + side of a single-ended signal to "+" terminal of the Module.
- (2) Connect - side of a single-ended signal to "-" terminal of the Module,
- (3) Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module and short "Shield" terminal to "-" terminal.

Incorrect connection will make input signal unstable and cause malfunction.

c) For an unused input circuit, short its "+" terminal to "-" terminal and also short one of these terminals to its "Shield" terminal.

Incorrect connection will make input signal unstable and cause malfunction.

d) Refer to 6.2.5 *Grounding* for the grounding of Analog Input Modules.

Note: There is no isolation provided between the various input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

3) Wiring the Analog Input Modules (0 to 10V, 4 channel)

a) Connecting Single-ended Signal Source

- (1) Connect the "+" side of a single-ended signal to the "+" terminal of the Module.
- (2) Connect the "-" side of a single-ended signal to the "-" terminal of the Module.
- (3) Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module and short the "Shield" terminal to the "-" terminal.

Incorrect connection will make input signal unstable and cause malfunction.

b) For an unused input circuit, short its "+" terminal to "-" terminal and also short one of these terminals to its "Shield" terminal.

Incorrect connection will make input signal unstable and cause malfunction.

c) Refer to 6.2.5 *Grounding* for the grounding of Analog Input Modules.

Note: Isolation between Input Channels

There is no isolation provided between the various input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

4) Wiring the Analog Input Modules (4 to 20 mA, 4 channel)

a) Connecting Current Signal Source

- (1) Connect + side of a current signal to "+" terminal of the Module.
- (2) Connect - side of a current signal to "-" terminal of the Module.
- (3) Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module and short "Shield" terminal, "S" terminal, and "-" terminal.

Incorrect connection will make the input signal unstable and cause malfunction.

b) Connecting Voltage Signal Source

- (1) Connect + side of a voltage signal to "+" terminal of the Module.
- (2) Connect - side of a voltage signal to "-" terminal of the Module.
- (3) Connect the shield of a shielded twisted-pair wire to "Shield" terminal of the Module and short "Shield" terminal to "-" terminal. Open "S" terminal of the Module.

Incorrect connection will make input signal unstable and cause malfunction.

c) For an unused input circuit, short its "+" terminal to "-" terminal and also short one of these terminal to its "Shield" terminal.

Incorrect connection will make input signal unstable and cause malfunction.

d) Refer to 6.2.5 *Grounding* for the grounding of Analog Input Modules.

Note: Isolation between Input Channels

There is no isolation provided between the various input circuit channels. If isolation between channels is required, use a commercial isolation amplifier for each channel.

5) Wiring the Analog Output Modules

a) Connecting Output Signals

- (1) Connect + side of a load to "+" terminal of the Module.
- (2) Connect "-" side of a load to "-" terminal of the Module.
- (3) Ground the shield of a shielded twisted-pair wire at one point either on the load side or on the Module side.

Incorrect connection may make output signal unstable and cause malfunction.

b) Grounding Shield of a Shielded Twisted-pair Wire

- (1) Normally, ground the shield at one point on the load side. However, better output characteristics may be obtained by grounding the shield on the Module side rather than on the load side. Choose the best method for the situation.
- (2) The FG terminal of the Module is connected to the Mounting Base via the Module. When grounding on the Module side, use the FG terminal. Use the terminals not connected inside the Module as relay terminals.

Incorrect connection may make output signal unstable and cause malfunction.

- (3) Refer to 6.2.5 *Grounding* for the grounding of Analog Output Modules.

6.2.5 Grounding

1) Grounding the Analog Input Modules

CAUTION Do not allow foreign matter such as cable chips in the Modules or Mounting Bases.

Foreign matter in the Modules or Mounting Bases may cause fire, failures, and/or malfunctions.

CAUTION Ground the ground terminal of the Analog Input Module to a resistance of 100 Ω max.

Not grounding the ground terminal may result in malfunction of the GL120 and GL130.

- Connect the ground terminal (FG) and the ground terminal of the control panel (E) with 1.5 mm² (AWG16) to 2.5 mm² (AWG13) cable (in-panel ground cable.)
- If more than one Analog Input Module is used, do not cross-wire between the ground terminals. Connect the ground terminal of each Analog Input Module to the ground terminal of the control panel separately, as shown in the following figure.
- M3 Phillips screws are used on the field wiring terminals. Accordingly, use crimp terminals for M3 Phillips screws for the in-panel ground cable ends.

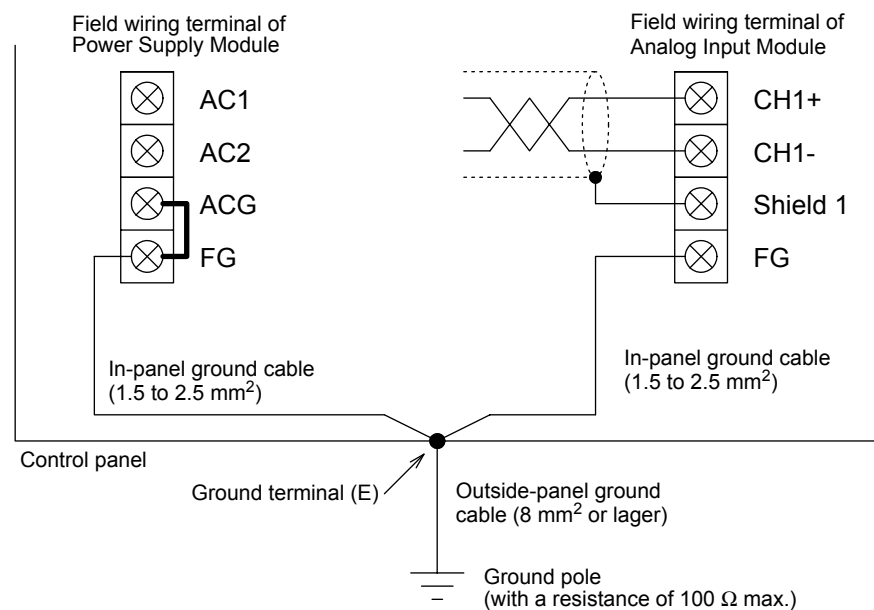


Fig. 6.6 Grounding for Analog Input Module

2) Grounding the Analog Input Signal Cables

- a) Connect the shield of the shielded twisted-pair wire to the “Shield” terminal of the Module.
- b) Use a wire of the following specifications to connect the Analog Input Module ground terminal (FG) directly to the control panel ground terminal (E).
 - Wire size: 1.5 mm² (AWG16) to 2.5 mm² (AWG13)
- c) When connecting the ground terminals (FG) of several Analog Input Modules, also use a wire of the above specifications to connect the Analog Input Module ground terminal (FG) to the control panel ground terminal (E). Do not cross wires between the Analog Input Module ground terminals.

Incorrect connection may make input signal unstable and cause malfunction.

3) Grounding the Analog Output Signal Cables

- a) As a rule, ground the shield of the shielded twisted-pair wire to one point on the load side. Better output characteristics, however, may be obtained by grounding it at one point on the Module side. Ground according to the actual situation.
- b) Ground the shield of the shielded twisted-pair wire to an unused terminal of the Analog Output Module. Unused terminals are used as relay terminals.
- c) Use a wire of the following specifications to connect the unused terminals, to which the shield is grounded, directly to the control panel ground terminal (E).
 - Wire size: 1.5 mm² (AWG16) to 2.5 mm² (AWG13)
- d) When connecting the unused terminals of several Analog Output Modules, to which the shields are grounded, also use a wire of the above specifications to connect these unused terminals directly to the control panel ground terminal (E). Do not cross wires between the Analog Output Module ground terminals.

Incorrect connection may make output signal unstable and cause malfunction.

4) Grounding the Control Panel

- a) Connect the ground terminal of the control panel and the ground pole with a cable (outside-panel ground cable) of 8 mm^2 (AWG8) or larger. Make sure that the length of this ground cable is as short as possible.
- b) Use a ground pole with a resistance of 100Ω max. Do not use together with ground cables or ground poles of high-voltage electrical devices.

The following figure shows an example of the ground cable connection.

◀ EXAMPLE ▶

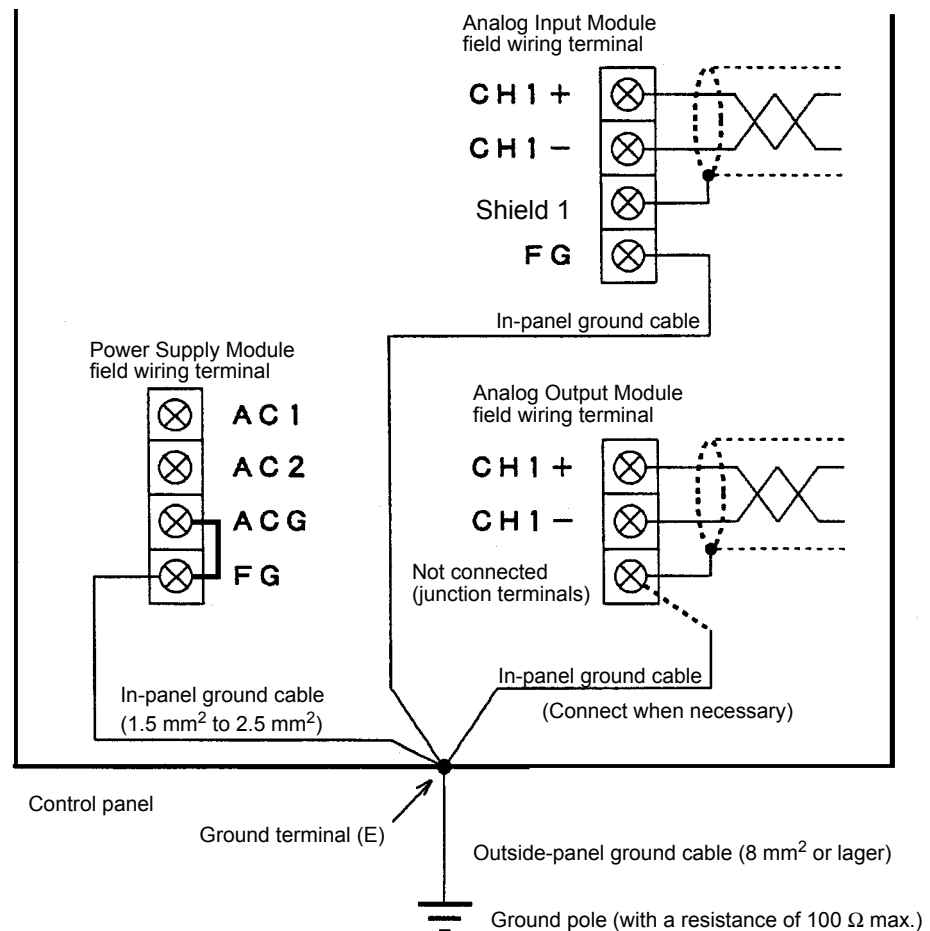


Fig. 6.7 Ground Cable Connection Example

5) Grounding Method

- a) Dedicated Ground

As a rule, the Modules forming the GL120 or GL130 should be grounded to an independent ground pole at a ground resistance of 100Ω max.
- b) Common Ground Pole

The Modules forming the GL120 or GL130 and devices related to general control circuits can share a common ground pole. Do not, however, share the same ground pole between GL120 or GL130 Modules and power devices.
- c) Common Ground Line

The Modules forming the GL120 or GL130 and devices related to general control circuits cannot share a common outside-panel ground cable.

6.3 External Wiring

This section describes the basic external wiring procedure for Digital I/O Modules.

6.3.1 External Wiring for Digital I/O Modules -----6-31

6.3.1 External Wiring for Digital I/O Modules

1) Selection and Separation of Digital I/O Signal Cables

The digital I/O signal cable used for external wiring for Digital I/O Modules must be selected according to the operating environment, including the mechanical strength, effects of electric noise, voltage used, etc. Use the following table to select and separate appropriate I/O signal cables.

Table 6.14 Wiring Procedures for Digital I/O Signal Cables

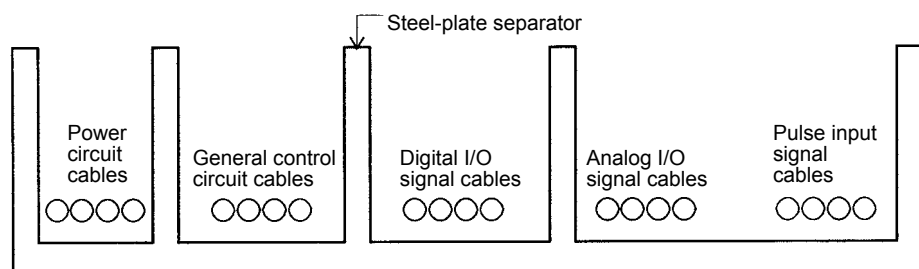
Wiring Length	Procedures
30 m or less	a) A DC output signal line, a DC input signal line, an AC output signal line, and an AC input signal line may be housed in the same cable. b) DC I/O signal lines and AC I/O signal lines must be housed in separate cables.
30 to 300 m	a) Each DC output signal line, DC input signal line, AC output signal line, and AC input signal line must be housed in a separate cable. b) If the induction voltage is large, attach either dummy resistance, or use a separate fully shielded cable and ground the shield on the GL120 and GL130 end.
300 m or longer	a) Considering the inrush current to Output Module, the length of cable must be 300 m or less. b) When the wiring length is more than 300 m, install a junction relay in between so that the length between the junction relay and the control panel is not more than 30 m.

2) Laying Digital I/O Signal Cables

I/O signal cables connected to Digital I/O Modules must be separated from general control circuit cables and power circuit cables as much as possible.

Leave 10 cm or more between digital I/O signal cables and a general control circuit cables, and 20 cm or more between digital I/O signal cables and power circuit cables. If separation is not possible, then use fully shielded cables, or as shown in the following figure, take measures such as separating them by way of iron plate separators.

◀ EXAMPLE ▶



6.4 Precautions on Wiring

This section describes precautions when using 120-series I/O Modules.

6.4.1 AC Input Modules	-----	6-32
6.4.2 AC Output Modules	-----	6-35
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6.4.1 AC Input Modules

1) Power Supply Phasing for Input Signals

CAUTION Connect power supplies of the same phases to the common 1 and common 2 of the AC I/O Module.

If power supplies of different phases are connected, overheating or fire may occur.

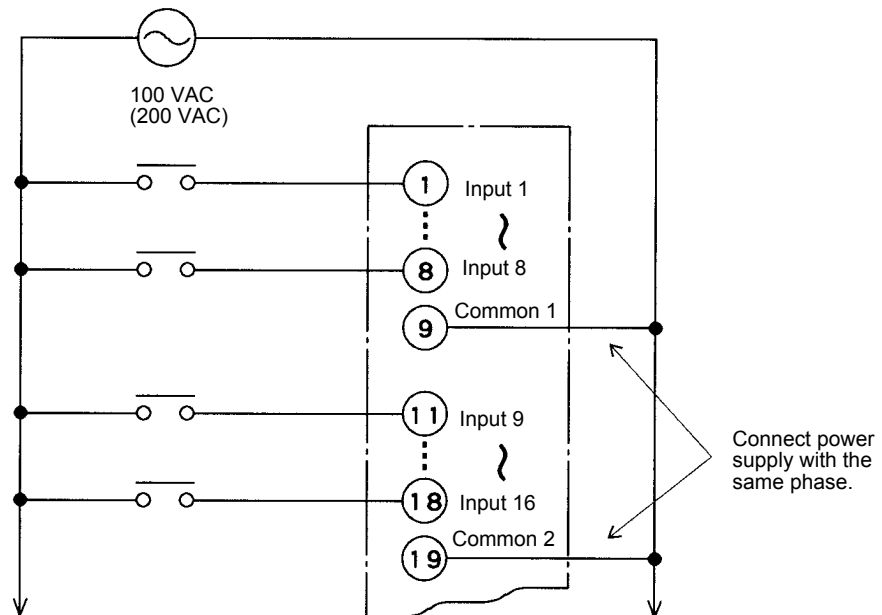


Fig. 6.8 Power Supply Phasing for Input Signals

2) Connecting Inductive Loads

CAUTION If connecting an inductive load in parallel with AC Input Module, connect the surge absorber in parallel with the inductive load to prevent surge voltage.

Failure to connect a surge absorber may result in damage to the AC Input Module.

Although the capacity of surge absorber must be adjusted to the load, the following surge absorber is recommended for general applications:

- CR50500 (manufactured by Okaya Electric Industries Co., Ltd.) or equivalent

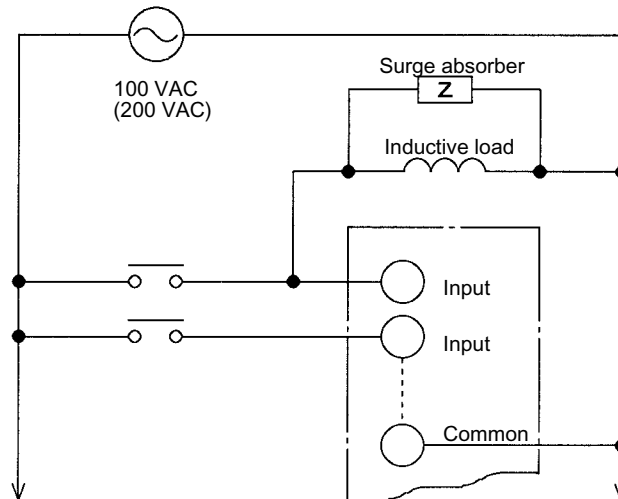


Fig. 6.9 Connecting Inductive Loads

3) Long Wiring Runs from Input Devices

When long wiring is required for connection to external devices or when a large induced voltage is generated due to a nearby inductive source, a dummy resistor should be connected in parallel with the AC Input Module to suppress the induced voltage.

If the dummy resistor is not connected, the input signal may become unstable and malfunction will occur.

Although the size of dummy resistor must be adjusted to the inductive voltage, the following surge values are recommended for general applications:

- At 100 VAC: 5k Ω (10W min.)
- At 200VAC: 10k Ω (20W min.)

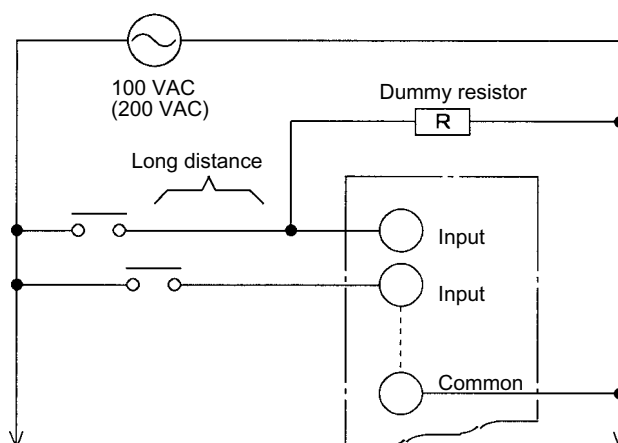


Fig. 6.10 Long Wiring Runs from Input Devices

4) Leakage Current from Input Devices

When connecting an input device that exhibits leakage current during the OFF state (such as non-contact switches or limit switches with neon lamps) to an AC Input Module, the leakage current may be too large to stay within the OFF voltage range and the input signal may never go OFF.

The following diagram shows what can happen when a non-contact switch with a 5-mA leakage current is connected to the AC Input Module (100 VAC).

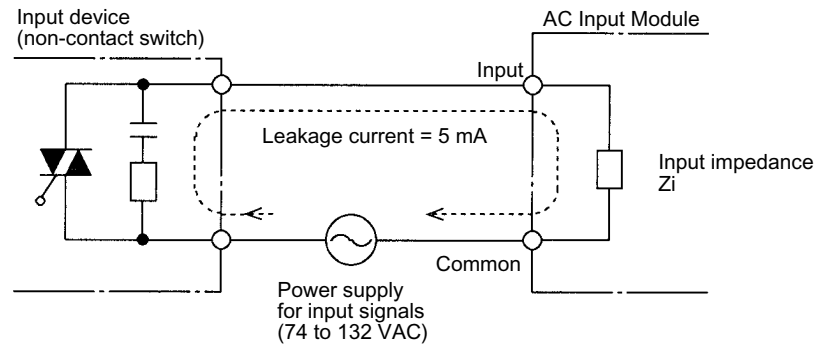


Fig. 6.11 Leakage Current from Input Devices

The input voltage V_i Input to the AC Input Module by a leakage current of 5 mA can be calculated as follows:

$$V_i = 5 \text{ mA} \times Z_i = 5 \text{ mA} \times 14.3 \text{ k} \approx 72 \text{ V}$$

This voltage will not go below 30 V as required by the OFF voltage range of the input conditions, so the input signal will not go OFF.

Here, a dummy resistor can be connected in parallel with the input terminals of the AC Input Module to correct the problem.

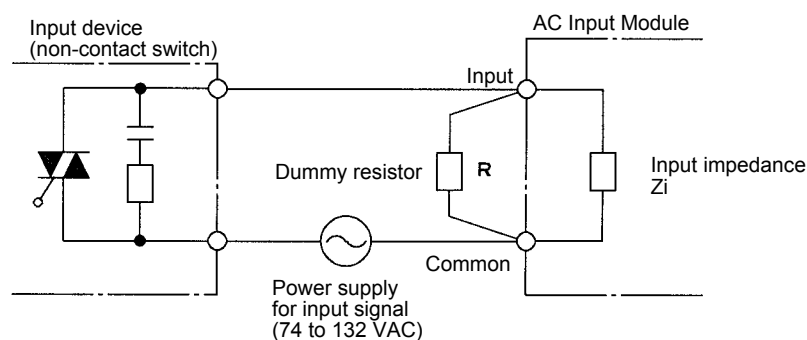


Fig. 6.12 Connecting a Dummy Resistor

The resistance of the dummy resistor must be selected so that the voltage V_i input to the AC Input Module is 30 V or less.

$$\frac{R \times Z_i}{R + Z_i} \times \text{Leakage current} < 30 \text{ V}$$

$$\frac{R \times 14.3 \text{ k}\Omega}{R + 14.3 \text{ k}\Omega} \times 5 \text{ mA} < 30 \text{ V}$$

$$\therefore R < 10.3 \text{ k}\Omega$$

Therefore, the resistance of the dummy resistor must be 10.3 k Ω or less.

If the resistance is too small, the amount of heat generation will increase, and a high wattage will be required. Here, the wattage for a dummy resistor of 10 kΩ is calculated.

The wattage of the dummy resistor is as follows:

$$W = \frac{(\text{Power supply voltage})^2}{R} = \frac{(100 \text{ V})^2}{10 \text{ k}\Omega} = 1 \text{ W}$$

Normally, about three times the computed value is used to allow surplus wattage. A 3-W resistor would therefore be used.

6.4.2 AC Output Modules

1) Power Supply Phasing for Output Signals

⚠ CAUTION Connect power supplies of the same phases to the common 1 and common 2 of the AC I/O Module.

If power supplies of different phases are connected, overheating or fire may occur.

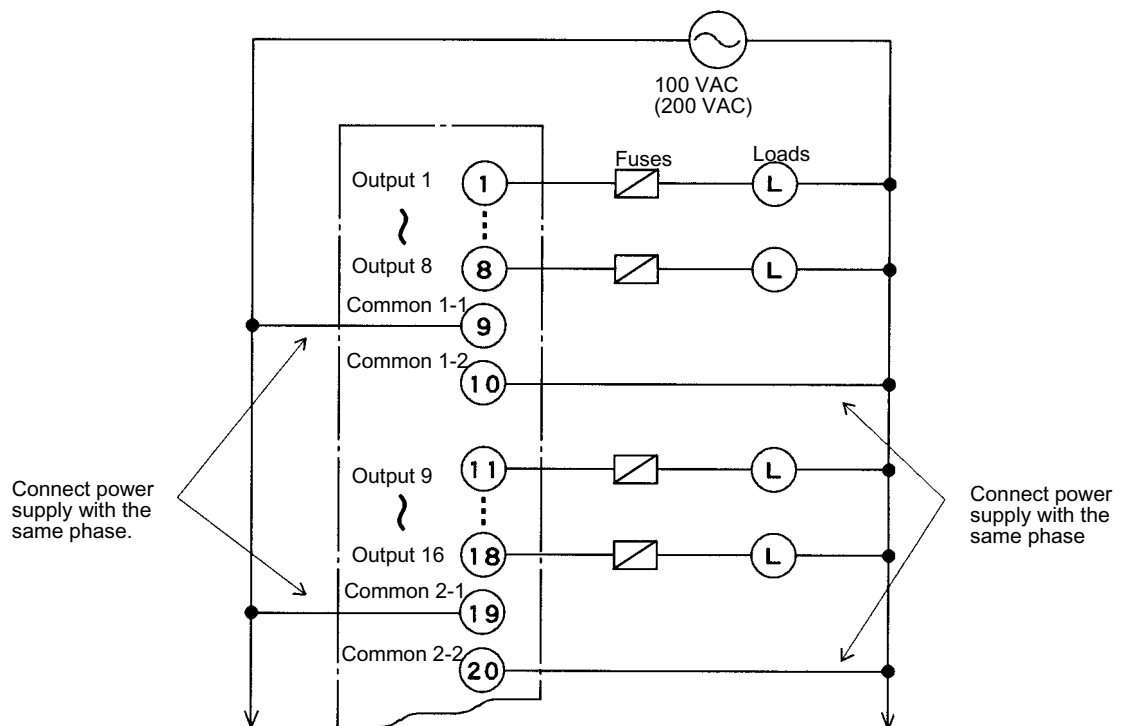


Fig. 6.13 Power Supply Phasing for Output Signals

2) Protective Fuses

⚠ CAUTION If using an Output Module, connect a fuse that complies with the load specifications in series with the load.

A protective fuse built into the following Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the device or output circuits may occur if the load is short-circuited or the circuit overload.

The built-in fuse protects the Output Module from damage that may occur in the following cases:

- When over-voltage is applied to the load driving power supply terminal of the Output Module.
- When foreign matter such as chips are in the Output Module and short-circuiting the internal circuits.

Not installing external fuses may cause fire and damage to the output circuit and the Module if an over-voltage or short-circuit occurs.

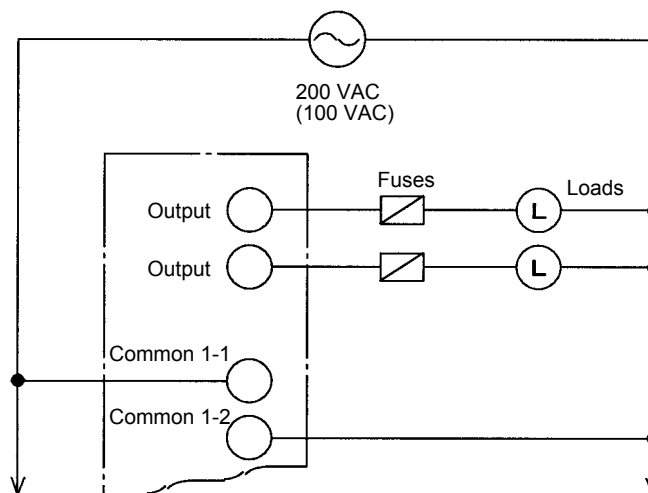


Fig. 6.14 Protective Fuses

3) Connecting Contacts to an Inductive Load

⚠ CAUTION If connecting an inductive load to the AC Output Module, connect the surge absorber in parallel with the inductive load to prevent surge voltage.

Failure to connect a surge absorber may result in damage to the AC Output Module.

Although the capacity of the surge absorber used must be adjusted to the load, the following surge absorber is recommended for general applications:

- CR50500 (manufactured by Okaya Electric Industries Co., Ltd.) or equivalent.

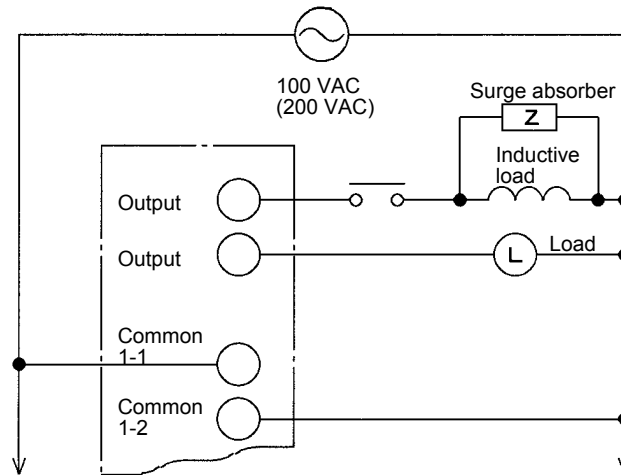


Fig. 6.15 Connecting Contacts to an Inductive Load

4) Maximum Load Current

⚠ CAUTION Although a 0.6-A load can be connected to each output point for AC 16-point Output Module, the total load must be 2.4 A or less for each common. Keep the maximum load at 2.4-A for each common.

If this limit is exceeded, damage may occur to the output circuit.

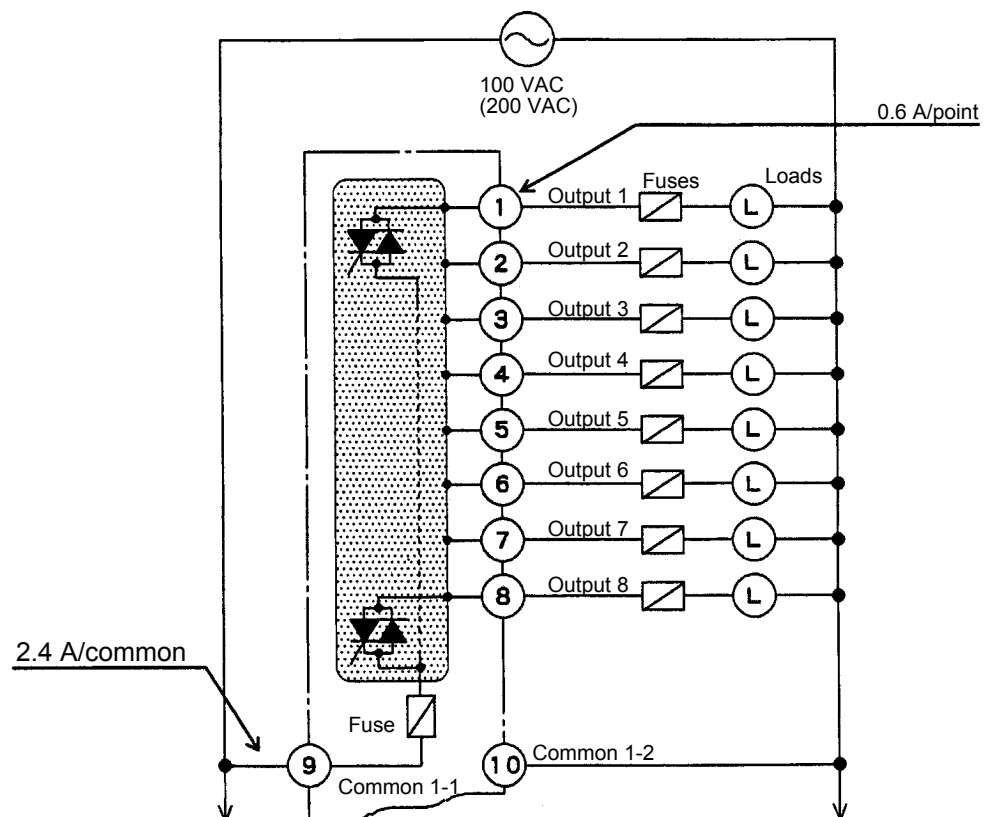


Fig. 6.16 Maximum Load Current

5) Minimum Switching Voltage/Current

A triac is used for the output switch of AC output Modules. Since a triac cannot operate stably if the load is less than the specified minimum switching voltage/current, be sure to use a load with a rated current level higher than the minimum switching voltage/current.

If the minimum switching voltage/current cannot be maintained, connect a dummy resistor in parallel with the load so that the total switching voltage/current is higher than the minimum switching voltage/current.

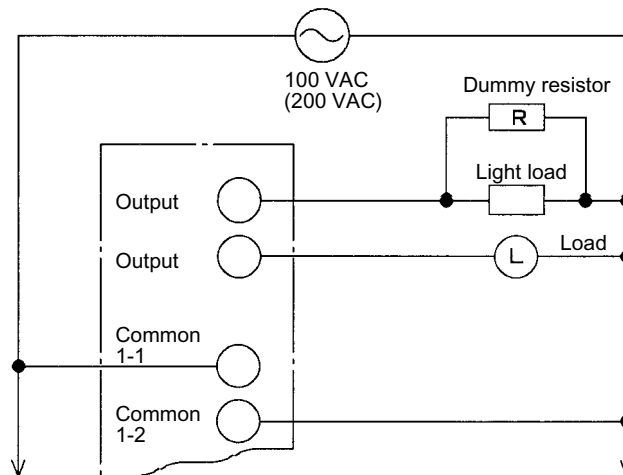


Fig. 6.17 Minimum Switching Voltage/Current

6) Leakage Current from Output Modules

Leakage current flows from an AC Output Module when the Module is OFF, and a light load, such as a relay, connected to the AC Module may turn OFF because of the leakage current.

The following diagram shows a load device with the load impedance is $6\text{ k}\Omega$ connected to an AC Output Module. This load will not turn OFF due to the leakage current of 3 mA .

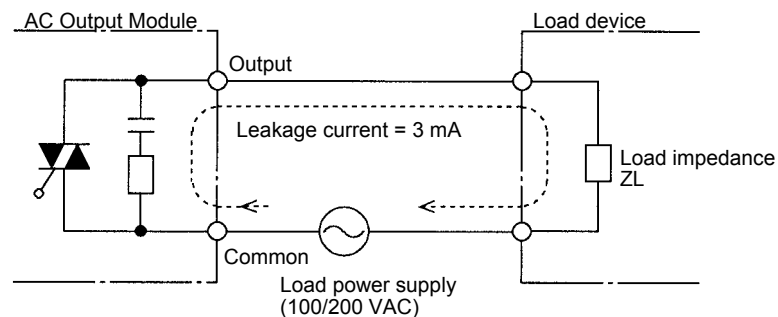
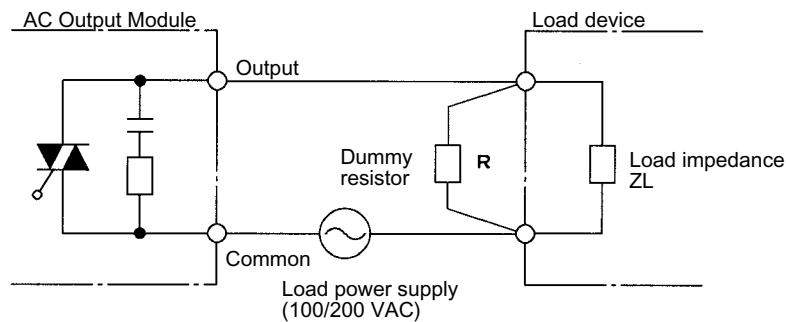


Fig. 6.18 Leakage Current from Output Modules

Here, a dummy resistor can be connected in parallel with the input load to correct the problem.



Assuming that the load will operate properly with a leakage current of 1.5 mA or less, then the value of the dummy resistor R can be computed as follows:

$$3 \text{ mA} \times \frac{R}{R + 6 \text{ k}\Omega} < 1.5 \text{ mA}$$

$$\therefore R < 6 \text{ k}\Omega$$

Thus, the value for R should be 6 kΩ or less.

If the resistance is too small, the amount of heat generation will increase, and a high wattage will be required. Here, we will compute the wattage for a dummy resistor of 6 kΩ.

$$W = \frac{(\text{Power supply voltage})^2}{R} = \frac{(100 \text{ V})^2}{6 \text{ k}\Omega} = \text{Approx. } 1.7 \text{ W}$$

Normally, about three times the computed value is used to allow surplus wattage. A 5-W resistor would thus be used.

7) Connecting Solenoids with Diodes

Some solenoids used as the load of the AC Output Module may contain built-in diodes.

Solenoids with diodes have an advantage in that they are driven by half-wave rectification and thus require a lower activation current.

Abide by the following precautions when such diodes are used as a load for an AC Output Module.

- a) Overvoltage can be applied to the load when the output is OFF. The rectifying diode must therefore be able to withstand a reverse voltage of $2\sqrt{2} E$ or greater.

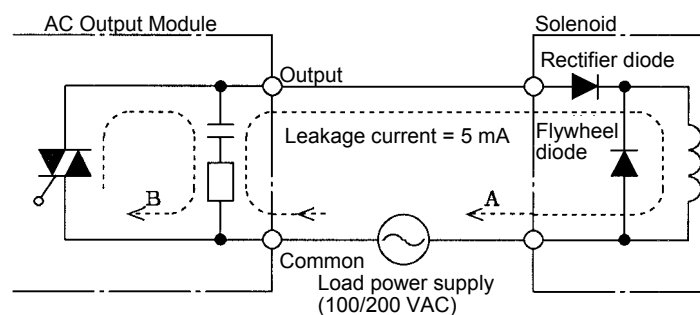


Fig. 6.19 Solenoids with Diode (1)

When the output of the AC Output Module is OFF, the rectifying diode is forward biased and current A flows, as indicated by the dotted line in the figure, for a half the cycle of the power supply to charge the capacitor. In the next half cycle, the rectifying diode is reverse biased and blocks current A, so that discharge current B flows from the capacitor. Here, the supply voltage and the voltage charge on the capacitor are superimposed, and are applied to the solenoid. The peak value for this voltage is about $2\sqrt{2} E$ (E: supply voltage). This is why the rectifying diode requires to withstand a reverse voltage of $2\sqrt{2} E$ or more.

Connect a resistance ranging from multiples of ten to several hundred k Ω on both ends of the solenoid to reduce the voltage applied to the solenoid.

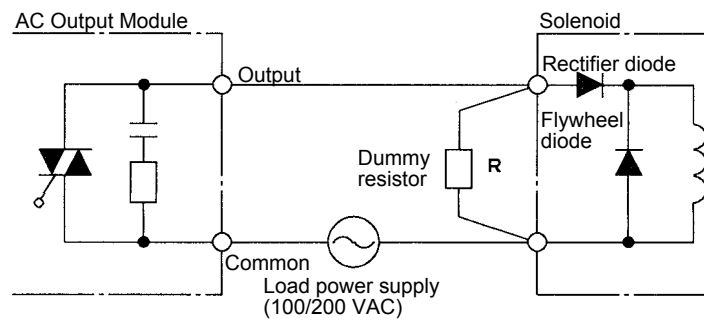


Fig. 6.20 Solenoids with Diode (2)

b) The solenoid may not turn ON even though the output is ON.

When a solenoid with a diode is connected, the solenoid may not turn ON because the voltage at the output is not reduced to a usable operating level due to the voltage charge on the capacitor. Here again, connect a resistance ranging from multiples of ten to several hundred k Ω on both ends of the solenoid to reduce the voltage applied to the solenoid.

6.4.3 DC Input Modules

1) Connecting Inductive Loads

CAUTION If connecting an inductive load in parallel with DC Input Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Input Module.

Although the capacity of flywheel diode used must be adjusted to the load, the following diode is recommended for general applications:

- H14-series Diode (manufactured by Hitachi Ltd.) or equivalent

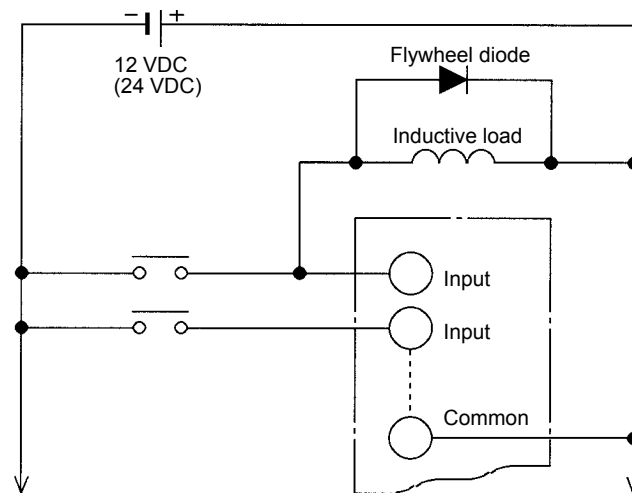


Fig. 6.21 Connecting Inductive Loads (Sourcing Inputs)

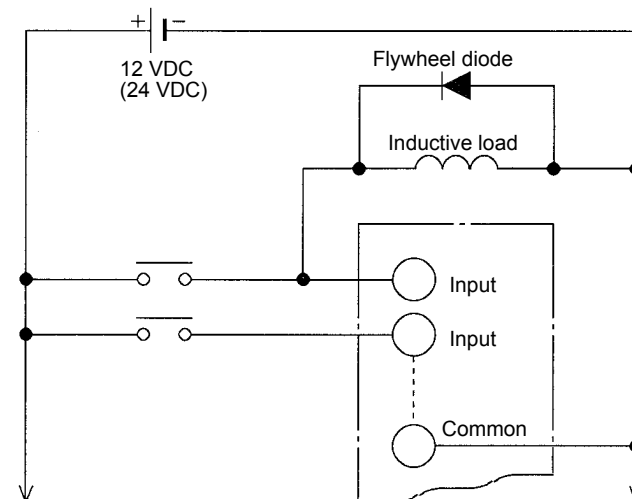


Fig. 6.22 Connecting Inductive Loads (Sinking Inputs)

2) Leakage Current from Input Devices

When connecting an input device that exhibits leakage current during the OFF state (such as limit switch with LEDs) to a DC Input Module, the leakage current may be too large to stay within the OFF voltage range and the input signal may never go OFF.

The following diagram shows when a LED-equipped limit switch with a 3-mA leakage current is connected to the Input Module (12/24 VDC, 16-point).

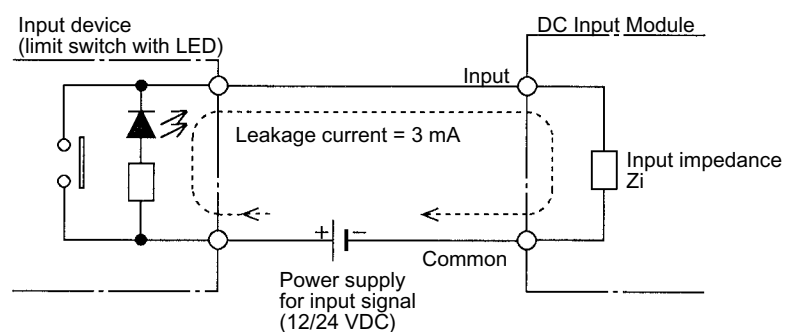


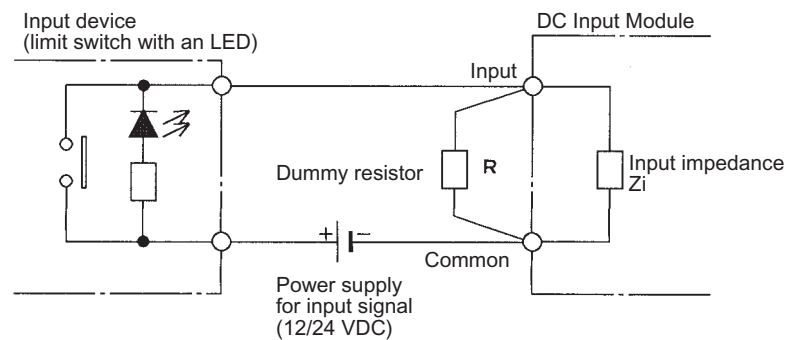
Fig. 6.23 Leakage Current from Input Devices (1)

The input voltage V_i input to the DC Input Module by a leakage current of 3 mA can be calculated as follows:

$$V_i = 3 \text{ mA} \times Z_i = 3 \text{ mA} \times 3.0 \text{ k}\Omega = 9.0 \text{ V}$$

This voltage will not go below 5 V as required by the OFF voltage range of the input conditions, so the input signal will not go OFF.

Here, a dummy resistor can be connected in parallel with the input terminals of the DC Input Module to correct the problem.

**Fig. 6.24 Leakage Current from Input Devices (2)**

The resistance of the dummy resistor must be selected so that the voltage V_i input to the DC Input Module is 5 V or less.

$$\frac{R \times Z_i}{R + Z_i} \times \text{Leakage current} < 5 \text{ V}$$

$$\frac{R \times 3.0 \text{ k}\Omega}{R + 3.0 \text{ k}\Omega} \times 3 \text{ mA} < 5 \text{ V}$$

$$\therefore R < 3.75 \text{ k}\Omega$$

Thus, the value for R should be 3.75 k Ω or less.

If the resistance is too small, the amount of heat generation will increase, and a high wattage will be required. Here, the wattage for a dummy resistor of 3 k Ω is calculated.

The wattage of the dummy resistor is as follows:

$$W = \frac{(\text{Power supply voltage})^2}{R} = \frac{(24 \text{ V})^2}{3 \text{ k}\Omega} = \text{Approx. } 190 \text{ mW}$$

Normally, about three times the computed value is used to allow surplus wattage. A 0.5- to 1-W resistor would thus be used.

3) Connecting DC Input Devices with Different Voltage Ratings

Normally, the power supply voltage of the input device should match that of the DC Input Module. The following table shows examples of input devices with different voltage ratings and advises whether or not they may be connected to the DC Input Module.

Input Device	Open collector output ($V1 < V2$)
Connection	Can be connected.
<p>V1: Input signal power supply V2: Input device power supply</p> <p>DC Input Module</p> <p>+Common 1 Photocoupler</p> <p>V1 24 VDC</p> <p>V2 48 VDC</p> <p>Input device</p> <p>Input 1</p> <p>R</p>	
Input Device	Output with a diode ($V1 < V2$)
Connection	Can be connected.
<p>V1: Input signal power supply V2: Input device power supply</p> <p>DC Input Module</p> <p>+Common 1 Photocoupler</p> <p>V1 24 VDC</p> <p>V2 48 VDC</p> <p>Input device</p> <p>Input 1</p> <p>R</p>	
Input Device	Output with a resistor and LED ($V1 < V2$)
Connection	Cannot be connected. When the input device is OFF, current indicated by the dotted line in the figure on the left may flow, causing the LED of the input device to glow dimly.
<p>V1: Input signal power supply V2: Input device power supply</p> <p>DC Input Module</p> <p>+Common 1 Photocoupler</p> <p>V1 24 VDC</p> <p>V2 48 VDC</p> <p>Input device</p> <p>Input 1</p> <p>R</p>	

Input Device	Open collector output ($V1 > V2$)
Connection	Can be connected. The voltage resistance of the output transistor in the input device must be 40 V or more.
Input Device	Output with a diode ($V1 > V2$)
Connection	Cannot be connected. When the input device is OFF, current indicated by the dotted line in the figure on the left may flow, and the input may not turn OFF.
Input Device	Output with a resistor and LED ($V1 > V2$)
Connection	Cannot be connected. When the input device is OFF, current indicated by the dotted line in the figure on the left may flow and apply reverse voltage to the LED, possibly damaging the LED.

6.4.4 DC Output Modules

1) Protective Fuses

CAUTION If using an Output Module, connect a fuse that complies with the load specifications in series with the load.

A protective fuse built into the following Output Modules does not protect the output element. If a fuse is not connected, a fire or damage to the device or output circuits may occur if the load is short-circuited or the circuit overload.

The built-in fuse protects the Module from damage that may occur in the following cases:

- When over-voltage is applied to the load driving power supply terminal of the Output Module.
- When foreign matter such as chips are in the Output Module and short-circuiting the internal circuits.

Not installing external fuses may cause fire and damage to the output circuit and the Module.

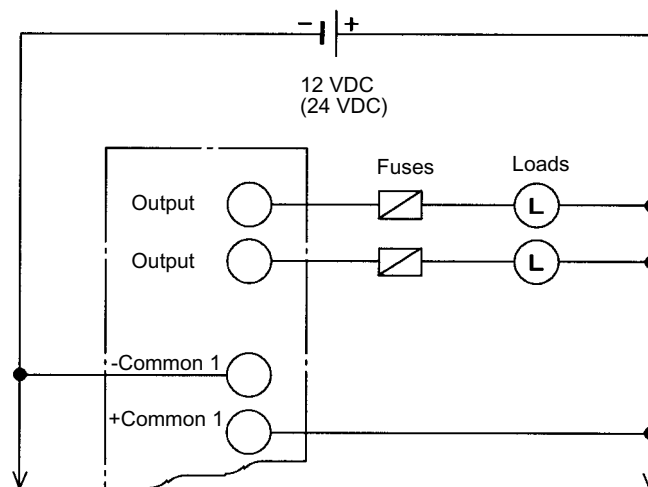


Fig. 6.25 Protective Fuses

2) Connecting Inductive Loads

⚠ CAUTION If connecting an inductive load to the DC Output Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Output Module.

⚠ CAUTION If connecting a contact to an inductive load of the DC Output Module, connect the flywheel diode in parallel with the inductive load to prevent surge voltage.

Failure to connect a flywheel diode may result in damage to the DC Output Module.

Although the capacity of flywheel diode must be adjusted to the load, the following diode is recommended for general applications:

- H14E series Diode (manufactured by Hitachi Ltd.) or equivalent.

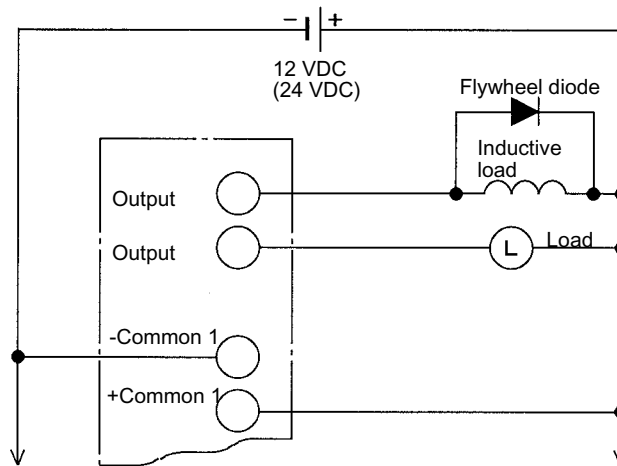


Fig. 6.26 Connecting Inductive Loads

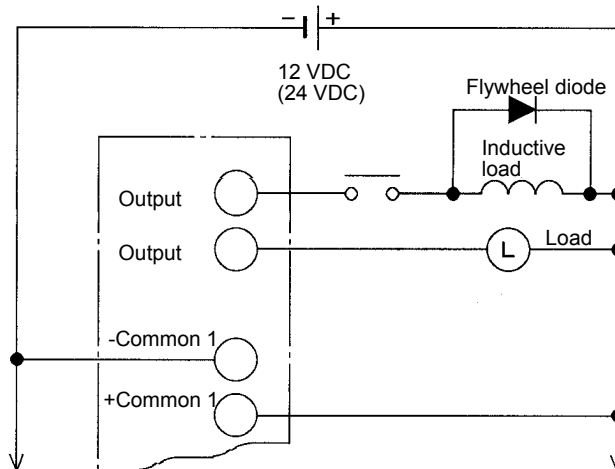


Fig. 6.27 Connecting Contacts to Inductive Loads

3) Maximum Load Current for 12/24-VDC 16-point Output Modules

⚠ CAUTION Although a 0.5-A load can be connected to each output point for the DC 16-point Output Module, the total load must be 1.0 A or less for each of the four output points in the same area marked by the shaded portion in the following figure. Keep the load distribution within the 1.0-A limit.

If this limit is exceeded, damage may occur to the output circuit.

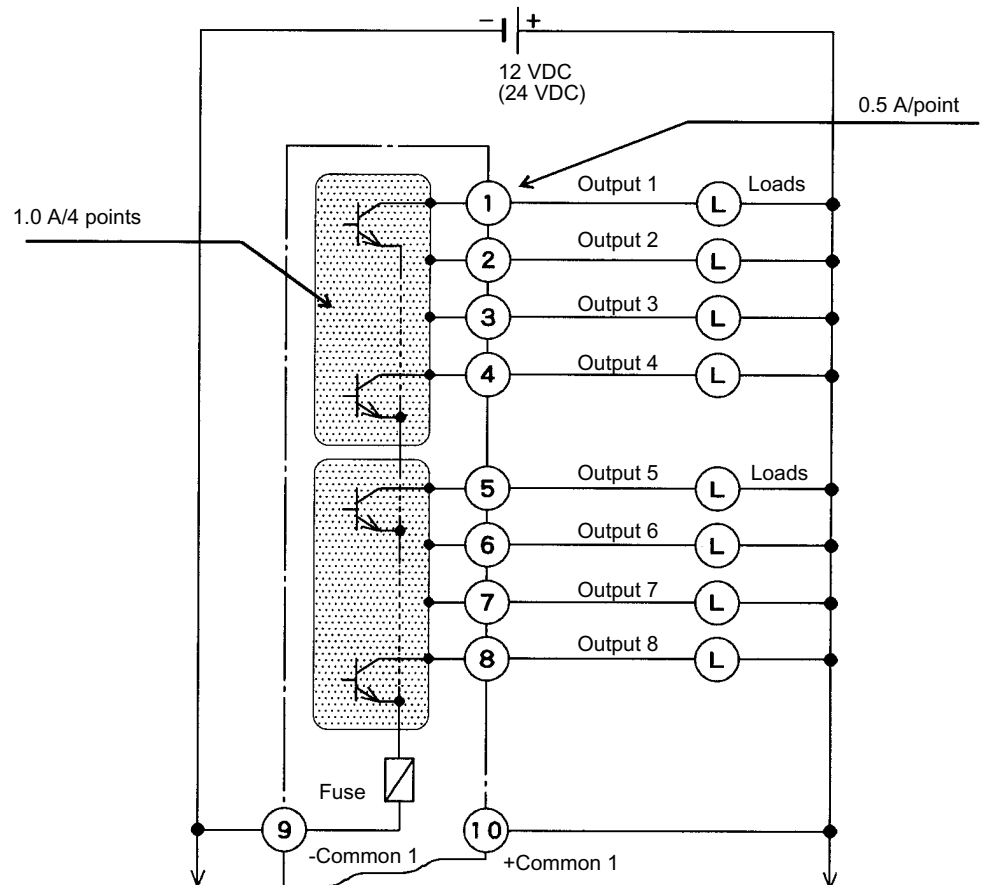


Fig. 6.28 Maximum Load Current for 16-point Output Modules

4) Maximum Load Currents for 12/24-VDC 32-point Output Module

⚠ CAUTION Although a 0.3-A load can be connected to each output point of the DC 32-point Output Module, the total load must be 0.4 A or less for each of the four output points in the same area marked by the shaded portion in the following figure. Keep the load distribution within the 0.4-A limit.

If this limit is exceeded, damage may occur to the output circuit.

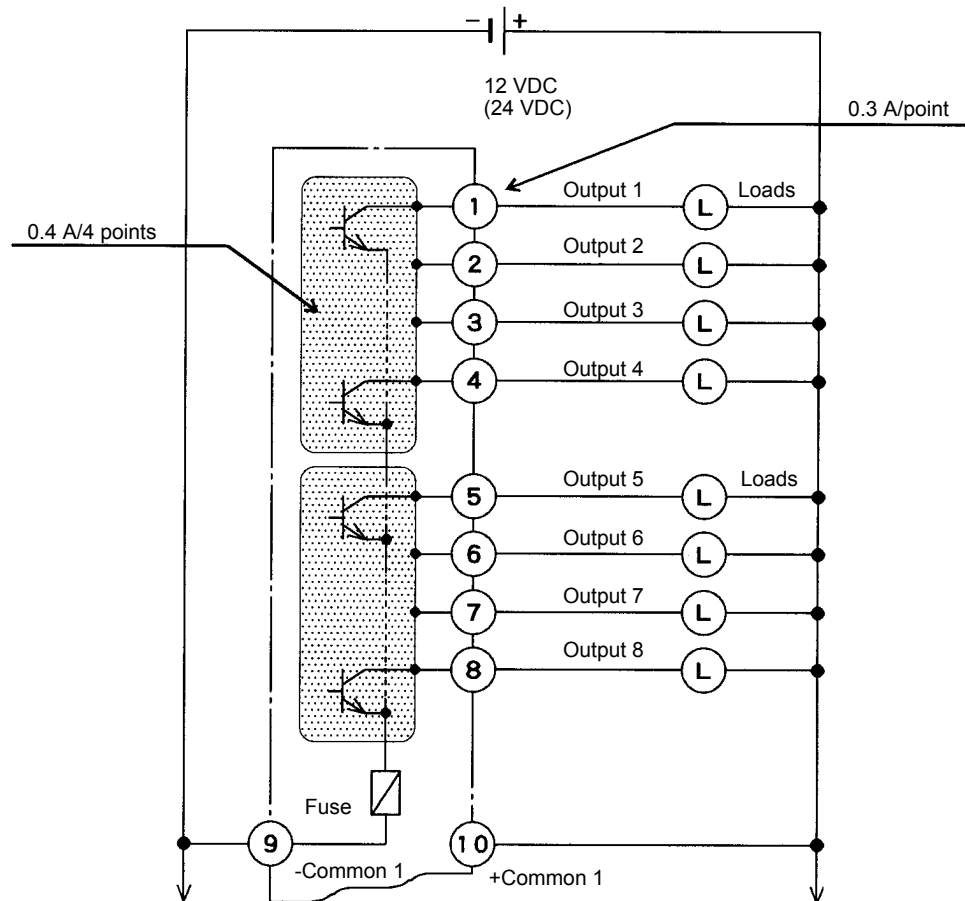


Fig. 6.29 Maximum Load Currents for 32-point Output Module

5) Loads with Large Inrush Current

Connecting a load with a large inrush current, such as incandescent light bulbs, may cause dark current flow of up to 30 % of the rated current of the incandescent bulb. Here install a current limiting resistor in series with the load. Be sure to use this or other methods to keep the inrush current below the maximum load current of the Output Module.

If the load current exceeds the maximum load current, the output circuit will be damaged.

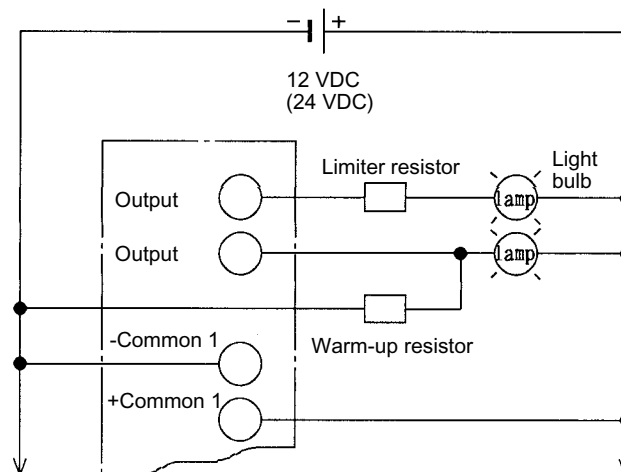


Fig. 6.30 Loads with Large Inrush Current

6.4.5 Connections between AC I/O Modules

- 1) Whenever two or more GL120 or GL130 PLCs are used in a system, connect them as shown in the following figures to exchange signals between the AC I/O Modules of the GL120 or GL130. Use AC Input Modules and AC Output Modules with the same voltage ratings.

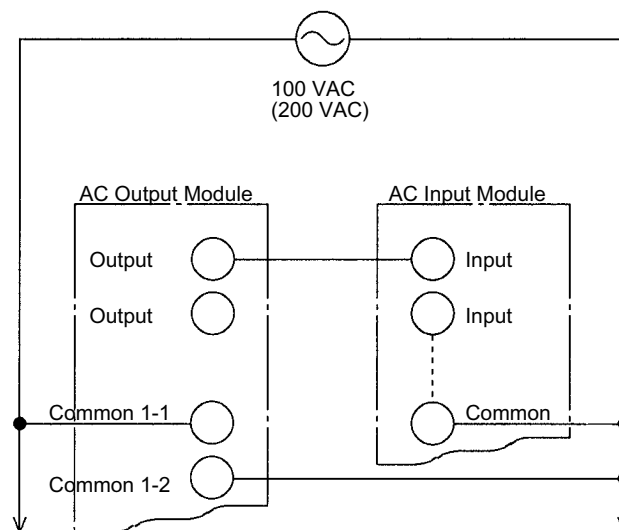


Fig. 6.31 Connections between AC I/O Modules

- 2) Using GL120 or GL130 in combination with Existing MEMOCON PLCs

When signals are exchanged between existing MEMOCON PLCs and a GL120 or GL130 PLC through an AC Input Module and an AC Output Module, the following items must be considered. Contact your Yaskawa representative.

	AC Output Module		AC Input Module
1	Rated Voltage		Rated Voltage
2	Rated Frequency		Rated Frequency
3	Maximum Load Current	>	Rated Current
4	Minimum Load Current	<	Rated Current

6.4.6 Connections between DC I/O Modules

- 1) Whenever two or more GL120 or GL130 PLCs are used in a system, connect them as shown in the following figure to exchange signals between the DC I/O Modules of the GL120 or GL130.

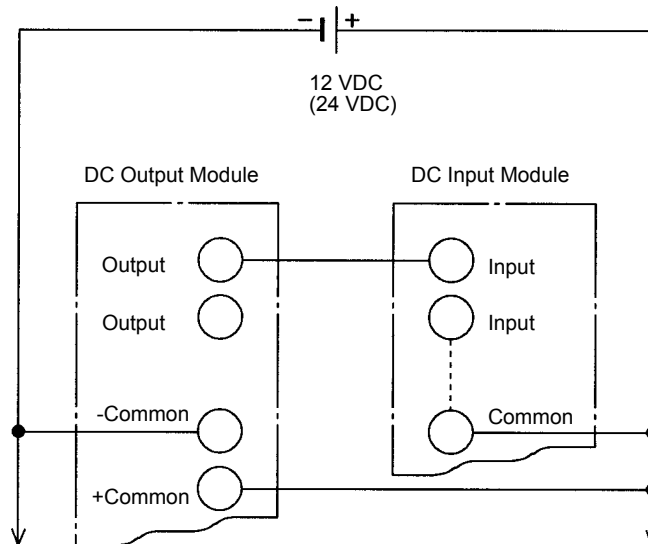


Fig. 6.32 Connections between DC I/O Modules

- 2) Using GL120 or GL130 in Combination with Existing MEMOCON PLCs

When signals are exchanged between existing MEMOCON PLCs and a GL120 or GL130 PLC through a DC Input Module and a DC Output Module, the following items must be considered. Contact your Yaskawa representative.

DC Output Module		DC Input Module
1	Rated Voltage	Rated Voltage
2	Output Type (Source or Sink)	Input Type (Source or Sink)
3	Maximum Load Current	> Rated Current
4	Output Voltage Drop	< Maximum OFF Voltage Range

6.4.7 Analog Input Modules

1) Input Circuit Insulation

CAUTION Insulation is not provided between the channels of the Analog Input Module. To insulate all the analog signals connected to the Analog Input Module, use a commercial isolation amplifier for each channel.

Incorrect connections may cause damages and malfunctions of the Analog Input Modules.

2) Analog Input Signal Wires


Use Shielded twisted-pair wires for the analog input signal lines. An improper connection will cause noise interference, which results in a malfunction.

3) Grounding Shielded Cables


Connect the shield of the Shielded twisted-pair cable to the “Shield” terminal of the Module. An improper connection will cause noise interference, which results in a malfunction.

6.4.8 Analog Output Modules


1) Maximum Load Current (Voltage Output)

 CAUTION The maximum allowable load current for Analog Output Modules ($\pm 10\text{V}$, 2 channels) is $\pm 5\text{ mA}$ ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.


 CAUTION The maximum allowable load current for Analog Output Modules (0 to 10V , 2 channels) is 5 mA ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

 CAUTION The maximum allowable load current for Analog Output Modules (0 to 5V , 2 channels) is 2.5 mA ($2\text{ k}\Omega$). The load resistance must be $2\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

2) Maximum Load Resistance (Current Output)

 CAUTION The maximum allowable load resistance for Analog Output Modules (4 mA to 20 mA , 2 channels) is $550\text{ k}\Omega$. The load resistance must be $550\text{ k}\Omega$ or more.

Incorrect connection may cause the output signal to be overloaded, and result in damages or malfunction of the Analog Output Module.

3) Analog Output Signal Wires

Use shielded twisted-pair cables for the analog output signal lines.

An improper connection will cause noise interference, which results in a malfunction.

4) Grounding Shielded Cables

As a rule, ground the shield of the shielded twisted-pair cable to one point on the load side. Better output characteristics, however, may be obtained by connecting it at one point on the Analog Output Module side, so ground according to the actual situation.

An improper connection will cause noise interference, which results in a malfunction.

5) Unused Terminals of the Output Module

The “not connected” terminals inside the Analog Output Modules are not used, so they can therefore be used as junction terminals.

6.4.9 External Power Supplies

- 1) A standard DC stabilized power supply should be used as an external power supply for DC I/O Modules.
- 2) Add a noise filter on the AC input side of the DC stabilized power supply, for special modules such as Analog Modules or Counter Modules to prevent the introduction of noise. Do not run the primary and secondary side of the noise filter and the DC output through the same wiring duct.
- 3) If a simple DC power supply such as a full-wave rectifying power supply must be used, minimize ripple by adding a smoothing capacitor, and observe the following precautions.
 - Instantaneous output voltage including ripple voltage should always be within the maximum allowable voltage range of the DC I/O Modules.
 - Output voltage, even when power is turned ON and OFF, should never exceed the maximum allowable voltage of the DC I/O Modules.
 - Prevent the introduction of surge voltage by adding a noise filter on the input to the rectifying device.
 - Prevent surge voltage that may occur when a contactor is installed at the full-wave rectifying output by applying a surge suppressor or other device between contactor outputs at the Module.



7.1 Built-in Fuses	7-2
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7.1 Built-in Fuses

This section describes the built-in fuses of the 120-series I/O Modules.

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7.1.1 I/O Modules with Built-in Fuses

Fuses are not built in all the 120-series I/O Modules. The fuse blowout detection and indication function is provided in some of the 120-series Output Modules. The indicator lamp indicates the fuse state. For replacement of the built-in fuses that cannot be replaced by users, contact your Yaskawa representative.


The following table shows the Modules with or without built-in fuses, whether the fuse can be replaced or not, and the fuse blowout indication.

Table 7.1 Built-in Fuses

Product	Name	Model No.	Built-in Fuse		Fuse Blowout Indicator Lamp
			With/Without	Replacement	
Digital Output Modules	100/200-VAC 8-point Output Module	JAMSC-120DAO83000	Without	–	No indication
	100/200-VAC 16-point Output Module	JAMSC-120DAO84300	With	Prohibited	“F” is lit when the fuse is blown out.
	12/24-VDC 8-point Output Module	JAMSC-120DDO33000	With	Prohibited	No indication
	12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	With	Permitted	“F” is lit when the fuse is blown out.
	12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	With	Permitted	“F” is lit when the fuse is blown out.
	12/24-VDC 32-point Output Module (sinking)	JAMSC-120DDO35410	With	Prohibited	“F” is lit when the fuse is blown out.
	12/24-VDC 64-point Output Module (sinking)	JAMSC-120DDO36410	With	Prohibited	“F” is lit when the fuse is blown out.
	Relay Contact 16-point Output Module	JAMSC-120DRA84300	Without	–	No indication
Special Purpose Modules	Register Input Module	JAMSC-120RDI34410	With	Prohibited	“F” is lit when the fuse is blown out.
	Register Output Module	JAMSC-120RDO34410	With	Prohibited	“F” is lit when the fuse is blown out.

7.1.2 Built-in Fuses


1) AC 16-point Output Modules

 **CAUTION** Do not replace the built-in fuses of the AC 16-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or a malfunction may occur in the AC 16-point Output Modules, and the guarantee is void.

- a) The fuse inside an AC 16-point Output Module is not to protect the output circuit. The fuse prevents the Module from damage that may occur in the following cases:
- External causes: For example, when over-voltage is applied to the power terminals for driving load of the AC 16-point Output Module.
 - Internal causes: For example, when foreign matter such as chips are present in the AC 16-point Output Module, and thereby short-circuiting the internal circuits.
- b) When the built-in fuses are blown out, the indicator lamp “F” of the AC 16-point Output Module is lit. If the fuses are blown out, eliminate the cause and replace the Module with a spare AC 16-point Output Module.

2) DC 8-point Output Modules

 **CAUTION** Do not replace the built-in fuses of the DC 8-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 8-point Output Modules, and the guarantee is void.

- a) The fuse inside a DC 8-point Output Module is not to protect the output circuit. The fuse prevents the Module from damage that may occur in the following cases:
- External causes: For example, when over-voltage is applied to the power terminals for driving load of the DC 8-point Output Module.
 - Internal causes: For example, when foreign matter such as chips are present in the DC 8-point Output Module, and thereby short-circuiting the internal circuits.
- b) Neither the fuse blowout detecting circuit nor indication lamp is provided in the DC 8-point Output Modules.
- If the output current does not flow though the rated voltage is applied to the DC 8-point Output Module and the output signal indicator lamp is lit, the built-in fuse may be blown out. If the fuse is blown out, eliminate the cause and replace the Module with a spare DC 8-point Output Module.

3) DC 16-point Output Module

- a) The fuse inside a DC 16-point Output Module is not to protect the output circuit. The fuse prevents the Module from damage that may occur in the following cases:
- External causes: For example, when over-voltage is applied to the power terminals for driving load of the DC 16-point Output Module.
 - Internal causes: For example, when foreign matter such as chips are present in the DC 16-point Output Module, and thereby short-circuiting the internal circuits.
- b) When the built-in fuses are blown out, the indicator lamp “F” of the DC 16-point Output Module is lit. If the fuses are blown out, eliminate the cause and replace the fuse.



The fuses built in the DC 16-point Output Modules can be replaced by users.

4) DC 32-point Output Modules




CAUTION Do not replace the built-in fuses of the DC 32-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 32-point Output Modules, and the guarantee is void.

- a) The fuse inside a DC 32-point Output Module is not to protect the output circuit. The fuse prevents the Module from damage that may occur in the following cases:
- External causes: For example, when over-voltage is applied to the power terminals for driving load of the DC 32-point Output Module.
 - Internal causes: For example, when foreign matter such as chips are present in the DC 32-point Output Module, and thereby short-circuiting the internal circuits.
- b) When the built-in fuses are blown out, the indicator lamp “F” of the DC 32-point Output Module is lit. If the fuses are blown out, eliminate the cause and replace the Module with a spare DC 32-point Output Module.

5) DC 64-point Output Modules

 **CAUTION** Do not replace the built-in fuses of the DC 64-point Output Modules.

If the built-in fuses are replaced by anyone other than a Yaskawa-approved technician, a failure or malfunction may occur in the DC 64-point Output Modules, and the guarantee is void.

- a) The fuse inside a DC 64-point Output Module is not to protect the output circuit. The fuse prevents the Module from damage that may occur in the following cases:
- External causes: For example, when over-voltage is applied to the power terminals for driving load of the DC 64-point Output Module.
 - Internal causes: For example, when foreign matter such as chips are present in the DC 64-point Output Module, and thereby short-circuiting the internal circuits.
- b) When the built-in fuses are blown out, the indicator lamp “F” of the DC 64-point Output Module is lit. If the fuses are blown out, eliminate the cause and replace the Module with a spare DC 64-point Output Module.

7.1.3 Replacement of Built-in Fuses

1) I/O Modules whose Built-in Fuses can be Replaced by Users

The fuses of the following Output Modules can be replaced by users.

- 12/24-VDC 16-point Output Module (sinking output):
Model No. JAMSC-120DDO34310
- 12/24-VDC 16-point Output Module (sourcing output):
Model No. JAMSC-120DDO34320

2) Replacement Procedure

Use the following procedure to replace the built-in fuses of DC 16-point Modules.

- (1) Turn OFF the DC power to the Module for driving loads.
- (2) Remove the terminal block from the Module. For details, refer to 6.1.2 (3) *Removing the Terminal Block from the Module*.
- (3) Remove the Module from the Mounting Base. For details, refer to 6.1.2 (4) *Removing Modules*.
- (4) Remove the built-in fuse from the Module.
- (5) Replace a spare fuse on the Module.
- (6) Eliminate the cause of the fuse blowout and install the Module on the Mounting Base.
- (7) Install the terminal block on the Module.

7.2 Hot Swapping

This section describes precautions on mounting or removing 120-series I/O Modules while the power is being supplied.

7.2.1 Hot Swapping ----- 7-6

7.2.1 Hot Swapping

1) Meaning of Hot Swapping

- a) Mounting or removing an I/O and other Modules while the external power supply is being supplied ON to the Power Supply Module will allow the CPU Module to continue working normally. This function is called hot swapping (removal/insertion under power).
- b) Hot swapping allows replacement of I/O Modules without stopping the operation of CPU Module.
- c) If a Module is hot swapped, it will take several scan cycles for the new Module to run normal I/O and communications processing as follows.

(1) I/O and Special Purpose Modules

Module will start normal I/O processing several scan cycles after being mounted to the slot.

IMPORTANT

To use hot swapping effectively, remember that some Modules cannot be mounted or removed while power is being supplied. Also be sure to consider the impact on the overall control system before removing a Module.

2) Modules that Support Hot Swapping

The following table shows the Modules which support hot swapping.

Table 7.2 Modules that Support Hot Swapping


Product	Name	Model No.	Permitted/ Not permitted	Safety Switch Required
Digital Input Modules	100-VAC 16-point Input Module	JAMSC-120DAI54300	Permitted	Yes
	200-VAC 16-point Input Module	JAMSC-120DAI74300	Permitted	Yes
	12/24-VDC 16-point Input Module	JAMSC-120DDI34300	Permitted	--
	12/24-VDC 32-point Input Module	JAMSC-120DDI35400	Permitted	--
	12/24-VDC 64-point Input Module	JAMSC-120DDI36400	Permitted	--
Analog Input Modules	Analog Input Modules ($\pm 10V$, 4 channels)	JAMSC-120AVI02000	Permitted	--
	Analog Input Modules (0-10 V, 4 channels)	JAMSC-120AVI02100	Permitted	--
	Analog Input Modules (4 to 20 mA, 4 channels)	JAMSC-120ACI02000	Permitted	--

Table 7.2 Modules that Support Hot Swapping


Product	Name	Model No.	Permitted/ Not permitted	Safety Switch Required
Digital Output Modules	100/200-VAC 8-point Output Module	JAMSC-120DAO83000	Permitted	Yes
	100/200-VAC 16-point Output Module	JAMSC-120DAO84300	Permitted	Yes
	12/24-VDC 8-point Output Module	JAMSC-120DDO33000	Permitted	–
	12/24-VDC 16-point Output Module (sinking)	JAMSC-120DDO34310	Permitted	–
	12/24-VDC 16-point Output Module (sourcing)	JAMSC-120DDO34320	Permitted	–
	12/24-VDC 32-point Output Module (sinking)	JAMSC-120DDO35410	Permitted	–
	12/24-VDC 64-point Output Module (sinking)	JAMSC-120DDO36410	Permitted	–
	Relay Contact 16-point Output Module	JAMSC-120DRA84300	Permitted	AC loads: Yes DC loads: NO
Analog Output Modules	Analog Output Modules (± 10 V, 2 channels)	JAMSC-120AVO01000	Permitted	–
	Analog Output Modules (0-10 V, 2 channels)	JAMSC-120AVO01100	Permitted	–
	Analog Output Modules (0-5 V, 2 channels)	JAMSC-120AVO01200	Permitted	–
	Analog Output Modules (4 to 20 mA, 2 channels)	JAMSC-120ACO01000	Permitted	–
Special Purpose Modules	Register Input Module	JAMSC-120RDI34410	Permitted	–
	Register Output Module	JAMSC-120RDO34410	Permitted	–

3) Precautions When Hot Swapping

Heed the following precautions when hot swapping (removal/insertion under power).

-  **CAUTION** When inserting or removing an AC I/O Module while the AC power supply is turned ON, install a safety switch for each Module and always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing an AC I/O Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

-  **CAUTION** When using a single-phase AC power supply (100/200 VAC) for driving the loads of the Relay Contact Output Module, install a safety switch for each Module. Before inserting or removing the Relay Contact Output Module, always turn this safety switch OFF to turn OFF the AC power supply to the Module.

Inserting or removing a Relay Contact Output Module while AC power is being supplied may result in an electric shock at touching the power supply terminals.

- Note:** (1) Do not hot swap more than one Module at a time, even if the Modules all support hot swapping. Hot swapping more than one Module at the same time may cause the CPU to reset or to stop completely.
- (2) When hot swapping on an I/O Module which supply DC power as the I/O power supply, there is no need to setup safety switches. However, it may cause I/O signal chatter when inserting or removing a terminal block or a connector to or from the Module. If this is a problem, then setup a chatter prevention switch for each Module and be sure to turn this switch OFF to turn OFF the DC power supply.
- (3) When hot swapping, never short-circuit the terminal block or the connectors of the Module.
- (4) Inserting or removing a Module which does not permit hot swapping may cause the CPU Module to stop.

EN Standard Low voltage Directive Compliant I/O Modules

8



This chapter describes the specifications of I/O Modules that conform to EN Standards (Low voltage Directive).

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8.1.1	Low Voltage Directive Compliant I/O Modules	-----	8-2
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8.1.4	Specifications of the I/O Modules	-----	8-7

8.1 EN Standard Compliant I/O Modules

This section describes the I/O Modules that conform to Low Voltage Directive.

8.1.1 Low Voltage Directive Compliant I/O Modules	8-2
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8.1.1 Low Voltage Directive Compliant I/O Modules

The following I/O Modules conform to the Low Voltage Directive.

Table 8.1 Low Voltage Directive Compliant I/O Modules

Product	Name	Model Name	Model No.	Features
Digital Input Modules	100 to 120-VAC 16-point Input Module	AC100IN-16P	JAMSC-120DAI54309	1) Used to input digital signals. 2) 100 to 120 VAC, 16 points, 7mA (50Hz)
	200 to 240-VAC 16-point Input Module	AC200IN-16P	JAMSC-120DAI74309	1) Used to input digital signals. 2) 200 to 240 VAC, 16 points, 7mA (50Hz)
Digital Output Modules	100 to 120-VAC or 200 to 240- VAC 8-point Output Module	ACOUT-8P	JAMSC-120DAO83009	1) Used to output digital signals. 2) 100 to 120 VAC or 200 to 240 VAC, 8 points, 1.0 A/point
	100 to 120-VAC or 200 to 240- VAC 16-point Output Module	ACOUT-16P	JAMSC-120DAO84309	1) Used to output digital signals. 2) 100 to 120 VAC or 200 to 240 VAC, 16 points, 0.3 A/point
	Relay Contact 16-point Output Module	RELAY-16P	JAMSC-120DRA84309	1) Used to output digital signals. 2) Relay contacts, 16 points, 1.0 A/point

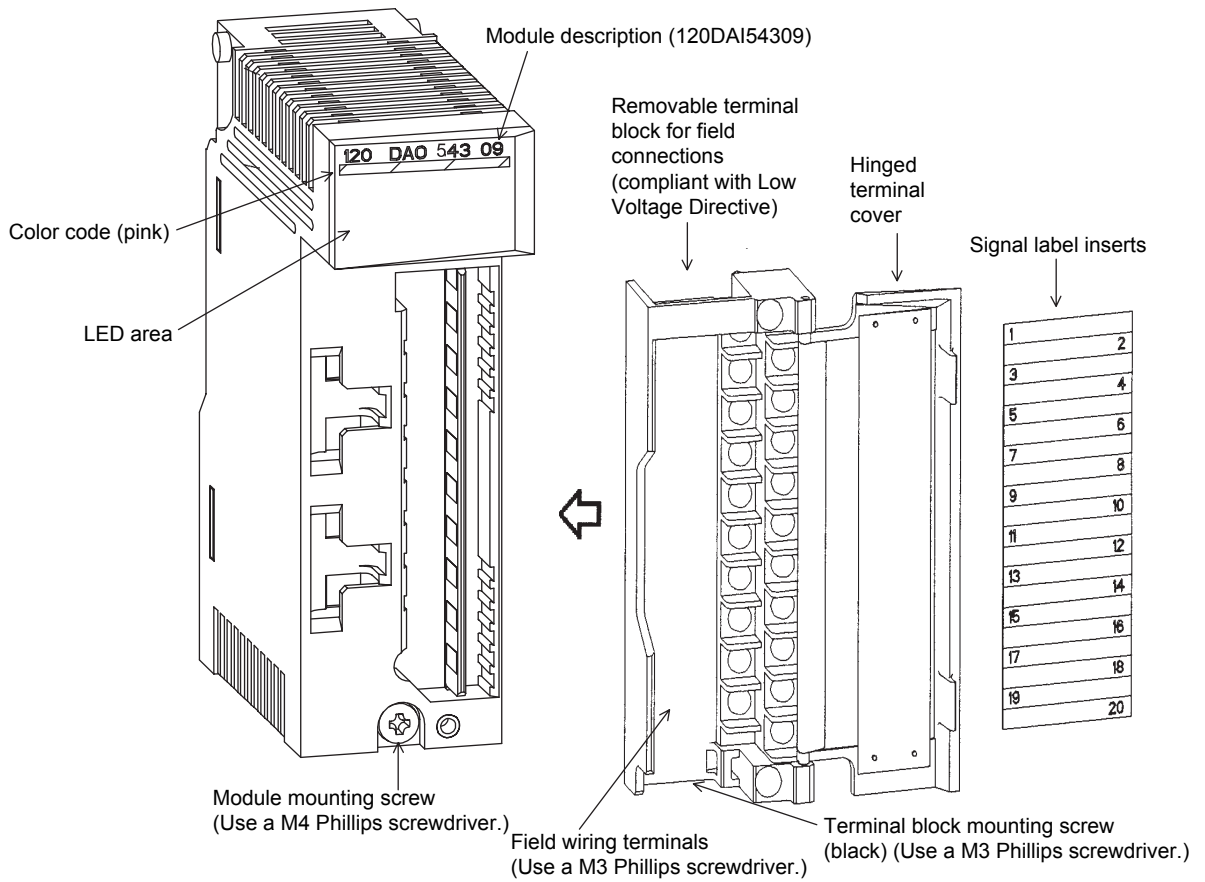
For the details of I/O Modules, refer to *Chapter 2 Digital I/O Module*.

8.1.2 External Appearances

1) AC Input Module

100-to 120-VAC 16-point Input Module (JAMSC-120DAI54309)

200-to 240-VAC 16-point Input Module (JAMSC-120DAI74309)



LED Area	
120 DAO 843 09	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O
F	Red	Always not lit
1 to 16	Green	The corresponding LED is lit when the input signal is ON.

Note: The affixed model descriptions are as follows:

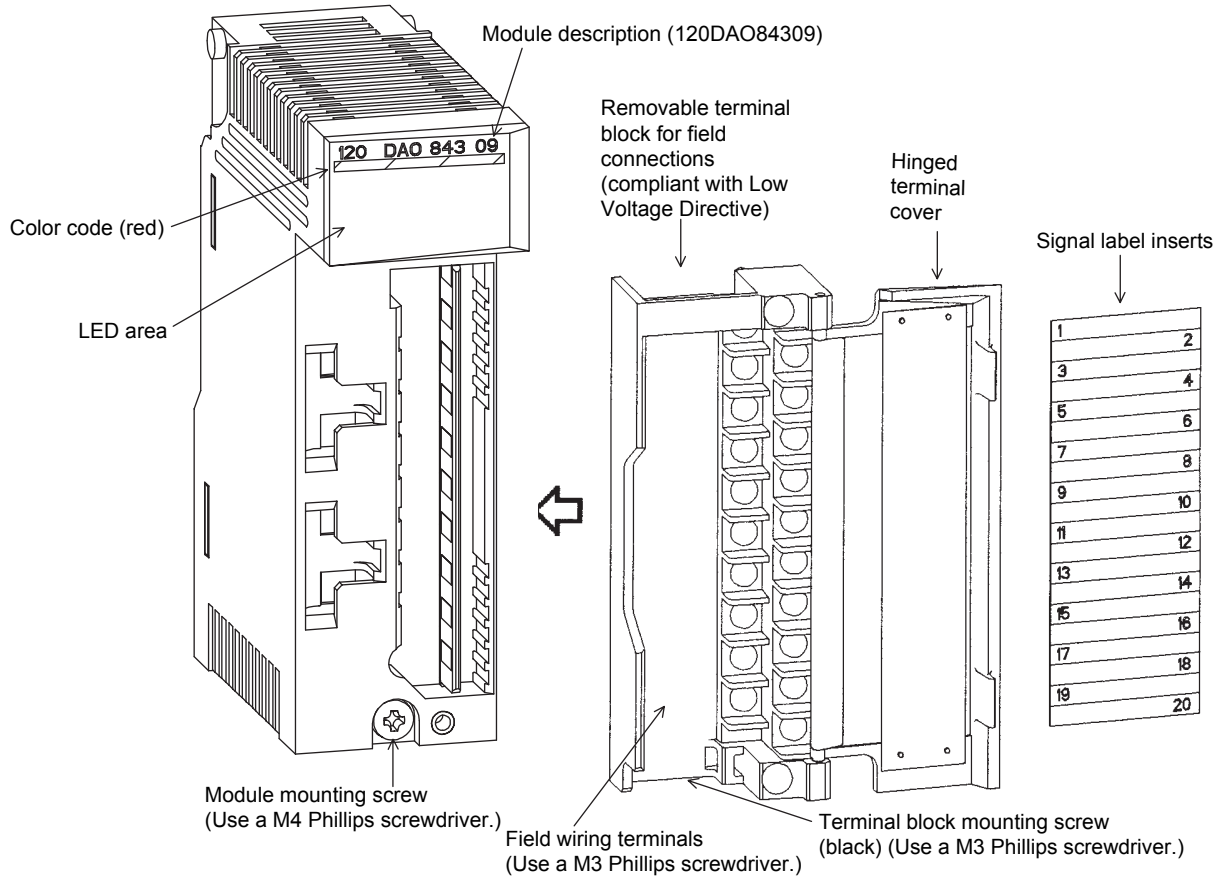
Model No.	Module Description
JAMSC-120DAI54309	120DAI54309
JAMSC-120DAI74309	120DAI74309

2) AC Output Module

100-to 120-VAC or 200-to 240-VAC 16-point Output Module
(JAMSC-120DAO84409)

100-to 120-VAC or 200-to 240-VAC 8-point Output Module
(JAMSC-120DAO83009)

Relay Contact 16-point Output Module (JAMSC-120DRA84309)



LED Area	
120 DAO 843 09	
ACTIVE	F
1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

LED	Color	Indication when ON
ACTIVE	Green	Processing I/O
F	Red	Fuse blown-out, or external power supply disconnected
1 to 16	Green	The corresponding LED is lit when the output signal is ON.

Note: The affixed model descriptions are as follows. The LED indicator “F” is provided only for the model JAMSC-120DAO84309.

Model No.	Module Description	“F” fuse LED
JAMSC-120DAO84309	120DAO84309	Required
JAMSC-120DAO84009	120DAO84009	Not required
JAMSC-120DRA84309	120DRA84309	Not required

8.1.3 EN Standards

The I/O Modules complies with the following EN Standards.

However, reconfirmation is required after being installed in the final product because these products are built-in type devices.

- EN61131-1
- EN61131-2

1) Differences from Standard Modules

The I/O Modules differ from the standard Modules in the following items.

- Removable terminal block

2) Conditions Low Voltage Directive

The following conditions must be satisfied to conform to the Low Voltage Directive.

a) Terminal block

- Use terminal blocks that are certified as the Low Voltage Directive compliant products.
- The terminal blocks of the I/O Modules complies with the Low Voltage Directive. To identify these terminal blocks, the shape of the field wiring terminals and the color of the terminal block mounting screws are different from standard terminal blocks as shown in the following table.

Specifications	Standard Terminal Block	EN Standard Compliant Terminal Block
Shape of field wiring terminals	With square washers	With round washers
Color of screws	Silver (nickel plated)	Black

Note: For the field wiring terminals, make sure to use the terminal block provided with the product.
If other terminal blocks are used, the product does not comply with the Low Voltage Directive.



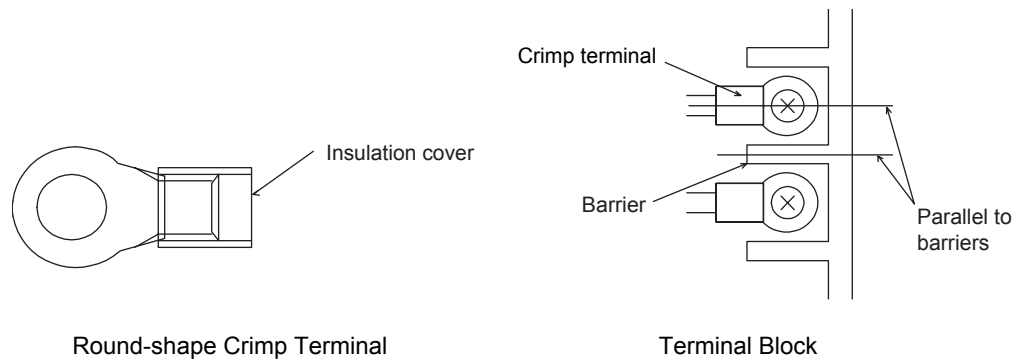
Low Voltage Directive

One of the requirements under the European Electrical Safety Regulations. It applies to the electrical equipment designed to operate in the voltage range 50 VAC to 1000 VAC or 75 VDC to 1500 VDC.

b) Connecting to Field Wiring Terminals

Make sure to use M3 crimp terminals (round shape) that are appropriate for the size of the wire. Put installation covers at each crimp when connecting to the field wiring terminals as shown in the following figure.

Make sure that the minimum clearance for air circulation is provided on both sides of each crimp terminal by checking that the terminals are parallel to the barriers between the terminals.



⚠ CAUTION

When connecting to field wiring terminals, always use round shape crimp terminals for M3 screws and mount insulation cover at each crimp.

If bare wire are used, an electric shock or a short-circuit if the wires become loose.

c) Protective Fuses

When the output modules are used, install fuses to the circuit to protect the output circuit. Use a fuse with a current rating of 2A or less, which meets the specifications described in IEC 1272 Sheet 2.

Recommended fuse: 217000 Series (manufactured by Littelfuse Inc.)

8.1.4 Specifications of the I/O Modules

This section describes the specifications of Low Voltage Directive compliant I/O Modules.

1) 100- to120-VAC 16-point Input Modules

Table 8.2 Specifications of 100- to120-VAC 16-point Input Modules

Item	Specifications
Name	100- to 120-VAC 16-point Input Module
Model Name	AC100IN-16P
Model No.	JAMSC-120DAI54309 (EN standard)
Rated Voltage	100 to 120 VAC
Maximum Allowable Voltage	132 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Inrush Current	160 mA
Rated Current	7 mA (at 100 VAC, 50 Hz)
Input Impedance	14.3 k Ω (at 100 VAC, 50 Hz) 12.5 k Ω (at 100 VAC, 60 Hz)
Standard Operating Ranges	ON voltage range: 74 to 132 VAC OFF voltage range: 30 VAC max.
Input Type	AC type 2 (according to IEC 1131-2)
Input Delay Times	OFF to ON: 20 ms max. ON to OFF: 35 ms max.
Number of Commons	2
Number of Inputs per Common	8 points/common
Input Power Supply per Common	Connect power supplies of the same phases to the common 1 and common 2.
External Connections	Removable terminal block with M3 screw terminals.
Number of Inputs	16
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic
Status Indication	ACTIVE: Lit during input processing
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min. or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measure by a 500-VDC test voltage megohmmeter)
External Power Supply	100 to 120 VAC supplied to signals
Derating Conditions	None
Internal Current Consumption	90 mA max. at 5 VDC (with all points ON)
Hot Swapping (Removal/insertion under power)	Permitted
Maximum Heating Value	2.0 W
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

2) 200- to 240-VAC 16-point Input Modules

Table 8.3 Specifications of 200- to 240-VAC 16-point Input Modules

Item	Specifications
Name	200- to 240-VAC 16-point Input Module
Model Name	AC200IN-16P
Model No.	JAMSC-120DAI74309 (EN standard)
Rated Voltage	200 to 240 VAC
Maximum Allowable Voltage	264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Inrush Current	320 mA
Rated Current	7 mA (at 200 VAC, 50 Hz)
Input Impedance	28.6 k Ω (at 200 VAC, 50 Hz) 23.1 k Ω (at 200 VAC, 60 Hz)
Standard Operating Ranges	ON voltage range: 159 to 264 VAC OFF voltage range: 40 VAC max.
Input Type	AC type 2 (according to IEC 1131-2)
Input Delay Times	OFF to ON: 20 ms max. ON to OFF: 35 ms max.
Number of Commons	2
Number of Inputs per Common	8 points/common
Input Power Supply per Common	Connect power supplies of the same phases to the common 1 and common 2.
External Connections	Removable terminal block with M3 screw terminals.
Number of Inputs	16
Input Signal Indication	Indicator for each point; lit when the input is ON. Status saved in internal logic
Status Indication	ACTIVE: Lit during input processing
Insulation Method	Photocoupler
Dielectric Strength	1,500 VAC for 1 min. or 1,800 VAC for 1 s between input terminals and internal circuits and between all input commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between input terminals and ground (measure by a 500-VDC test voltage megohmmeter)
External Power Supply	200 to 240 VAC supplied to signals
Derating Conditions	None
Internal Current Consumption	90 mA max. at 5 VDC (with all points ON)
Hot Swapping (Removal/insertion under power)	Permitted
Maximum Heating Value	3.5 W
Approximate Mass	250 g
External Dimensions	40.3×130×103.9 mm (W×H×D)

3) 100- to 120-VAC or 200- to 240-VAC 16-point Output Modules

Table 8.4 Specifications of 100- to 120-VAC or 200- to 240-VAC 16-point Output Modules

Item	Specifications
Name	100- to 120-VAC or 200- to 240-VAC 16-point Output Module
Model Name	ACOUT-16P
Model No.	JAMSC-120DAO84309 (EN standard)
Rated Voltage	100 to 120 VAC or 200 to 240 VAC
Allowable Voltage Range	80 to 264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Maximum Load Current	0.6 A rms/point, 2.4 A/common
Output Voltage Drop	1.0 V rms
Output Delay Times	OFF to ON: 5ms max. ON to OFF: 1/2 cycle + 5 ms max.
OFF Leakage Current	3 mA max. at 240 VAC, 50 Hz
Minimum Load Current	7 mA rms
Output Type	Triac outputs
Number of Commons	2
Number of Outputs per Common	8 points/common
Output Power Supply per Common	Connect power supplies of the same phases to the common 1 and common 2.
External Connections	Removable terminal block with M3 screw terminals.
Output Protection Type	Unprotected outputs (according to IEC 1131-2)
Built-in Fuse	Two (one per common) 5A-fuses (Burnout time: 2 min max. at 200% of rated current)
Surge Suppressor	Varistor
Other Output Protections	None
Number of Outputs	16
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic
Status Indication	ACTIVE: Lit during output processing F : Lit when a fuse is blown out or the output power supply is disconnected.
Insulation Method	Phototriac
Dielectric Strength	1,500 VAC for 1 min. or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measure by a 500-VDC test voltage megohmmeter)
External Power Supply	100 to 120 VAC or 200 to 240 VAC to drive loads
Derating Conditions	None
Internal Current Consumption	300 mA max. at 5 VDC (with all points ON)
Hot Swapping (Removal/insertion under power)	Permitted
Maximum Heating Value	5.5W
Approximate Mass	300g
External Dimensions	40.3×130×103.9 mm (W×H×D)

4) 100- to 120-VAC or 200- to 240-VAC 8-point Output Modules

Table 8.5 Specifications of 100- to 120-VAC or 200- to 240-VAC 8-point Output Modules

Item	Specifications
Name	100- to 120-VAC or 200- to 240-VAC 8-point Output Module
Model Name	ACOUT-8P
Model No.	JAMSC-120DAO83009 (EN standard)
Rated Voltage	100 to 120 VAC or 200 to 240 VAC
Allowable Voltage Range	80 to 264 VAC
Rated Frequency	50/60 Hz
Allowable Frequency Range	47 to 63 Hz
Maximum Load Current	1.0 A rms/point
Output Voltage Drop	1.0 V rms
Output Delay Times	OFF to ON: 5ms max. ON to OFF: 1/2 cycle + 5 ms max.
OFF Leakage Current	3 mA max. at 240 VAC, 50 Hz
Minimum Load Current	10 mA rms
Output Type	Triac outputs
Number of Commons	8 (Each output circuit is independent.)
Output Power Supply per Common	Different phase power supplies can be connected to the commons.
External Connections	Removable terminal block with M3 screw terminals.
Output Protection Type	Unprotected outputs (according to IEC 1131-2)
Built-in Fuse	None
Surge Suppressor	Varistor
Other Output Protections	None
Number of Outputs	8
Output Signal Indication	Indicator for each point; lit when the output is ON. Status saved in internal logic
Status Indication	ACTIVE: Lit during output processing
Insulation Method	Phototriac
Dielectric Strength	1,500 VAC for 1 min. or 1,800 VAC for 1 s between output terminals and internal circuits and between all output circuits.
Insulation Resistance	100 M Ω min. at room temperature and humidity between output terminals and ground (measure by a 500-VDC test voltage megohmmeter)
External Power Supply	100 to 120 VAC or 200 to 240 VAC to drive loads
Derating Conditions	None
Internal Current Consumption	150 mA max. at 5 VDC (with all points ON)
Hot Swapping (Removal/insertion under power)	Permitted
Maximum Heating Value	9.0W
Approximate Mass	300g
External Dimensions	40.3×130×103.9 mm (W×H×D)

5) Relay Contact 16-point Output Modules

Table 8.6 Specifications of Relay Contact 16-point Output Modules

Item		Specification	
Name		Relay Contact 16-point Output Module	
Model Name		RELAY-16P	
Model No.		JAMSC-120DRA84309 (EN standard)	
Contact Specifications	Rated Voltage/Current	240 VAC, 1 A, resistive load 24 VDC, 1 A, resistive load	
	Maximum Load Power	750 VA (AC loads) 90 W (DC loads)	
	Maximum Load Voltage	264 VAC/125 VDC	
	Minimum Load Voltage/Current	100 mVDC, 0.1 mA	
	Contact Resistance	100 mΩ max.	
	Contact Life	Electrical	3 A at 30 VDC, resistive load: 100,000 operations min.
			1 A at 30 VDC, resistive load: 300,000 operations min. $\tau = 7$ ms: 150,000 operations min. $\tau = 40$ ms: 40,000 operations min.
			1 A at 120 VAC, $\cos\phi = 1.0$: 400,000 operations min. $\cos\phi = 0.4$: 250,000 operations min.
			1 A at 240 VAC, $\cos\phi = 1.0$: 300,000 operations min. $\cos\phi = 0.4$: 200,000 operations min.
		Mechanical	20 million operations min.
Output Delay Times		OFF to ON: 10 ms max. ON to OFF: 15 ms max.	
Output Type		Relay contact outputs	
Number of Commons		2	
Number of Outputs per Common		8 points/common	
Output Power Supply per Common		a) When using an AC power supply (100 to 120 VAC or 200 to 240 VAC), connect Power supplies with the same phase to the common 1 and common 2. b) Do not connect AC power supply and DC power supply to one common.	
External Connections		Removable terminal block with M3 screw terminals	
Output Protection Type		Unprotected outputs (according to IEC1131-2)	
Built-in Fuse		None	
Surge Suppressor		None	
Other Output Protection		None	
Number of Outputs		16	
Output Signal Indication		Indicator for each point; lit when the output is ON. Status saved in internal logic.	
Status Indication		ACTIVE: Lit during output processing	
Insulation Method		Relay	
Dielectric Strength		1,500 VAC for 1 min or 1,800 VAC for 1 s between output terminals and internal circuits and between all output commons	
Insulation Resistance		100 MΩ min. at room temperature and humidity between output terminals and ground (measured by a 500-VDC test voltage megohmmeter)	
External Power Supply		100 to 120-VAC or 200 to 240-VAC or 24 VDC supplied to drive loads	
Derating Conditions		None	

Table 8.6 Specifications of Relay Contact 16-point Output Modules

Item	Specification
Internal Current Consumption	610 mA at 5 VDC (with all points ON)
Hot Swapping (Removal/insertion under power)	Permitted
Maximum Heating Value	3.1 W
Approximate Mass	300 g
External Dimensions	40.3 × 130 × 103.9 mm (W × H × D)

Appendix **A**

External Dimensions

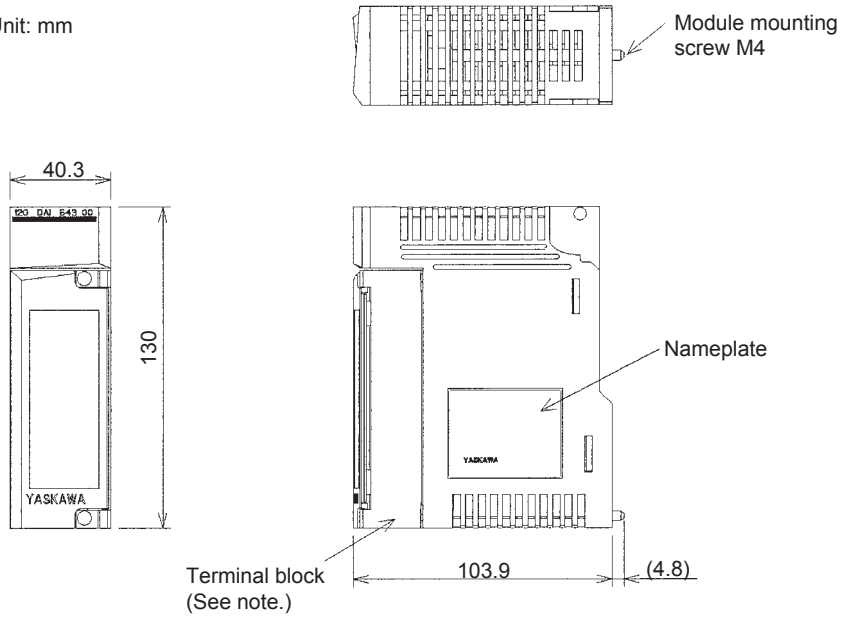
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A.3 DC 32-point I/O Modules	A-3
A.4 DC 64-point I/O Modules	A-4
A.5 Register I/O Modules	A-4

A.1 I/O Module Types

	Approx. Mass (g)	External Connection
1) Digital Input Modules		
• 100-VAC 16-point Input Module: Model No. JAMSC-120DAI54300	250	Terminal block
• 200-VAC 16-point Input Module: Model No. JAMSC-120DAI74300	250	Terminal block
• 12/24-VDC 16-point Input Module: Model No. JAMSC-120DDI34300	250	Terminal block
• 12/24-VDC 32-point Input Module: Model No. JAMSC-120DDI35400	250	Connector
• 12/24-VDC 64-point Input Module: Model No. JAMSC-120DDI36400	300	Connector
2) Analog input Modules		
• Analog Input Module ($\pm 10V$, 4 channels): Model No. JAMSC-120AVI02000	300	Terminal block
• Analog Input Module (0 to 10V, 4 channels): Model No. JAMSC-120AVI02100	300	Terminal block
• Analog Input Module (4 to 20mA, 4 channels): Model No. JAMSC-120ACI02000	300	Terminal block
3) Digital Output Modules		
• 100/200-VAC 8-point Output Module: Model No. JAMSC-120DAO83000	300	Terminal block
• 100/200-VAC 16-point Output Module: Model No. JAMSC-120DAO84300	300	Terminal block
• 12/24-VDC 8-point Output Module: Model No. JAMSC-120DDO33000	250	Terminal block
• 12/24-VDC 16-point Output Module (sinking): Model No. JAMSC-120DDO34310	250	Terminal block
• 12/24-VDC 16-point Output Module (sourcing): Model No. JAMSC-120DDO34320	250	Terminal block
• 12/24-VDC 32-point Output Module (sinking): Model No. JAMSC-120DDO35410	250	Connector
• 12/24-VDC 64-point Output Module (sinking): Model No. JAMSC-120DDO36410	300	Connector
• Relay Contact 16-point Output Module: Model No. JAMSC-120DRA84300	300	Terminal block
4) Analog Output Modules		
• Analog Output Module ($\pm 10V$, 2 channels): Model No. JAMSC-120AVO01000	350	Terminal block
• Analog Output Module (0 to 10V, 2 channels): Model No. JAMSC-120AVO01100	350	Terminal block
• Analog Output Module (0 to 5V, 2 channels): Model No. JAMSC-120AVO01200	350	Terminal block
• Analog Output Module (4 to 20mA, 2 channels): Model No. JAMSC-120ACO01000	350	Terminal block

A.2 I/O Modules with Terminal Blocks

Unit: mm

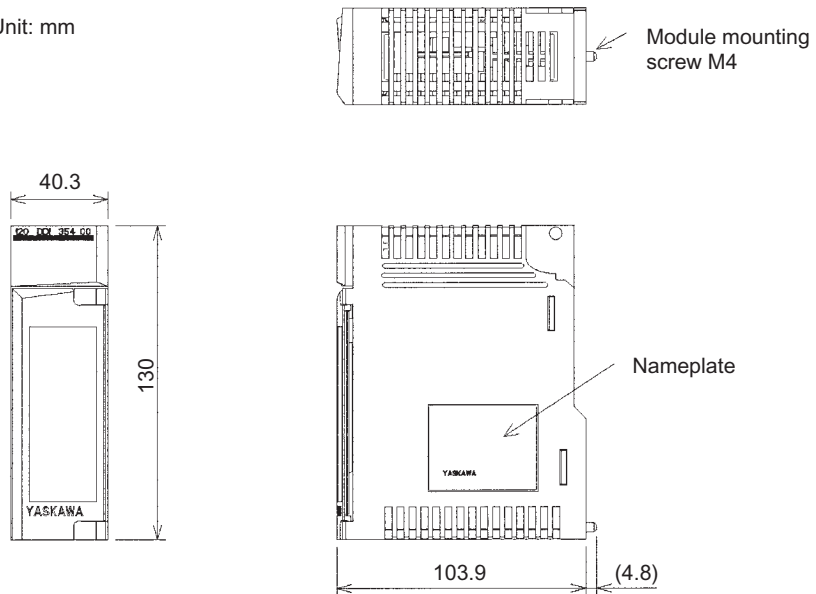


Note Terminal block comes as accessory.

A.3 DC 32-point I/O Modules

- 1) 12/24-VDC 32-point Input Module: Model No. JAMSC-120DDI35400
- 12/24-VDC 32-point Output Module: Model No. JAMSC-120DDO35410

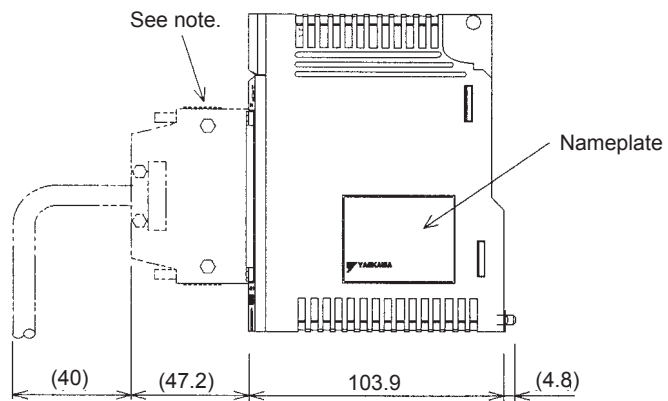
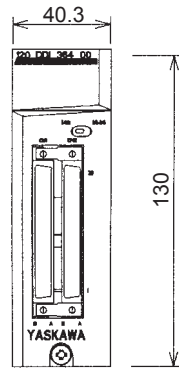
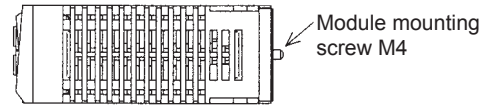
Unit: mm



A.4 DC 64-point I/O Modules

- 1) 12/24-VDC 64-point Input Module: Model No. JAMSC-120DDI36400
 12/24-VDC 64-point Output Module: Model No. JAMSC-120DDO36410

Unit: mm
 Mass: approx. 300 g

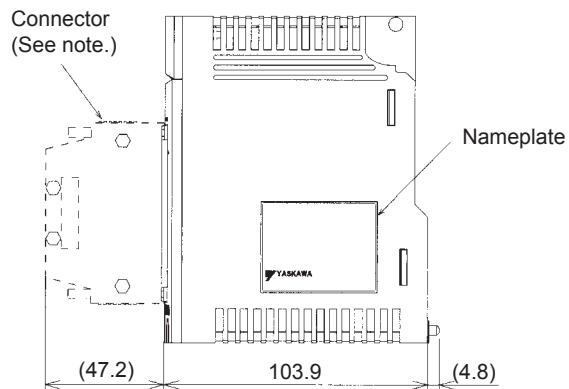
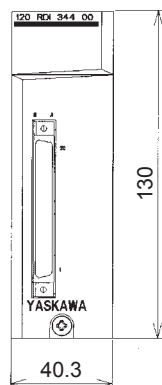
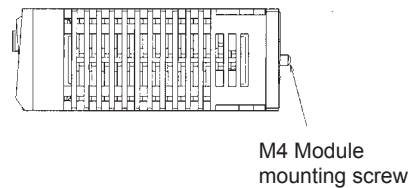


Note Connector and cover come as accessory.
 Connector: FCN-361J040-AU (Fujitsu)
 Cover: FCN-360C040-B (Fujitsu)

A.5 Register I/O Modules

- 1) Register Input Module: Model No. JAMSC-120RDI34410
 Register Output Module: Model No. JAMSC-120RDO34410

Unit: mm
 Mass: Approx. 300 g



Note Connector and cover come as accessory.
 Connector: FCN-361J040-AU (Fujitsu)
 Cover: FCN-360C040-B (Fujitsu)

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