SHARP®

Ver.1.0
Produced in Jan. 1998

VME built-in controller

Model name

JW-32CV1
JW-32CV2

Instruction Manual

We thank you for your purchase of the SHARP built-in controller JW-32CV1/32CV2.
Carefully read this instruction manual so that having thoroughly familiarized yourself with the functions and their operation method.
We are confident that these booklets will be helpful whenever you face problem.

Note

- This module is made in accordance with Japanese domestic specifications. Its guarantee clauses are described in a separate guarantee card (packed together with the module). When this module is used outside Japan, these guarantee clauses are not applicable. In addition, the guarantee should be understood as a guarantee of the delivered product as a single unit and every other damages or losses due to damage or malfunction of the product will not be included in this guarantee.
- Should you have any questions and inquiries, please feel free to contact our dealers.
- The whole or partial photocopy of this booklet is prohibited.
- Contents of this booklet may be revised for improvement without notice.

Table of contents

Safety precautions 1
Chapter 1 Outline 3
Chapter 2 Precautions for use 4
Chapter 3 System configuration 5
3-1 System configuration 5
3-2 System configuration using communication 6
[1] Communication system using communication port 6
[2] Communication system using the satellite I/O link function 7
[3] Communication system using the data link function 7
3-3 Cautions on system design 10
Chapter 4 Name and function of each part 11
Chapter 5 Installation method 12
Chapter 6 Wiring 13
6-1 Wire connections for the halt output and ground 13
6-2 Wiring for satellite I/O link, data link (JW-32CV2) 14
[1] Wiring for satellite I/O link 14
[2] Wiring for data link 14
6-3 Wiring for communication port 17
[1] Pin arrangement of PG/COMM1 port, PG/COMM2 port 17
[2] Wiring figure 18
Chapter 7 How to use 19
7-1 Switch setting 19
[1] Switch setting of JW-32CV1 19
[2] Switch setting of JW-32CV2 20
7-2 Memory map 29
[1] Relationship between this module's memory and the VME master memory 29
[2] PC section memory 30
7-3 Access method of dual port RAM 31
[1] Data transfer using a ladder program indirect assignment instruction 31
[2] Data transfer by area assignment 33
7-4 Operation check of the VME master and the JW-32CV1/32CV2 35
[1] To use this module to check the VME master operation. 35
[2] To check the operation of the module with the VME master 35
7-5 Allocation of I/O address 36
Chapter 8 Troubleshooting and maintenance 38
[1] Troubleshooting 38
[2] Self-diagnostic function 38
[3] Exchange method of batteries 39
Chapter 9 Specifications 40
[1] General specifications 40
[2] PC section performance specifications 41
[3] Interface specifications 42

Safety precautions

Read this manual and attached documents carefully before installation, operation, maintenance and checking in order to use the machine correctly. Understand all of the machine knowledge, safety information, and cautions before starting to use. In this instruction manual, safety precautions are ranked into “danger” and “caution” as follows.

Danger : Wrong handling may possibly lead to death or heavy injury.

Caution : Wrong handling may possibly lead to medium or light injury.

Even in the case of Caution, a serious result may be experienced depending on the circumstances. Anyway, important points are mentioned. Be sure to observe them strictly.

The picture signs of prohibit and compel are explained below.

: It means don’ts. For example, prohibition of disassembly is indicated as ( ).

: It means a must. For example, obligation of grounding is indicated as ( ).

1) Installation

Caution

- Use in the environments specified in the catalog and instruction manual.
  Electric shock, fire or malfunction may be caused when used in the environments of high temperature, high humidity, dusty or corrosive atmosphere, vibration or impact.
- Install according to the manual.
  Wrong installation may cause drop, trouble or malfunction.
- Never admit wire chips or foreign matter.
  Or fire, trouble or malfunction may be caused.

2) Wiring

Compel

- Be sure to ground.
  Unless grounded, electric shock or malfunction may be caused.

Caution

- Connect the rated power source.
  Connection of a wrong power source may cause a fire.
- Wiring should be done by qualified electrician.
  Wrong wiring may lead to fire, trouble or electric shock.

3) Use

⚠ Danger

- Don't touch the terminal while the power is being supplied or you may have on electric shock.
- Assemble the emergency stop circuit and interlock circuit outside of the JW-32CV1/32CV2. Otherwise breakdown or accident damage of the machine may be caused by the trouble of the JW-32CV1/32CV2.

⚠ Caution

- "Run" or "stop" during operation should be done with particular care by confirming safety. Misoperation may lead to damage or accident of the machine.
- Turn ON the power source in the specified sequence. Turn ON with wrong sequence may lead to machine breakdown or accident.

4) Maintenance

⚠ Danger

- Never connect battery in wrong polarity, or charge, disassemble, heat, throw into fire, or short-circuit. Or it may be broken or ignited.
- Do not subject the battery to impact of any kind. Do not pull on the lead wires of the battery, or liquid leakage accident may occur.

Prohibit

- Don't disassemble or modify the modules.
  Or fire, breakdown or malfunction may be caused.

⚠ Caution

- Turn OFF the power source of VME rack panel before detaching or attaching the JW-32CV1/32CV2. Or electric shock, malfunction or breakdown may be caused.

Chapter 1 Outline

The JW-32CV1/32CV2 VME built-in controller (hereafter referred to as "the module") can be connected directly to the VME bus by installing it in a VME slot. This is a high performance programmable controller (hereafter referred to as a "PC"). It can easily create a data interface to a VME master through its dual port RAM.
Its PC section is based on a CPU core which is equivalent to Sharp's JW30H series PC control module JW-32CUH1, and offers super high speed PC operation.
With variety of interfaces equivalent to the JW30H series PC (I/O bus, communication port, I/O link, and data link), it can easily be integrated into a system together with other PCs, LCD control terminals, and host computers.

[JW-32CV1/32CV2 function]

Item		Contents	
		JW-32CV1	JW-32CV2
Maximum number of input/output points		1024 points	
Program capacity		31.5 K words	
Data memory	Register*	25 K bytes	
	File memory	32 K bytes (file 2)	
Clock function		Standard	
Communication port data transfer rate		115200/57600/38400/19200/9600/4800/2400/1200 bits/s	
Instruction processing speed		Basic instruction: 0.038 μs Transfer instructions (F-00): 1.22 μs	
Number of modules on a single expansion rack panel		3 modules maximum	
Total I/O expansion cable distance		14 m maximum	
Satellite I/O link (functionally equivalent to the JW-23LMH)		None	Yes
Data link (functionally equivalent to the JW-21CM)			

*The general registers include a register (16K bytes) for file 1 which can use application instructions to directly assign addresses.

· The JW-32CV2 has both a satellite I/O link function and a data link function. However, the JW-32CV1 does not have these functions.

[Other reference manuals]

This manual describes the installation method, wiring method, switch settings, memory map, and specifications of the module. For details about its use and other settings, see the instruction manuals listed below.

· PC functions ⇒ See the description for the JW-32CUH1 functions (program capacity: 31.5 K words, file 2 capacity: 32 K bytes) in the "JW30H user's manual - hardware version" and the "JW30H programming manual - ladder instruction version."
· Satellite I/O link functions ⇒ See the description for the JW-23LMH functions in the "JW-23LMH user's manual."
· Data link functions (remote I/O, DL1 data link, DL9 data link, computer link)
⇒ See the description for the JW-21CM in the "JW-21CM user's manual."
· Data link functions (M net communication) ⇒ See the "M net user's manual."

Chapter 2 Precautions for use

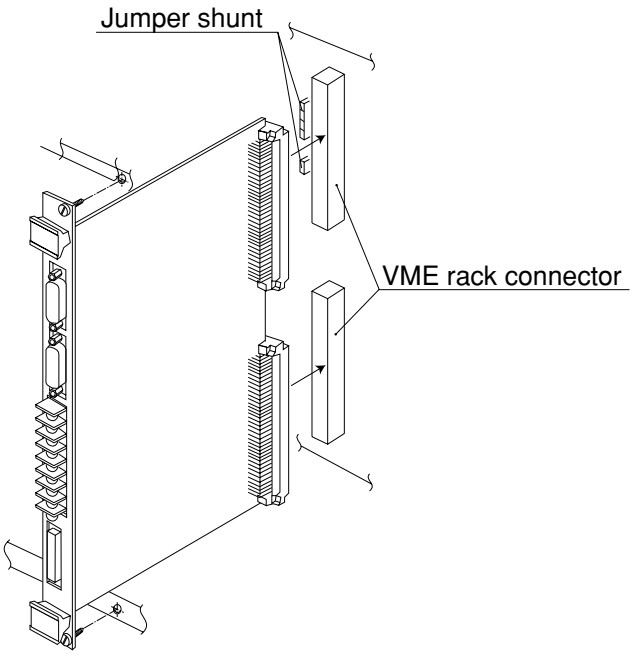
Pay attention to the following items when installing or using the module.

(1) Handling

· Do not install or store the module in places that are subject to direct sunlight, rapid temperature variation, high humidity, dust, strong magnetic fields, vibration, or strong shocks.
· In order to protect the LSIs and ICs inside the module from damage by static electricity, cover the modules with anti-static conductive sheets to transport or store them.
· Make sure to turn OFF the power, before changing the jumper shunts on the module.
· If you set up a separate power supply for the module, make sure the power it supplies has a low output impedance with very low ripple and noise characteristics.

(2) Installation and removal of the module

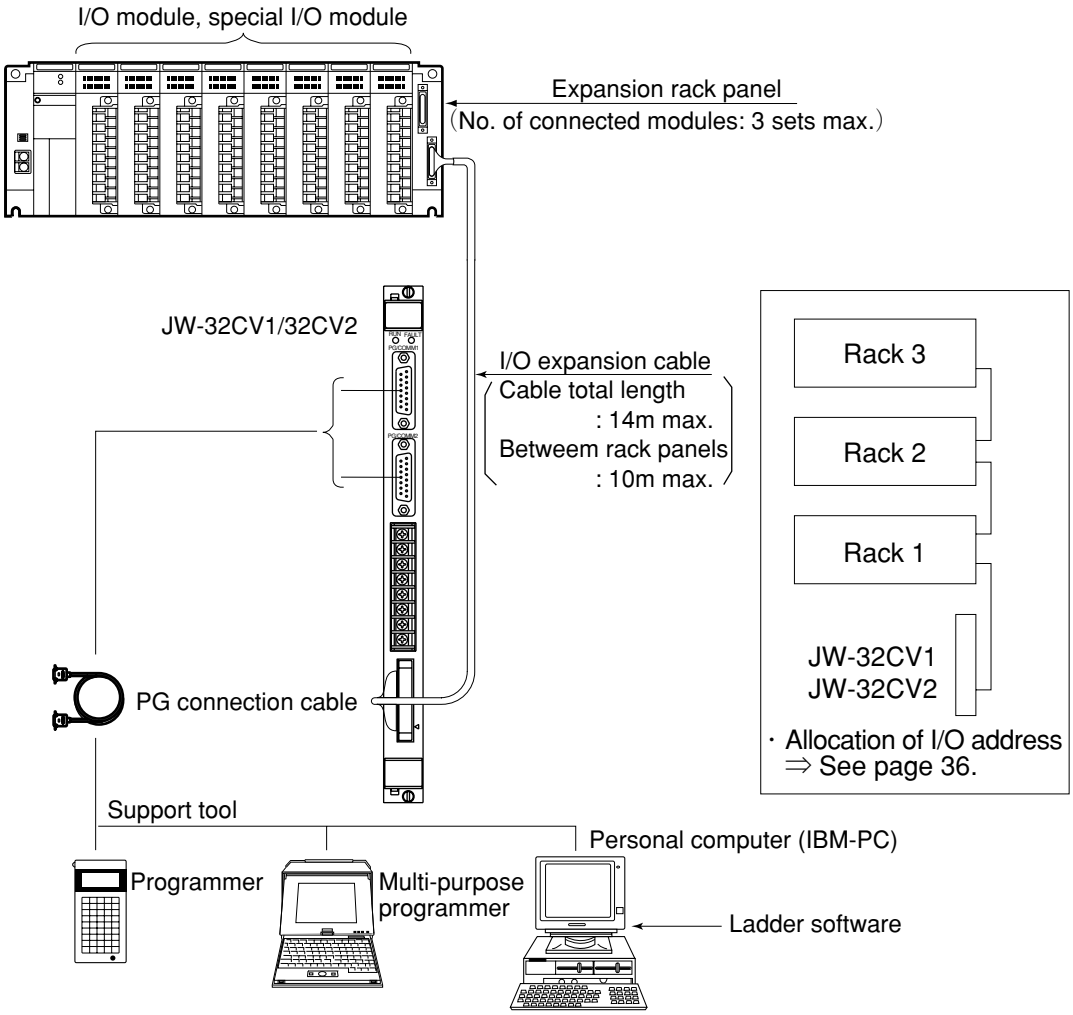
· Make sure to turn OFF the power before installing or removing the module.
· If you install the module on a VME bus (install the module in the 2nd or lower slots of the VME bus back plane), make sure to remove the respective jumper shunt on the VME bus back plane.
1. Check the setting of the jumpers on the module.
2. Turn OFF the VME system power, and remove all the jumper shunts on the respective VME back plane position where the module is installed.
3. Connect all necessary connectors before turning ON the power.
4. Turn ON the power to the system and check the operation of each module.



· To install or remove the module in a VME rack, push it straight in or pull it straight out in order not to make contact with other modules in the adjacent slots. (See page 12)
· If the module does not function after installation, the jumper shunt for the module on the VME back plane may not have been removed (or some other jumper shunt was removed), or the module may not be set appropriately. Be careful. If the module is not set appropriately, it may malfunction.
· Make sure to disconnect both the module halt output signal lines before removing the module from the slot. If you want to remove another module next to this module, you should also disconnect the power to the halt output signal of the module. (See page 12)

Chapter 3 System configuration

3-1 System configuration

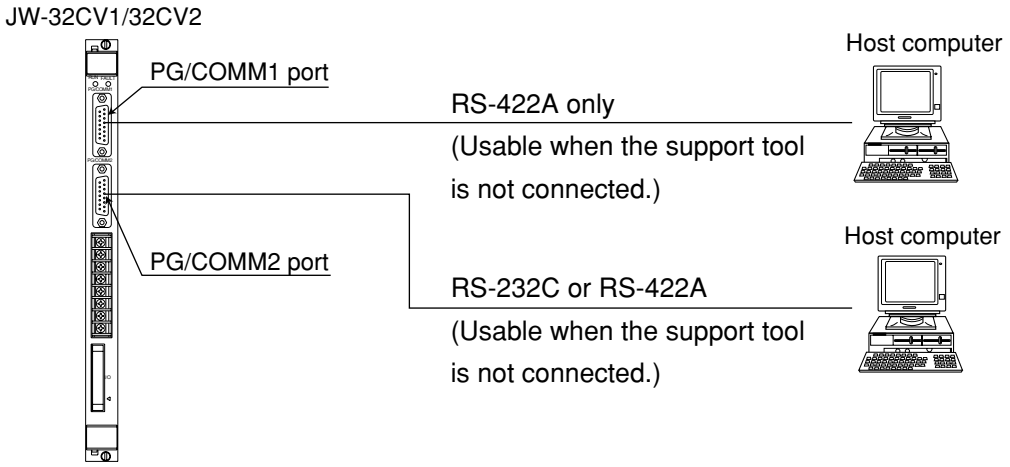


Number of modules on a single expansion rack panel (maximum number of racks)	3 modules maximum (3 racks maximum) · The module can be connected to JW-34ZB/36ZB/38ZB expansion rack panel for the JW20H/30H. (An I/O bus extension adapter cannot be used.)
Number of input/output and special I/O modules	A total of 24 modules can be installed on racks 1 through 3. · I/O modules and special I/O modules for the JW20H/30H can be installed, but the option module cannot be used.
Total cable extension length	14 m maximum (10 m maximum between any two basic rack panels) · A JW-203EC/207EC/22EC/25EC/210EC I/O expansion cable for the JW20H/30H can be used to connect rack panels.

3-2 System configuration using communication

[1] Communication system using communication port

By using a communication port of the module, the JW-32CV1/32CV2 can communicate with a host computer such as a personal computer and a LCD control terminal.
JW-32CV1/32CV2 have 2 ports (PG/COMM1,PG/COMM2) for communication port.



Item	Specifications	
	RS-232C connection	RS-422A connection
Number of connected modules of JW-32CV1/32CV2	1 sets (1: 1 connection)	31 sets max. (1: N connection) *1
Communication cable	Shielded cable 15 m max.	Shielded twisted pair cable Cable total length: 1 km max. 4-wire system *2 (Party line connection)
Transfer speed	115200/57600/38400/19200/9600/4800/2400/1200 bits/s	
Data formats	Start bit : 1 bits Data length : 7 bits Parity bit : 1 bit (odd/even/none) Stop bit : 1/2 bits	
Used characters	ASCII alphanumerical characters	

*1 To obtain data transfer speeds higher than 38400 bit/s, the JW-32CV1 must be connected directly to a host computer.

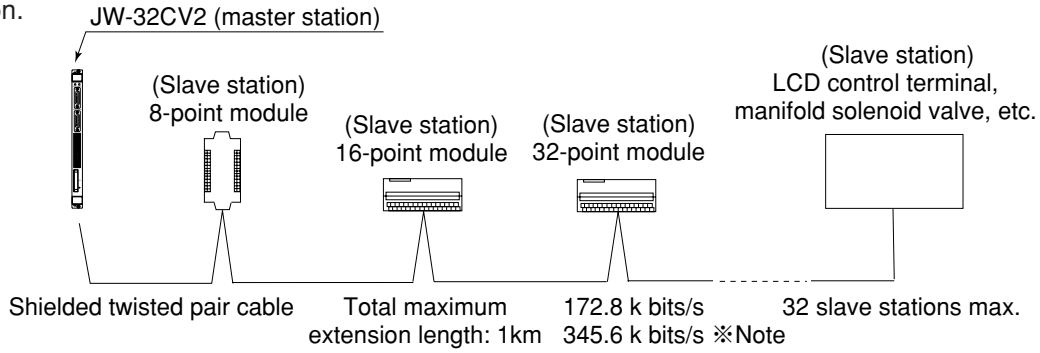
*2 Two-wire system communications are not possible.

The use of the communication port, such as for setting system memory, is the same as for the JW-32CHU1.

⇒ See “JW30H user’s manual hardware version.”

[2] Communication system using the satellite I/O link function

The system can communicate between a JW-32CV2 as an I/O link master station and an I/O link slave station.



Note: The communication speed of 345.6 k bits can be achieved only when in communication with high speed type slave module as follows:

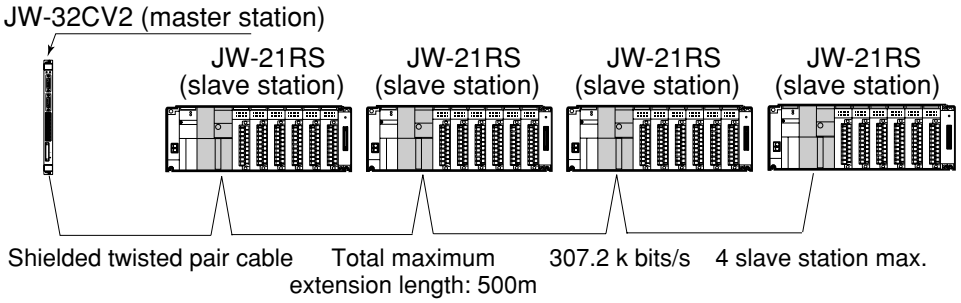
Item	Specifications
Model name of slave station	8-point module : ZW-82N (input), ZW-82S (output) 16-point module : ZW-161N/162N (input), ZW-161S/162S/164S (output), ZW-162M (I/O) 16-point module (high speed type) : ZW-164NH (input), ZW-162SH (output), ZW-162MH (I/O) 32-point module (high speed type) : ZW-324NH (input), ZW-322SH (output), ZW-322MH (I/O) 8-point module (sensor connector system, high speed type) : ZW-84NC (input) 16-point module (sensor connector system, high speed type) : ZW-162MC (I/O) LCD control terminal: Z-SM10
No. of slave station connected	32 sets max.
No. of I/O link points	504 points max.

[3] Communication system using the data link function

By toggling switch SW10, you can set the JW-32CV2 to function as a remote I/O master station, a DL1 data link (N: M system), a DL9 data link (1: N system), a computer link, or a M net communication device. With this selection, you can use any one communication system and the satellite I/O link function [2].

(1) Remote I/O master station

The system can communicate between a JW-32CV2 as remote I/O master station and a JW series module as remote I/O slave station.

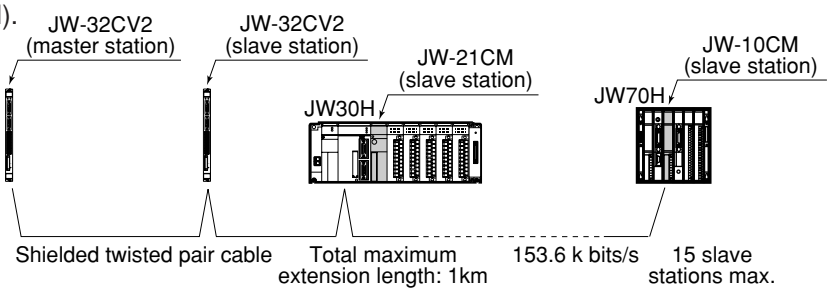


Item	Specifications
Model name of slave station (PC)	JW-21RS (JW20H, JW30H)
No. of slave stations connected	4 sets max.
No. of remote I/O points	Total points: 512 (64 bytes)
No. of I/O points per station	128 points (16 bytes)
No. of special I/O modules mounted on a JW-21RS	8 max. (total of 4 slave stations)

(2) DL1 data link

The system communicates between the JW30H and JW series PC through the JW-32CV2 as a master or a slave station.

This link offers communication between a master and a slave station, or between 2 slave stations. (N: M method).

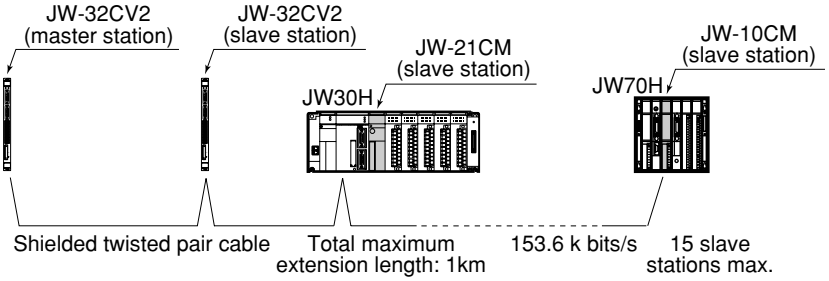


Item	Specifications
Model name of master/slave station (PC)	JW-32CV2 JW-21CM (JW20H, JW30H) JW-10CM (W70H/100H, JW50H/70H/100H) Z-331J/332J (J-board)
No. of modules connected	16 sets max. (including master station)
No. of link bytes	Total 64 bytes (512 points)
No. of link bytes per station	· Divided equally according to the number of slave stations when a JW-32CV2, JW-21CM, or a Z-331J/332J is used as master station. (1 station: 32 bytes, 2 or 3 stations: 16 bytes each, 4 to 7 stations: 8 bytes each, and 8 to 15 stations: 4 bytes each.) · When master station is other than JW-32CV2, JW-21CM, or Z-331J/332J, total of max. 64 bytes will be allocated.

(3) DL9 data link

The system communicates between the JW30H and JW series PC through the JW-32CV2 as a master or a slave station.

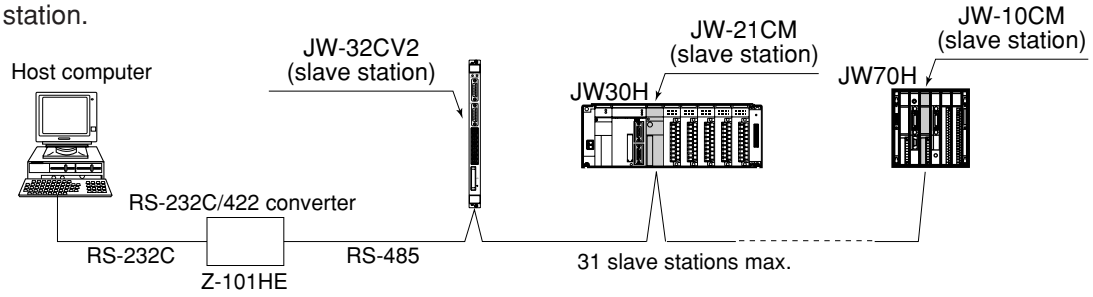
This link offers communication between a master and a slave station. It cannot perform communication between 2 slave stations (1: N method).



Item	Specifications
Model name of master/slave station (PC)	JW-32CV2 JW-21CM (JW20H, JW30H) JW-10CM (W70H/100H, JW50H/70H/100H) Z-331J/332J (J-board)
No. of slave stations connected	15 sets max.
No. of link bytes	· Select from 512/256/128/64 bytes when a master station is a JW-32CV2, JW-21CM, or Z-331J/332J. · When master station is other than JW-21CM, or Z-331J/332J, total of max. 512 bytes will be allocated.
No. of link bytes per station	· Divided equally according to the number of slave stations when a JW-32CV2, JW-21CM or a Z-331J/332J is used as master station. (1or 2 stations: 128 bytes, 3 or 4 stations: 64 bytes each, 5 to 8 stations: 32 bytes each, and 9 to 16 stations: 16 bytes each.) · When master station is other than JW-32CV2, JW-21CM, or Z-331J/332J, total of max. 127 bytes will be allocated.

(4) Computer link

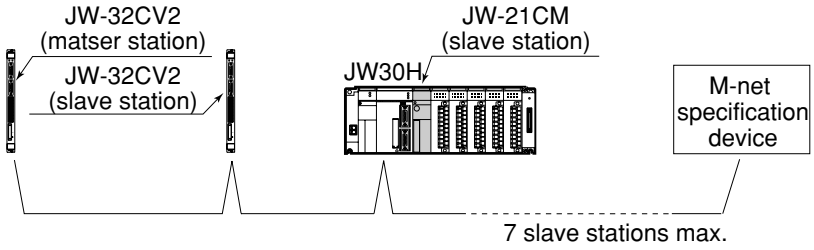
The link offers communication between a host computer as a master station and a JW-32CV2 as a slave station.



Item	Specifications
Model name of slave stations (PC)	JW-32CV2, JW-21CM (JW20H, JW30H), Z-331J/332J (J-board), JW-10CM (W70H/100H, JW50H/70H/100H)
No. of slave stations connected	31 sets max. (1: N connection)
Communication cable	A shielded twisted pair cable. Cable total length: 1 km. 2-wire system.
Transfer speed	19200/9600/4800/2400/1200/600/300 bits/s
Data formats	Start bit : 1 bit Data length : 7 bits Parity bit : 1 bit (odd/even) Stop bit : 2 bits
Used characters	ASCII alphanumeric characters

(5) M net communication

With M net communication, automatic control facility equipment for production (such as a PC or robot controller) controls the data sent and received between a master station and slave station. This system cannot be used to communicate directly between slave stations.



Item	Specifications	
Master station and slave stations	Equipment M net specifications (When using Sharp PC series controllers) · Models which can be used as master and slave stations JW-32CV2, JW-21CM (JW20H, JW30H) JW-10CM (W70H/100H, JW50H/70H/100H), Z-331J/332J (J-board) · Models which can be used as slave stations. ZW-82N/82S, ZW-161N/162N/161S/162S/164S/162M, ZW-84NC/162MC ZW-164NH/162SH/162MH, ZW-324NH/322SH/322MH	
Number of stations that can be connected	8 stations maximum (1 master and 7 slave stations)	Same as on the left
Number of linke points connectable	512 points maximum (a total of 64 bytes for sending and receiving)	256 points maximum (32 bytes)
Transfer speed	19.2 k bits/s, 38.4 k bits/s	19.2 k bits/s
Data transfer specifications	Equivalent to M net specifications	———
Communication cable	Cable total length 1 km maximum	Cable total length 100 m maximum
Communication method	Half-duplex system	Same as on the left

Sharp PC specifications (master station) | Standard M net system specifications (reference)

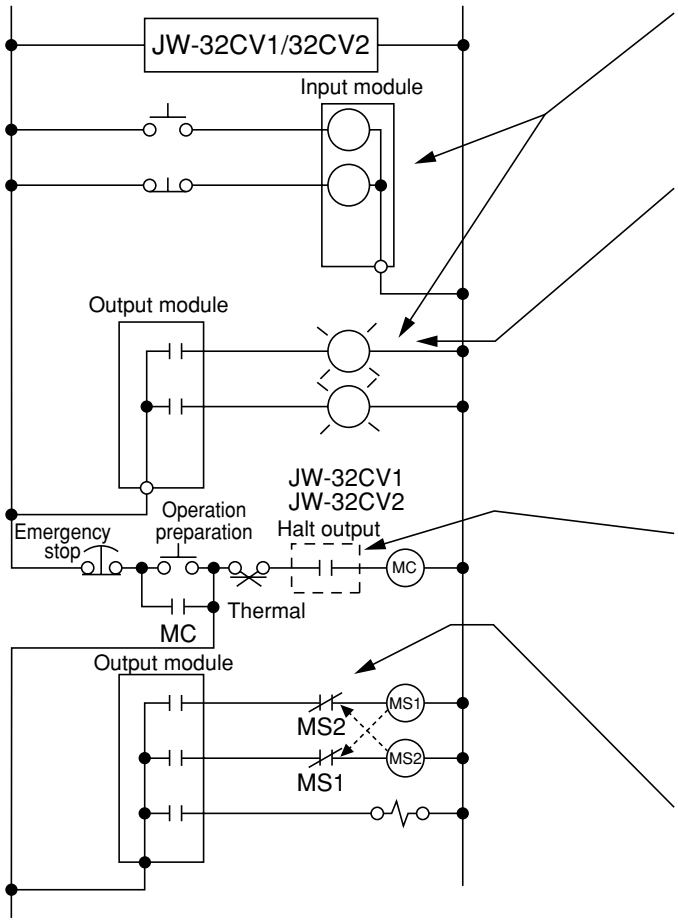
· M net is a system equivalent to an “interface standard between stations” for creating a data link between a PC and other devices.

3-3 Cautions on system design

A principle difference between a programmable controller (PC) and a conventional relay circuit is that a PC controls each operation cyclically (in series), whereas relay circuit controls it in parallel.
Therefore, relay circuits limit the effect of an abnormal operation to a block.
However, a PC allows abnormal operations of the whole system when an abnormal condition occur.
In order to create a fail-safe system, we recommend preparing independent external protective circuits for following functions, which may cause a breakdown of machine or injury to workers:

- Emergency stop circuit,
- Protection circuit,
- Operating circuit of high voltage device.

Also, be aware of the operation response time, as a PC operates using cyclic processing.
To prevent mis-operation due to output signal of the output module soon after switching on power to the JW-32CV1/32CV2, connect in series the halt output for the JW-32CV1/32CV2 in the following operation stand-by circuit.



· Connecting the input module and output module for lighting lamps in front of emergency stop circuit makes it possible to grasp the stop condition of devices.

· When the JW-32CV1/32CV2 stops its operation, all the output module indicate ON/OFF condition just before stopping.

Note: When setting an output holding address in the system memory, all the output after the setting address is retained and you can reset the previously set address. (only available when power is supplied to the JW-32CV1/32CV2.)

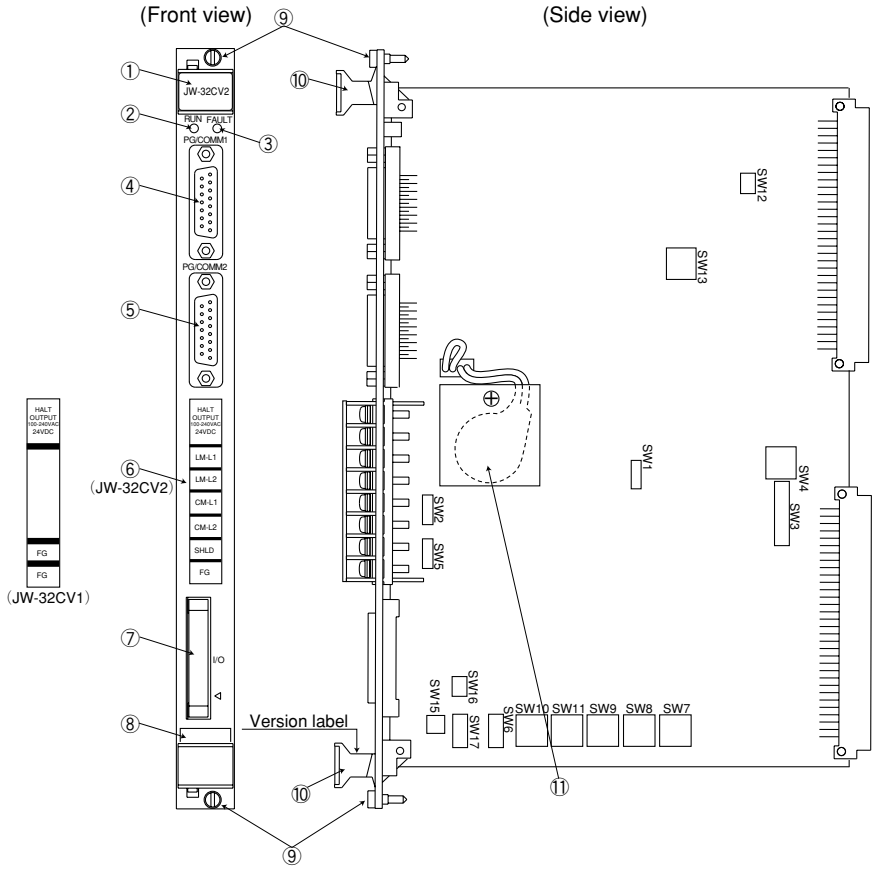
· Halt output
An output which opens when the CPU has an error (internal watch dog timer times out) or is halted.

[Relay output (normally closed, opens on error/halt)
Maximum load: 1 A/30 VDC, 250 VAC]

· Interlock circuit
Prepare external interlock circuit to prevent reverse operation, damage of machines and injury of workers.

Note: When DC output module is used as a output module, use AC relay and install its contact in the emergency stop circuit.

Chapter 4 Name and function of each part



• SW1 to 13, SW15 to 17 are switches. (JW-32CV1 uses SW1/12/13/15 only.)
For setting contents of switch, see “7-1 Switch setting.”

	Name	Function
①	Model name label	JW-32CV1 or JW-32CV2
②	RUN lamp (green)	· Lights when the module is operating normally. · Programming after connecting support tool: Blinking, (PC stops operation) · Detect errors by self-diagnosis function: Lights OFF. (when battery is error, lights ON.)
③	FAULT lamp (red)	Lights when detecting errors by self-diagnosis. PC stops its operations. (However, it operates even when battery is error.)
④	PG/COMM1 port	· Connecting with support tool. · Connecting with device having serial I/O port such as personal computer. (RS-422)
⑤	PG/COMM2 port	· Connecting with device having serial I/O port such as personal computer. (RS-422/RS-232C) (Also possible to connect with support tool.)
⑥	Terminal block	Connecting extended line of halt output, FG, I/O link, and data link.
⑦	I/O expansion connector	Install an I/O expansion cable, and connect it with this connector.
⑧	Battery label	Indicates the battery is low, and shows the time left to change the battery without data loss. (See page 39)
⑨	Module retention screw	Install the module on the VME rack.
⑩	Ejector handle	Used to remove the module from the VME rack.
⑪	Battery	Backup battery for the module.

Chapter 5 Installation method

This chapter describes how to install or remove the module on a VME rack.

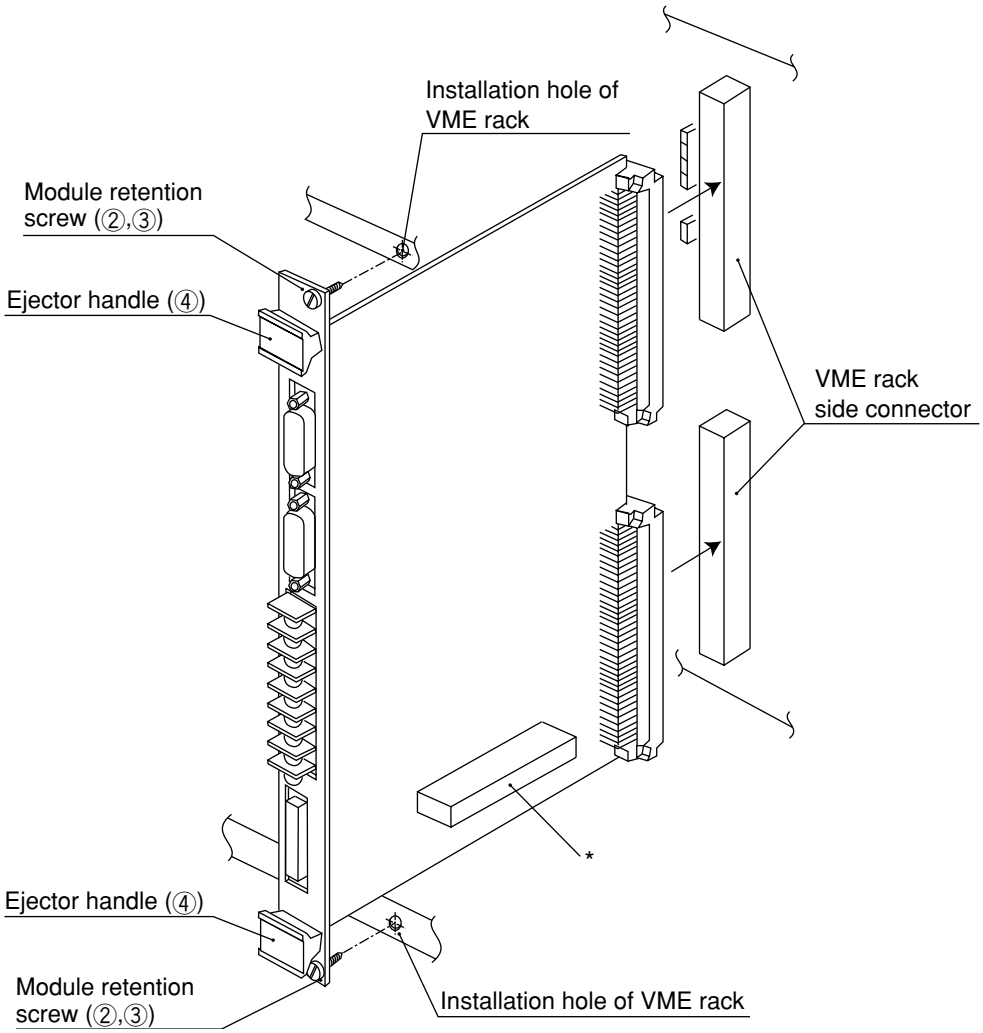
Make sure to turn OFF the power to the VME rack before installing or removing the module.

[Installation procedure]

① Insert the module into a slot (connector) on the VME rack.

· Insert it straight into the VME module while being careful that the connector marked with an asterisk * in the figure below does not touch an adjacent module.

② Secure the module in the VME rack using the two module screws.



[Removal procedure]

Before removing the module, make sure to disconnect the power lines to both terminals for the module's halt output signal.

③ Remove the two screws securing the module in the VME rack.

④ Pull the module out from the VME rack using the two ejection handles.

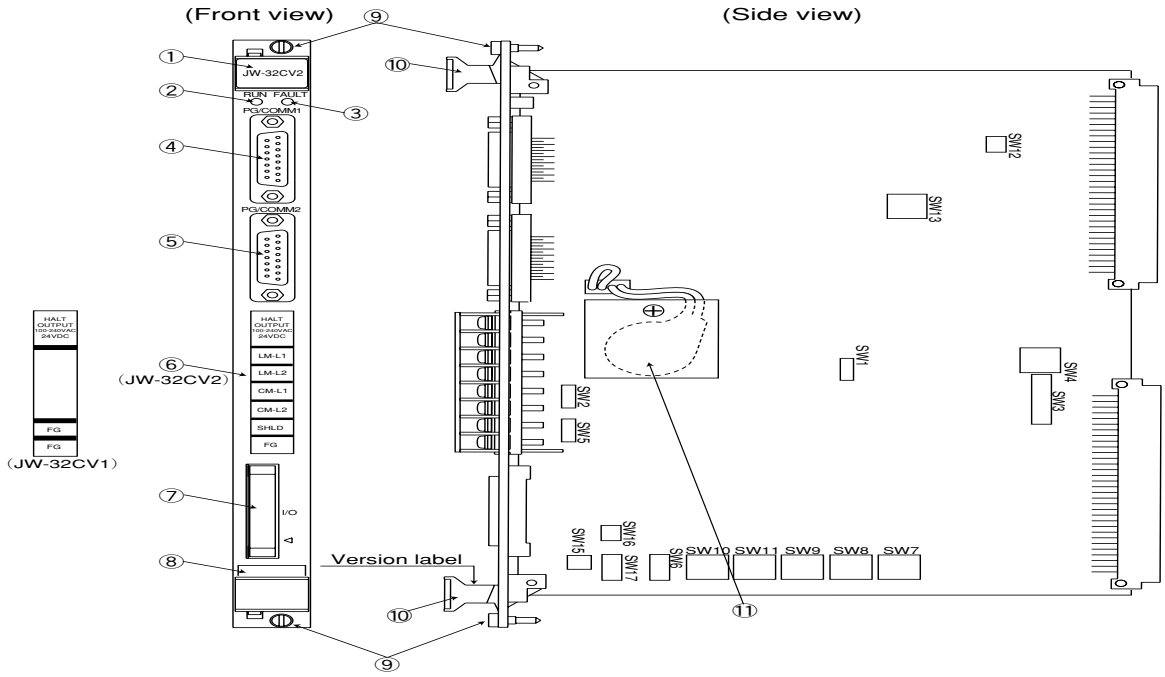
· Pull the module straight out while being careful not to allow the connector marked with an asterisk * in the figure above to touch an adjacent module.

For precautions about working around the VME rack, see "Chapter 2 Precautions for use" in this manual.

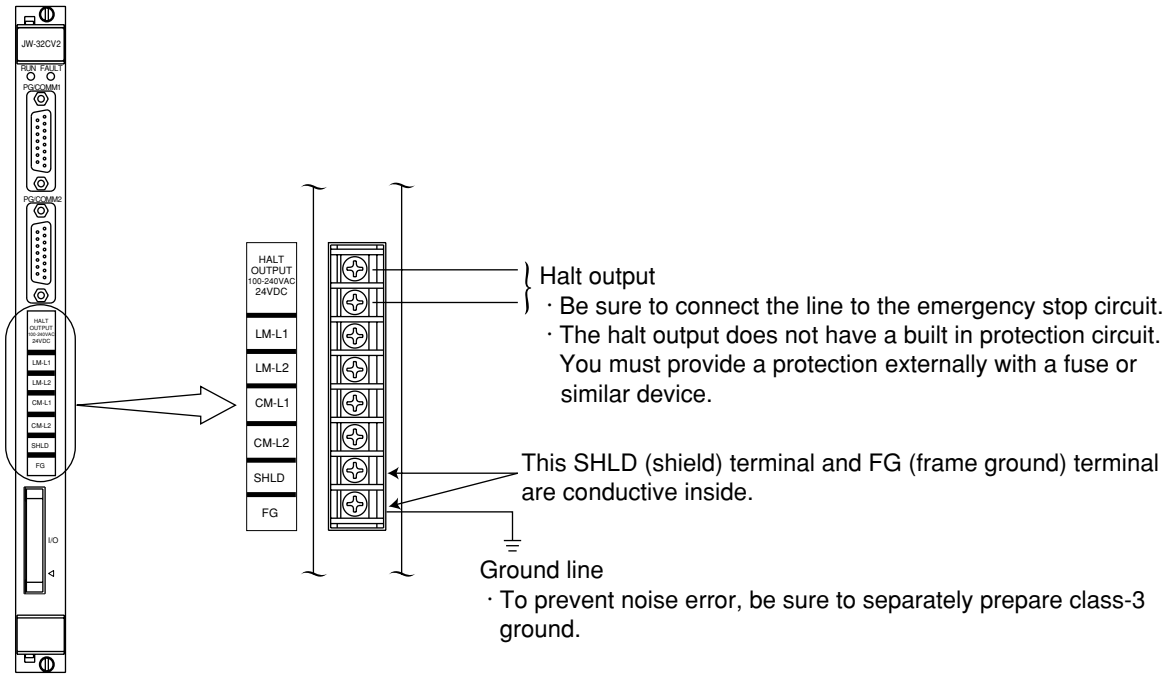
Chapter 6 Wiring

6-1 Wire connections for the halt output and ground

(1) In case of JW-32CV1



(2) In case of JW-32CV2



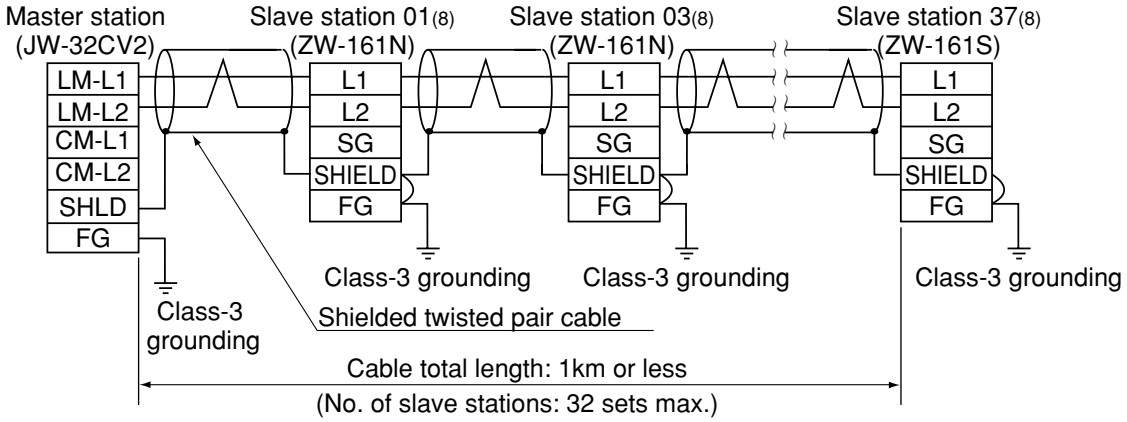
6-2 Wiring for satellite I/O link, data link (JW-32CV2)

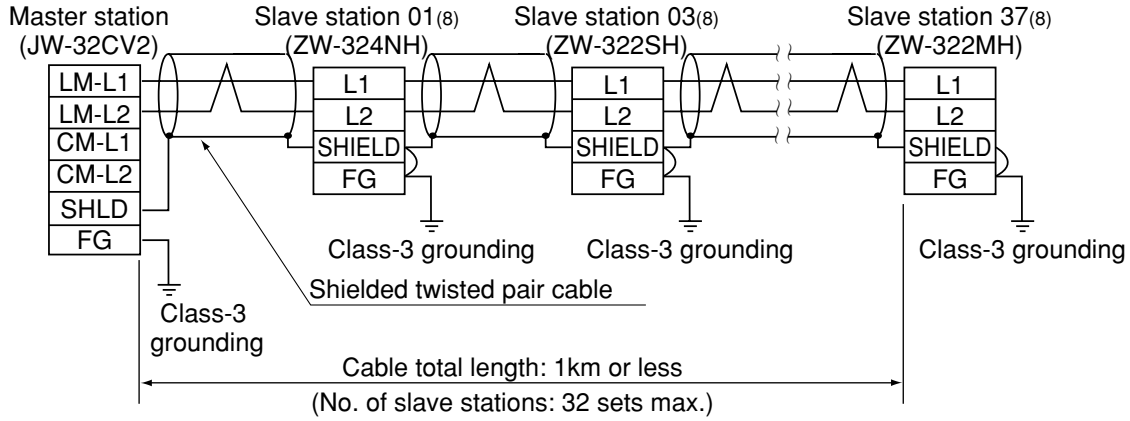
Shown below is a method for hooking up a JW-32CV2 using the satellite I/O link function and the data link function.

[1] Wiring for satellite I/O link

Connect to a two-wire system.

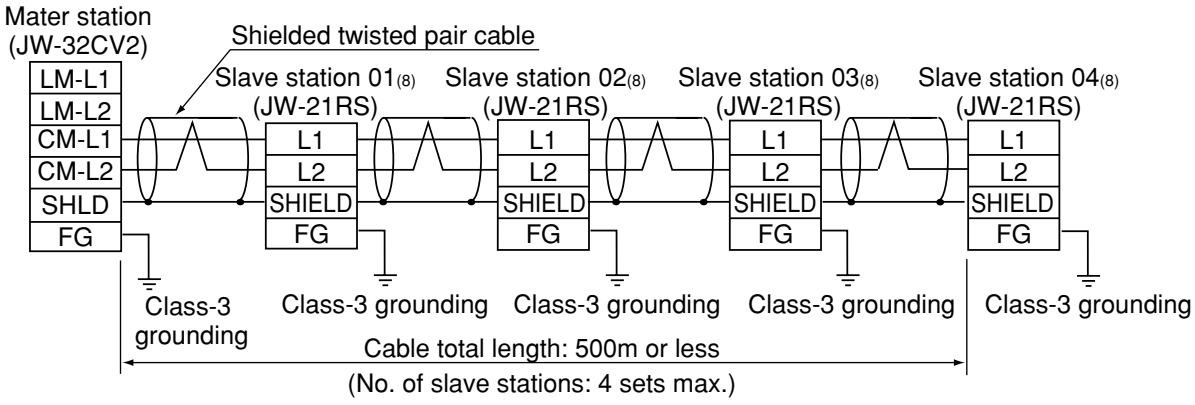
[Example]



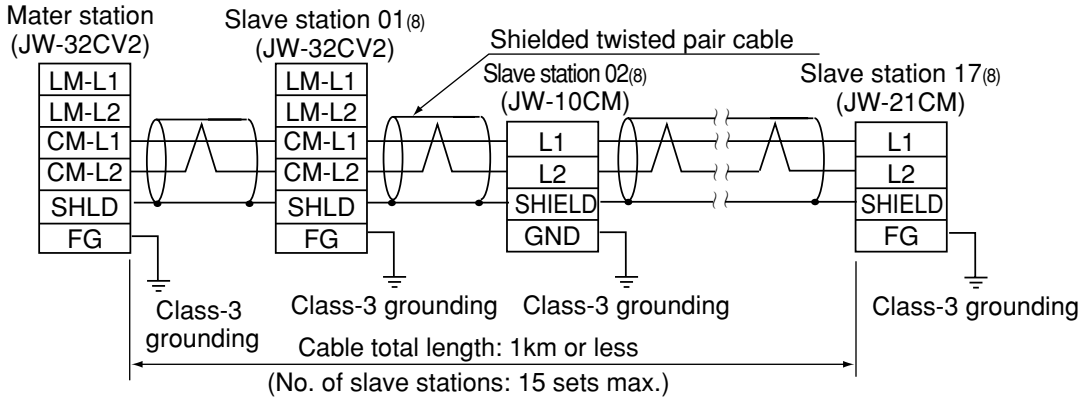


[2] Wiring for data link

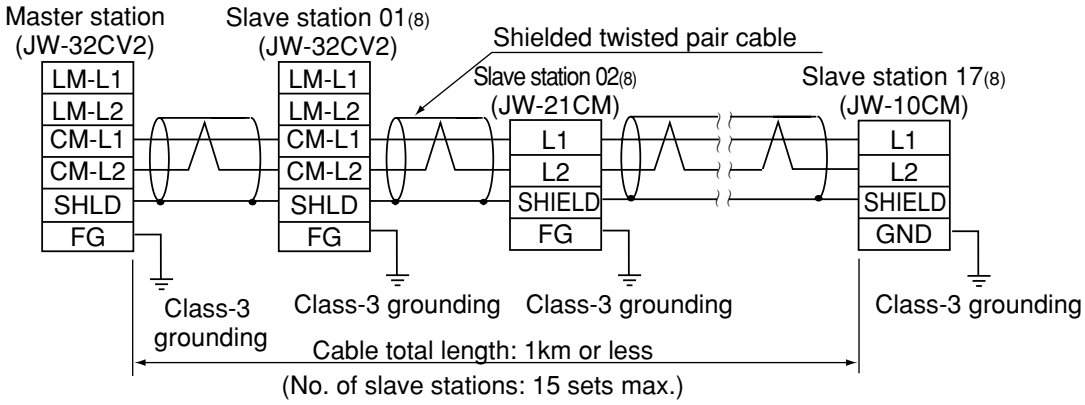
(1) When using remote I/O function



(2) When using DL1 data link function

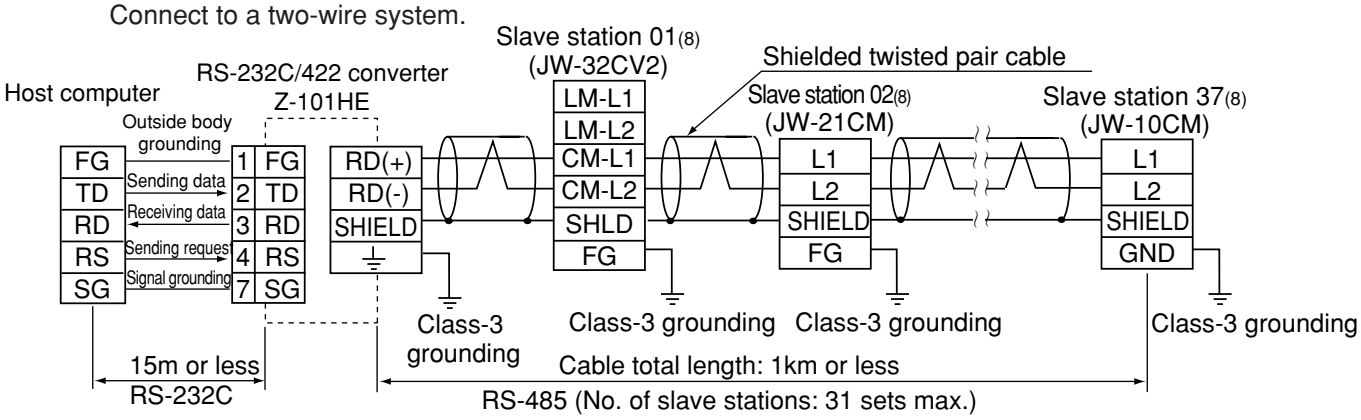


(3) When using DL9 data link function



(4) When using computer link function

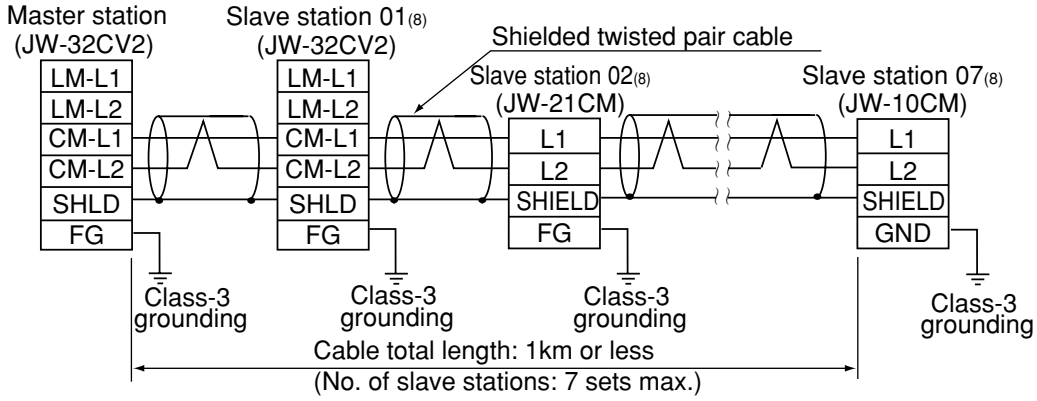
Connect to a two-wire system.



(5) When using M net communication function

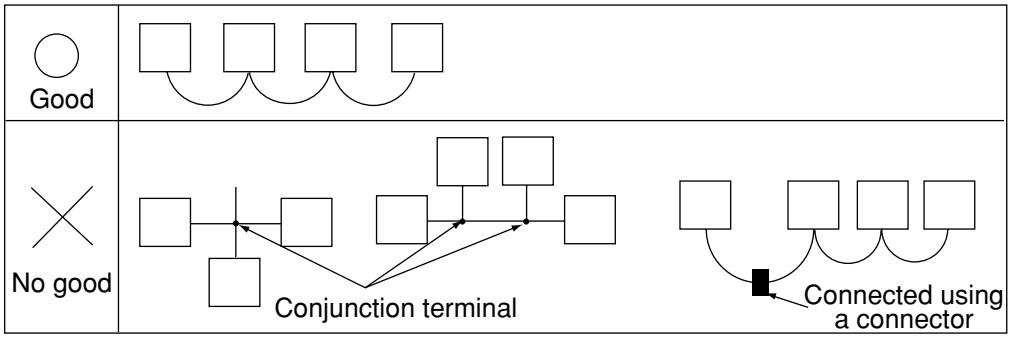
Connect to a two-wire system.

Shown below is an example using Sharp PC devices for all master and slave stations.

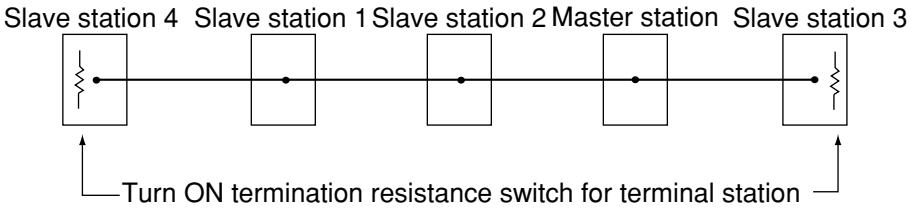


Note

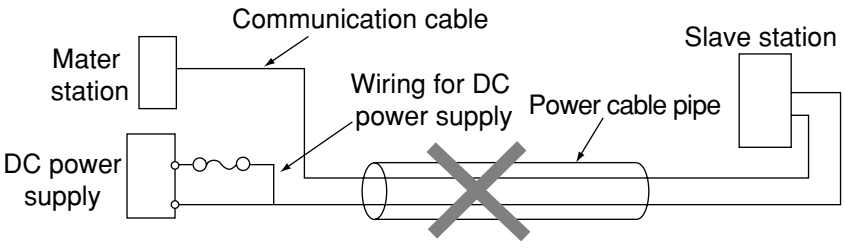
· Connect the shield line of the cable with SHIELD terminal of master/slave station.
· Be sure to execute class-3 groundin FG terminal of the master station JW-32CV2 and slave station via the basic rack panel. Avoid co-grounding with other modules. If not grounded, modules easily pick up electric noise, which causes a malfunction.
· Do not execute multiple-wiring from one source point for communication cable.



· Keep the communication cable as far away as possible from the high voltage and power lines, so as not to close in parallel.
· Use our recommended cable for communication cable and keep its total length within provisional length.
· Not necessary to set the master station JW-32CV2 and the slave station in order, one by one nor setting the master station as terminal station. The following example is available.



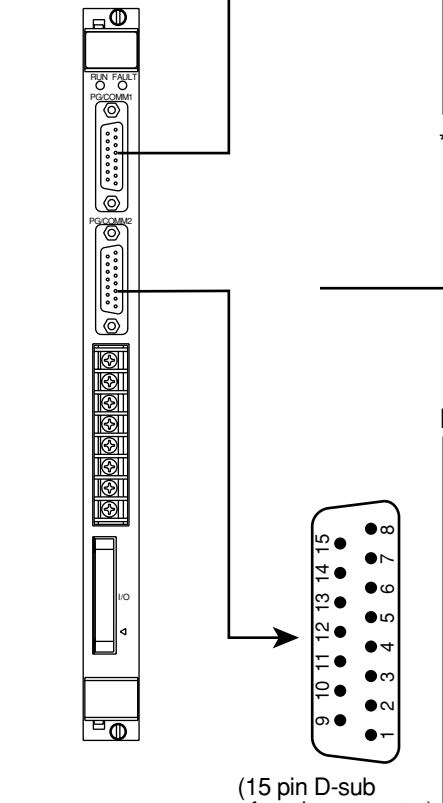
· Do not wire load driving cabels and power supply in the same duct of communication cable. (For the cable supplying power to a slave station exclusively and not for load driving, wiring in the same duct is available.)



6-3 Wiring for communication port

Shown below is a method for connecting the module communication port (PG/COMM1, PG/COMM2) to equipment with an RS-232C/RS-422A I/O port, such as a host computer.

[1] Pin arrangement of PG/COMM1 port, PG/COMM2 port



PG/COMM1 port

Pin No.	Signal name	Contents	Signal
1	FG	Outside body grounding	——
2	——	*	
3	SD (+)	Sending data (PC to personal computer)	RS-422A
4	——	*	——
5	RTS (–)		RS-422A
6	SG	Signal grounding	——
7	SG	Signal grounding	
8	——	*	
9	RD (+)	Receiving data (personal computer to PC)	RS-422A
10	RD (–)	Receiving data (personal computer to PC)	
11	SD (–)	Sending data (PC to personal computer)	
12	——		——
13	RTS (+)	*	RS-422A
14	+5V		——
15	+5V		

* Not connected with pin No. 2, 4, 8, and 12.

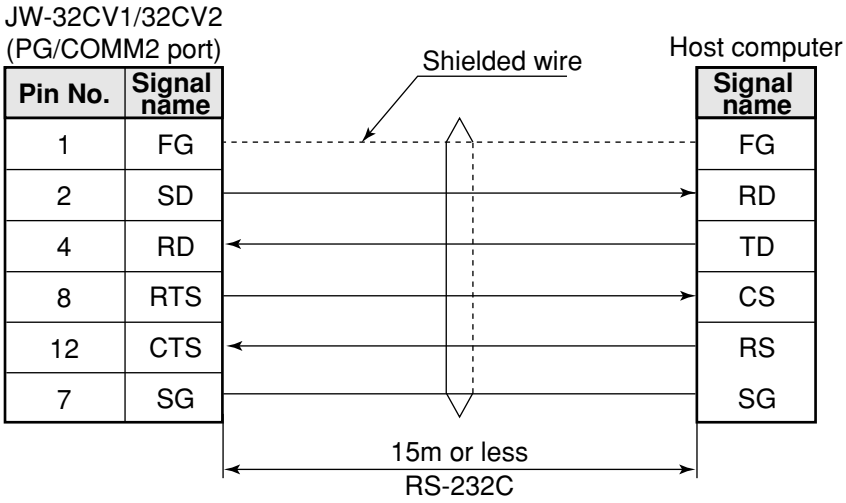
PG/COMM2 port

Pin No.	Signal name	Contents	Signal
1	FG	Outside body grounding	——
2	SD	Sending data (PC to personal computer)	RS-232C
3	SD (+)	Sending data (PC to personal computer)	RS-422A
4	RD	Receiving data (personal computer to PC)	RS-232C
5	RTS (–)		RS-422A
6	SG	Signal grounding	——
7	SG	Signal grounding	
8	RTS	ON while PC is supplied power source	RS-232C
9	RD (+)	Receiving data (personal computer to PC)	RS-422A
10	RD (–)	Receiving data (personal computer to PC)	
11	SD (–)	Sending data (PC to personal computer)	
12	CTS	ON : Available sending, OFF : Ban sending	RS-232C
13	RTS (+)		RS-422A
14	+5V		——
15	+5V		

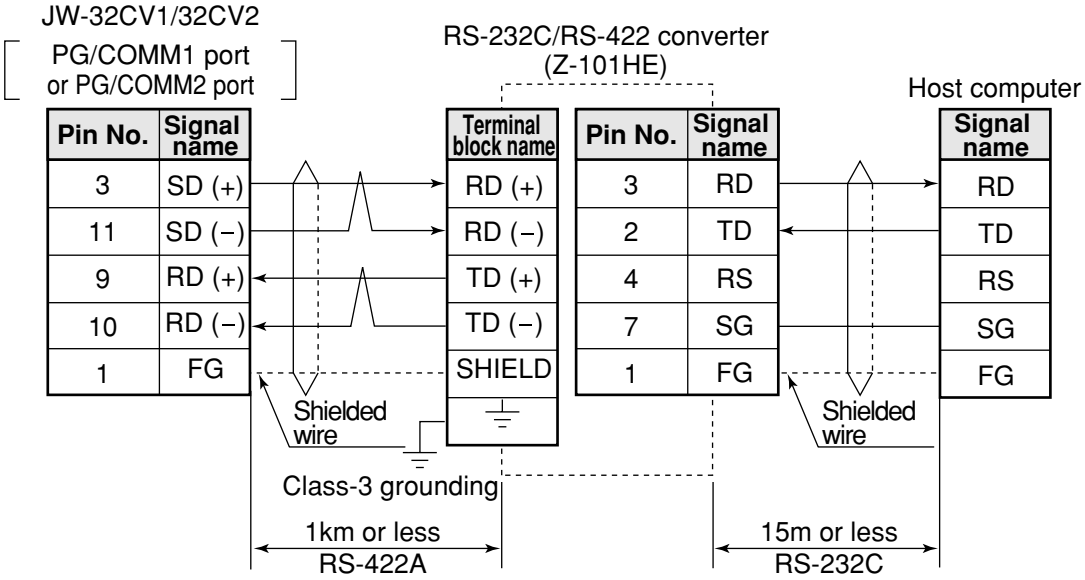
[2] Wiring figure

(1) When using RS-232C for communication method of host computer side

Be within 15m for the total length of a communication cable.

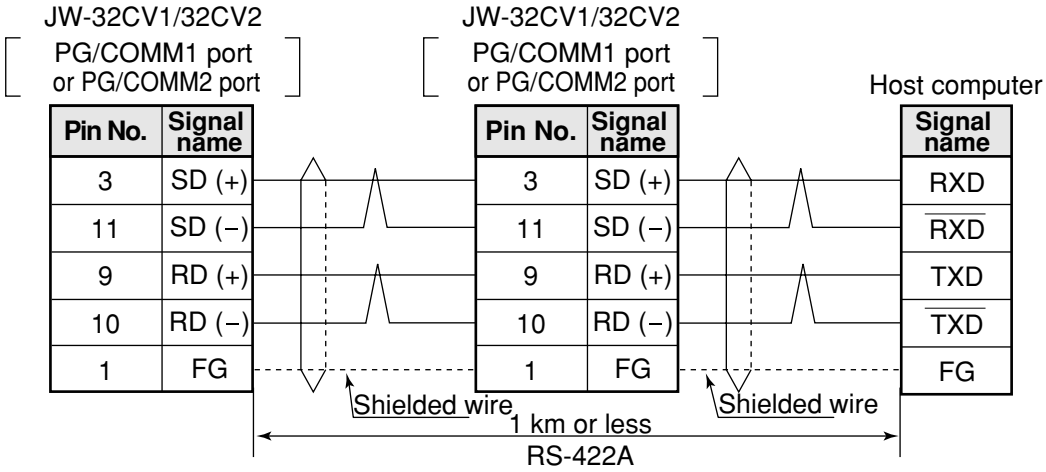


Use the RS-232C/RS-422 converter, such as Z-101HE, when the total length of the communication cable is over 15m.



(2) When using RS-422A for communication method

Be within 1km for the total length of a communication cable.



*1 To obtain data transfer speeds higher than 38400 bit/s, the JW-32CV1 must be connected directly to a host computer.

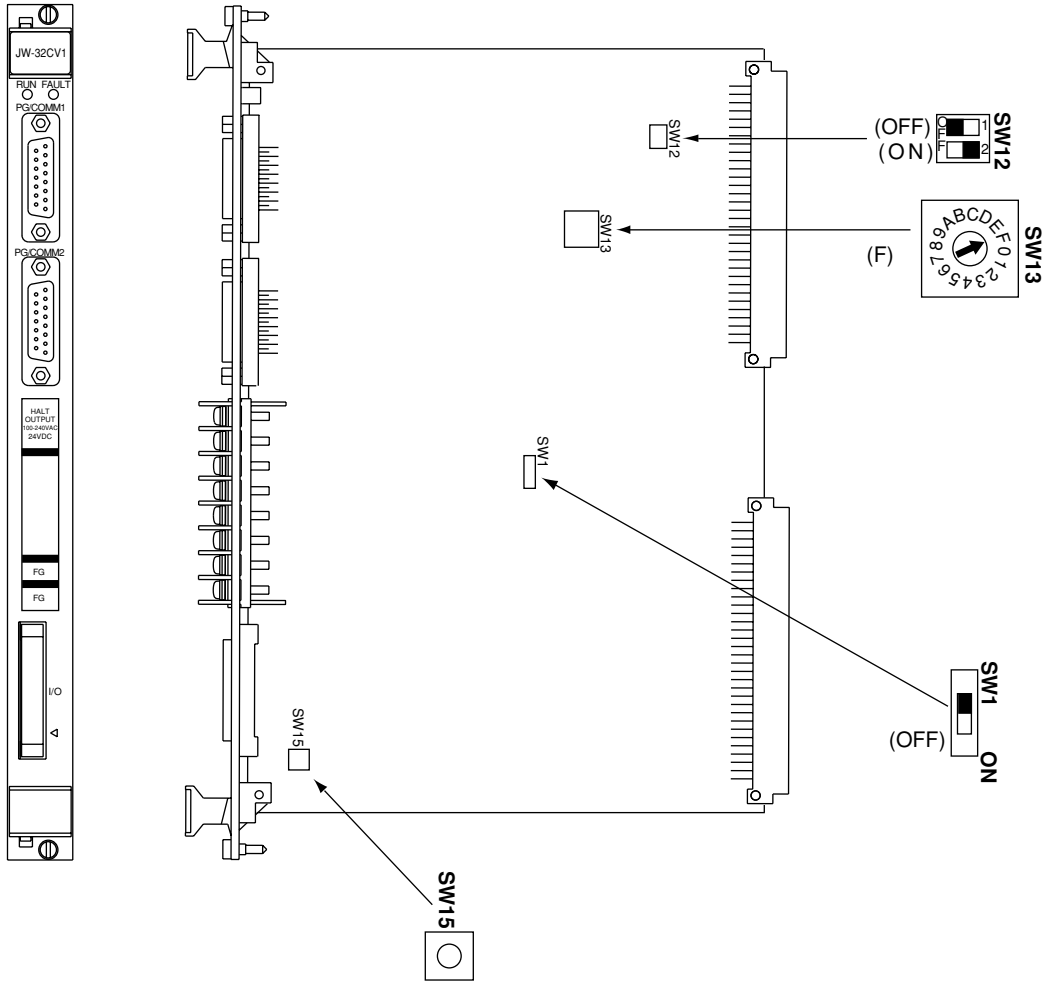
Two-wire system communications are not possible.

Chapter 7 How to use

7-1 Switch setting

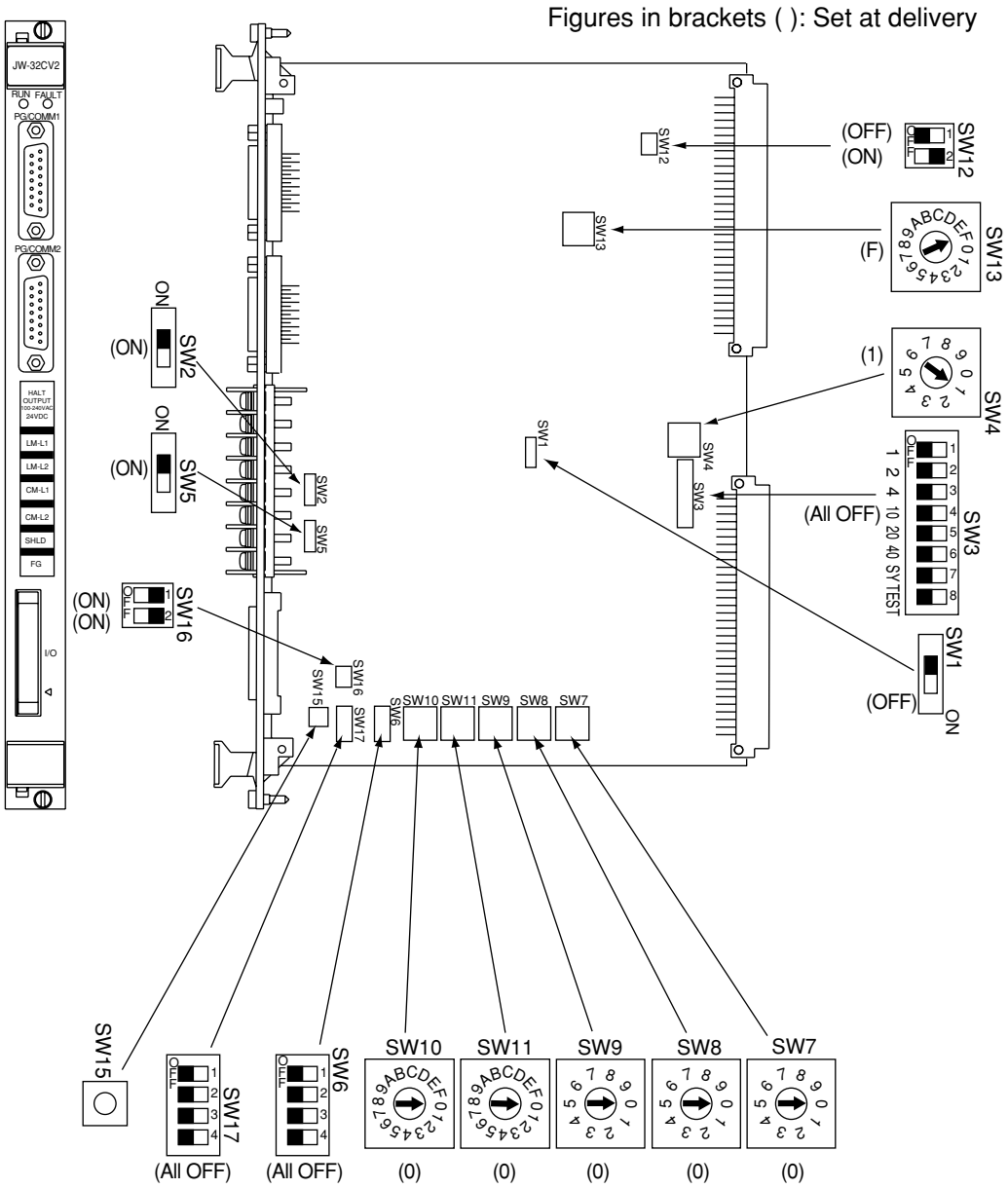
[1] Switch setting of JW-32CV1

Figures in brackets ( ) : Set at delivery



Switch No.	Item set	Setting details
SW1	Prohibit/enable writing	Select prohibit/enable for the program memory and system memory. ON: ON Prohibit writing OFF: OFF Enable writing
SW12	System	SW12-1: Always set to OFF
		SW12-2: Always set to ON
SW13	VME address	Assign the address of the module on the VME. (See page 29 for details)
SW15	Forced program mode	Use this mode if an endless loop sequence is created in a use program and you are unable to stop the program by waiting for the watchdog timer to time out. · Turn ON the power while pressing this switch, and the system will be forced into program mode.

[2] Switch setting of JW-32CV2



<table>
<tr><th>Setting function</th><th>Switch No.</th><th>Item set</th><th>Setting details</th></tr>
<tr><td>Setting the all functions</td><td>SW1</td><td>Prohibit/enable writing</td><td>Select prohibit/enable for the program memory and system memory.<table><tr><td>ON</td><td>ON Prohibit writing</td></tr><tr><td>OFF</td><td>OFF Enable writing</td></tr></table></td></tr>
<tr><td rowspan="3">I/O link</td><td>SW2</td><td>Termination resistance</td><td rowspan="3">⇒ See the next page</td></tr>
<tr><td>SW3</td><td>No. of link bytes</td></tr>
<tr><td>SW4</td><td>Mode</td></tr>
<tr><td rowspan="8">Remote I/O
DL1 data link
DL9 data link
Computer link
M net communication</td><td>SW5</td><td>Termination resistance</td><td rowspan="8">· Remote I/O ⇒ See page 23
· DL1 date link ⇒ See page 24
· DL9 date link ⇒ See page 25
· Computer link ⇒ See page 26
· M net communication ⇒ See page 27</td></tr>
<tr><td>SW6</td><td>Operation mode</td></tr>
<tr><td>SW7</td><td>Station number (lower)</td></tr>
<tr><td>SW8</td><td>Station number (upper)</td></tr>
<tr><td>SW9</td><td>I/O area
Link area</td></tr>
<tr><td>SW10</td><td>Select function</td></tr>
<tr><td>SW11</td><td>No. of slave stations connected (transfer rate)</td></tr>
<tr><td rowspan="6">Setting the all functions</td><td rowspan="2">SW12</td><td rowspan="2">System</td><td>SW12-1: Always set to OFF</td></tr>
<tr><td>SW12-2: Always set to ON</td></tr>
<tr><td>SW13</td><td>VME address</td><td>Assign the address of the module on the VME. (See page 29 for details)</td></tr>
<tr><td>SW15</td><td>Forced program mode</td><td>Use this mode if an endless loop sequence is created in a use program and you are unable to stop the program by waiting for the watchdog timer to time out.
· Turn ON the power while pressing this switch, and the system will be forced into program mode.</td></tr>
<tr><td>SW16</td><td>System</td><td>SW16-1 to 2: Always set to OFF</td></tr>
<tr><td>SW17</td><td>System</td><td>SW17-1 to 4: Always set to ON</td></tr>
</table>

(1) Switch settings for the I/O link (SW2 to 4: JW-32CV2)

SW2 (termination resistance)

Set the termination resistance for the I/O link circuit.

⇒ This switch is equivalent to LT switch on the JW-23LMH

ON	Impose a termination resistance (when this module is the last one on either end of the link circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the link circuit)

SW3 (number of bytes in the I/O link)

Set the number of I/O link bytes used by the slave module with switches 1 to 6 (1 to 40) on SW3, and set the communication cycle mode using switch 7 (SY) on SW3.

⇒ These switches are equivalent to the number of I/O link bytes set with switch (SW2) on the JW-23LMH.

7 (SW) of SW3	Communication cycle
ON	I/O link communication is synchronized with the PC's function.
OFF	I/O link communication is not synchronized with the PC's function.

[Ex.] When the number of I/O link bytes is 16 ($20_{(8)}$)

- Always set switch 8 (TEST) on SW3 to OFF.
- If you connect more slave modules than the number of I/O link bytes set by these switches, data may collide with each other and may cause a communication malfunction.
- If the number of I/O link bytes exceeds the total number of possible bytes for the slave module, a communication error (mode 1) may occur.

SW4 (mode)

Set the operation mode and transfer rate.

⇒ Equivalent to the model switch on the JW-23LMH.

Operation contents		Mode switch setting value 1	2	3	4	5	6
At normal	• When power to the JW-32CV1/32CV2 turns "ON," the module intially checks its connected stations one time.	○	○	○	○	○	○
At normal	• The master module continues to check its connected stations once per 100 communications with all slave module.	○	○	–	○	○	–
At normal	• When the CHECK relay is "ON," the master module checks its connected stations.	–	–	○	–	–	○
At communication error	• The master module repeats connected station check until communication becomes normal.	○	–	–	○	–	–
At communication error	• The master module checks its connected stations once per 100 communications with all slave module, and check no response station's recovery	–	○	–	–	○	–
At communication error	• When the CHECK relay is ON, the master module checks its connected stations, and check no response station's recovery.	–	–	○	–	–	○
At communication error	• The master module executes communication regarding no response slave module as disconnected station.	–	○	○	–	○	○
At communication error	• No response station number is output to display panel and status section.	○	–	–	○	–	–
At communication error	• Only PC 1 cycle of no response station number is output to status section.	–	○	○	–	○	○
Transfer speed (k bits/s)		172.8			345.6		

- If the switch is set to "0" or "7" through "9", errors will arise and the module will not function.

· The I/O link area and flag area are fixed, as shown below.

I/O link area	Flag area
⊐2000 to ⊐2077 (512 points)	⊐1570 to ⊐1571

⇒ Equivalent to the module No. switch on the JW-23LMH.

(2) Setting remote I/O switches (SW5 to SW11: JW-32CV2)

SW5 (termination resistance)

Set the termination resistance for the remote I/O circuit.
⇒ This switch is equivalent to switch SW7 (LT) on the JW-21CM.

ON	Impose a termination resistance (when this module is the last one on either end of the remote I/O circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the remote I/O circuit)

SW6 (operation mode)

Set the operation mode when an error occurs using switches 3 and 4 of SW6.
⇒ This switch is equivalent to switch SW3 on the JW-21CM.

SW6-3	SW6-4	Mode	Operation response
OFF	OFF	Mode 0	When any station has an error due to a mis-set parameter or a slave station error, the module will stop remote I/O operation and halt PC operation.
OFF	ON	Mode 1	When any slave station has an error, the module will stop remote I/O operation. But, the PC will
ON	OFF	Mode 2	When a single slave station has an error, other normal slave stations and the PC will continue

· When the error is corrected, the module will automatically return to normal operation in modes 0 to 2.
· The remote I/O error is a kind of I/O errors. Therefore, normally set to mode 0 (stop PC when the error occurs).
· Mode 1 or mode 2 should be selected when the module operation is not directly related to the system sequence operations (such as simply using the remote I/O as an output to a monitor board), or when you want to stop a remote slave station operation for tests.
· Set switches 1 and 2 of SW6 to OFF (setting when delivered).

SW7: Station No. lower bit
SW8: Station No. upper bit

Set to 00 (8) (To use as master station).
⇒ This switch is equivalent to switch SW1 and SW2 (station No.) on the JW-21CM.

SW9 (I/O area)

Set the areas to be used for the remote I/O (memory address for slave stations 01 to 04).
⇒ This switch is equivalent to switch SW8 (module No.) on the JW-21CM.

SW9	Remote I/O area
0	∃1000 to ∃1007
1	∃1100 to ∃1177
2	∃1200 to ∃1277
3	∃1300 to ∃1377
4	∃1400 to ∃1477
5	89000 to 89077
6 to 9	Must not be changed

SW10 (function selection)

Set to 1 (remote I/O)
⇒ This switch is equivalent to switch SW0 on the JW-21CM.

SW11 (number of slave stations connected)

Set the number of slave stations to be connected.
⇒ This switch is equivalent to switch SW4 on the JW-21CM.

SW11	Number of slave stations
0	Must not be changed
1	1
2	2
3	3
4	4
5 to F	Must not be changed

(3) Switch settings for the DL1 data link (SW5 to SW11: JW-32CV2)

SW5 (termination resistance)

Sets the termination resistance for the data link circuit.
⇒ This switch is equivalent to switch SW7 (LT) on the JW-21CM.

ON	Impose a termination resistance (When this module is the last one on either end of the link circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the link circuit)

SW6 (operation mode)

Set all switches 1 to 4 on SW6 to OFF.
⇒ This switch is equivalent to SW3 on the JW-21CM.

SW7: Station No. lower bit
SW8: Station No. upper bit

Set to 00 (8) if it is master station. Set to 01 to 17 (8), if it is a slave station.
⇒ This switch is equivalent to switches SW1 and 2 (station No.) on the JW-21CM.

SW9 (link relay area)

Sets the relay area for the data link.
⇒ This switch is equivalent to switch SW8 (module No.) on the JW-21CM.

SW9	Data link area	Communication monitor flag
0	⊐1000 to ⊐1077	15000 to 15017
1	⊐1100 to ⊐1177	15100 to 15117
2	⊐1200 to ⊐1277	15200 to 15217
3	⊐1300 to ⊐1377	15300 to 15317
4	⊐1400 to ⊐1477	15400 to 15417
5	89000 to 89077	15500 to 15517
6 to 9	Must not be changed	

SW10 (function selection)

Set to 2 (data link DL1)
⇒ This switch is equivalent to switch SW0 on the JW-21CM.

SW11
(number of slave stations connected. Set only for a master station)

Sets the number of slave stations to be connected, if it is master station.
⇒ This switch is equivalent to switch SW4 on the JW-21CM.

SW11	Number of slave stations	SW11	Number of slave stations
0	Must not be changed	8	8
1	1	9	9
2	2	A	10
3	3	B	11
4	4	C	12
5	5	D	13
6	6	E	14
7	7	F	15

· This switch is not set when the module is used as a slave station.

(4) Switch settings for the DL9 data link (SW5 to SW11: JW-32CV2)

SW5 (termination resistance)

Sets termination resistance for the data link circuit.

⇒ This switch is equivalent to switch SW7 (LT) on the JW-21CM.

ON	Impose a termination resistance (when this module is the last one on either end of the link circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the link circuit)

SW6 (total number of bytes. Set only if it is master station)

Sets the total number of DL9 data link if it is master station.

⇒ Sets the total number of DL9 data link if it is master station.

Total number of bytes	SW6			
	1	2	3	4
64	OFF	OFF	OFF	OFF
128	OFF	OFF	OFF	ON
256	OFF	OFF	ON	OFF
512	OFF	OFF	ON	ON

· This switch is not set when the module is used as a slave station.

SW7: Station No. lower bit
SW8: Station No. upper bit

Set to 00 (8) if it is master station. Set to 01 to 17 (8), if it is a slave station.

⇒ This switch is equivalent to switches SW1 and 2 (station No.) on the JW-21CM.

SW9 (link area)

Set the data link area for the data link.

⇒ This switch is equivalent to switch SW8 (module No.) on the JW-21CM.

SW9	Data link area	Communication monitor flag (slave station)	Initial sequence completion flag (master station)	Link operation flag (master station)	Individual monitor flag (master station)
0	ㅋ1000 to	15000	15001	15003	15020 to 15077
1	ㅋ1100 to	15100	15101	15103	15120 to 15177
2	ㅋ1200 to	15200	15201	15203	15220 to 15277
3	ㅋ1300 to	15300	15301	15303	15320 to 15377
4	ㅋ1400 to	15400	15401	15403	15420 to 15477
5	89000 to	15500	15501	15503	15520 to 15577
6 to 9	Must not be changed				

SW10 (function selection)

Set to 3 (data link DL9)

⇒ This switch is equivalent to switch SW0 on the JW-21CM.

SW11 (number of slave stations connected. Set only for a master station)

Sets the number of slave stations to be connected, if it is master station.

⇒ This switch is equivalent to switch SW4 on the JW-21CM.

SW11	Number of slave stations
0	Must not be changed
1	1
2	2
3	3
4	4
5	5
6	6
7	7

SW11	Number of slave stations
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

· This switch is not set when the module is used as a slave station.

(5) Switch settings for the computer link (SW5 to SW11: JW-32CV2)

SW5 (termination resistance)

Sets termination resistance for the computer link circuit.
⇒ This switch is equivalent to switch SW7 (LT) on the JW-21CM.

ON	Impose a termination resistance (when this module is the last one on either end of the link circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the link circuit)

SW6 (operation mode)

Sets the communication system parameters and parity check mode.
⇒ This switch is equivalent to switch SW3 on the JW-21CM.

SW6	Operation mode
1	OFF: Invalid setting
2	OFF: Two-wire system, ON: Four-wire system
3	OFF: Invalid setting
4	OFF: Even, ON: Odd

SW7: Station No. lower bit
SW8: Station No. upper bit

Set to 01 to 37 (8).
⇒ This switch is equivalent to switches SW1 and 2 (station No.) on the JW-21CM.

SW9 (flag)

Sets the flags which will be used when the module receives a command, including a global address.
⇒ This switch is equivalent to switch SW8 (module No.) on the JW-21CM.

SW9	Completion of global address
0	15000
1	15100
2	15200
3	15300
4	15400
5	15500
6	15600
7 to 9	Must not be changed

SW10 (function selection)

Set to 4 (computer link).
⇒ This switch is equivalent to switch SW0 on the JW-21CM.

SW11 (transfer speed)

Set transfer speed (baud rate).
⇒ This switch is equivalent to switch SW4 on the JW-21CM.

SW11	Transfer speed (bit/s)
0	19200
1	9600
2	4800
3	2400
4	1200
5	600
6	300
7 to F	Must not be changed

(6) Switch setting for M net communication (SW5 to SW11: JW-32CV2)

SW5 (termination resistance)

Sets the termination resistance for the M net circuit.
⇒ This switch is equivalent to switch SW7 (LT) on the JW-21CM.

ON	Impose a termination resistance (when this module is the last one on either end of the M net circuit)
OFF	Do not impose a termination resistance (when this station is not on the end of the M net circuit)

SW6 (operation mode)

Sets the operation mode when an error occurs.
⇒ This switch is equivalent to switch SW3 on the JW-21CM.

SW6-1	Always OFF
SW6-2	
SW6-3	ON : Continue communication only with normal stations when an error occurs. OFF: Stop all communication when an error occurs.
SW6-4	Always OFF

SW7: Station No. lower bit
SW8: Station No. upper bit

Set to 00 (8) if it is master station. Set to 01 to 07 (8) if it is slave station.
⇒ This switch is equivalent to switches SW1 and 2 (station No.) on the JW-21CM.

SW9 (address)

Sets the top address, parameter storage area, communication selection register, and error flags for the data memory.
⇒ This switch is equivalent to switch SW8 (module No.) on the JW-21CM.

		Data memory		Parameter storage area	Communication selection register	Error flag
		Top address	**Area (64 bytes)**			
SW9 setting	**0**	ㅋ1000	ㅋ1000 to ㅋ1077	O—0 000 to 017	ㅋ1500	15010
	1	ㅋ1100	ㅋ1100 to ㅋ1177	O—1 000 to 017	ㅋ1510	15110
	2	ㅋ1200	ㅋ1200 to ㅋ1277	O—2 000 to 017	ㅋ1520	15210
	3	ㅋ1300	ㅋ1300 to ㅋ1377	O—3 000 to 017	ㅋ1530	15310
	4	ㅋ1400	ㅋ1400 to ㅋ1477	O—4 000 to 017	ㅋ1540	15410
	5	89000	89000 to 89077	O—5 000 to 017	ㅋ1550	15510
	6～9	Invalid setting		Invalid setting	Invalid setting	Invalid setting
Station selected		Master station/slave station		Master station/ slave station	Master station	Master station/ slave station

* Slave stations do not use the communication selection register.

· Both master and slave stations use maximum of 64 bytes for data memory.
· For details about the parameter storage area, see the next page.

SW10 (function selection)

Set to 7 (M net communication)
⇒ This switch is equivalent to switch SW0 on the JW-21CM.

SW11 (transfer speed)

Sets the transfer speed (baud rate).
⇒ This switch is equivalent to switch SW4 on the JW-21CM.

1	19.2 k bits/s
7	38.4 k bits/s

· Normally, the module is used with a data transfer speed of 19.2 k bits/s. If you want to use it at a speed of 38.4 k bits/s, you must set the transfer speed of all the modules to 38.4 k bits/s.

[M net communication parameter storage area]

· When the module is used as a master station

SW9 setting value	0	1	2	3	4	5	Contents
Parameter storage area	O-0 000	O-1 000	O-2 000	O-3 000	O-4 000	O-5 000	Number of bytes to be transferred from the master station 00 to slave station 01.
	O-0 001	O-1 001	O-2 001	O-3 001	O-4 001	O-5 001	Number of bytes to be transferred from the slave station 01 to the master station 00.
	O-0 002	O-1 002	O-2 002	O-3 002	O-4 002	O-5 002	Number of bytes to be transferred from the master station 00 to slave station 02.
	O-0 003	O-1 003	O-2 003	O-3 003	O-4 003	O-5 003	Number of bytes to be transferred from the slave station 02 to the master station 00.
	O-0 004	O-1 004	O-2 004	O-3 004	O-4 004	O-5 004	Number of bytes to be transferred from the master station 00 to slave station 03.
	O-0 005	O-1 005	O-2 005	O-3 005	O-4 005	O-5 005	Number of bytes to be transferred from the slave station 03 to the master station 00.
	O-0 006	O-1 006	O-2 006	O-3 006	O-4 006	O-5 006	Number of bytes to be transferred from the master station 00 to slave station 04.
	O-0 007	O-1 007	O-2 007	O-3 007	O-4 007	O-5 007	Number of bytes to be transferred from the slave station 04 to the master station 00.
	O-0 010	O-1 010	O-2 010	O-3 010	O-4 010	O-5 010	Number of bytes to be transferred from the master station 00 to slave station 05.
	O-0 011	O-1 011	O-2 011	O-3 011	O-4 011	O-5 011	Number of bytes to be transferred from the slave station 05 to the master station 00.
	O-0 012	O-1 012	O-2 012	O-3 012	O-4 012	O-5 012	Number of bytes to be transferred from the master station 00 to slave station 06.
	O-0 013	O-1 013	O-2 013	O-3 013	O-4 013	O-5 013	Number of bytes to be transferred from the slave station 06 to the master station 00.
	O-0 014	O-1 014	O-2 014	O-3 014	O-4 014	O-5 014	Number of bytes to be transferred from the master station 00 to slave station 07.
	O-0 015	O-1 015	O-2 015	O-3 015	O-4 015	O-5 015	Number of bytes to be transferred from the slave station 07 to the master station 00.
	O-0 016	O-1 016	O-2 016	O-3 016	O-4 016	O-5 016	Number of slave station connected.
	O-0 017	O-1 017	O-2 017	O-3 017	O-4 017	O-5 017	00 (No setting)

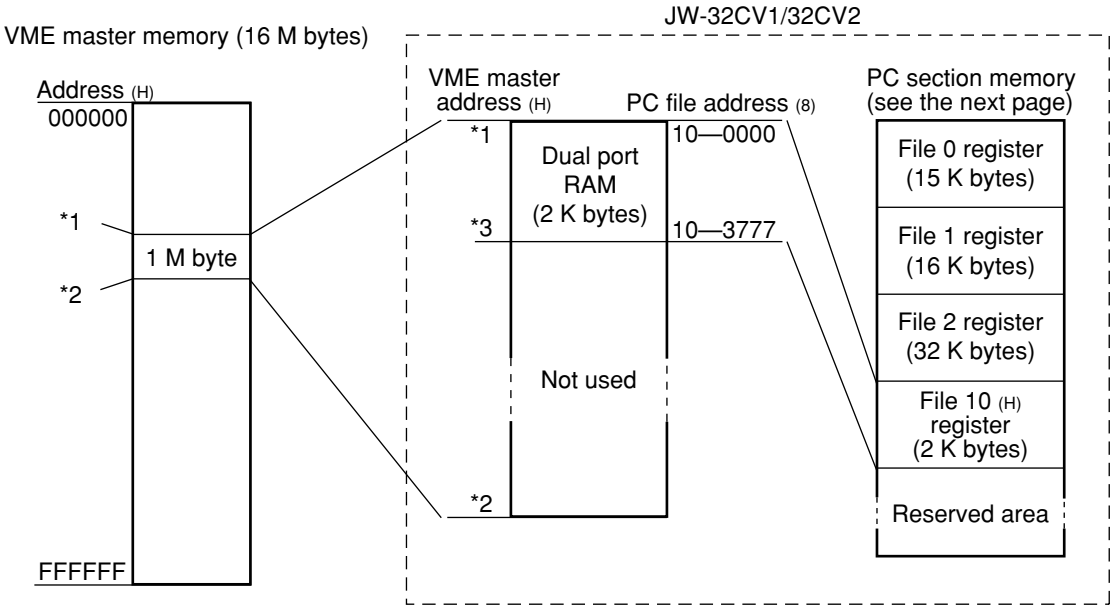
· When the module is used as a slave station

SW9 setting value	0	1	2	3	4	5	Contents
Parameter storage area	O-0 000	O-1 000	O-2 000	O-3 000	O-4 000	O-5 000	Number of bytes to be transferred from the master station 00 to slave station 01.
	O-0 001	O-1 001	O-2 001	O-3 001	O-4 001	O-5 001	Number of bytes to be transferred from the slave station 01 to the master station 00.

7-2 Memory map

[1] Relationship between this module's memory and the VME master memory

Shown below is the relationship between this module's memory map and the VME master memory.



· The memory address (1 M byte: within the range of *1 to *2) for this module, which is installed on a VME back place, is set by switch SW13 on the module. The memory for file $10_{(H)}$ (2 K bytes) used for this PC's memory must be within the range of *1 to *3, and the VME master will access it on odd byte boundaries.

SW13 setting value in a JW-32CV1/32CV2	Memory address (H) allocated to the VME master		
	*1	*2	*3
0	000001	0FFFFF	000FFF
1	100001	1FFFFF	100FFF
2	200001	2FFFFF	200FFF
3	300001	3FFFFF	300FFF
4	400001	4FFFFF	400FFF
5	500001	5FFFFF	500FFF
6	600001	6FFFFF	600FFF
7	700001	7FFFFF	700FFF
8	800001	8FFFFF	800FFF
9	900001	9FFFFF	900FFF
A	A00001	AFFFFF	A00FFF
B	B00001	BFFFFF	B00FFF
C	C00001	CFFFFF	C00FFF
D	D00001	DFFFFF	D00FFF
E	E00001	EFFFFF	E00FFF
F	F00001	FFFFFF	F00FFF

• When SW13 is set to "0"

VME master address	PC file address (file 10 (H))	
0001 (H)	0000 (H)	0000 (8)
0003 (H)	0001 (H)	0001 (8)
0005 (H)	0002 (H)	0002 (8)
. . .	. . .	. . .
0FFD (H)	07FE (H)	3776 (8)
0FFF (H)	07FF (H)	3777 (8)

Note: If you install more than one module on the same VME rack, do not use the same settings for switch SW13 on each module. Double use of the same settings will cause malfunctions.

[2] PC section memory

File number, file address, and application of PC memory assignment is shown below.

File No. (H)	File address (8) (capacity)	Assignment	How to use
0	000000 to 035777 (15 K bytes)	Relay Timer (TMR) Counter (CNT)	Direct access using basic instructions (reading/writing)
		Register	Direct/indirect access using application instructions (reading/writing)
1	000000 to 037777 (16 K bytes)	Register	Direct/indirect access using application instructions (reading/writing)
		Comment memory	Used to store ladder software comments
2	000000 to 077777 (32 K bytes)	Register	Indirect access using application instructions (reading/writing)
		Comment memory	Used to store ladder software comments.
		Structural programing memory	Used to create structural program from ladder software instructions
10	000000 to 003777 (2 K bytes)	VME master memory	Access to the VME master memory through the dual port RAM (2 K bytes)

· The details of files No. 0 to 2 are the same as when setting the JW-32CUH1 “program capacity: 31.5 K words, file 2 capacity: 32 K bytes.”
For more information about the details, see the “JW30H programming manual - ladder instruction version.”

7-3 Access method of dual port RAM

The module exchanges data with the VME master memory through the dual port RAM inside the module. (See page 29)

There are two methods to transfer data between the module's PC section memory and the dual port RAM.

① Data transfer using an indirect assignment instruction in a ladder program ⇒ See item [1]

② Programless data transfer by assigning a specific area ⇒ See item [2].

The data transfer method is selected by setting system memory address #261 in this module.

System memory No. (8)	Item set	Contents
#261	Data transfer system	Specify whether the module's PC section memory or the dual port RAM will be used for data transfer. 00 (H) ··· Data transfer using indirect assignment instruction in a ladder program 22 (H) ··· Data transfer by area assignment without program

· The initial value of address #261 is 00 (H).

Note: When a JW-32CV2 is used, it uses a part of the PC section memory for the I/O link function and the data link function. Therefore, do not send data to these areas.

Ex.: The I/O link function always uses file address $030000_{(8)}$ (byte address: ⊐2000) as its status area.

For details about each function, see the description on page 3.

[1] Data transfer using a ladder program indirect assignment instruction

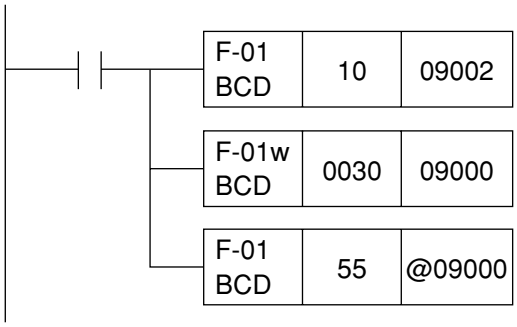
With this method, the module reads/writes data directly to the dual port RAM by using a ladder program application instruction (indirect assignment). (The dual port RAM is treated as file $10_{(H)}$ by the module's PC section memory.)

(1) System memory setting

Set to $00_{(H)}$ (data transfer using a ladder program indirect assignment instruction) at system memory address #261 in the module. (Initial value: $00_{(H)}$)

(2) Example program

① An example of a ladder program for writing the value 55 in file $10_{(H)}$: VME master address = $061_{(H)}$, at the VME master address 030 $_{(H)}$ in the dual port RAM.

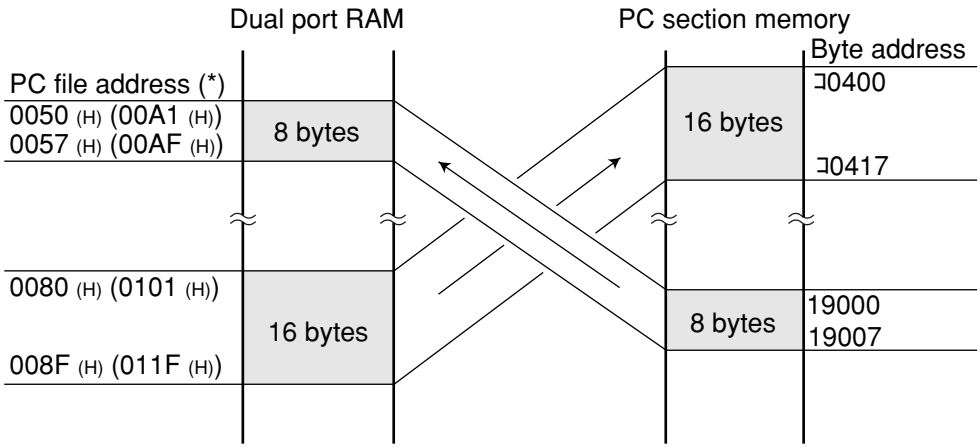


Assign file 10 (H) to register 09002.

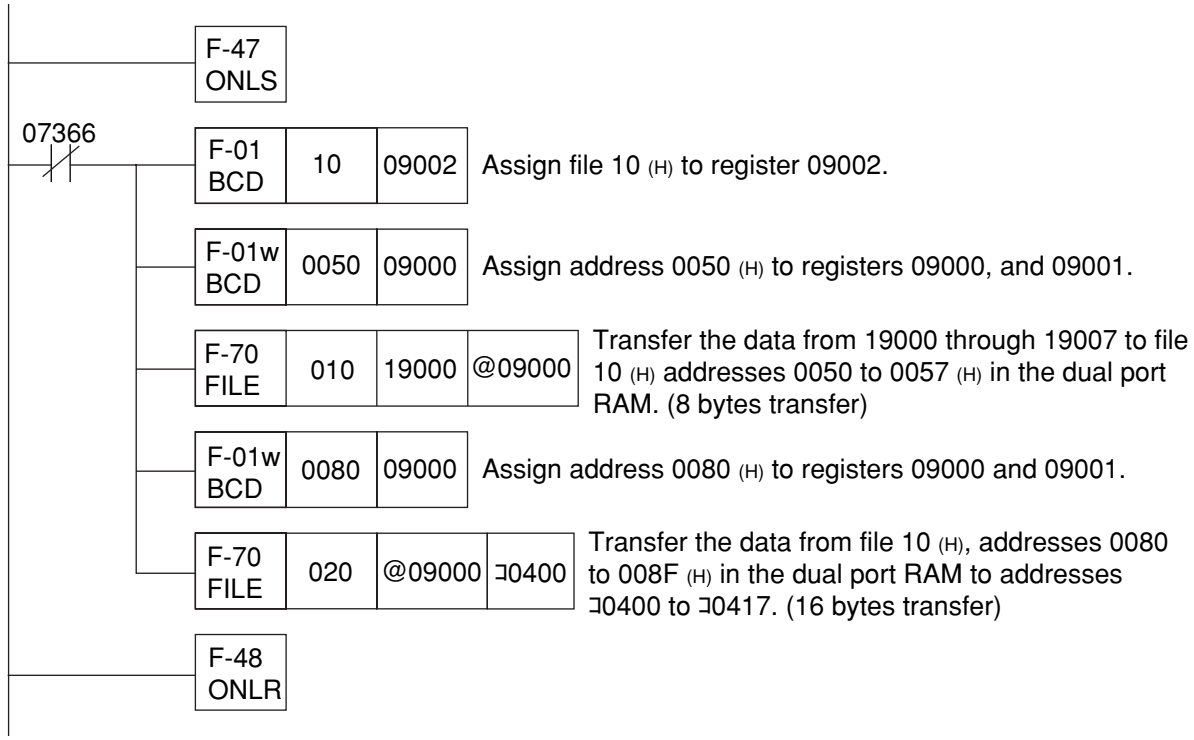
Assign registers 09000 and 09001 to address 0030 (H).

Write the number 55 at address 0030 (H) in file 10 (H) (indirect assignment).

② Shown below is an example of a ladder program for transferring the data from registers 19000 to 19007 (8 bytes) in the PC's section memory to addresses $050_{(H)}$ to $057_{(H)}$ in the dual port RAM, and the data from addresses $080_{(H)}$ to $08F_{(H)}$ (16 bytes) in dual port RAM to addresses ⊐0400 to ⊐0417 in the PC's section memory in each scan sequence.



* The figures in parenthesis ( ) are VME master side addresses$_{(H)}$. (When SW13 is set to "0.")

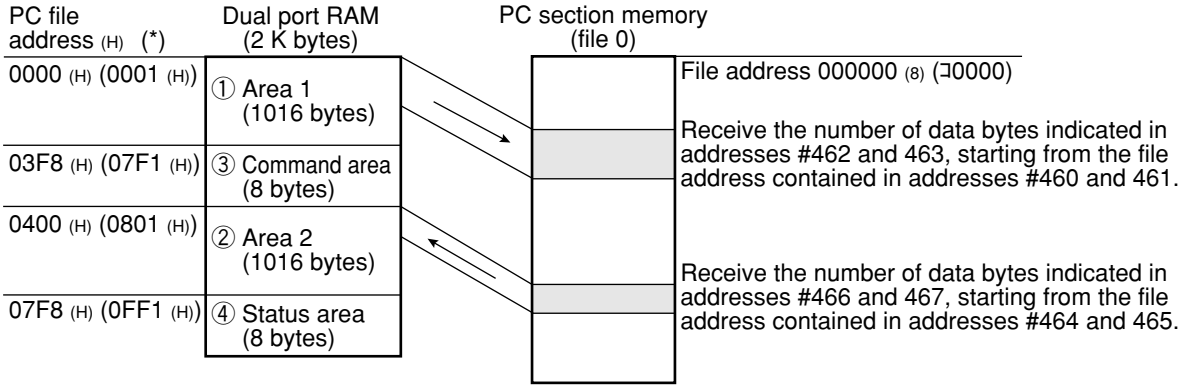


[2] Data transfer by area assignment

This method does not need a ladder program to transfer data between the module PC's section memory (file 0) and the dual port RAM. It can transfer data during each scan by putting the data in system memory.

(1) Data transfer area

The dual port RAM in this module is divided into 4 areas.



* The figures in parenthesis ( ) are VME master side addresses$_{(H)}$. (When SW13 is set to "0")

① Area 1: Area used to transfer data from the dual port RAM to the PC's section memory.

② Area 2: Area used to transfer data from the PC's section memory to the dual port RAM.

③ Command area: Area used to store control data which is sent from the VME master to the module.

· This area occupies 8 bytes of the dual port RAM.
· The control data is written from the VME master.

03F8 (H) (07F1 (H))	
03F9 (H) (07F3 (H))	
03FA (H) (07F5 (H))	
03FB (H) (07F7 (H))	Reserved area
03FC (H) (07F9 (H))	
03FD (H) (07FB (H))	
03FE (H) (07FD (H))	
03FF (H) (07FF (H))	Timer reset for operation check

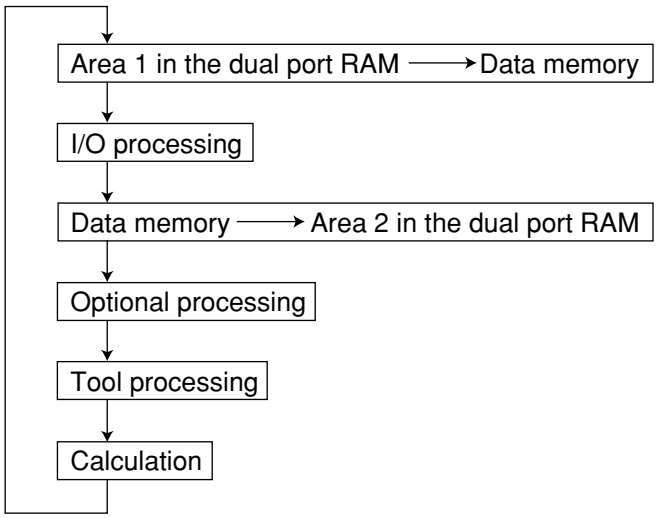
④ Status area: Area used to store operating condition data being sent from the module to the VME master.

· This area occupies 8 bytes of dual port RAM.
· This module automatically writes data from addresses ⊐0730 to ⊐0737 in the PC's section memory.

07F8 (H) (0FF1 (H))	⊐0730 data
07F9 (H) (0FF3 (H))	⊐0731 data
07FA (H) (0FF5 (H))	⊐0732 data
07FB (H) (0FF7 (H))	⊐0733 data
07FC (H) (0FF9 (H))	⊐0734 data
07FD (H) (0FFB (H))	⊐0735 data
07FE (H) (0FFD (H))	⊐0736 data
07FF (H) (0FFF (H))	⊐0737 data

· Error codes are stored at addresses ⊐0734 and ⊐0737 when the PC has an error. For the details about the error codes, see the "JW30H programming manual, ladder instruction"

Reference Operation flow chart for the PC



(2) System memory setting

Set system memory addresses #261 and #460 to #467 in the module using the settings shown below.

System memory No. (8)	Item set	Contents
#261	Data transfer system	Select the data transfer system between this module's PC section memory and the dual port RAM. Enter 22(H) for this system. 22 (H) ··· Data transfer by area assignment.
#460 #461	Transfer top address (RAM → PC)	Set the PC's section memory top address which is used to transfer data from dual port RAM area 1. Set this top address with a file address (octal) in word notation. [Ex.] When register using 09000 (file address 004000 (8)) for the top address. # 461 # 460 004000 (8)
#462 #463	Number of transfer bytes (RAM → PC)	Set the number of bytes to be transferred from the dual port RAM area 1 to the PC's section memory. Enter this number in word notation within the range of 0000 to 1016 (0000 to 03F8 (H)).
#464 #465	Transfer top address (PC → RAM)	Set PC's section memory top address which will be used to transfer data to dual port RAM area 2.
#466 #467	Number of transfer bytes (RAM → PC)	Set the number of bytes to be transferred from the PC's section memory to dual port RAM areas. Enter this number in word notation within the range of 0000 to 1016 (0000 to 03F8 (H)).

· The initial value is 00 (H) for address #261, and is not fixed for addresses #460 to #467.

7-4 Operation check of the VME master and the JW-32CV1/32CV2

(Programless data transfer mode only)

The operation of the module and the VME master can be checked against each other using this function.

However, this function can only be used when the dual port RAM access system is in the "programless data transfer mode." (Enter $22_{(H)}$ at system memory address #261. See page 33 and 34.)

[1] To use this module to check the VME master operation

The timer in this module is used to check the operation of the VME master.

· The operation check timer is reset by an instruction from the VME master.

· If the VME master does not send a reset signal within the specified time, the operation check will time out and relay 07300 in the PC's section memory turns ON.

Therefore, the module can check for VME master errors by checking the ON status of relay 07300.

(1) Resetting the operation check timer

To reset the operation check timer, rewrite the data at address $03FF_{(H)}$ (address $07FF_{(H)}$ in the VME master station) in the dual port RAM (command area) using the VME master. The module samples this data once each scan. If the sampled data is different from the previous data, the timer has been reset.

(2) Setting the time for the operation check timer

Enter a time for the operation check timer at system memory addresses #262 and 263. Enter a value between 0 and 1000 ms (minimum unit: 1 ms) in word notation.

[Ex.] Enter a time of 300 ms for the operation check timer.

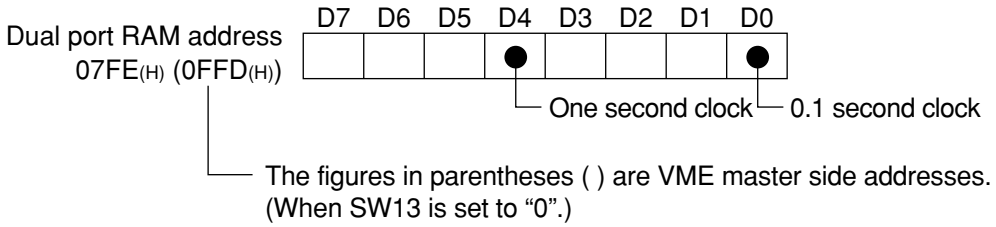
Write 0300 in decimal notation, or $012C_{(H)}$ in hexadecimal notation.

#263	#262
012C (C)	

[2] To check the operation of the module with the VME master

The D4 and D0 bits at address $07FE_{(H)}$ (VME master address $0FFD_{(H)}$) in the dual port RAM (status area) are clock signals. Bit D4 is a one second clock (0.5 second ON and OFF intervals), and bit D0 is a 0.1 second clock (0.05 second ON and OFF intervals). The clock stops when the module's PC section has been stopped by an error, or it is in program mode.

Therefore, by using this clock, the operating condition of the module (PC section) can be checked by an application running in the VME master.

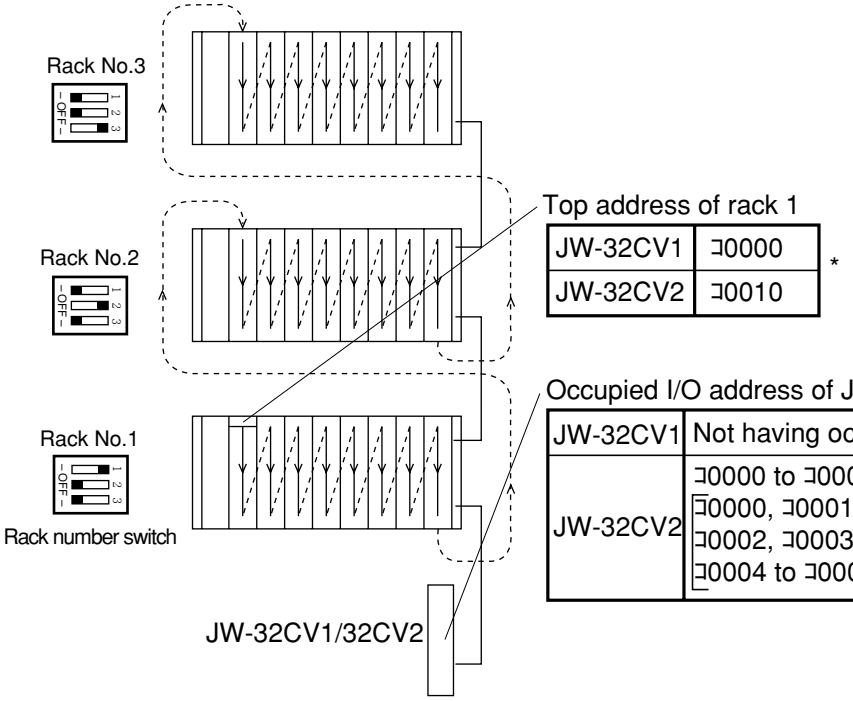


7-5 Allocation of I/O address

I/O address of I/O module, special I/O module installed on expansion rack panel are assigned by automatic registration when the power source is turned ON (switch SW1: OFF), or by I/O registration (automatic registration/table creation) of the support tool (corresponding to JW30H). (Same as JW-32CUH1) However, the actual installation position of the module is in slot 0 or later in rack 1.

(1) In case of auto registration

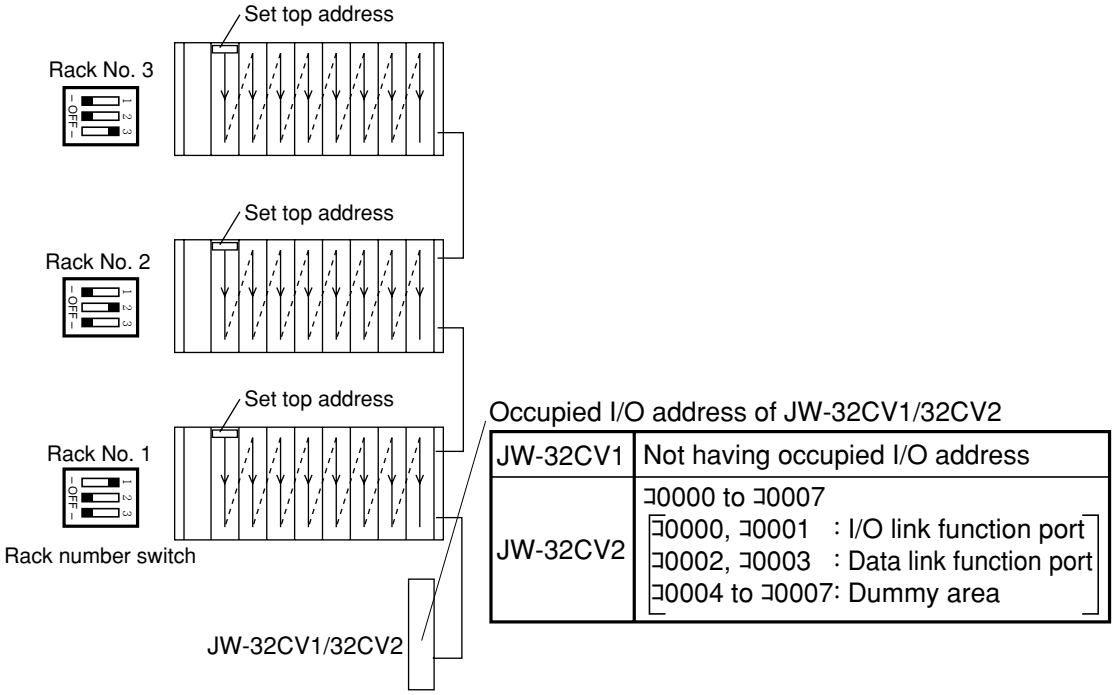
Top address of rack number 1 is set automatically in the continuous address from ⊐0000 (JW-32CV1), ⊐0010 (JW-32CV2).



* The top addresses of JW-32CV1 and JW-32CV2 are different. To make the top address of the JW-32CV1, ⊐0010, the same address as in the JW-32CV2, you have to create the table described in item (2) below.

(2) In case of table creation

In the expansion rack panel (rack numbers 1 to 3), the top address of relay number is set in even address (within area of ⊐0000 to ⊐1577).



■ Max. no. of control I/O points of JW-32CV1/32CV2

	Max. no. of control I/O points	Maximum number of I/O relay points that can be allocated	I/O address area	
			Auto registration	Table creation
JW-32CV1	1024 points	768 points	□0000 to □0137	□0000 to □1577
JW-32CV2		832 points	□0000 to □0147	

■ The maximum number of relay points and slave modules that can be installed for each model.

Kinds of modules		The number of relay points affecting the maximum number of I/O points	Maximum number of I/O relay points that can be allocated	Maximum number of modules that can be installed
8 points input/output module		16 points	16 points	24 sets
16 points input/output module		16 points	16 points	24 sets
32 points input/output/I/O module		32 points	32 points	24 sets
Special I/O module	64 points input/output	64 points *	16 points	16 sets
	Except 64 points input/output	0	16 points	24 sets
Vacant slot		0	16 points	—

*Control relay of 64 points input/output module use relay area (□3000 to □3777) for special I/O module.

Chapter 8 Troubleshooting and maintenance

[1] Troubleshooting

In the event of error, check the LED (RUN, FAULT) of the JW-32CV1/32CV2, and remedy according to the check flow depending on the state.

[State of LED]

RUN	FAULT	Remarks
OFF ○	ON ●	Detectable error for self-diagnosis
OFF ○	OFF ○	Power supply OFF
Blink ◎	OFF ○	Halt mode
ON ●	OFF ○	Disable detection error by self-diagnosis (input relation)
		Disable detection error by self-diagnosis (output relation)
ON ●	ON ●	Others

For contents of countermeasure, see “JW30H user’s manual hardware version.”

[2] Self-diagnostic function

By the self-diagnostic function, the system is running while checking if its own hardware is normal or not. As a result of self-diagnosis, if an error is detected, the stop output is turned OFF (opened), and the fault lamp lights up to stop operation.
Self-diagnosis is executed in every scan, and when recovered to normal state, the stop output is automatically turned ON (closed), and the operation is resumed. (By the infinite loop of user program or the like, when the watchdog timer is actuated, the operation is stopped by the program mode, and the stop output is opened.)

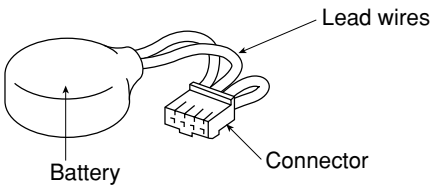
See “JW30H user’s manual hardware version” in detail.

[3] Exchange method of batteries

Exchange battery for memory backup in JW-32CV1/32CV2 within its validity.

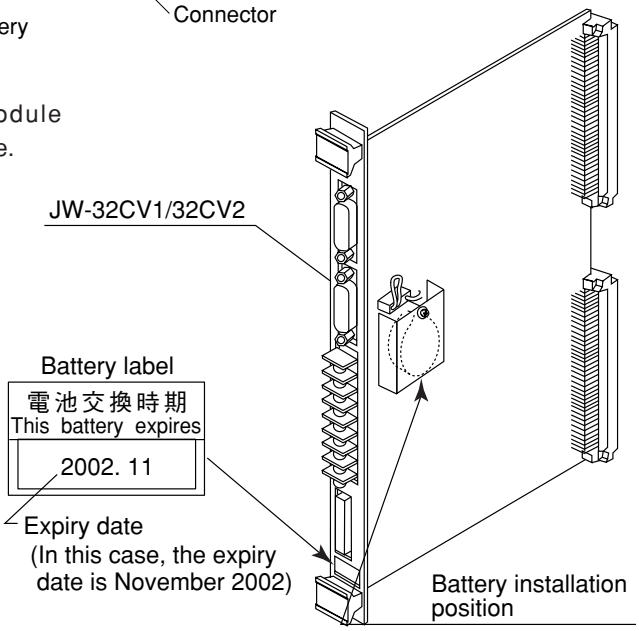
[Model name of battery module]

UBATN5005NCZZ



[Battery exchange procedure]

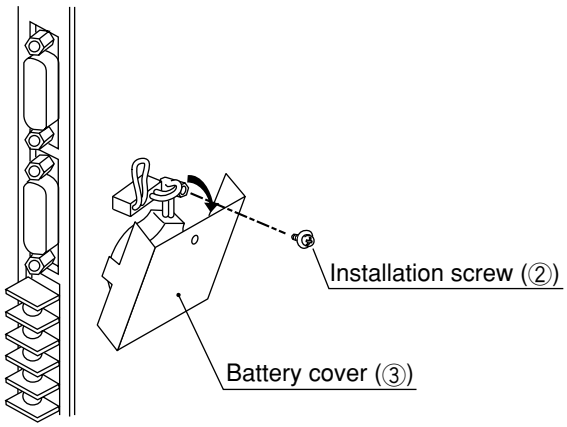
① Prepare a new battery module UBATN5005NCZZ for exchange.

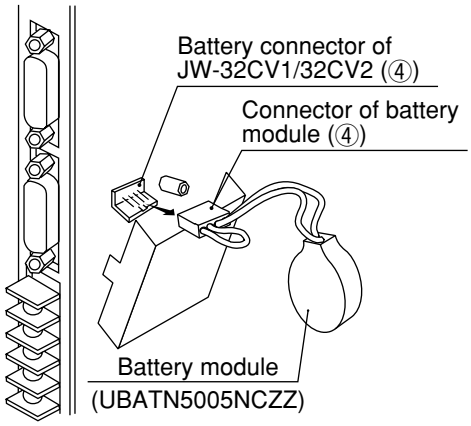


② Remove the fixing screws on the battery cover.

③ Open the battery cover.

④ Disconnect the battery module connector from the JW-32CV1/32CV2 battery connector and remove the battery module.





⑤ Insert a new battery module connector in the battery connector of the JW-32CV1/32CV2.
The battery change must completed within 5 minutes. Otherwise, the memory may be erased.

⑥ Mounting the battery cover.

Note

· Do not subject the battery to impact of any kind. Do not pull on the lead wires of the battery, or liquid leakage accident may occur.

Chapter 9 Specifications

[1] General specifications

Item	Specifications	
	JW-32CV1	JW-32CV2
Power voltage	5 VDC (4.75 to 5.25V): Power supply from VME bus side	
5 VDC current consumption	900mA max.	1100mA max.
Storage temperature	−20 to 70˚C	
Ambient temperature	0 to 90˚C	
Ambient humidity	35 to 90%RH (non-condensing)	
Atmosphere	Free from corrodive gas	
Vibration resistance	JIS C 0911 or equivalent (2 hours in X, Y, Z axis)	
Shock resistance	JIS C 0912 or equivalent (10G, 3 times in each X, Y and Z axis)	
Outside dimesion (module alone)	20mm (W)×262mm (H)×188mm (D)	
Weight	Approx. 350g	Approx. 400g
Standard which apply	None	
Accessories	One instruction manual	

[2] PC section performance specifications

Item		Specifications
Program system		Stored program system
Control system		Compatible cyclic calculation and interrupt dealing system
Processing speed		Basic instruction (except OUT, TMR, CNT, MD): 0.038 μs/instruction
		OUT instruction: 0.076 μs/instruction
		Application instructions, TMR, CNT, MD instructions: average number μ to several tens μs
Type and numbers of instruction		Basic instruction: 20 Application instruction: 177
No. of control I/O points		1024 points max.
Program size		31.5K words
Data memory		Relay : 30720 points (includes special relay) TMR/CNT/MD : 1024 points Register : 25600 bytes File register : 32K bytes
Memory back-up		By built-in lithium battery. (Back up period: Five years) (available for ROM operation using integrated flash ROM.)
External interface	I/O bus (40-pin connector)	· A maximum of three expansion rack panels can be connected to work with the JW30H series. To connect an expansion rack panel, use an I/O extension cable for the JW20H/30H. The total allowable cable length is a maximum of 14 m. · I/O modules and special I/O modules can be connected to JW20H/30H series. Option modules cannot be connected.
	Communication port 1 (D-sub 15-pin)	Both support tool and computer link communications can be used. **[When using computer link communication]** Communication standard: RS-422A (four-wire system) Communication protocol : Equivalent to the Sharp computer link specifications. Transfer speed: 115200/57600/38400/19200/9600/4800 /2400/1200 bits/s · If an RS-422A is used, a network of 1: N (N = maximum 31 modules) connections is possible. The total maximum extension length is 1 km.
	Communication port 2 (D-sub 15-pin)	Both support tool and computer link communications can be used. **[When using computer link communication]** Communication standard: Selectable from RS-232C and RS-422A (four-wire system) Communication protocol: Equivalent to the Sharp computer link specifications. Transfer speed: 115200/57600/38400/19200/9600/4800 /2400/1200 bits/s · If an RS-422A is used, a network of 1: N (N = maximum 31 modules) connections is possible. However, if you want to use a transfer rate higher than 38400 bits/s., connect the module in a 1: 1 arrangement. The total maximum extension length is 1 km.
	I/O link * (terminal block)	Communication as a master station in a satellite I/O link (the same function as in the JW-23LMH). Note: This can only be done with a two-wire system.
	Date link * (terminal block)	Select a remote I/O master station, DL1 data link, DL9 data link, computer link, or M net communication mode. (The same function as in the JW-21CM) Note: The computer link and M net communications modes are available only in two-wire system.

* The I/O link function and data link function are only available in the JW-32CV2.

Item	Specifications
Halt output (terminal block)	This output opens when the CPU detects an error (the internal WDT has timed out) or the module is in halt mode. Relay output (normally closed, opens on error or when halted) Maximum load: 1 A/30 VDC, 250 VAC
Clock feature	Integrated
Programming tool	The support tools that can be used with the JW30H series, such as the JW-13PG and JW-50SP can be used with these models. (Specify the model that can handle JW-32CUH1, 31.5 K words)

[3] Interface specifications

Item	Specifications
Usable VME slot	Double width slot (only connector P1 is used) · The module occupies one slot.
Bus system in the VME	Address bus: 24 bits (A23 to A0) Data bus: 16 bit (D15 to D0) · The module uses 8 bits (D0 to D7, a one byte unit) only for data exchange. Therefore, only odd addresses are available for access from the VME master.
Data exchange system	By reading/writing data in the integrated dual port RAM, the module and VME master are able to exchange data. (Simultaneous access is possible from both sides of the port.) · Dual port RAM addresses in the VME master can be set to a base address (A20 to A23) by using switch SW13. · Dual port RAM addresses in the module PC will be at file 10. They can be read and written by ladder program.