SHARP®

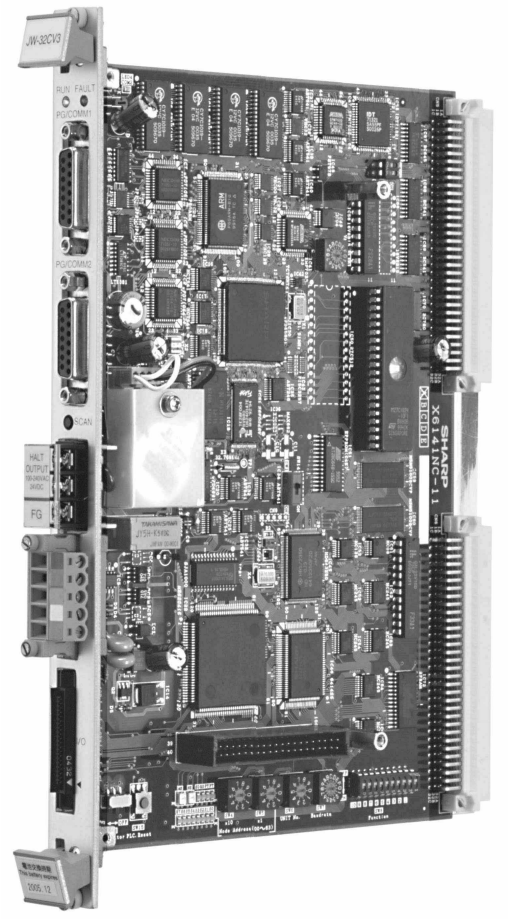
Version 1.1
Produced in Mar. 2003

VME Built-in Controller

Model name
JW-32CV3

Instruction Manual

Applicable to software version 2.4(S2.4)



Thank you for purchasing this VME built-in controller, the JW-32CV3.
Please familiarize yourself with the module by reading this user's manual thoroughly.
The following manuals are also available for the JW-32CV3's PLC function. Read these together with this manual. (The items below are not described in this manual.)

Manual name	Details that affect the use of the JW-32CV3
JW30H User's Manual, Hardware Version	Descriptions concerning PLC functions and use of expansion rack panel of the JW-32CV3, items below are the same for the JW30H control modules (such as JW-32CUH1). - System design procedures. - Use and wiring methods for expansion rack panels, the power supply module, I/O modules, and special I/O modules. - Precautions for using I/O modules. - I/O module specifications. - ROM operation. - Trial operation.
JW30H Programming Manual, Ladder Instruction Version	Software descriptions concerning the data memory, program memory, system memory, and commands for the JW-32CV3 control section (program capacity: 31.5 K-word, file capacity: 32 K-bytes). References to the "JW-32CUH1" in this manual should be read as "JW-32CV3."
JW-21CM User's Manual	When the JW-32CV3 is used for communicating with a personal computer through its communication port. The descriptions for computer link commands referring to the "JW-32CUH1" apply equally to the "JW-32CV3."

- Beside the manuals above, also refer to each of the manuals for optional JW30H modules, special I/O modules, and support tools (JW-14PG etc.).

Software version

This manual describes on the assumption that the JW-32CV3 uses software version V2.4.
The software version V2.4 is added the following functions on the version V2.1.
Data created with the previous version V2.1 can be used with the version V2.4, and mixed use of version V2.1 installed JW-32CV3 and version V2.4 installed JW-32CV3 on the same network is possible.

■ Additional functions of the software version V2.4 (against V2.1)

Additional function	Outline
Specify data length when editing the scan list	When the JW-32CV3 is used with the master mode, the data length when editing a scan list can be specified on the system memory between 1 to 64 bytes.
Select status of slave area when a communication error occurs	When the JW-32CV3 is used with the slave mode, slave areas status when a communication error occurs (latch/clear) can be selected on the system memory.
Specify response time to the master station	When the JW-32CV3 is in slave mode, specify a response time (0 to 65528 ms) to the master station can be specified on the system memory. This shall be specified when communication processing time of the master station is extremely long. (Normally specify 0 ms.)
Valid the SCAN switch while in operation	When the JW-32CV3 (control section) is in master mode, and hold down the SCAN switch for 3 seconds and it will enter the scan list edit mode.

- The software version V2.4 installed JW-32CV3s are affixed with [S2.4] mark on their housings. ⇨ See page 4-1.

Notes

- Should you have any questions or inquires, please feel free to contact one of our dealers, or our service department.
- Copying this manual in part of in total is prohibited.
- The contents of this manual may be revised without notice.

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, instruction manual, and user's 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

- 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-32CV3. Otherwise breakdown or accident damage of the machine may be caused by the trouble of the JW-32CV3.

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-32CV3.
  Or electric shock, malfunction or breakdown may be caused.

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Chapter 1: Outline

The JW-32CV3 VME built-in controller can be connected directly to the VME bus. This is a high performance programmable controller (hereafter referred to as a "PLC"). It can easily create a data interface to a VME master through its dual port RAM.
Its PLC section is based on a CPU core which is equivalent to Sharp's JW30H series PLC control module JW-32CUH1, and offers super high speed PLC operation. Further, the JW-32CV3 is equipped with a DeviceNet communication port as standard, and can be connected with various DeviceNet compatible equipment.
With variety of interfaces equivalent to the JW30H series PC (I/O bus, communication port), it facilitates effective use of PLC support tools on a VME base system.

● **JW-32CV3 major function**

Item		Contents
Maximum number of input/output points		1024 points
Program capacity		31.5 K words
Data memory	Register*	25 K bytes - Including a file 1 register (16 K bytes) that can directly be specified using application instructions.
	File memory	32 K bytes (file 2)
Instruction processing speed		Basic instruction: 0.038 ∝s Transfer instructions (F-00): 1.22 ∝s
DeviceNet communication function		Yes (master/slave)
Clock function		Standard
Communication port data transfer rate		115200/57600/38400/19200/9600/4800/2400/ 1200 bits/s
Number of modules on a single expansion rack panel		3 modules maximum
Total I/O expansion cable distance		14 m maximum
J-board add-on connection		1 modules maximum (Connectable board: Z-322J, Z-333J, Z-334J, Z-335J, Z-336J, Z-337J, Z-338J)

- DeviceNet is a trademark of the ODVA (Open DeviceNet Vendor Association).

Chapter 2: Precautions for Use

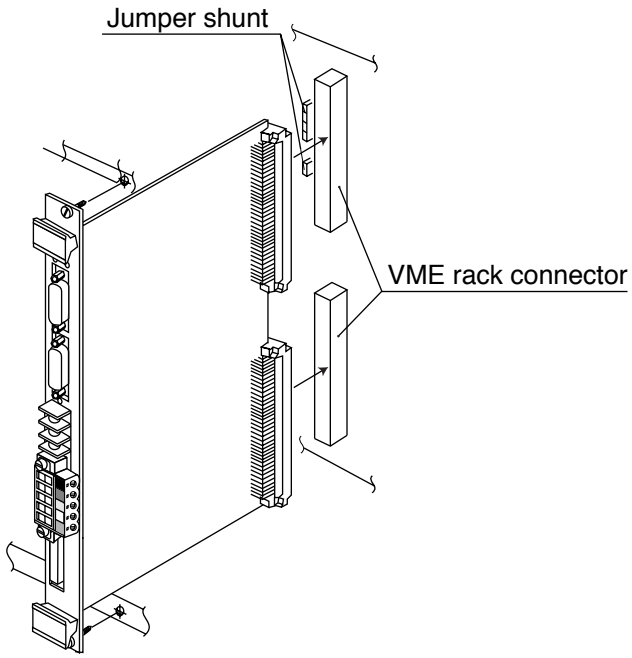
Pay attention to the following items when installing or using the JW-32CV3.

(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 JW-32CV3.
- 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 JW-32CV3

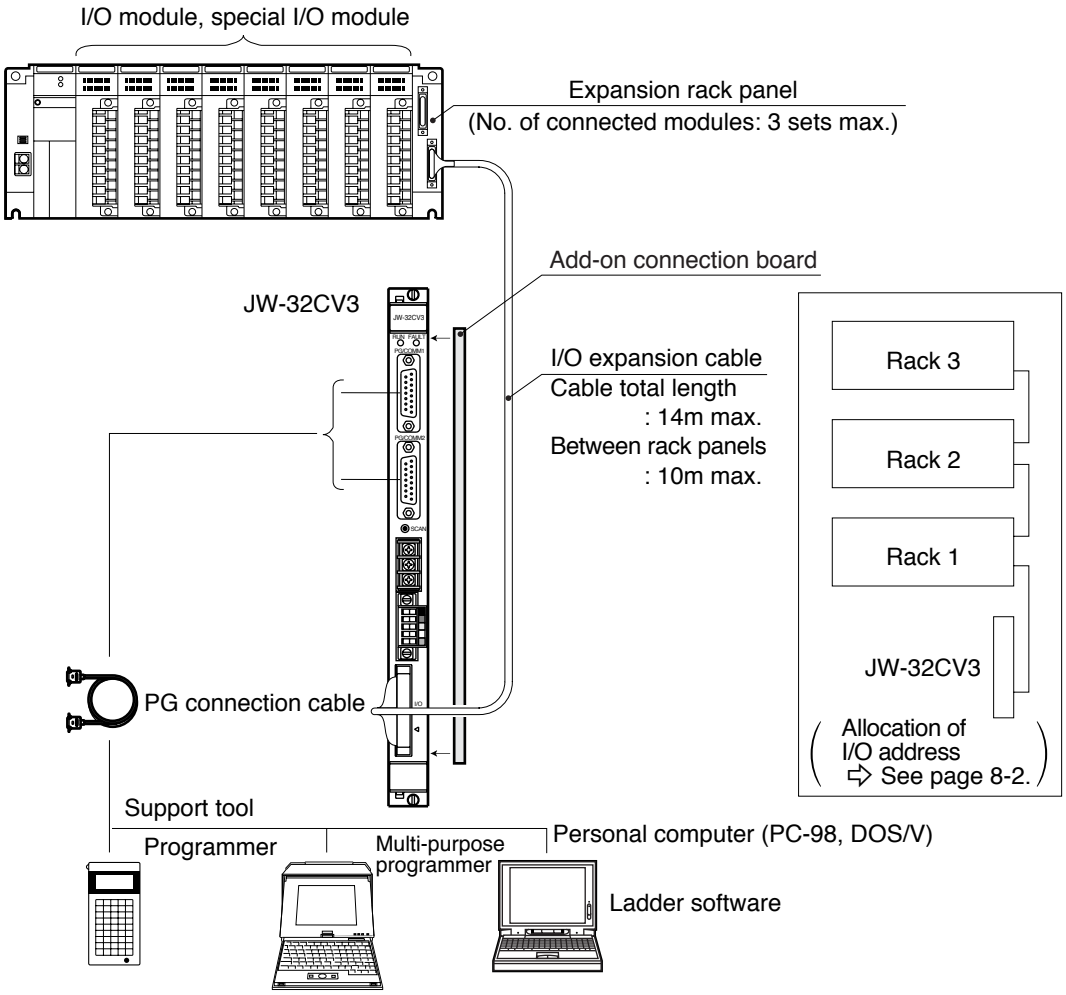
- Make sure to turn OFF the power before installing or removing the JW-32CV3.
- If you install the JW-32CV3 on a VME bus (install the JW-32CV3 in the 2nd or lower slots of the VME bus back plane), make sure to remove the respective jumper shunt on the VME bus back plane.
  1. Check the setting of the jumpers on the JW-32CV3.
  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 JW-32CV3 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 5-1.
- If the JW-32CV3 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 JW-32CV3 is not set appropriately, it may malfunction.
- Make sure to disconnect both the JW-32CV3 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 5-1.

Chapter 3: System Configuration

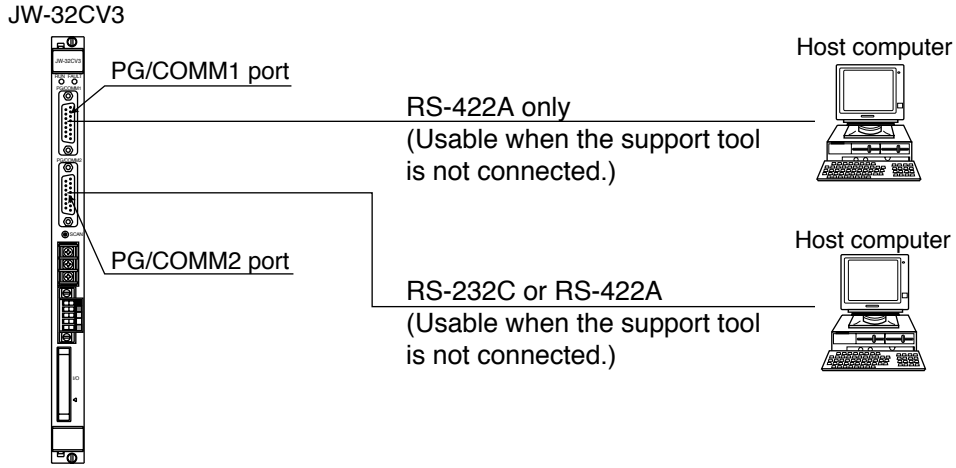
3-1 Basic system configuration



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 installed	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 rack panels) - A JW-203EC/207EC/22EC/25EC/210EC I/O expansion cable for the JW20H/30H can be used to connect rack panels.
Number of modules and types of add-on connection board	1 modules maximum Connectable board (J-board) - I/O board: Z-322J - Communication board: Z-333J, Z-334J, Z-335J, Z-336J, Z-337J, Z-338J)
Support tool	Usable support tools that conform to JW30H (JW-32CUH1)

3-2 Communication system using communication port

By using a communication port of the module, the JW-32CV3 can communicate with a host computer such as a personal computer and a LCD control terminal. (Computer link)
The JW-32CV3 has 2 ports (PG/COMM1,PG/COMM2) for communication port.



Item	Specifications	
	RS-232C connection	RS-422A connection
Number of connected modules of JW-32CV3	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 (Party line connection) *2
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	

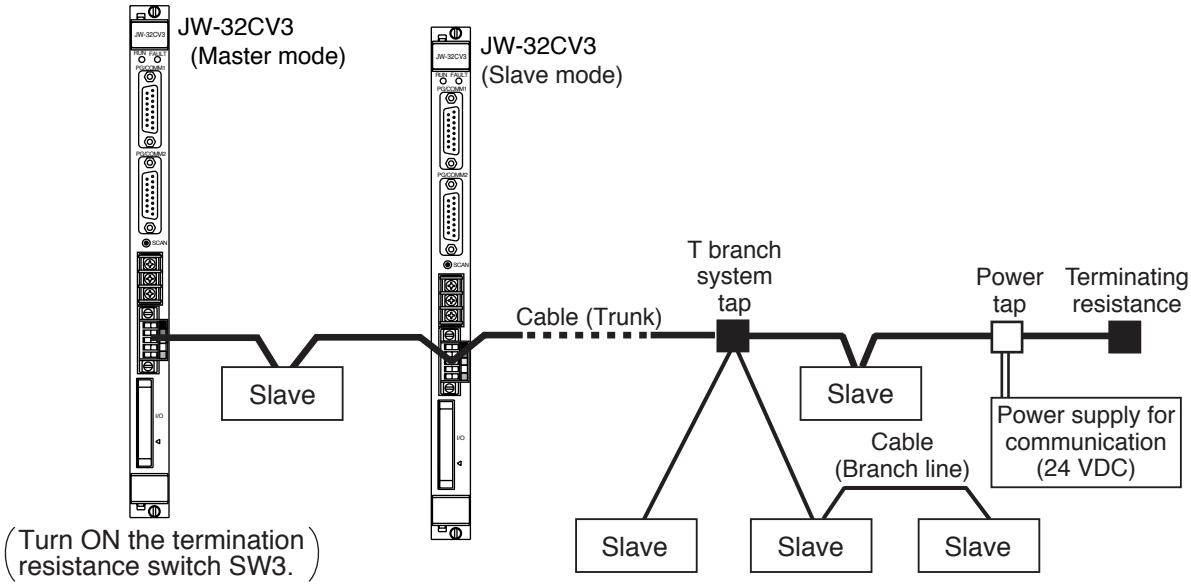
*1 To obtain data transfer speeds higher than 38400 bit/s, the JW-32CV3 must be connected directly to a host computer (1:1 connection).
*2 Two-wire system communications are not possible.

The use of the communication port, such as for setting system memory, is the same as for the JW-32CUH1.
⇨ See "JW30H user's manual hardware version."

3-3 Configuration of communication system using DeviceNet function

The JW-32CV3 can be used to communicate as a master or slave module in a DeviceNet.

● **Connection example**



● **Communication specifications of the DeviceNet section**

Item	Specification			
Communication protocol	Conforms to the DeviceNet protocol			
Basic operation mode	Master mode, slave mode			
Number of nodes	Maximum of 63 nodes slave station for one master station.			
Number of I/O points	4,096 points max. (512 bytes max.: Total number of I/O points of I/O messages).			
Communication speed	Selectable: 125 k bps, 250 k bps, or 500 k bps.			
Communication distance (max.)	**Communication speeds**	**125 k bps**	**250 k bps**	**500 k bps**
	Trunk length using a thick cable	500 m	250 m	100 m
	Trunk length using a thin cable	100 m	100 m	100 m
	Maximum branch length	6 m	6 m	6 m
	Total branch length	156 m	78 m	39 m
Communication services	I/O message function (Polling I/O function, Bit Strobe function) Explicit message function			
Communication carrier	Specialized cable (5 lines: 2 signal lines, 2 power lines, 1 shield line) - Thick cable: For trunk lines - Thin cable: For trunk or branch lines			
Data table allocation method when the master mode	Select the method used for I/O data mapping in the scan list edit mode from "allocation in address order," "even number allocation," or "allocation in the order in which vacant nodes are occupied."			
Specification of the number of I/O bytes when the slave mode	Number of input bytes: 0 to 127 bytes Number of output bytes: 0 to 127 bytes			

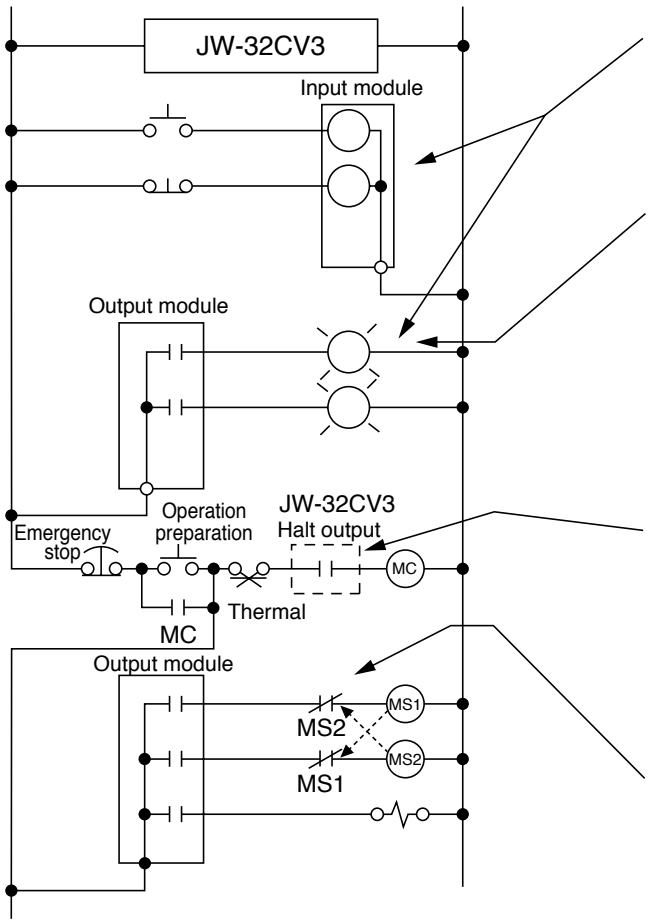
As for the DeviceNet communication function of the JW-32CV3, see "Chapter 9: PLC DeviceNet communication function."

3-4 Cautions on system design

A principle difference between a programmable controller (PLC) and a conventional relay circuit is that a PLC 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 PLC 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 PLC operates using cyclic processing.
To prevent mis-operation due to output signal of the output module soon after switching on power to the JW-32CV3, connect in series the halt output for the JW-32CV3 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-32CV3 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-32CV3.)

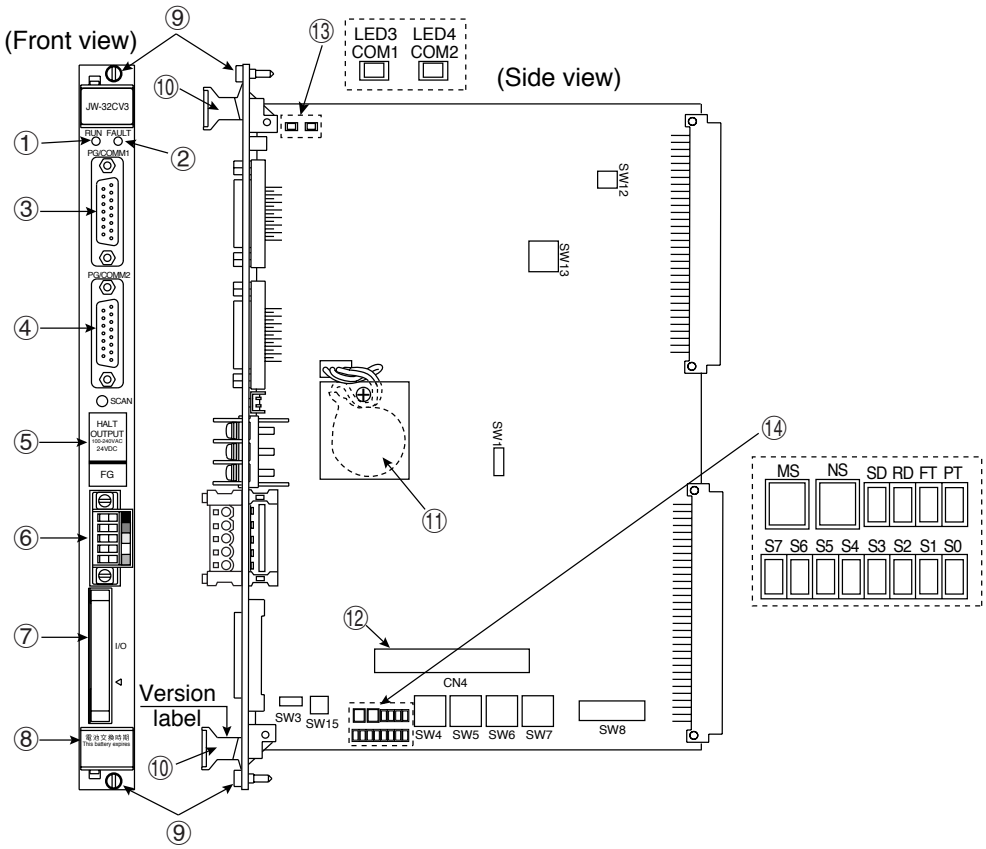
- Halt output
  An output which opens when the CPU has an error (internal watch dog timer times out) or is halted.

  [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

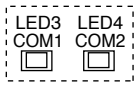


	Name	Function	
①	RUN lamp (green)	- Lights when the module is operating normally. - Programming after connecting support tool: Blinking, (PLC control section stops operation) - Detect errors by self-diagnosis function: Lights OFF. (when battery is error, lights ON.)	⇨ See "8-3 Error and treatment, maintenance"
②	FAULT lamp (red)	Lights when detecting errors by self-diagnosis. PLC control section stops its operations. (However, it operates even when battery is error.)	
③	PG/COMM1 port	- Connecting with support tool. - Connecting with device having serial I/O port such as personal computer. (RS-422)	
④	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.)	
⑤	Terminal block	Connecting extended line of halt output and FG.	
⑥	DeviceNet communication connector	Connect to nodes (master and slave stations) of the DeviceNet system.	
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 8-6)	
⑨	Module retention screw	Install the JW-32CV3 on the VME rack.	
⑩	Ejector handle	Used to remove the JW-32CV3 from the VME rack.	
⑪	Battery	Backup battery for the JW-32CV3.	
⑫	Add-on connection connector	Use when to connect a board (J-board) with add-on connection to the JW-32CV3.	
⑬	Control LED	Display status of the control section. ⇨ See the next page.	
⑭	DeviceNet communication LED	Display status of the DeviceNet communication. ⇨ See page 4-2 and 9-9.	
---	Switch SW1, 3 to 8, and 12	Settings concerning VME interface, PLC control, and PLC DeviceNet communication. ⇨ See page 4-3, 4-4, 9-8 to 9-13.	

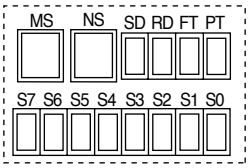
4-1 LED display

These LEDs show operation details of control functions and DeviceNet communication functions of the JW-32CV3 by lighting/blinking/OFF.

Control LEDs



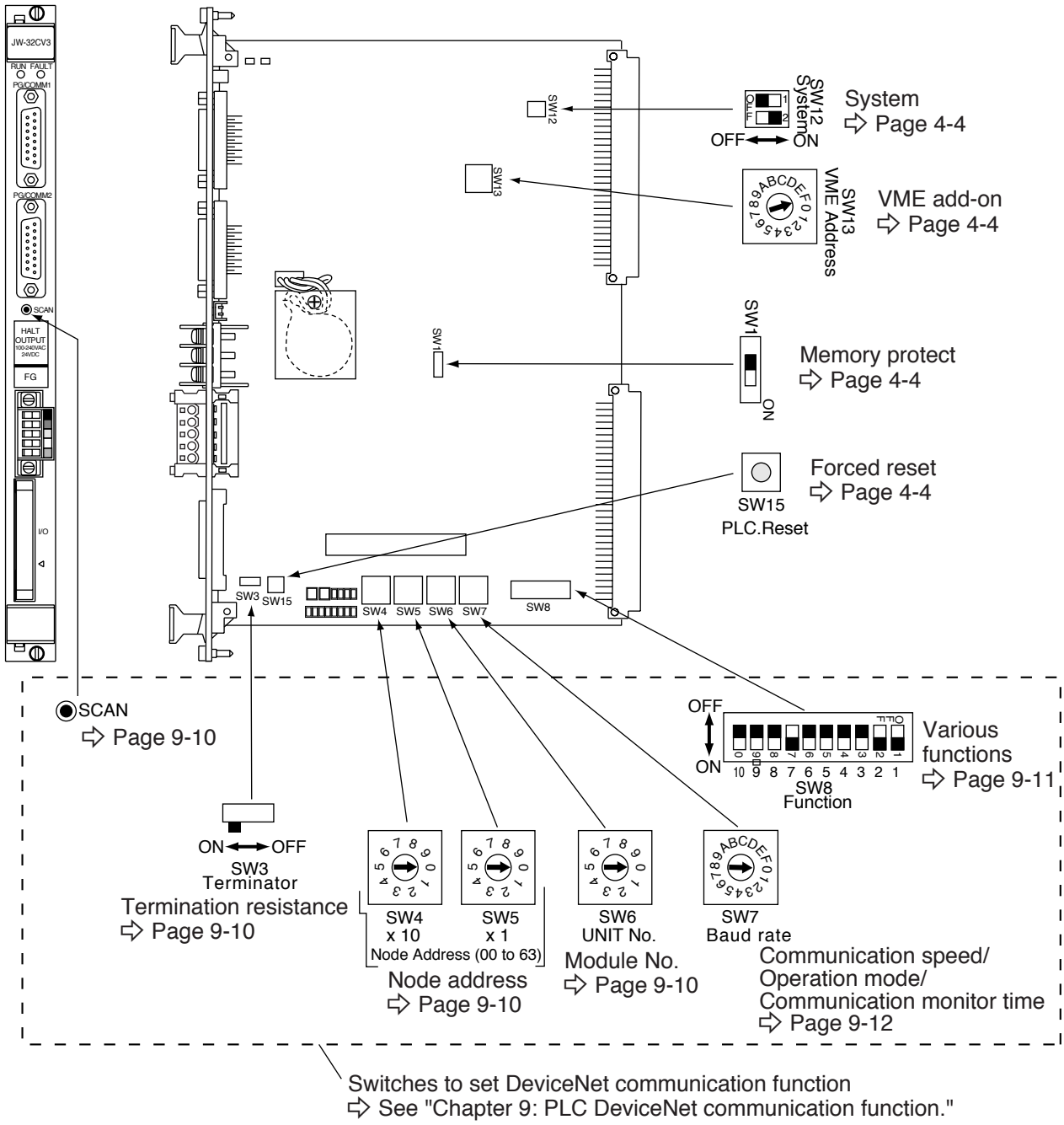
DeviceNet communication LEDs



Lamp name		Color	Operation details	
Control LEDs	COM1	Red	Lights when communicating with a personal computer using the PG/COMM1 port. Lights when monitoring using a support tool.	
	COM2	Red	Lights when communicating with a personal computer using the PG/COMM2 port. Lights when monitoring using a support tool.	
DeviceNet communication LEDs	MS	Green/Red	Indicates the module's status.	⇨ See page 9-9, 9-38
	NS	Green/Red	Indicates the network status.	
	SD	Red	Lights when sending data.	
	RD	Red	Lights when receiving data.	
	FT	Red	Lights when the JW-32CV3 (DeviceNet section) is faulty.	
	PT	Red	Lights when the JW-32CV3 (DeviceNet section) is in the protected mode.	
	S7 to S0	Red	Displays error codes and the node address when the DeviceNet communication system has an error.	

4-2 Switches

Using these switches, set each switch concerning VME interface, PLC control, and PLC DeviceNet communication of the JW-32CV3.



[1] VME interface

(1) System switch SW12

Always keep the setting as below.

SW12	Setting	
1	OFF	(Settings at delivery)
2	ON	

(2) VME address switch SW13

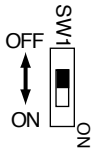
Allocate address of the JW-32CV3 using the VME switch. ⇨ See page 7-1.

(Setting at delivery: F)

[2] PLC control

(1) Memory protect switch SW1

Select permit/prohibit writing of the program memory and system memory of the JW-32CV3.



OFF	Permit writing
ON	Prohibit writing

(Setting at delivery: OFF)

(2) Forced reset switch SW15

When a loop is established in a user program, and the watchdog timer times up and unable to control, press this switch.

- Turn ON the power while pressing this switch, the JW-32CV3 forcibly enters the program mode.

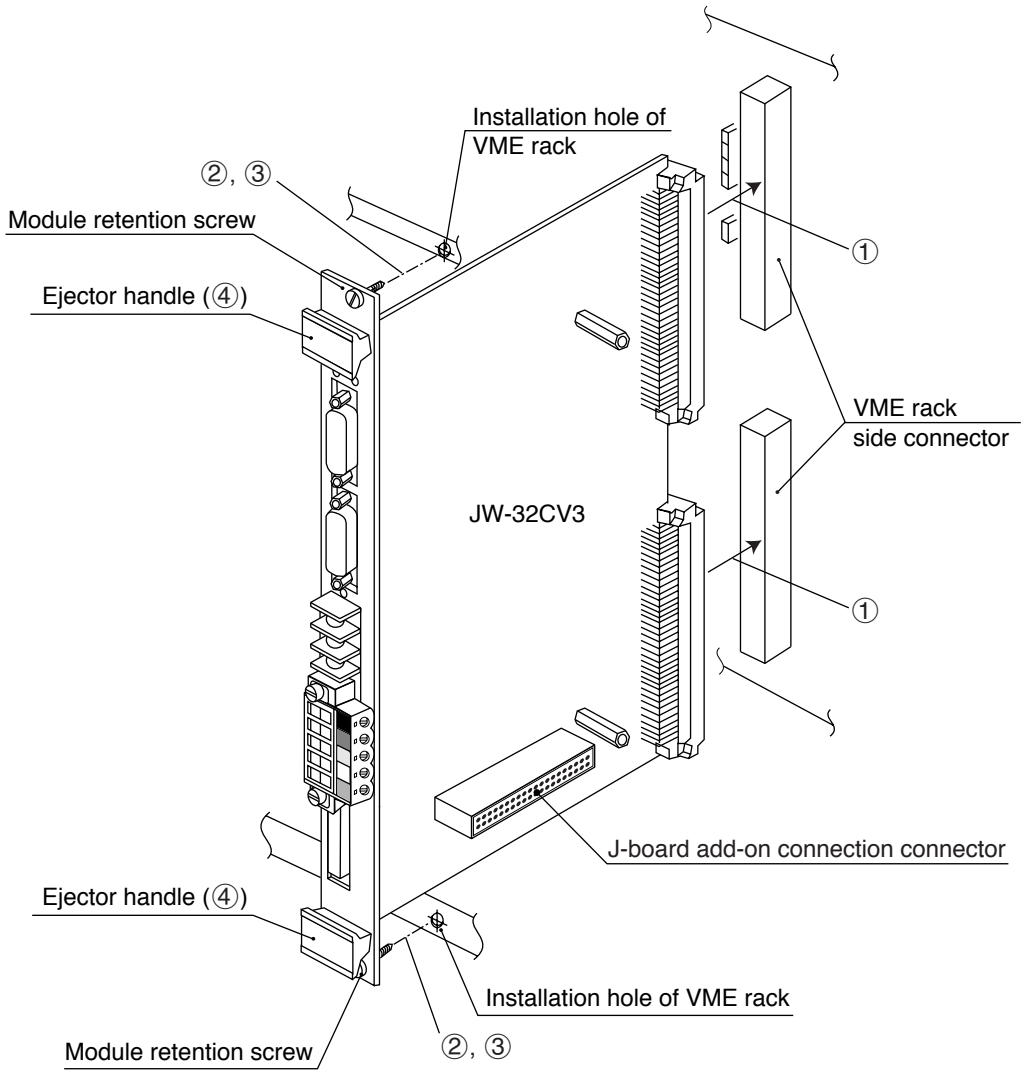
Chapter 5: Installation Method

[1] Installation on the VME rack

This chapter describes how to install or remove the JW-32CV3 on/from a VME rack.
Make sure to turn OFF the power to the VME rack before installing or removing the JW-32CV3.

■ Installation procedure

① Insert the JW-32CV3 into a slot (connector) on the VME rack.
Insert it straight into the VME module while being careful that the J-board add-on connection connector of the JW-32CV3 does not touch an adjacent JW-32CV3.
② Secure the JW-32CV3 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.
(When removing the adjacent modules, also be sure to disconnect the power lines to both terminals of them.)

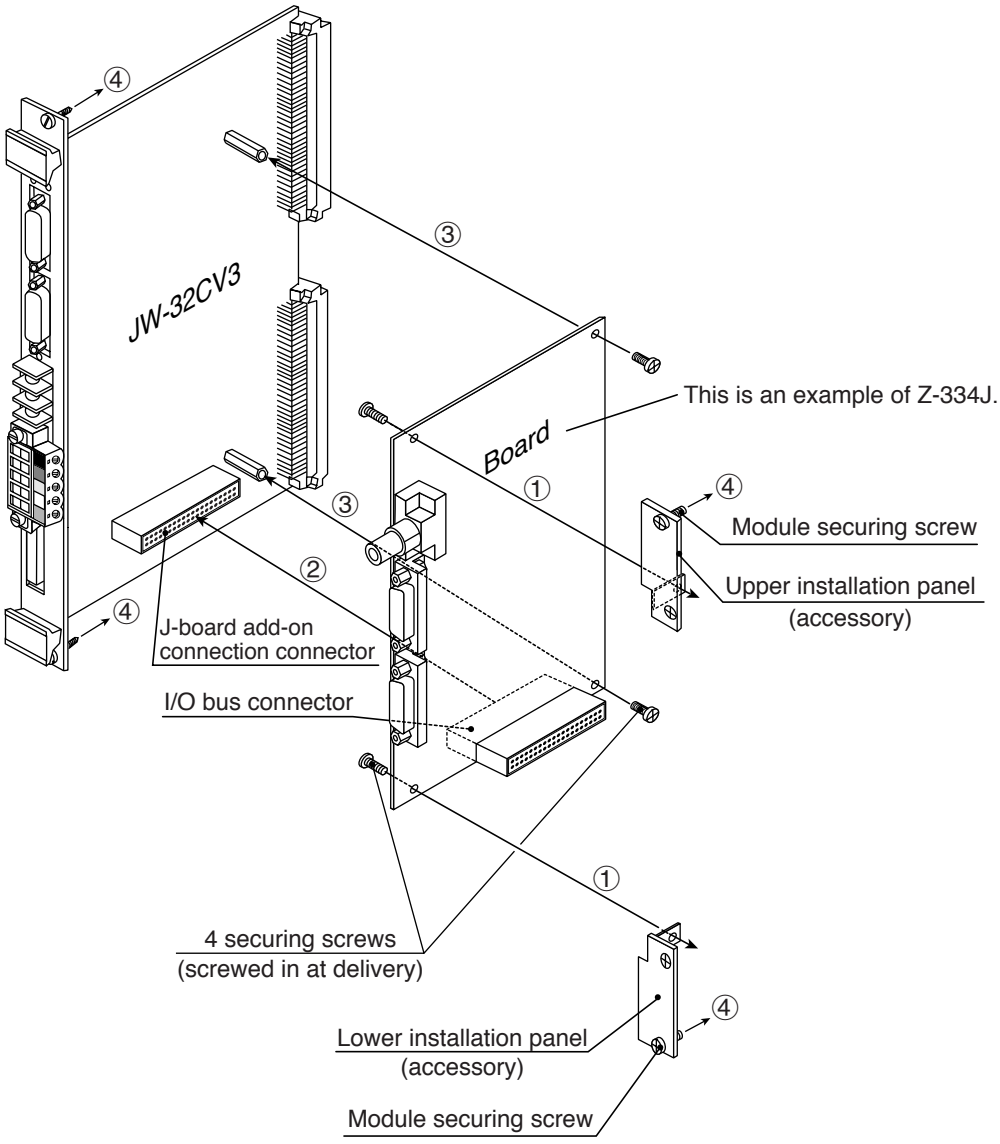
① Remove the two screws securing the module in the VME rack.
② Pull the module out from the VME rack using the two ejection handles.
Pull the module straight out while being careful not to allow the connector marked with an asterisk * in the figure above to touch an adjacent module. J-board add-on connection of the JW-32CV3.

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

[2] Add-on connection of board (J-board)

One set of the J-board can be connected to the J-board add-on connection connector on the JW-32CV3.
- For connection, use an installation panel (upper and lower) that comes with the JW-32CV3.
- Connectable boards are following 7 models.

I/O board	Z-322J (64 points: 32 points of DC input, 32 points of transistor output)
Communication board	Z-333J (Satellite I/O link master station), Z-334J (ME-NET board), Z-335J (satellite net board), Z-336J (FL-net board), Z-337J (DeviceNet board), Z-338J (DeviceNet board, 32 points I/O)



■ Installation procedures

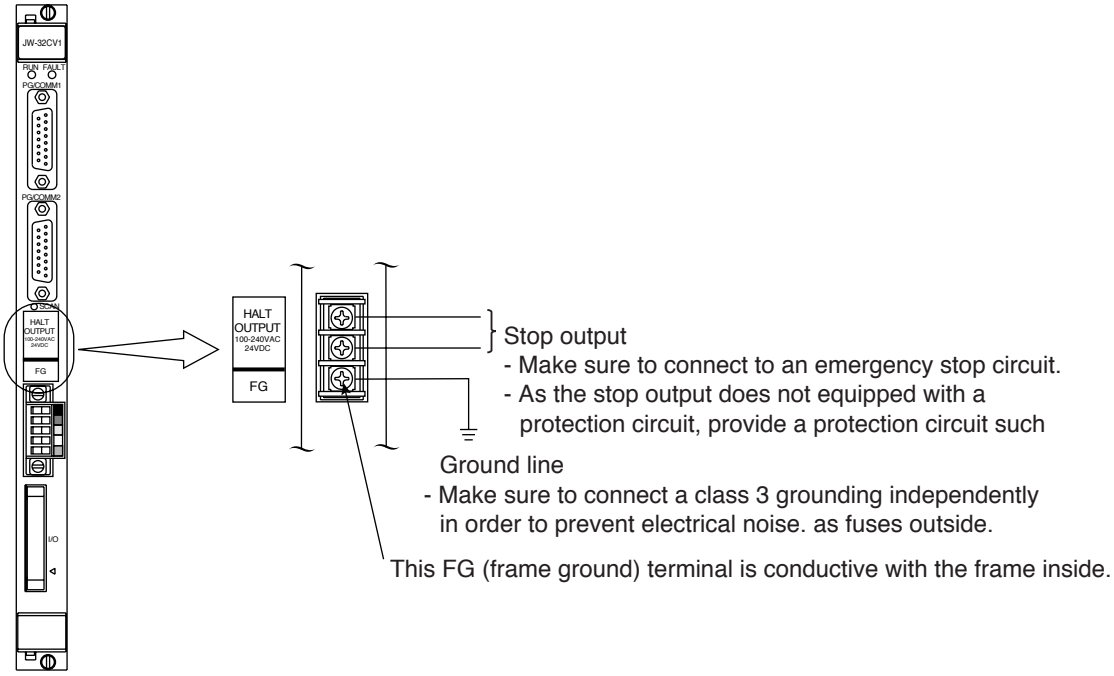
① Secure the upper and lower installation panels on a board (such as Z-333J) using 2 securing screws. These screws are screwed into the installation panels at delivery.
② Connect I/O bus connector of a board to the J-board add-on connection connector on the JW-32CV3.
③ Secure the board on the JW-32CV3 using the 2 securing screws.
These securing screws are screwed in the installation side of the JW-32CV3 at delivery.
④ Secure the JW-32CV3 (board) to the VME rack using the 4 module securing screws of the JW-32CV3 (board).

As for settings of the add-on connection on the board switches, see page 8-3.

Chapter 6: Wiring (Connection) Method

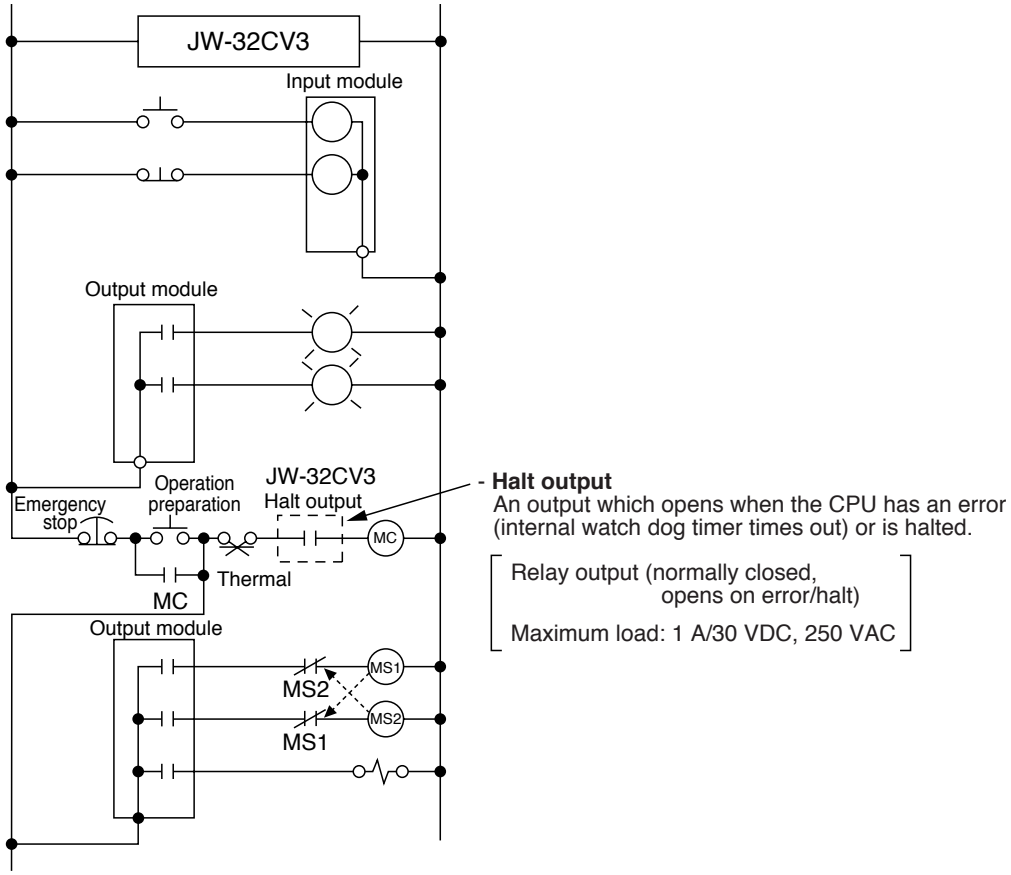
This chapter describes wiring a stop output, grounding, and communication port, as well as connection with the DeviceNet.

6-1 Connection of stop output and grounding



6

- **Halt output**



As for precautions for designing a system, see page 3-4.

6-2 Wiring for communication port

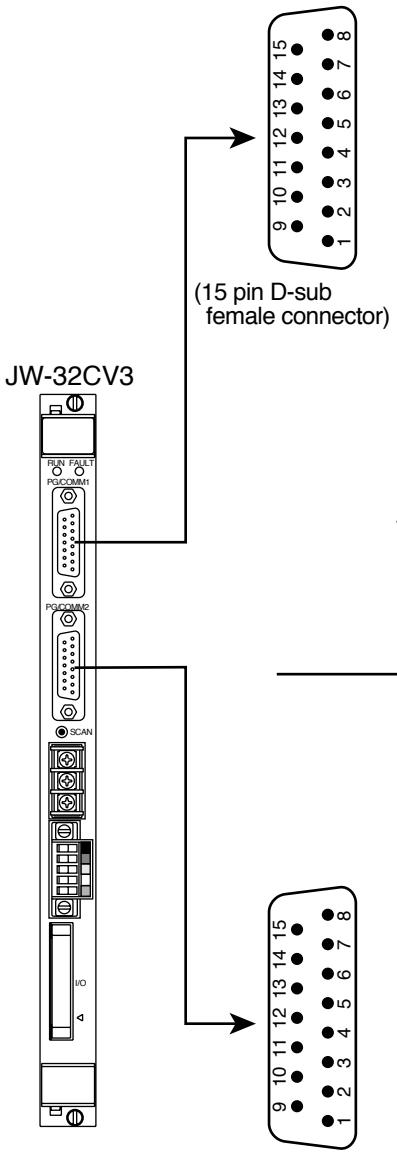
Shown below is a method for connecting the JW-32CV3 communication port (PG/COMM1, PG/COMM2) to equipment with an RS-232C/RS-422A I/O port, such as a host computer.

[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	——	*1	
3	SD (+)	Sending data (PLC to personal computer)	RS-422A
4	——	*1	——
5	RTS (—)		RS-422A
6	SG	Signal grounding	——
7	SG	Signal grounding	
8	——	*1	
9	RD (+)	Receiving data (personal computer to PLC)	RS-422A
10	RD (—)	Receiving data (personal computer to PLC)	
11	SD (—)	Sending data (PLC to personal computer)	
12	——		——
13	RTS (+)	*1	RS-422A
14	+5V		——
15	+5V		

*1: 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 (PLC to personal computer)	RS-232C
3	SD (+)	Sending data (PLC to personal computer)	RS-422A
4	RD	Receiving data (personal computer to PLC)	RS-232C
5	RTS (—)		RS-422A
6	SG	Signal grounding	——
7	SG	Signal grounding	
8	RTS	ON while PLC is supplied power source *2	RS-232C
9	RD (+)	Receiving data (personal computer to PLC)	RS-422A
10	RD (—)	Receiving data (personal computer to PLC)	
11	SD (—)	Sending data (PLC to personal computer)	
12	CTS	ON : Available PLC sending OFF : Ban PLC sending	RS-232C
13	RTS (+)		RS-422A
14	+5V		——
15	+5V		

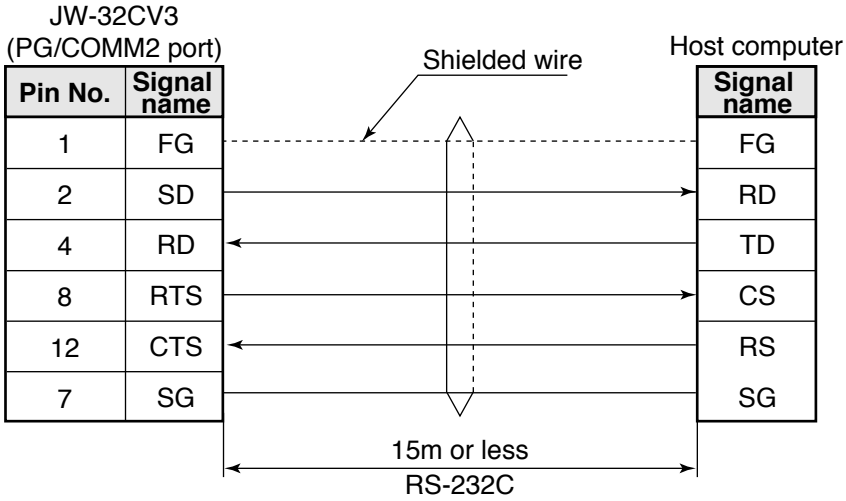
*2: When system memory #222 of the JW-32CV3 is 00_{HEX} (initial value), the RTS signal will be "ON while PLC is input the power." When 02_{HEX} is specified on the same memory address, the RTS signal will be "OFF while sending data, and ON while other than sending data."

- Connectable connector type for the communication port (PG/COMM1 port and PG/COMM2 port) is 17JE-23150-02(D8A) made by DDK.

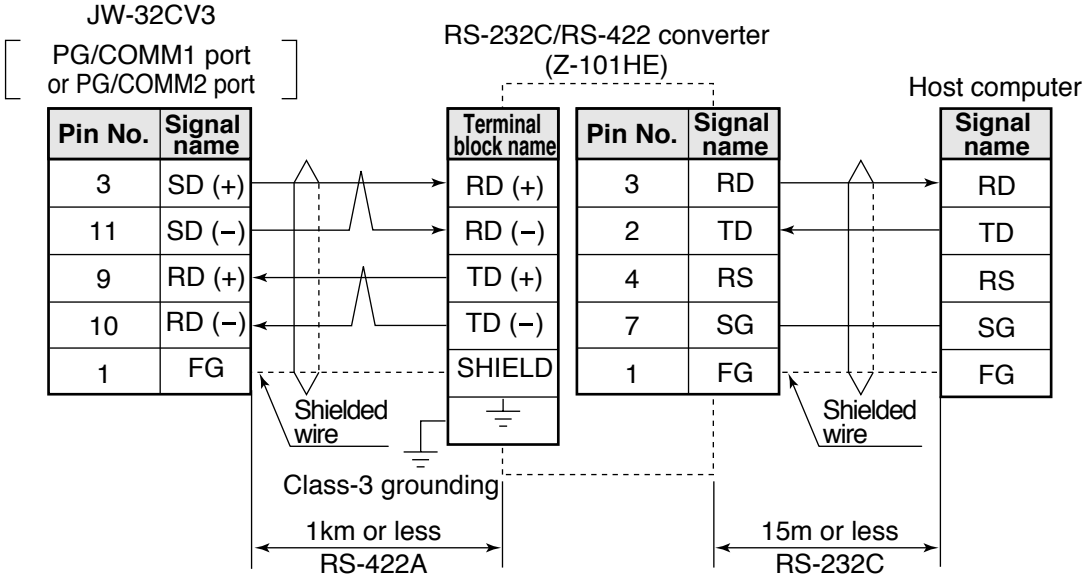
[2] Wiring figure

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

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

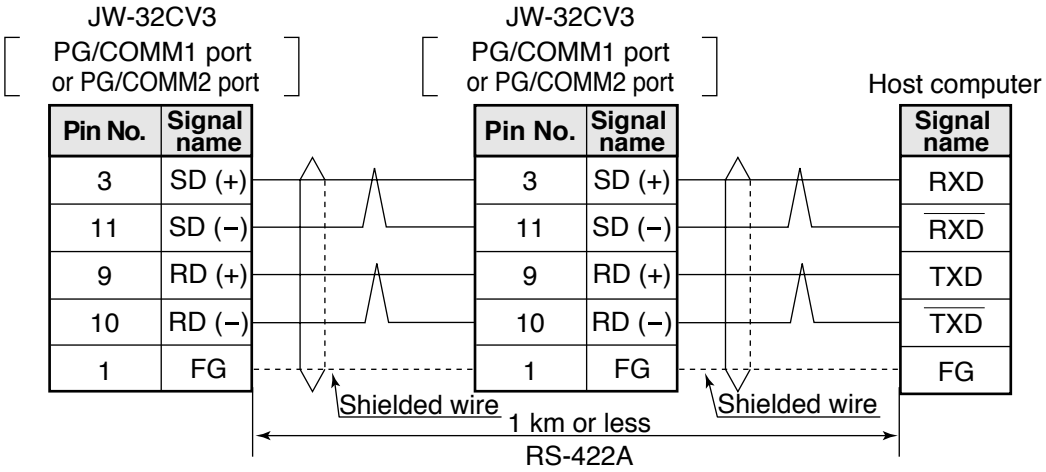


Use the RS-232C/RS-422 converter, such as Z-101HE, when the total length of the communication cable is over 15m.



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

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



Note: To obtain data transfer speeds higher than 38400 bit/s, the JW-32CV3 must be connected directly to a host computer.

Two-wire system communications are not possible.

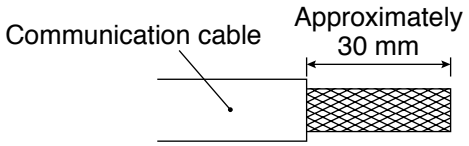
6-3 Connection with DeviceNet

[1] Preparing a communication cable

This section describes how to install a connector on a communication cable for this network.
Prepare the communication cable by following the steps below to attach the connector.

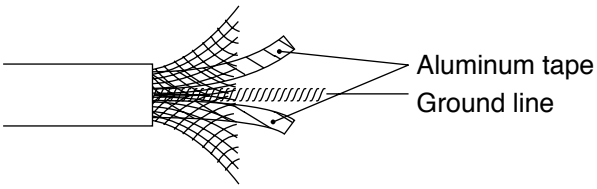
① Remove approximately 30 mm of insulation from the communication cable

Remove the insulation without damaging the coaxial shield around the cable.
Do not remove more insulation than necessary, as it may cause a short-circuit.



② Unwrap the wires in the coaxial shield carefully

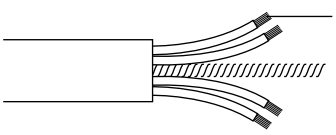
Under the coaxial shield there is one signal line, one power line, and one ground line. The signal line and power lines are wrapped in aluminum tape.



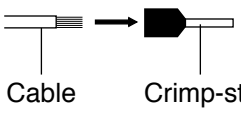
③ Cut off the excess coaxial shield and peel back the aluminum tape on the signal line and power line.

④ Remove the insulation from the signal and power lines until enough bare wire is exposed to fit into a crimp-style terminal.

Twist the strands of wire in the signal and power lines tightly, in order to slide them into a terminal.



⑤ Crimp a terminal on each of the individual lines and then insulate it using vinyl tape or shrink tubing.



Shown below are the recommended crimp-style terminals

Recommended crimp-style terminals	Special tool
AI series made by Phoenix Contact	ZA3 made by Phoenix Contact
TC series made by Nichifu - For thin wire□:□TME TC-0.5 - For thick wire□□TME TC-2-11 (power line) □□ TME TC-1.25-11 (communication line)	NH-32

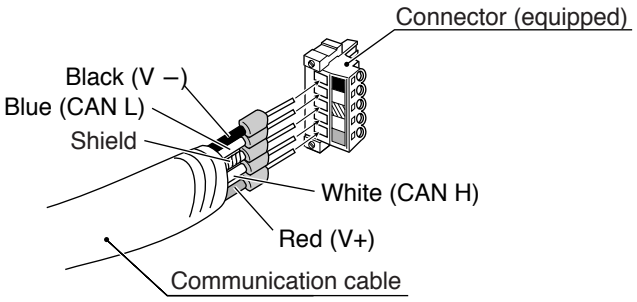
To the next page

From the previous page

⑥ Insert the signal line, power line, and the ground line into the appropriate connector holes.

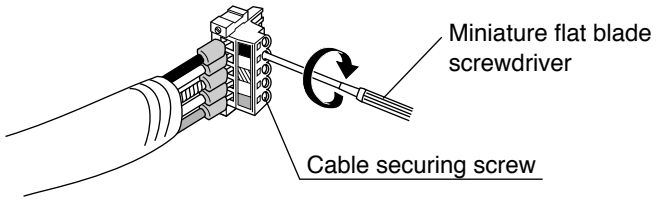
- Insert the wires from the top down, in the following order: red, white, ground , blue, and black. Pay strict attention to the connector orientation.
- Before inserting the wires, loosen the screws on the connector enough to insert the wires easily.
- The JW-32CV3 is supplied with one set of BLZ5.08/5F AU-DN (with connector securing screw: made by Nihon Weidmuller)

.

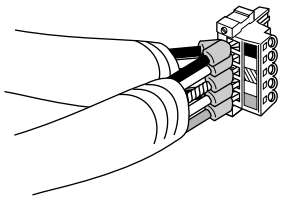


⑦ Secure each wire tightly using the wire retention screws of the connector.

- Use a miniature flat blade screwdriver which has the same diameter from the neck all the way to the end. Tighten the screws using 0.5 N-m of force.



■ **When connecting two thin cables in a multi-drop system**
Insert the wires from each cable with the same color insulation into the same hole.



Crimp a terminal to the tip of the two wires.

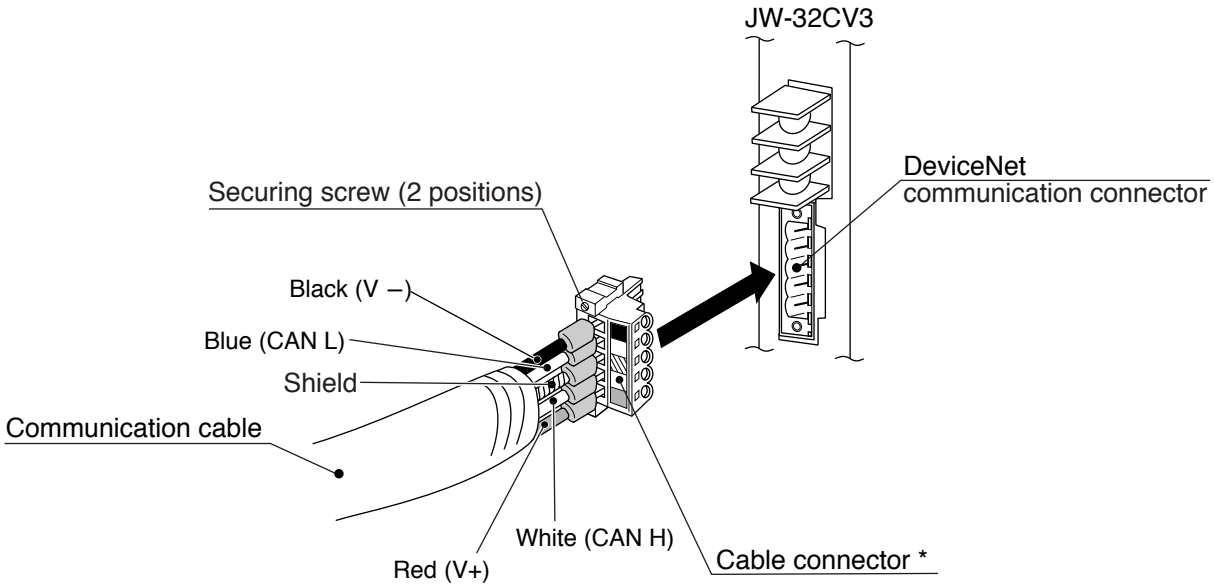
Remarks

- Before connecting the communication cable, make sure to turn OFF the power to the VME rack, all nodes, and the communication power supply.
- Do not pull hard on the communication cable since the connector can be pulled off or disconnected easily.

[2] Communication cable connections

This section describes how to plug a connector that has been installed on the communication cable into the JW-32CV3.

Match the orientation of the connector on the cable with the DeviceNet communication connector on the JW-32CV3 and insert the male cable connector as far as it will go. After inserting it all the way, tighten the screws on the male connector. The appropriate tightening torque is 0.3 N-m of force.



* One male connector is supplied with the JW-32CV3.
Model name: BLZ5.08/5F AU-DN (made by Nihon Weidmuller)

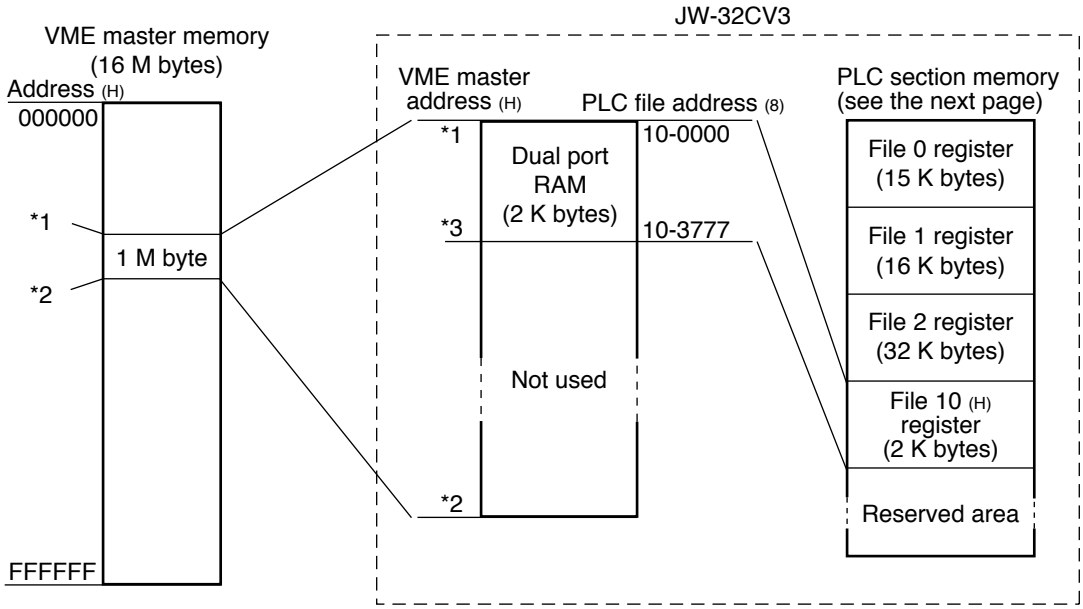
Chapter 7: VME Interface Function

This chapter describes memory map, access method, and operation checks between the JW-32CV3 and VME master mode.

7-1 Memory map

[1] Relationship between this JW-32CV3 memory and the VME master memory

Shown below is the relationship between this JW-32CV3 memory map and the VME master memory.



- The memory address (1 M bytes: within the range of *1 to *2) for this JW-32CV3, which is allocated on a VME is set by switch SW13 on the JW-32CV3. The memory for file 10(H) (2 K bytes) used for this PLC'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 on the □ JW-32CV3	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 (default setting)	F00001	FFFFFF	F00FFF

- When SW13 is set to "0"

VME master address	PLC 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 JW-32CV3 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] PLC section memory

File number, file address, and application of PLC section 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 programming 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 JW-32CV3 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."

7-2 Access method of dual port RAM

The JW-32CV3 exchanges data with the VME master memory through the dual port RAM inside the module. ⇨ See page 7-1.

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

① Data transfer using an indirect assignment instruction in a ladder program ⇨ See below.

② Programless data transfer by assigning a specific area ⇨ See page 7-5.

The data transfer method is selected by setting system memory address #261 in this JW-32CV3.

System memory No. (8)	Item set	Contents
#261	Data transfer system	Specify whether the JW-32CV3 PLC 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 (mode 1) 55 (H) □□□ Data transfer by area assignment □ without program (mode 2)

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

Note: With the JW-32CV3 DeviceNet function, it uses a part of the PLC section memory. Therefore, do not send data to these areas. ⇨ See chapter 9.

7-2-1 Data transfer using a ladder program indirect assignment instruction

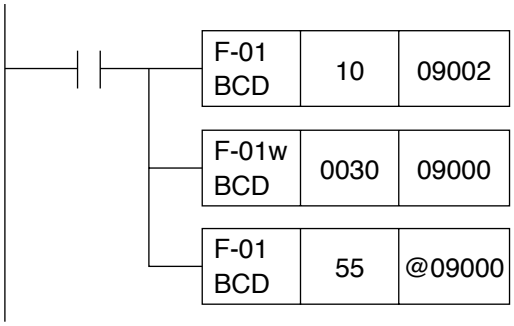
With this method, the module reads/writes data directly to the dual port RAM by using a ladder program application instruction (indirect assignment). (The dual port RAM is treated as file $10_{(H)}$ by the JW-32CV3 PLC section memory.)

(1) System memory setting

Set to $00_{(H)}$ (data transfer using a ladder program indirect assignment instruction) at system memory address #261 in the JW-32CV3. (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.

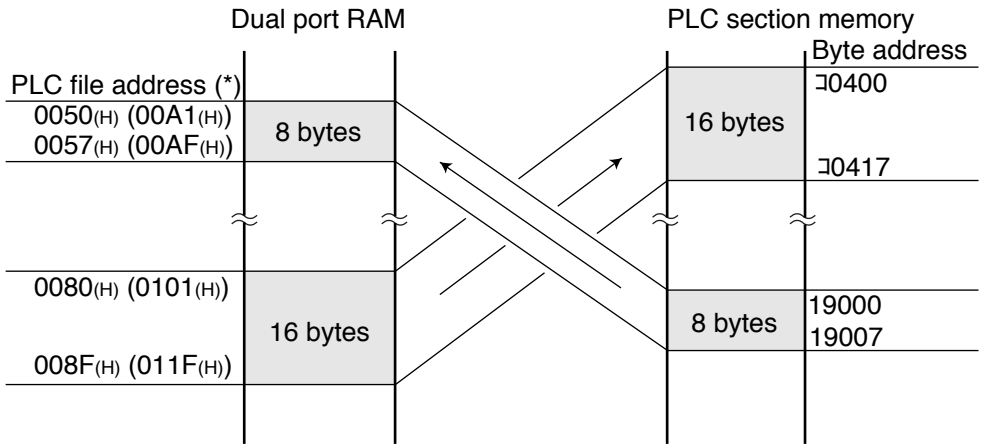


Assign file 10 (H) to register 09002.

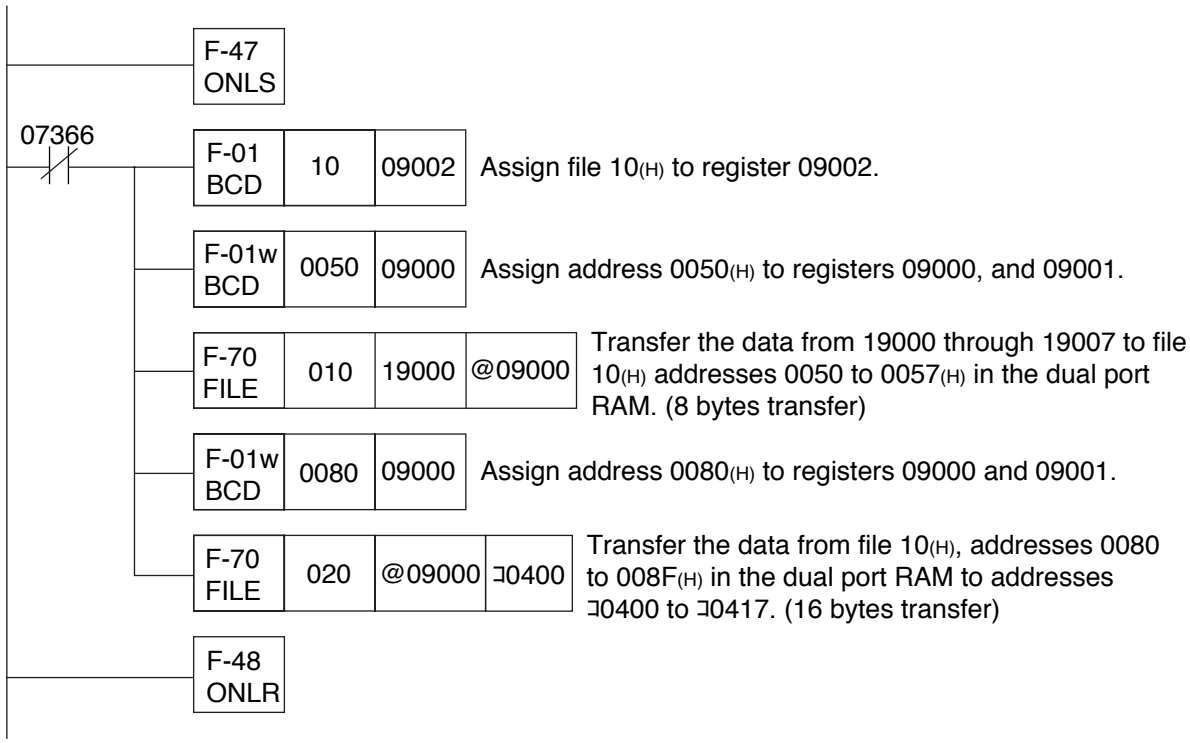
Assign registers 09000 and 09001 to address 0030 (H).

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 PLC'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 PLC's section memory in each scan sequence.



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



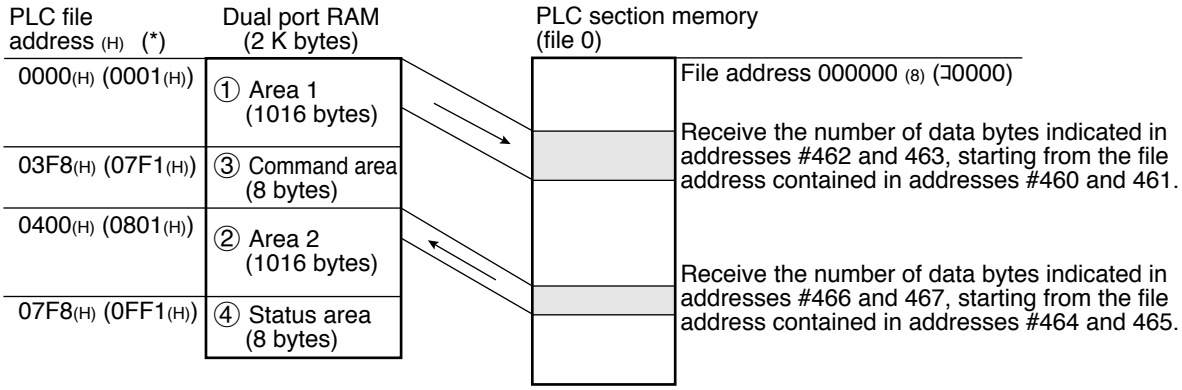
7-2-2 Data transfer by area assignment

This method does not need a ladder program to transfer data between the JW-32CV3 PLC's section memory (file 0) and the dual port RAM. It can transfer data during each scan by putting the data in system memory. Both mode 1 and mode 2 are available for data transfer.

[1] Mode 1

(1) Data transfer area

The dual port RAM in this JW-32CV3 is divided into 4 areas.



* The figures in parentheses ( ) 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 PLC's section memory.
② **Area 2:** Area used to transfer data from the PLC'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 JW-32CV3.
- This area occupies 8 bytes of the dual port RAM.
- The control data is written from the VME master.

3F8(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 JW-32CV3 to the VME master.
- This area occupies 8 bytes of dual port RAM.
- This JW-32CV3 automatically writes data from addresses Ǝ0730 to Ǝ0737 in the PLC's section memory.

07F8(H) (0FF1(H))	Ǝ0730 data
07F9(H) (0FF3(H))	Ǝ0731 data
07FA(H) (0FF5(H))	Ǝ0732 data
07FB(H) (0FF7(H))	Ǝ0733 data
07FC(H) (0FF9(H))	Ǝ0734 data
07FD(H) (0FFB(H))	Ǝ0735 data
07FE(H) (0FFD(H))	Ǝ0736 data
07FF(H) (0FFF(H))	Ǝ0737 data

- Error codes are stored at addresses Ǝ0734 and Ǝ0737 when the PLC has an error. For the details about the error codes, see the "JW30H programming manual, ladder instruction version."

(2) System memory setting

Set system memory addresses #261 and #460 to #467 in the JW-32CV3 using the settings shown below.

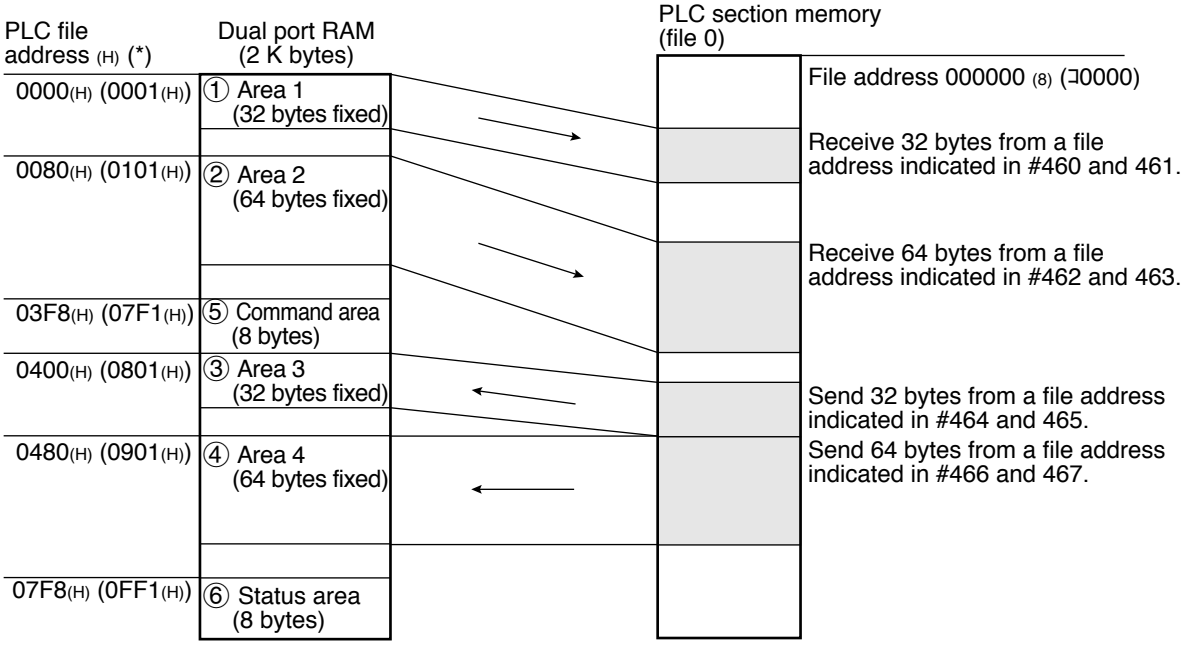
System memory No. (8)	Item set	Contents
#261	Data transfer system	Select the data transfer system between this JW-32CV3 PLC section memory and the dual port RAM. Enter 22(H) for this system. 22 (H) --- Data transfer by area assignment.
#460 #461	Transfer top address (RAM → PLC)	Set the PLC section memory 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 → PLC)	Set the number of bytes to be transferred from the dual port RAM area 1 to the PLC section memory. Enter this number in word notation within the range of 0000 to 1016 (0000 to 03F8 (H)).
#464 #465	Transfer top address (PLC → RAM)	Set PLC section memory top address which will be used to transfer data to dual port RAM area 2.
#466 #467	Number of transfer bytes (PLC → RAM)	Set the number of bytes to be transferred from the PLC section memory to dual port RAM area 2. 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.

[2] Mode 2

(1) Data transfer area

The dual port RAM in this JW-32CV3 is divided into 6 areas.



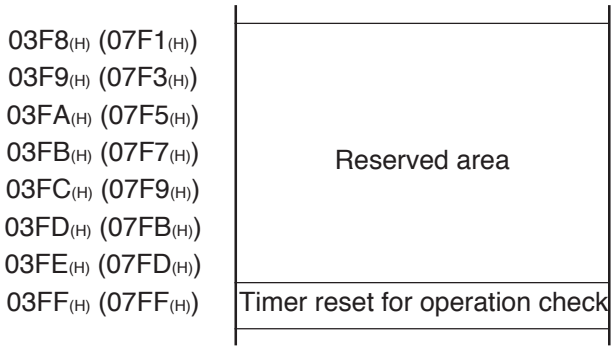
* The figures in parentheses ( ) are VME master side addresses(H). (When SW13 is set to "0")

① Area 1, ② Area 2: Area used to transfer data from the dual port RAM to the PLC's section memory.

③ Area 3, ④ Area 4: Area used to transfer data from the PLC's section memory to the dual port RAM.

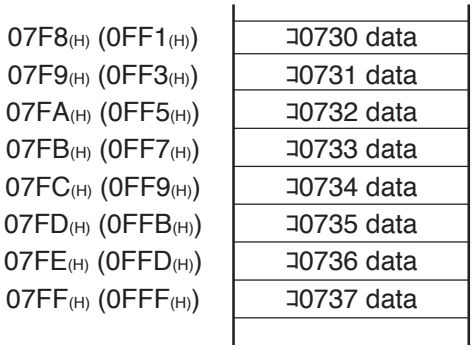
⑤ Command area: Area used to store control data which is sent from the VME master to the JW-32CV3.

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



⑥ Status area: Area used to store operating condition data being sent from the JW-32CV3 to the VME master.

- This area occupies 8 bytes of dual port RAM.
- This JW-32CV3 automatically writes data from addresses ⊐0730 to ⊐0737 in the PLC's section memory.



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

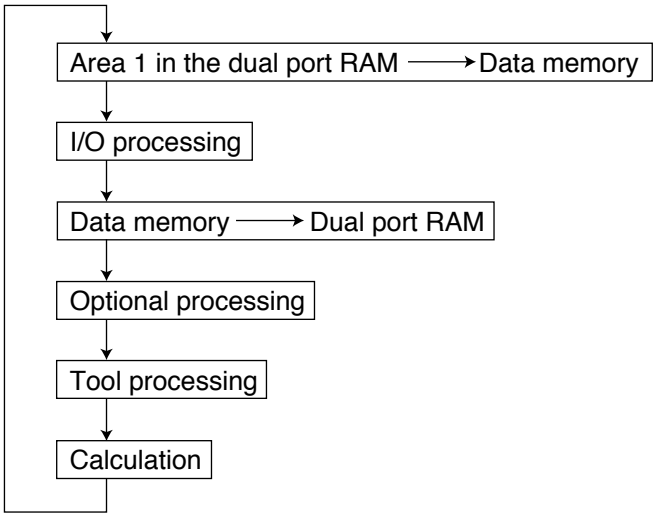
(2) System memory setting

Set system memory addresses #261 and #460 to #467 in the JW-32CV3 using the settings shown below.

System memory No. (8)	Item set	Contents
#261	Data transfer system	Select the data transfer system between this JW-32CV3 PLC section memory and the dual port RAM. Enter 55(H) for this system. 55 (H) □□□ Programless data transfer by area assignment (mode 2).
#460 #461	Transfer top address (RAM □ PLC)	Set the PLC 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 using register 09000 (file address 004000 (8)) for the top address. # 461 # 460 004000 (8)
#462 #463	Number of transfer bytes (RAM □ PLC)	Set the number of bytes to be transferred from the dual port RAM area 2 to the PLC section memory. Specify top address with word unit using file address (octal).
#464 #465	Transfer top address (PLC □ RAM)	Set PLC section memory top address which will be used to transfer data to dual port RAM area 3. Specify top address with word unit using file address (octal).
#466 #467	Number of transfer bytes (PLC □ RAM)	Set the number of bytes to be transferred from the PLC section memory to dual port RAM area 4. Specify top address with word unit using file address (octal).

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

Reference Operation flow chart for the PLC (Mode 1/Mode 2)



7-3 Operation check of the VME master and the JW-32CV3

(Programless data transfer mode only)

The operation of the JW-32CV3 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 $22_{(H)}$ or $55_{(H)}$ at system memory address #261. See page 7-5 to 7-8.)

[1] To use this JW-32CV3 to check the VME master operation

The timer in this JW-32CV3 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 PLC's section memory turns ON.

Therefore, the JW-32CV3 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 JW-32CV3 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

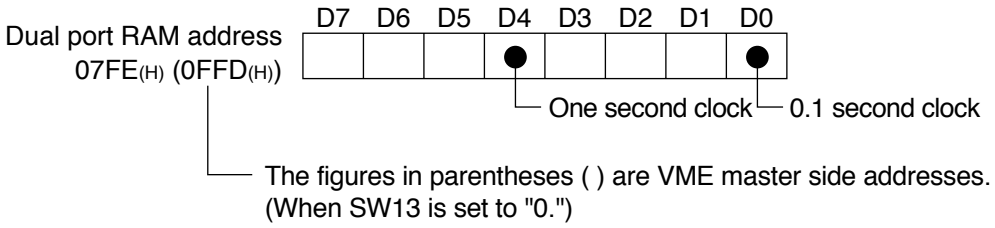
Enter a time for the operation check timer at system memory addresses #262 and 263. Enter a value between 0 and 1000 ms (minimum unit: 1 ms) in word notation.

[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
$012C_{(H)}$	

[2] To check the operation of the JW-32CV3 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 JW-32CV3 PLC section has been stopped by an error, or it is in program mode.
Therefore, by using this clock, the operating condition of the JW-32CV3 (PLC section) can be checked by an application running in the VME master.



Chapter 8: PLC Control Function

8-1 Functional description

The PLC control functions of the JW-32CV3 are equivalent to ones of the JW-32CUH1 control module of the JW30H.
Differences from the JW-32CUH1 are shown below.

Item	JW-32CUH1	JW-32CV3
Program capacity / file capacity	15.5 K-words / 64 K-bytes or 31.5 K-words / 32 K-bytes	Fixed to 31.5 K-words / 32 K-bytes
Number of connectable modules on an expansion rack panel	Max. 3 - When an I/O bus extension adapter is used, 7.	Max. 3
I/O bus expansion adapter	Usable	Not usable
Number of input/output modules	Max. 32 on basic/extension rack panels (rack 0 to 3) *	- Max. 24 on an expansion rack panel (rack 1 to 3) - On I/O board (Z-322J) to the JW-32CV3 (add-on connection) ⇨ See page 5-2.
Special I/O module	Max. 32 on basic/extension rack panels (rack 0 to 3) *	Max. 24 on an expansion rack panel.
Option module	Max. 7 on a basic rack panel.	One communication board to the JW-32CV3 (add-on connection). ⇨ See page 5-2.
I/O link module	Max. 4 on a basic rack panel	
DeviceNet module	Max. 4 on a basic rack panel	
Allocation of I/O address	---	See section 8-2.

* When not using an I/O bus expansion adapter.

Considering the differences above, refer the "JW30H User's Manual, Hardware Version" and "JW30H Programming Manual, Ladder Instruction version."

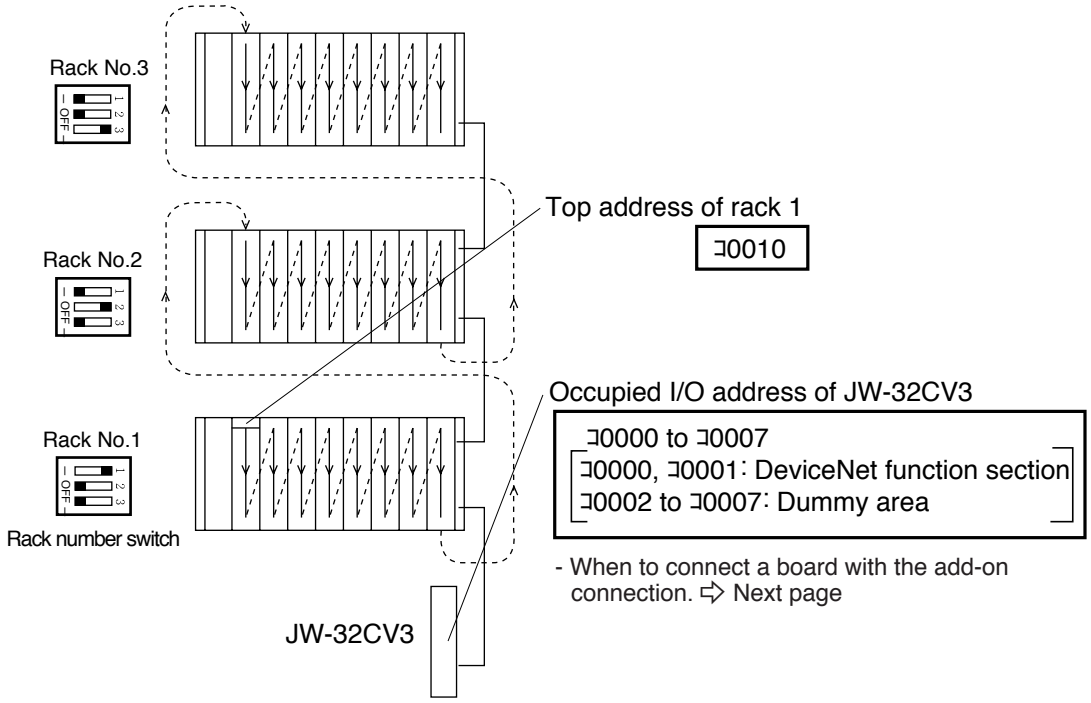
8-2 Allocation of I/O address

I/O address of I/O module, special I/O module installed on expansion rack panel are assigned by automatic registration when the power to the JW-32CV3 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). The I/O addresses (I/O relay numbers) are automatically allocated just like the JW-32CUH1.

However, the actual installation position of the module is in slot 0 or later in rack 1.

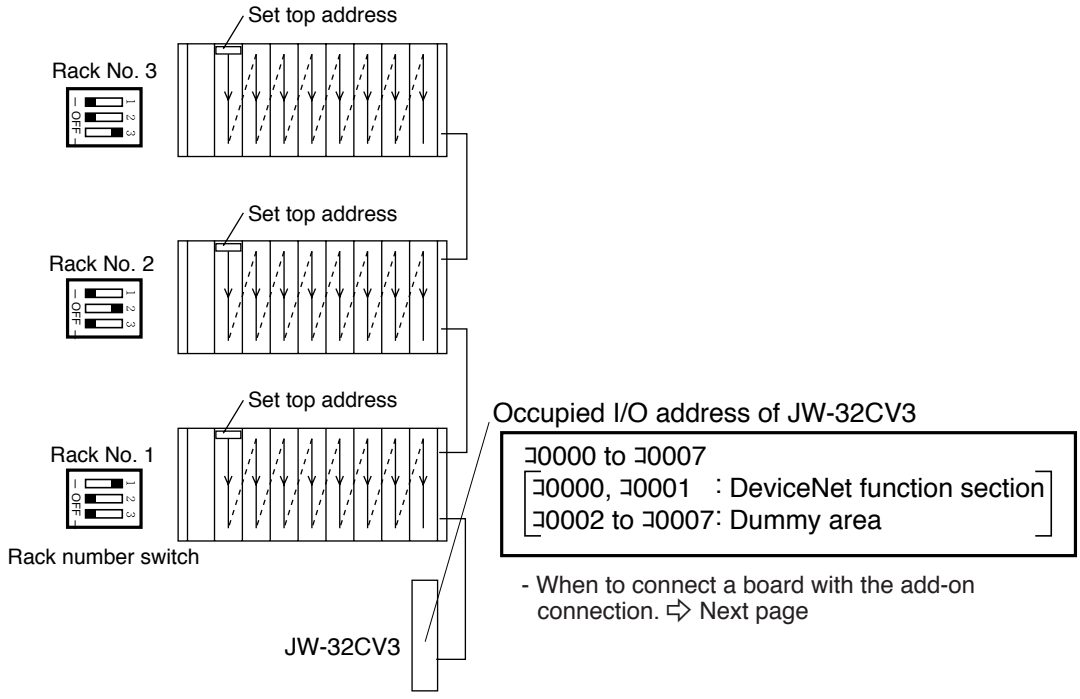
(1) In case of auto registration

Top address of rack number 1 is set automatically in the continuous address from "Ↄ0010."



(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 Ↄ0010 to Ↄ1577).



■ Max. number of control I/O points of JW-32CV3

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
1024 points	832 points	ㅋ0000 to ㅋ0147	ㅋ0000 to ㅋ1577

■ The number of relay points and number of modules that can be installed for each module in expansion rack panel.

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 (ㅋ3000 to ㅋ3777) for special I/O module.

The option module, I/O link module, and DeviceNet module cannot be mounted on an expansion rack panel.

■ **When to connect the board as the add-on connection**

When to connect a board (J-board) to the JW-32CV3, rack first address will be as follows.

Boards that can connect with the add-on connection	Occupied I/O address	I/O registration	
		Automatic registration (top address of rack 1)	Create table (top address of rack 1 to 3)
I/O board (Z-322J: 64 points)	ㅋ0010 to ㅋ0017	ㅋ0020	Even addresses from ㅋ0020 to ㅋ1577
Communication board (Z-333J/334J/335J/-336J/337J/338J)	ㅋ0010 to ㅋ0017 (dummy area)	ㅋ0020	Even addresses from ㅋ0020 to ㅋ1577

Settings of switches on boards for the add-on connection are as follows.

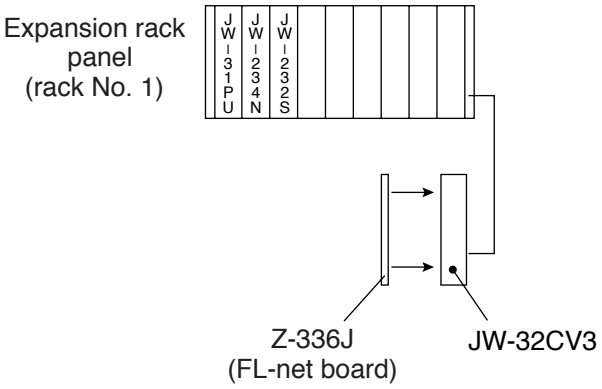
Objective switch	Setting details
SW1 (rack number) *1	All OFF (initial setting): Rack number = 0
SWA (allocation of front half and last half) *2	1 = OFF, 2 = ON: Allocate last half

*1: Some boards do not have SW1 switch. (In this case, there is no need setting.)
*2: The Z-322J has "SW2" despite "SWA."

As for other switches, see user's manuals for each board.

To next page

■ Examples of I/O allocation (auto allocation)



	Model name	Allocation (occupying I/O address)		
		I/O relay address	Mounted address	Remarks
Base section	JW-32CV3	□0000, □0001	R=0, S=0	DeviceNet function section (dummy)
		□0002, □0003	R=0, S=1	Vacant (dummy)
		□0004, □0005	R=0, S=2	Vacant (dummy)
		□0006, □0007	R=0, S=3	Vacant (dummy)
Add-on connection section	Z-336J	□0010, □0011	R=0, S=4	FL-net function section (dummy)
		□0012, □0013	R=0, S=5	Vacant (dummy)
		□0014, □0015	R=0, S=6	Vacant (dummy)
		□0016, □0017	R=0, S=7	Vacant (dummy)
Extension rack section (rack No. 1)	JW-234N	□0020 to □0023	R=1, S=0	I/O data
	JW-232S	□0024 to □0027	R=1, S=1	I/O data

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8-3 Errors and measures, maintenance

[1] Troubleshooting

In the event of error, check the LED (RUN, FAULT) of the JW-32CV3, 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 JW-32CV3 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.)

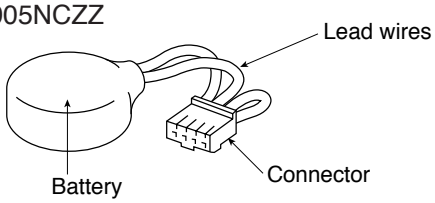
See "JW30H user's manual hardware version" in detail.

[3] Exchange method of batteries

Exchange battery for memory backup in JW-32CV3 within its validity.

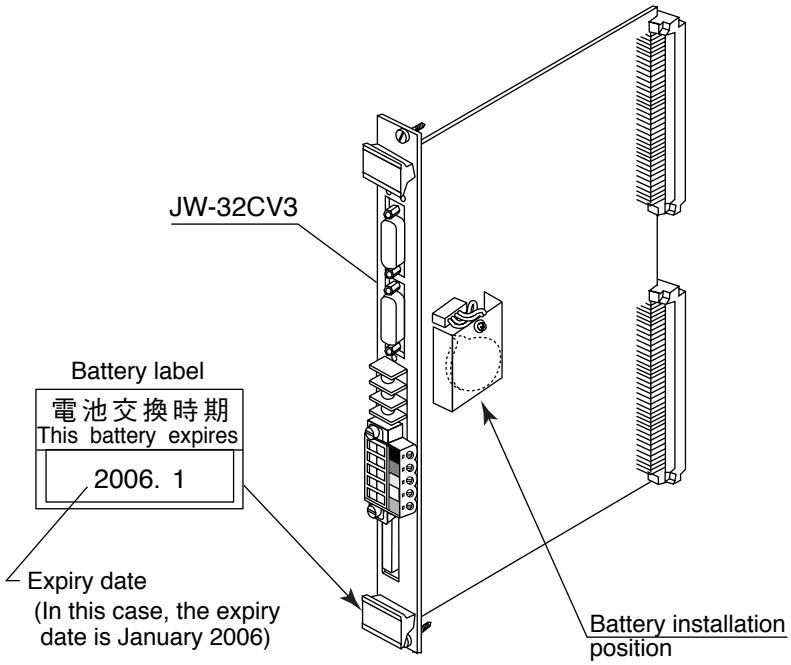
■ Model name of battery module

UBATN5005NCZZ

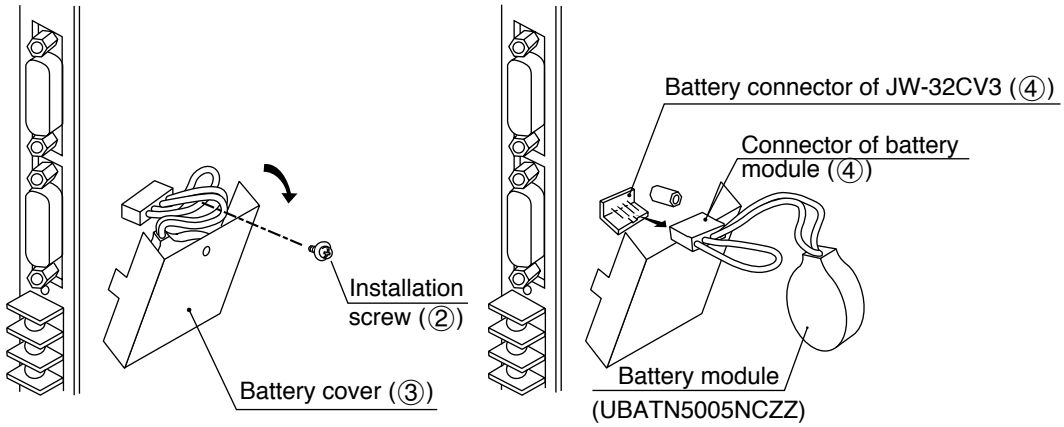


■ Battery exchange procedure

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-32CV3 battery connector and remove the battery module.



⑤ Insert a new battery module connector in the battery connector of the JW-32CV3.
The battery change must completed within 5 minutes. Otherwise, the memory may be erased.
⑥ Mounting the battery cover.

Remarks

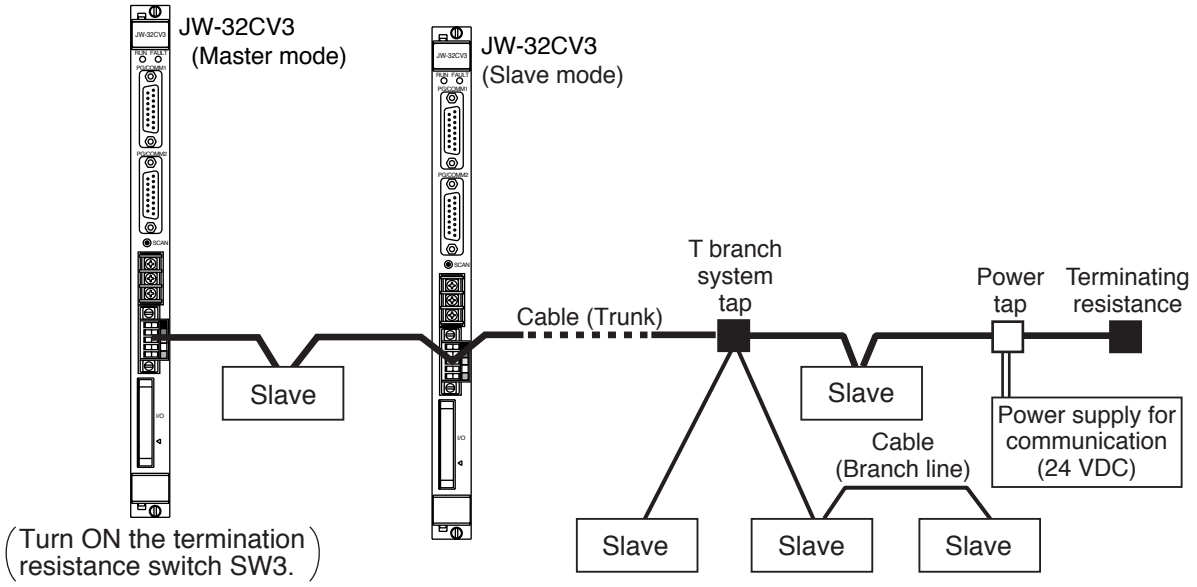
- Do not subject the battery to impact of any kind. Do not pull on the lead wires of the battery, or liquid leakage accident may occur.

Chapter 9: PLC DeviceNet Communication Function

9-1 DeviceNet

The JW-32CV3 can be used to communicate as a master or slave module in a DeviceNet.

● **Connection example**



- Select the basic operation mode (master/slave) using the SW8-8 switch on the JW-32CV3. ⇨ See page 9-11
- Prepare master modules, slave modules, cables, T branch taps, power taps, and termination resistors that are compatible with DeviceNet, for use in a system containing the JW-32CV3.

● **SHARP's modules applied for the DeviceNet (master/slave)**

Model name	Master	Slave	PLC to install
JW-50DN	○	○	JW50H, JW70H, JW100H
JW-20DN	○	○ (V 2.1 or more)	JW20H, JW30H
JW-32CUM1	○	—	JW30H
JW-32CUM2	○	○	JW30H
JW-32CV3	○	○	VME built-in controller
Z-337J	○	○ (V 2.1 or more)	J-board
Z-338J	○	○ (V 2.1 or more)	(Z300/Z500 series)
JW-D164N	—	○	———
JW-D162S	—	○	
JW-D162M	—	○	

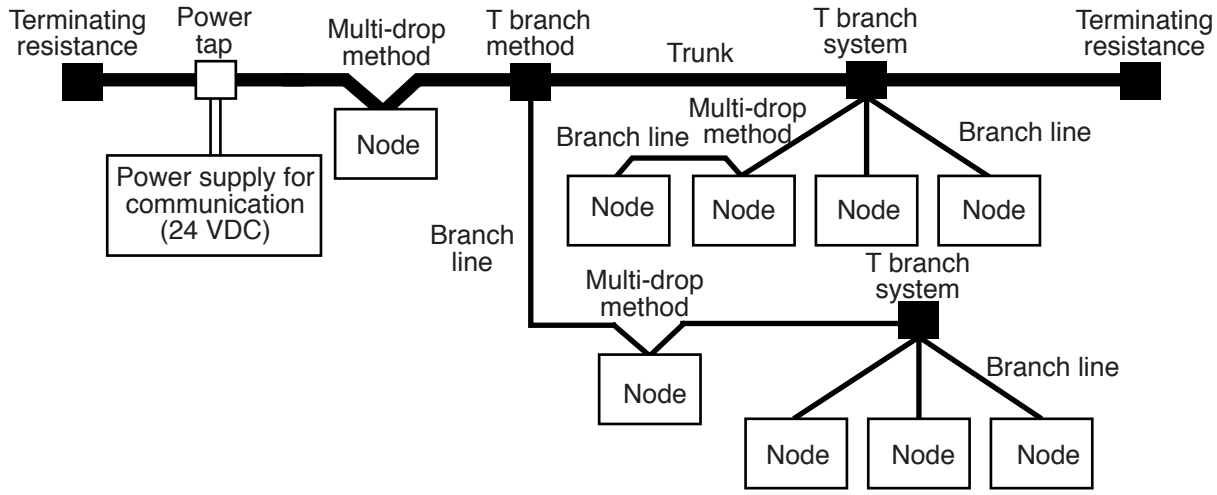
○ : Usable, Inside parentheses: Software version

9

[1] Network names and functions

This section lists the device names and functions used in DeviceNet networks.

● **Network example**



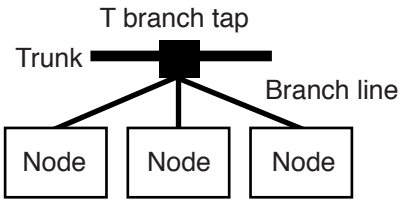
Names	Functions
Node	Master and slave nodes are available on the DeviceNet. Master: Integrates external I/Os from each slave. Slave: provides connections for external I/Os. - Since there are no restrictions in allocating a master and slaves, you can arrange nodes at any location shown above.
Trunk	Cable with a terminating resistance at both ends. - Normally, the cable connecting the terminals the furthest distance apart will be a trunk cable. - Use a five conductor cable (2 signal wires, 2 power wires, 1 shield). - The trunk length is not always equal to the maximum length of the network.
Branch line	A cable branching off the trunk. - You can add new branch lines to the trunk - Use a five conductor cable (2 signal wires, 2 power wires, 1 shield).
Connection method	There are two methods for connecting nodes: T branch and Multi-drop. T branch method: Uses T branch taps for up to three separate branch lines. Multi-drop method: Connects a node directly to a trunk or to a branch line. - Both the T branch method and the Multi-drop method can be used in the same network.
Terminating resistance	Install a terminating resistance (121ohms) on both ends of the trunk, in order to reduce signal reflection and stabilize the communication. - JW-32CV3 (DeviceNet section) has an integrated terminating resistance which can be enabled or disabled.
Power supply for communication	Communication power should be supplied to the communication connector on each node through the five conductor cable. - Use only a power supply dedicated exclusively to communications. Do not share this power supply with other devices.

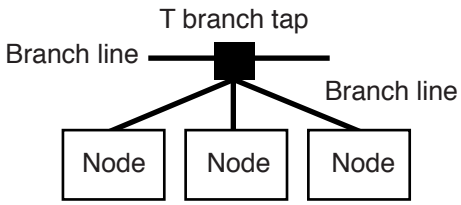
[2] Connection method

There are two methods for connecting nodes: T branch and Multi-drop.

(1) T branch method

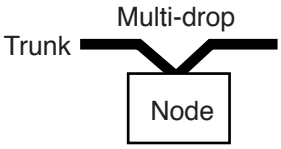
You can make up to three branch lines away from a trunk or a branch line. Use a T branch tap to branch off.

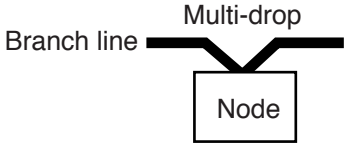




(2) Multi-drop method

Connect a node directly to a trunk or a branch line.





[3] Cable length

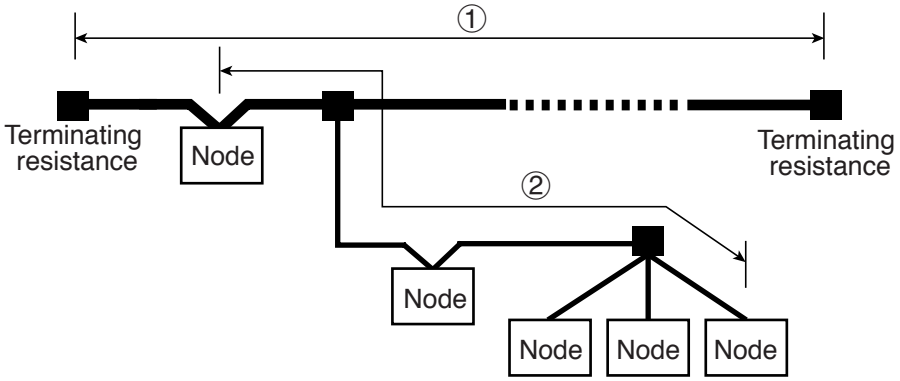
(1) Maximum network length

The maximum network length will be the longest of the following:

① The distance between the two terminating resistances

② The distance between the two nodes in the network that are the farthest apart

● **Ex.**



The maximum network length possible will vary, depending on the type of cable used.

	Cable type	Maximum network length
①	Thick cable: 5 conductors	500 m
	Thin cable: 5 conductors	100 m
②	Thin cable: 5 conductors	100 m

- The maximum network length is also limited by the communication speed. ⇨ See section (3) below.
- When thick and thin cables are mixed in the same network, the following conditions must be met.

Communication speed	Maximum network length
500 k bits/s	(A + B) is less than 100 m
250 k bits/s	(A + 2.5 x B) is less than 250 m
125 k bits/s	(A + 5 x B) is less than 500 m

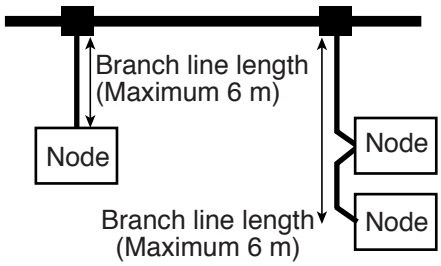
A: Thick cable length
B: Thin cable length

(2) Maximum branch line length

The maximum branch line length is 6 m.

- You can make a new branch line from a branch line.
  However, the maximum distance between the branch point on the trunk and the end of the most distant branch line should not be more than 6 m.

● **Ex.**



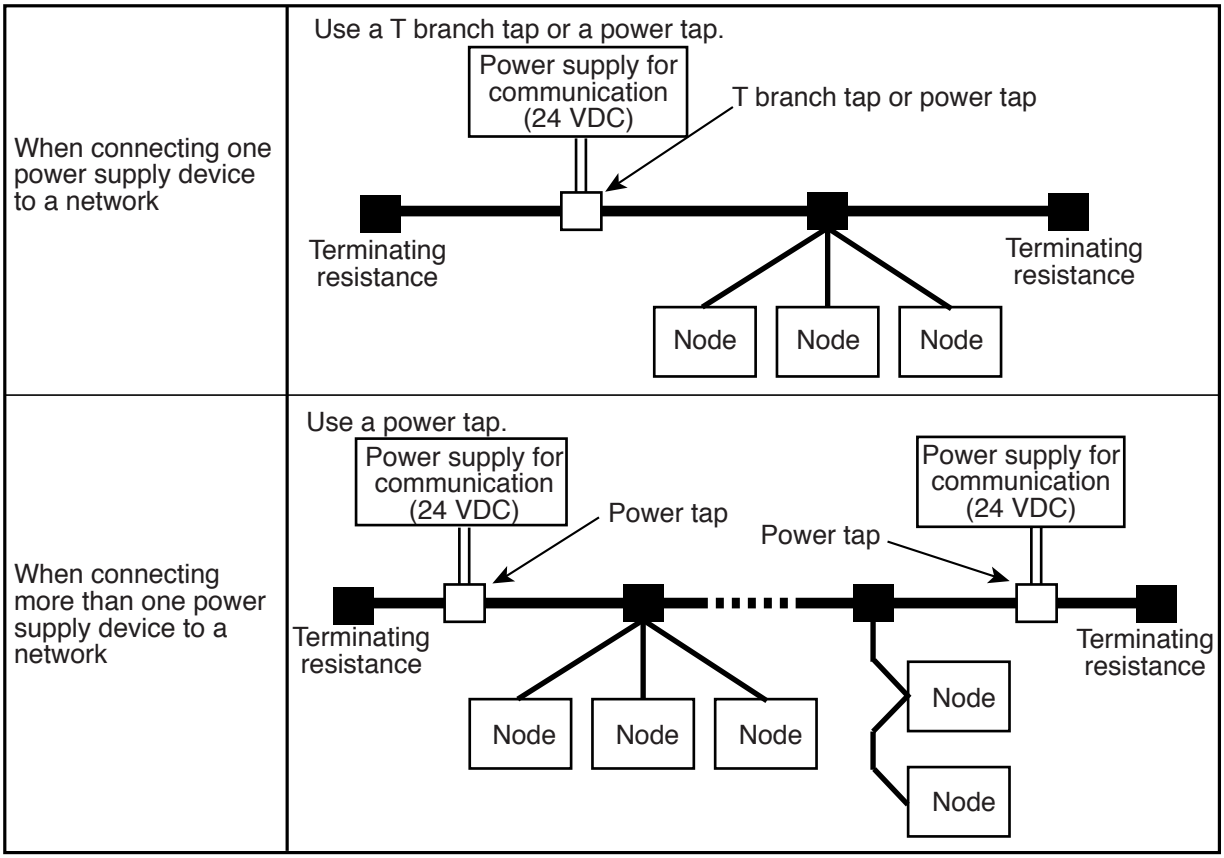
(3) Communication speed and communication distance

The communication distance will vary, depending on the communication speed.

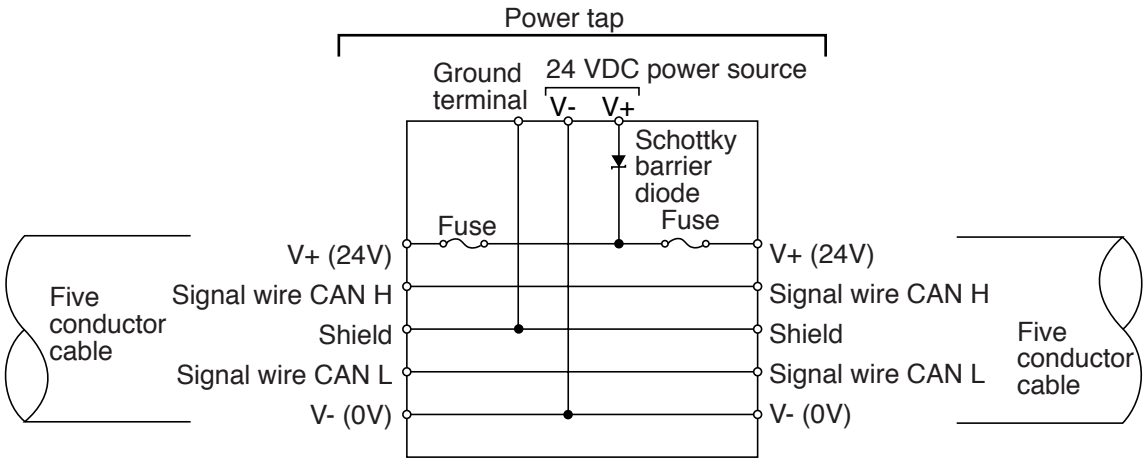
Communication speed	Maximum network length		Branch line length	Total length of branch lines
	Thick cable	Thin cable		
500 k bits/s	100 m or less	100 m or less	6 m or less	39 m or less
250 k bits/s	250 m or less			78 m or less
125 k bits/s	500 m or less			156 m or less

[4] Power supply

Connect the communication power supply to the trunk.
Two of the five conductors in the cable used for trunk and branch lines are assigned to carry power for communication (24 VDC).
The following methods can be used to connect a communication power source to the trunk.



● **Configuration of a power tap**



Remarks

- Do not share the communication power source with other devices.

[5] Communication related devices

In addition to master and slave nodes, the following devices can be used in this system: cables, T branch taps, power taps, communication connectors, terminating resistances, and communication power supplies. Listed below are the models of devices currently available (by manufacturer).

(1) Cable

Thick or thin five conductor cable is available.

Number of conductors	Manufacturers	Type	Model	Length (m)	Outside diameter (mm)	Main use
Five Signal lines: 2 Power source lines: 2 Shield: 1	Allen-Bradley	Thick	1485C-P1-A50	50	11.6 to 12.1	Trunk
		Thin	1485C-P1-C150	150	6.9	Branch line or trunk *
	Omron	Thick	DCA2-5C10	100	11.6 to 12.1	Trunk
		Thin	DCA1-5C10	100	6.9	Branch line or trunk *

* When using a thin cable for a trunk, make sure that the trunk is not more than 100 m long.

(2) T branch tap

You can connect up to three new branch lines off a single existing branch line.

Model	Number of connectors	Remarks	Manufacturer
DCN1-1C	Three (this tap is used to connect one new branch line)	- Has three connectors for connecting up to three new lines - Connects to a terminating resistor	Omron
DCN1-3C	Five (this tap is used to connect three new branch lines)	- Has five connectors for connecting up to five new lines - Connects to a terminating resistor	

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(3) Power tap

This tap is used to supply power to the five conductor cable when connecting more than one communication power supply to a single network .

Model	Specifications	Manufacturer
1485T-P2T5-T5	Power tap With a reverse current prevention function and ground terminal	Allen-Bradley

- This tap can be used to connect a single communication power supply to a network. In this case, you can also use a T branch tap (above), in addition to the power tap.
- When connecting a power supply device to a single network, use this multi-outlet power strip to prevent reverse current flow to the power supply, due to a difference in potential.

(4) Communication connector

This JW-32CV3 contains one BLZ5.08/5F AU-DN (with a screw for securing the connector made by Nihon Weidmuller). ⇨ See page 6-5 and 6-6.

(5) Terminating resistance

Model	Remarks	Manufacturer
DRS1-T	Terminal block type terminating resistance (121 ohms)	Omron
----	Terminating resistance attached to the T branch tap (121 ohms)	

(6) Communication power supply

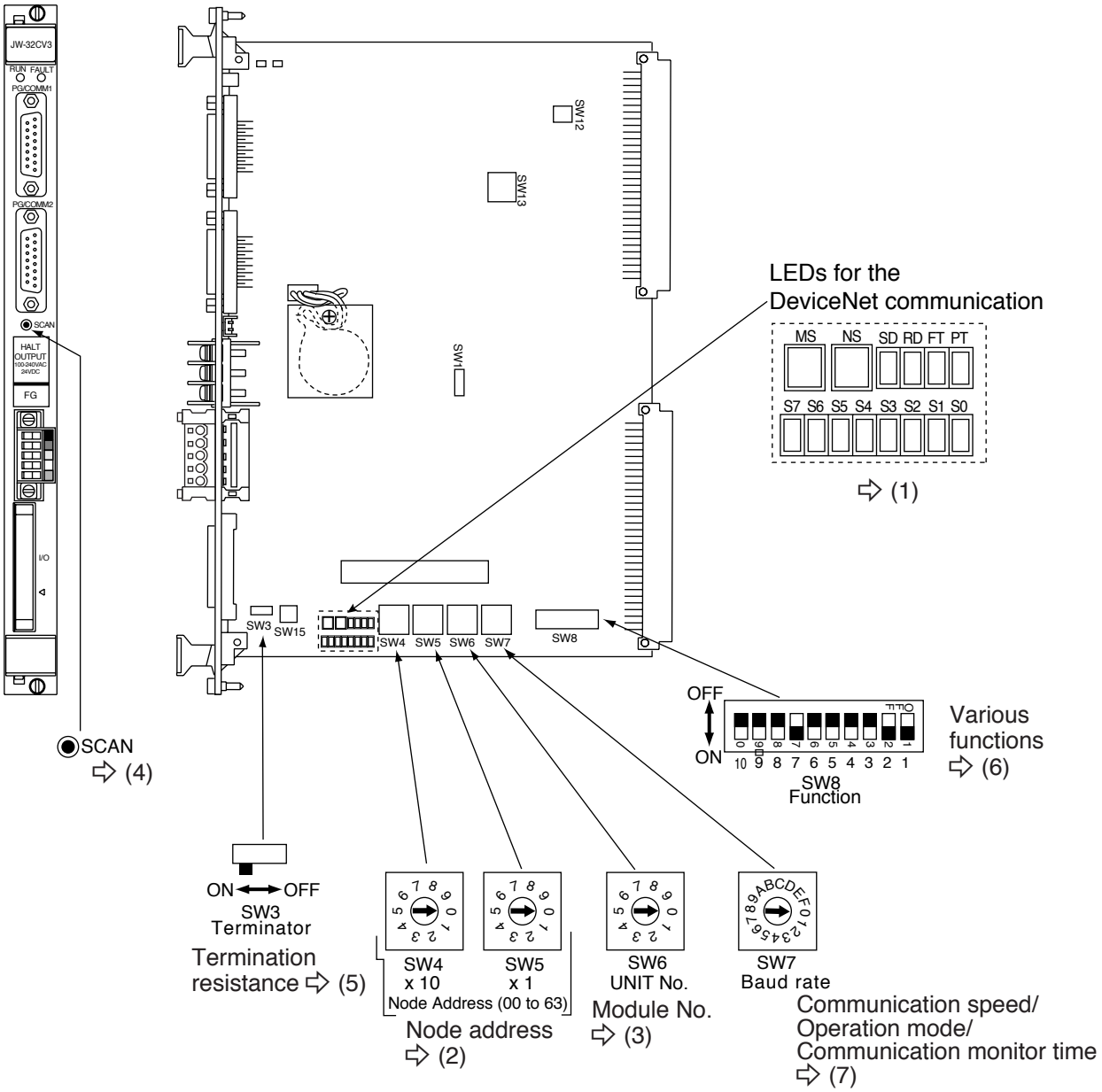
Make sure to use a power supply device for communication that conform to the specifications below.

Item	Specifications
Output voltage	24 VDC ± 1%
Output current	16 A or less
Input variation	0.3 % max.
Load variation	0.3 % max.
Influence of ambient temperature	0.03 %/℃ max.
Input voltage	100 to 1200 V
Input frequency	47 to 450 Hz
Output ripple	250 mVp-p
Output side capacity	7000 ∝F max.
Ambient temperature	Operation: 0 to 60℃, Storage: -40 to 85℃
Instantaneous maximum output current	65 A or less (peak)
Overvoltage protection	Provided
Overcurrent protection	Provided (Max. current: 125 %)
Start up time	250 ms until 5 % value of final output current
Overshoot while starting up	0.2 % max.
Insulation	Between output - AC, and output - frame ground
Conformity	Essential: UL Recommend: FCC Class B, CSA, TUV, VDE
Ambient humidity	30 to 90 % (without dewing)
Surge current capacity	Up to 10 %

9-2 Description of switches and lamps and setting data memory and system memory

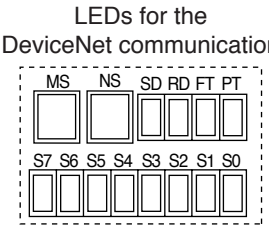
[1] Name and function of switches and lamps

This section describes switches and lamps related to the DeviceNet communication the JW-32CV3.



(1) LED display

The JW-32CV3 displays operation details concerning the DeviceNet by lighting/blinking/going OFF LEDs for the DeviceNet communication on the JW-32CV3.



Lamp name		Color	Operation	
LEDs for the DeviceNet communication	MS	Green/Red	Indicates the module's status.	Detail ⇨ see table below.
	NS	Green/Red	Indicates the network status.	
	SD	Red	Lights when sending data.	
	RD	Red	Lights when receiving data.	
	FT	Red	Lights when the JW-32CV3 (DeviceNet section) is faulty.	
	PT	Red	Lights when the module is in the protected mode.	
	S7 to S0	Red	Displays error codes and the node address when the DeviceNet communication system has an error.	

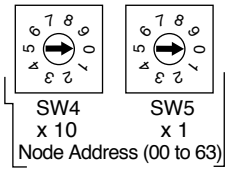
- As for LED display when an error occurs with the JW-32CV3 DeviceNet work, see page 9-38.

● **Configuration of a power tap**

Lamp name	Color	Status		Details
MS (Module Status)	Green	ON	Normal	JW-32CV3 (DeviceNet section) is functioning normally.
		Blinks	Not yet set	Currently reading the switch settings.
	Red	ON	Hardware error	JW-32CV3 (DeviceNet section) has a hardware error.
		Blinks	Abnormal setting	Mis-set switches.
	---	OFF	No power supplied	- Hardware error in the JW-32CV3 (DeviceNet section). - No power is supplied to the master JW-32CV3 (DeviceNet section). - Currently resetting - Waiting for initialization.
NS (Network Status)	Green	ON	On-line/connnected	The network is functioning normally (communication has been established)
		Blinks	On-line/not yet connected	Though the network is functioning normally, communication has not yet been established.
	Red	ON	Communication error 1	- Communication error (the module detected an error indicating that communication on the network is not possible). - A node address has been used twice. - Detected Bus Off.
		Blinks	Communication error 2	A slave station or some other stations are causing a communication error.
	---	OFF	Off-line/power OFF status	There are no nodes other than the JW-32CV3.

(2) Node address switch SW4 and SW5

Specify node (master/slave) address of the JW-32CV3 within 0 to 63 (decimal notation).



(Factory settings: Both 0)

- Switch SW4 is for upper digit (set value x 10), and switch SW5 is for lower digit (set value x 1).

- Unless double the same address with other node in the same network, the JW-32CV3 can be set any number within 0 to 63. When the same address is doubled, the node address doubled error occurs and the JW-32CV3 cannot communicate.

(3) Module No. switch SW6

Allocate the data table (such as the input/output table) for the DeviceNet that are used for the DeviceNet communication section of the JW-32CV3 to the control section of the JW-32CV3. ⇨ See page 9-14.

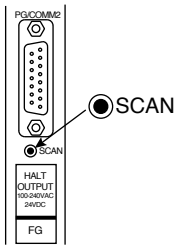
(Factory settings: 0)

(4) SCAN switch

When using the JW-32CV3 as the master mode (switch SW8-8 = OFF), keep pressing the SCAN switch for longer than three seconds, the JW-32CV3 creates a scan list.

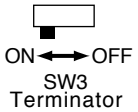
However, this operation is invalid if the SCAN operation mode is set to "with protect" using the switch SW7 on the JW-32CV3.

- When the JW-32CV3 (DeviceNet section) is "Bus off" error, the network has communication error. Turn OFF and ON the PLC power switch or keep pressing the SCAN switch longer than three seconds, the network is disconnected connection and reissued connection. If there is no problem on communication, the JW-32CV3 normally communicates.



(5) Termination resistance switch SW3

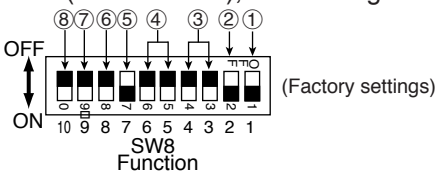
When the JW-32CV3 is used as termination station on the DeviceNet communication trunk, turn this switch ON.



(Factory settings: Both 0)

(6) Function switch SW8

Specify I/O data allocation method for basic operation mode (master/slave), and editing scan list for DeviceNet communication of the JW-32CV3.



Basic operation mode		Switch No.		Set details
Master	Slave			
O	–	①	SW8-1	**CU operation status when a slave communication error occurs** - Select whether or not to continue operation of JW-32CV3 (control section) when a communication error occurs while communicating with a slave station. OFF: The JW-32CV3 (control section) continues operation. ON: The JW-32CV3 (control section) stops operation and enters the program mode. (Default setting) - When the slave mode is selected, this switch shall be fixed to "continue operation" regardless of the setting.
		②	SW8-2	**Synchronous/asynchronous operation** - Select whether or not to synchronize one cycle communication with the JW-32CV3 (control section). OFF: Not synchronized. ON: Synchronized with the operation (default setting) - When the slave mode is selected, this switch shall be fixed to "Not synchronized" regardless of the setting.
		③	SW8-3, 4	**I/O data allocation method** - I/O data table allocation method set by editing the scan list. SW8-4 / SW8-3 / Details: OFF / OFF: Address order allocation (default setting) OFF / ON: Even number allocation ON / OFF: Allocation in the order in which vacant nodes are occupied ON / ON: Setting prohibited - Detail of allocation method ⇨ See page 9-23.
		④	SW8-5, 6	**Data length while editing the scan list** - Select the data length for each node when "even allocation" is selected, and select the vacant node data length when "sequential allocation to empty nodes" has been selected. SW8-6 / SW8-5 / Details: OFF / OFF: 1 byte (default setting) OFF / ON: 2 bytes ON / OFF: 4 bytes ON / ON: 8 bytes
		⑤	SW8-7	**Explicit message request** - Select whether or not to use the Explicit message function. OFF: Does not use the Explicit message send function. ON: Uses the Explicit message send function
O	O	⑥	SW8-8	**Basic operation mode** Select basic operation mode (master/slave) of the JW-32CV3 (DeviceNet section). OFF: Master (default setting) ON: Slave
–	–	⑦	SW8-9	Do not use this switch (Fix to OFF factory setting)
		⑧	SW8-10	

(O: Enable -: Disable)

(7) Switch SW7

Set the communication speed, protection ON or OFF, and communication monitor time for the DeviceNet communication of JW-32CV3.

SW7

(Factory settings: 0)

Note: Do not set switch SW7 to positions 3, 7, B, or F, as it may cause a malfunction.

SW7 setting value		Communication speed (kbps)	Protection (ON/OFF)	Communication monitor time
0 (Factory settings)		125	Protection OFF	Long mode
1		250		
2		500		
4		125	Protection ON	
5		250		
6		500		
8		125	Protection OFF	Normal mode
9		250		
A		500		
C		125	Protection ON	
D		250		
E		500		
Basic operation mode	Master	O	O	O
	Slave	O	O	–

O: Enable
–: Disable

① Communication speed

Select a baud rate: 125 kbps, 250 kbps, or 500 kbps.

② Protection function (ON/OFF)

Select whether to use the protection function.

Not protected	When the JW-32CV3 (control section) is stopped, hold down the SCAN switch for 3 seconds and it will enter the scan list edit mode. - The scan list is created by collecting slave data from the slave stations. - Change the JW-32CV3 (control section) to operating status and it will start I/O message operation.
Protected	The SCAN switch will not function. - This mode is selected to prevent I/O message operation from being stopped by mistaken operation of the SCAN switch.

- Regardless of protected mode is selected (yes/no) or the JW-32CV3 (control section) status (operating/stopped), when a "Bus off" error occurs (F1: Page 9-39), hold down the SCAN switch for 3 seconds. The JW-32CV3 will disconnect the network and restart the connection.

⑥ Communication monitor time

Communication monitor time (ISD, EPR) is timeout time of communication. Select either of "normal mode" and "long mode."

Number of slave modules	Communication monitor time (ms)			
	Normal mode		Long mode	
	ISD	EPR	ISD	EPR
1 to 15	40	1000	80	1500
16 to 31	60		120	
32 to 47	80		160	
48 to 63	100		200	

- When the "fixed allocation" is selected, the communication monitor time will be as per the tables above according to the number of slave modules.
- When the "free allocation" is selected, the monitor time ISD/EPR can be set to any figure (2 to 65536 ms/4 to 65536 ms) on the system memory. ⇨ see page 9-17.
- The communication time can be measured using a commercial DeviceNet analyzer.

- **ISD (InterScan Delay)**
  The ISD is the communication monitor time allowed after the master module sends a request to a slave module until it receives a response from the last slave module.
  When the time allowed for the ISD has elapsed without a response from the last slave, the JW-50DN advances to the next communication cycle.
- **EPR (Expected Packet Rate)**
  The EPR is the communication monitor time allowed after a master module sends a request to a slave module until it receives a response from all of the slave modules.
  If one or more of the slave modules fails to return a response within the time allowed, a communication error occurs.

[2] Setting data memory and system memory

Below shows setting lists of the data memory and system memory of the JW-32CV3 (DeviceNet section).

Basic operation mode		Switch SW6 setting value	0		1		2	3	4	Pages to refer
		Data table allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	⇨ 9-10
Master	Slave	Setting item								
O	□	Top address of I/O table (Top address when free allocation)	⊐2000 to ⊐2777	#300 to #303	⊐5000 to ⊐5777	#500 to #503	⊐6000 to ⊐6777	79000 to 79777	⊐0100 to ⊐0777	⇨ 9-15 □ 9-23
O	O	Diagnostic table (Top address when free allocation)	39000 to 39377	#304 to #307	49000 to 49377	#504 to #507	59000 to 59377	69000 to 69377	39000 to 39377	⇨ 9-15 □ 9-42
O	□	Explicit message table: request (Top address when free allocation)	39400 to 39565	#310 to #313	49400 to 49565	#510 to #513	59400 to 59565	69400 to 69565	39400 to 39565	⇨ 9-15 □ 9-32
O	□	Explicit message table: response (Top address when free allocation)	39600 to 39765		49600 to 49765		59600 to 59765	69600 to 69765	39600 to 39765	
O	□	Scan list table (Top address when free allocation)	E0000 to E0777	#314 to #317	E1000 to E1777	#514 to #517	E2000 to E2777	E3000 to E3777	E0000 to E0777	⇨ 9-16 □ 9-31
O	□	Data length when editing scan list	#321		#521					⇨ 9-16
O	□	ISD (communication monitor time)	#324 #325		#524 #525					⇨ 9-17
O	□	EPR (communication monitor time)	#326 #327		#526 #527					
O	□	Slave module output status when the control section is not operating.	#330		#530		Latch (idle status)			
□	O	Top address of I/O table (when used as slave station)	⊐2000	#360 to #363	⊐5000	#560 to #563				⇨ 9-18
□	O	Number of I/O bytes (when used as slave station)	#364 to #367		#564 to #567					
□	O	Latch/clear slave area when communication error occurs (when used as slave station)	#370		#570					
□	O	Response time to master (when used as slave)	#371 #372		#571 #572					

(O: Enable, □: Disable, Switch SW6 = module No. switch SW6)

- When the slave mode is selected, set switch SW6 to 0 or 1.
- "Fix" and "Free" in the data table allocation method above mean fixed allocation and free allocation, respectively.

1. When fixed allocation is selected, the area of each table to be allocated as fixed. (When slave mode is selected, only the diagnostic table is available.)
2. When free allocation is selected, the JW-32CV3 allocates the top address of each address in system memory that was specified by switch SW6. (When slave mode is selected, only the diagnostic table is available.)

- When switch SW6 is set to 0 or 1, the JW-32CV3 allocates addresses with "fixed" or "free" allocation. To select between "fixed" and "free," turn ON or OFF the 7th bit of the system memory (4th byte) specified by each table. ⇨ See page 9-15, 9-16, and 9-18.
- When the master mode is selected and switch SW6 is set to 2 to 4, only the "fixed" allocation is available.
- Set switch SW6 between 0 to 4. Setting switch SW6 to 5 to 9 means as follows.
  5: The same as "1." (However, setting using the system memory is not available.)
  6, 7: Unable to set (Error code F4)
  8: The same as "0."
  9: The same as "1."

Remarks

- When using the JW-32CV3 while setting switch SW6 to "0 or 1," the available system memory ranges are #300 to #377 and #500 to #577. Set other addresses to 00 (HEX).

Below describes system memory setting concerning the JW-32CV3 DeviceNet communication.

(1) Top address of the I/O table (with the master mode and free allocation)

When the JW-32CV3 is used as master mode, this system memory location is used to store the top address of the I/O table (max. 512 bytes) that will be used for I/O message functions. (I/O data table: See page 9-23.)

Module No. ⟶

System memory		Bit number							
0	1	D7	D6	D5	D4	D3	D2	D1	D0
#300	#500	File address 000000 to 177777(OCT)							
#301	#501								
#302	#502	File number (00(HEX) fixed)							
#303	#503	●	0 (OFF) fixed						

- ● About bit ⇨ See * below.

(2) Top address of the diagnosis table (when used as free allocation)

This system memory location is used to store the top address and to enable/disable the diagnosis table (256 bytes in the master mode, 128 bytes in the slave mode) which is used to check the communication status of the nodes (master, slave). The diagnosis table can be used in both the master and slave modes. (Diagnostic data table: See page 9-42.)

Module No. ⟶

System memory		Bit number							
0	1	D7	D6	D5	D4	D3	D2	D1	D0
#304	#504	File address 000000 to 177777(OCT)							
#305	#505								
#306	#506	File number (00 to 02(HEX))							
#307	#507	●	0 (OFF) fixed						▲

- About ● bit ⇨ See * below.
- When the ▲ bit is ON, both the "free allocation" and "fixed allocation" will be invalid, and the diagnostic table area does not exist.

(3) Top address of the Explicit message table

When the JW-32CV3 is used in the master mode, this system memory location is used to store the top address of the Explicit message table (256 bytes) which is used for the Explicit message function. (Explicit message data table: See page 9-32.)

Module No. ⟶

System memory		Bit number							
0	1	D7	D6	D5	D4	D3	D2	D1	D0
#310	#510	File address 000000 to 177777(OCT)							
#311	#511								
#312	#512	File number (00 to 02(HEX))							
#313	#513	●	0 (OFF) fixed						

- About ● bit ⇨ See * below.
- When the slave mode is selected, I/O table will be allocated in order of input and output from the top address.

***** When the ● bit is OFF, the "fixed allocation" will be valid.
When the ● bit is ON, the "free allocation" will be valid. The file address specified on the system memory (from #300, and from #500, etc.) will be top address of each table. ("Fixed allocation" is not valid.)
When the ● bit is ON, and top address (from #300, and from #500, etc.) is not yet specified (left as 00 (HEX)), the top address will be "⊐0000." Be careful that the occupied I/O address and allocated address may be doubled.

Remarks

- The "free allocation" of each table (such as I/O table) can be used when the module No. switch SW6 is "0 or 1" on the JW-32CV3.

(4) Top address of the scan list table (with the master mode and free allocation)
When the JW-32CV3 is used in the master mode, this system memory location is used to store the top address of the scan list table (512 bytes) which is used when editing the scan list. (Scan list data table: See page 9-31.)

Module No. →

System memory		Bit number							
0	1	D7	D6	D5	D4	D3	D2	D1	D0
#314	#514	File address 000000 to 177777(OCT)							
#315	#515								
#316	#516	File number (00 to 02(HEX))							
#317	#517	●	0 (OFF) fixed						▲

- When the ● bit is ON ⇨ See * in the previous page.
- When the ▲ bit is ON, both the "free allocation" and "fixed allocation" will be invalid, and the diagnostic table area does not exist.

(5) Data length when editing the scan list (when used as the master mode)
This system memory is allocated the data length between 1 byte and 64 bytes by editing a scan list, when the JW-32CV3 is used in the master mode.

Module No. →

System memory		Setting item
0	1	
#321	#521	Data length: 1 to 64 bytes (1 to 100(oct)) - When set too, setting of "function switch SW8-5, and 8-6" will be valid. ⇨ See page 9-11. - When allocation method of the I/O data while edition scan list is "address order allocation," the setting of the JW-32CV3 is in valid.

9

(6) Communication monitor time ISD, EPR (when used as the master mode)

Module No. →	System memory		Setting item	
	0	1		
	#324	#524	ISD (Inter Scan Delay) - 2 to 65534 ms (2 to 65534(DCM)) specify in units of 2 ms.	When set to 0, the initial values are applied.
	#325	#525		
	#326	#526	EPR (Expected Packet Rate) - 4 to 65532 ms (4 to 65532(DCM)) specify in units of 4 ms.	
	#327	#527		

- **Initial values of the ISD and EPR** (when set to 0)

Number of slave modules	Communication monitor time (ms)			
	Normal mode (when SW7=8 to A, C to E)		Long mode (when SW7=0 to 2, 4to 6)	
	ISD	EPR	ISD	EPR
1 to 15	40	1000	80	1500
16 to 31	60		120	
32 to 47	80		160	
48 to 63	100		200	

- A number of slave stations and set value of the switch SW7 determine initial value of the ISD and EPR.
- As for switch SW7, ISD, and EPR, see page 9-13.

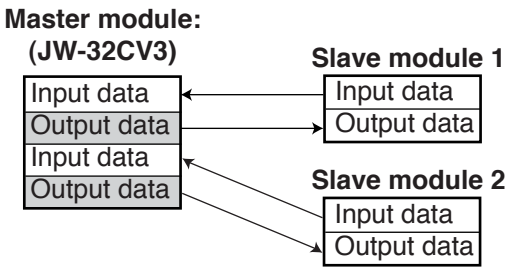
(7) Output status of the slave module when the control section stops operation (when used as master mode)

When the JW-32CV3 is used in the master mode, this system memory location is used to select the data sent to the slave modules when the JW-32CV3 (control section) stops operation (enters the program mode).
⇨ See page 9-50.

Module No. →	System memory		Setting item
	0	1	
	#330	#530	00(HEX): Send idle data. * 01(HEX): Clear

* For details about slave station operation when a slave station receives idle data, see the instruction manual for each slave station.

- The areas shown in gray in the figure below can be set to "send/clear idle data" when the control section stops operation.



- When the module number switch SW6 is set to "2, 3, or 4," the JW-32CV3 sends the idle data.

(8) Top address of the I/O table (when in the slave mode)
This system memory location is used to store the top address of the I/O table when the JW-32CV3 is in the slave mode.

Module No. →

System memory		Bit number							
0	1	D7	D6	D5	D4	D3	D2	D1	D0
#360	#560	File address 000000 to 177777(OCT)							
#361	#561								
#362	#562	File number (00(HEX) fixed)							
#363	#563	●	0 (OFF) fixed						

- When the ● bit is OFF (#363/#563 = 00(HEX)), the "fixed allocation" will be valid.
  Ex.: When the module number is 0, top address of the I/O table will be "Ⅱ2000."
- When the ● bit is ON (#363/#563 = 80(HEX)), the "free allocation" will be valid and file address specified on the system memory (#360 to #362/#560 to #562) will be top address of each table.
  (Address when the "fixed allocation" is selected will be invalid.)

Note: When the ● bit is turned ON without setting (left 00(HEX)) top address (#360 to #362/#560 to #562), the top address will be "Ⅱ0000" and be careful that the occupied I/O address and the allocated address will be doubled.

(9) Number of I/O bytes (when in the slave mode)
This system memory location is used to store the number of input bytes (0 to 127 bytes) and output bytes (0 to 127 bytes) when the JW-32CV3 is in the slave mode.

Module No. →

System memory		Setting item
0	1	
#364	#564	Number of input (sending) bytes: 0 to 127 bytes (0 to 177(OCT))
#365	#565	00(HEX): Fixed
#366	#566	Number of output (receiving) bytes: 0 to 127 bytes (0 to 177(OCT))
#367	#567	00(HEX): Fixed

- The specified number of bytes are allocated from the top address in the I/O table (when used in the slave mode) with input bytes being allocated first, followed by the area for the output bytes.

(10) Restore/clear the slave area when a communication error occurs (when used in the slave mode)
When the JW-32CV3 is used in the slave mode, this system memory location is used to determine whether the JW-32CV3 (DeviceNet section) is restored or cleared when a communication error occurs. ⇨ See page 9-50.

Module No. →

System memory		Setting item
0	1	
#370	#570	00(HEX): Latch 01(HEX): Clear

(11) Response time to master station (when slave mode is selected)
When the JW-32CV3 is in slave mode, this system memory is used to specify the response time (0 to 65528 ms) to the master station.

Module No. →

System memory		Setting item
0	1	
#371	#571	Response time to the master station - Specify within 0 to 65528 ms (0 to 65528 (DCM)) in units of 8 ms. - If 1 to 7 ms is set, it will automatically become 8 ms. Figures less than a multiple of 8 will be rounded down. (e.g.: When 15 ms is entered, it will become 8 ms.)
#372	#572	

- Enter the response time when the communication processing time of the master station is exceptionally long. (Normally set to 0 ms.)

[3] Table of switches, data memory, and system memory setting

(1) When the JW-32CV3 is used in the master mode

■ Switch setting (master mode)

<table>
<tr><th colspan="2">Switch name</th><th colspan="6">Setting item</th><th>Set (value)</th></tr>
<tr><td colspan="2" rowspan="8">UNIT No. SW6
(Module number)</td><td></td><td>0 *</td><td>1 *</td><td>2</td><td>3</td><td>4</td><td rowspan="8"></td></tr>
<tr><td>I/O table</td><td>□2000
to □2777</td><td>□5000
to □5777</td><td>□6000
to □6777</td><td>79000
to 79777</td><td>□0100
to □0777</td></tr>
<tr><td>Diagnostic table</td><td>39000
to 39377</td><td>49000
to 49377</td><td>59000
to 59377</td><td>69000
to 69377</td><td>39000
to 39377</td></tr>
<tr><td rowspan="2">Explicit message table</td><td>39400
to 39565</td><td>49400
to 49565</td><td>59400
to 59565</td><td>69400
to 69565</td><td>39400
to 39565</td></tr>
<tr><td>39600
to 39765</td><td>49600
to 49765</td><td>59600
to 59765</td><td>69600
to 69765</td><td>39600
to 39765</td></tr>
<tr><td>Scan list table</td><td>E0000
to E0777</td><td>E1000
to E1777</td><td>E2000
to E2777</td><td>E3000
to E3777</td><td>E0000
to E0777</td></tr>
<tr><td colspan="6">* Free allocation in each table system memory setting of ISD etc.
⇨ See next page.</td></tr>
<tr><td rowspan="2">Node Address</td><td>SW4 (x10)</td><td>Upper digit of node address</td><td colspan="4" rowspan="2">00 to 63</td><td rowspan="2"></td></tr>
<tr><td>SW5 (x1)</td><td>Lower digit of node address</td></tr>
<tr><td colspan="2">Terminator SW3</td><td>Termination resistance</td><td colspan="4">Set termination node to ON</td><td></td></tr>
<tr><td rowspan="11">SW8</td><td>1</td><td>Select CU operation status when an communication error occurs.</td><td colspan="4">OFF: Continue operation
ON: Stop operation</td><td></td></tr>
<tr><td>2</td><td>Select synchronize/ asynchronize between the communication cycle and CU operation</td><td colspan="4">OFF: Asynchronous calculation
ON: Synchronous calculation</td><td></td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">I/O data allocation system when editing scan list</td><td colspan="4">4: OFF, 3: OFF = Order allocation</td><td rowspan="3"></td></tr>
<tr><td colspan="4">: OFF, : OFF = Even allocation</td></tr>
<tr><td rowspan="2">4</td><td colspan="4">: ON, : OFF = Allocate in the order of empty node areas</td></tr>
<tr><td rowspan="4">5</td><td rowspan="4">Data length when editing scan list</td><td colspan="4">6: OFF, : OFF = 1 bytes</td><td rowspan="4"></td></tr>
<tr><td colspan="4">: OFF, : ON = 2 bytes</td></tr>
<tr><td rowspan="2">6</td><td colspan="4">: ON, : OFF = 4 bytes</td></tr>
<tr><td colspan="4">: ON, : ON = 8 bytes</td></tr>
<tr><td>7</td><td>Request Explicit message</td><td colspan="4">ON = Used
OFF= Not used</td><td></td></tr>
<tr><td>8</td><td>Basic operation mode</td><td colspan="4">Set OFF (master mode)</td><td>OFF</td></tr>
<tr><td>9, 10</td><td>Not used</td><td colspan="4">Set OFF (default setting)</td><td>OFF</td></tr>
<tr><td colspan="2" rowspan="12">SW7</td><td rowspan="12">- Communication speed (kbps)
- Protection function (ON/OFF)
- Communication monitor mode (long mode/□ normal mode)</td><td colspan="4">0 = 125, OFF, long</td><td rowspan="12"></td></tr>
<tr><td colspan="4">1 = 250, OFF, long</td></tr>
<tr><td colspan="4">2 = 500, OFF, long</td></tr>
<tr><td colspan="4">4 = 125, ON, long</td></tr>
<tr><td colspan="4">5 = 250, ON, long</td></tr>
<tr><td colspan="4">6 = 500, ON, long</td></tr>
<tr><td colspan="4">8 = 125, OFF, normal</td></tr>
<tr><td colspan="4">9 = 250, OFF, normal</td></tr>
<tr><td colspan="4">A = 500, OFF, normal</td></tr>
<tr><td colspan="4">C = 125, ON, normal</td></tr>
<tr><td colspan="4">D = 250, ON, normal</td></tr>
<tr><td colspan="4">E = 500, ON, normal</td></tr>
</table>

■ **System memory setting** (master mode: module No. = 0, 1)

Module No. Switch SW6 setting value		Set details				Set value
0	1	Item			Set range, etc.	
#300 #301	#500 #501	Top address of I/O table (occupy max. 512 bytes)	File address		000000 to 177777(OCT) (Set with octal and word)	
#302	#502		File number		Fix to 00(HEX)	00
#303	#503		*1		00 to 80(HEX)	
#304 #305	#504 #505	Top address of diagnosis table (occupy 256 bytes)	File address		000000 to 177777(OCT) (Set with octal and word)	
#306	#506		File number		00 to 02(HEX)	
#307	#507		*2		00, 01, 80(HEX)	
#310 #311	#510 #511	Top address of Explicit message table (occupy 256 bytes)	File address		000000 to 177777(OCT) (Set with octal and word)	
#312	#512		File number		00 to 02(HEX)	
#313	#513		*1		00, 80(HEX)	
#314 #315	#514 #515	Top address of scan list table (occupy 512 bytes)	File address		000000 to 177777(OCT) (Set with octal and word)	
#316	#516		File number		00 to 02(HEX)	
#317	#517		*2		00, 01, 80(HEX)	
#320	#520	Not used	---		Fix to 00(HEX)	00
#321	#521	Data length when editing scan list	1 to 64 bytes (when in order of allocation time is selected)		001 to 100(HEX) (set with octal)	
#322 to #323	#522 to #523	Not used	---		Fix to 00(HEX)	00
#324 #325	#524 #525	ISD (communication monitor time)	2 to 65534 ms (in units of 2 ms)	- A setting of "0" enables the reading of the setting on SW7.	00002 to 65534(DCM) (Set with decimal and word)	
#326 #327	#526 #527	EPR (communication monitor time)	4 to 65532 ms (in units of 4 ms)		00004 to 65532(DCM) (Set with decimal and word)	
#330	#530	Slave output status when the control section is stopped operation	00(HEX): Send idling data 01(HEX): Clear		00, 01(HEX)	
#331 to #377	#531 to #577	Not used	---		Set to 00(HEX)	00

*1: When bit D7 is ON (D0 to D6 are fixed to OFF), the "free allocation" will be valid and a file address specified into the system memory will be top address of the I/O table.
(Addresses when the "fixed allocation " is selected will be invalid.)

*2: When bit D7 is ON (D0 to D6 are fixed to OFF), the "free allocation" will be valid and a file address specified into the system memory will be top address of each table.
(Addresses when the "fixed allocation " is selected will be invalid.)
When bit D0 is ON, both the "free allocation" and "fixed allocation" will be invalid and diagnosis table and scan list table area does not exist.

(2) When the JW-32CV3 is used in the slave mode

■ Switch setting (slave mode)

Switch name		Setting item				Set (value)
UNIT No. SW6 (Module number)			0	1	2 to 4	
		Diagnostic table	39000 to 39377	49000 to 49377	Unable to set	
		* Free allocation in each table system memory setting of ISD etc. ⇨ See next page.				
Node Address	SW4 (x10)	Upper digit of node address	00 to 63			
	SW5 (x1)	Lower digit of node address				
Terminator SW3		Termination resistance	Set termination node to ON			
SW8	1	Select CU operation status when an communication error occurs.	*1			□
	2	Select synchronize/ asynchronize between the communication cycle and CU operation	*2			□
	3	I/O data allocation system when editing scan list	*3			□
	4					
	5	Data length when editing scan list				
	6					
	7	Request Explicit message				
	8	Basic operation mode	Set ON (slave mode)			ON
	9, 10	Not used	Set OFF (default setting)			OFF
SW7		- Communication speed (kbps) - Protection function (ON/OFF) - Communication monitor mode (long mode/ normal mode) *4	0 = 125, OFF, long			
			1 = 250, OFF, long			
			2 = 500, OFF, long			
			4 = 125, ON, long			
			5 = 250, ON, long			
			6 = 500, ON, long			
			8 = 125, OFF, normal			
			9 = 250, OFF, normal			
			A = 500, OFF, normal			
			C = 125, ON, normal			
			D = 250, ON, normal			
			E = 500, ON, normal			

*1: Even a communication error occurs, the control section continues operation regardless of the set condition.

*2: Calculation between the communication cycle and control section asynchronize regardless of the setting.

*3: Setting of the I/O data allocation system is invalid.

*4: Setting of the communication monitor time is invalid.

■ **System memory setting** (slave mode: module No. = 0, 1)

Module No. Switch SW6 setting value		Set details			Set value
0	1	Item		Set range	
#300 to #303	#500 to #503	Not used	---	Fix to 00(HEX)	00
#304 #305	#504 #505	Top address of diagnostic table (occupy max. 256 bytes)	File address	000000 to 177777(OCT) (Set with octal and word)	
#306	#506		File number	00 to 02(HEX)	
#307	#507		*1	00, 01, 80(HEX)	
#310 to #357	#560 to #561	Not used	---	Fix to 00(HEX)	00
#360 #361	#560 #561	Top address of I/O table (occupy 254 bytes)	File address	000000 to 177777(OCT) (Set with octal and word)	
#362	#562		File number	Fix to 00(HEX)	
#363	#563		-2	00, 80(HEX)	00
#364	#564	Number of input bytes	0 to 127 bytes	000 to 177(OCT) (Set with octal)	
#365	#565	Not used	---	Set to 00(HEX)	00
#366	#566	Number of output bytes	0 to 127 bytes	000 to 177(OCT) (Set with octal)	
#367	#565	Not used	---	Set to 00(HEX)	00
#370	#570	Latch or clear the slave area when a communication error occurs.	00(HEX): Latch 01(HEX): Clear	00, 01(HEX)	
#371 #372	#571 #572	Response time to the master station	0 to 65528 ms (8 ms unit) - Use in 0 ms at normal.	00000 to 65528(DCM) (Set with decimal and word)	00
#373 to #377	#573 to #577	Not used	---	Set to 00(HEX)	00

*1: When this value is 00(HEX), the fixed allocation will be valid.
When this value is 80(HEX), the free allocation will be valid, and file address specified into system memory (#304 to #306/#504 to #506) will be top address of the diagnosis table.
(When the fixed allocation is selected, this address will be invalid.)
When 01(HEX) is selected both the "free allocation" and "fixed allocation" are invalid, and diagnosis table area does not exist.

*2: When this value is 00(HEX), the fixed allocation will be valid.
When this value is 80(HEX), the free allocation will be valid, and file address specified into system memory (#360 to #362/#560 to #562) will be top address of the I/O table.
(When the fixed allocation is selected, this address will be invalid.)

9-3 I/O Message Function

Among I/O messages of the DeviceNet, the JW-32CV3 supports Polling I/O function and Bit Strobe function. The JW-32CV3 (master mode) can communicate messages with slave modules having either of these two functions.

- The Polling I/O is a method that a master module sends a command (point to point) to each slave module and receive messages, if any.
- Bit Strobe is a message that multiple slave modules receive one command and respond using broadcasting function. This is convenient for collecting small data such as multiple slaves devices are arranged like sensors. Use the JW-32CV3 with master mode, when creating a scan list, it establishes connection with the Bit Strobe for slave modules having Bit Strobe function.

When the JW-32CV3 is used as the master mode, specify top address of the I/O table (occupy max. 512 bytes) to communicate with the I/O message function using module No. switch SW6 (system memory). ⇨ See page 9-14.

- **Input/output data table addresses**

Basic operation mode		Number of bytes	Module No. Switch SW6 setting value						
			0		1		2	3	4
Master	Slave		Fix	Free	Fix	Free	Fix	Fix	Fix
O	□	512	⊐2000 to ⊐2777	#300 * to #303	⊐5000 to ⊐5777	#500 * to #503	⊐6000 to ⊐6777	79000 to 79777	⊐0100 to ⊐0777 (448 bytes)

(O: Enable, □: Disable) * Specify top address and valid/invalid.

[1] Input/output data table allocation

The JW-32CV3 (DeviceNet section) can select from several allocation methods for the slave station input/output data table. The choices are "allocation in address order," "even number allocation," and "allocation in the order in which vacant nodes are occupied." For selection, set function switches SW8-3, 4 of the JW-32CV3.⇨ See page 9-11.

Allocation method	Input/output data table allocation details	Details
Address order allocation	1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Enter the data length required by each slave station. 3. A slave station that does not have a I/O message function is not assigned a data length. 4. Any slave station number (node address), that does not have hardware connected is not assigned a data length.	Page 9-24
Even number allocation	1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Assign the default data length required evenly for each slave station. For any slave station that needs more data than the default data length, increase the size in multiples of the default number of bytes. 3. A slave station that does not have a I/O message function is not assigned a default data length. 4. Any slave station number (node address), that does not have hardware connected is assigned a default data length.	Page 9-26
Allocation in the order in which vacant nodes are occupied	1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Enter the number of bytes required by each slave station with a I/O message function. 3. A slave station that does not have a I/O message function is not assigned a data length. 4. Any slave station number (node address), that does not have hardware connected, is assigned the default data length.	Page 9-28

- No matter which allocation method is selected, you have to start the master module JW-32CV3 in the scan list edit mode, collect the data from slave stations, and create a scan list. The scan list classifies slave station inputs and outputs, data lengths, and addresses. Therefore, a separate configuration program is not needed for the input/output data table allocation. ⇨ See page 9-30, 9-31.
- Set the default data length used in the "Even number allocation" and "Allocation in the order in which vacant nodes are occupied" modes to 1 to 64 bytes. For selecting data, use the function switches SW8-5, 6 and system memory in the JW-32CV3. ⇨ See page 9-11, 9-16.

Remarks

- Number of I/O points with the JW-32CV3 is maximum 4096 (512 bytes).
  When editing the scan list while the total number of I/O points of slave modules connected exceeds 4096, node addresses exceeding 4096 will be ignored.

Three allocation examples are shown below (1) to (3).

- Node address 0 : The JW-32CV3 (master)
- Node address 1 : Slave station — Polling I/O input data = 1 byte; Polling I/O output data = 1 byte
- Node address 2 : Not connected
- Node address 3 : Slave station — Polling I/O input data = 3 bytes; Polling I/O output data = 3 bytes
- Node address 4 : Slave station (No I/O message function)
- Node address 5 : Slave station — Polling I/O input data = 3 bytes; Polling I/O output data = 0 byte

(1) Address order allocation

Assign data length (the number of bytes of data) to the input/output data table in node addresses order for the slave stations.

1. Assign the data length required by each slave station.
2. A slave station that does not have I/O message function is not assigned a data length.
3. Any slave station number (node address), that does not have hardware connected, is not assigned a data length.

■ Allocation example

The allocation results from assigning data lengths "in the order in which vacant nodes are occupied" are as follows:

Address *		
1st	byte	(3000)
2nd	byte	(3001)
3rd	byte	(3002)
4th	byte	(3003)
5th	byte	(3004)
6th	byte	(3005)
7th	byte	(3006)
8th	byte	(3007)
9th	byte	(3010)
10th	byte	(3011)
11th	byte	(3012)
12th	byte	(3013)
	to	
512th	byte	(3777)

Input/output data table

Node address 1 (slave station)	Input
	Output
Node address 3 (slave station)	Input
	Output
Node address 5 (slave station)	Input
Not used	

* The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

Node address	Required data length (bytes)	I/O message function	Assigned data length (bytes)
1	2 (1 input, 1 output)	Yes	2 (1 input, 1 output)
2	Not connected	-	0
3	6 (3 input, 3 output)	Yes	6 (3 input, 3 output)
4	0	No	0
5	3 (3 input, 0 output)	Yes	3 (3 input)

- The required number of bytes are assigned to the slaves at nodes 1, 3, and 5.
- Slave 2 (nothing connected) and slave 4 (doesn't have a I/O message function) are not assigned any data length.

The scan list table (page 9-31) will be as follows:

Address *	Value (hexadecimal): Details	
1st byte (E2000)	FF: This JW-32CV3 station (master)	Node address 0
2nd byte (E2001)	All zeroes	
3rd byte (E2002)		
4th byte (E2003)		
5th byte (E2004)		
6th byte (E2005)		
7th byte (E2006)		
8th byte (E2007)		
9th byte (E2010)	02: A slave station with a Polling I/O function	Node address 1
10th byte (E2011)	00: Not used	
11th byte (E2012)	01: 1 byte (input data length)	
12th byte (E2013)	01: 1 byte (output data length)	
13th byte (E2014)	00: 1st byte	
14th byte (E2015)	00: (input data offset)	
15th byte (E2016)	01: 2nd byte	
16th byte (E2017)	00: (output data offset)	
17th byte (E2020)	00: Not connected	Node address 2
18th byte (E2021)	All zeroes	
19th byte (E2022)		
20th byte (E2023)		
21st byte (E2024)		
22nd byte (E2025)		
23rd byte (E2026)		
24th byte (E2027)		
25th byte (E2030)	02: A slave station with a Polling I/O function	Node address 3
26th byte (E2031)	00: Not used	
27th byte (E2032)	03: 3 bytes (input data length)	
28th byte (E2033)	03: 3 bytes (output data length)	
29th byte (E2034)	02: 3rd byte	
30th byte (E2035)	00: (input data offset)	
31st byte (E2036)	05: 6th byte	
32nd byte (E2037)	00: (output data offset)	
33rd byte (E2040)	01: A slave station without a I/O message function	Node address 4
34th byte (E2041)	All zeroes	
35th byte (E2042)		
36th byte (E2043)		
37th byte (E2044)		
38th byte (E2045)		
39th byte (E2046)		
40th byte (E2047)		
41st byte (E2050)	02: A slave station with a Polling I/O function	Node address 5
42nd byte (E2051)	00: Not used	
43rd byte (E2052)	03: 3 bytes (input data length)	
44th byte (E2053)	00: 0 byte (output data length)	
45th byte (E2054)	08: 9th byte	
46th byte (E2055)	00: (input data offset)	
47th byte (E2056)	0B: 12th byte	
48th byte (E2057)	00 (output data offset)	

Address *	$Value_H$: Details	
49th byte (E2060)	All zeroes	Node address 6
50th byte (E2061)		
51st byte (E2062)		
52nd byte (E2063)		
53rd byte (E2064)		
54th byte (E2065)		
55th byte (E2066)		
56th byte (E2067)		
to	to	to
505th byte (E2770)	All zeroes	Node address 63
506th byte (E2771)		
507th byte (E2772)		
508th byte (E2773)		
509th byte (E2774)		
510th byte (E2775)		
511th byte (E2776)		
512th byte (E2777)		

* The addresses shown in parentheses ( ) are correct when the module No. switch SW6 is set to 2.

(2) Even number allocation

Assign the data length (number of bytes of data) in the input/output data table in the order that the node addresses were assigned to each slave station.

1. Assign the required data length evenly for each slave station.
   For any slave station that needs more data than the default data length, the JW-32CV3 allocates additional length in units of the default data length (a length multiplied the default data length).
2. The JW-32CV3 assigns the default data length to slave stations that do not have a I/O message function.
3. The JW-32CV3 also assigns the default data length to slave station numbers (node addresses) that do not have any hardware connected to them.

Enter default data length of 1 to 3 above on switch SW8-5 and 8-6 and system memory of the JW-32CV3. ⇨ See page 9-11, 9-16.

■ Allocation example

The allocation results from assigning data lengths by "even number allocation" are as shown on page 9-24, as follows.

- The default data length is 2 bytes.

Address *			Input/output data table	
1st	byte	(⊐6000)	Node address 1 (slave station)	Input
2nd	byte	(⊐6001)		Output
3rd	byte	(⊐6002)	Node address 2 (not connected)	Not used
4th	byte	(⊐6003)	Node address 3 (slave station)	Input
5th	byte	(⊐6004)		
6th	byte	(⊐6005)		
7th	byte	(⊐6006)		Output
8th	byte	(⊐6007)		
9th	byte	(⊐6010)		
10th	byte	(⊐6011)		
11th	byte	(⊐6012)	Node address 4 (slave station)	Not used
12th	byte	(⊐6013)	Node address 5 (slave station)	Input
13th	byte	(⊐6014)		
14th	byte	(⊐6015)		Not used
15th	byte	(⊐6016)		
16th	byte	(⊐6017)		
17th	byte	(⊐6020)		
18th	byte	(⊐6021)		
	to			
131st	byte	(⊐6202)		
132nd	byte	(⊐6203)		
133rd	byte	(⊐6204)		
	to			
512th	byte	(⊐6777)		

* The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

Node address 6 (not connected)	Not used
to	to
Node address 63 (not connected)	Not used
Not used	

(When the default data length is set to 2 bytes)

Node address	Required data length (bytes)	I/O message function	Assigned data length (bytes)
1	2 (1 input, 1 output)	Yes	2 (1 input, 1 output)
2	Not connected	-	2
3	6 (3 input, 3 output)	Yes	6 (3 input, 3 output)
4	0	No	2
5	3 (3 input, 0 output)	Yes	4 (3 input, 1 not used)

- The needed data length (2 bytes) is assigned to slave station 1.
- Slave station 2 (not connected) and slave station 4 (does not have a I/O message function) are assigned the default data length (2 bytes).
- Slave stations 3 and 5 need a larger number of bytes than the default data length. (2 bytes).
- Therefore, in these cases, a different data length is assigned which is a multiple of the default data length (2 bytes).
  ⇨ Slave station 3 needs 6 bytes and is assigned 6 bytes (2 x 3).
  ⇨ Slave station 5 needs 3 bytes and is assigned 4 bytes (2 x 2).

The scan list table (page 9-31) for this example will be as follows:

Address * 1	Value (hexadecimal): Details	
1st byte (E2000)	FF: This JW-32CV3 station (master)	Node address 0
2nd byte (E2001)	All zeroes	
3rd byte (E2002)		
4th byte (E2003)		
5th byte (E2004)		
6th byte (E2005)		
7th byte (E2006)		
8th byte (E2007)		
9th byte (E2010)	02: A slave station with a Polling I/O function	Node address 1
10th byte (E2011)	00: Not used	
11th byte (E2012)	01: 1 byte (input data length)	
12th byte (E2013)	01: 1 byte (output data length)	
13th byte (E2014)	00: 1st byte	
14th byte (E2015)	00: (input data offset)	
15th byte (E2016)	01: 2nd byte	
16th byte (E2017)	00: (output data offset)	
17th byte (E2020)	00: Not connected	Node address 2
18th byte (E2021)	00: Not used	
19th byte (E2022)	00: 0 byte (input data length)	
20th byte (E2023)	00: 0 byte (output data length)	
21st byte (E2024)	02: 3rd byte	
22nd byte (E2025)	00: (input data offset)	
23rd byte (E2026)	02: 3rd byte	
24th byte (E2027)	00: (output data offset)	
25th byte (E2030)	02: A slave station with a Polling I/O function	Node address 3
26th byte (E2031)	00: Not used	
27th byte (E2032)	03: 3 bytes (input data length)	
28th byte (E2033)	03: 3 bytes (output data length)	
29th byte (E2034)	04: 5th byte	
30th byte (E2035)	00: (input data offset)	
31st byte (E2036)	07: 8th byte	
32nd byte (E2037)	00: (output data offset)	
33rd byte (E2040)	01: A slave station without a I/O message function	Node address 4
34th byte (E2041)	00: Not used	
35th byte (E2042)	00: 0 byte (input data length)	
36th byte (E2043)	00: 0 byte (output data length)	
37th byte (E2044)	0A: 11th byte	
38th byte (E2045)	00: (input data offset)	
39th byte (E2046)	0A: 11th byte	
40th byte (E2047)	00: (output data offset)	
41st byte (E2050)	02: A slave station with a Polling I/O function	Node address 5
42nd byte (E2051)	00: Not used	
43rd byte (E2052)	03: 3 bytes (input data length)	
44th byte (E2053)	00: 0 byte (output data length)	
45th byte (E2054)	0C: 13th byte	
46th byte (E2055)	00: (input data offset)	
47th byte (E2056)	0F: 16th byte	
48th byte (E2057)	00: (output data offset)	

Address * 1	$Value_H$: Details	
49th byte (E2060)	00	Node address 6
50th byte (E2061)	00	
51st byte (E2062)	00	
52nd byte (E2063)	00	
53rd byte (E2064)	11 * 2	
54th byte (E2065)	00	
55th byte (E2066)	11 * 2	
56th byte (E2067)	00	
to	to	to
505th byte (E2770)	00	Node address 63
506th byte (E2771)	00	
507th byte (E2772)	00	
508th byte (E2773)	00	
509th byte (E2774)	83 * 2	
510th byte (E2775)	00	
511th byte (E2776)	83 * 2	
512th byte (E2777)	00	

*1: The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

*2: The offset values are calculated by adding 2 bytes (default data length) to each address.

(3) Allocation in the order in which vacant nodes are occupied

Assign the data length (number of bytes of data) in the input/output data table in the order that the node addresses were assigned to each slave station.

1. Assign the required data length to slave stations using the I/O message function.
2. The JW-32CV3 does not allocate any data length for slave stations that do not have a I/O message function.
3. The JW-32CV3 will allocate the default data length to any slave station number (node address) that does not actually have hardware connected.
   Enter default data length using switch SW8-5 and 8-6 and the system memory of the JW-32CV3. ⇨ See page 9-11, 9-16.

■ Allocation example

The results of "allocation in the order in which vacant nodes are occupied, "for the example shown on page 9-24, are as follows.

- The default data length was set to 2 bytes.

Address *			Input/output data table	
1st	byte	(Ⅎ6000)	Node address 1 (slave)	Input
2nd	byte	(Ⅎ6001)		Output
3rd	byte	(Ⅎ6002)	Node address 2 (not connected)	Not used
4th	byte	(Ⅎ6003)		
5th	byte	(Ⅎ6004)	Node address 3 (slave)	Input
6th	byte	(Ⅎ6005)		
7th	byte	(Ⅎ6006)		
8th	byte	(Ⅎ6007)		Output
9th	byte	(Ⅎ6010)		
10th	byte	(Ⅎ6011)		
11th	byte	(Ⅎ6012)	Node address 5 (slave)	Input
12th	byte	(Ⅎ6013)		
13th	byte	(Ⅎ6014)		
14th	byte	(Ⅎ6015)	Node address 6 (not connected)	Not used
15th	byte	(Ⅎ6016)	to	to
to				
128th	byte	(Ⅎ6177)	Node address 63 (not connected)	Not used
129th	byte	(Ⅎ6200)		
130th	byte	(Ⅎ6201)	Not used	
to				
512th	byte	(Ⅎ6777)		

* The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

(When the default data length is set to 2 bytes)

Node address	Required data length (bytes)	I/O message function	Assigned data length (bytes)
1	2 (1 input, 1 output)	Yes	2 (1 input, 1 output)
2	Not connected	-	2
3	6 (3 input, 3 output)	Yes	6 (3 input, 3 output)
4	0	No	0
5	3 (3 input, 0 output)	Yes	3 (3 input)

- The default data length is assigned to slave stations 1, 3, and 5.
- Slave station 2 (no hardware connected) is assigned the default data length (2 bytes).
- Slave station 4 (without a I/O message function) is not allocated any data length.

The scan list table (page 9-31) will be as follows:

Address * 1	Value (hexadecimal): Details	
1st byte (E2000)	FF: This JW-32CV3 station (master)	Node address 0
2nd byte (E2001)	All zeroes	
3rd byte (E2002)		
4th byte (E2003)		
5th byte (E2004)		
6th byte (E2005)		
7th byte (E2006)		
8th byte (E2007)		
9th byte (E2010)	02: A slave station with a Polling I/O function	Node address 1
10th byte (E2011)	00: Not used	
11th byte (E2012)	00: 1 byte (input data length)	
12th byte (E2013)	01: 1 byte (output data length)	
13th byte (E2014)	00: 1st byte	
14th byte (E2015)	00: (input data offset)	
15th byte (E2016)	01: 2nd byte	
16th byte (E2017)	00: (output data offset)	
17th byte (E2020)	00: Not connected	Node address 2
18th byte (E2021)	00: Not used	
19th byte (E2022)	00: 0 byte (input data length)	
20th byte (E2023)	00: 0 byte (output data length)	
21st byte (E2024)	02: 3rd byte	
22nd byte (E2025)	00: (input data offset)	
23rd byte (E2026)	02: 3rd byte	
24th byte (E2027)	00: (output data offset)	
25th byte (E2030)	02: A slave station with a Polling I/O function	Node address 3
26th byte (E2031)	00: Not used	
27th byte (E2032)	03: 3 bytes (input data length)	
28th byte (E2033)	03: 3 bytes (output data length)	
29th byte (E2034)	04: 5th byte	
30th byte (E2035)	00: (input data offset)	
31st byte (E2036)	07: 8th byte	
32nd byte (E2037)	00: (output data offset)	
33rd byte (E2040)	01: A slave station without a I/O message function	Node address 4
34th byte (E2041)	All zeroes	
35th byte (E2042)		
36th byte (E2043)		
37th byte (E2044)		
38th byte (E2045)		
39th byte (E2046)		
40th byte (E2047)		
41st byte (E2050)	02: A slave station with a Polling I/O function	Node address 5
42nd byte (E2051)	00: Not used	
43rd byte (E2052)	03: 3 bytes (input data length)	
44th byte (E2053)	00: 0 byte (output data length)	
45th byte (E2054)	0A: 11th byte	
46th byte (E2055)	00: (input data offset)	
47th byte (E2056)	0D: 14th byte	
48th byte (E2057)	00: (output data offset)	

Address *1	$Value_H$: Details	
49th byte (E2060)	00	Node address 6
50th byte (E2061)	00	
51st byte (E2062)	00	
52nd byte (E2063)	00	
53rd byte (E2064)	0F *2	
54th byte (E2065)	00	
55th byte (E2066)	0F *2	
56th byte (E2067)	00	
to	to	to
505th byte (E2770)	00	Node address 63
506th byte (E2771)	00	
507th byte (E2772)	00	
508th byte (E2773)	00	
509th byte (E2774)	81 *2	
510th byte (E2775)	00	
511th byte (E2776)	81 *2	
512th byte (E2777)	00	

*1: The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

*2: The offset values are calculated by adding 2 bytes (default data length) to each address.

[2] Editing the scan list

Before using the JW-32CV3 as a master mode for the first time, you will have to edit the scan list (to allocate I/O data).

(1) Editing procedure

Shown below are the procedures used to edit the scan list.

■ Procedures

① Switch the JW-32CV3 (control section) to the program mode.

↓

② Turn OFF the power to the VME master (JW-32CV3) and remove it.

↓

③ Change switch SW7 on the JW-32CV3 to "protection OFF." ⇨ See page 9-12.

↓ - If switch SW7 is set to the protected mode, the procedures below will not work.

④ Install the JW-32CV3 in the VME rack. ⇨ See chapter 5.

↓

⑤ Connect any slave stations.

↓ - Basically, all slave stations must be started. ⇨ See *1 below.

⑥ Turn ON the power to the VME master.

↓

⑦ Press and hold the SCAN switch on the JW-32CV3 for at least 3 seconds.

↓ - The JW-32CV3 will edit the scan list. ⇨ See *2 below.

⑧ After the editing process is complete, turn OFF the power to the VME master.

↓

⑨ Remove the JW-32CV3 from the VME rack.

↓

⑩ Set switch SW7 on the JW-32CV3 to the "protection ON."

↓

⑪ Reinstall the JW-32CV3 in the VME rack.

↓

⑫ Turn ON the power to the VME master.

↓

⑬ Put the JW-32CV3 (control section) in the operation mode.

*1: Connecting the slave stations mentioned in step ⑤ above
When "even number allocation" or "allocation in the order in which vacant nodes are occupied" is selected for the I/O data allocation method, and some node addresses are not occupied by slave stations, those node address will be assigned the default number of bytes. This will make operation possible with only the connected slave stations.
When a slave station is connected at a vacant address, and if this station needs more than the default number of bytes for I/O, the I/O addresses thereafter can be incremented by editing the next time a scan list is created.

*2: Scan list editing procedure mentioned in step ⑦
When the JW-32CV3 (DeviceNet section) is in the "protection OFF" and you change the JW-32CV3 (control section) to the operation mode, the JW-32CV3 will start I/O communication. However, when you press the SCAN switch immediately after communication is started, the JW-32CV3 will start editing the scan list. This may cause a malfunction. Therefore, we recommend that you change to the "protection ON" as described in step ⑧ above.

(2) Scan list data table

Specify address of the scan list data table (512 bytes) using the module No. switch SW6 (system memory) on the JW-32CV3. ⇨ (See page 9-14.)

■ **Addresses in the scan list data table**

Basic operation mode		Number of bytes	Module No. Switch SW6 setting value						
			0		1		2	3	4
Master	Slave		Fix	Free	Fix	Free	Fix	Fix	Fix
O	□	512	E0000 to E0777	#314 * to #317	E1000 to E1777	#514 * to #517	E2000 to E2777	E3000 to E3777	E0000 to E0777

(O: Enable, □: Disable) * Specify top address and valid/invalid.

■ **Details of the scan list data table**

Address *1	Details		
1st byte (E2000)	Slave information flag *2		Node address 0 information
2nd byte (E2001)	Not used		
3rd byte (E2002)	Input data length	- Data length for the data which slave stations will send and receive in I/O messages.	
4th byte (E2003)	Output data length		
5th byte (E2004)	Input data offset	- These indicate the byte mappings in the I/O data table (page 9-23) that data will be sent from or received into using I/O messages. *3.	
6th byte (E2005)			
7th byte (E2006)	Output data offset		
8th byte (E2007)			
9th byte (E2010) to 16th byte (E2017)	Node address 1 information (same as node address 0)		
17th byte (E2020) to 24th byte (E2027)	Node address 2 information (same as node address 0)		
⋮ ⋮ ⋮	⋮		
505th byte (E2770) to 512th byte (E2777)	Node address 63 information (same as node address 0)		

*1 : The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

*2 : Slave information flag

Value(HEX)	Details
00	Node not connected
01	Node connected, does not have a I/O message function
02	Node connected with a Polling I/O function
04	Node connected with a Bit Strobe.
FF	JW-32CV3's node address

*3 : The position of an address from the top byte is expressed by a byte + 1.
(Ex.: When the value is 0, it is the 1st byte. When the value is 2, it is the 3rd byte.)

9-4 Explicit Message Function

This function is not needed when you use the I/O message function.
The JW-32CV3 can send a request for service to any device made by another manufacturer that uses the Explicit message function defined in the DeviceNet specifications. (Turn ON switch 8-7 ⇨ See page 9-11.) This function uses the Explicit message data table (118 bytes for both request and response) in the JW-32CV3 (control section).
- An Explicit message data table request issues an Explicit message defined by DeviceNet, and asks any corresponding device to provide service.
- The Explicit message data table response stores the service data details from the slave station.

Set the address of the Explicit message table using the module No. switch SW6 of the JW-32CV3 (system memory) to the following point in system memory.
⇨ See page 9-14.

■ Addresses of the Explicit message data table areas (requests and responses)

Basic operation mode		Table	No. of bytes	Module No. Switch SW6 setting value						
				0		1		2	3	4
Master	Slave			Fix	Free	Fix	Free	Fix	Fix	Fix
O	–	Requests	118	39400 to 39565	#310 * to #313	49400 to 49565	#510 * to #513	59400 to 59565	69400 to 69565	39400 to 39565
		Responses	118	39600 to 39765		49600 to 49765		59600 to 59765	69600 to 69765	39600 to 39765

(O: Enable, -: Disable) * Specify top address and valid/invalid.

[1] Details of the Explicit message data table (requests)

DeviceNet section reading flag, control section writing flag, and other parameters are described.

Address *	Parameter name	Details
1st byte (59400)	DeviceNet section side reading flag	When the JW-32CV3 DeviceNet section has finished reading the contents being sent, the data in memory is automatically inverted. (Inverting data changes $00_{(H)}$ to $01_{(H)}$, and vise-versa.)
2nd byte (59401)	Control section writing flag	When the data has been inverted, the host (control section ⇒ DeviceNet section) will send a request message to the slave station.
3rd byte (59402)	Status	The device status and response information are stored.
4th byte (59403)	TXID (transaction ID)	Assign an ID when creating a request.
5th byte (59404)	Size	Set the request data length.
6th byte (59405)	Reserved area	Use prohibited.
7th byte (59406)	MAC ID	Set a node address for the transaction object.
8th byte (59407)	Service code	Service code for the DeviceNet request.
9th byte (59410) 10th byte (59411)	Class ID	Assign a class ID to the Explicit message sending target.
11th byte (59412) 12th byte (59413)	Instance ID	Assign an instance ID to the Explicit message sending target.
13th byte (59414) 118th byte (59565)	Service data (106 bytes)	Assign data that is defined by a service code.

*1: The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.

(Address when setting others ⇨ See page 9-34).

- For details about the Explicit message parameters, see the "DeviceNet specifications." To obtain a copy of "DeviceNet specifications," contact an ODVA branch office in your country.

[2] Details of the Explicit message data table (responses)

Control section reading flag, DeviceNet section writing flag etc. are provided for parameters.

Address *	Parameter name	Details
1st byte (59600)	Control section writing flag	The JW-32CV3 control section, after reading the received data, writes the same value as the DeviceNet section write flag.
2nd byte (59601)	DeviceNet section reading flag	When the DeviceNet section has finished reading the contents being sent, the data in memory is automatically inverted. (Inverting data changes $00_{(H)}$ to $01_{(H)}$, and vise-versa.)
3rd byte (59602)	Status	The device status and response information are stored.
4th byte (59603)	TXID (transaction ID)	Assign an ID when creating a request.
5th byte (59604)	Size	Set the request data length.
6th byte (59605)	Reserved area	Use prohibited.
7th byte (59606)	MAC ID	Set a node address for the transaction object.
8th byte (59607)	Service code	Service code for the DeviceNet request.
9th byte (59610) to 118th byte (59765)	Responses data (110 bytes)	Assign data that is defined by a service code.

*1: The addresses shown in parentheses ( ) are correct when the module No. switch SW6 of the JW-32CV3 is set to 2.
(Address when setting others ⇨ See page 9-34)

- For details about the Explicit message parameters, see the "DeviceNet specifications."
  To obtain a copy of "DeviceNet specifications," contact an ODVA branch office in your country.

[3] Parameter addresses for the Explicit message data table (requests, responses)

Shown below are the parameter addresses that are selected using the module No. switch SW6.

Setting value of switch SW6	0		1		2	3	4	Parameter name	
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix		
Address	39400	*1	49400	*2	59400	69400	39400	DeviceNet section reading flag	Requests
	39401	↓	49401	↓	59401	69401	39401	Control section writing flag	
	39402	↓	49402	↓	59402	69402	39402	Status	
	39403	↓	49403	↓	59403	69403	39403	TXID (transaction ID)	
	39404	↓	49404	↓	59404	69404	39404	Size	
	39405	↓	49405	↓	59405	69405	39405	Reserved area	
	39406	↓	49406	↓	59406	69406	39406	MAC ID	
	39407	↓	49407	↓	59407	69407	39407	Service code	
	39410 39411	↓	49410 49411	↓	59410 59411	69410 69411	39410 39411	Class ID	
	39412 39413	↓	49412 49413	↓	59412 59413	69412 69413	39412 39413	Instance ID	
	39414 to 39565	↓	49414 to 49565	↓	59414 to 59565	69414 to 69565	39414 to 39565	Service data (106 bytes)	
	39600	*3	49600	*4	59600	69600	39600	Control section reading flag	Responses
	39601	↓	49601	↓	59601	69601	39601	DeviceNet section writing flag	
	39602	↓	49602	↓	59602	69602	39602	Status	
	39603	↓	49603	↓	59603	69603	39603	TXID (transaction ID)	
	39604	↓	49604	↓	59604	69604	39604	Size	
	39605	↓	49605	↓	59605	69605	39605	Reserved area	
	39606	↓	49606	↓	59606	69606	39606	MAC ID	
	39607	↓	49607	↓	59607	69607	39607	Service code	
	39610 to 39765	↓	49610 to 49765	↓	59610 to 59765	69610 to 69765	39610 to 39765	Response data (110 bytes)	

*1: Enter top address to system memory #310 to #313.
*2: Enter top address to system memory #510 to #513.
⇨ See page 9-15.
*3: "*1+128th byte" address.
*4: "*2+128th byte" address.

[4] Example

Shown below is an example of reading the vendor ID of the identified object in a slave station.
(Module No. switch SW6 setting of JW-32CV3: 2)

Explicit message data table (requests)

Address	Parameter name	Value(HEX)
59400	DeviceNet section reading flag	00 (01)
59401	Control section writing flag	00 (01)
59402	Status	00
59403	TXID	00
59404	Size	06
59405	Reserved area	00
59406	MAC ID	00
59407	Service code	00
59410	Class ID	01
59411		00
59412	Instant ID	01
59413		00
59414	Service data	01
59415		00

③④ ② ①

Explicit message data table (responses)

Address	Parameter name	Value(HEX)
59600	Control section reading flag	00 (01)
59601	DeviceNet section writing flag	00 (01)
59602	Status	01
59603	TXID	00
59604	Size	02
59605	Reserved area	00
59606	MAC ID	01
59607	Service code	8E
59610	Response data	68
59611		00

⑦ ⑥ ⑤

When Sharp's vendor ID is returned:
104 (decimal) = 68 (hex.)

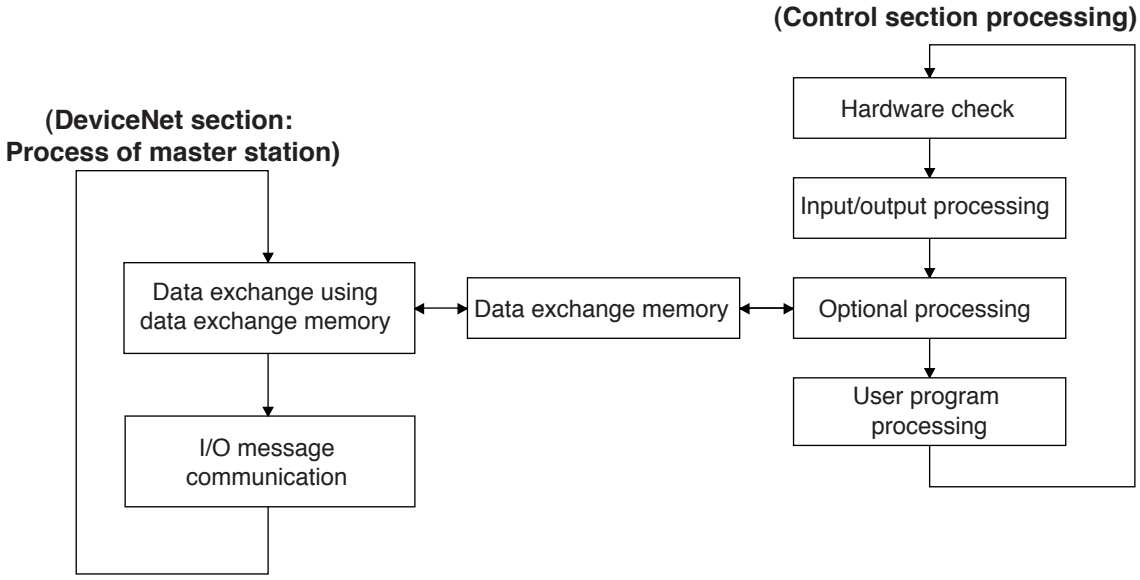
- **Request table**
  - ① Enter the values above in the request table (59402 to 59415).
  - ② Reverse the write flag (59401) . (00 ⇨ 01:*)
  - ③ When the write flag (59401) and read flag (59400) are not the same, the JW-32CV3 (DeviceNet section) starts reading the details of the transaction.
  - ④ When the read process is complete, the JW-32CV3 automatically reverses the read flag (59400) (00 ⇨ 01:*), so that the read flag will be same value as the write flag (59401).
    ⇨ The JW-32CV3 sends a request message to a slave module.
- **Response table**
  - ⑤ When the JW-32CV3 receives a response corresponding to the request above from a slave station, or if a time out occurs, the JW-32CV3 writes data to the transaction block in the response table.
    - The JW-32CV3 stores the response data from a slave station in the transaction block, starting at address 59602. In practice, the slave station vender ID104(DCM) for MAC ID01 is stored with the service data.
  - ⑥ The values of the write flag (59601) in the response is reversed.
  - ⑦ Until the write flag (59600) (00 ⇨ 01:*) is reversed, the details of the transaction block are not allowed to change. To issue messages consecutively, the [read/write/reverse] flag should be reversed.

* Reverse
The initial status of each flag is 00. When receiving a response after sending a request, the flag changes to 01. Then the flag changes back to 00 again, and so on.

9-5 Communication Timing

This chapter describes the communication between the JW-32CV3 (control section), the JW-32CV3 (DeviceNet section: master), and the slave stations when using the JW-32CV3 as DeviceNet mater mode.

To exchange data between the DeviceNet section and the control section, the JW-32CV3 uses optional processing.



The DeviceNet section receives responses from all slave stations. If not, after a communication time out, it will complete one I/O message communication cycle, and exchange data with the control section.

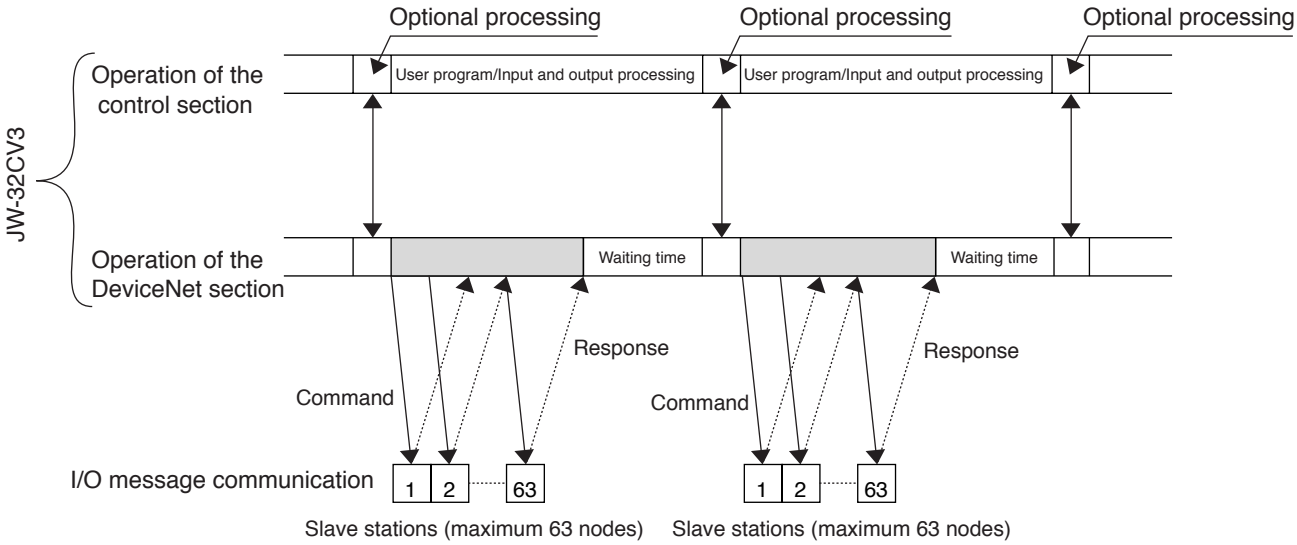
- The time-out time is the normal time required after the DeviceNet section completes sending commands to all of the slave stations, until it receives responses from all of the slave stations. The actual communication time-out period is determined by the setting of Switch SW7 on the JW-32CV3 and the number of slave stations connected. ⇨ See page 9-13.

9

The communication timing between the I/O message communication time and the operation time of the JW-32CV3 (control section) is as follows.

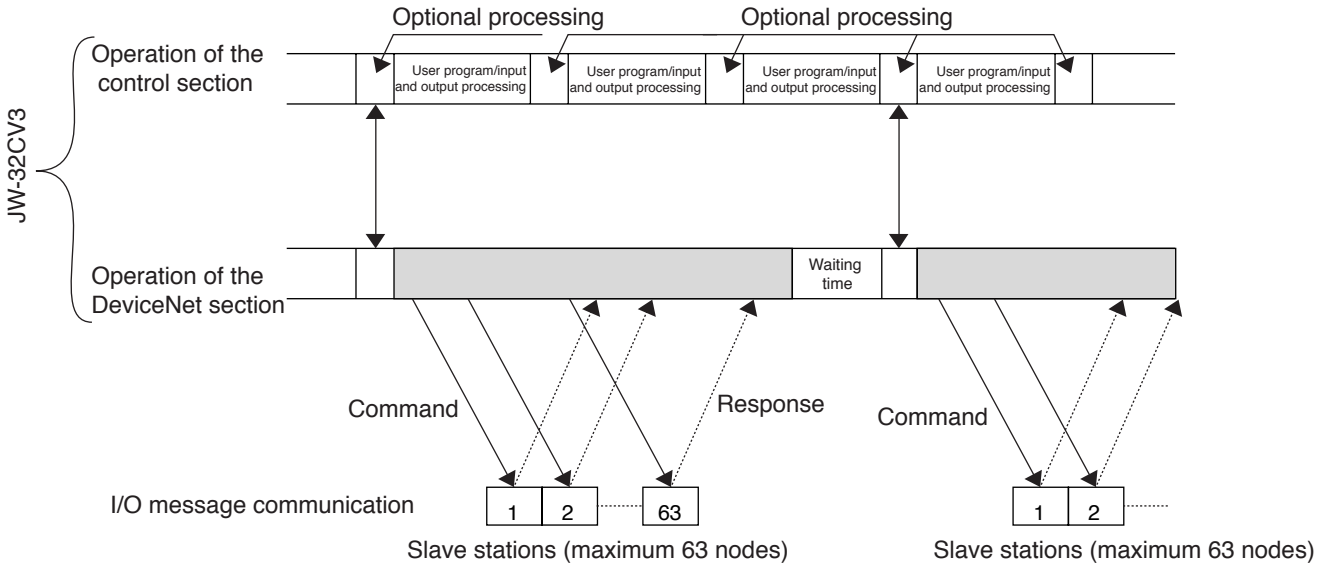
[1] When the I/O message communication time is shorter than the JW-32CV3 (control section) cycle operation time

■ Communication cycle: Asynchronous/synchronous

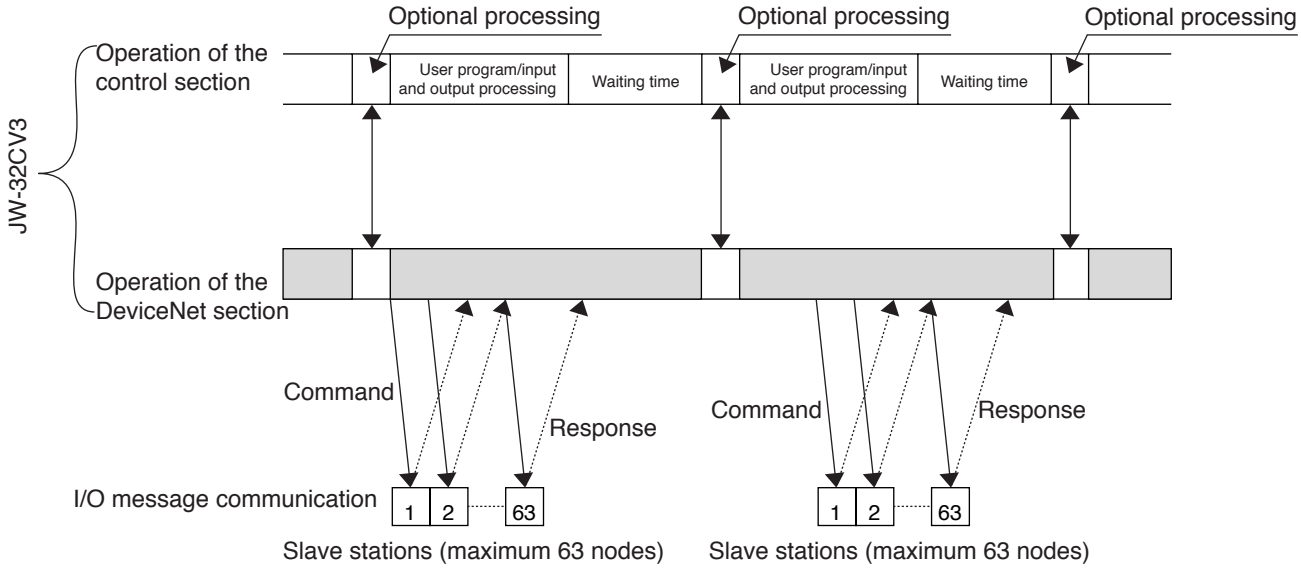


[2] When the I/O message communication time is longer than the JW-32CV3 (control section) cycle operation time

(1) Communication cycle: Asynchronous



(2) Communication cycle: Synchronous



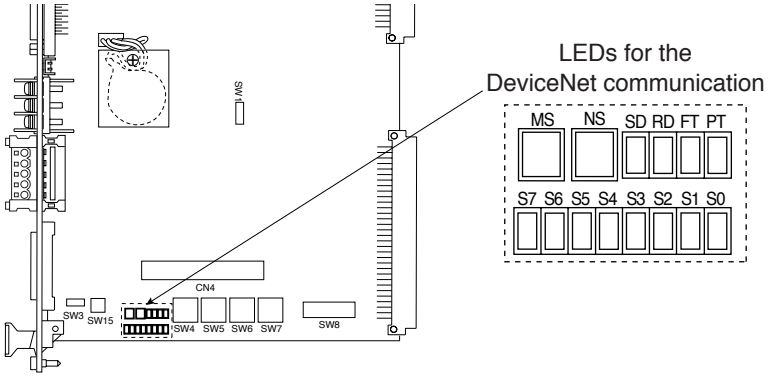
9

9-6 Error Handling

When an error occurs while in DeviceNet communication of the JW-32CV3, check the error detail referring the LED display and diagnosis table, and take measures.

9-6-1 LED display

When an error occurs on a node (master/slave), the LEDs (S7 to S0) of the JW-32CV3 show error code and node address of the error occurred node, alternately.



[1] Error code

(1) Error code display

The JW-32CV3 displays error codes using lights S0 to S7 on the display panel.

S0 to S7 lamp status (●: Lit, ○: Off)								Error code (hexadecimal)
S7	S6	S5	S4	S3	S2	S1	S0	
●	●	○	●	○	○	●	○	D2
●	●	○	●	○	●	○	●	D5
●	●	○	●	○	●	●	○	D6
●	●	○	●	●	○	○	●	D9
●	●	●	○	○	○	○	○	E0
●	●	●	●	○	○	○	○	F0
●	●	●	●	○	○	○	●	F1
●	●	●	●	○	○	●	○	F2
●	●	●	●	○	○	●	●	F3
●	●	●	●	○	●	○	○	F4
●	●	●	●	○	●	○	●	F5
●	●	●	●	○	●	●	●	F7
●	●	●	●	●	○	○	○	F8
●	●	●	●	●	○	○	●	F9
●	●	●	●	●	○	●	○	FA
●	●	●	●	●	○	●	●	FB

(2) Error details

The error code details and actions are as follows.

LED		Error details		Communication operation	Master status *1	Treatment
MS/NS/FT	S0 to S7 (error code)					
MS: Keeps the current status NS: Red lamp blinks	D2	Configuration error	The I/O area of one slave station exceeds input 127 bytes, output 127 bytes	- Does not retry connection for error slave station. - Dose not communicate with all the slave station.	D4 turns ON * 2	Reset the slave node addresses.
	D5	Verification error	- There is no slave data table at all. - The slave does not exist.		D16 and D3 turn ON * 2	- Check whether the slaves are properly connected. - Recreate the scan list after checking the slave connections and node assignments.
	D6		The slave's I/O data size does not match the scan list register details.	- Retry connection for error slave station. - Communicate with normal slave station.		After checking the number of I/O bytes used by the slaves, recreate the scan list.
	D9	Communication error	- A slave time out has occurred 6 times in a row while waiting for a response. - A fragmentation protocol error has occurred 3 times.		D16 and D2 turn ON * 2	Check the following: - Make sure the communication speed of the master station and slave stations are the same. - Make sure there are no disconnected or loose cables. - Make sure there is not too much electrical noise. - Make sure the cable lengths (trunk and branches) are appropriate. - Make sure the terminating resistances are connected to both ends and only to the ends.
MS: Green lamp blinks NS: Goes OFF	E0	Network power source error (Sending error)	Communication power dose not supply normally.	Waiting power supply from network power supply.	D16 and D5 turn ON	Check wiring of network power supply and network cable.
MS: Keeps the current status NS: Red lamp lights	F0	A node address has been used twice	The master station node address has been assigned to another node.	Operation stopped	D16 and D1 turn ON.	Check the other node addresses. Eliminate the duplicated node address and restart the master station
	F1	Detected a Bus OFF	The Bus OFF status is active (communication was stopped due to frequent data errors).			Check the following: - Make sure the communication speed of the master station and slave stations are the same. - Make sure there are no disconnected or loose cables. - Make sure there is not too much electrical noise. - Make sure the cable lengths (trunk and branches) are appropriate. - Make sure the terminating resistances are connected both ends and only to the ends.
MS: Red lamp blinks NS: Goes OFF	F2	Node address error	Some of the switches on the JW-32CV3 are set incorrectly.		D16 and D0 turn ON.	Check the node address switch.
	F3	Communication speed error				Check the SW7 switch settings.
	F4	Module No. error				Check the Module No. switch SW6 settings.
	F5	Other switch setting error	Other than "F2, F3 and F4"			
	F6	System memory setting error	Some settings in the JW-32CV3 system memory are out of the specified range.			Check the set values of the system memory.

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* 1 : Master status ⇨ See page 9-46.
* 2 : D17 will turn ON when the JW-32CV3 is connected to more than 1 slave station. (If the master station detects a problem or is unable to establish connection with all slave stations, D17 will turn OFF.)

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LED		Error details		Communication operation	Master status *	Treatment
MS/NS/FT	S7 to S0 (error node)					
MS: Red lamp lights NS: Goes OFF	F7	Scan list data error	The EEPROM has a memory error. - Unable to read or write the scan list parameters since no data table exists on the master module.	Operation stopped	D16 and D0 turns ON	Recreate the scan list and recreate the data table in the JW-32CV3. Or, replace the JW-32CV3.
	F8	Serial No. error				
	F9	RAM error	An error occurred during a RAM check of the JW-32CV3.		—	
	FA	ROMSU-M error	An error occurred during a ROM check of the JW-32CV3.			
	FB	DPRAM error	An error occurred during a common RAM check of the JW-32CV3.			
MS: Keeps the current status NS: Keeps the current status	—	Watchdo-g timer error	A watchdog timer error occurred on the JW-32CV3.	Operation stopped	—	Replace the JW-32CV3.
FT: Lights	—	Watchdog timer error on the JW-32CV3 (Hardware error on the JW-32CV3).		Operation stopped	—	

* Master status ⇨ See page 9-46.

[2] Display of node addresses

The JW-32CV3 displays node addresses using the S0 to S7 lamps on the display panel.

S0 to S7 lamp status (●: Lit, ○: Off)								Node address (decimal)
S7	S6	S5	S4	S3	S2	S1	S0	
○	○	○	○	○	○	○	○	0
○	○	○	○	○	○	○	●	1
○	○	○	○	○	○	●	○	2
○	○	○	○	○	○	●	●	3
○	○	○	○	○	●	○	○	4
○	○	○	○	○	●	○	●	5
○	○	○	○	○	●	●	○	6
○	○	○	○	○	●	●	●	7
○	○	○	○	●	○	○	○	8
○	○	○	○	●	○	○	●	9
○	○	○	●	○	○	○	○	10
○	○	○	●	○	○	○	●	11
○	○	○	●	○	○	●	○	12
○	○	○	●	○	○	●	●	13
○	○	○	●	○	●	○	○	14
○	○	○	●	○	●	○	●	15
○	○	○	●	○	●	●	○	16
○	○	○	●	○	●	●	●	17
○	○	○	●	●	○	○	○	18
○	○	○	●	●	○	○	●	19
○	○	●	○	○	○	○	○	20
○	○	●	○	○	○	○	●	21
○	○	●	○	○	○	●	○	22
○	○	●	○	○	○	●	●	23
○	○	●	○	○	●	○	○	24
○	○	●	○	○	●	○	●	25
○	○	●	○	○	●	●	○	26
○	○	●	○	○	●	●	●	27
○	○	●	○	●	○	○	○	28
○	○	●	○	●	○	○	●	29
○	○	●	●	○	○	○	○	30
○	○	●	●	○	○	○	●	31
○	○	●	●	○	○	●	○	32
○	○	●	●	○	○	●	●	33
○	○	●	●	○	●	○	○	34
○	○	●	●	○	●	○	●	35
○	○	●	●	○	●	●	○	36
○	○	●	●	○	●	●	●	37
○	○	●	●	●	○	○	○	38
○	○	●	●	●	○	○	●	39
○	●	○	○	○	○	○	○	40
○	●	○	○	○	○	○	●	41
○	●	○	○	○	○	●	○	42
○	●	○	○	○	○	●	●	43
○	●	○	○	○	●	○	○	44
○	●	○	○	○	●	○	●	45

S0 to S7 lamp status (●: Lit, ○: Off)								Node address (decimal)
S7	S6	S5	S4	S3	S2	S1	S0	
○	●	○	○	○	●	●	○	46
○	●	○	○	○	●	●	●	47
○	●	○	○	●	○	○	○	48
○	●	○	○	●	○	○	●	49
○	●	○	●	○	○	○	○	50
○	●	○	●	○	○	○	●	51
○	●	○	●	○	○	●	○	52
○	●	○	●	○	○	●	●	53
○	●	○	●	○	●	○	○	54
○	●	○	●	○	●	○	●	55
○	●	○	●	○	●	●	○	56
○	●	○	●	○	●	●	●	57
○	●	○	●	●	○	○	○	58
○	●	○	●	●	○	○	●	59
○	●	●	○	○	○	○	○	60
○	●	●	○	○	○	○	●	61
○	●	●	○	○	○	●	○	62
○	●	●	○	○	○	●	●	63

9-6-2 Diagnostic data table

Using the diagnostic data table created on the JW-32CV3 (control section), you can check the communication status of the nodes (master and slave stations). Specify address of the diagnosis table (master mode: 256 bytes, slave mode: 128 bytes) using the module No. switch SW6 on the JW-32CV3.
⇨ See page 9-14.

Diagnostic data table addresses

Basic operation mode		No. of bytes	Module No. Switch SW6 setting value						
			0		1		2	3	4
Master	Slave		Fix	Free	Fix	Free	Fix	Fix	Fix
O	O	Master: 256 Slave: 128	39000 to 39377	#304 * to #307	49000 to 49377	#504 * to #507	59000 to 59377	69000 to 69377	39000 to 39377

(O: Enable) * Specify top address and valid/invalid.

- When using the JW-32CV3 as slave mode, set switch SW6 to "0 or 1." You cannot set 2, 3, and 4 for this setting.

[1] When JW-32CV3 is master mode

The diagnostic data table contains a communication monitor table, an operating status monitor table, a device status table, and master status details.

Diagnostic table (256 bytes)

Address * 1	D7	D6	D5	D4	D3	D2	D1	D0 ← Bit number
1st byte (39000)	7	6	5	4	3	2	1	0
2nd byte (39001)	15	14	13	12	11	10	9	8
3rd byte (39002)	23	22	21	20	19	18	17	16
4th byte (39003)	31	30	29	28	27	26	25	24
5th byte (39004)	39	38	37	36	35	34	33	32
6th byte (39005)	47	46	45	44	43	42	41	40
7th byte (39006)	55	54	53	52	51	50	49	48
8th byte (39007)	63	62	61	60	59	58	57	56

Communication monitor table (8 bytes)
- The node addresses are numbered 0 to 63. The communication status of each node is indicated by turning the bits in these 8 bytes ON and OFF.
  - ON: Normal
  - OFF: Abnormal

⇨ See the next page.
- Bits of the master station will turn OFF when any of the slave stations is abnormal.

9th byte (39010)	Reserved area * 2
32nd byte (39037)	

Address * 1	D7	D6	D5	D4	D3	D2	D1	D0
33rd byte (39040)	7	6	5	4	3	2	1	0
34th byte (39041)	15	14	13	12	11	10	9	8
35th byte (39042)	23	22	21	20	19	18	17	16
36th byte (39043)	31	30	29	28	27	26	25	24
37th byte (39044)	39	38	37	36	35	34	33	32
38th byte (39045)	47	46	45	44	43	42	41	40
39th byte (39046)	55	54	53	52	51	50	49	48
40th byte (39047)	63	62	61	60	59	58	57	56

Operating status monitor table (8 bytes)
- The node addresses are numbered 0 to 63. The operating status of each node is indicated by turning the bits in these 8 bytes ON and OFF.
  - ON: The slave station is operating
  - OFF: The slave station is idle.

⇨ See the next page.
- For details about the operating status of slave stations, see the specifications for each slave station.

41st byte (39050)	Reserved area * 2
64th byte (39077)	
65th byte (39100)	Node 0
66th byte (39101)	Node 1
127th byte (39176)	Node 62
128th byte (39177)	Node 63

Device status table (64 bytes)
- The status of the slave station devices can be monitored by keeping track of the device status codes assigned to each node address. $00_{(H)}$ is normal. ⇨ See page 9-44.

	D7	D6	D5	D4	D3	D2	D1	D0
129th byte (39200)	D7	D6	D5	D4	D3	D2	D1	D0
130th byte (39201)	D17	D16	D15	D14	D13	D12	D11	D10

Master status (2 bytes)
- The error information and operating status of the master station is indicated by turning bits ON and OFF. ⇨ See page 9-46.

131st byte (39202)	Reserved area * 2
210th byte (39321)	
211th byte (39322)	Vender information (46 bytes) ⇨ Page 9-47.
256th byte (39377)	

* 1: The addresses shown in parentheses ( ) are correct when switch SW6 of the JW-32CV3 is 0 and fixed allocation is selected.
* 2: Do not change any values in the reserved area. If you do, the JW-32CV3 will malfunction.

Shown below are the addresses of the diagnostic table (communication monitor table, etc.) by setting module No. switch SW6.

(1) Address of the communication monitor table

Setting value of switch SW6	0		1		2	3	4	Node addresses (bits)							
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	D7	D6	D5	D4	D3	D2	D1	D0
Address	39000	*1	49000	*2	59000	69000	39000	7	6	5	4	3	2	1	0
	39001		49001		59001	69001	39001	15	14	13	12	11	10	9	8
	39002		49002		59002	69002	39002	23	22	21	20	19	18	17	16
	39003		49003		59003	69003	39003	31	30	29	28	27	26	25	24
	39004		49004		59004	69004	39004	39	38	37	36	35	34	33	32
	39005		49005		59005	69005	39005	47	46	45	44	43	42	41	40
	39006		49006		59006	69006	39006	55	54	53	52	51	50	49	48
	39007	↓	49007	↓	59007	69007	39007	63	62	61	60	59	58	57	56

*1: Enter top address to system memory #304to #307.
*2: Enter top address to system memory #504 to #507.
⇨ See page 9-15

- The bits at node addresses 0 to 63 indicate the communication status of each node.
(ON: Normal, OFF: Abnormal)
- The master node turns ON when it can communicate normally with all the slave modules on the scan list table.
- Even the "even allocation" and " allocation in order of securing empty notes" are selected, bits corresponding to node addresses of "not connected slave module" and "slaves without I/O message" are always OFF.

(2) Operating status monitor table addresses

Setting value of switch SW6	0		1		2	3	4	Node addresses (bits)							
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	D7	D6	D5	D4	D3	D2	D1	D0
Address	39040	*3	49040	*4	59040	69040	39040	7	6	5	4	3	2	1	0
	39041		49041		59041	69041	39041	15	14	13	12	11	10	9	8
	39042		49042		59042	69042	39042	23	22	21	20	19	18	17	16
	39043		49043		59043	69043	39043	31	30	29	28	27	26	25	24
	39044		49044		59044	69044	39044	39	38	37	36	35	34	33	32
	39045		49045		59045	69045	39045	47	46	45	44	43	42	41	40
	39046		49046		59046	69046	39046	55	54	53	52	51	50	49	48
	39047	↓	49047	↓	59047	69047	39047	63	62	61	60	59	58	57	56

*3: "*1+32th byte" address.
*4: "*2+32th byte" address.

- The bits at node addresses 0 to 63 indicate the operating status of each node.
(ON: Slave station is operating, OFF: Slave station is idle)
- The master node turns ON when it can communicate normally with all the slave modules on the scan list table.
- Even the "even allocation" and " allocation in order of securing empty notes" are selected, bits corresponding to node addresses of "not connected slave station" and "slaves without I/O message" are always OFF.

(3) Device status table addresses

When an error occurs on a slave station device, a device status code (next page) will be stored at the following addresses. (When the communication is normal, $00_{(HEX)}$ will be stored.)

Setting value of switch SW6	0		1		2	3	4	Node address
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	
Address	39100	*5	49100	*6	59100	69100	39100	0□
	39101		49101		59101	69101	39101	1□
	39102		49102		59102	69102	39102	2□
	39103		49103		59103	69103	39103	3□
	39104		49104		59104	69104	39104	4□
	39105		49105		59105	69105	39105	5□
	39106		49106		59106	69106	39106	6□
	39107		49107		59107	69107	39107	7□
	39110		49110		59110	69110	39110	8□
	39111		49111		59111	69111	39111	9□
	39112		49112		59112	69112	39112	10□
	39113		49113		59113	69113	39113	11□
	39114		49114		59114	69114	39114	12□
	39115		49115		59115	69115	39115	13□
	39116		49116		59116	69116	39116	14□
	39117		49117		59117	69117	39117	15□
	39120		49120		59120	69120	39120	16□
	39121		49121		59121	69121	39121	17□
	39122		49122		59122	69122	39122	18□
	39123		49123		59123	69123	39123	19□
	39124		49124		59124	69124	39124	20□
	39125		49125		59125	69125	39125	21□
	39126		49126		59126	69126	39126	22□
	39127		49127		59127	69127	39127	23□
	39130		49130		59130	69130	39130	24□
	39131		49131		59131	69131	39131	25□
	39132		49132		59132	69132	39132	26□
	39133		49133		59133	69133	39133	27□
	39134		49134		59134	69134	39134	28□
	39135		49135		59135	69135	39135	29□
	39136		49136		59136	69136	39136	30□
	39137		49137		59137	69137	39137	31□
	39140		49140		59140	69140	39140	32□
	39141		49141		59141	69141	39141	33□
	39142		49142		59142	69142	39142	34□
	39143		49143		59143	69143	39143	35□
	39144		49144		59144	69144	39144	36□
	39145		49145		59145	69145	39145	37□
	39146		49146		59146	69146	39146	38□
	39147		49147		59147	69147	39147	39
	39150		49150		59150	69150	39150	40□
	39151		49151		59151	69151	39151	41□
	39152		49152		59152	69152	39152	42□
	39153		49153		59153	69153	39153	43
	39154		49154		59154	69154	39154	44□
	39155		49155		59155	69155	39155	45
	39156		49156		59156	69156	39156	46
	39157		49157		59157	69157	39157	47
	39160		49160		59160	69160	39160	48
	39161		49161		59161	69161	39161	49
	39162		49162		59162	69162	39162	50
	39163		49163		59163	69163	39163	51
	39164	↓	49164	↓	59164	69164	39164	52

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*5: "*1+64th byte" address.
*6: "*2+64th byte" address.
(*1, *2: previous page)

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Setting value of switch SW6	0		1		2	3	4	Node address
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	
Address	39165	*7	49165	*8	59165	69165	39165	53
	39166		49166		59166	69166	39166	54
	39167		49167		59167	69167	39167	55
	39170		49170		59170	69170	39170	56
	39171		49171		59171	69171	39171	57
	39172		49172		59172	69172	39172	58
	39173		49173		59173	69173	39173	59
	39174		49174		59174	69174	39174	60
	39175		49175		59175	69175	39175	61
	39176		49176		59176	69176	39176	62
	39177	↓	49177	↓	59177	69177	39177	63

*7: "*5+53th byte" address.
*8: "*6+53th byte" address.
(*5, *6: previous page)

- **Device status code**

Device status code		When used as master mode	When used as slave mode
Decimal	Hexadecimal		
0	0	The slave station is normal or it is not in the scan list.	The node is normal.
72	48	The slave station device has stopped communication.	The device stops commnication.
75	4B	"Bus off" occurs, or network power error. No other device on the network.	---
77	4D	The data size is different from the setting.	
78	4E	The slave station device does not return a response.	
83	53	Received on error while connection.	
84	54	Response time out while connection.	
86	56	The slave station device is idle.	The node is normal (on line or the master is idle).
90	5A	---	Doubled MAC ID error, "Bus off" error, network power error, or, no other device on the network

(4) Master status address

Displays error information and operating status by turning bits ON and OFF.

Setting value of switch SW6	0		1		2	3	4	Diagnostic details
Allocation method	Fix	Free	Fix	Free	Fix	Fix	Fix	
Address	39200	*9	49200	*10	59200	69200	39200	Error information (D0 to D7)
	39201	↓	49201	↓	59201	69201	39201	Operation status (D10 to D17)

*11

*9: "*1+128th byte" address.
*10: "*2+128th byte" address.
(*1, *2: page 9-43)

*11: Details of the D0 to D7, and D10 to D17 bits.

Error information	D0	Incorrect switch settings, EEPROM error
	D1	Duplicated assignment of a node address. Bus OFF is detected.
	D2	Communication error
	D3	Verification error
	D4	Configuration error
	D5	Sending error
	D6	Reserved area
	D7	
Operation status	D10	Currently creating scan list
	D11	Currently writing serial numbers
	D12	Reserved area
	D13	
	D14	Disabled scan list (protected mode)
	D15	Message communication enable flag
	D16	Error is currently occurring
	D17	Currently performing I/O message communication. - Turns ON when communicating with "any of slaves" on the scan list table.

(5) Vender data address

The vender data is used when SHARP provides services to JW-32CV3 (DeviceNet) users. Do not use the vender data in your applications.

Address (*1)	Vender data	Storage value (data details)	
211th byte (39322) 212th byte (39323)	Vender ID (2 bytes)	$104_{(DCM)}$ $000_{(DCM)}$	Vender ID code (Sharp = 104)
213th byte (39324) 214th byte (39345)	Device Type (2 bytes)	$012_{(DCM)}$ $000_{(DCM)}$	Device type (communication adapter = 012)
215th byte (39326) 216th byte (39327)	Product Code (2 bytes)	$001_{(DCM)}$ $000_{(DCM)}$	Product code (JW-32CV3 = JW-20DN = 001)
217th byte (39330) 218th byte (39331)	Revision (2 bytes)	$02_{(HEX)}$ $02_{(HEX)}$	Software version (The values left is when S2.2).
219th byte (39332) 220th byte (39333) 221st byte (39334) 222nd byte (39335)	Serial Number (4 bytes)	Serial No.:□□△△11○○○○$_{(DCM)}$ *2 (Written when manufacturing the JW-32CV3)	
223rd byte (39336)	Product Name (32 bytes)	$4A_{(HEX)}$: J	"JW-20DN" of ASCII code.
224th byte (39337)		$57_{(HEX)}$: W	
225th byte (39340)		$35_{(HEX)}$: 2	
226th byte (39341)		$30_{(HEX)}$: 0	
227th byte (39342)		$44_{(HEX)}$: D	
228th byte (39343)		$4E_{(HEX)}$: N	
229th byte (39344)		$00_{(HEX)}$	All $00_{(HEX)}$
: :		:	
: :		:	
254th byte (39375)		$00_{(HEX)}$	
255th byte (39376)	Scan list establishing flag	When scan list is established, $01_{(HEX)}$ (if not $00_{(HEX)}$).	
256th byte (39377)	Serial No. establishing flag	When serial No. is established, $01_{(HEX)}$ (if not $00_{(HEX)}$).	

*1: The addresses shown in parentheses ( ) are correct when switch SW6 of the JW-32CV3 is 0 and fixed allocation is selected.

*2: Serial number. □□△△11○○○○$_{(DCM)}$

- □□: Year manufactured (lower two digits of Western year: "01" for 2001
- △△: Month manufactured ("01" for January, --- "12" for December)
- 11 : Model code (JW-32CV3 and JW-20DN is "11")
- ○○○○: Serial number (reset each month)

Ex.: A unit first manufactured in Nov 2001: $0111110001_{(DCM)}$

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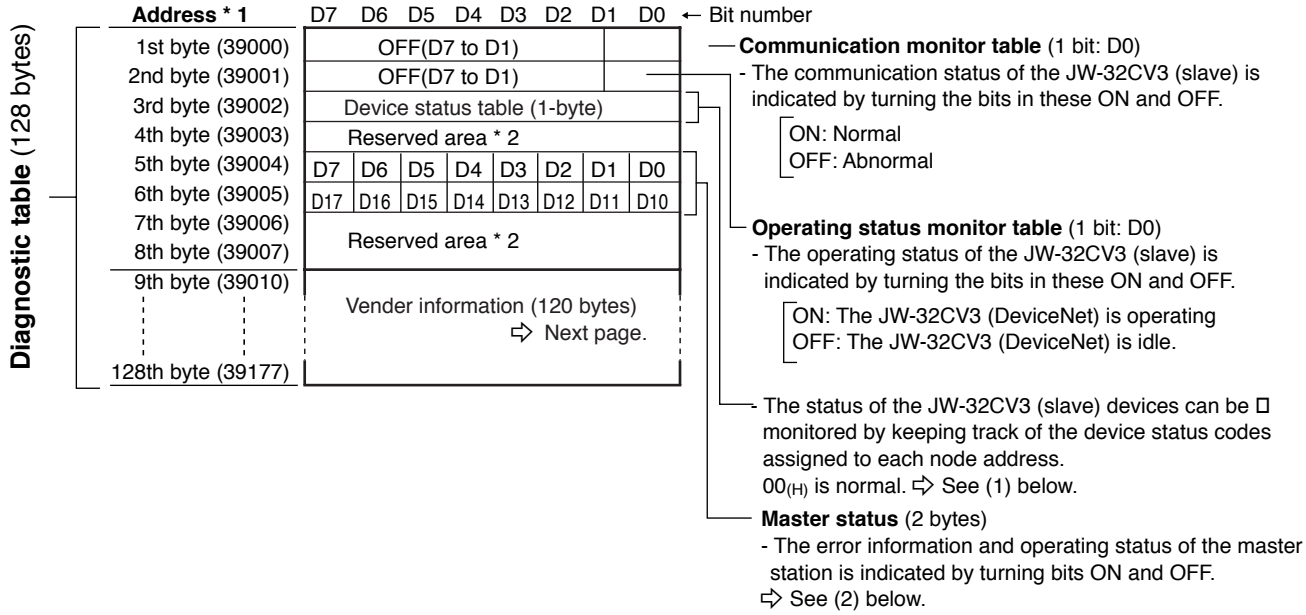
[2] When the JW-32CV3 is used in the slave mode

The diagnosis tables contain a communications monitor table, an operating status monitor table, a device status table, a master status table, and vender data.



*1: The addresses shown in parentheses ( ) are correct when switch SW6 of the JW-32CV3 is 0 and fixed allocation is selected.

*2: Do not modify the numbers in the reserved areas. That may cause the machine to malfunction.

(1) Device status code

Device status code		Details
Decimal	Hexadecimal	
0	0	The slave station is normal or it is not in the scan list.
72	48	The slave station device has stopped communication.
73	49	Identification of the slave station device does not match the value in the scan list.
77	4D	The data size is different from the setting.
78	4E	The slave station device does not return a response.
86	56	The slave station device is idle.

(2) Master status address (D0 to D17: 2 bytes)

Error information	D0	Incorrect switch settings, EEPROM error
	D1	Duplicated assignment of a node address. Bus OFF is detected.
	D2	Communication error
	D3	Verification error
	D4	Configuration error
	D5	Sending error
	D6	Reserved area
	D7	
Operation status	D10	Reserved area
	D11	Currently writing serial numbers
	D12	Reserved area
	D13	
	D14	
	D15	Message communication enable flag
	D16	An error is occurred, and the I/O message stops communication.
	D17	Currently performing I/O message communication.

(3) Vender data address

The vender data is used when SHARP provides services to JW-32CV3 (DeviceNet) users. Do not use the vender data in your applications.

Address (*1)	Vender information	Storage value (data details)	
9th byte (39010) 10th byte (39011)	Vender ID (2 bytes)	104(DCM) 000(DCM)	Vender ID code (Sharp = 104)
11th byte (39012) 12th byte (39013)	Device Type (2 bytes)	012(DCM) 000(DCM)	Device type (communication adapter = 012)
13th byte (39014) 14th byte (39015)	Product Code (2 bytes)	001(DCM) 000(DCM)	Product code (JW-32CV3 = JW-20DN = 001)
15th byte (39016) 16th byte (39017)	Revision (2 bytes)	02(HEX) 02(HEX)	Software version (The values left is when S2.2).
17th byte (39020) 18th byte (39021) 19th byte (39022) 20th byte (39023)	Serial Number (4 bytes)	Serial No. □□△△11○○○○(DCM) *2 (Written when manufacturing the JW-32CV3)	
21st byte (39024)	Product Name (32 bytes)	4A(HEX) : J	"JW-20DN" of ASCII code.
22nd byte (39025)		57(HEX) : W	
23rd byte (39026)		35(HEX) : 2	
24th byte (39027)		30(HEX) : 0	
25th byte (39030)		44(HEX) : D	
26th byte (39031)		4E(HEX) : N	
27th byte (39032)		00(HEX)	All 00(HEX)
: :		:	
52nd byte (39063)		00(HEX)	
53rd byte (39064) : : 126th byte (39175)	Reserved area	- Do not change the numeric values. Otherwise, malfunction will occur.	
127th byte (39176)	Scan list establishing flag	When scan list is established, 01(HEX) (if not 00(HEX)).	
128th byte (39177)	Serial No. establishing flag	When serial No. is established, 01(HEX) (if not 00(HEX)).	

*1: The addresses shown in parentheses ( ) are correct when switch SW6 of the JW-32CV3 is 0 and fixed allocation is selected.

*2: Serial number. □□△△11○○○○(DCM)

- □□: Year manufactured (lower two digits of Western year: "01" for 2001
- △△: Month manufactured ("01" for January, --- "12" for December)
- 11 : Model code (JW-32CV3 and JW-20DN is "11")
- ○○○○: Serial number (reset each month)

Ex.: A unit first manufactured in Nov 2001: 0111110001(DCM)

9-6-3 Communication operation of DeviceNet section when the control section has stopped operation or error has occurred

When the JW-32CV3 (control section) is stopped or has an error, communication operation of the JW-32CV3 (DeviceNet section) is as follows. (The LED display and master status are the same as normal communication.)

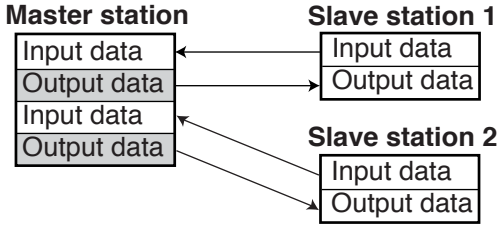
		Communication operation
When used in the master mode	Input data	Transfer data received from an input slave station to the control section.
	Output data	The data sent to an output slave station depends on the system memory settings. *1
When used in the slave mode	Input data	Always sends idle data to the master station. *2
	Output data	Transfer data received from the master station to the control section.

*1: Output to slave stations (when the control section is stopped) is determined by the value (00, 01$_{(HEX)}$) in system memory addresses #330 (module address = 0), and #530 (module address = 1).

- 00$_{(HEX)}$: Restore (master station sends idle data)
- 01$_{(HEX)}$: Clear (master module sends 00$_{(HEX)}$ data)

*2: Slave area status (when the communication error is occurred) is determined by the value (00, 01$_{(HEX)}$) in system memory addresses #370 (module address = 0), and #570 (module address = 1).

- 00$_{(HEX)}$: Restore (master module sends idle data)
- 01$_{(HEX)}$: Clear (master module sends 00$_{(HEX)}$ data)



- **When receiving idle data**
  When the DeviceNet section receives idle data, the data sent to the control section is always the same.

Chapter 10: Specifications

[1] General specifications

Item	Specifications
Power voltage	5 VDC (4.75 to 5.25 V): Supply from the VME bus.
Consumption current (inside 5 VDC)	Maximum 1100 mA (this module) Note: When connecting the J-board with the add-on connection, consumption current of a connecting board also shall be counted.
Power voltage for DeviceNet communication (current capacity)	11 to 25 VDC (50 mA/ for this module)
Storage temperature	-20 to +70 □ C
Ambient operating temperature	0 to +55 □ C
Ambient humidity	35 to 90%RH (non condensing)
Atmosphere	No corrosive gas
Vibration resistance	Equivalent to JIS C 0911 (2 hours each for X, Y, and Z directions). Oscillation distance and acceleration: 0.075 mm (10 to 55 Hz), 9.8 m/s^2 (55 to 150 Hz)
Shock resistance	Equivalent to JIS C0912. 98 m/s^2 (3 times each in the X, Y, and Z directions)
External dimensions	20 (W) x 262 (H) x 188 mm (D)
Weight	Approximately 400 g
Accessories	One upper securing panel One lower securing panel * One instruction manual

* One connector for connecting DeviceNet node (with connector securing screws) is supplied together with the DeviceNet communication connector of the JW-32CV3.
Model name of connector to be installed: BLZ5.08/5F AU-DN (made by Nihon Weidmuller)

[2] VME interface specifications

Item	Specifications
Usable VME slot	Double width slot (only connector P1 is used) - The module occupies one slot. Note: When connecting a board to the J-board add-on connection port, it occupies two slots.
Bus system in the VME	Address bus: 24 bits (A23 to A0) : Standard address (AM code: 3D, 39) Data bus: 16 bit (D15 to D0) - The JW-32CV3 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 JW-32CV3 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 JW-32CV3 PLC will be at file 10. They can be read and written by ladder program.

[3] PLC control section performance specifications

The PLC control section of the JW-32CV3 corresponds to the JW-32CUH1 control module of the JW30H. (Different points ⇨ See page 8-1.)

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 ∝s/instruction
		OUT instruction: 0.076 ∝s/instruction
		Application instructions, TMR, CNT, MD instructions: average number ∝ to several tens ∝s
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 (fixed)
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 (PG/COMM1: 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 bps - 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 (PG/COMM2: 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 bps - 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. However, if you want to use a transfer rate higher than 38400 bps., connect the module in a 1: 1 arrangement.
	DeviceNet communication port (terminal block)	⇨ See [4] Specifications of PLC DeviceNet section communication.
	J-board add-on connection port	One board of the J-board series can be connected with the add-on connection. - For connection, use the securing panel (accessory) . One slot space is needed at right side of the JW-32CV3. - Boards that can be connected are as follows. I/O board: Z-322J Communication board: Z-333J, Z-334J, Z-335J, Z-336J, Z-337J, Z-338J
	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 resistance load
Clock feature		Integrated
Programming tool		The support tools that can be used with the JW30H series, such as the JW-14PG, JW-100SP and JW-50SP can be used with these models. (Specify the model that can handle JW-32CUH1, 31.5 K words)

[4] PLC DeviceNet section communication specifications

Item	Specifications			
Communication protocol	Conforms to the DeviceNet protocol			
Basic operation mode	Master mode, slave mode			
Number of connectable nodes	Maximum of 63 slave station nodes for one master station.			
Number of I/O points	4,096 points max. (512 bytes max.: Total number of I/O points of I/O message.)			
Communication speed	Selectable: 125 Kbps, 250 Kbps, or 500 Kbps.			
Communication distance (max.)	**Communication speeds**	**125 k bit/s**	**250 k bit/s**	**500 k bit/s**
	Trunk length using a thick cable	500 m	250 m	100 m
	Trunk length using a thin cable	100 m	100 m	100 m
	Maximum branch length	6 m	6 m	6 m
	Total branch length	156 m	78 m	39 m
Communication services	I/O message function (Polling I/O function, Bit strobe function) Explicit message function			
Communication carrier	Specialized cable (5 lines: 2 signal lines, 2 power lines, 1 shield line) - Thick cable: For trunk lines - Thin cable: For trunk or branch lines			
Data table allocation method when the master mode is selected	Select the method used for I/O data mapping in the scan list edit mode from "allocation in address order," "even number allocation," or "allocation in the order in which vacant nodes are occupied."			
Setting of number of I/O bytes when the slave mode is selected.	Number of input bytes: 0 to 127 bytes. Number of output bytes: 0 to 127 bytes.			