SHARP®

Version 2.2
Produced in Oct. 1997

SHARP Programmable Controller
New Satellite W series

Model Name

Network module ***JW-20CM***
Remote I/O slave module ***JW-20RS***

User's Manual

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Thank you for purchasing the network module (JW-20CM), remote I/O slave module (JW-20RS) for the SHARP programmable controller.
Read this manual thoroughly to completely familiarize yourself with the operation according to the examples.
Besides this manual, the manuals of control module, support tool, and option module are available for the respective programmable controller.
We ask you to also read these manuals as well as this manual.
Keep this manual for future reference. We are confident that this manual will be helpful whenever you encounter a problem.

Note

★ This manual describes the JW-20CM, JW-20RS with 30Hn mark in front of the module. The following functions are added for the JW-20CM and JW-20RS without [30Hn] marks.
① This module can be communicated with JW30H.
② For data link, available for use the following functions.
· Data link (memory capacity save function)
· Data memory start system for SEND/RECEIVE function.

In this manual, additional functions are represented by the V5 mark.

★ In this manual, programmable controller is referred to as “PC.”

★ In this manual, programmable controllers and I/O modules with model name "ZW-xx" are referred to as "ZW model," and programmable controllers and I/O modules with model name "JW-xx" are referred to as "JW model."

Note

· This manual is written with the utmost care.
· No part of this manual may be reproduced in any form without permission of SHARP corporation.
· The contents of this manual are subject to change without prior notice.

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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, breakdown, or malfunction.
- Never admit wire chips or foreign matters.
  Or fire, breakdown or malfunction may be caused.

2) Wiring

Compel

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

Caution

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

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3) Use

Danger

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

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. Turning ON with wrong sequence may lead to machine breakdown or accident.

4) Maintenance

Prohibit

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

Caution

- Turn OFF the power source before detaching or attaching the module.
  Or electric shock, malfunction or breakdown may be caused.

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■ Configuration of this manual

The network module JW-20CM has three functions: "remote I/O," "data link," and "computer link" functions. Accordingly, this manual describes about these three functions. Read each section according to your use of any of these functions.

Users who use the network module for the first time.

Read this manual from chapter 1.
First, thoroughly understanding general, precautions, name and function of each section. Then, read the contents from chapter 5 for proper use.

Users who want to use the remote I/O function.

Read from chapter 1 to chapter 7 and properly install and connect wiring work of the module. Then set switches and parameters by referring chapter 8 for correct use.

Switch setting

· Master module: JW-20CM ..... See page 8·9
· Slave module: JW-20RS ..... See page 8·14

Parameter setting

· Master module: JW-20CM ..... See page 8·19
· Slave module: JW-20RS ..... See page 8·30

Users who want to use the data link function (including the computer link function)

Read from chapter 1 to chapter 7 and properly install and connect wiring work of the module. Then set switches and parameters by referring chapter 9 for correct use.
The module also can function the computer link as data link system with a host computer having a network module: ZW-98CM/ZW-20AX.

Switch setting

· Master module ..... See page 9·17
· Slave module ..... See page 9·17

Parameter setting

· Master module ..... See page 9·22
· Slave module ..... See page 9·33

Users who want to use only the computer link function

Read from chapter 1 to chapter 7 and properly install and connect wiring work of the module. Then set switches by referring chapter 10 for correct use.

Switch setting ..... See page 10·3

Users who want to save and load parameter contents using a support tool.

Carefully read the contents of chapter 11 for correct use.

Users who want to add a communication station.

Carefully read the contents of chapter 7 and add a station.

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Network module JW-20CM
Remote I/O slave module JW-20RS
- User's Manual -

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Chapter 2. Safety Precautions
Chapter 3. System Configuration
Chapter 4. Name and Function of Each Part
Chapter 5. Installation
Chapter 6. Processing of Cables
Chapter 7. Wiring
Chapter 8. Remote I/O
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Chapter 1 Outline

Using network module JW-20CM, you can construct a communications system (satellite net) which can easily send and receive an ON/OFF signal (machine information) and numerical data (production data) between PCs and a host computer using equipment control.
Using remote I/O slave module JW-20RS, you can construct a remote I/O system as master station for PC that installed JW-20CM.
PCs which can use JW-20CM and JW-20RS are W70H/100H, JW50/70/100, and JW50H/70H/100H.

① **Data link/computer link function**

This function enables to send and receive ON/OFF signals and numeric data between modules on a network (satellite net) which is connected PCs and personal computers having network module ZW-20CM/JW-20CM/JW-22CM, network module ZW-98CM/ZW-20AX, and satellite net board Z-335J.

② **Remote I/O function**

If remote I/O slave module ZW-20RS/JW-20RS are mounted on I/O modules located separately, one PC having a network module JW-20CM can control these slave modules. (Connectable maximum 63 modules of slave stations.)

· In the remote I/O function, the remote I/O can choose either of synchronous or asynchronous for sending and receiving data with slave stations.

Synchronous type: Slave station scans input/output operation one time for each operation of the PC.

Asynchronous type: When PC's operation time is longer than data transfer required time of the remote I/O, the slave station scans input/output operation one time for each operation of the PC. When PC's operation time is shorter than the data transfer required time of the remote I/O, the slave station operate input and output one time for several operation of the PC.

③ **Remote programming/remote monitor function**

By constructing a satellite system using the JW-20CM, you can program and monitor other station's PC's (master station's PC in case that remote I/O function) on the satellite system using a support tool.

· These remote programming and remote monitor functions are also available beyond one hierarchical layer difference (satellite net ←→ satellite net, satellite net ←→ SUMINET-3200).

* "SUMINET-3200" is a trademark of Sumitomo Electric Industries, Ltd.

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Chapter 2 Safety Precautions

2-1 Installation

● Do not install or store the JW-20CM in the following conditions.

- Direct sunlight
- Ambient temperature exceeding the range of 0 to 55 ˚C (Storage temperature : -20 to 70 ˚C)
- The relative humidity exceeding the range of 35 to 90%.
- Sudden temperature changes which may cause condensation.
- Corrosive or inflammable gas
- Vibration or hard jolts

● Prior to installing or detaching the JW-20CM, make sure to turn OFF the power supply to the PCs.

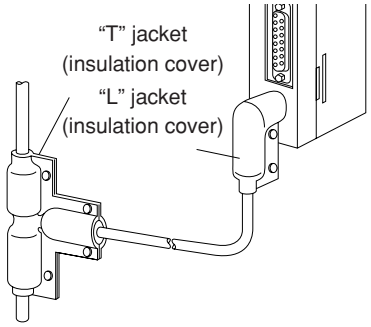
● All screws must be tightened firmly.

2-2 Wiring

● Make sure to use only the recommended types (see page 6 · 1) for cables, connectors, and crimping tools.

● When using connectors for branch or joint lines, provide jackets to protect connectors.

(When a connector touches with an external enclosure or the like, a communication error may occur.)



● Do not connect the ground terminal of the power supply module together with other equipment's ground lines. Make sure to provide class-3 grounding.
When the JW-20CM is used without connecting a class-3 grounding, malfunctions by noise may occur.

● Communication cables should be arranged as far from any high voltage lines and strong power lines as possible. Do not lay the communication cable parallel or proximate to these lines.

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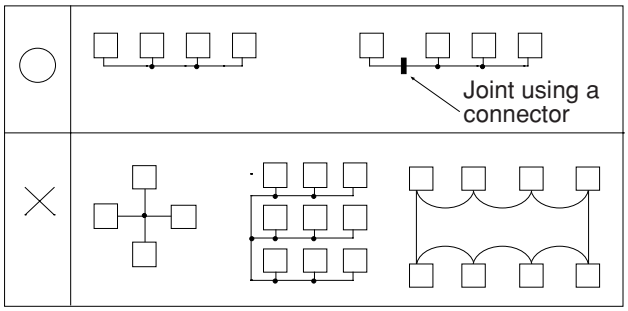
● Communication cables should be laid from the master station to the slave station one by one. Multiple wiring from one point or wiring without terminators may cause communication errors.

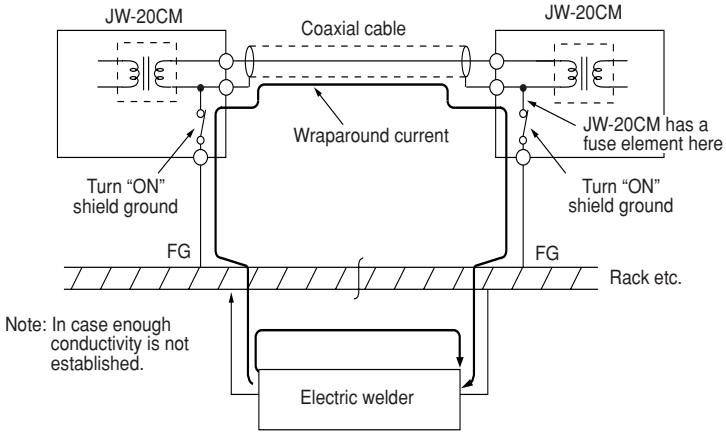


2

● Arrange total cable length within 1 km.

● Arrange branch cable line from a trunk within 400 mm.

● Prior to any electric welding around the JW-20CM, take out the coaxial cable from the JW-20CM. While the coaxial cable is connected to the JW-20CM, any electric welding nearby the JW-20CM will cause the welding current to enter the JW-20CM and may damage part of its circuit pattern.



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2-3 Treatment

- For ventilation, holes are provided in the cabinet to prevent a temperature rise. Do not block the ventilation holes. Good ventilation is necessary.
- Never allow a liquid such as water and chemical solution and a metallic object like a copper wire inside the JW-20CM to avoid a possible hazard. Otherwise, it may be a cause of machine trouble.
- When a trouble or abnormal condition such as overheat, fume, or smoke is met, stop the operation immediately, and call your dealer or our service department.

2-4 Static electricity

In extremely dry circumstances, the human body may have excessive static current. This excessive static current may damage parts in the JW-20CM's PC board. Therefore, prior to accessing the JW-20CM, touch your hand to a grounded piece of metal to discharge the static current in your body.

2-5 Maintenance

Use a clean, dry cloth when cleaning the JW-20CM. Do not use volatile chemicals such as thinner or alcohol as it may result in deformation and color fading.

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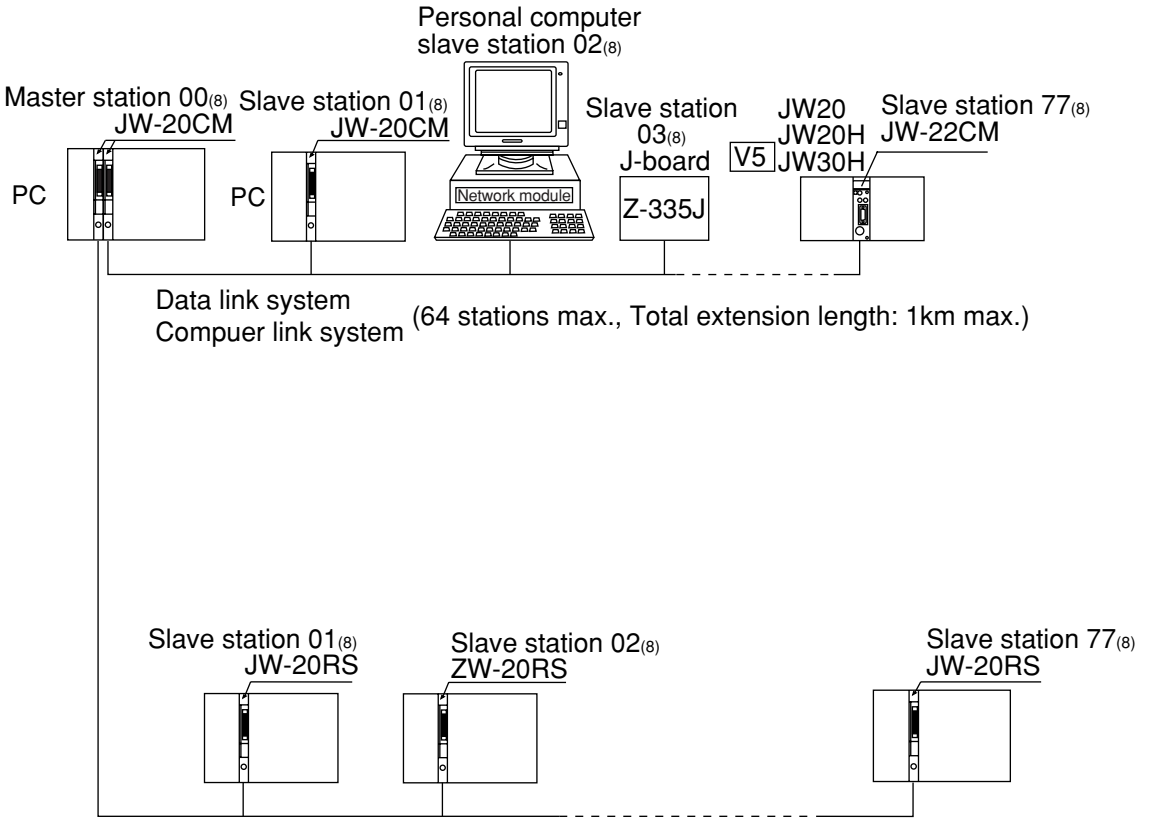
Chapter 3 System Configuration

(Example of system configuration)



"PC" indicates W70H/100H, JW50/70/100, and JW50H/70H/100H.

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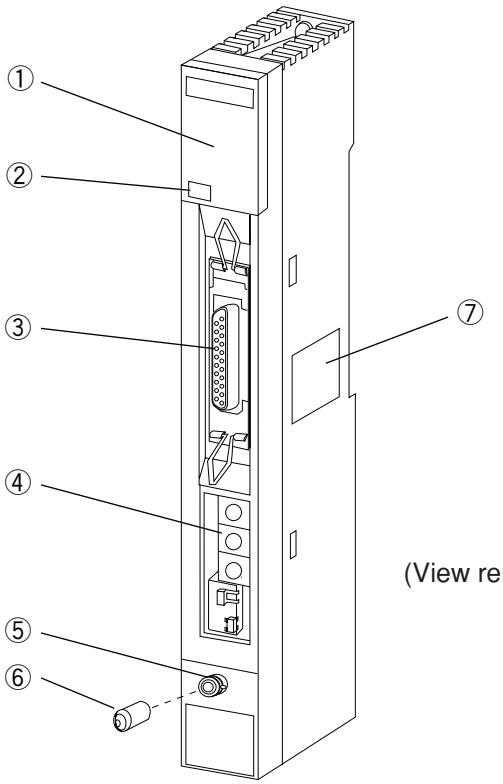
Chapter 4 Name and Function of Each Part

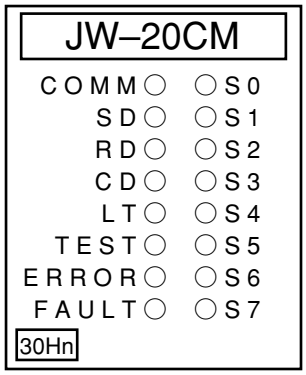
4-1 JW-20CM



(View removing the cover on the setting section)

① **Indication lamps**

Lamps light ON/OFF indicates operation condition.



Name	Operation
COMM	Lights during communicating
SD	Lights when data sending
RD	Lights when data receiving
CD	Lights when detecting carrier
LT	Lights when turning "ON" the termination resistance
TEST	Lights during testing
ERROR	Lights at a communication error
FAULT	Lights at time up of the watchdog timer
S0 to S7	Lights error code when error occurs.

② **30Hn mark (Applied to JW30H)**

JW-20CMs having 30Hn mark can communicate with JW30H.

JW-20CMs having 30H can communicate with conventional modules of JW30H (JW-31CUH/32CUH/33CUH). However, when they will communicate with new modules of JW30H (JW-31CUH1/32CUH1/33CUH1/33CUH2/33CUH3), they recognizes these new modules as conventional modules.

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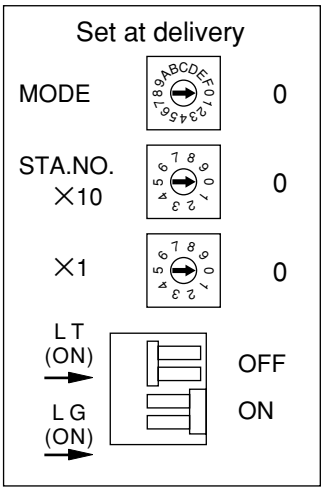
③ **Support tool connection connector**
Connect a support tool and set parameter etc.

④ **Setting switch**
Set functions of JW-20CM.



· **MODE switch .... Select functions**

Number	Function
0	Set at delivery
1	Remote I/O
2	Data link (standard function)
	Computer link
3	Data link (memory capacity save function)
	Computer link
4 to F	Do not set.

· **S T A . N O. × 10, × 1** **.... Set station number**
· **L T .... Set ON/OFF of termination resistance**
· **L G .... Set shield ground ON/OFF of communication cable**

⑤ **Communication cable connection connector**
BNC type receptacle (jack)

⑥ **Connector protective cap**

⑦ **Rating plate**

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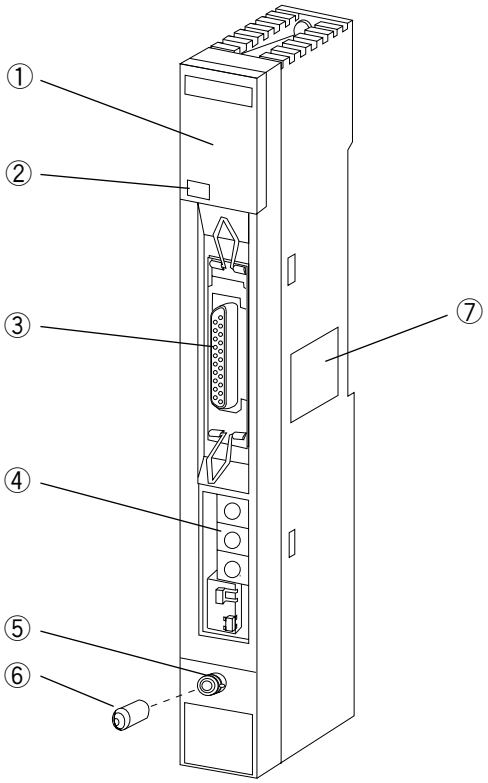
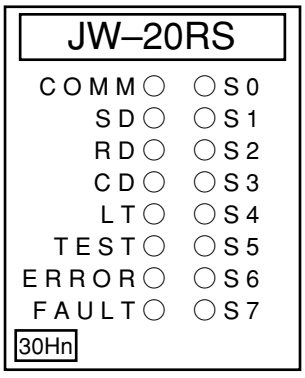
4-2 JW-20RS



① **Indication lamps**

Lamps light ON/OFF indicates operation condition.



Name	Operation
COMM	Lights during communicating
SD	Lights when data sending
RD	Lights when data receiving
CD	Lights when detecting carrier
LT	Lights when turning "ON" the termination resistance
TEST	Lights during testing
ERROR	Lights at a communication error
FAULT	Lights at time up of the watchdog timer
S0 to S7	Indicates error code.

② **30Hn mark (Applied to JW30H)**

JW-20RSs having 30Hn mark can communicate with JW30H.

JW-20RSs having 30H can communicate with conventional modules of JW30H (JW-31CUH/32CUH/33CUH). However, when they will communicate with new modules of JW30H (JW-31CUH1/32CUH1/33CUH1/33CUH2/33CUH3), they recognizes these new modules as conventional modules.

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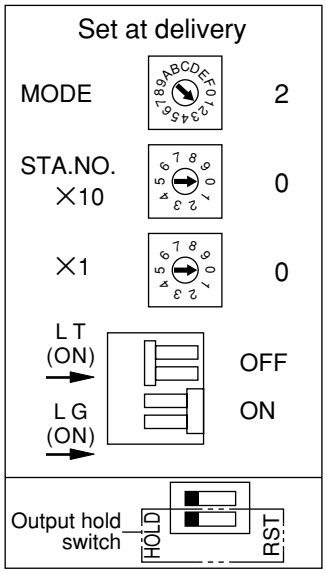
③ **Support tool connection connector**

Connect a support tool and set parameter etc.

④ **Setting switch**

Set functions of JW-20RS.



· **MODE switch .... Select functions**

Number	Function
0	Do not set.
1	Remote I/O (ZW-I/O)
2	Remote I/O (JW-I/O)
3 to F	Do not set.

· **S T A . N O. × 10, × 1** **.... Set station number**

· **L T .... Set ON/OFF of termination resistance**

· **L G .... Set shield ground ON/OFF of communication cable**

⑤ **Communication cable connection connector**

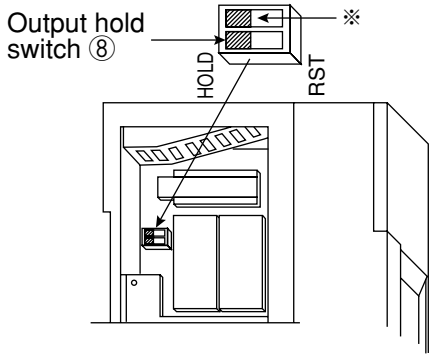
BNC type receptacle (jack)

⑥ **Connector protective cap**

⑦ **Rating plate**

⑧ **Output hold switch**

Set the status of the output module when the JW-20RS stops operation.



· **In case of using ZW-I/O**
HOLD: Holds operation condition
RST: All points is OFF

· **In case of using JW-I/O**
Be sure to setting at HOLD.

Keep the switch marked with ※ as the setting at delivery (condition in the figure above).

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Chapter 5 Installation

5-1 JW-20CM

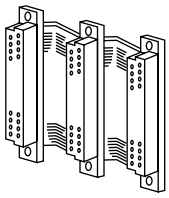
(1) Installation of cable for option module

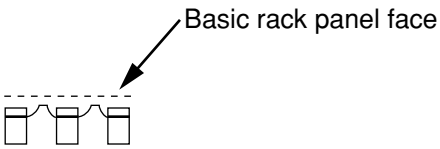
Install the optional cable on the basic rack panel that installed JW-20CM.

PC module name		Basic rack panel model name	Cable for option module	Available for using I/O
ZW model	W70H	ZW-28KB	ZW-2CC	I/O module of ZW model
	W100H	ZW-46KB	ZW-2CC/4CC	
JW model	JW50	ZW-28KB	ZW-2CC	
	JW70	ZW-46KB	ZW-2CC/4CC	
	JW100	JW-4BU	ZW-2CC	I/O module of JW model
	JW50H	JW-6BU	ZW-2CC/4CC	
	JW70H	JW-8BU	ZW-2CC/4CC/6CC	
	JW100H	JW-13BU	ZW-2CC/4CC/6CC	

In case that install a basic rack panel JW-4BU to ZW-2CC

① Bend the optional cable





Install the cable in a manner that it may be slack towards the rack panel.

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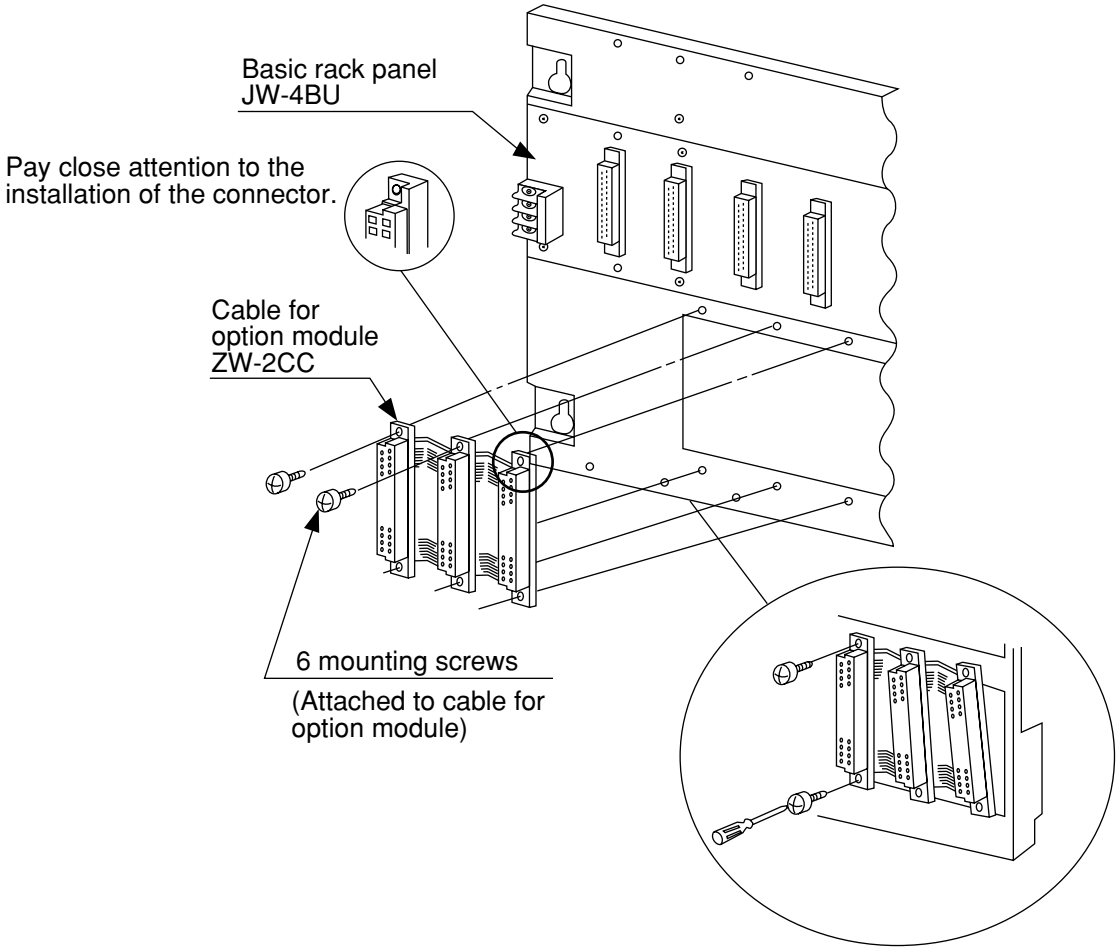
② Attach the connectors in the optional cable one after another, starting from the left side.



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(2) Installation of JW-20CM

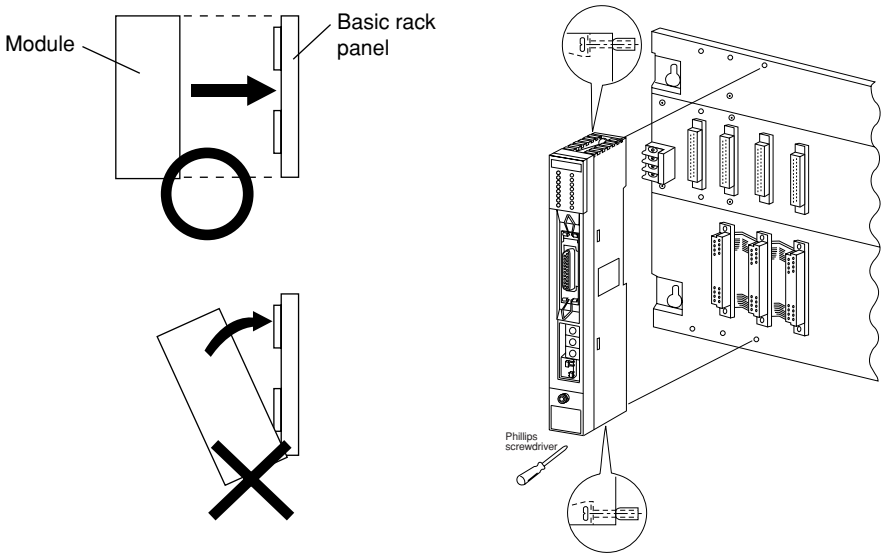
Attach the basic rack panel using the two attachment screws.

Before installation or removal, make sure to shut OFF the power supply to the PC.

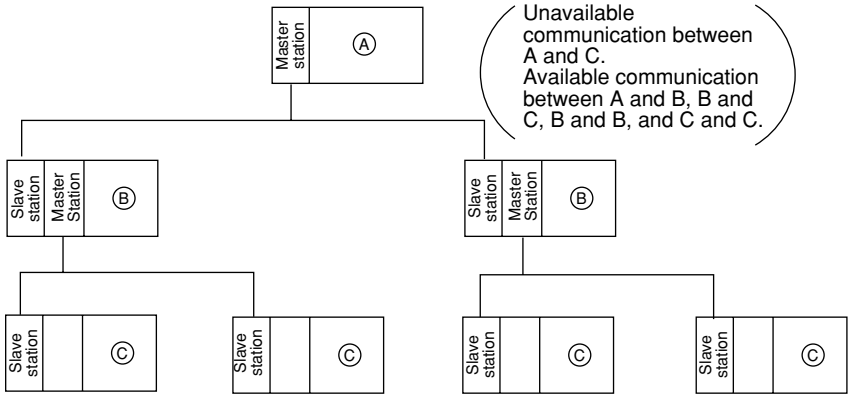
(Example) Install on basic rack panel JW-4BU

· This module can be installed in any one of the optional slots.

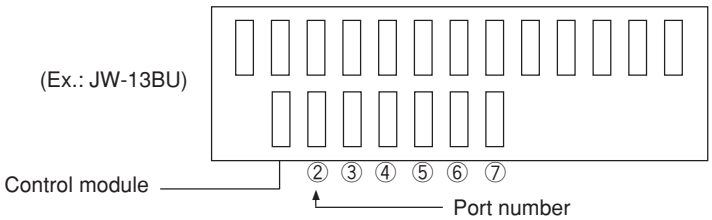
· Be careful not to bend the connector pins on the module by applying too much force to them.



· More than one modules of JW-20CM can be installed on one basic rack panel. However they cannot communicate by crossing-over another network.



· Optional slots have each port numbers. When an error occurs, the JW-20CM stores the port number corresponding to the error occurred module into system memory #050 in the PC. This is applied only error code 53: Optional error.



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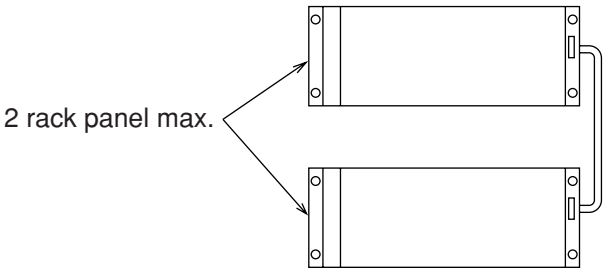
5-2 JW-20RS

Choose type of basic rack panel of the remote I/O slave module (JW-20RS) considering kinds and number of I/O modules to be installed.

Kinds of I/O modules	Rack panel model name
I/O module of ZW model	ZW-08BU (for 8 modules)
	ZW-04KB (for 4 modules)
	ZW-02KB (for 2 modules)
I/O module of JW model	JW-4BU (for 4 modules)
	JW-6BU (for 6 modules)
	JW-8BU (for 8 modules)
	JW-13BU (for 13 modules)

When I/O modules for JW model are used, maximum two modules of basic rack panel can be connected per one remote I/O slave module. However, I/O bus expansion adapter (JW-1EA/JW-2EA) cannot be used.



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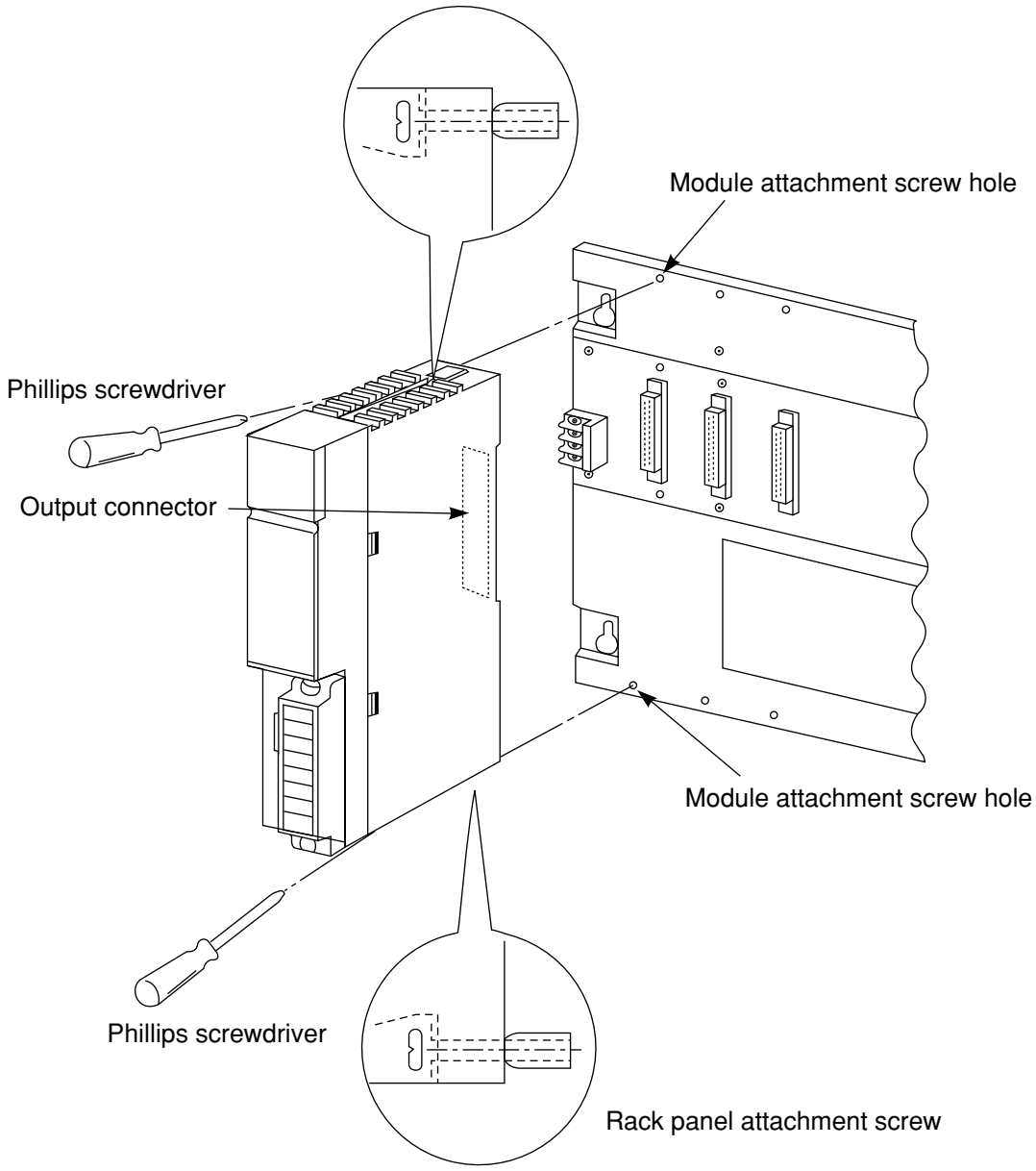
(1) Installation of power supply module

Attach the end left of rack panel using the two module attachment screws.



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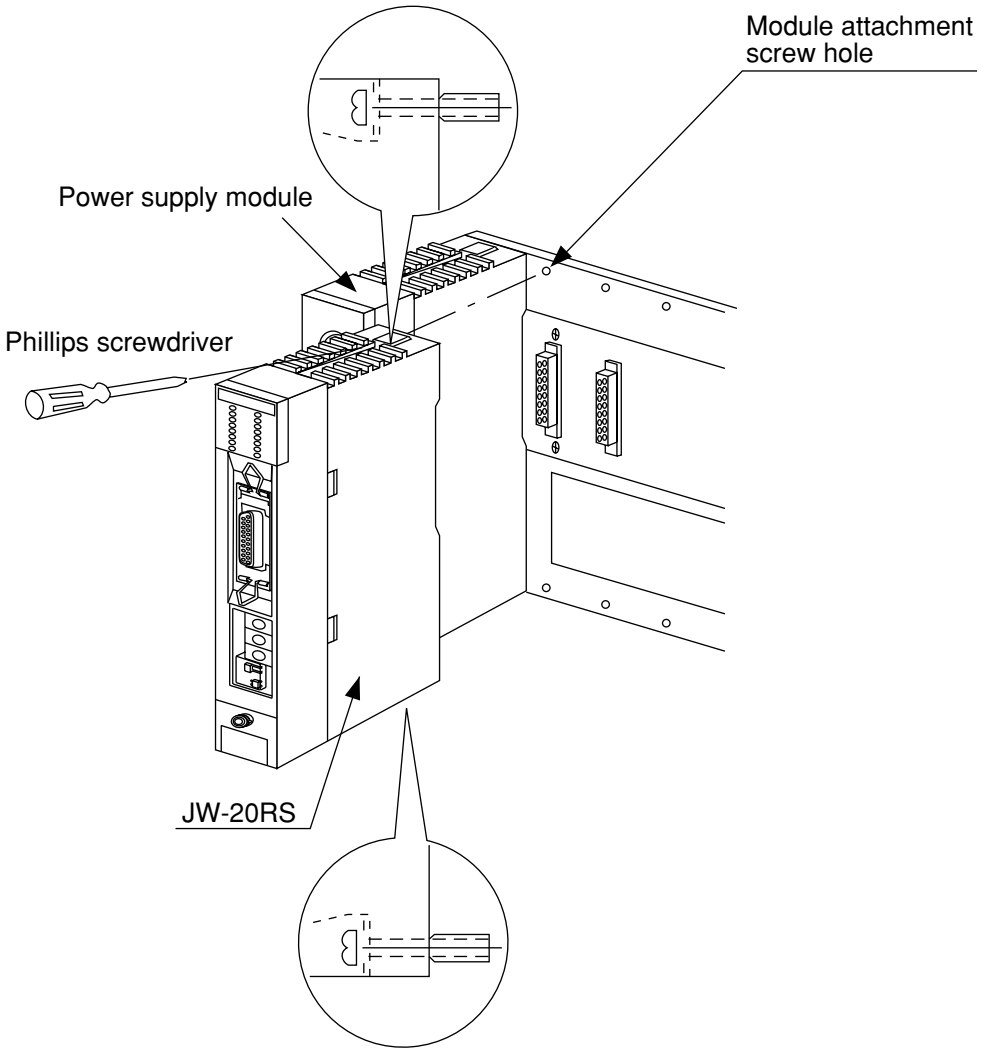
(2) Installation of JW-20RS

Install the JW-20RS in the second slot from the left end using the two module attachment screws.
Before installation or removal, make sure to shut OFF the power supply to the PC.



5

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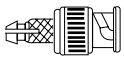
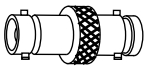
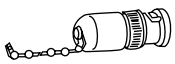
Chapter 6 Processing of Cables

Make sure to use the recommended models shown below for cables and connectors.

Name		Model	Maker
Cable	High frequency coaxial cable	ME-5C-2V	Mitsubishi Cable Industries,. Ltd. Fujikura Cable,. Ltd. Furukawa Denko Corporation Chugoku Cable,. Ltd. Shinagawa Cable,. Ltd.
Crimping tools		ME-42H Dice: 67-42H	Toko Denshi Corporation
Stripper for high frequency coaxial cable		CST-TM (The system consists of the main body, a blade cassette, and a blade setting gauge)	Nihon Weidmüller Co., Ltd.
Jacket	"L" jacket	SB-2878	Shinagawa Shoko Co., Ltd.
	"T" jacket	SB-2879	
Insulation tape	Self-adhesive tape	NO.11	Nitto Denko Corporation
Connectors	Connector 	ME-GP-01	Toko Denshi Corporation DDK Ltd.
	Straight 	ME-JJ-01	
	Elbow	ME-LA-01	
	T's	ME-TA-01	
	Termination 	ME-75	

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6-1 Processing cable end

① **Applicable cable**

High frequency coaxial cable: ME-5C-2V

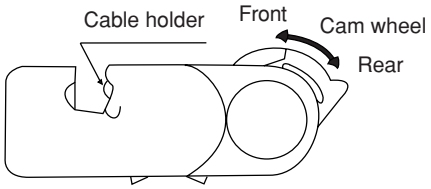
② **Required tools**

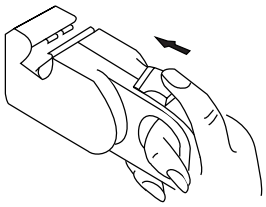
Stripper for high frequency coaxial cable: CST-TM

③ **Processing procedure**

<Basic operation>

Move the cam wheel of the stripper (amber colored ring) back and forth and the cable holder moves back and forth accordingly. Confirm this movement of the stripper first.
To hold the stripper, put your forefinger through the hole and move the cam while pushing back and forth with your thumb.



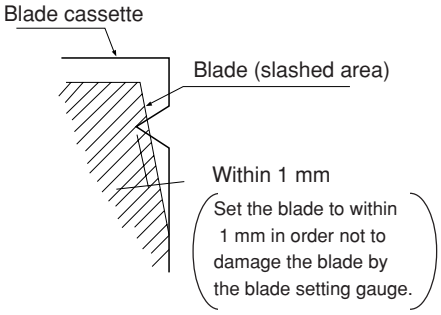


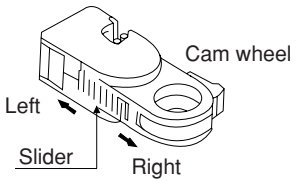
<Pressure setting>

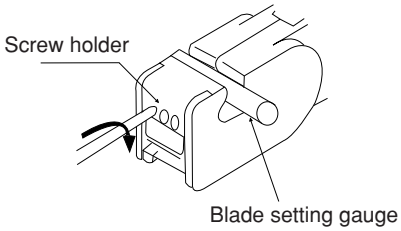
Set the operation range of the cable holder by moving the slider at the bottom of the body. Move to the left to increase pressure.
In this example, set the slider to the cam wheel side's end (right side) to set the pressure to low.

<Adjustment of blade cutting depth>

Adjust the cutting depth of the blade by turning the two screws at both ends of the screw holder. Set the blade position to within 1 mm from the cutting surface of the blade cassette prior to adjusting the cutting depth. For the cutting depth adjustment, use the "blade setting gauge" supplied as an accessory and match the blade position with the caved position of the gauge. Then move the cam wheel forward and secure firmly. Turn right lightly both adjustment screws at either end of the screw holder for adjustment. (Be careful not to break the blade setting gauge as it is made of aluminum.)







(Fine adjustment is required to get the optimum cutting depth.)

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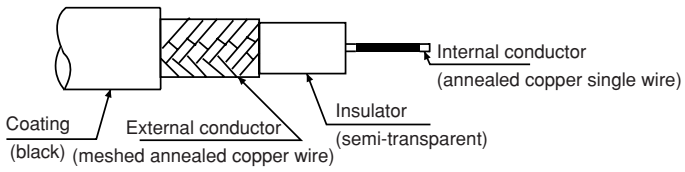
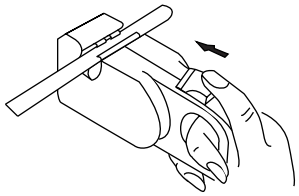


From the previous page

<Cutting of coating, external conductor, and insulator>

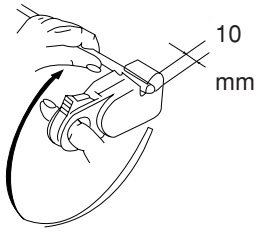
Put a coaxial cable while remaining approximately 10 mm into the cable stripper and securely tighten the cable with the middle finger, ring finger, and little finger of your left hand in order to hold stable during turning the stripper.
Put your right hand forefinger into the cam wheel and execute the procedure in order from step 1 below.



Step 1 Press the cam wheel forward 3 times and turn the stripper in the direction of arrow 2 to 3 times.

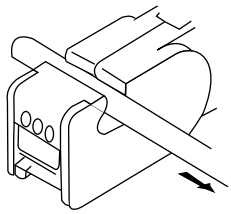
Step 2 Press the cam wheel forward 1 time and then turn the stripper in the direction of arrow a further 2 to 3 times.

Step 3 Press the cam wheel forward 1 more time and turn the stripper in the direction of the arrow another 2 to 3 times.



<Removal of coating, external conductor, and insulator>

While holding the coaxial cable with your left hand, grip the cable stripper so that it keeps a right angle against the coaxial cable, and press out the cable stripper with your left hand's thumb.

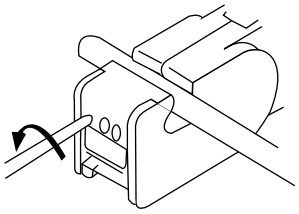


When the adjustment of the blade is not required

If the stripper cannot be removed smoothly, adjustment of the blade is not appropriate. In this case slide the cam wheel backward and remove the coaxial cable. Then adjust the blade.

<Fine adjustment of blade cutting depth>

When the cutting depth is too shallow or too deep, and damages the external conductor or the internal conductor, turn the screws on the screw holder and adjust the blade depth a little.



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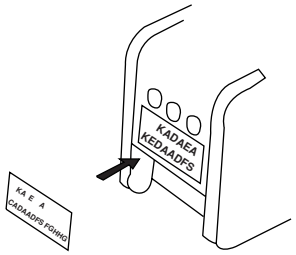
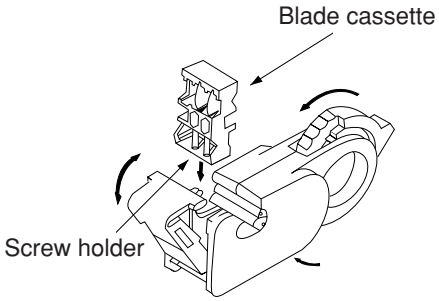
<Display of blade setting>

We recommend that in order to keep the adjusted position of the adjustment screws, after completion of adjustment for the coaxial cable and the screw holder, write the screw position etc. on a sticker and adhere it to the adjustment screws.



<Replacement of blades>

Hold up the upper section of the screw holder with a minus driver, and open the screw holder. Remove the blade cassette and reinsert by turning the current blade back side front or insert a new blade cassette from its top.



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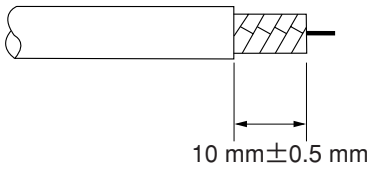
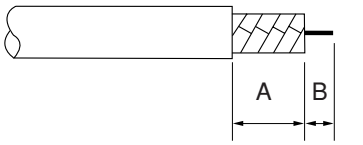
<Processing of cable end>

Cut the internal conductor of the coaxial cable, which is already cut by the stripper, using a nipper etc. to the optimum dimension of 4 mm.





A: 10±0.5 mm
B: 4±0.5 mm

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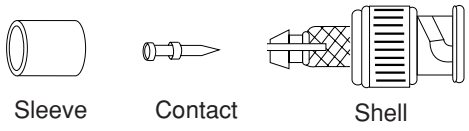
6-2 Connector crimping procedure

① **Required tools: Hand-held crimping tool**

Model	: ME-42H
Dice No.	: 67-42H
Crimping width	: 10 mm

Connector parts

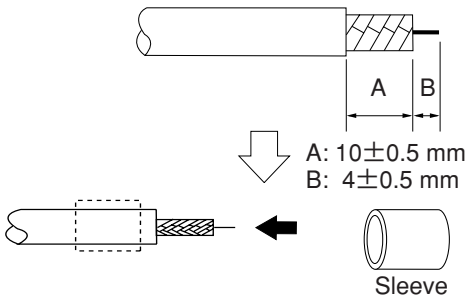


② **Connector: ME-GP-01**

③ **Processing procedure**

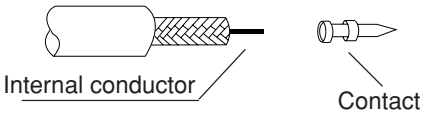
<Insert a sleeve>

Put through a sleeve to an end-processed high frequency coaxial cable.

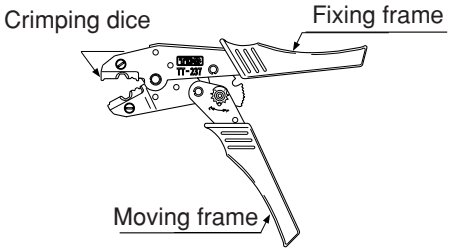


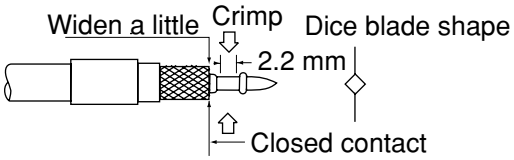
<Crimping contact>

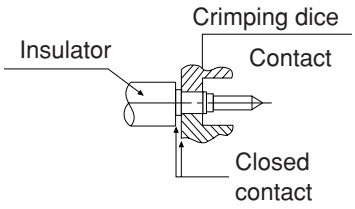
Insert a contact into the internal conductor and crimp.



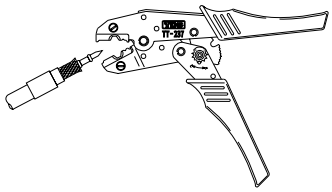
Put a contact into dice having a diamond shape and closely stick its end surface with the insulator and the dice. Pull the moving frame to the fixing frame side and crimp until the ratchet is removed.
(Crimping width: 2.2 mm)







* Use the crimping tool in the direction shown in the illustration right.
Using the crimping tool in the reverse direction will not crimp correctly.



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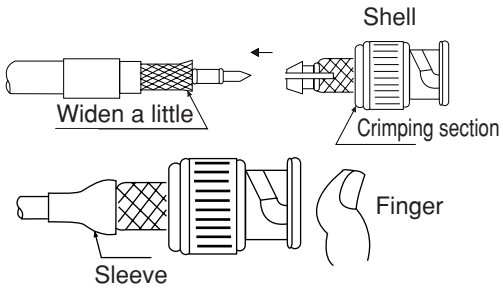
<Fixing the connector>

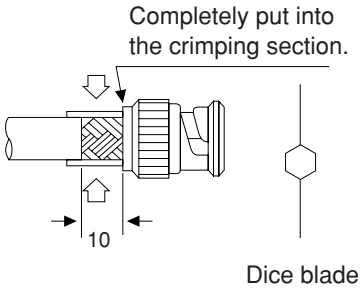
Slightly widen the external conductor of the coaxial cable, which is crimped to a contact on the internal conductor, in order to smoothly enter the shell inside the external conductor. Press in the external conductor end of the coaxial cable to just before the crimping part of the shell and put the sleeve into the crimping section. Then press in the coaxial cable until a “click” sound can be heard. Confirm that the contact end point touches your finger cushion.



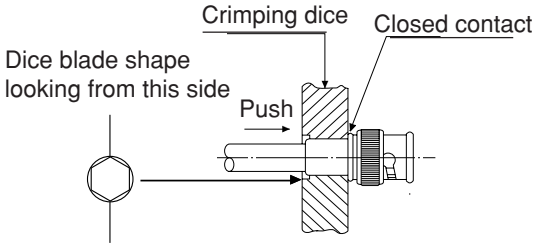
<Crimping external conductor>

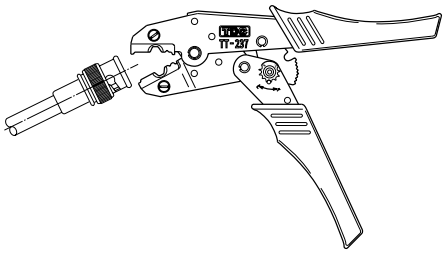
Crimp the external conductor.

Insert thoroughly the sleeve into the crimping section of the shell and crimp. Put the sleeve in the hexagonal dice and closely stick the shell to the crimping dice. Pull the moving frame to the fixing frame side while pressing the coaxial cable and shell from both sides, and crimp until the ratchet is removed.
(Crimping width: 10 mm)



* Use the crimping tool in the direction shown in the illustration right.
Using the crimping tool in the reverse direction will not crimp correctly.

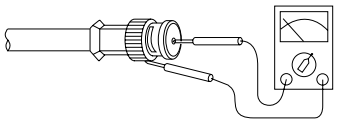




<Insulation test>

Insulation test of shell and contact

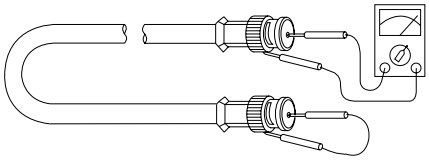
Using a tester, check the conductivity between the internal conductor and the external conductor in the connector. When the indication of the tester shows ∞ ohms, the insulation is appropriate.



<Conductivity test>

Conductivity test

After short-circuiting the one end of the connector crimped to the coaxial cable, check that conductivity is attained.



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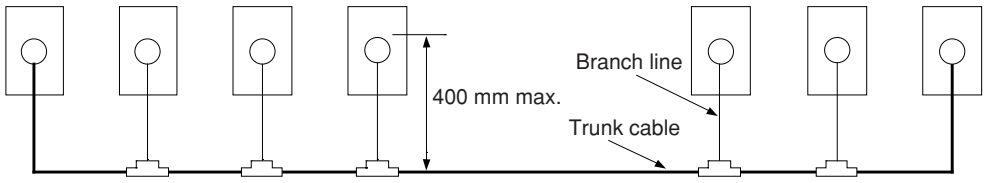
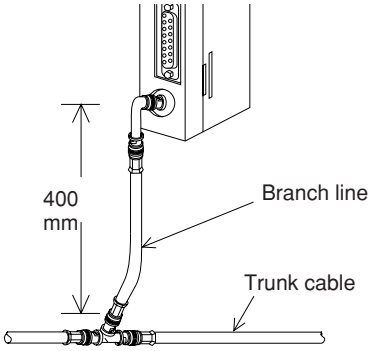
Chapter 7 Wiring

7-1 Cable trunk and branch lines

① On the illustration of the cable wiring below, a bold line means a trunk and the thin lines branched from the trunk with a “T” shape are called branch lines.



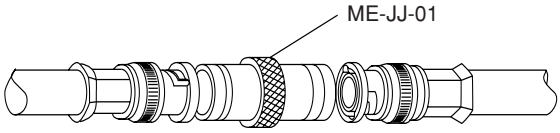
② The length of branch lines branched from the trunk should be within 400 mm.



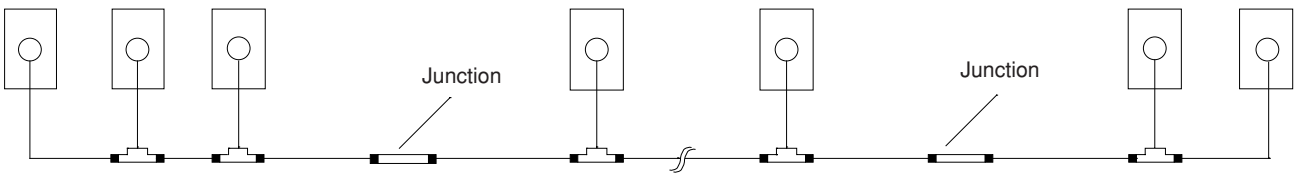
③ Total cable length should be within 1 km.

7-2 Relaying of trunk cables

① To relay trunk cables, use the straight joint (ME-JJ-01).



② Relaying of trunk cables should be limited to indispensable cases only. Inadvertent relaying of trunk cables may cause a communication fault such as a weakened signal level due to contact resistance in the junction connector (straight).



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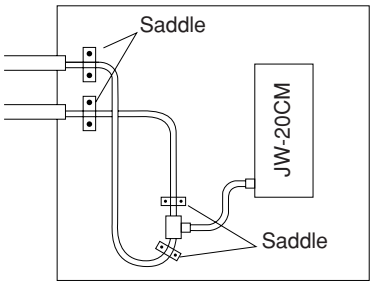
7-3 Cable wiring procedure in control panel

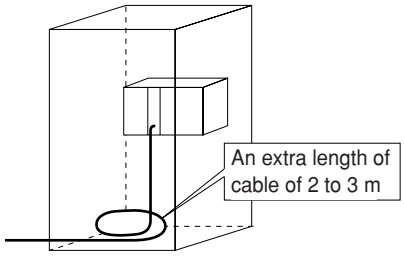
[1] Fixing of the cable

In order not to put any force on the cable and the JW-20CM, fasten the cable to an line nearby input of a control panel or a “T” branch point to the JW-20CM using saddles etc.



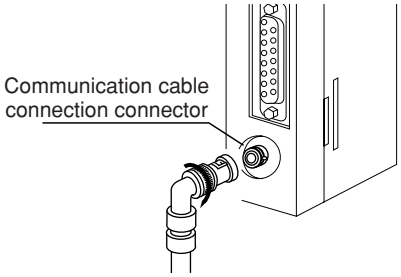
[2] Extra length of cable

Provide an extra length of the cable of 2 to 3 m inside a control panel for easier processing of the cable end and easier wiring when changing module positions.



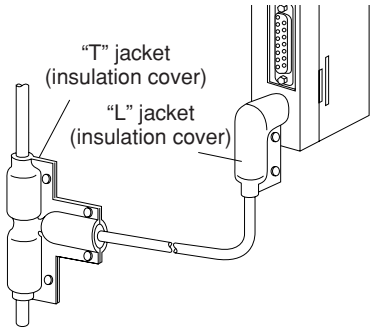
[3] Connection to the JW-20CM

The connector to the JW-20CM should be turned right to secure locking, not merely inserted.



[4] Insulation cover

When the connector touches with a high voltage section or external enclosures, communication errors may occur. Make sure to install an insulation cover.



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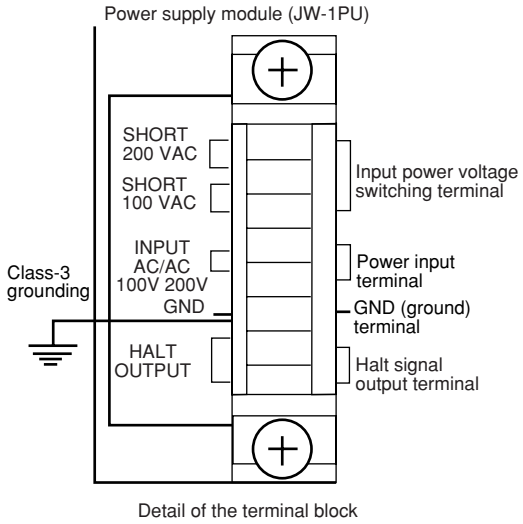
[5] Grounding of power supply module

Make sure to connect the GND terminal of the power supply module to a class-3 grounding.

- If the power supply module is not grounded, the JW-20CM cannot conduct with the ground after turning “ON” the shield ground switch.

In case of AC power supply module (JW-1PU)



Detail of the terminal block

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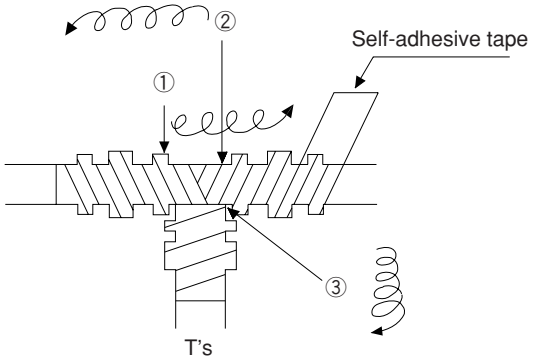
7-4 Waterproof and insulation processing of connectors

In order to prevent water intrusion into the “T” branch connectors and the straight connectors, we recommend to wind a self-adhesive tape and provide waterproof processing for them. For insulation purposes, cover these connectors with jackets.

[1] “T” branch connector

To wind a self-adhesive tape, cut the tape at about 10 cm each and start winding from position ①. Start winding cut tapes from ② and ③ as well.



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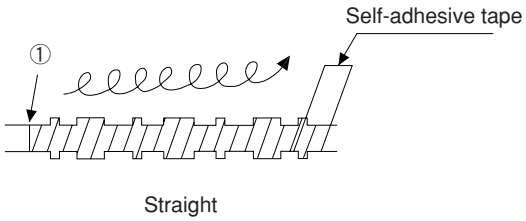
[2] Straight connector

To wind the self-adhesive tape, cut the tape at about 15 cm each and start winding from position ① .



Remarks

Prior to adhering the tape, clean the surface of the connectors and stick the adhesive side of the tape on the connector surface. Wind to lightly spread on the connector surface, and overlap with the next wrap to half of the tape width. Wind the tape for each wrap evenly so that the connector metal portion is completely covered with the tape.
Be careful not to excessively stretch the tape.

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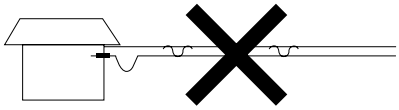
7-5 Wiring of cables at outside control panels

① Do not bundle the coaxial cable (the trunk and branch lines) together with power cables, and separate from power cables at least by 100 mm. Do not put the coaxial cable into a power line wired duct. The best way is to put the communication line in an independent duct.

② Be careful that the coaxial cable does not receive any load by laying under a heavy weight such as other cables.

When other cables run in the same duct as the coaxial cable, run the coaxial cable on the top position.

③ Do not run the coaxial cable outdoors as it may cause damage to the JW-20CM due to inductive lightning or atmospheric charge during lightning.



7-6 Check after wiring

Check the items below after completion of wiring.

	Check contents
1	The recommended connector types are used.
2	The connectors are securely locked.
3	The connectors are insulated by T jacket or L jacket.
4	The recommended coaxial cable type is used.
5	Curved radius of the coaxial cables are more than 45 mm.
6	No heavy load is on the coaxial cables.
7	The coaxial cable is not bundled with a power line cable. (Away from power line cables more than 100 mm.)
8	Length of branch lines is shorter than 400 mm.
9	Total length of the cable is less than 1 km.
10	Settings of the termination resistance switch and the shield ground switch are as per the drawings.

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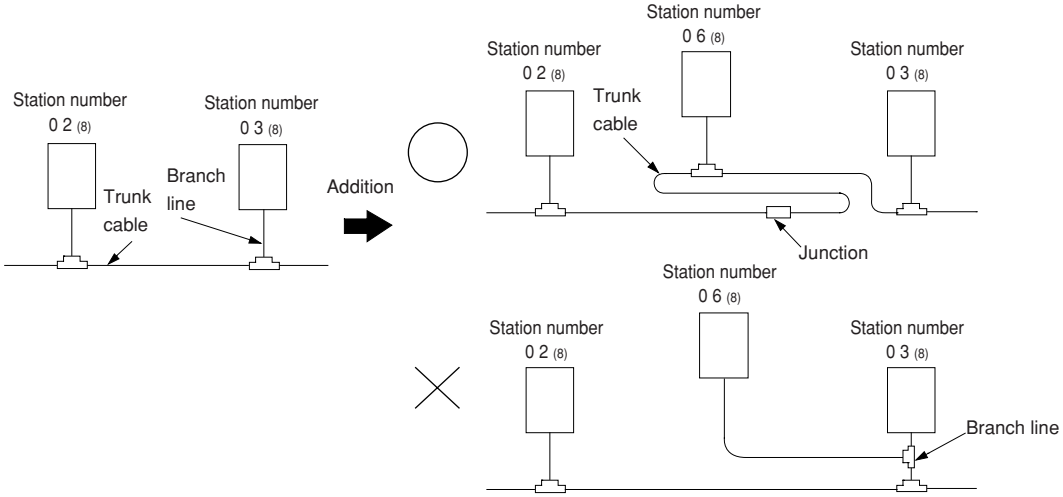
7-7 Wiring method for adding a communication station

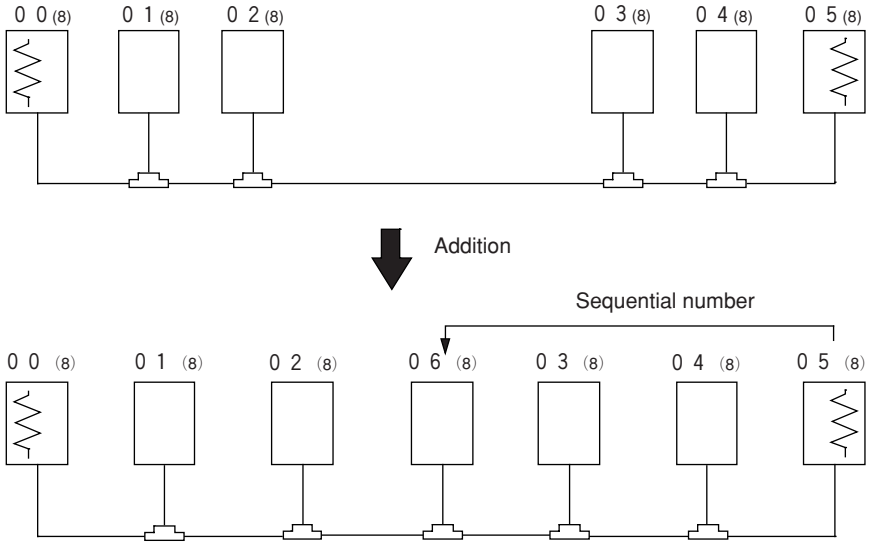
[1] Branching method

When branching a line for an additional station, be sure to branch from the trunk using a T connector. Never branch from a branch line.



[2] Station number of the additional station

Station number of the newly added station should be next largest number from the current largest numbered station. Each station should not be required to be arranged in order of each station's number.



≷ means the termination resistance switch being turned "ON."

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[3] Notes

When adding a communication station, follow the items below.

No.	Item	Reason
1	Branch from the trunk cable.	Another branch line from a branch line may not give appropriate communication by reflection wave.
2	Don't use the same station number twice.	The use of the same station number twice may cause communication errors.
3	Check the termination resistance switch.	When the newly added station becomes a termination of the circuit, change the setting of the LT switch.
4	Provide extra length for the expansion cable.	Have enough cable length in order to provide easy wiring.
5	Do not exceed the 1 km limit for total length of the cable.	Longer wiring may cause communication error by signal attenuation.
6	Change the layout drawing for installation.	Maintain the added work data for future maintenance use.
7	Do not overlap with any PC's communication area.	When the communication area or the flag area of the added station overlaps with other addresses in use, communication errors may occur.
8	Set the parameter memory of the master station and that of the newly added station.	Without setting the parameter memory of the master station and that of the slave station, the added station cannot communicate.

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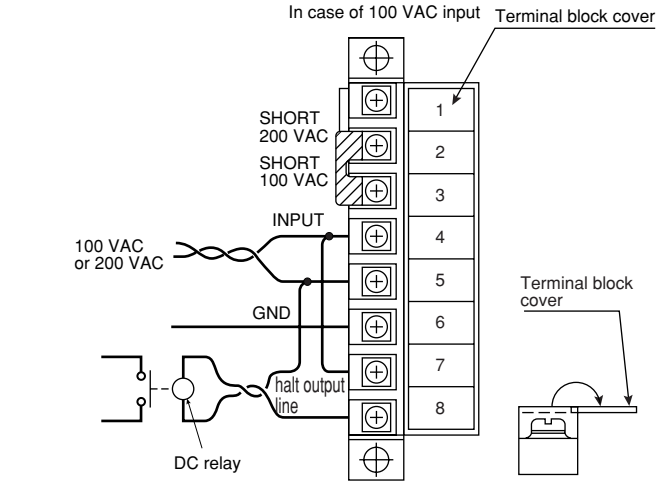
7-8 Wiring to power supply module

[1] JW-1PU

· Open the terminal block cover, fasten with the screw with torque of less than 12kg·cm.

· A maximum of three halt output lines can be connected serial. To use more than three sets, use a relay for interconnection.

In case of 100 VAC input



The coil rating must conform to the power supply voltage.

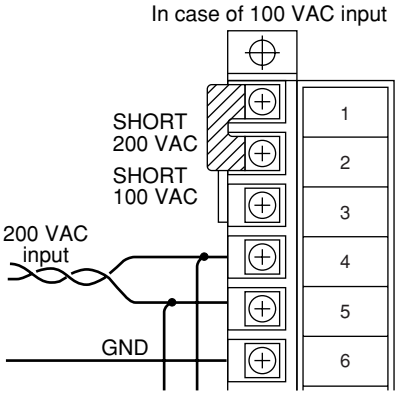
7

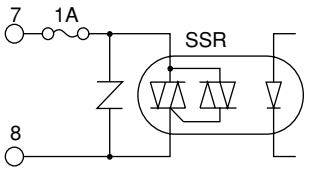
In case of using DC output module, connect the AC relay in the halt output line and insert the contact with the emergency stop circuit.

In case of 200 VAC input

· In case of using 200 VAC, switched to the 200 V side in terminal block of power supply module.

· If 200 V is added with the clip connected to the 100 V side, it may damage the power supply module.





Halt output internal circuit

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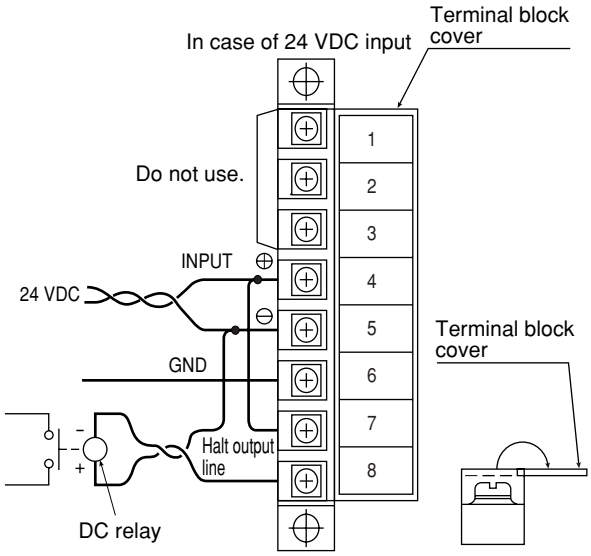
[2] JW-2PU

· Open the terminal block cover, fasten with the screw with torque of less than 12kg·cm.

· Halt output lines can not be connected serial. To use more than two sets, use a relay for interconnec-tion.



The coil rating must conform to the power supply voltage.

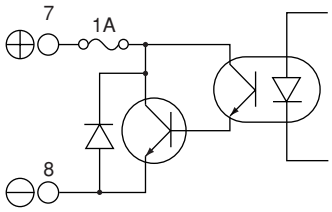
Connect the DC relay in the halt output line and insert the contact with the emergency stop circuit.

7

Remarks

· Connect without confusing polarities of input power supply and halt output signal.

· Wrong polarity connection may damage the power supply module when charged.



Halt output internal circuit

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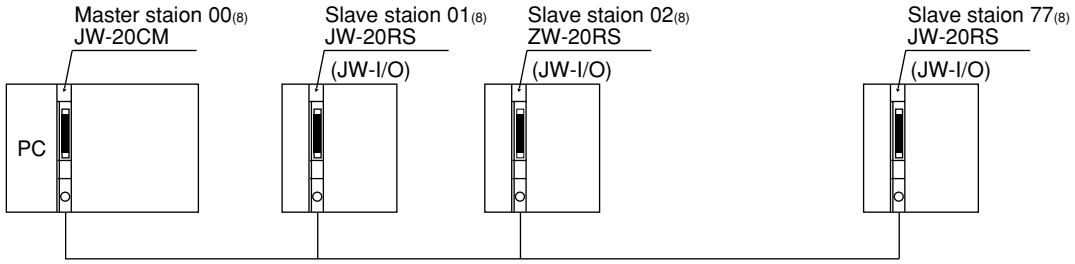
Chapter 8 Remote I/O

8-1 Description of remote I/O

· If remote I/O slave module JW-20RS is installed on I/O modules located separately, one PC (master station) having a network module JW-20CM can control these I/O modules.
· Connect between a master station JW-20CM and slave station JW-20RS using one coaxial cable. As the network module JW-20CM and remote I/O slave module JW-20RS control communication, there is no need any special program for the PC.
· More than one master stations can be mounted on one PC.
· Maximum 63 modules of slave stations can be connected within the cable total extension length 1 km.
· If a JW model PC has a master station, it can connect with stave stations having JW model I/O modules and slave stations having ZW model I/O modules. However, mixed installation of JW and ZW model I/O modules on one slave station is not available.

[If a master station is installed on a ZW model PC, it can connect only with slave stations having ZW model I/O modules.]



(Slave station : 63 stations max., cable total extension length : 1km max.)

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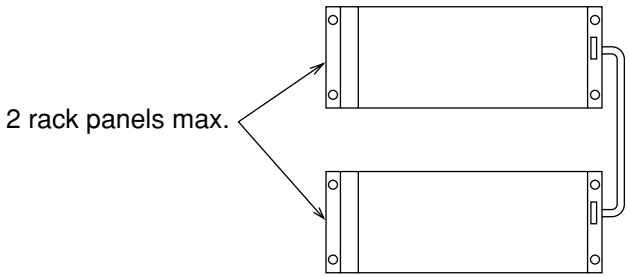
· Rack panel can use 2 sets max. per slave station. But, unavailable for use I/O bus expansion adapter (JW-1EA,JW-2EA).



· Special I/O module of JW model has the following limitation for number of modules to be used.

Per remote I/O slave station	Total of special I/O module	8 modules max.
	Total number of bytes of special I/O module	128 bytes max.
All remote I/O slave station	Total of special I/O module	32 modules max.
	Total number of bytes of special I/O module	512 bytes max.

Module name	Model name	Number of occupied bytes
Analog input	JW-8AD	36 bytes
Analog output	JW-2DA	8 bytes
High-speed counter	JW-2HC	8 bytes
I/O link master station	JW-31LM	2 to 64 bytes
ID control module	JW-11DU JW-12DU	Maximum 64 bytes
Positioning module	JW-12PM	16 bytes

8

· Allocation of number of I/O points per remote I/O slave station have “fixed allocation” and “manual allocation.”

Allocation method	Contents	Number of I/O points per station	Available for connected number of slave stations	Total number of I/O points
Fixed allocation	· Allocate for every 64 points or 128 points	64 points	63 stations	4032 points (504 bytes)
		128 points	32 stations	4096 points (512 bytes)
Manual allocation	· Allocate between 8 to 1024 points in 8 point unit · Number of connectable slave stations and total number of I/O points are limited, 63 stations and 4096 points at maximum, be careful do not exceed these limitaitons.	(Example 1) In case of 64 points	63 stations	4096 points (512 bytes)
		(Example 2) In case of 1024 points	4 stations	4096 points (512 bytes)

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8-2 Data transfer required time and communication timing

(1) Required time for data transfer

Time required for a master station to communicate with all the slave stations is determined by number of connected stations and number of points of all slave stations, as well as number of data bytes of JW model special I/O modules.

$$T = \frac{(N + 136 \times P) \times 2}{1250} + 1.4P + 5.3 + 2.5\,(P + 1) + \alpha\ [ms]$$

N : Total number of data bytes of all the slave station's I/O model and JW model special I/O modules (value to be calculated by number of bytes × 8 points)

P : Number of slave stations

136 : Use 136 bits for station address on the communication format and error check function.

1250 : Baud rate; 1.25 M bit/sec.

1.4P + 5.3 : Data processing time of the master station

2.5 : Total sequential send processing of the communication stations.

α : Communication time at executing remote program/remote monitor.

8

Remarks

- If "synchronous" is selected, one scan cycle time of a PC will vary with change of transfer required time.
- Number of data bytes on the JW model special I/O module is a value set in parameter address 000600 to $000777_{(8)}$ on the master station.

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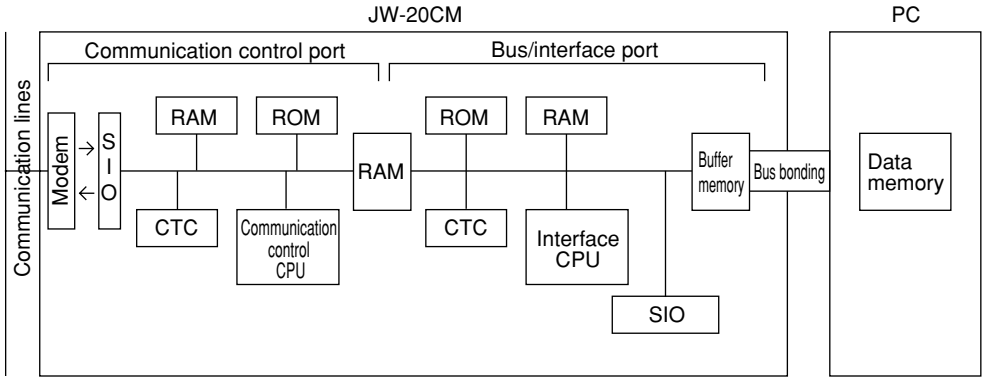
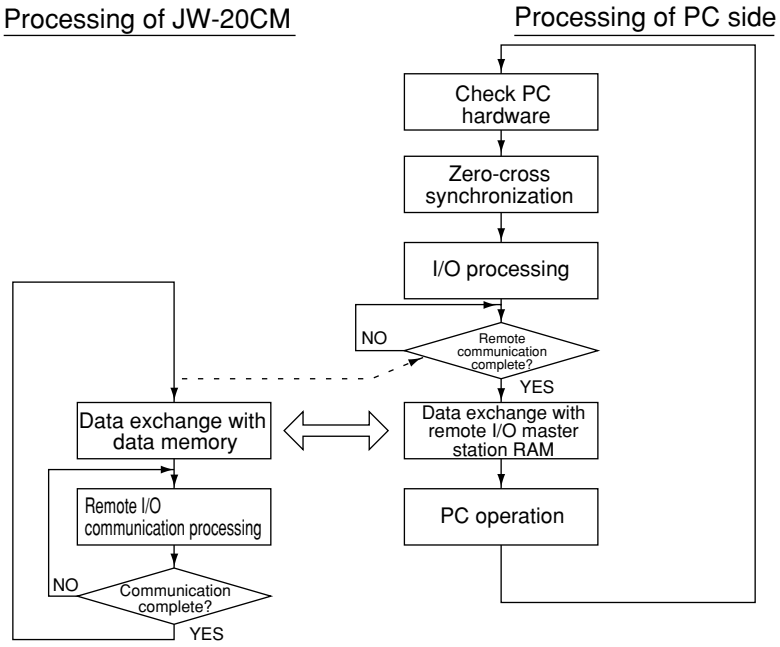
(2) Communication timing

- For communication with slave stations, either of "synchronous" and "asynchronous" can be selected for operation with the master station PC.
- When "synchronous" is selected, the JW-20CM communicates with synchronize with operation (one scan) of the master station PC.
- When "asynchronous" is selected, the JW-20CM communicates with slave stations regardless of operation of the master station PC. Therefore, even if communication of all stave stations is not completed, the JW-20CM starts data exchange with the master station and PC.





Remarks

The slave station will not performs the zero-cross operation even if the master station PC is “set zero-cross (zero-cross switch 07367 at OFF)”.

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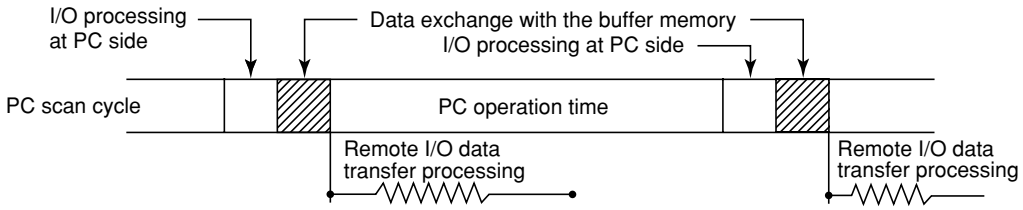
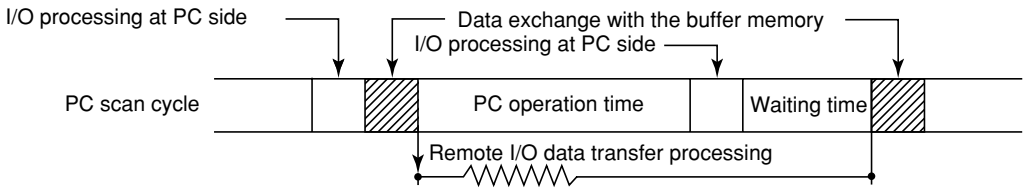
① **Operational synchronous**

When more than one JW-20CM is installed while using the remote I/O function, set only one module as “operational synchronous.” When a link module ZW-10CM or JW-10CM is used for remote I/O, the JW-20CM should be set as “operational asynchronous.”

a. When operation interval (one scan) of the master station PC is longer than data transfer time of the remote I/O:



b. When operation interval (one scan) of the master station PC is shorter than data transfer time of the remote I/O:



※ A waiting time is provided after the PC process to match with end timing of the data transfer process of the remote I/O so that the remote I/O can synchronize with the PC scan cycle.

8

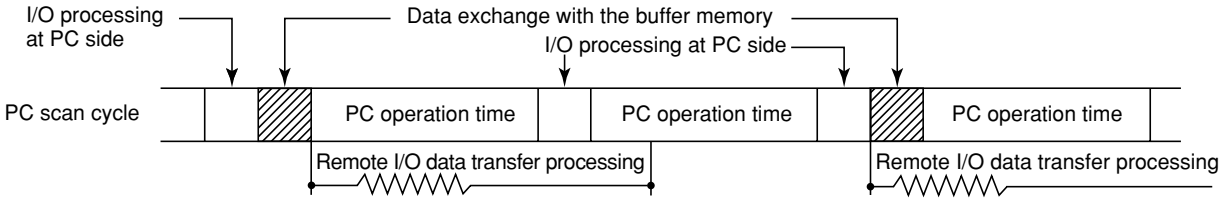
② **Operational asynchronous**

The special I/O module can not be used with the remote I/O slave module as the special I/O module cannot synchronize with the master station PC for data exchange.

a. When operation interval (one scan) of the master station PC is longer than data transfer time of the remote I/O:

Same as operational synchronous above.

b. When operation interval (one scan) of the master station PC is shorter than data transfer time of the remote I/O:



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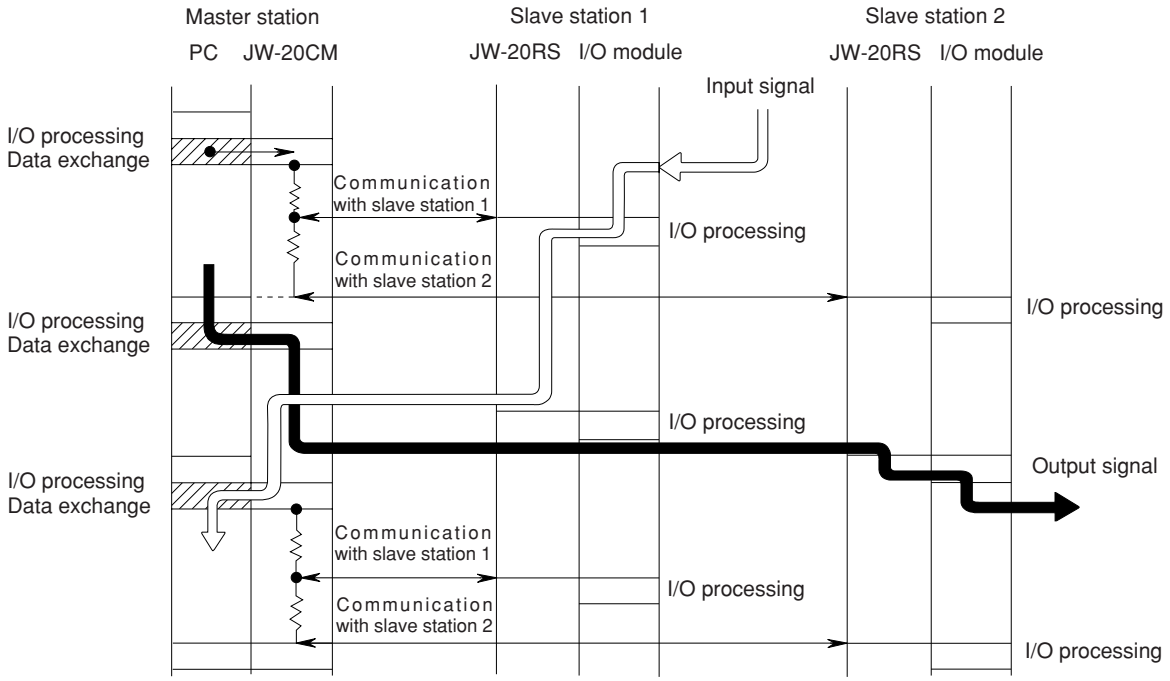
(2) Data flow with slave module

I/O processing of the slave module shall be carried out after completion of communication with the master station.



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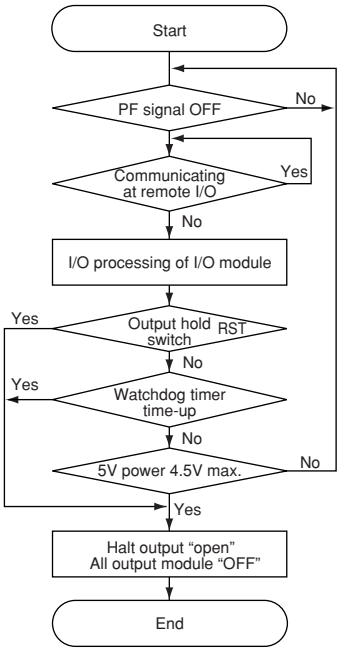
(4) Voltage interruption time of slave module

The voltage interruption operation of slave module is carried out for service interruption signal (PF signal) of power supply module, watchdog timer of slave module, and check 5 V power regardless of setting voltage interruption time (#246) of master module.

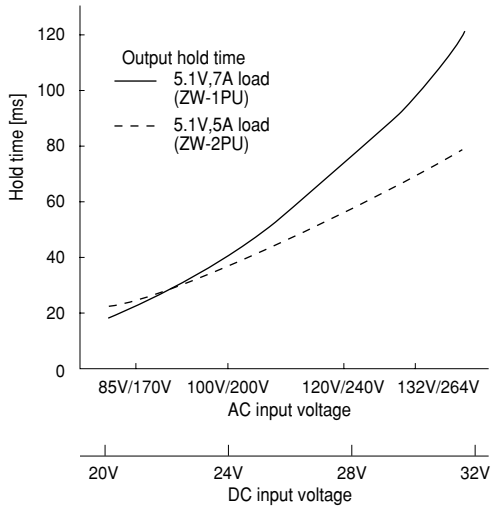


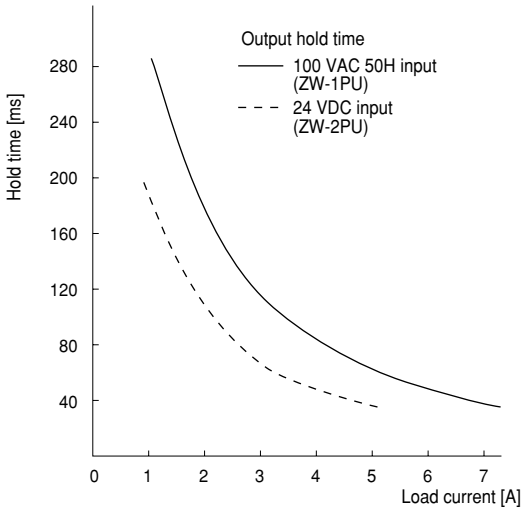
· The PF signal of the power supply module goes "OFF" below 85% of the rated voltage.

· The watchdog timer of the slave module goes time-up in "320 ms."

· When output hold switch is "RST," the all halt output and output module become "OFF" when communication with master station have interruption of 320 ms.

· When the check of 5 V power is gone below 4.5 V, all are forced to reset. The power supply characteristics varies according to the consumption current of the power supply module as following diagrams.





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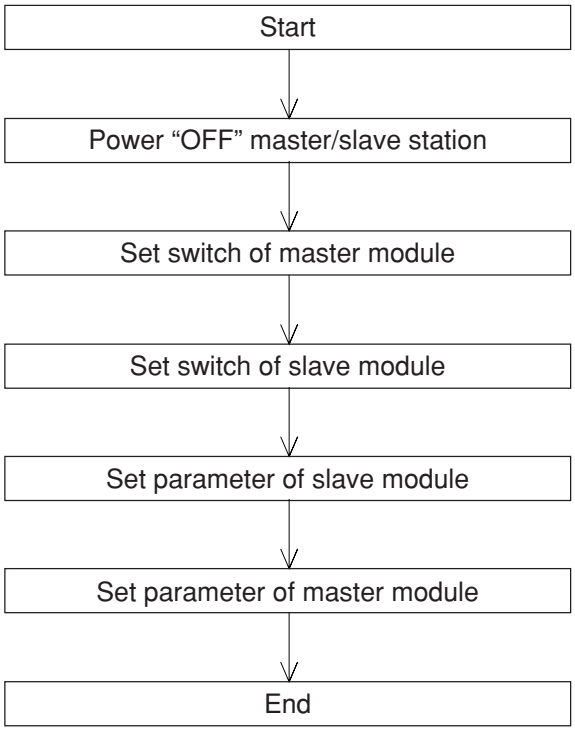
8-3 Outline of switch and parameter setting procedure

In brackets: See page



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Remarks

- Make sure to turn “OFF” the power of the PC prior to setting the switch.
- Parameter must be started from the slave module first.
- Prior to setting the parameters of master module, set the operation mode of the JW-20CM to “program mode.”
- Make sure to write the set parameters into the EEPROM on the JW-20CM after setting.

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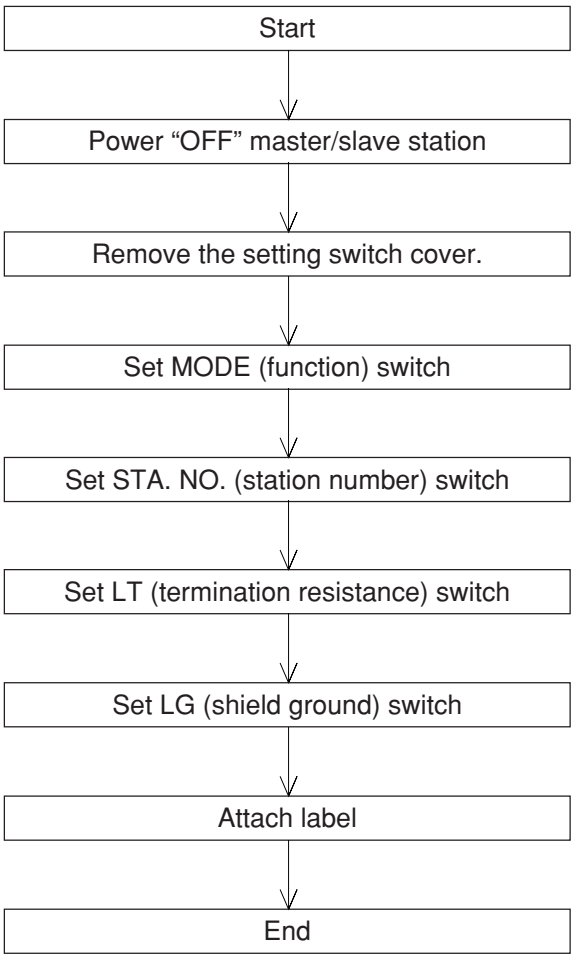
(1) Switch setting of master module (JW-20CM)

In brackets: See page

Operation procedure



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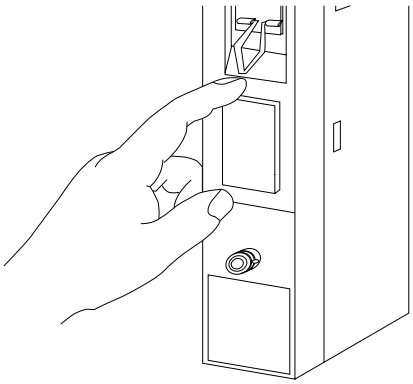
Turn master module and slave module power "OFF."

Remove the setting switch cover of master module JW-20CM.



· With your fingertips over the top and bottom of the switch cover, pull the cover towards you to remove it.
· Keep the cover saved as it must be installed after switch setting.

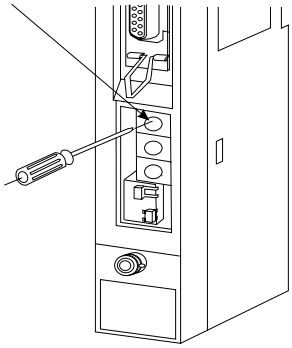
Set MODE (function) switch

· Be sure to setting "1."

Setting value	Function
0	Set at delivery
1	Remote I/O
2	Data link (standard function)
	Computer link
3	Data link (memory capacity save function)
	Computer link
4-F	Test mode A service man will use these switches for adjustment.

Do not set "4 to F."

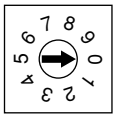
MODE



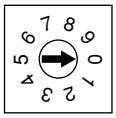
Set STA. NO. (station number) switch

· Set the station address to "00."

STA.NO.
X10



X1



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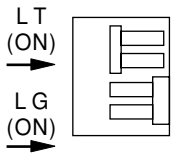
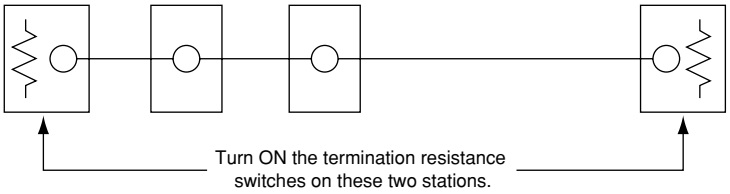
From the previous page

Set LT (termination resistance) switch

• When a JW-20CM master module is at either end the communication line, make sure to set the termination resistance switch "ON."

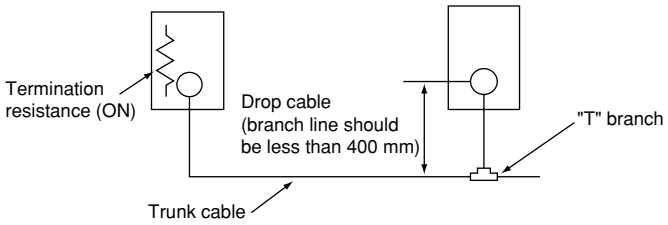




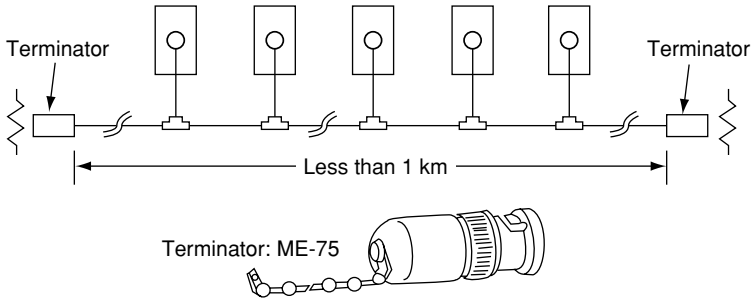
Reference: Function of the termination resistance switch

If the communication line does not have a termination resistance, the high frequency signal will be reflected at the ends of the cable. These reflected signals can collide with the original communication signals, so that some stations will not be able to communicate normally. The use of termination resistance suppresses reflected signals. If the termination resistance switch on any of the stations in between the end of the cable is turned ON, the station will generate a reflection wave signal or attenuate the original signal and may not communicate normally.

· When the trunk line has a branch in it, turn ON the termination resistance at the station on the trunk cable.



· If you use a terminator (termination resistance made by Toko Denshi: ME-75) at the end of a signal cable, turn OFF the termination resistance at the station on the end of the cable.



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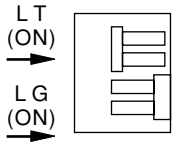
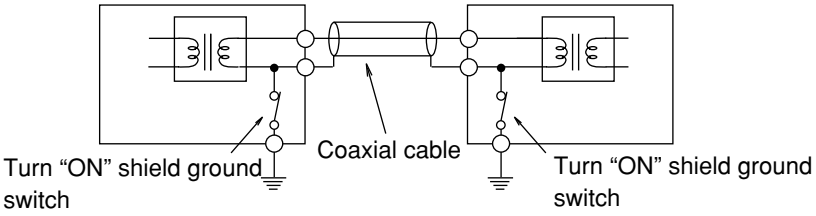


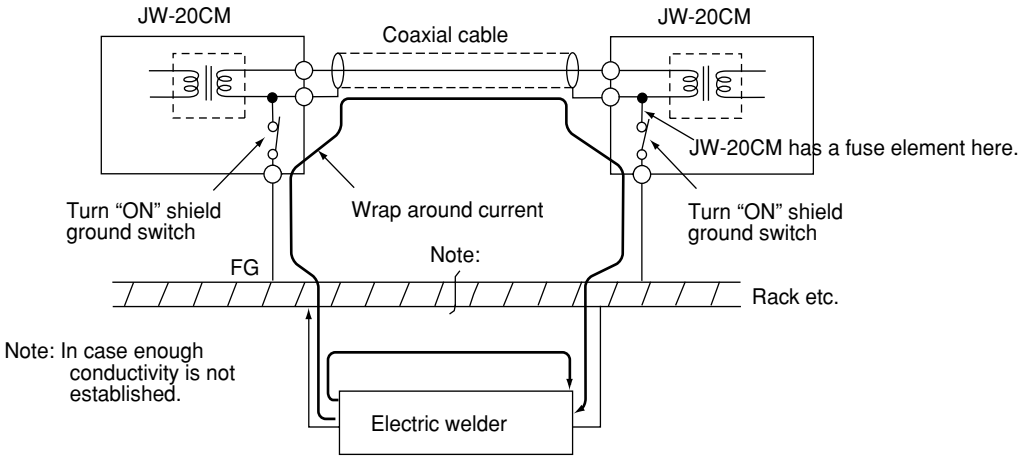
Set LG (shield ground) switch

· For communication lines, use a coaxial cable.
· As coaxial cable is an unbalanced circuit, ground its shield by turning “ON” the shield ground switch.



- Make sure to provide a class-3 grounding for the GND terminal of the power supply module. Without grounding the power supply module, the JW-20CM cannot become conductive with the ground after turning “ON” the shield ground switch. (See page 7·2.)

- Prior to any electric welding around the JW-20CM, take out the coaxial cable from the JW-20CM. While the coaxial cable is connected to the JW-20CM, any electric welding nearby the JW-20CM will cause the welding current to the JW-20CM and may damage part of its circuit pattern.



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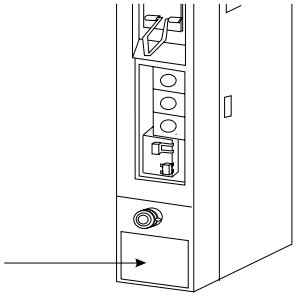
From the previous page

Attach label

· Attach the remote I/O master station label to this module, make setting “remote I/O master station function” clear.
· Write “FIX” on this label.



Switch setting end of master module

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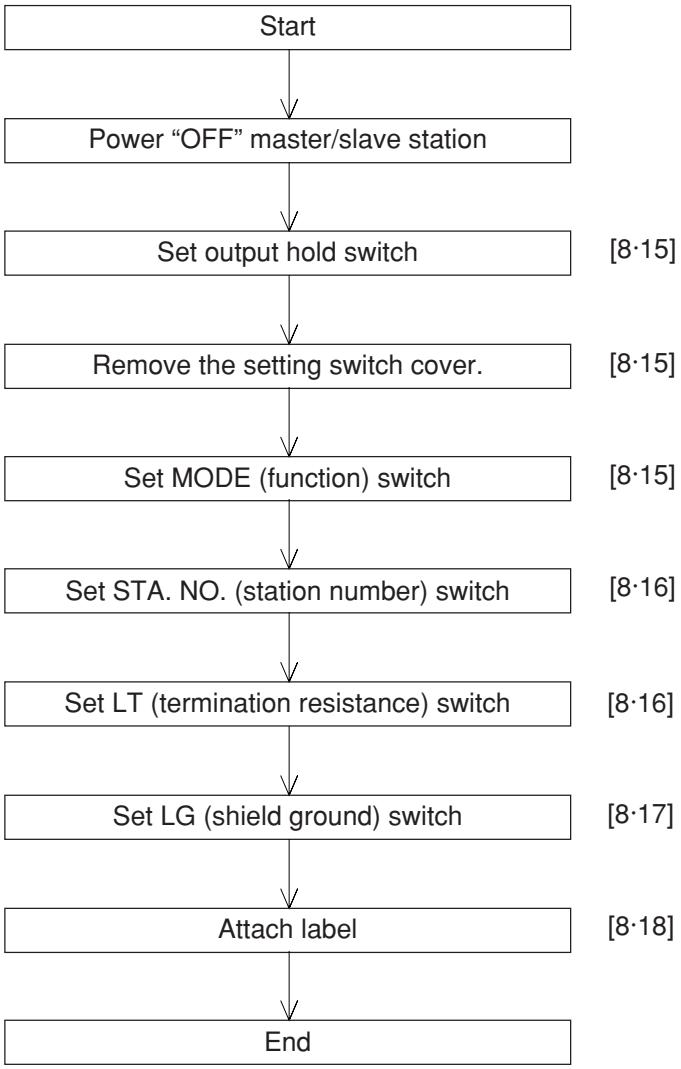
(2) Switch setting of slave module (JW-20RS)

Operation procedure **All slave module in common for setting method**

In brackets: See page



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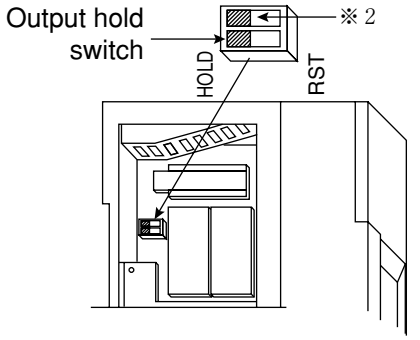
Power "OFF" master/slave station

Set output hold switch



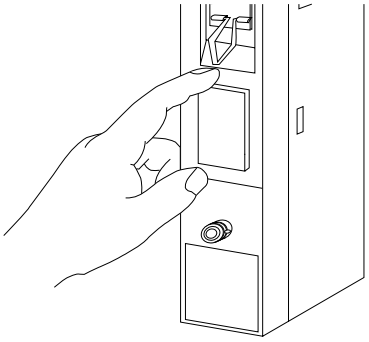
Keep *2 switch above as delivered condition.

· Set this switch whether to "latch" or "turn OFF all points" of output circuits when the slave module JW-20RS stops operation.
· In case of using I/O module of JW model, be sure to setting "HOLD".

Switch setting		Contents
In case of using I/O module of ZW model	HOLD	"Hold"
	RST※1	"All points OFF"
In case of using I/O module of JW model	HOLD	Setting at "hold"

※ 1 When the slave module JW-20RS stopped, the halt output turns "open" and output module sets "all points OFF". (See page 8·50).

Remove the setting switch cover of master module JW-20RS.



· With your fingertips over the top and bottom of the switch cover, pull the cover towards you to remove it.
· Keep the cover saved as it must be installed after switch setting.

Set MODE (function) switch

· Select the model of I/O module that installed on respective slave module.

Setting value	Model of I/O module
1	I/O module of ZW model
2	I/O module of JW model

The mode switch is set to "2" at delivery. Positions "3 to F" will be used only by our service man. Do not set the switch to these positions.

· If the master station PC is JW model, it can connect to the slave modules having "ZW model I/O module" and "JW model I/O module" on the same circuit.

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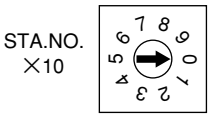
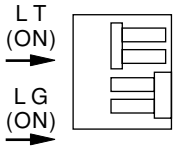
Set STA. NO. (station number) switch

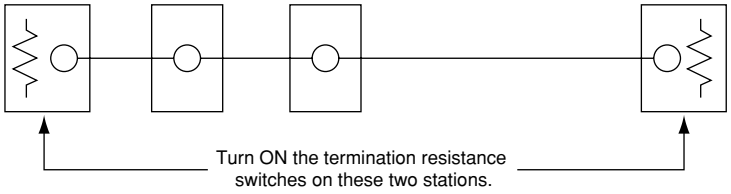


· Set "STA. NO" (station number) in octal notation in sequential numbers from 01 to 77. Be careful that there is no doubled setting or lacked number setting. (Number of connectable slave stations: See page 8·2)

Set LT (termination resistance) switch



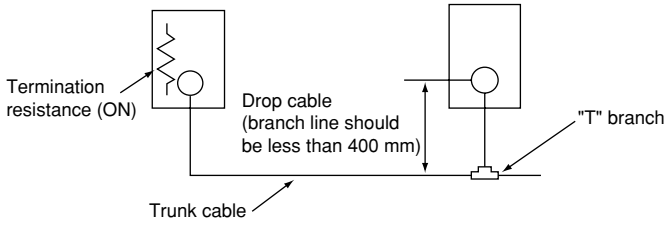
• When a JW-20RS slave module is at either end the communication line, make sure to set the termination resistance switch "ON."



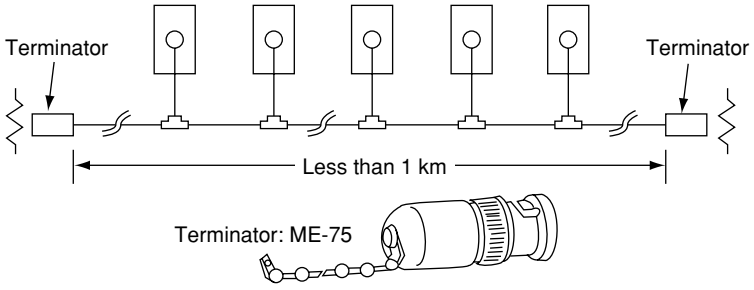
Reference: Function of the termination resistance switch

If the communication line does not have a termination resistance, the high frequency signal will be reflected at the ends of the cable. These reflected signals can collide with the original communication signals, so that some stations will not be able to communicate normally. The use of termination resistance suppresses reflected signals. If the termination resistance switch on any of the stations in between the end of the cable is turned ON, the station will generate a reflection wave signal or attenuate the original signal and may not communicate normally.

· When the trunk line has a branch in it, turn ON the termination resistance at the station on the trunk cable.



· If you use a terminator (termination resistance made by Toko Denshi: ME-75) at the end of a signal cable, turn OFF the termination resistance at the station on the end of the cable.



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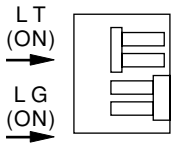
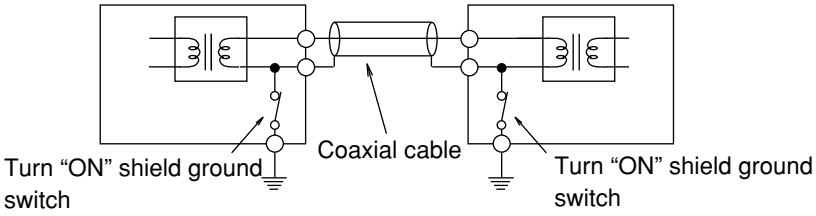
Set LG (shield ground) switch

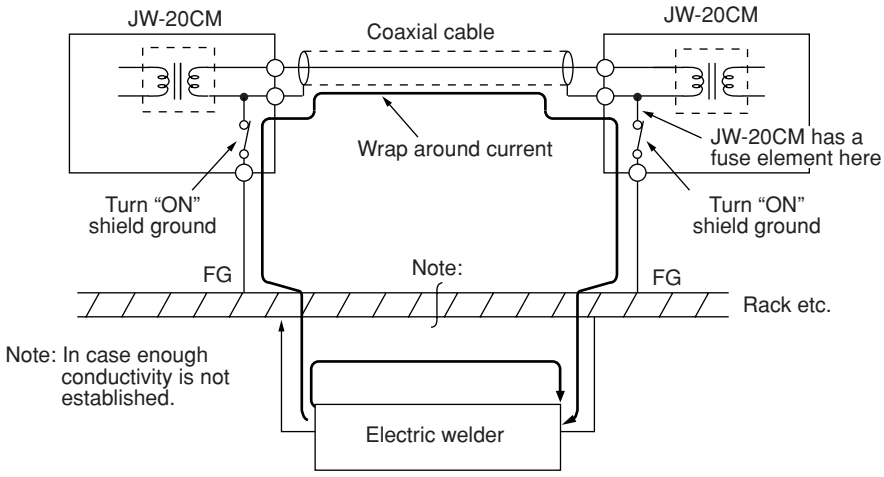


· For communication lines, use a coaxial cable.
· As coaxial cable is an unbalanced circuit, ground its shield by turning “ON” the shield ground switch.



- Make sure to provide a class-3 grounding for the GND terminal of the power supply module. Without grounding the power supply module, the JW-20CM cannot become conductive with the ground after turning “ON” the shield ground switch. (See page 7·2.)

- Prior to any electric welding around the JW-20CM, take out the coaxial cable from the JW-20CM. While the coaxial cable is connected to the JW-20CM, any electric welding nearby the JW-20CM will cause the welding current to the JW-20CM and may damage part of its circuit pattern.



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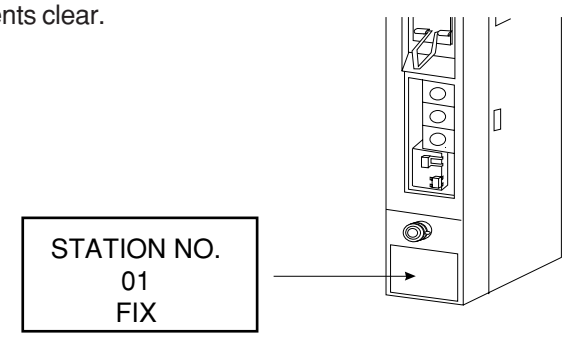
Write in label

· Write “FIX” and “STA. NO.” on label of remote I/O slave station, make setting contents clear.



Switch setting end of slave module

8

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(3) Parameter setting of slave module (JW-20RS)

Set the following parameter address after setting switch. Setting item varies with using I/O module (JW model or ZW model).

O: Necessity for setting

Item	Address (8)	Initial value (H)	Setting contents	JW-I/O	ZW-I/W	See page
Setting no. of dummy I/O points · Use 1 byte per vacant 2 slots · Set at only manual I/O table registration	000000 to 000017	00	0 : No. of dummy I/O points : No points 1 : No. of dummy I/O points : 16 points (2 bytes) 2 : No. of dummy I/O points : 32 points (4 bytes) 3 : No. of dummy I/O points : 48 points (6 bytes) 4 : No. of dummy I/O points : 64 points (8 bytes) 5 : No. of dummy I/O points : 80 points (10 bytes) 6 : No. of dummy I/O points : 96 points (12 bytes) 7 : No. of dummy I/O points : 112 points (14 bytes) 8 : No. of dummy I/O points : 128 points (16 bytes) 9 : No. of dummy I/O points : 144 points (18 bytes) A : No. of dummy I/O points : 160 points (20 bytes) B : No. of dummy I/O points : 176 points (22 bytes) C : No. of dummy I/O points : 192 points (24 bytes) D : No. of dummy I/O points : 208 points (26 bytes) E : No. of dummy I/O points : 224 points (28 bytes) F : No. of dummy I/O points : 240 points (30 bytes)	○	—	8・25
Set kinds of I/O module · Use 1 byte per slot · Set at only manual I/O table registration	000100 to 000137	00	91 : 16 points output 92 : 32 points output 94 : 64 points output 00 : Vacant slot (lower is dummy I/O points) A1 : 16 points output A2 : 32 points output A4 : 64 points output D1 : Special I/O module F1 : Special I/O module	○	—	8・26
Set max.racks and slot number	001000	00	Upper 4 bits : Rack number Lower 4 bits : Slot number	○	—	8・28
Set manual I/O table registration	001001	00	60 : Manual setting for both dummy I/O points and kinds of I/O module 64 : Manual setting for dummy I/O points and auto setting for kinds of I/O module 65 : 00 for dummy I/O points and auto setting for kinds of I/O module 00 : When setting is normal end	○	—	8・27
Register automatically or not I/O table at power input.	001002	00	00 : Auto registration 03 : Prohibit the auto registration	○	—	
Set remote I/O top address	001004 001005	00	Set file address in octal when only using search module (SU) lamp.	○	—	8・29
Check no. of I/O bytes	003750	00	00 : No check the no. of I/O bytes 45 : Check the no. of I/O bytes	—	○	8・24
Set no. of I/O bytes	003752	00	If "checking number of I/O bytes to be used by the I/O module" function is selected to "not to check" using decimal notation 000 to 128, this setting is not needed.	—	○	
	003753	00				
Writing to the EEPROM, start operation/stop setting.	003777	01	00 : Stop remote I/O operation 01 : Start remote I/O operation 80 : Writing to the EEPROM, stop operation 81 : Writing to the EEPROM, start operation 08 : Initialize the parameter	○	○	8・22 8・23

· There is no difference of parameter setting between "fixed allocation" and "manual allocation."

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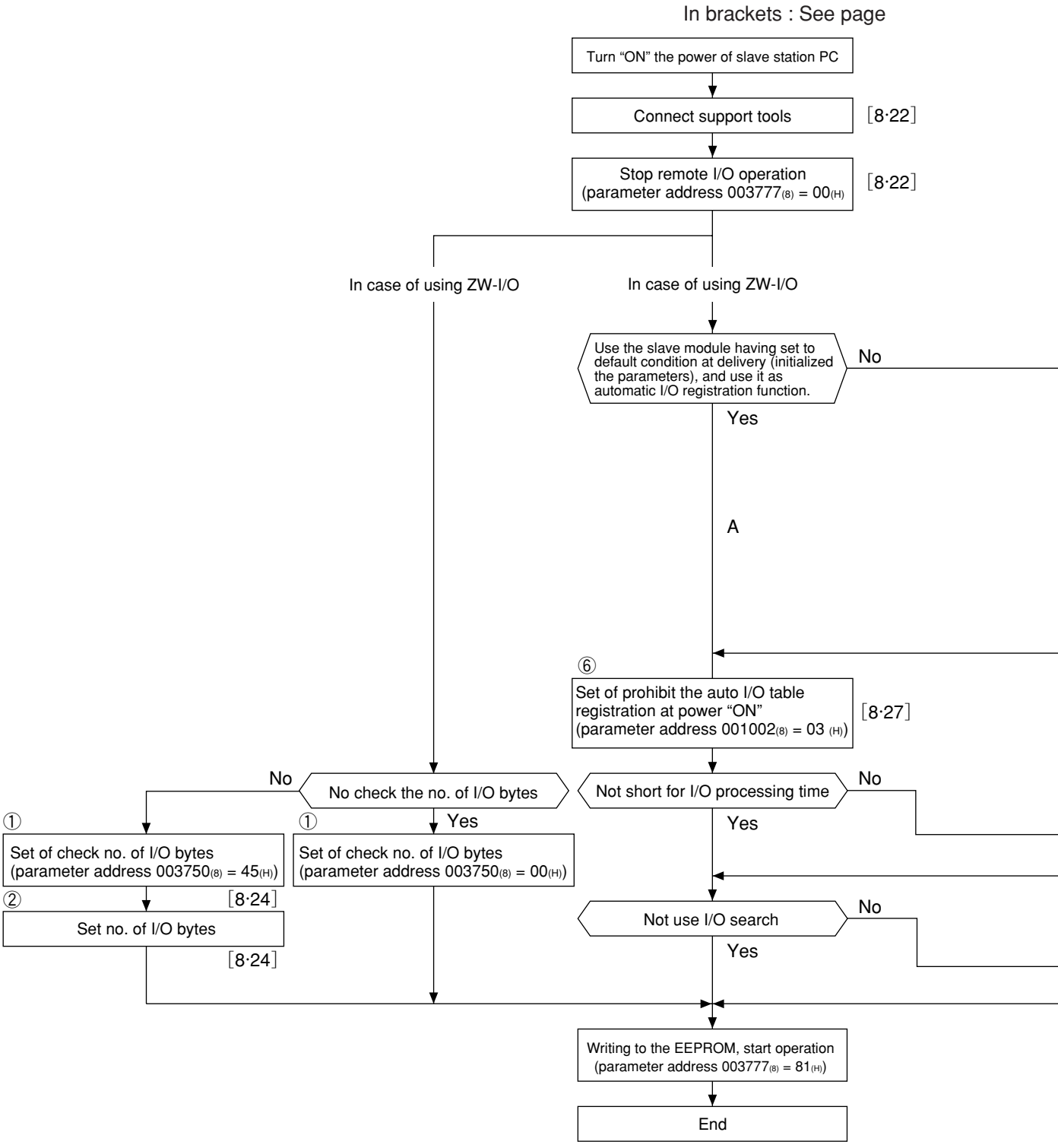
Operation procedure



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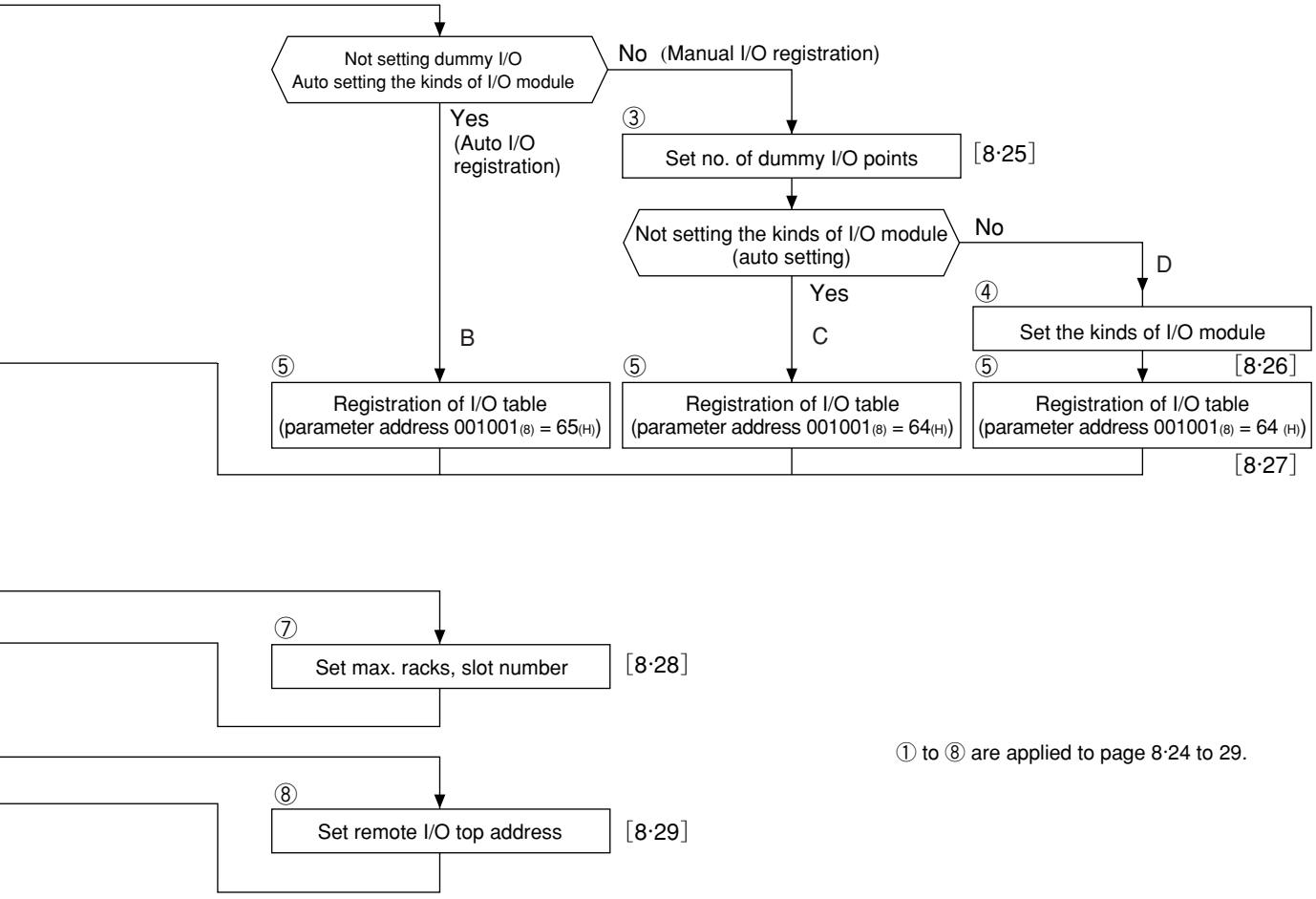
[I/O table registration in case of using JW-I/O]

1. In case of not setting dummy I/O
   Register I/O table based on the installed I/O module. (Set parameter address 001001$_{(8)}$ = 65$_{(H)}$, the procedure B in the flow chart.)
   However, in case of parameter address of JW-20RS 001002$_{(8)}$ = 00$_{(H)}$ (default setting), the JW-20CM automatically registers I/O table when the power is input and there is no need to register I/O table. (Procedure A in the flow chart.)

2. In case of setting dummy I/O
   Set number of dummy I/O points for each slot and registers I/O table based on this setting and the installed I/O module. (Set parameter address 001001$_{(8)}$ = 64$_{(H)}$, procedure C in the flow chart.)

   Procedure D in the flow chart is special method to set byte of I/O module for each slot. Normally set I/O module type using steps 1 and 2 above.



① to ⑧ are applied to page 8·24 to 29.

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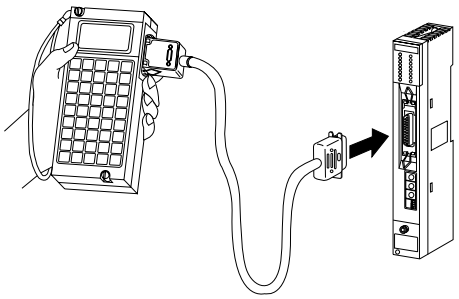
Turn "ON" the power of slave module

Connect support tools



· Connect a support tool with the slave module JW-20RS and prepare the setting parameter.

<Usable support tools>
JW-13PG/12PG
JW-50SP
JW-50PG, Z-100LP2S

• For operation of each support tool, see the instruction manual attached. The following describes an example of JW-13PG's key operation.

Stop operation of remote I/O **[HEX (hexadecimal), byte]**

· Setting of the parameter is only available when the operation of the JW-20RS is stopped.
· Write "$00_{(H)}$" to parameter address $003777_{(8)}$ and stop operation of the JW-20RS.

(Operation example of JW-13PG)

B 1 (Parameter setting) | D 3 7 7 7 モニタ MNTR (Display the contents of parameter address 007777 by hexadecimal.) | A 0 書込 ENT (Write $00_{(H)}$.)

Screen display of JW-13PG

```
 07775      HEX   00
 07776      HEX   1F
I PARAM.
>07777      HEX   00
```

Reference **Function of JW-13PG**

• 変換 CONV key: Changeover unit of figures

→HEX (hexadecimal) → OCT (octal) → DCM (decimal) →Bit pattern →

• FORCE LNGTH key: Byte display ⟷ Changeover word display

· Please set ① to ⑧ of 8·24 and after when using ZW-I/O or JW-I/O.

To the next page

Remarks

Indicates in [ ] of each item mean as follows:
(Example) Stop remote I/O operation [HEX (hexadecimal), bytes]
This means to set "stop remote I/O operation" by hexadecimal and byte unit.

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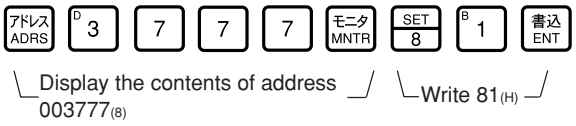
Writing to the EEPROM, start operation **[HEX (hexadecimal), byte]**

· Write "$81_{(H)}$" into parameter address $003777_{(8)}$ and write the set parameter contents into the EEPROM. Then start the slave module.
· After starting operation, the setting value changes to "$01_{(H)}$."

Setting value (H)	Contents
0 0	Stop operation
0 1	Start operation
8 0	Writing to the EEPROM, stop operation
8 1	Writing to the EEPROM, start operation
0 8	Initialize setting values of parameter addresses

(Operation example of JW-13PG)



Screen display of JW-13PG

```
 03775     HEX     00
 03776     HEX     00
I PARAM.
>03777     HEX     01
```

Remarks

· Writing time to EEPROM is approximately 0.7 sec. When any error is found for parameter settings, lights the error code $9F_{(H)}$ by the indication lamp.
· Written contents into the EEPROM are automatically written to the RAM of the slave module when turning ON the power of the PC. At reading, the PC checks BCC and compares BCC check code of the parameter memory address ($003776_{(8)}$). When an error is found, the JW-20RS lights the error code $9E_{(H)}$ by the indication lamp.
· After initialized the parameters, the JW-20RS initializes parameter address 000000 to $003776_{(8)}$.

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"Only when using ZW model I/O module"

① **Select "number of I/O byte checking" function** **[OCT (Octal), bytes]**

(Applied to item ① on pages 8·20 to 22)

· Select whether to check or not number of bytes of I/O module used for the remote I/O slave module. Set selection in parameter address $003750_{(8)}$. If "check" is selected, the I/O module can detect when number of I/O modules is changed by fault or disconnection of the I/O modules.

Set value	Contents
$00_{(H)}$	Do not check
$45_{(H)}$	Check

Initial value: $00_{(H)}$ (Do not check)

(To select "check" using JW-13PG)

クリア CLR | D 3 | 7 | F 5 | A 0 | モニタ MNTR | E 4 | F 5 | 書込 ENT

Display contents of address $003750_{(8)}$ — Write $45_{(H)}$

Screen display of JW-13PG

```
 03746     HEX     00
 03747     HEX     00
I PARAM.
>03750     HEX     45
```

"Only when using ZW model I/O module"

② **Set number of I/O bytes** **[DCM (decimal), word]**

(Applied to item ② on pages 8·20 to 22)

· Set total number of bytes of installed modules when "yes" is selected (address $003750_{(8)} = 45_{(H)}$).
· If the set number of I/O bytes mismatch with the actual number of bytes of the installed module, the JW-20RS detects as error (error code $92_{(H)}$).
· Set between 000 to 128 in decimal notation.

Address	Contents
$003752_{(8)}$	Lower bytes
$003753_{(8)}$	Upper bytes

Initial value: $00_{(D)}$ for both upper and lower bytes.

Ex.:
If one ZW-16N1 (16 points/2 bytes) and one ZW-16S1 (16 points/2 bytes) are installed,

(Set 2 bytes + 2 bytes = 4 bytes using the JW-13PG)

STEP (+) | STEP (+) | FORCE LNGTH | 変換 CONV | 変換 CONV | E 4 | 書込 ENT

Display the contents of address $003752_{(8)}$ in decimal notation and words. — Write data 4

Screen display of JW-13PG

```
 03746     D   00000
 03750     D   00037
I PARAM.
>03752     D   00004
```


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"Only when manual I/O registration using the JW model I/O module"

③ **Set number of dummy I/O points** **[HEX (hexadecimal), bytes]**

(Applied to item ③ on pages 8·20 to 22)

· Set to allocate addresses (dummy I/Os) on vacant slots in parameter address 000000 to $000017_{(8)}$.

· Set two slots with one byte of parameter address.

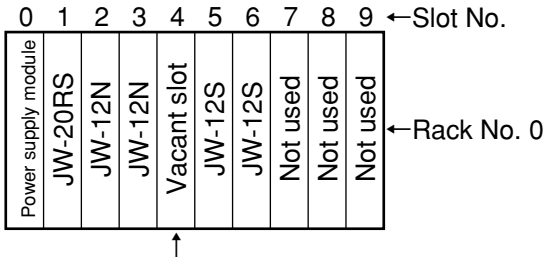
Parameter address(8)	Rack No. 0 7 6 5 4	Rack No. 0 3 2 1 0
000000	Set to 0	Set to 0
000001	Slot 3	Slot 2
000002	Slot 5	Slot 4
000003	Slot 7	Slot 6
000004	Slot 9	Slot 8
000005	Slot B	Slot A
000006	Slot D	Slot C
000007	Slot F	Slot E

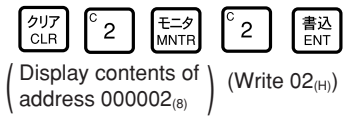
Parameter address(8)	Rack No. 1 7 6 5 4	Rack No. 1 3 2 1 0
000010	Slot 1	Slot 0
000011	Slot 3	Slot 2
000012	Slot 5	Slot 4
000013	Slot 7	Slot 6
000014	Slot 9	Slot 8
000015	Slot B	Slot A
000016	Slot D	Slot B
000017	Slot F	Slot E

Set value(H)	Contnets
0	No dummy I/O point
1	16 points of dummy I/O (2 bytes)
2	32 points of dummy I/O (4 bytes)
3	48 points of dummy I/O (6 bytes)
4	64 points of dummy I/O (8 bytes)
5	80 points of dummy I/O (10 bytes)
6	96 points of dummy I/O (12 bytes)
7	112 points of dummy I/O (14 bytes)

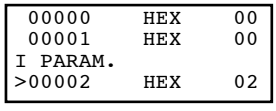
Set value(H)	Contnets
8	128 points of dummy I/O (16 bytes)
9	144 points of dummy I/O (18 bytes)
A	160 points of dummy I/O (20 bytes)
B	176 points of dummy I/O (22 bytes)
C	192 points of dummy I/O (24 bytes)
D	208 points of dummy I/O (26 bytes)
E	224 points of dummy I/O (28 bytes)
F	240 points of dummy I/O (30 bytes)

Ex.: Set 32 points (4 bytes) of dummy I/O in the following vacant slots using JW-13PG.





Screen display of JW-13PG



8

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"Only when manual I/O registration using JW model I/O modules"

④ **Set type of I/O module** **[HEX (hexadecimal), byte]**

(Applied to item ④ on pages 8·20 to 22)

· Set types of installed I/O module in each slot and number of dummy I/O points set for vacant slot into parameter address 000100 to $000137_{(8)}$.

· Set one slot with one byte of parameter address.

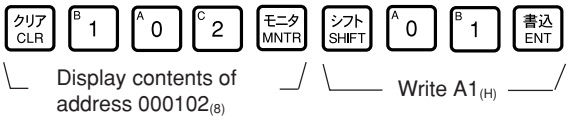
Parameter address (8)	Contents in rack No. 0
000100	Set to $00_{(H)}$
000101	Set to $00_{(H)}$
000102	Slot 2
000103	Slot 3
000104	Slot 4
000105	Slot 5
000106	Slot 6
000107	Slot 7
000110	Slot 8
000111	Slot 9
000112	Slot A
000113	Slot B
000114	Slot C
000115	Slot D
000116	Slot E
000117	Slot F

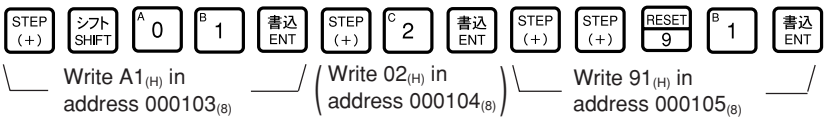
Parameter address (8)	Contents in rack No. 1
000120	Slot 0
000121	Slot 1
000122	Slot 2
000123	Slot 3
000124	Slot 4
000125	Slot 5
000126	Slot 6
000127	Slot 7
000130	Slot 8
000131	Slot 9
000132	Slot A
000133	Slot B
000134	Slot C
000135	Slot D
000136	Slot E
000137	Slot F

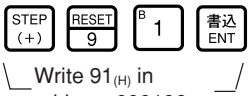
Set value(H)	Model name of the installed module
91	JW-12S, JW-13S
92	JW-32S JW-32SC, JW-33S JW-34S, JW-35S
94	JW-62SC
00 to 0F	Vacant slot 00 ↑ Lower bits are number of dummy I/O points
A1	JW-11N, JW-12N JW-13N
A2	JW-31N, JW-32N JW-34N, JW-34NC
A4	JW-64NC
D1	JW-2DA, JW-8AD JW-31LM
F1	JW-2HC, JW-11DU JW-12DU

Set $00_{(H)}$ for a slot having power supply module or slave module JW-20RS.

Ex.: Set the I/O module in the previous page using the JW-13PG







Screen display of JW-13PG

```
 00104     HEX     02
 00105     HEX     91
I PARAM.
>00106     HEX     91
```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"Only when using JW model I/O modules"

⑤ **Registration of I/O table** **[HEX (hexadecimal), byte]**

(Applied to item ⑤ on pages 8·20 to 22)

· Set in parameter address $001001_{(8)}$

Set value$_{(H)}$	Contents
60	Set both number of dummy I/O points and type of I/O module with operation described in page 8·25 and 26
64	Manual setting number of dummy I/O points and automaticl setting of I/O module type.
65	Number of dummy I/O points is 00 (number of dummy I/O points set by operatoin in page 8·25 will be 00), and set I/O module type automatically.

When setting is complete normally, set value will be $00_{(H)}$.

· When manual I/O table registration is selected, the JW-20RS automatically registers I/O address table for each rack slot into parameter address 004000 to $004077_{(8)}$.
It also stores sum check code of parameter address 000000 to $000277_{(8)}$ into parameter address $000300_{(8)}$.

Ex.: Set number of dummy I/O points and I/O module type set in page 8·25 and 26 using the JW-13PG.

Screen display of JW-13PG

```
 00777     HEX     00
 01000     HEX     00
I PARAM.
>01001     HEX     60
```

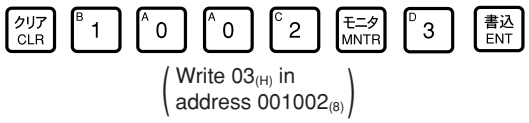
"Only when using JW model I/O module"

⑥ **Prohibit automatic registration of I/O table at inputting power** **[HEX (hexadecimal), bytes]**

(Applied to item ⑥ on pages 8·20 to 22)

· Set $03_{(H)}$ in parameter address $001002_{(H)}$ to prohibit "automatic registration of I/O table" during inputting power to the slave station module.

(In case of setting using the JW-13PG)



Screen display of JW-13PG

```
 01000     HEX     00
 01001     HEX     60
I PARAM.
>01002     HEX     03
```

Note: If $00_{(H)}$ is set to parameter address $001002_{(8)}$, the JW-20RS automatically register I/O at inputting power. If the power is reinput when an I/O module is faulty, the I/O address will automatically be registered. If the I/O module is faulty, reinput of power may register wrong I/O address. In this case use this function to prohibit wrong registration.

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"Only when using JW model I/O module"

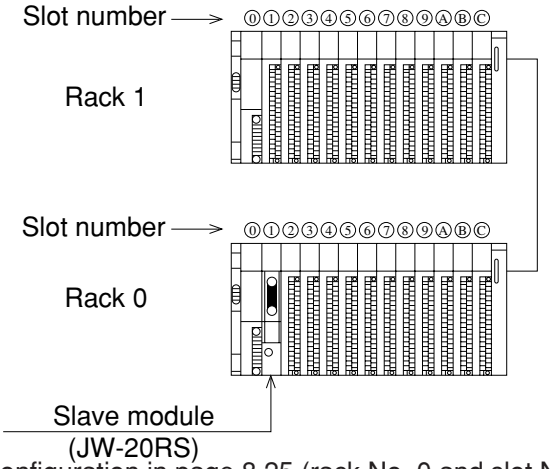
⑦ **Set maximum rack and slot numbers** **[HEX (hexadecimal), bytes]**

(Applied to item ⑦ on pages 8·20 to 22)

- Set maximum rack and slot numbers in parameter address $001000_{(8)}$ and shorten I/O processing time.
- If this is left $00_{(H)}$ (default value), the JW-20RS processes from rack No. 1 and slot number F so that it takes approximately 8 ms.
- Set rack number in upper 4 bits and slot number in lower 4 bits.

	7	6	5	4	3	2	1	0
001000(8)	Rack No.				Slot No.			

- Maximum amount of usable racks is 2 and a rack having slave module JW-20RS is rack No. 0. Even the rack panel JW-13BU is used, number of slots will be up to "C."



Ex.: Set the configuration in page 8·25 (rack No. 0 and slot No. 6) using the JW-13PG.

クリア CLR | B 1 | A 0 | A 0 | A 0 | モニタ MNTR | 6 | 書込 ENT

Display contents of address $001000_{(8)}$ — (Write $06_{(H)}$)

Screen display of JW-13PG

```
 00776     HEX     00
 00777     HEX     00
I PARAM.
>01000     HEX     06
```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"Only when using JW model I/O module"

⑧ **Setting remote I/O top address** **[OCT (octal), word]**

(Applied to item ⑧ on pages 8·20 to 22)

· In order to light a search module (SU) lamp, set remote I/O top address of each slave station which are allocated in the master station using file address into parameter address 001004 and $001005_{(8)}$.

001000(8)	Lower bits
001000(8)	Upper bits

Display on the JW-13PG

```
 01000     0  000006
 01002     0  000003
I PARAM.
>01004     0  000200
```

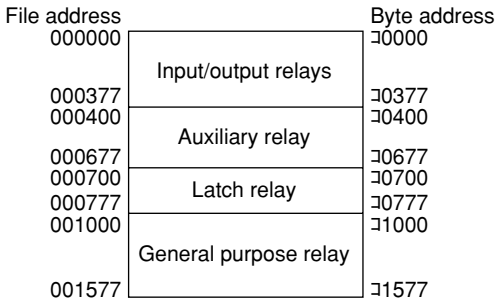
(When to set file address 000200(⊐0200) using the JW-13PG)

クリア CLR → B 1 → A 0 → A 0 → E 4 → モニタ MNTR → FORCE LNGTH (Word display) → 変換 CONV (Octal) → C 2 → A 0 → A 0 → 書込 ENT

Display contents of address $00104_{(8)}$ — Write file address $000200_{(8)}$

Remarks

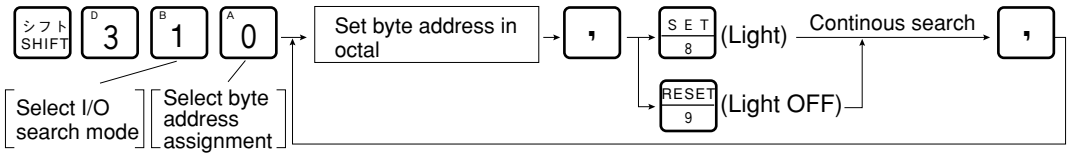
· Though input output relays, auxiliary relays etc. of the PC are allocated their byte addresses for each item, allocate the file address which are allocated throughout the memory register range.



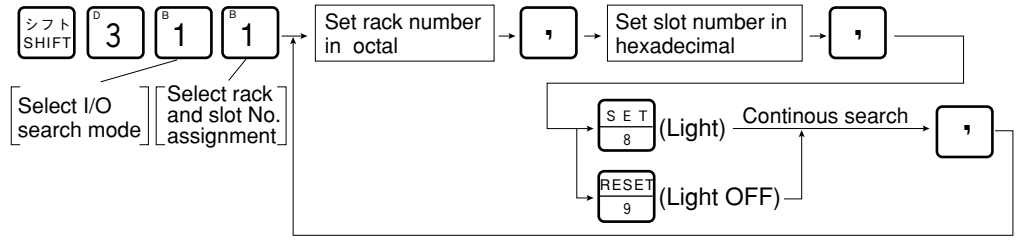
[Operation method of I/O search (slave station): In case of JW-13PG]

Connect the JW-13PG to the slave module JW-20RS in which an I/O shall be searched.

· **Assign byte address**



· **Assign rack number and slot number**



8

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(4) Parameter setting of master module (JW-20CM)

Set the following parameter address after setting switch. Setting item varies with using PC (JW model or ZW model).

O: Necessity for setting

Item	Address (8)	Initial value (H)	Setting contents	JW-PC		ZW-PC		See page
				Fixed	Manual	Fixed	Manual	
Set remote I/O operation mode	000000	00	001(8): Fixed allocation, asynchronous, error mode 1 002(8): Fixed allocation, asynchronous, error mode 2 004(8): Fixed allocation, synchronous, error mode 0 005(8): Fixed allocation, synchronous, error mode 1 006(8): Fixed allocation, synchronous, error mode 2 011(8): Manual allocation, asynchronous, error mode 1 012(8): Manual allocation, asynchronous, error mode 2 014(8): Manual allocation, synchronous, error mode 0 015(8): Manual allocation, synchronous, error mode 1 016(8): Manual allocation, synchronous, error mode 2	○	○	○	○	8· 34
Set number of connected slave stations	000001	00	Set number of connected modules by decimal notation (01 to 63)	○	○	○	○	8· 35
Set remote I/O top address	000002 000003	00	Set file address by octal notation	○	○	○	○	8· 35
Enter the remote I/O top address of slave station 02 to 77	000004 to 000177	00	Enter the file address by octal notation	—	○	—	○	8· 40
Enter the number of slave I/O points	000200	00	00(H): 64 points (8 bytes), number of slave station; 63 01(H): 128 points (16 bytes), number of slave station; 32	○	—	○	—	8· 38
Enter the number of I/O bytes for each slave station	000201 to 000277	00	Enter the number of bytes of each slave station in decimal notation (0 to 128)	—	○	—	○	8· 42
Set blank between stations	000301 to 000376	00	Enter the number of blank bytes between stations in decimal notation (0 to 255)	○	—	○	—	8· 39
Enter I/O type for each slave station	000400 to 000407	FF	Set each station in bit unit 0: ZW model I/O module 1: JW model I/O module	○	○	—	—	8· 43
Enter the data register address of the special I/O mode	000600 to 000777	00	Set using 4 bytes per module (Set slave station number, rack number, slot number, number of data bytes, and register top address.)	○ ※	○ ※	—	—	8· 44
Set top address of flag area	003764 to 003767	00	Set file address with octal notation.	○	○	○	○	8· 36
Writing to the EEPROM, start operation/stop setting	003777	01	00(H) : Stop remote I/O operation 01(H) : Start remote I/O operation 80(H) : Writing to the EEPROM, stop operation 81(H) : Writing to the EEPROM, start operation 08(H) : Initialize the parameter	○	○	○	○	8· 37

· If a special I/O module is not set in a slave station, the setting is not required.

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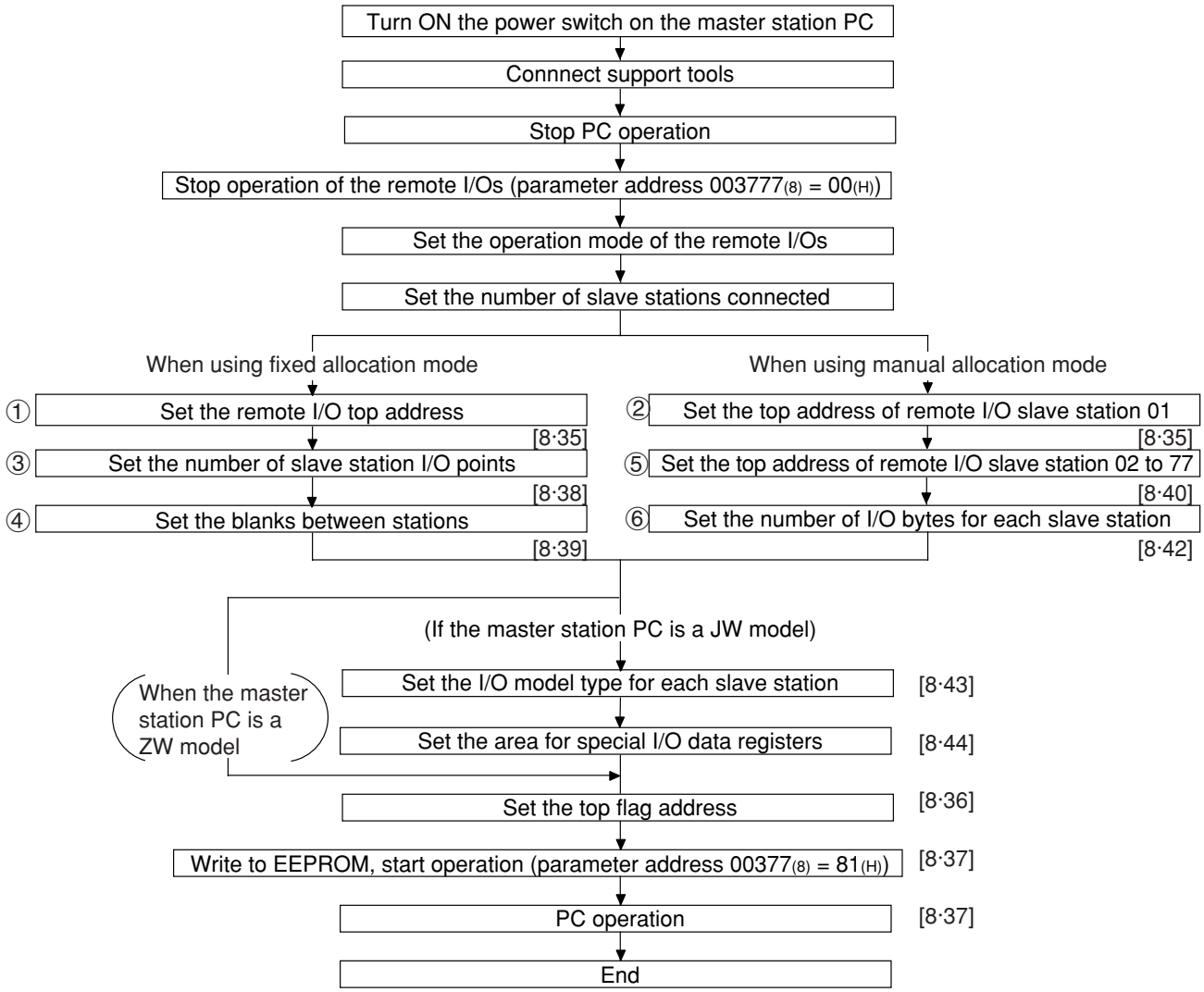
In brackets: See page

Operation procedure



Steps ① to ⑧ correspond to the steps on pages 8·38 to 8·44.

8

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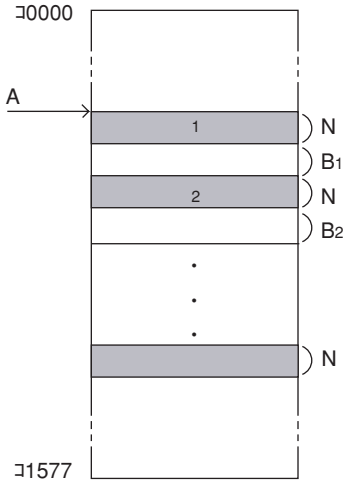
Parameter setting range

<Fixed allocation>

· When fixed allocation is used, set parameter within the range shown below:



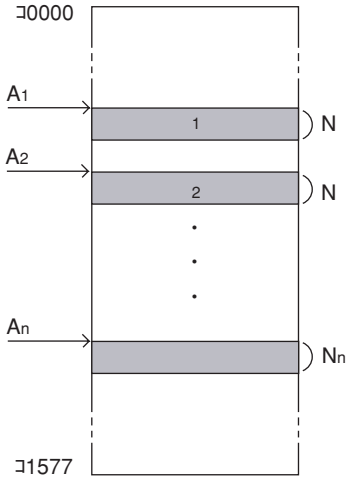
1 to n : Number of slave stations (1 ≦ n ≦ 32 or 63)
A : Remote I/O top address
N : Number of slave station I/O points (fixed to 64 points or 128 points)
B_1 to B_n : Blank between stations

(Setting of JW model special I/O module)

Data register	0 to 128 bytes in total per remote slave station 0 to 512 bytes in total of all stations
Number of modules	Up to 8 modules per remote slave station Up to 32 modules in total of all stations

<Manual allocation>

· When the manual allocation is used, set parameter within the range shown below:



1 to n : Number of slave stations (1 ≦ n ≦ 63)
A_1 to A_n : Remote I/O top address
N_1 to N_n : Number of slave station I/O bytes ($0 \leqq N_n \leqq 128$)
$N_1 + N_2 + \cdots + N_n \leqq 512$

$A_1 \leqq A_2 \leqq \cdots \leqq A_n$

(Setting of JW model special I/O module)

Data register	0 to 128 bytes in total per remote slave station 0 to 512 bytes in total of all stations
Number of modules	Up to 8 modules per remote slave station Up to 32 modules in total of all stations

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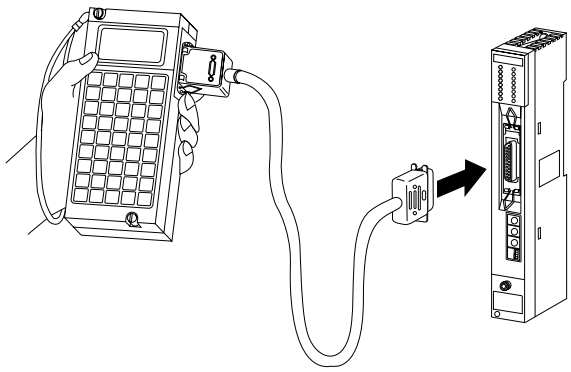
Turn "ON" the power of master module

Connect support tools



· Connect a support tool with the JW-20CM master module and prepare the setting parameter.

<Usable support tools>
JW-13PG/12PG
JW-50SP
JW-50PG, Z-100LP2S

· For operation of each support tool, see the instruction manual attached. The following describes an example of JW-13PG's key operation.

Stop PC operation

· Turn to program mode (stop PC operation). Setting of parameters is only available when the PC is in program mode.

(Operation example of JW-13PG)

[*] [*] [PROG MODE] [SET 8] → Stop PC operation

[クリア CLR] [*] [*] [シフト SHIFT] [INTL DISP] [SET 8] [B 1] → Select parameter setting mode.

Select initial mode — (Parameter setting)

Stop operation of remote I/O **[HEX (hexadecimal), byte]**

· Setting of the parameter is only available when the operation of the JW-20CM is stopped.
· Write "$00_{(H)}$" to parameter address $007777_{(8)}$ and stop operation of the JW-20CM.

(Operation example of JW-13PG)

[D 3] [7] [7] [7] [モニタ MNTR] [A 0] [書込 ENT]

Display the contents of parameter address 003777 by hexadecimal.

(Write $00_{(H)}$.)

Screen display of JW-13PG

```
 03775     HEX     00
 03776     HEX     00
I PARAM.
>03777     HEX     00
```

Reference **Function of JW-13PG**

• [変換 CONV] key: Changeover unit of figures

→HEX (hexadecimal) → OCT (octal) → DCM (decimal) →Bit pattern

• [PROG MODE] key: Byte display ⟷ Changeover word display

To the next page

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From the previous page

Set remote I/O operation mode **[OCT (octal, word)]**

· Set operation method of the remote I/O into parameter address $000000_{(8)}$.

Set value(8)	Operation method		
	Operation when a slave station error occurs	Communication method	Allocation of I/O address
001	• Remote I/O operation (communication) stops. • The PC continues operation. (Mode 1)	Asynchronous	Fixed allocation
002	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)		
004	• Remote I/O operation (communication) stops. • The PC also stops operation. (Mode 0)	Synchronous	
005	• Remote I/O operation (communication) stops. • The PC continues operation. (Mode 1)		
006	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)		
011	• Remote I/O operation (communication) stops. • The PC continues operation. (Mode 1)	Asynchronous	Manual allocation
012	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)		
014	• Remote I/O operation (communication) stops. • The PC also stops operation. (Mode 0)	Synchronous	
015	• Remote I/O operation (communication) stops. • The PC continues operation. (Mode 1)		
016	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)		

· Concerning the contents of "synchronous" and "asynchronous" communications, see page 8·4 "Communication timing."

(Set "slave station operation at error: mode 0" and "communication method: synchronous" and "address allocation: manual")

クリア CLR　モニタ MNTR
(Display the contents of $000000_{(8)}$)

変換 CONV　B 1　E 4　書込 ENT
(After converting to octal notation, write it at $014_{(8)}$.)

Screen display of JW-13PG

```
 17776     OCT  000
 17777     OCT  000
I PARAM.
>00000     OCT  014
```

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From the previous page

Set number of connected slave stations **[DCM (decimal), byte]**

· Set number of connected remote I/O slave stations into parameter address $000001_{(8)}$.
· Maximum number of connectable slave stations varies with setting value of I/O points per slave station.

Number of I/O points	Number of connected modules
64 points/station	0 to $63_{(D)}$
128 points/station	0 to $32_{(D)}$

Initial value: $00_{(H)}$

(When to set $10_{(D)}$ using the JW-13PG)

STEP (+) 変換 CONV B 1 A 0 書込 ENT → Write setting value $10_{(D)}$ in address $000001_{(8)}$ after converted into decimal notation.

Screen display of JW-13PG

```
 17777     DCM    000
 00000     DCM    012
I PARAM.
>00001     DCM    010
```

"Only when using fixed allocation mode"

① **Set remote I/O top address** **[OCT (octal, word)]**

"Only when using manual allocation mode"

② **Set remote I/O top address of slave station 01** **[OCT (octal), word]**

· Set remote I/O top address to parameter address 000002 and $000003_{(8)}$ with file address (see page 8·32 and 13·20). (slave station 01 when free allocation is selected.).

$000002_{(8)}$	Lower bits
$000003_{(8)}$	Upper bits

Initial value: $00_{(H)}$

(In case of setting file address 000200(⊐0200) using the JW-13PG)

STEP (+) FORCE LNGTH (Word display) 変換 CONV 変換 CONV 変換 CONV C 2 A 0 A 0 書込 ENT

After converting into octal notation, write in file address $000200_{(8)}$.

Screen display of JW-13PG

```
 17776     0   000000
 00000     0   005014
I PARAM.
>00002     0   000200
```

· **Set step ③ to ⑧ starting from page 8·38 with cases of fixed/manual allocation and ZW or JW series PC.**

To the next page

· Steps ① to ⑧ above correspond to each step in operation procedures in page 8·31.

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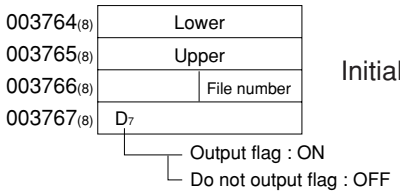
From the previous page

Set top address of flag area

OCT (octal), word
MET (hexadecimal), byte

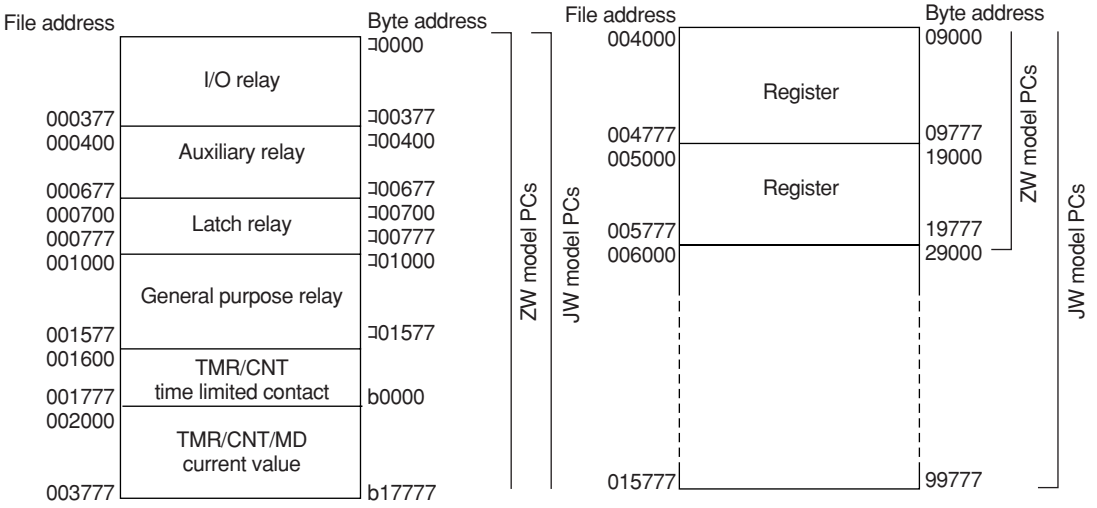
· Set the top address of the flag area (8 bytes) in order to monitor the communication condition and PC operation condition on the parameter address 003764 to $003767_{(8)}$.
· Flag area uses 8 bytes regardless number of connecting stations.



Initial value: $00_{(H)}$ for all addresses

Remarks

· The PC's input/output relays, auxiliary relays, registers etc. are all allocated individual byte addresses for each item. However, the JW-20CM can assign these addresses with file addressees allocated throughout the memory.



· The usable file numbers will vary with the memory module that is installed on the PC.

Name of memory module	Usable file numbers
ZW-1MA, JW-1MAH	0 or 1※
ZW-2MA, JW-2MAH	0 or 1
ZW-3MA, JW-3MAH	0, 1, 2
ZW-4MA, JW-4MAH	0, 1, 2, 3, 4, 5, 6, 7

※ If file number is 1, file address shall be within 000000 to $037777_{(8)}$.
(See page 13·20 and 21 for other cases.)

(In case of setting file address 000700 (Ↄ0700) using the JW-13PG)

クリア CLR | D 3 | 7 | 6 | E 4 | モニタ MNTR | FORCE LNGTH | 変換 CONV | 7 | A 0 | A 0 | 書込 ENT

Write in file address $003764_{(8)}$. (Word display) Write in file address $000700_{(8)}$.

STEP (+) | FORCE LNGTH | 変換 CONV | 変換 CONV | 変換 CONV | A 0 | 書込 ENT | STEP (+) | SET 8 | A 0 | 書込 ENT

(Byte display)
After converting into byte display to $003766_{(8)}$, write in file number 0 in hexadecimal notation.
Write (80(H)) to output to a flag in $003767_{(8)}$

Screen display of JW-13PG

```
 03765      HEX     01
 03766      HEX     00
I PARAM.
>03767      HEX     80
```

To the next page

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From the previous page

Writing to the EEPROM of the JW-20CM, start operation [HEX (hexadecimal), byte]

· Write "$81_{(H)}$" into parameter address $003777_{(8)}$ and write the set parameter contents into the EEPROM of the JW-20CM. Then start the remote I/O operate.
· After starting operation, the setting value changes to "$01_{(H)}$."

Setting value (H)	Contents
0 0(H)	Stop operation of the remote I/O (initial value)
0 1	· Calculate BCC of parameter addresses 000000 to 003775(8). When normal, the remote I/O will start operation. When abnormal, the module will output error code BE(H).
8 0(H)	① Check the parameter contents When normal, the module calculates BCC and writes the check sum value into address 003776(8). When abnormal, it outputs a BF(H) error code. ② Changes the value to 00(H) (stops the operation of the remote I/O), and writes it into the EEPROM. If a write error to the EEPROM occurs, it outputs a 30(H) error code and keeps the value set to 80(H). Writing to the EEPROM of the JW-20CM, start operation
8 1(H)	① Check the parameter contents When normal, the module calculates BCC and writes the check sum value into address 003776(8). When abnormal, it outputs a BF(H) error code. ② Changes the value to 01(H) (starts the operation of the remote I/O), and writes it into the EEPROM. If a write error to the EEPROM occurs, it outputs a 30(H) error code and keeps the value set to 81(H). Writing to the EEPROM of the JW-20CM, start operation
0 8	Initialize setting values of parameter addresses 000000 to 003777(8)

(Operation example of JW-13PG)

アドレス ADRS | D 3 | 7 | 7 | 7 | モニタ MNTR | SET 8 | B 1 | 書込 ENT

Display the contents of address 003777(8) — Write 81(H)

Screen display of JW-13PG

```
 03775     HEX     00
 03776     HEX     00
I PARAM.
>03777     HEX     01
```

PC operation

Turning a master station PC to monitor or change mode (PC operation).

(Operation example of JW-13PG)

* | * | MNTR MODE | SET 8 → Monitor mode

* | * | CHNG MODE | SET 8 → Change mode

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"Only when using fixed allocation"

③ **Enter the number of slave station I/O points** **[HEX (hexadecimal), bytes]**

(Applied to item ③ on pages 8·31 and 8·35)

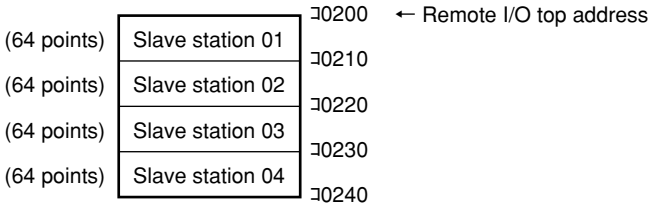
· Store the number of I/O points per slave station at parameter address $000200_{(8)}$.

· The number of slave stations that can be connected varies with the setting for the number of I/O points per slave station.

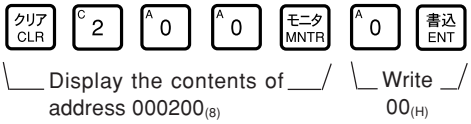
Set value	Number of I/O points	Number of modules that can be connected.
$00_{(H)}$	64 points/station	0 to $63_{(D)}$
$01_{(H)}$	128 points/station	0 to $32_{(D)}$

Initial value: $00_{(H)}$

· Allocates the number of I/O points per slave station as 64 points per unit or 128 points per unit, starting from the top address set by the procedure on the previous page.
Ex.: When a remote I/O's top address is ⊐0200 and the number of slave station I/O points is 64.



(When set for 64 points per station using the JW-13PG)



Screen display of JW-13PG

```
 00176     HEX     00
 00177     HEX     00
I PARAM.
>00200     HEX     00
```

8

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"Only when using fixed allocation"

④ **Set blanks between stations** **[DCM (decimal), bytes]**

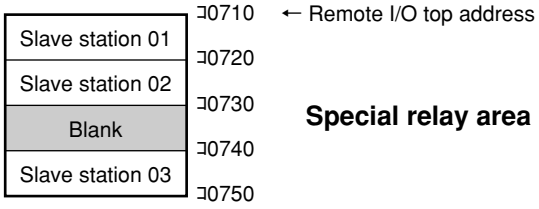
(Applied to item ④ on pages 8·31 and 8·35)

· Enter the number of blank bytes for each slave station at parameter addresses 000301 to $000376_{(8)}$.
· Enter only the number of blank stations needed using 0 to $255_{(D)}$ bytes.

Address(8)	Stations(8)	Address(8)	Stations(8)	Address(8)	Stations(8)	Address(8)	Stations(8)
-	-	000320	20 to 21	000340	40 to 41	000360	60 to 61
000301	1 to 2	000321	21 to 22	000341	41 to 42	000361	61 to 62
000302	2 to 3	000322	22 to 23	000342	42 to 43	000362	62 to 63
000303	3 to 4	000323	23 to 24	000343	43 to 44	000363	63 to 64
000304	4 to 5	000324	24 to 25	000344	44 to 45	000364	64 to 65
000305	5 to 6	000325	25 to 26	000345	45 to 46	000365	65 to 66
000306	6 to 7	000326	26 to 27	000346	46 to 47	000366	66 to 67
000307	7 to 10	000327	27 to 30	000347	47 to 50	000367	67 to 70
000310	10 to 11	000330	30 to 31	000350	50 to 51	000370	70 to 71
000311	11 to 12	000331	31 to 32	000351	51 to 52	000371	71 to 72
000312	12 to 13	000332	32 to 33	000352	52 to 53	000372	72 to 73
000313	13 to 14	000333	33 to 34	000353	53 to 54	000373	73 to 74
000314	14 to 15	000334	34 to 35	000354	54 to 55	000374	74 to 75
000315	15 to 16	000335	35 to 36	000355	55 to 56	000375	75 to 76
000316	16 to 17	000336	36 to 37	000356	56 to 57	000376	76 to 77
000317	17 to 20	000337	37 to 40	000357	57 to 60	-	-

Initial value: $00_{(H)}$ in all addresses

Ex.: In case of setting as blanks in slave stations 2 to 3 to prevent double use of the 8 bytes in the special relay area (⊐0730 to ⊐0737)



Display the contents of address $000302_{(8)}$

After converting to decimal notation, write it at $8_{(D)}$.

Screen display of JW-13PG

```
 00300     DCM    000
 00301     DCM    000
I PARAM.
>00302     DCM    008
```

8

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"Only when using manual allocation"

⑤ **Enter the I/O top addresses of slave stations 02 to 77** **[OCT (octal), words]**

(Applied to item ⑤ on pages 8·31 and 8·35)

· Enter the remote I/O top address for each slave station at parameter addresses 000004 to $000177_{(8)}$, using file addresses.

· "Single address" or "continuous address" can be selected by setting the upper bit (D_7) in the 2nd byte.

$000004_{(8)}$ Lower bit

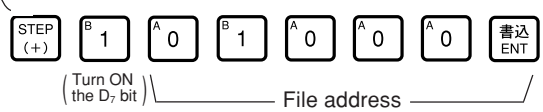
$000005_{(8)}$ Upper bit

Initial value: $00_{(H)}$ in all addresses

- ON : Single address (enter only the slave station)
- OFF : Continuous address (continue from the previous slave station. It is not possible to change the address value.)

Address (8)	Slave station number(8)	Address (8)	Slave station number(8)	Address (8)	Slave station number(8)	Address (8)	Slave station number(8)
-	-	000040 000041	20	000100 000101	40	000140 000141	60
- -	- -	000042 000043	21	000102 000103	41	000142 000143	61
000004 000005	02	000044 000045	22	000104 000105	42	000144 000145	62
000006 000007	03	000046 000047	23	000106 000107	43	000146 000147	63
000010 000011	04	000050 000051	24	000110 000111	44	000150 000151	64
000012 000013	05	000052 000053	25	000112 000113	45	000152 000153	65
000014 000015	06	000054 000055	26	000114 000115	46	000154 000155	66
000016 000017	07	000056 000057	27	000116 000117	47	000156 000157	67
000020 000021	10	000060 000061	30	000120 000121	50	000160 000161	70
000022 000023	11	000062 000063	31	000122 000123	51	000162 000163	71
000024 000025	12	000064 000065	32	000124 000125	52	000164 000165	72
000026 000027	13	000066 000067	33	000126 000127	53	000166 000167	73
000030 000031	14	000070 000071	34	000130 000131	54	000170 000171	74
000032 000033	15	000072 000073	35	000132 000133	55	000172 000173	75
000034 000035	16	000074 000075	36	000134 000135	56	000174 000175	76
000036 000037	17	000076 000077	37	000136 000137	57	000176 000177	77

‹. Enter a single file address 001000 (∃100) at the remote I/O top address on slave station 0 using the JW-13PG.



Screen display of JW-13PG

```
 00000    0  005014
 00002    0  000200
I PARAM.
>00004    0  101000
```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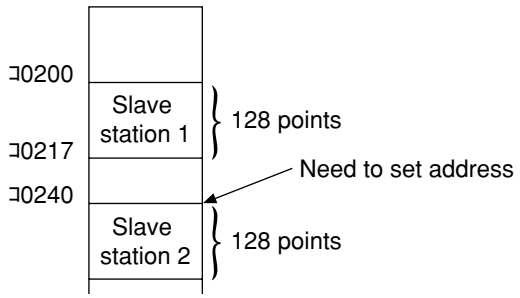
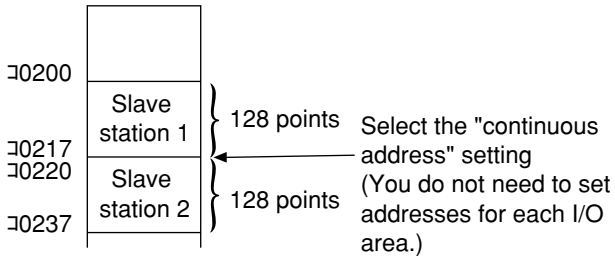
[Single address and continuous address]

· If a slave station's I/O area is not linked to the previous slave station's I/O area, this slave station should be set as a "single address slave station ."



· If a slave station's I/O area is linked to the previous slave station's I/O area, you do not have to set the address this slave station if "continuous address" is selected (turn OFF the D_7 bit in the address's upper byte).



· If "continuous address" is selected, the address changes in the previous slave station (the top I/O address in slave station 1 in the example above) will automatically changes the addresses of the linked slave stations accordingly.
If you want to disable automatic address changes, select the "single address" mode, even if the slave station address is in a continuous series with the previous slave station addresses. Then enter the address of the slave station manually.

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"Only when using manual allocation "

⑥ **Enter the number of I/O bytes for each slave station** **[DCM (decimal), byte]**

(Applied to item ⑥ on pages 8·31 and 8·35)

· Enter the number of I/O bytes per slave station at parameter addresses 000201 to $000277_{(8)}$.
· Enter the number of I/O bytes per slave station (1 to 128 bytes) in decimal notation. Entering a value greater than 128 is treated as an error.

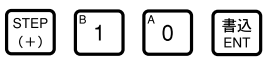
Address (8)	Slave station number(8)	Address (8)	Slave station number(8)	Address (8)	Slave station number(8)	Address (8)	Slave station number(8)
-	-	000220	20	000240	40	000260	60
000201	01	000221	21	000241	41	000261	61
000202	02	000222	22	000242	42	000262	62
000203	03	000223	23	000243	43	000263	63
000204	04	000224	24	000244	44	000264	64
000205	05	000225	25	000245	45	000265	65
000206	06	000226	26	000246	46	000266	66
000207	07	000227	27	000247	47	000267	67
000210	10	000230	30	000250	50	000270	70
000211	11	000231	31	000251	51	000271	71
000212	12	000232	32	000252	52	000272	72
000213	13	000233	33	000253	53	000273	73
000214	14	000234	34	000254	54	000274	74
000215	15	000235	35	000255	55	000275	75
000216	16	000236	36	000256	56	000276	76
000217	17	000237	37	000257	57	000277	77

Initial value: $00_{(H)}$ in all addresses

Ex. Assign 8 bytes (64 points) to slave station 01 and 10 bytes (80 points) to slave station 02 using the JW-13PG.

Display the contents of address $000201_{(8)}$

After converting into decimal notation, write the result in $8_{(D)}$.



Write $10_{(D)}$ at address $000202_{(8)}$.

Screen display of JW-13PG

```
 00200     DCM   000
 00201     DCM   008
I PARAM.
>00202     DCM   010
```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"Only when the master station is a JW model"

⑦ **Enter the I/O type for each slave station** **[Bit pattern, bytes]**

(Applied to item ⑦ on pages 8·31 and 8·35)

· Declare whether the I/O module installed in each slave station (01 to $77_{(8)}$) is a "JW model" or a "ZW model" at parameter address 000400 to $000407_{(8)}$.

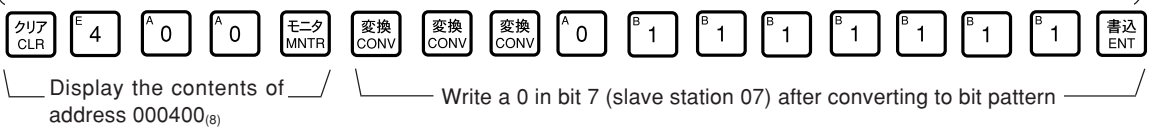
· Set the bit corresponding each slave station to 0 (OFF) if it is a ZW model, or 1 (ON) if it is a JW model.

Set value	Enter the value of the I/O type
0 (OFF)	ZW model
1 (ON)	JW model

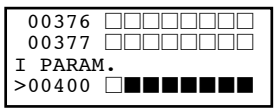
Parameter addresses$_{(8)}$	Corresponding to the slave station number$_{(8)}$							
	7	6	5	4	3	2	1	0
000400	07	06	05	04	03	02	01	-
000401	17	16	15	14	13	12	11	10
000402	27	26	25	24	23	22	21	20
000403	37	36	35	34	33	32	31	30
000404	47	46	45	44	43	42	41	40
000405	57	56	55	54	53	52	51	50
000406	67	66	65	64	63	62	61	60
000407	77	76	75	74	73	72	71	70

Initial value: $FF_{(H)}$ in all addresses

Ex. Make slave station 07 a "ZW model" and all the other slave stations JW models, using the JW-13PG.



Screen display of JW-13PG



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"Only when the master station PC is a JW model and a JW model special I/O module is used as a slave station"

⑧ **Enter the data register address of the special I/O module**

(Applied to item ⑧ on pages 8·31 and 8·35)

Station number: OCT (octal), bytes
Rack and slot numbers: HEX (hexadecimal), bytes
Number of data bytes: DCM (decimal), bytes
Register top address: OCT (octal), bytes

· Since the special I/O module uses an I/O relay area and a data memory area, you have to enter slave station numbers, rack/slot numbers, the number of data bytes, and the top register addresses of the slave station which contains the special I/O module at parameter address 000600 to $000777_{(8)}$.

· Use 4 bytes of memory to assign one special I/O module.

Parameter address (8)	Set contents	Special I/O number
000600	Slave station number (00 to $77_{(8)}$)	No.1
000601	Upper 4 bits: Rack number (0 or 1) Lower 4 bits: Slot number (00 to $0F_{(H)}$)	
000602	Number of data bytes (01 to $64_{(D)}$)	
000603	Top register address (file address) D7 bit: 1 for set, 0 for not set.	
to	to	to
000774	Slave station number (00 to $77_{(8)}$)	No.32
000775	Upper 4 bits: Rack number (0 or 1) Lower 4 bits: Slot number (00 to $0F_{(H)}$)	
000776	Number of data bytes (01 to $64_{(D)}$)	
000777	Top register address (file address) D7 bit: 1 for set, 0 for not set.	

Initial value: $00_{(H)}$ in all addresses

8

■ Number of data bytes

Enter the number of bytes that the special I/O module uses for data exchange.
A maximum of 128 bytes can be assigned per station. A maximum of 512 byes can be assigned to all stations.

Special I/O module model name	Number of data bytes
JW-8AD (analog input)	36 bytes
JW-2DA (analog output)	8 bytes
JW-2HC (high speed counter)	8 bytes
JW-31LM (I/O link master station)	2 to 6 bytes
JW-11DU/12DU (ID control module)	64 bytes max.
JW-12PM (positioning module)	16 bytes

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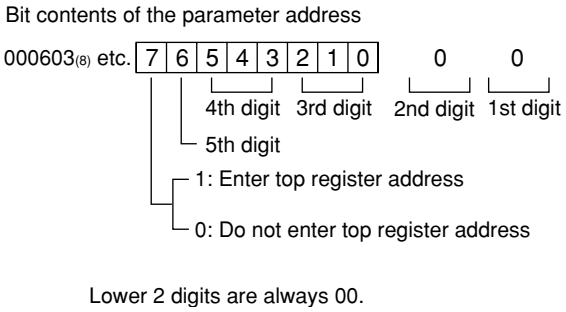
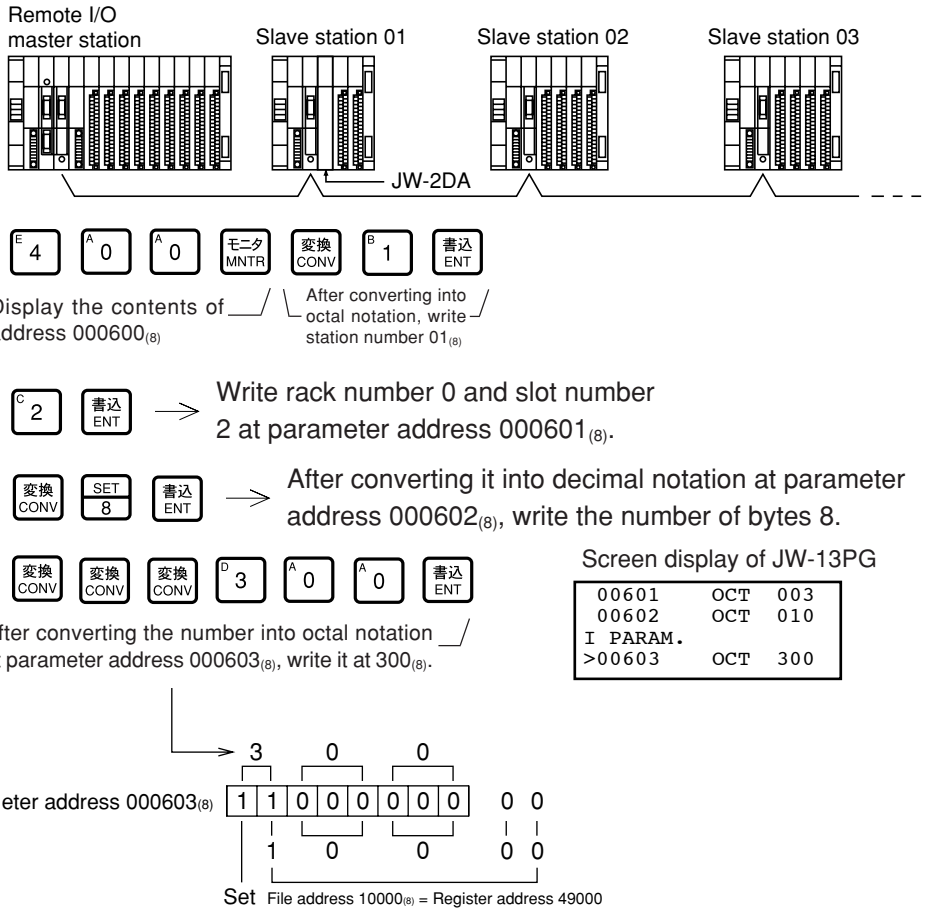
■ Top register address

Enter top address of each special I/O module, which can be allocated up to 64 points per unit, at file addresses 000000 to $017700_{(8)}$.



Ex.: Set a JW-2DA (8 data bytes and a top register address of 490000) installed in "slave station number 01," "rack number 0," "slot number 2" and assigned as No. 1 (1st module) using the JW-13PG.



8

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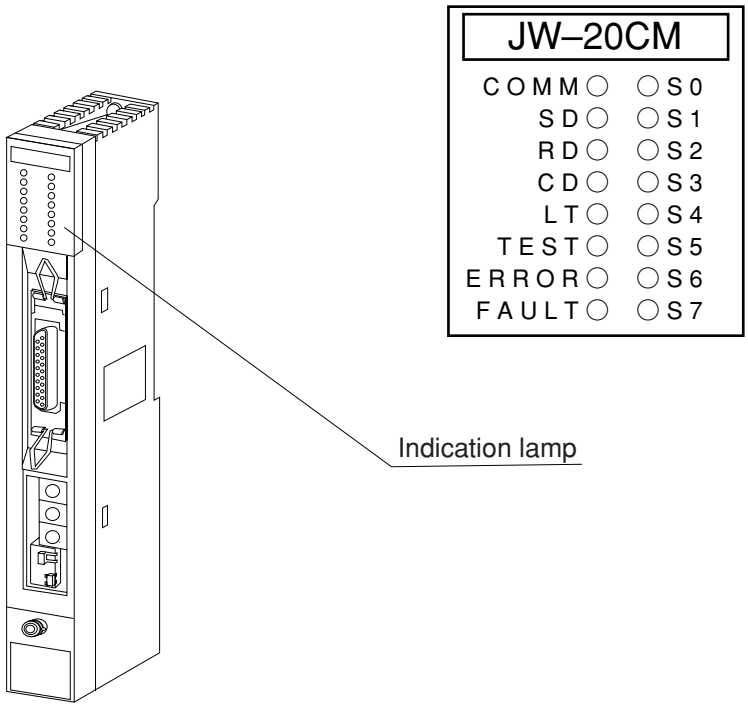
8-4 Error and treatment

Operation status of the JW-20CM can be check by indication lamps, flags, or system memory.

(1) Indication lamp

① JW-20CM



8

Name	Operation	Recovery
COMM	Lights while the remote I/O is operating	————————
SD	Flickers while sending data	————————
RD	Flickers while receiving data	————————
CD	Flickers while detecting a carrier	————————
LT	Lights when the termination resistance switches turned ON	————————
TEST	Lights while testing	————————
ERROR	Lights while an error is detected (Indicate error code by S0 to S7 LEDs)	· Check disconnection of communication cable · Check settings of switches · Check settings of parameter · Check power supply voltage.
FAULT	Lights when the watchdog timer is time up (JW-20CM is faulty)	Replace the JW-20CM
S0 to S7	Indicates error codes by hexadecimal when an error is occurred	See the next page

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(Error code)

LED name								Error code (HEX)	Cause	Measure
S7	6	5	4	3	2	1	S0			
○	○	○	○	○	○	○	●	$01_{(H)}$	ROM error, upper CPU	Replace the JW-20CM
○	○	○	○	○	○	●	○	$02_{(H)}$	RAM error, upper CPU	
○	○	○	○	○	○	●	●	$03_{(H)}$	2 port RAM error against PC, upper CPU	
○	○	○	○	○	●	○	○	$04_{(H)}$	2 port RAM error against communication CPU, upper CPU	
○	○	○	●	○	○	○	●	$11_{(H)}$	ROM error, communication CPU	• Check the communication cable • Check for doubled allocation of slave station number • Replace the JW-20CM
○	○	○	●	○	○	●	○	$12_{(H)}$	RAM error, communication CPU	
○	○	○	●	●	○	○	○	$18_{(H)}$	Communication LSI error, communication CPU	
○	○	○	●	●	●	●	●	$1F_{(H)}$	No response, communication CPU	
○	○	●	○	○	○	○	○	$20_{(H)}$	More than one token detected	Check the parameter setting and switch setting.
○	○	●	○	○	○	○	●	$21_{(H)}$	Doubled address detected	
○	○	●	○	○	○	●	○	$22_{(H)}$	Fault of sending section	• Replace the JW-20CM • Check the communication cable
○	○	●	○	○	○	●	●	$23_{(H)}$	Token does not return within the rated interval	
○	○	●	○	●	○	●	○	$2A_{(H)}$	Overflow of receiving buffer. Occurs when the upper CPU processing is delayed.	Check the communication cable
○	○	●	○	●	○	●	●	$2B_{(H)}$	Flame length error • Occurs because of a media execution error or noise from outside.	
○	○	●	○	●	●	○	○	$2C_{(H)}$	Media error	
○	○	●	●	○	○	○	○	$30_{(H)}$	EEPROM error	Check the communication cable Replace the JW-20CM
●	○	●	●	●	●	●	○	$BE_{(H)}$	BCC error	Check the parameter contents.
●	○	●	●	●	●	●	●	$BF_{(H)}$	Parameter setting error	
●	●	○	○	○	○	○	●	※$C1_{(H)}$	Communication error • After converting into octal, the lower two digits represent the slave station number of the current error. (Ex. $01_{(H)} = 301_{(8)}$ = slave station 01)	Check the communication cable and slave module
to								to		
●	●	●	●	●	●	●	●	※$FF_{(H)}$		

● : ON, ○ : OFF

Remarks

- Error codes “23” and “$2A_{(H)}$” may occur when applying power. This is not an error.
- To check the communication cable, remove both connectors and short the connector terminals at one end. Then measure the conductivity using a tester.
- Check the parameter and switch settings for all stations. If the settings are correct, replace the JW-20CM or JW-20RS.

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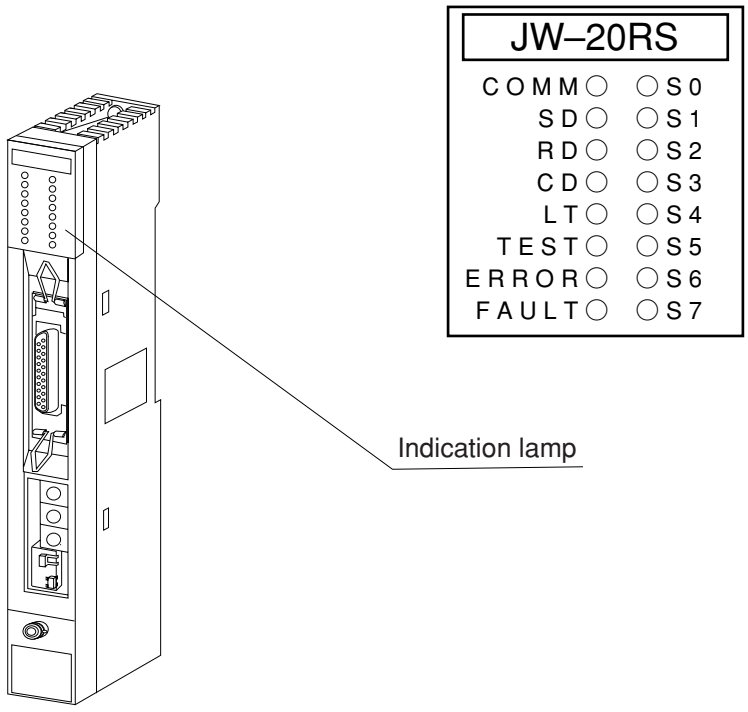
② JW-20RS



Name	Operation	Recovery
COMM	Lights while the remote I/O is operating	———————————
SD	Flickers while sending data	———————————
RD	Flickers while receiving data	———————————
CD	Flickers while detecting a carrier	———————————
LT	Lights when the termination resistance switches turned ON	———————————
TEST	Lights while testing	———————————
ERROR	Lights while an error is detected (Indicate error code by S0 to S7 LEDs)	· Check disconnection of communication cable · Check settings of switches · Check settings of parameter · Check power supply voltage.
FAULT	Lights when the watchdog timer is time up (JW-20RS is faulty)	Replace the JW-20RS
S0 to S7	Indicates error codes by hexadecimal when an error is occurred	See the next page

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(Error code)

LED name								Error code (HEX)	Cause	Measure
S7	6	5	4	3	2	1	S0			
○	○	○	○	○	○	○	●	$01_{(H)}$	ROM error, upper CPU	Replace the JW-20RS
○	○	○	○	○	○	●	○	$02_{(H)}$	RAM error, upper CPU	
○	○	○	○	○	○	●	●	$03_{(H)}$	2 port RAM error against PC, upper CPU	
○	○	○	○	○	●	○	○	$04_{(H)}$	2 port RAM error against communication CPU, upper CPU	
○	○	○	●	○	○	○	●	$11_{(H)}$	ROM error, communication CPU	
○	○	○	●	○	○	●	●	$13_{(H)}$	RAM error, communication CPU	• Check the communication cable • Check for doubled allocation of slave station number • Replace the JW-20RS
○	○	○	●	●	○	○	○	$18_{(H)}$	Communication LSI error, communication CPU	
○	○	●	○	○	○	○	○	$20_{(H)}$	More than one token detected	
○	○	●	○	○	○	○	●	$21_{(H)}$	Doubled address detected	
○	○	●	○	○	○	●	○	$22_{(H)}$	Fault of sending section	Replace the JW-20RS
○	○	●	○	○	○	●	●	$23_{(H)}$	Token does not return within the rated interval	• Check the communication cable • Replace the JW-20RS
○	○	●	○	●	○	●	○	$2A_{(H)}$	Overflow of receiving buffer. Occurs when the upper CPU processing is delayed.	Check the communication cable
○	○	●	○	●	○	●	●	$2B_{(H)}$	Flame length error • Occurs because of a media execution error or noise from outside.	
○	○	●	○	●	●	○	○	$2C_{(H)}$	Media error	
○	○	●	○	●	●	●	○	$2E_{(H)}$	Synchronization between master and slave station is deviated	• Reinput the power • Decrease load of slave station
○	○	●	●	○	○	○	○	$30_{(H)}$	EEPROM error	• Check the communication cable • Replace the JW-20RS
●	○	○	●	●	●	●	○	$90_{(H)}$	I/O bus error	• Check I/O module, option cables
●	○	○	○	○	○	○	●	$91_{(H)}$	I/O signal error	
●	○	○	●	○	○	●	○	$92_{(H)}$	Mismatch number of I/O points	
●	○	○	●	○	○	●	●	$93_{(H)}$	Interrupted data from master station	Check the communication cable and master module
●	○	○	●	○	●	○	○	$94_{(H)}$	Defected power failure at I/O processing	Check power supply
●	○	○	●	○	●	○	●	$95_{(H)}$	Master station PC error	Check master station PC, master module, or communication cable
●	○	○	●	●	●	●	○	$9E_{(H)}$	BCC error	Check parameter contents
●	○	○	●	●	●	●	●	$9F_{(H)}$	Parameter setting error	

● : ON, ○ : OFF

Remarks

- Error codes “23” and “$2A_{(H)}$” may occur when applying power. This is not an error.
- To check the communication cable, remove both connectors and short the connector terminals at one end. Then measure the conductivity using a tester.
- Check the parameter and switch settings for all stations. If the settings are correct, replace the JW-20CM or JW-20RS.

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(I/O error code of JW model)

LED name								Error code (HEX)	Cause	Measure
80	40	20	10	8	4	2	1			
●	○	○	●	○	●	●	●	$97_{(H)}$	I/O table error	Register I/O table Replace the JW-20RS
●	○	○	●	●	○	○	○	$98_{(H)}$	Input data parity error	Replace basic rack panel, extension cable, I/O module, or register I/O table.
●	○	○	●	●	○	○	●	$99_{(H)}$	Output data error	
●	○	○	●	●	○	●	○	$9A_{(H)}$	I/O table registration error	
●	○	○	●	●	○	●	●	$9B_{(H)}$	Special I/O module error	
●	○	○	●	●	●	○	○	$9C_{(H)}$	Blown fuse	Replace the fuse

- When error numbers 98 through $9C_{(H)}$ occur, the module will store “rack No.” and “slot No.” in the parameter address $005000_{(8)}$ in the JW-20RS.

Parameter address	D7 D6 D5 D4	D3 D2 D1 D0
$005000_{(8)}$	Rack No.	Slot No.

When more than one module has and error, the lowest “rack No.” and “slot No.” will be stored.

- A special I/O module error ($9B_{(H)}$) can be detected by the JW-2DA/8AD/11DU/12DU/12PM. When the JW-2DA/12PM detects this error, you can also assume that there is a problem in the 24 V power supply.
- A fuse blown error ($9C_{(H)}$) can be detected by JW-12S/13S/32S/33S/35S.

If the error cannot be eliminated after replacing the module in which the error occurred, check the modules in the JW-20RS and then in the rack panel.

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③ PC body and JW-20CM, JW-20RS

The operating status of the remote master station and slave stations will vary according to the operation, stop, error, and power failure conditions in the PC as follows. For output hold switch in detail, see page 8·15

●: Light ON, ⊗: Blinks, No mark: Lights OFF

PC body operational condition	Power supply module		PC body				JW-20CM Indication lamps							
	Halt output HALT	Power lamp POWER	Indicator: Operating RUN	Indicator: Error FAULT	Flag relay	System memory #170 to #177	COMM	SD	RD	CD	ERROR	TEST	FAULT	S_0 to S_7
Operating at normal	Close	●	●		ON	Hold	●	⊗	⊗	⊗				
Stop at normal	Open	●	⊗		ON	Hold	●	⊗	⊗	⊗				
Error	Open	●		●	Not fixed	Hold	●	⊗	⊗	⊗	●			
Remote master station error	Open	●		●	Not fixed	Hold	●						●	

PC body operational condition	Power supply module		JW-20RS Indication lamps										
	Halt output HALT	Power lamp POWER	Condition of output module: Output hold switch “HOLD”	Condition of output module: Output hold switch “RST”	COMM	SD	RD	CD	ERROR	TEST	FAULT	S_0 to S_7
Operating at normal	Close	●	—	—	●	⊗	⊗	⊗				
Stop at normal	Open	●	Hold	Reset		⊗	⊗	⊗			●	※
Error	Open	●	Reset	Reset		⊗	⊗	⊗	●		●	Error code
Remote master station error	Open	●	Reset	Reset		Not fixed			●		●	Error code
PC power in OFF	Open	●	Reset	Reset		Not Fixed			●		●	Error code

※ When the JW-20RS fault lamp is lit and no error code is displayed, it might be the case that the PC has stopped operation (in the program mode).

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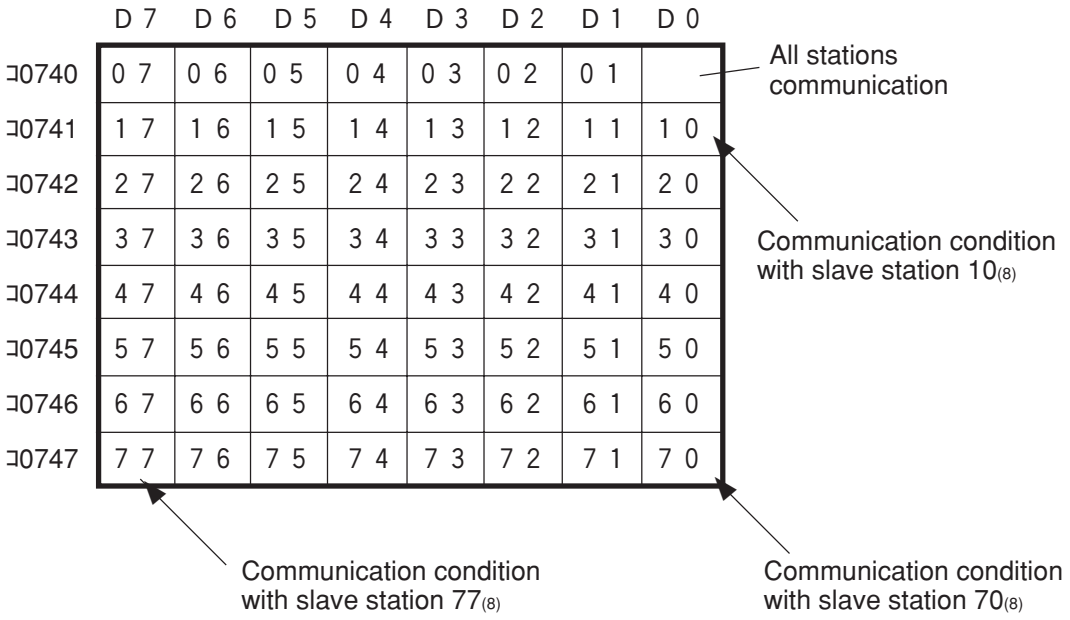
(2) Flag

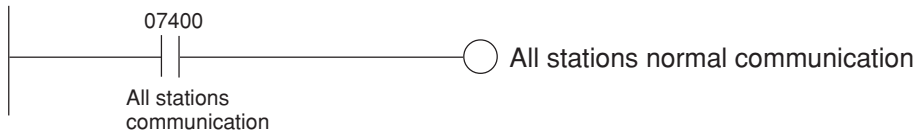
Flag area is 8 bytes from the “flag top address” set in the master station JW-20CM parameter, monitor communication condition.

Example: In this case the flag top address is file address $000740_{(8)}$ (ↄ0740)



① **All stations communication flag**

When the master module JW-20CM is communicating normally with the preset number of slave stations, this flag will be ON.



② **Individual communication flag**

The flags corresponding to the slave stations, which are communicating normally with the master module JW-20CM will be ON.

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(3) Error code

When an error occurs in the JW-20CM, it stores the occurred error's code to system memory #170 of each station's PC.

Error code (HEX)	Cause	Error code stored to system memory		Measure
		#160	#170	
01	ROM error, upper CPU	53(H)	———	Replace the JW-20CM
02	RAM error, upper CPU			
03	2 port RAM error against PC, upper CPU			
04	2 port RAM error against communication CPU, upper CPU			
11	ROM error, communication CPU			• Check the communication cable • Check for doubled allocation of slave station number • Replace the JW-20CM
12	RAM error, communication CPU			
18	Communication LSI error, communication CPU			
1F	No response	———	1F (H)	
20	More than one token detected	———	20 (H)	Check the parameter setting and switch
21	Doubled address detected	———	21 (H)	
22	Fault of sending section	———	22 (H)	Replace the JW-20CM Check the communication cable
23	Token does not return within the rated interval	———	23 (H)	
2A	Overflow of receiving buffer. Occurs when the upper CPU processing is delayed.	———	2A (H)	
2B	Flame length error	———	2B (H)	Check the communication cable
2C	Media error	———	2C (H)	Replace the JW-20CM
30	EEPROM error	———	30 (H)	Replace the JW-20CM
BE	BCC error	———	BE (H)	Check the switch setting
BF	Parameter setting error	———	BF (H)	
C1 to FF	Communication error • After converting into octal, the lower two digits represent the slave station number of the current error. (Ex. C1(H) = 301(8)= slave station 01)	———	C1 (H) to FF (H)	Check the communication cable and slave module

- In some cases, error code 23(H) or 2A(H) is stored when inputting power. This is not an error.

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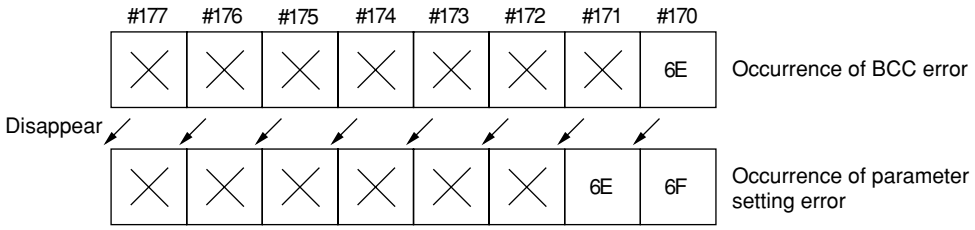
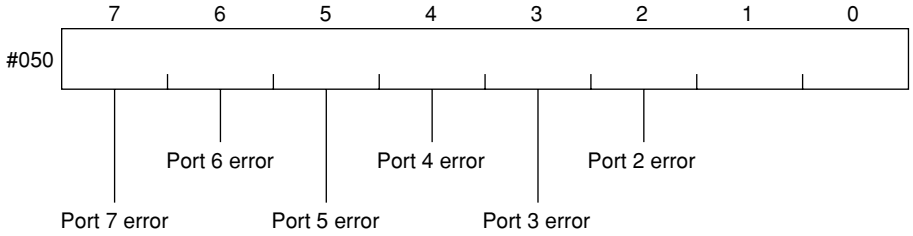
Remarks

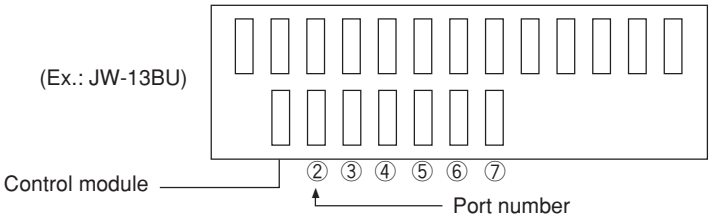
- The error code stored in the system memory #170 is shifted to #170 to #177 one after the other as new errors occur. Thus, the system memory can store up to 8 errors. When the PC is operating by RAM, these error codes do not disappear even after turning OFF the power.
  The contents of system memory #170 to #177 are kept storing after the JW-20CM recovers from the error.



- When any of errors "$01_{(H)}$" to "$18_{(H)}$" occurs among the error codes listed on the previous page, the JW-20CM stores error code "$53_{(H)}$" (optional error) in the system memory #160. It does not store any error code in system memory #170.
- In the case of an option error "53," when you monitor system memory #050, the bit of error option module switches ON. When more than 1 bit is error, these bits switch ON. The each ON bit becomes OFF by recovering from the error condition. But the last ON bit does not become OFF even if the error condition recovers.



- The option slot port numbers are assigned in the order 2, 3, 4, 5, 6, 7, and so on, starting from the position closet to the control module.



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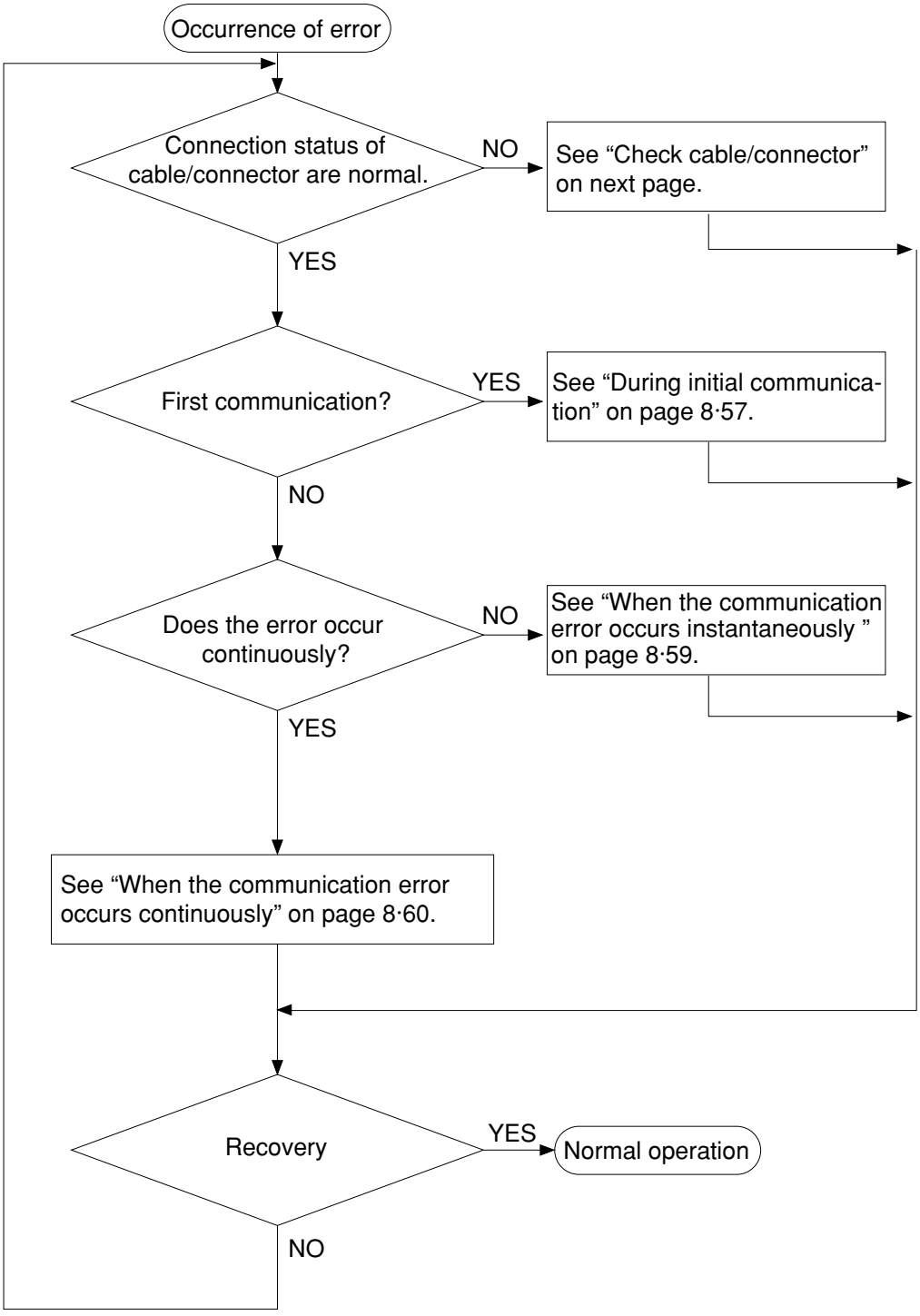
(4) Recovery method at communication errors

① Check flow chart



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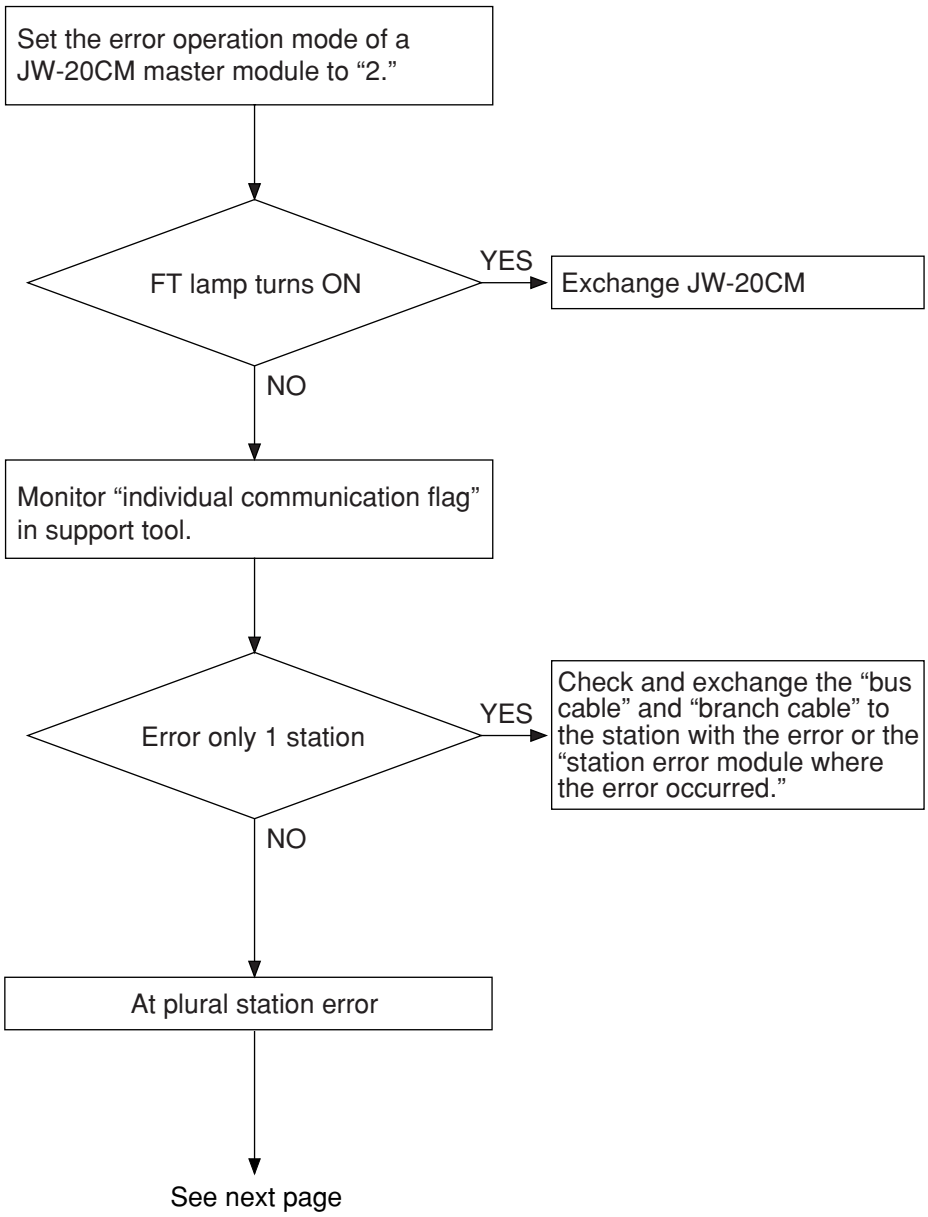
② **Check cable/connector**

As errors on the junction from the main cable to the drop cable or the contact failure on the connecting point of each station or errors of the master module are assumed, check with the following procedure.



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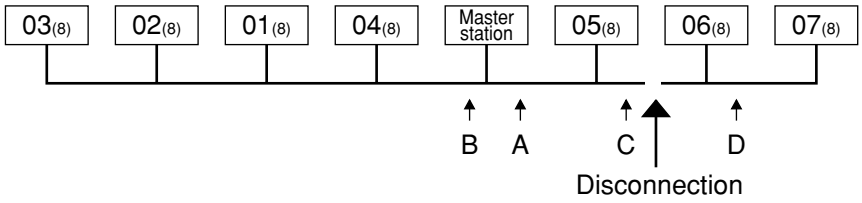
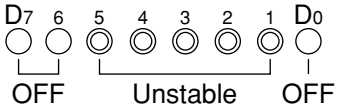
• If the bus cable between the slave station 05(8) and 06(8) is disconnected in the following system.

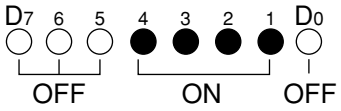


State of an individual communication flag



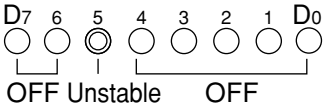
Remove the connector on point A, and turn ON the termination resistance of the master station.

As the communication possible stations 03(8), 02(8), 01(8), and 04(8) are normal, the state of communication monitoring flag is as follows.



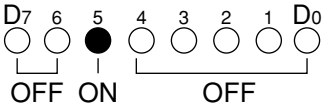
Connect the A connector, and then remove the connector on point B.

There is no normal station amoung commiunicatable station 05, 06, 07(8), and 05(8) is unstable.



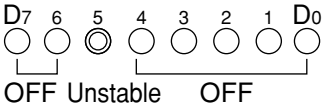
Remove the connector on point C and make sure the B connector is not connected.

As the communication possible station 05(8) is normal, abnormal points exists ahead of the point C.



Connect the C connector and make sure the B connector is not connected, and remove the connector at the next point to the point D.

The station 05(8) and 06(8) become communication possible stations, but the station 05(8) is unstable and the station 06(8) is turned to OFF, so the abnormal states occur between the point C and the point D.



Cause	Countermeasure
Disconnection in the bus cable and the branch cable between the station 05(8) and 06(8), or contact failure of the connectors	Remove both the bus cable and the branch cable connectors. After that, shorten one of these connectors and check conductivity using a tester.
Error on the slave station 06(8)	Exchange the slave module.

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③ **During initial communication (start-up of the system)**

Check the error code of master station

· **When the master station indicates error code $BF_{(H)}$**

The cause may be a parameter setting error of the master station. Check the master station parameters.

(See the next page)

· **When the master station indicates error code C1 to $FF_{(H)}$**

The cause may be a error of slave station. Check the error code of slave station.

· **When the COMM lamp of master station is OFF (SD, RD, and CD are flickering)**

Check the following master station's parameters

Parameter address	Contents	Setting value
$003777_{(8)}$	Start switch	01

· **Other cases**

Check the switches of the communication module
Check optional cable of PC (The PC does not operate normally without an optional cable.)
Check cable and connector
Check error code

Check the error code of slave station

· **When the error code of slave station is no display and FAULT lamp is ON**

The cause may be error of wiring. Check for wiring.

· **When the slave station indicates error code $93_{(H)}$ to $95_{(H)}$**

When the slave station indicates error code $9F_{(H)}$

· **The cause may be a parameter setting error of the slave station.**

Check the slave station parameters.

· **When relation I/O is error**

Check I/O and rack panel.

· **Other cases**

Check the switches of the communication module
Check optional cable of PC (The PC does not operate normally without an optional cable.)
Check cable and connector

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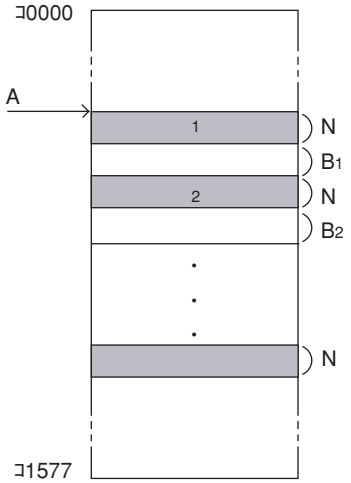
Parameter setting range

<Fixed allocation>

· When fixed allocation is used, set parameter within the range shown below:



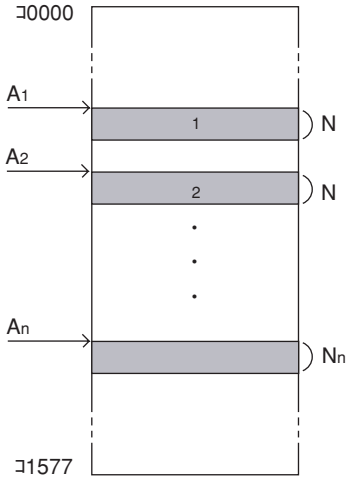
1 to n : Number of slave stations (1 ≦ n ≦ 32 or 63)
A : Remote I/O top address
N : Number of slave station I/O points (fixed to 64 points or 128 points)
B_1 to B_n : Blank between stations

(Setting of JW model special I/O module)

Data register	0 to 128 bytes in total per remote slave station 0 to 512 bytes in total of all stations
Number of modules	Up to 8 modules per remote slave station Up to 32 modules in total of all stations

<Manual allocation>

· When the manual allocation is used, set parameter within the range shown below:



1 to n : Number of slave stations (1 ≦ n ≦ 63)
A_1 to A_n : Remote I/O top address
N_1 to N_n : Number of slave station I/O bytes (0 ≦ N_n ≦ 128)
$N_1 + N_2 + \cdots + N_n \leqq 512$

(Setting of JW model special I/O module)

Data register	0 to 128 bytes in total per remote slave station 0 to 512 bytes in total of all stations
Number of modules	Up to 8 modules per remote slave station Up to 32 modules in total of all stations

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④ **When the communication error occurs instantaneously.**

Cause may be:

- Noise on the communication line.
- Fault of a communication module.
- Fault of a communication cable.

Check the error's timing.

When the error occurs synchronous with a peripheral industrial robot's operation, noise to the communication line may be a cause. Consider arrangement of the wiring route.

Identify the error station.

When the error occurs at only the specific station, the cause may be the station or nearby. Check the following items.

- Setting of the LT (termination resistance) switch.
- Check cables/connectors
  Looseness or removal of connectors (turn right until fixed securely)
  Whether connectors are assembled to cables appropriate (check insulation/conductivity)
  Cable length should be less than 1 km
  Branch cable length should be less than 40 cm
- Error code (See page 8·52)

When identification of the cause is difficult.

Condition of the circuit may be unstable. (See page 8·52 "check items of cables and connectors")

- Looseness or removal of connectors (turn right until fixed securely)
- Whether connectors are assembled to cables appropriate (check insulation/conductivity)
- Cable length should be less than 1 km
- Branch cable length should be less than 40 cm

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⑤ **When the communication error occurs continuously.**

Identify the error station.

Specify the error's station using the communication flag etc., (see page 8·51) and error code (see page 8·47). Then check this station.

- Check the power of the error's station.
- Check the error code of the error's station.
- Check cables/connectors
  Looseness or removal of connectors (turn right until fixed securely)
  Whether connectors are assembled to cables appropriate (check insulation/conductivity)
  Cable length should be less than 1 km
  Branch cable length should be less than 40 cm

When identification of the cause is difficult.

Condition of the whole circuit may be unstable.
Check cables and connectors.

- Looseness or removal of connectors (turn right until fixed securely)
- Whether connectors are assembled to cables appropriate (check insulation/conductivity)
- Cable length should be less than 1 km
- Branch cable length should be less than 40 cm

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Chapter 9 Data Link

9-1 Description for data link function

· The data link function us used to send and receive ON/OFF signals (relay link: max. 2048 points) and numerical data (register link : max. 2048 bytes) by PCs or between PC and personal computers connected in the satellite net system.

· The master station and slave stations are connected using a single coaxial cable. As the JW-20CM network module can control the data communications, the PC does not need any special programming.

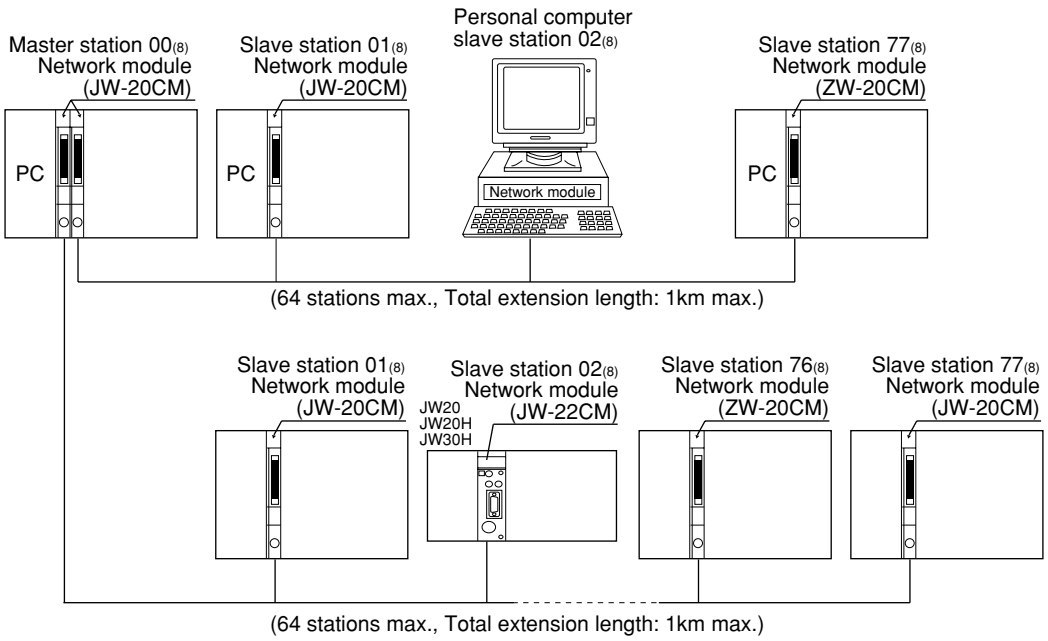
· When the JW-20CM is assigned as a slave station, it has the standard function and memory capacity save function for data link. But the data contents for receiving from other stations is different between these two functions. (When the JW-20CM is used as a master station, only the standard function is available.)

[When all of a master station and slave stations are JW-20CM]

- Master station — Data link (Standard function) } Receiving data are all relay link area, and
- Slave station — Data link (Standard function) } all register link area of all stations.
- Slave station — Data link (Memory capacity save function) — In order to effectively use the memory, unify a partial data area or sending/ receiving address (program) of slave stations.

· A maximum of 6 modules (a mixed installation of master and slave stations is allowed) can be installed on one PC.

· A maximum of 64 stations can transfer data on one network with maximum cable length of 1 km.



· Both JW and ZW model PCs can be connected on the same cable.

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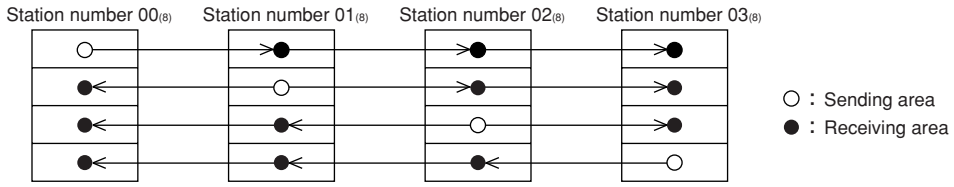
9-2 Communication method

[1] Data link (standard function)

Each station sends data in its sending area cyclically and stores data received from other stations in its receiving area.



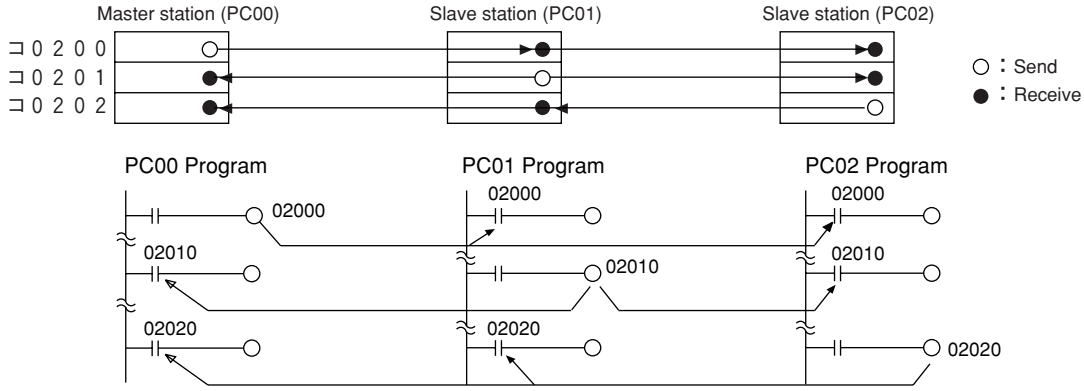
For the JW-20CM to execute automatically these sending and receiving procedures, a special program for communication is required. Data link have relay link and register link. They can use at the same time.

Function	Contents	
Relay link	N: M communication	Total no. of link points : 2048 max. (256 bytes)
Register link	N: M communication	Total no. of link bytes : 2048 max.

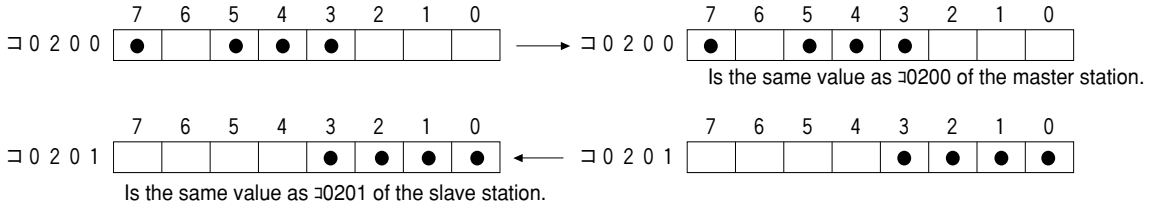
(1) Relay link function

Mainly used for sending and receiving ON/OFF information

[Example] In the case of sending 1-byte data from a master station and slave stations 01 and 02.



- The link relay of the receiving station must be programmed as input signal by the PC programming. Also, it may be used as source (S) side of application instruction.
- The sending and receiving data correspond in bits of one point unit.



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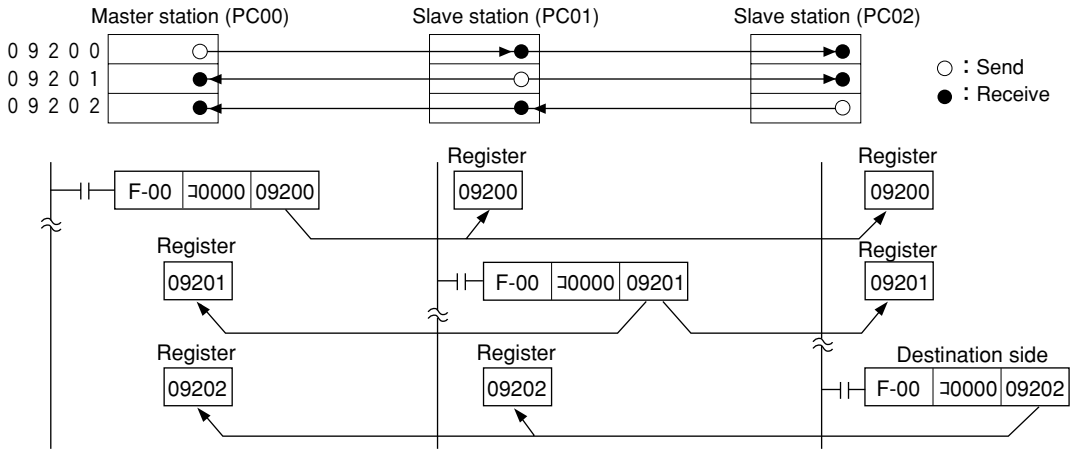
(2) Register link function

Mainly used for sending and receiving numerical data.

[Example] In the case of sending 1 byte data from a master station and slave station 01 and 02.



- The register link area of the sending station may be used as D (Destination) side of the application instruction of the PC program.
- The register link area of the receiving station may be used as S (Source) side of the application instruction of the PC program.

9

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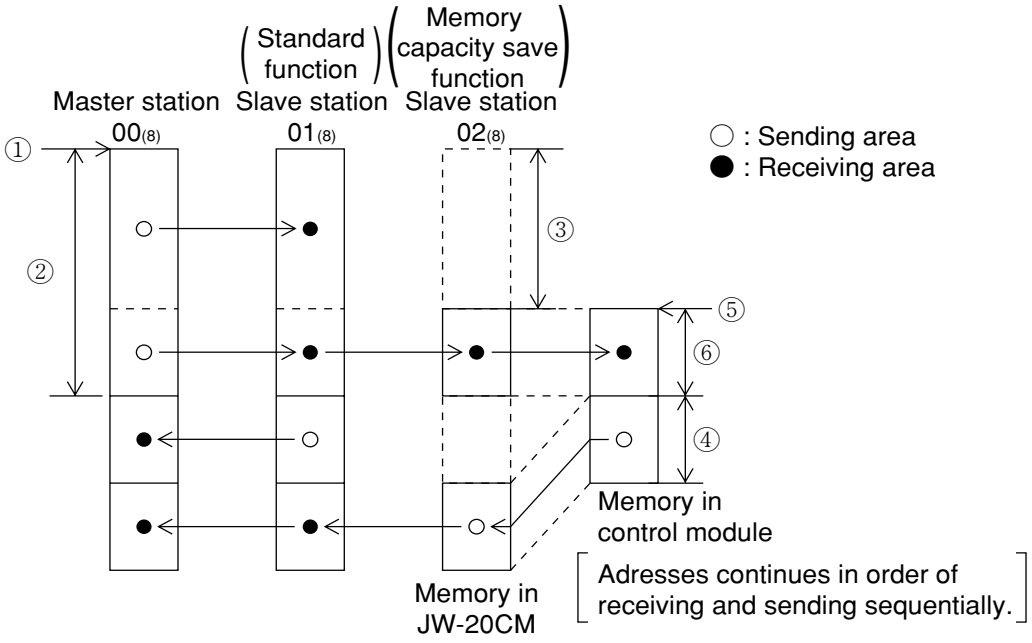
V5 **[2] Data link (Memory capacity save function)**

The memory capacity save function is to provide a part of the data link area in the slave station data memory as a receiving area. A slave station can receive only the required area by relay link/ register link so that the slave stations can save on use of the memory area.

As this function can unify the receiving area address and the sending area address of each slave station, the same program can be used for each slave station. Mixed allocation of the addresses with the data link (standard function) is also possible.



Function	Contents	
Relay link	N: M communication	Total link number of points: Maximum 2048 points (256 bytes) Total number of points of sending/receiving data per slave station: Maximum 512 points (64 bytes)
Register link	N: M communication	Total link number of points: Maximum 2048 bytes Total number of points of sending/receiving data per slave station: Maximum 512 bytes

Setting contents	Setting item
① Top address of master station link area	Master station 's parameter
② Number of sending data bytes of master station	
③ Number of offset bytes of slave station	
④ Number of sending data bytes of slave station	
⑤ Top address of slave station link area	Slave station's parameter
⑥ Number of data receiving bytes of slave station	

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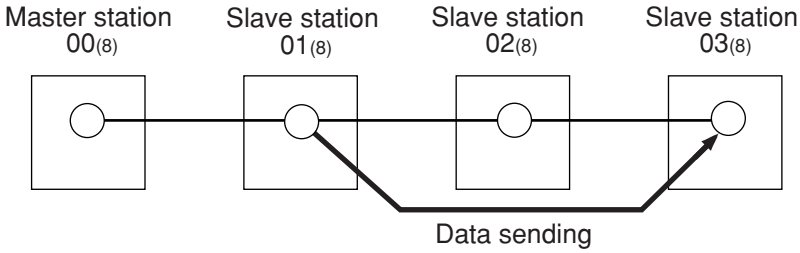
[3] Link function with specific station (F200/F201 link function)

There is a function for communicating data other than the parameter setting values using the PC's application instructions F-200 (write to ports) and F-201 (read from ports). The JW-20CM communicates data while executing data link operations.

See page 13·22 to 13·25 for application instructions F-200 and F-201 in details.

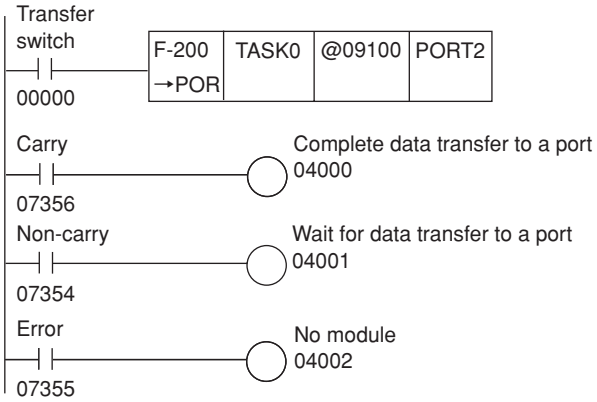
See instruction manual of ZW-98CM and ZW-20AX in case that communicating with host computer.



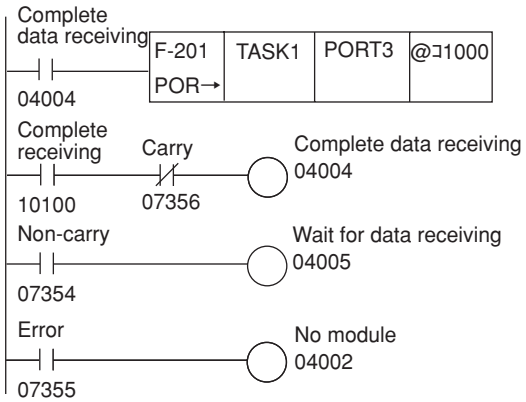
Example) In case of sending 8 bytes data from slave station 01(8) to slave station 03(8).

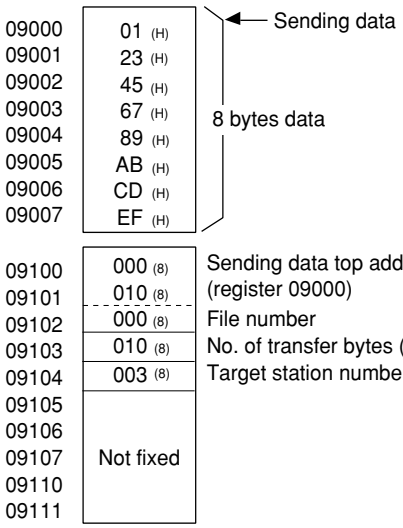
	Slave station 01(8)	Slave station 01(8)
Sending data top address	Register 09000	———
Receiving data top address	———	Register 09000
JW-20CM installed port number	2	3

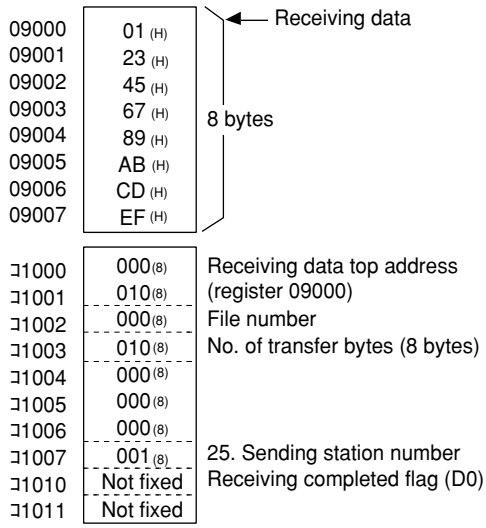
An example of program at slave station 01(8)



An example of program at slave station 03(8)







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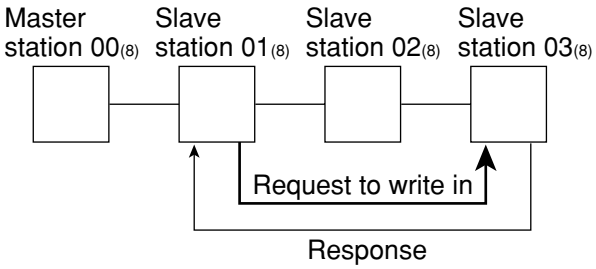
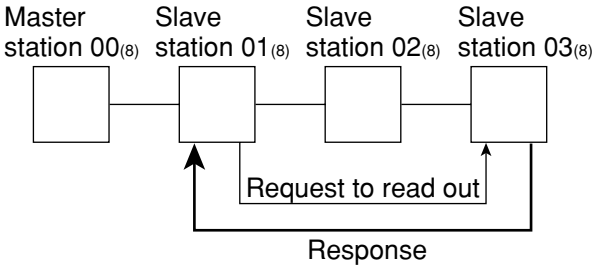
[4] SEND/RECEIVE function

Different from the data link, the SEND/RECEIVE functions are functions which exchange the data of the required station of the required time between a PC and a personal computer or between PCs. The SEND function is the function which writes in the data after assigning the station to send data to, and the RECEIVE function is the function which reads out the data.

[An example of the SEND function]

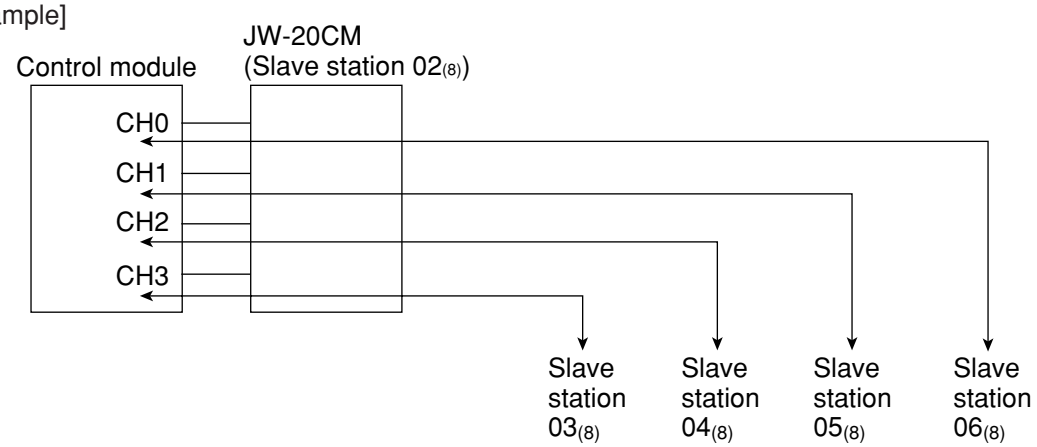


[An example of the RECEIVE function]



- In this instruction, the function is completed after the target station replies. A special program is not needed in the connected PC station. If the target station is an upper computer, a program is required for response after decoding the SEND/RECEIVE instructions.
  But if the upper computer cannot decode the SEND/RECEIVE instructions, these instructions can not be used.
- The data route for the SEND/RECEIVE functions between the control module and this module is called a “channel.” Each module has four channels, CH0 to CH3, and is able to transfer a maximum of 256 bytes of data. Therefore, four operations of SEND/RECEIVE functions can be executed simultaneously on a ladder program.

[Example]



· There are the “instruction system” and the “data memory starting system” as the starting system in SEND/RECEIVE functions.
  You can select the starting system in each channel using a parameter.

· With the "Data memory start system," the JW-20CM can communicate across different hierarchies of the satellite net. However, this type of communication has the following limitations.

1 JW20/20H cannot be used as relay stations.
2 ZW-98CM/ZW-20AX cannot be used as communication target stations.
3 The maximum amount of data is 256 bytes.

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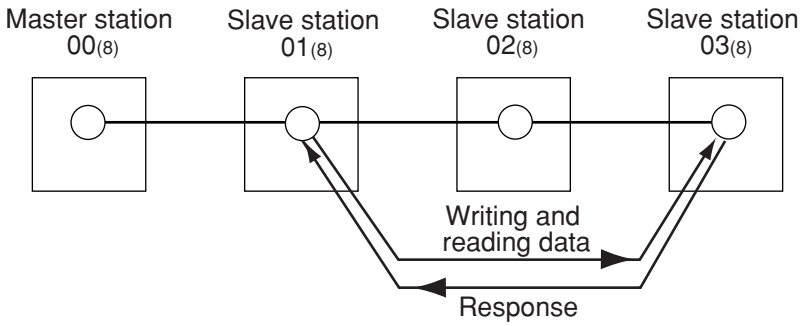
(1) Instruction system

The PC's application instruction F-202/203 (open channel), F-204 (sending instruction), and F-204 (receive instruction) to send and receive data between modules in a network, and from a module in a network to an upper stream computer is used.

- In this instruction, the function is completed after the target station replies. A special program is not needed in the connected PC station. If the target station is an upper computer, a program is required for response after decoding the SEND/RECEIVE instructions.
  But if the upper computer cannot decode the SEND/RECEIVE instructions, these instructions can not be used.

· SEND/RECEIVE functions of instruction system cannot be communicated two hierarchical layer.

Communication contents	Instruction to be used (see page)
Specify communication target station in octal notation. (for ZW/JW-20CM)	F-202 (13-26)
Write data in the specified station (SEND instruction)	F-204 (13-27)
Read data out of the specified station (RECEIVE instruction)	F-205 (13-28)



Input conditions of F-202/204/205 instructions should keep being ON until finishing execution of the instruction (when error flag or carry flag turns to ON.)

- If the input condition is turned OFF during execution of the instruction, the instruction ends in an incomplete condition. Under this condition, next, when this instruction is given, it will come to a "communication jam," and the instruction will not be executed. Turn the power OFF and then ON again for recovery.

Take any measure for the cases below:

- In case that on instantaneous power failure of min. 10ms occurs and the input conditions turn to OFF.

[Countermeasure] Change the input conditions to a latched relay.
However if you turn OFF and ON the power during execution of the instruction while the input condition is set to a latched relay, the JW-20CM will come to the following state.
F-204/205 instruction processing which is being executed is deleted, and rising edge of input signal can not be detected for the input condition is kept ON so that this instruction can not be executed.

[Countermeasure] All flags (07354 to 07357) are turned to OFF. Detect them with the timer, and operate the next instruction after resetting the input conditions.

Note: The SEND/RECEIVE instruction is not allowed to use 10 to $2C_{(H)}$ as the file numbers for the communication target station. The data memory start system can use these numbers.

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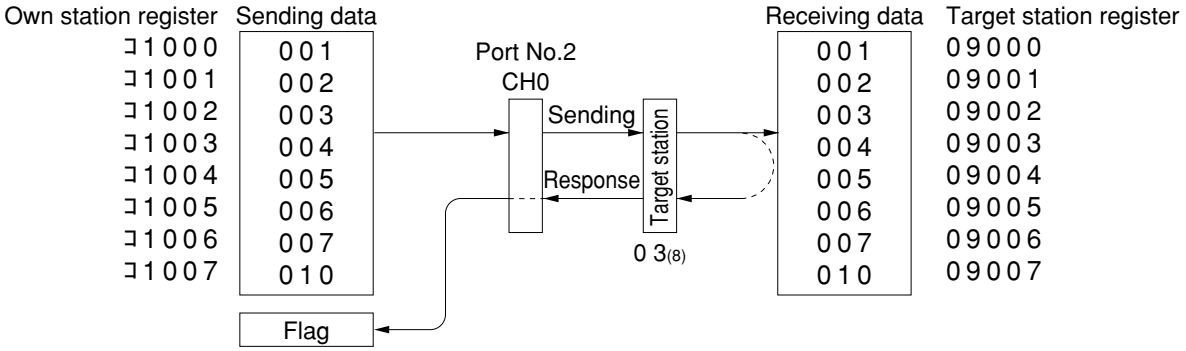
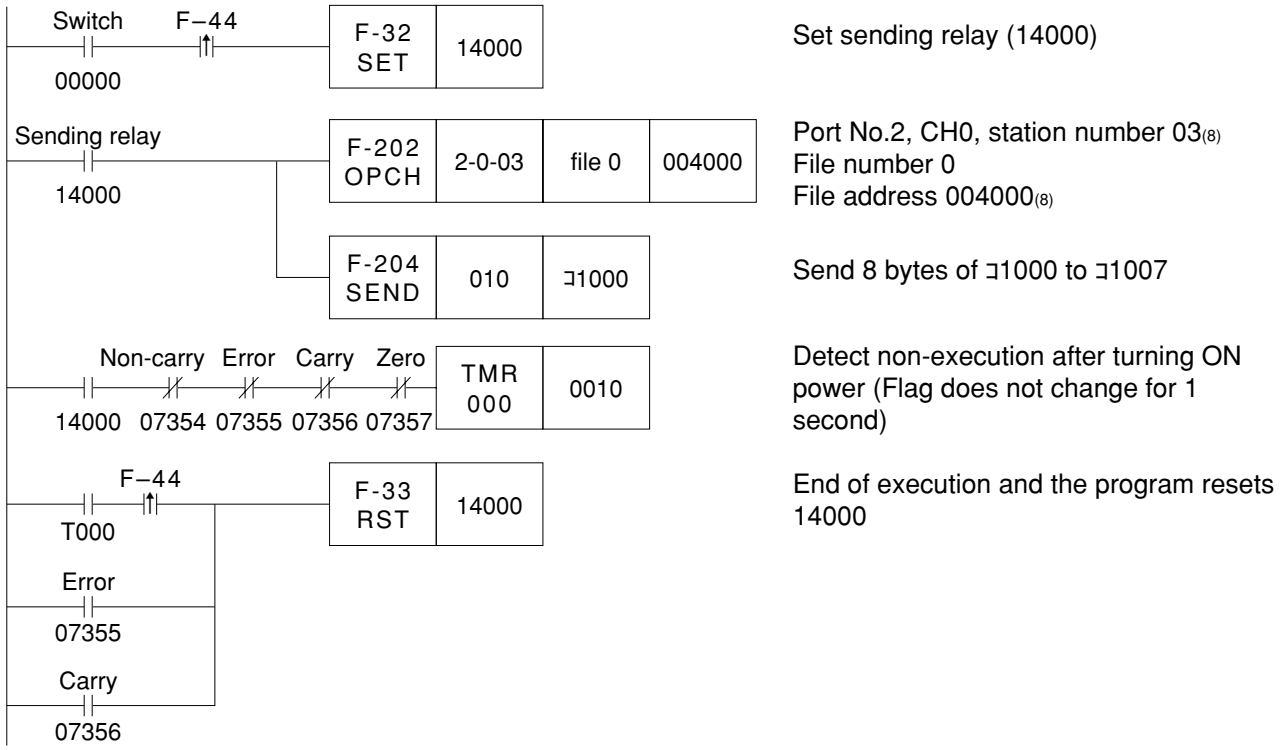
[Example] In case of writing data of 8 bytes to slave station $03_{(8)}$
Module number installing own station JW-20CM : 2
Channel number using own station JW-20CM : 0
Data area of slave station $03_{(8)}$: 0 (file number)
Receive top address of slave station $03_{(8)}$: Register 09000 (file address $004000_{(8)}$)
Send data top address of own station :Ⅎ1000



■ **PC program**



For an example to readout data from the assigned station using F-205, see page 13·28.

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V5 **(2) Data memory starting system**

The data memory starting system is the system which starts the SEND/RECEIVE functions without using exclusive instructions. Set the target station number, data memory address, etc. on the specified data memory (communication information storage area).

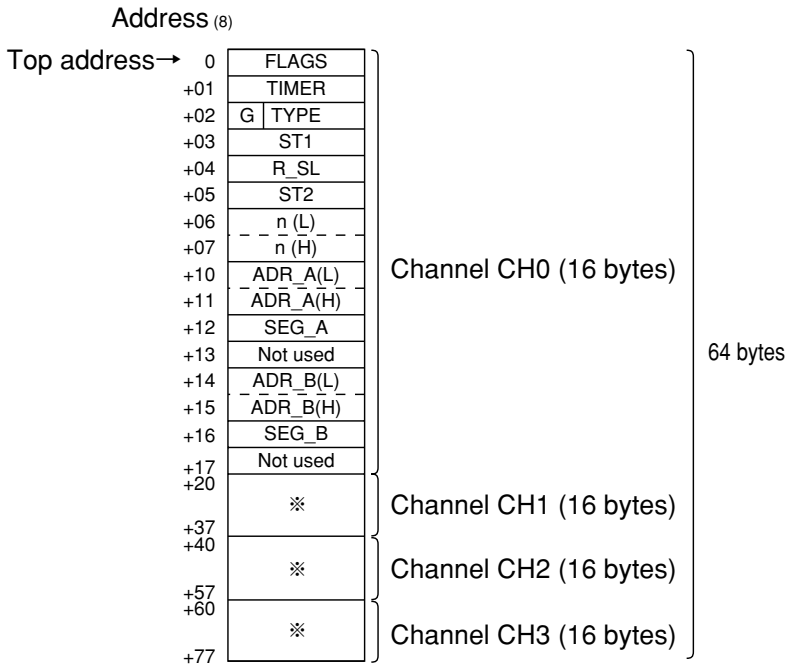
You can increase the amount of data to be transferred in one SEND/RECEIVE operation using multiple connected channels.

For cases using 1 channel alone, maximum 256 bytes
For cases using 2 connected channels, maximum 512 bytes
For cases using 3 connected channels, maximum 768 bytes
For cases using 4 connected channels, maximum 1024 bytes

Set these channel connections on the parameter (address 007700 to $007703_{(8)}$). (See page 9·27 and 48)

[Setting the contents in a communication information storage area]

In order to assign a communication information storage area (64 bytes), set the top address on the parameter (address 007710 to $007713_{(8)}$).



※ The contents of each area (16 bytes) in channel CH1 to CH3 are the same as the contents of CH0.

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Area	*Input/ Output	Contents
FLAGS	Input	Flag (the same as ⊐0735. Refer to the following table for the details.)
TIMER	Output	Communication monitoring time $001_{(D)}$ (0.1 second) to $255_{(D)}$ (25.5 seconds) (Initial value $000_{(D)}$ is 1 second.)
G (7th bit)	Output	Starting instruction. Turn ON after starting communication.
TYPE (0 bit to 6th bit)	Output	Transfer type ┌ $00_{(H)}$: SEND (one hierarchical layer), $01_{(H)}$: SEND (two hierarchical layer differences), $02_{(H)}$: RCV (one hierarchical layer), └ $03_{(H)}$: RCV (two hierarchical layer differences)
ST1	Output	For cases with one hierarchical layer, the number of the target station is 00 to $77_{(8)}$. For cases with two hierarchical layer differences, the number of the relay station is 00 to $77_{(8)}$.
R_SL	Output	For cases with two hierarchical layer differences, the module number of the next hierarchical layer difference in relay station. (When the relay station is JW50/70/100 or JW50H/70H/100H, it represents the rack/ slot number.) For cases with one hierarchical layer difference, invalid.
ST2	Output	For cases with two hierarchical layer differences, the number of the target station is 00 to $77_{(8)}$. For cases with one hierarchical layer difference, invalid.
n	Output	Number of transfer bytes 000 to $377_{(8)}$ ($000_{(8)}$ is 256 bytes)
ADR __ A	Output	File address of own station 000000 to $177777_{(8)}$
SEG __ A	Output	File number of own station 0 to 7
ADR __ B	Output	File address of target station 000000 to $177777_{(8)}$
SEG __ B	Output	File number of target station 0 to 7 · JW-20CM with 30H mark cannot set 10 to $2C_{(H)}$

* Input : Control module ← JW-20CM, Output : Control module → JW-20CM

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• Contents of FLAGS

Value of FLAGS (H)	Contents	Contents of bit				
		7	6	5	4	3 to 0
00	During non-execution	0	0	0	0	0
90	During communicating. Interval after operating the instruction till the completion.	1	0	0	1	0
40	Normal end	0	1	0	0	0
60	Abnormal end (communication time-out)	0	1	1	0	0
E0	Abnormal end (error response)	1	1	1	0	0

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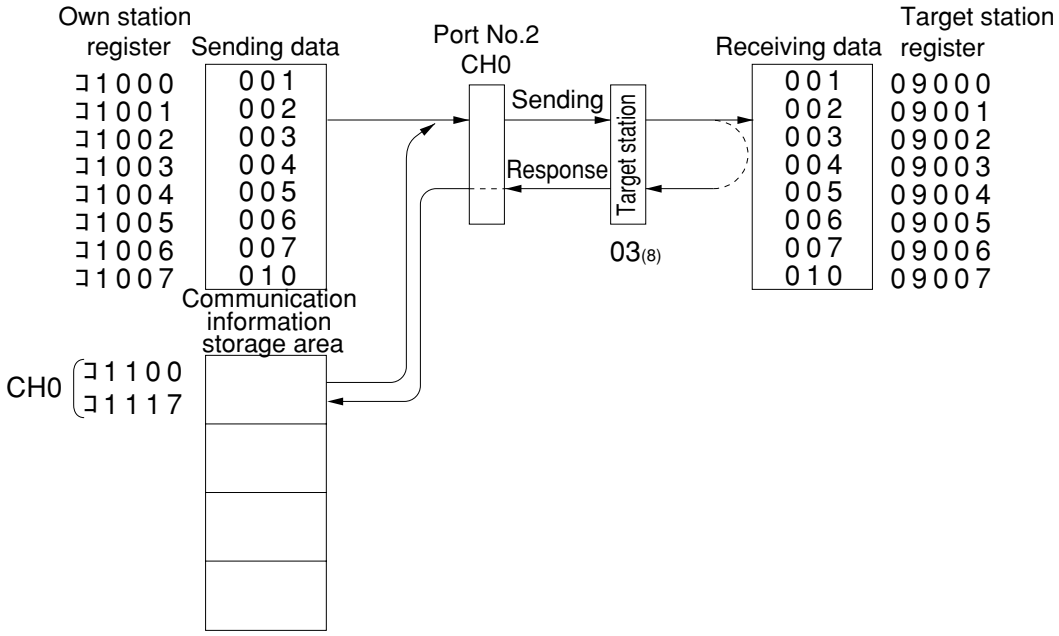
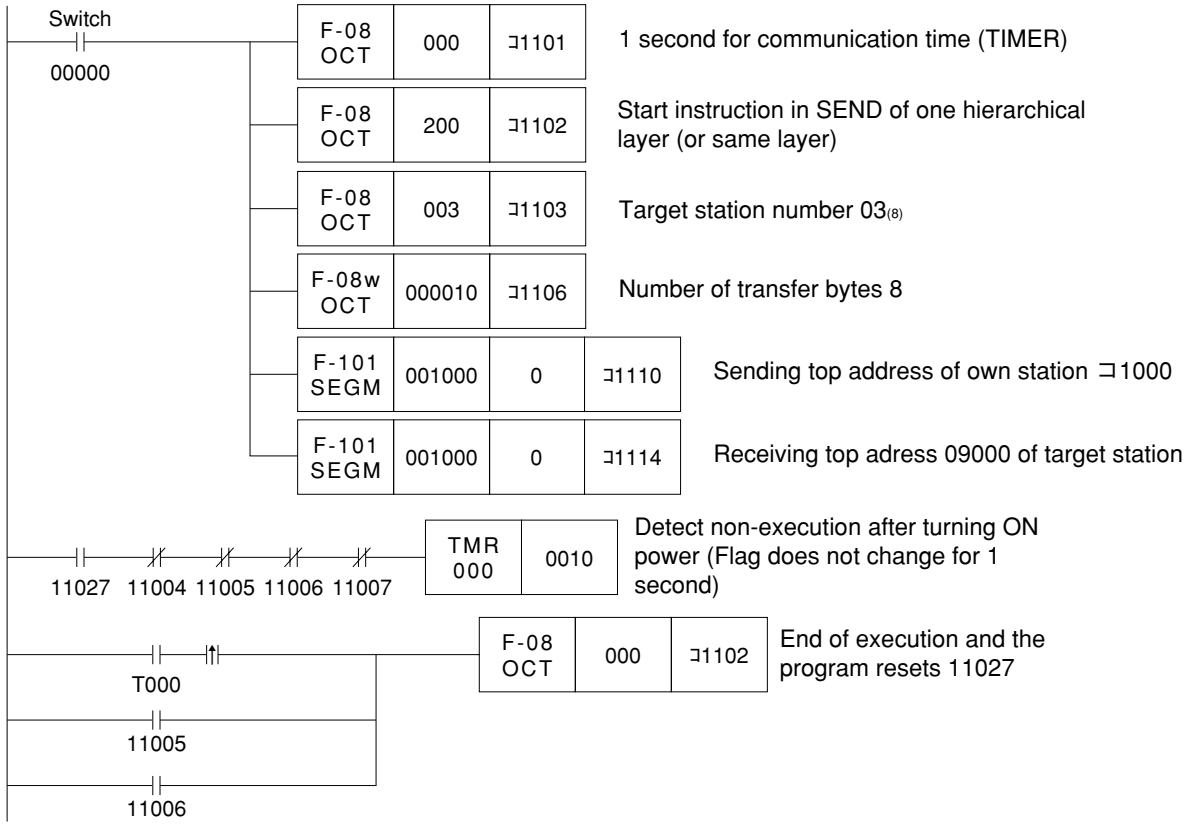
[Example] In case of writing 8 bytes data to slave station 03
Module number installing own station JW-20CM : 2
Channel number using own station JW-20CM : 0
Sending data top address of own station : ㅋ1000 (file 0, file address $001000_{(8)}$)
Data area of target station : 09000 (file 0, file address $004000_{(8)}$)
Top address of communication information storage area : ㅋ1100





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9-3 Data transfer required time and communication delay time

(1) Required time for data transfer

This is the time required for the master station to complete communication with all stations, and is determined by the number of connected stations with and the number of data items to transmit.

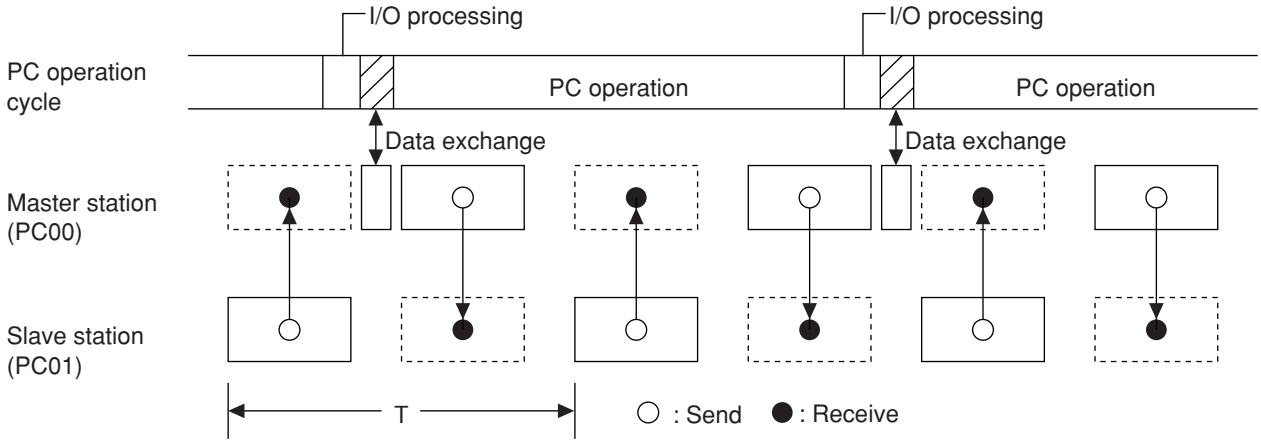
$$\text{Transmission T operation cycle} = \frac{N + 136 \times P}{1250} + 2.5 \times P + \alpha + 16 \text{ (ms)}$$

N : Total number of link points (value to be calculated by relay link bytes and register link bytes 8 points).
P : Number of connected stations (master + slave)
136 : 136 bits are used for station address and error check data on the communication format.
1250 : Transmission rate: 1.25M bits per second
2.5 : Inter-station wait time plus processing time to move to next station (unit : ms)
α : Communication recovery operation time
• When an error occurs at any station, the master station periodically treats the error.
α = 3.5 × number of error stations ms
16 : Time to maintain token bus. It can enter at random intervals.

[Example] In the case of two connected stations and 8 bytes of link points,

$$\text{Transmission T operation cycle} = \frac{8 \text{ bytes} \times 8 \text{ points} \times 2 \text{ stations} + 136 \times 2 \text{ stations}}{1250}$$

$$+ 2.5 \times 2 \text{ stations} + 16 = 21.32 \text{ ms}$$



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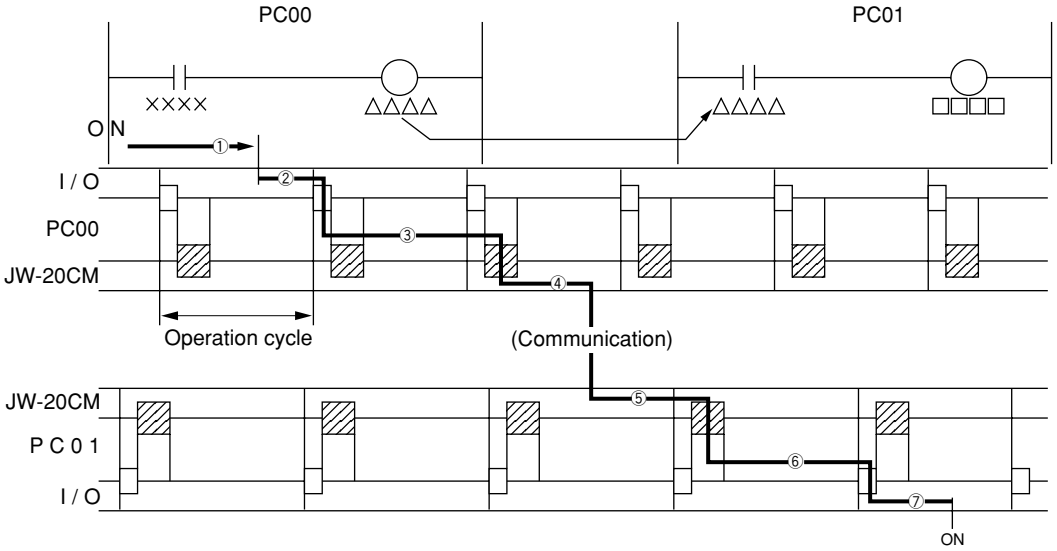
(2) Communication delay time

The communication data on the satellite net may have the delay shown below.



① Delay of input module
② Time required for PC to detect input state (one operation cycle max.)
③ Operation time of sending PC (one operation cycle)
④ Time to complete sending of operation result (one communication cycle max.)
⑤ Time required for receiving PC to write receive data in PC data memory (one operation cycle max.)
⑥ Operation time of receiving PC (one operation cycle)
⑦ Delay of output module

Communication delay time is the total time of ① to ⑦ above.

9

Remarks

The buffer memory contents of the JW-20CM is renewed for each PC operation cycle. Therefore, a contact point which turns “ON” for only one operation cycle of a PC may not be transferred.

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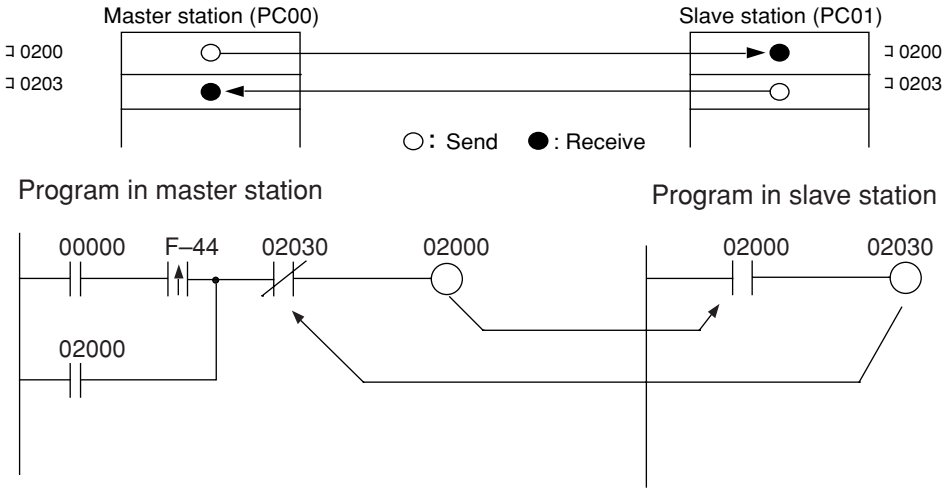
(3) Data transmission between master PC and slave PC

Providing synchronous transfer gives positive data communication.

[An example of synchronized transfer by OUT instruction]



- 00000 is turned “ON” at the master station side. (OUT 02000 is a self-holding circuit.)
- When 02000 is turned “ON” at the slave station side, OUT 02030 is also turned “ON.” This is sent back to the master station side.

9

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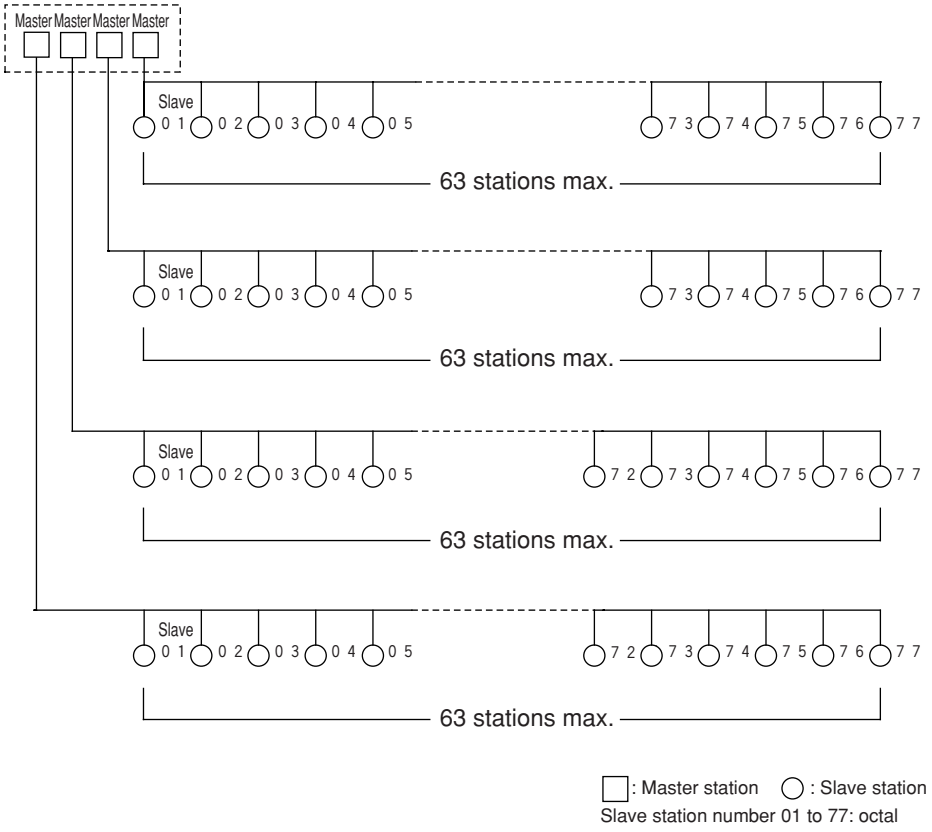
9-4 Expansion of network

The JW-20CM can transmit data between 64 stations at maximum. If more than 64 stations are required for data link, you can add communication stations with the procedure below.

(1) Multiple installation of the JW-20CM

Mounting more than one JW-20CM on the optional slot of the basic rack panel can increase the number of stations.

[In the case of mounting 4 sets of JW-20CM]



Remarks

- When installing multiple number of modules on a single PC, make them allocated so that relay link area, register link area, and flag area may not overlap with each other.
- When installing multiple number of modules on a single PC, pay attention to the total communication data volume and the number of bytes available for communication area.
- Though more than one JW-20CM can be mounted on single basic rack panel, they cannot directly communicate with other stations beyond one network.

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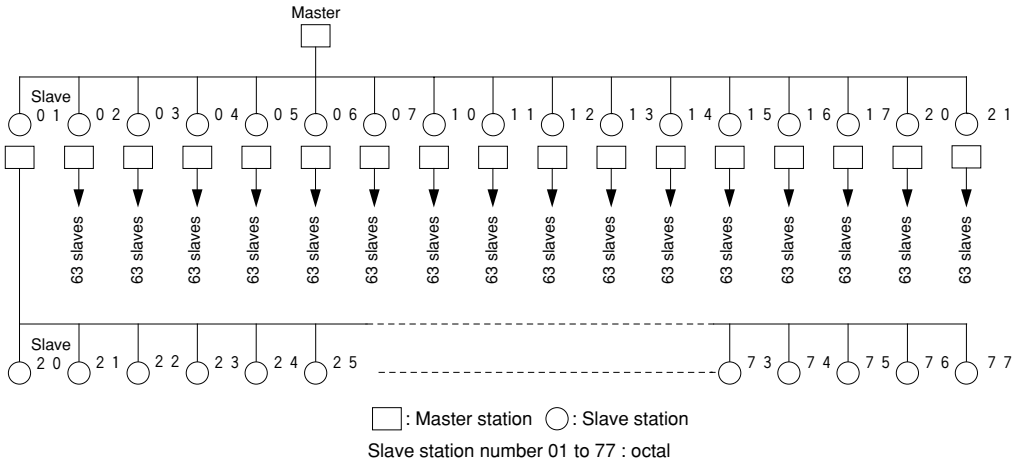
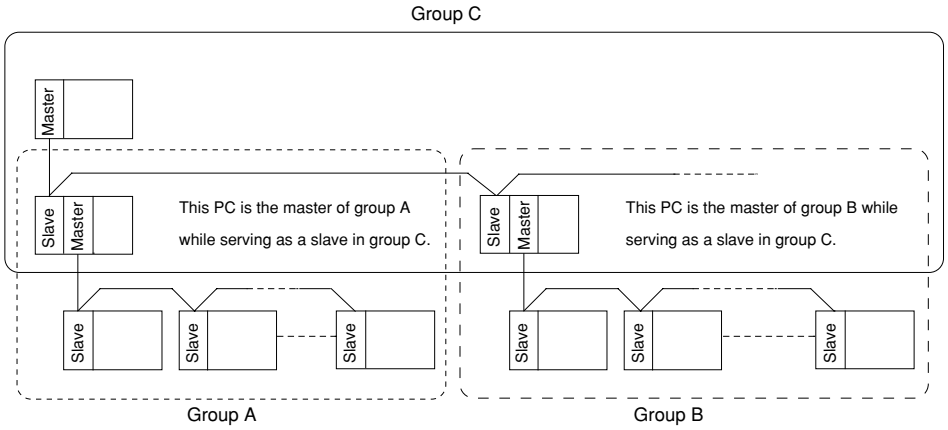
(2) Hierarchical link

When 2 sets of JW-20CM are mounted on the optional slot of the basic rack panel, hierarchical link communication is possible and can increase the number of stations.





9

Remarks

- Pay attention to hierarchical link system consisting of more than two levels as it takes time for communication between the stations at the highest level and at the lowest level.
- Though more than one JW-20CM can be mounted on single basic rack panel, they cannot directly communicate with other stations beyond one network.

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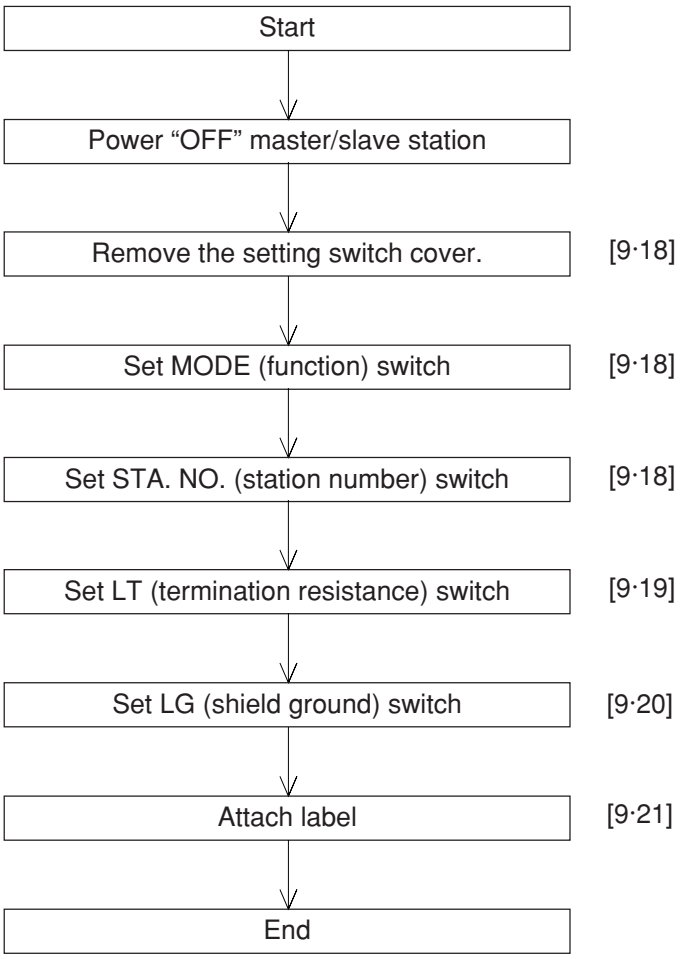
9-5 Switch setting of master station or slave station

Operation procedure

In brackets: See page in Chapter 9



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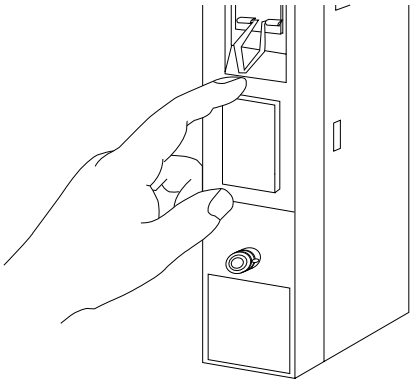
Turn master module and slave module power "OFF."

Remove the setting switch cover of network module JW-20CM.



· With your fingertips over the top and bottom of the switch cover, pull the cover towards you to remove it.
· Keep the cover saved as it must be installed after switch setting.

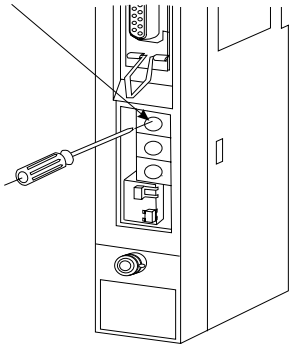
Set MODE (function) switch

· In case of master station, be sure to setting "1."
· In case of slave station, be sure to setting "2" or "3."

Setting value	Function
0	Set at delivery
1	Remote I/O
2	Data link (standard function)
	Computer link
3	Data link (memory capacity save function)
	Computer link
4-F	Test mode A service man will use these switches for adjustment.

Do not set "4 to F."

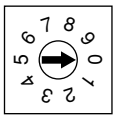
MODE



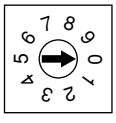
Set STA. NO. (station number) switch

· In case of master station, be sure to setting "$00_{(8)}$."
· In case of slave station, set 01 to $77_{(8)}$ in order "01" continuously.
A maximum number of 63 slave stations can be connected. Enter station numbers using octal notation.
Be careful not to assign the same number twice and do not skip any numbers.

STA.NO.
X10



X1



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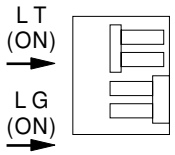
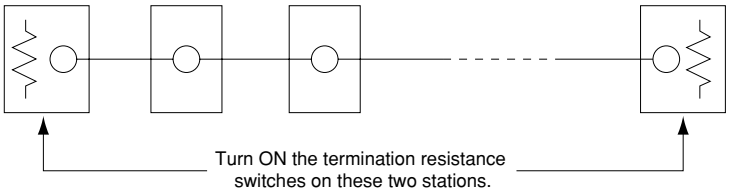
Set LT (termination resistance) switch

• When master module or slave module is at either end the communication line, make sure to set the termination resistance switch "ON."

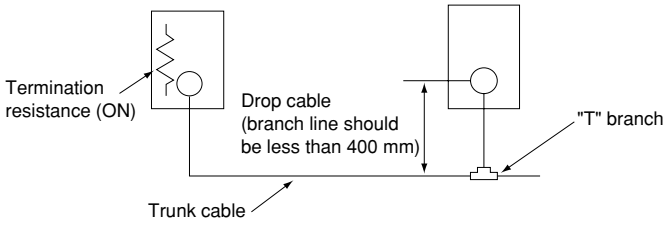




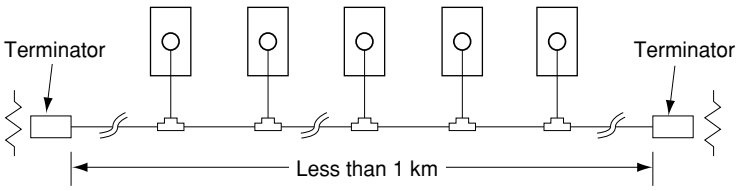
Reference: Function of the termination resistance switch

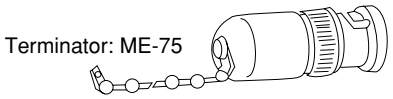
If the communication line does not have a termination resistance, the high frequency signal will be reflected at the ends of the cable. These reflected signals can collide with the original communication signals, so that some stations will not be able to communicate normally. The use of termination resistance suppresses reflected signals. If the termination resistance switch on any of the stations in between the end of the cable is turned ON, the station will generate a reflection wave signal or attenuate the original signal and may not communicate normally.

· When the trunk line has a branch in it, turn ON the termination resistance at the station on the trunk cable.



· If you use a terminator (termination resistance made by Toko Denshi: ME-75) at the end of a signal cable, turn OFF the termination resistance at the station on the end of the cable.





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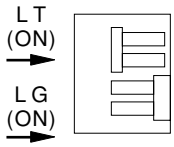
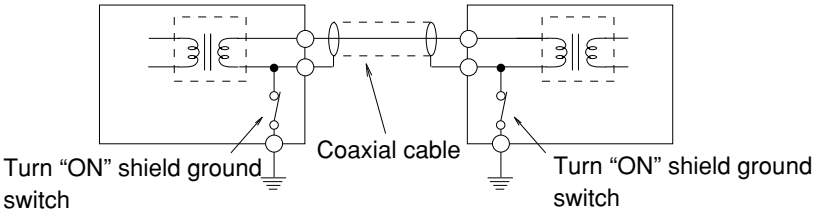
Set LG (shield ground) switch

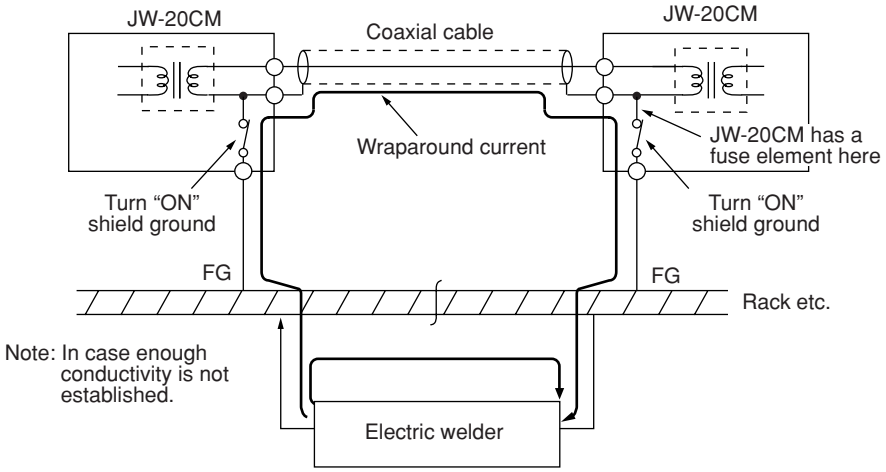


· For communication lines, use a coaxial cable.
· As coaxial cable is an unbalanced circuit, ground its shield by turning “ON” the shield ground switch.



- Make sure to provide a class-3 grounding for the GND terminal of the power module. Without grounding the power module, the JW-20CM cannot become conductive with the ground after turning “ON” the shield ground switch. (See page 7 · 2.)

- Prior to any electric welding around the JW-20CM, take out the coaxial cable from the JW-20CM. While the coaxial cable is connected to the JW-20CM, any electric welding nearby the JW-20CM will cause the welding current to the JW-20CM and may damage part of its circuit pattern.



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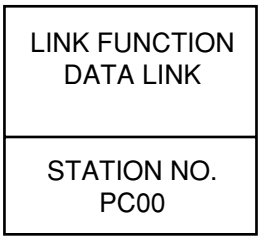
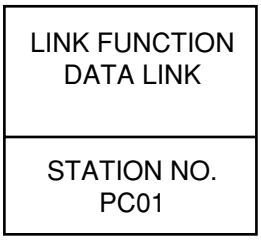
Attach label

· Attach the data link label to this module, make setting “data link function” clear.
· Write “STATION NO.” on this label.

In case of master module



In case of slave module



Switch setting end.

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9-6 Setting contents of slave station parameters

When the JW-20CM is used as a slave station, set the following items for parameters.

		Setting item	Address(8)	Initial value (H)	Contents		Corresponding signs on pages 11·7 and 11·8
※1	①	Setting time-out item of SEND/RECEIVE instruction	007500 to 007577	00	For using SEND/RECEIVE instruction, set the time out time by decimal. [001 (0.1 sec..) to 255 (25.5 sec.)]		——
	②	Setting PC model of each station in SEND/RECEIVE function	007600 to 007677	91	91(H): The PC is JW type and ZW-20CM has JW mark or JW-20CM or JW-22CM 81(H): The PC is ZW type and ZW-20CM has JW mark or JW-20CM. 00/81(H):ZW-20CM without JW mark		——
	③	Select system of each channel in SEND/RECEIVE function V5	007700 to 007703	00	Select instruction system or data memory starting system in CH0 to CH3		——
	④	Top addresses in communication information storage area when using data memory starting system of SEND/RECEIVE functions V5	007710 to 007713	00	Setting by file number and file address. · Setting within communication information storage area (64 bytes) File 0: 000000 to 015777(8) File 1 to 7: 000000 to 177777(8)		——
※2	⑤	Number of receiving bytes of relay link in memory capacity save function V5	007720 007721	00	Set the number of bytes by decimals. (0 to 64) · If 0 is set, the number of bytes will be the same as the number of the sending bytes which is set in the master station		h_1 to h_n
	⑥	Number of receiving bytes of register link in memory capacity save function V5	007722 007723	00	Set the number of bytes by decimals. (0 to 512) · If 0 is set, the number of bytes will be the same as the number of the sending bytes which is set in the master station		i_1 to i_n
	⑦	Top address of relay link area V5	007730 to 007733	00	Set by file number and file address. (See page 13·20 and 13·21)		f_1 to f_n
	⑧	Top address of register link area V5	007734 to 007737	00	Set by file number and file address. (See page 13·20 and 13·21)		g_1 to g_n
	⑨	Whether the station number information should be output or not V2	007763	00	Store the number of own station in the data memory when setting on 01(H). (storage area of 1 byte follows flag area of 24 bytes, valid when 007767(8) is 80(H))		——
	⑩	Top address of flag area (communication and PC operation condition monitor flag)	007764	E0	Lower of file address	Initial value: 01E0(H) ↓ 007767(8) (→0740)	e_1 to e_n
			007765	01	Upper of file address		
			007766	00	File number		
			007767	80	Flag output (Yes: 80(H) No: 00(H))		
	⑪	Communication error detection interval	007771	00	Settable detection interval with 100 ms pitch		——
	⑫	Writing to the EEPROM, start operation/stop setting	007777	01	00(H): Stop remote I/O operation 01(H): Start remote I/O operation 80(H): Writing to the EEPROM, stop operation 81(H): Writing to the EEPROM, start operation 08(H): Initialize the parameter		——

※ 1 Set only any of JW50/70/100 or JW50/70H/100H is used as PC, and using SEND/RECEIVE instruction.

※2 Set only any of JW50/70/100 or JW50/70H/100H is used as PC, and using the memory capacity save function.

① to ⑫ correspond to numbers in the next page.

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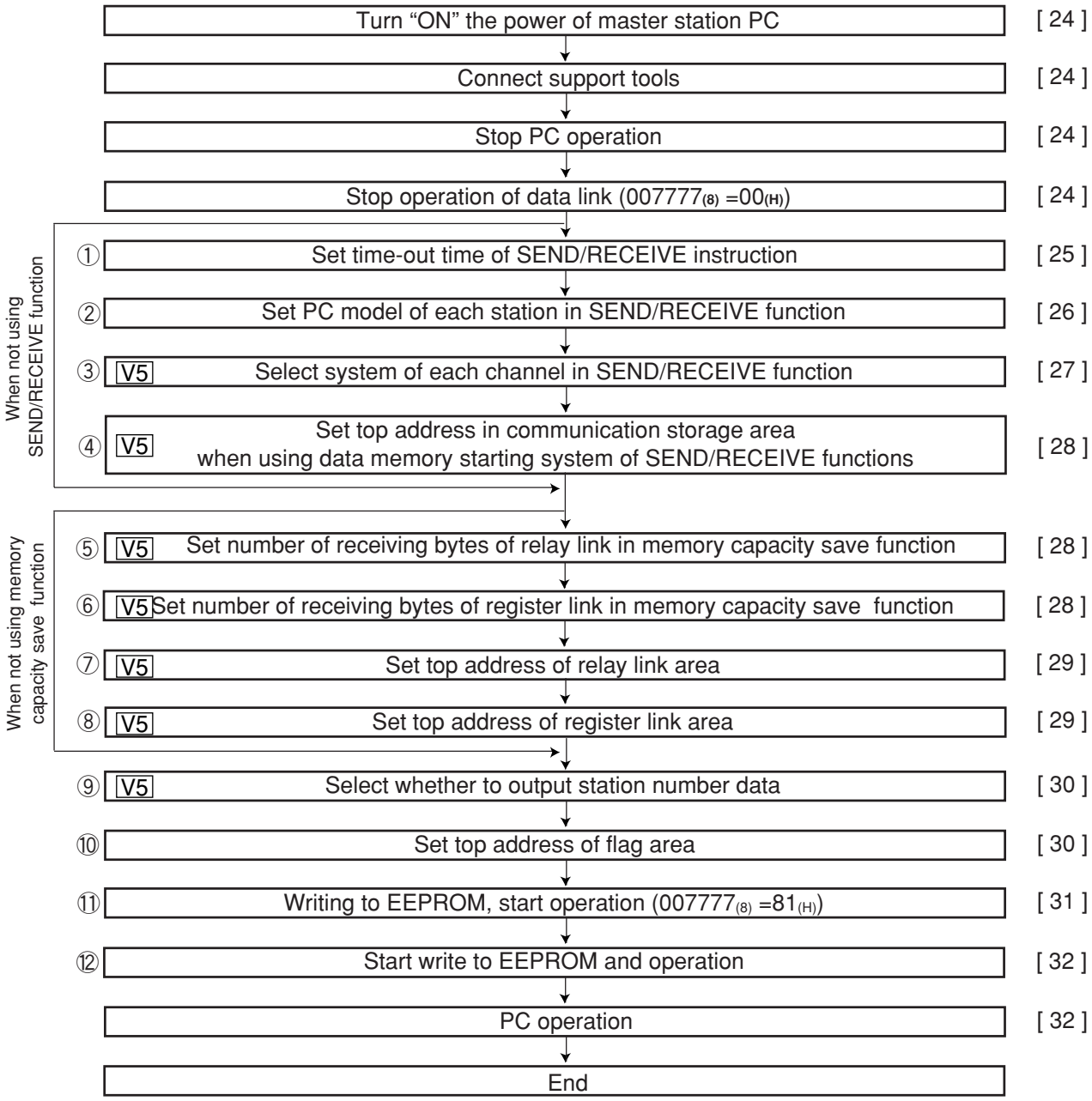
Operation procedure



① to ⑨ correspond to numbers in the previous page.

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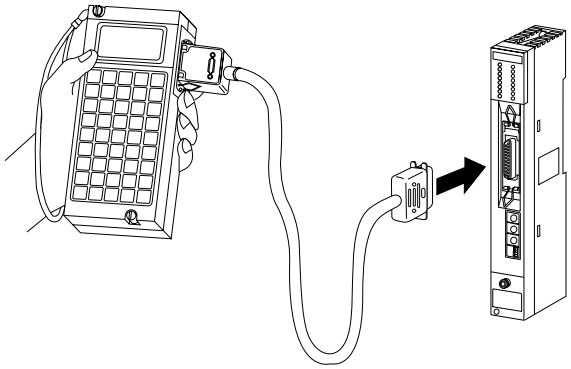
Turn "ON" the power of slave module

Connect support tools



· Connect a support tool with the JW-20CM and prepare the setting parameter.

<Usable support tools>
JW-13PG/12PG
JW-50SP
JW-50PG, Z-100LP2S

• For operation of each support tool, see the instruction manual attached. The following describes an example of JW-13PG's key operation.

Stop PC operation

· Turn to program mode (stop PC operation). Setting of parameters is only available when the PC is in program mode.
(Operation example of JW-13PG)

[*] [*] [PROG MODE] [SET 8] → Stop PC operation

[クリア CLR] [*] [*] [シフト SHIFT] [INTL DISP] [SET 8] [B 1] → Select parameter setting mode.

Select initial mode — (Parameter setting)

9

Stop operation of data link **[HEX (hexadecimal), byte]**

· Setting of the parameter is only available when the operation of the JW-20CM is stopped.
· Write "$00_{(H)}$" to parameter address $007777_{(8)}$ and stop operation of the JW-20CM.

(Operation example of JW-13PG)

[7] [7] [7] [7] [モニタ MNTR] [B 1]

Display the contents of parameter address 007777 by hexadecimal. / (Write $00_{(H)}$.)

Screen display of JW-13PG

```
 07775      HEX   00
 07776      HEX   00
I PARAM.
>07777      HEX   00
```

Reference Function of JW-13PG

• [変換 CONV] key: Changeover unit of figures
→ HEX (hexadecimal) → OCT (octal) → DCM (decimal) → Bit pattern →

• [FORCE LNGTH] key: Byte display ⟷ Changeover word display

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"When PC is JW model and the SEND/RECEIVE function is used"

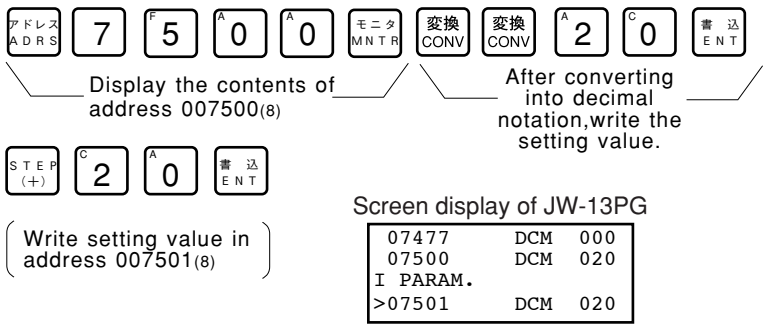
Set time-out time of SEND/RECEIVE function [DCM (decimal), byte]

When the own station uses the SEND/RECEIVE instructions, set the time-out time on each communication target station.
Setting range is 001 (0.1 sec.) to 255 (25.5 sec.) by decimal. 00(H) of initial value is 1 second.

Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)
007500	Master station	007520	2 0	007540	4 0	007560	6 0
007501	0 1	007521	2 1	007541	4 1	007561	6 1
007502	0 2	007522	2 2	007542	4 2	007562	6 2
007503	0 3	007523	2 3	007543	4 3	007563	6 3
007504	0 4	007524	2 4	007544	4 4	007564	6 4
007505	0 5	007525	2 5	007545	4 5	007565	6 5
007506	0 6	007526	2 6	007546	4 6	007566	6 6
007507	0 7	007527	2 7	007547	4 7	007567	6 7
007510	1 0	007530	3 0	007550	4 8	007570	7 0
007511	1 1	007531	3 1	007551	5 1	007571	7 1
007512	1 2	007532	3 2	007552	5 2	007572	7 2
007513	1 3	007533	3 3	007553	5 3	007573	7 3
007514	1 4	007534	3 4	007654	5 4	007574	7 4
007515	1 5	007535	3 5	007555	5 5	007575	7 5
007516	1 6	007536	3 6	007556	5 6	007576	7 6
007517	1 7	007537	3 7	007557	5 7	007577	7 7

Initial value: All address 00(H) (1 second)

(In case of setting 020(D) (2 sec.) in parameter addresses 007500(8) (master station) and 007501(8) (slave station 01).)



Screen display of JW-13PG

```
 07477      DCM  000
 07500      DCM  020
I PARAM.
>07501      DCM  020
```

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"When PC is JW model and the SEND/RECEIVE function is used"

Set PC model of each station [HEX (hexadecimal), byte]

· Assign model type of the communication target station from ZW and JW PCs, ZW-20CM with JW applied or not, or JW-22CM (JW20/20H, JW30H).

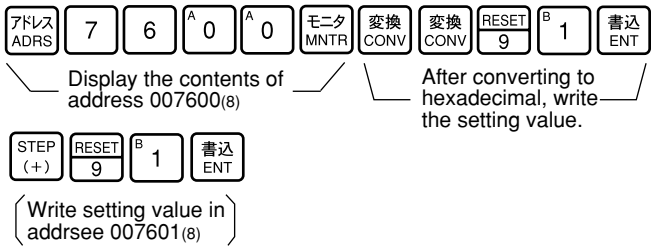
Communication module of target station \ PC of target station	ZW model	JW model
ZW-20CM (without JW applied sign)	00, 80	00, 80
ZW-20CM (with JW applied sign)	81	91
JW-20CM	81	91
JW-22CM	91(H)	

Setting value(H)

Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)
007760	Master station	007620	2 0	007640	4 0	007660	6 0
007601	0 1	007621	2 1	007641	4 1	007661	6 1
007602	0 2	007622	2 2	007642	4 2	007662	6 2
007603	0 3	007623	2 3	007643	4 3	007663	6 3
007604	0 4	007624	2 4	007644	4 4	007664	6 4
007605	0 5	007625	2 5	007645	4 5	007665	6 5
007606	0 6	007626	2 6	007646	4 6	007666	6 6
007607	0 7	007627	2 7	007647	4 7	007667	6 7
007610	1 0	007630	3 0	007650	4 8	007670	7 0
007611	1 1	007631	3 1	007651	5 1	007671	7 1
007612	1 2	007632	3 2	007652	5 2	007672	7 2
007613	1 3	007633	3 3	007653	5 3	007673	7 3
007614	1 4	007634	3 4	007654	5 4	007674	7 4
007615	1 5	007635	3 5	007655	5 5	007675	7 5
007616	1 6	007636	3 6	007656	5 6	007676	7 6
007617	1 7	007637	3 7	007657	5 7	007677	7 7

1. Initial value: All address 91(H).
2. Entering both 00(H) and 88(H) will produce the identical result. The SEND communication instruction (writing data) is not available with this setting.
3. You cannot program SEND/RECEIVE instructions in a ZW model PC. However, the ZW model PC will respond to SEND/RECEIVE instructions from a JW model PC.

Ex.: When you want to enter 91(H) at both the master station and at slave station 01 (if the PC a JW model and the I/O is a ZW-20CM with a sticker indicating that it can be used with the JW model).



Screen display of JW-13PG

```
 07577      HEX   00
 07600      HEX   91
I PARAM.
>07601      HEX   91
```

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"When PC is JW model and the SEND/RECEIVE function is used"

V5 **Select system in each channel in SEND/RECEIVE function**

Select the method of each channel (instruction or data memory starting) on the parameter address 007700 to $007703_{(8)}$.

$007700_{(8)}$	CH 0
$007701_{(8)}$	CH 1
$007702_{(8)}$	CH 2
$007703_{(8)}$	CH 3

1. When using 1 channel alone

Channel	Setting value (H)	System
CH 0	0 0	Instruction system
	8 0	Data memory starting system
CH 1	0 0	Instruction system
	8 1	Data memory starting system
CH 2	0 0	Instruction system
	8 2	Data memory starting system
CH 3	0 0	Instruction system
	8 3	Data memory starting system

2. When using connected channels (see page 10·2)

In the SEND/RECEIVE function, the JW-22CM can transfer and receive a maximum of 256 bytes of data for each channel. For the data memory starting system, the amount of communication data can be increased by connecting channels.

Set the data amount with $8X_{(H)}$ (X is 0 to 3, determined depending on which channel is used for the connector.)

When using connected channels, these should be consecutive channels. For example, channel 0 and 1, or channel 2 and 3 can be connected to each other, but channel 1 and 3 can not be connected to each other.

[Example 1] When all channels are used for the data memory starting system (using 1 channel alone)

CH 0	$007700_{(8)}$	8 0 (H)
CH 1	$007701_{(8)}$	8 1 (H)
CH 2	$007702_{(8)}$	8 2 (H)
CH 3	$007703_{(8)}$	8 3 (H)

[Example 2] When channel 0 is used for the instruction system, and channel 1 to 3 are the data memory starting system and used connected.
(In this case, channel 2 and 3 can not be used.)

CH 0	$007700_{(8)}$	8 0 (H)
CH 1	$007701_{(8)}$	8 1 (H)
CH 2	$007702_{(8)}$	8 1 (H)
CH 3	$007703_{(8)}$	8 1 (H)

If values other than "$00_{(H)}$, 80 to $83_{(H)}$" are set, they will be ignored.

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"When PC is JW model and the SEND/RECEIVE function is used"

V5 **Set top address in communication information storage area when using data memory system of SEND/RECEIVE function**

· Set file address$_{(8)}$ in parameter addresses 007710 to 007713$_{(8)}$.

007710$_{(8)}$	Lower	Top address of communication information storage area (file address)
007711$_{(8)}$	Upper	
007712$_{(8)}$	File number of communication information storage area	
007713$_{(8)}$	This setting is valid by 80$_{(H)}$	

"When PC is JW model and the memory capacity save function is used"

V5 **Set the number of sending bytes of the relay link in save memory function [DCM (decimal), word]**

· Set the number of sending bytes in decimal on the parameter address 007720 to 007721$_{(8)}$.

007200$_{(8)}$	Lower
007721$_{(8)}$	Upper

· In case of setting 4 bytes using JW-13PG: Example for slave station 02 of page 9·41

アドレス ADRS 7 7 C 2 A 0 モニタ MNTR → Display the contents of parameter addresses 007720 to 007721$_{(8)}$

変換 CONV 変換 CONV E 4 書込 ENT → Write 00004$_{(D)}$ after converting to decimal

Screen display of JW-13PG

```
 07714    D   00000
 07716    D   00000
I PARAM.
>07720    D   00004
```

007720$_{(8)}$ 007721$_{(8)}$	00004$_{(D)}$

"When PC is JW model and the memory capacity save function is used"

V5 **Set the number of receiving bytes of register link in save memory function**

Set the number of sending bytes in decimal on the parameter address 007722 to 007723$_{(8)}$.

007722$_{(8)}$	Lower
007723$_{(8)}$	Upper

· In case of setting 8 bytes for parameter addresses 007722 to 007723(8) using JW-13PG: Example for slave station 02 of page 9·41

アドレス ADRS 7 7 C 2 C 2 モニタ MNTR → Display the contents of parameter addresses 007722 to 007723$_{(8)}$

SET 8 書込 ENT → Write 00008$_{(D)}$

Screen display of JW-13PG

```
 07716    D   00000
 07720    D   00004
I PARAM.
>07722    D   00008
```

007722$_{(8)}$ 007723$_{(8)}$	00008$_{(D)}$

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"When PC is JW model and the memory capacity save function is used"

V5 **Set top address of relay link area.**

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte

· Set file address in parameter address 007730 to $007733_{(8)}$.
These top addresses should not overlap the register link area, flag area, or any area used by other option module.

$007730_{(8)}$	Lower	File address
$007731_{(8)}$	Upper	
$007732_{(8)}$	$00_{(H)}$	
$007733_{(8)}$	———	

In case of setting ⊐1000 (file address $001000_{(8)}$) using JW-13PG : Example for slave station 02 of page 9·41.

アドレス ADRS 7 7 D 3 A 0 モニタ MNTR → Display the contents of parameter address 007730 to $007731_{(8)}$.

変換 CONV 変換 CONV 変換 CONV B 1 A 0 A 0 A 0 書込 ENT → Write $001000_{(8)}$

STEP (+) A 0 書込 ENT → Write parameter address 007732 to $007733_{(8)}$ for $000000_{(8)}$.

Screen display of JW-13PG

```
 07726     0   000000
 07730     0   001000
I PARAM.
>07732     0   000000
```

"When PC is JW model and the memory capacity save function is used"

V5 **Set register link area of register link area.**

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte

9

· Set file address in parameter address 007734 to $007737_{(8)}$.
These top addresses should not overlap the relay link area, flag area, or any area used by other option module.

$007734_{(8)}$	Lower	File address
$007735_{(8)}$	Upper	
$007736_{(8)}$	File number	
$007737_{(8)}$	———	

In case of setting 09000 (file address $004000_{(8)}$) using JW-13PG : Example for slave station 02 of page 9·41.

STEP (+) E 4 A 0 A 0 A 0 書込 ENT → Write parameter address 007734 to $007735_{(8)}$ for $004000_{(8)}$.

STEP (+) A 0 書込 ENT → Write parameter address $007736_{(8)}$ for file number 0.

Screen display of JW-13PG

```
 07716     D   00000
 07720     D   00004
I PARAM.
>07722     D   00008
```

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V5 **Set whether the station number information should be output or not**

· Set whether the station number information should be output or not on the parameter address $007763_{(8)}$.

$007763_{(8)}$ — Whether the station number information should be output or not
- $00_{(H)}$: Do not output
- $01_{(H)}$: Output

The station number information is output on the next byte of the flag area (24 bytes.)

V5 **Set top address of flag area**

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte

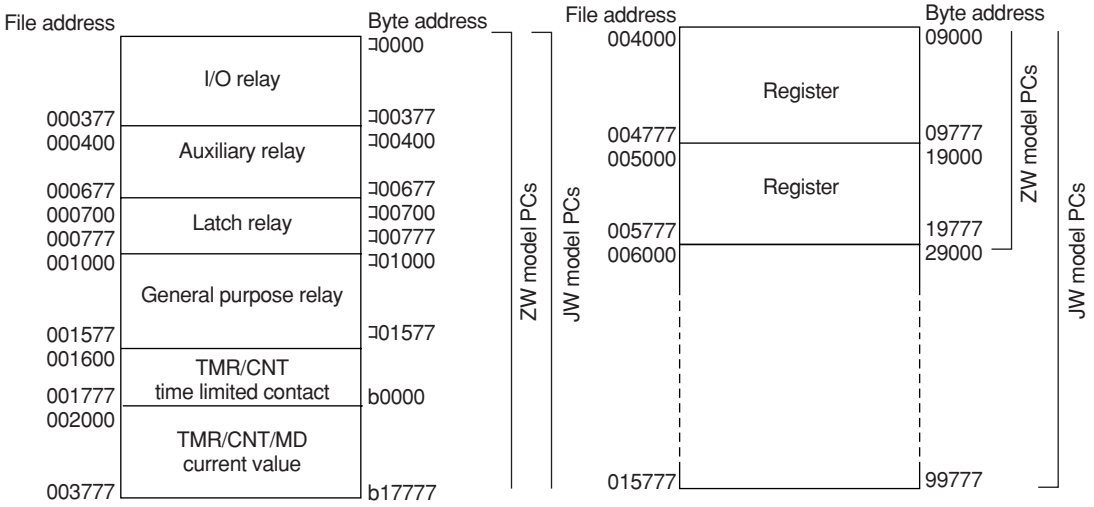
· Set the top address of the flag area (24 bytes) in order to monitor the communication condition and PC operation condition on the parameter address 007764 to $007767_{(8)}$.
· Flag area uses 24 bytes regardless number of connecting stations.

	Contents		Initial value	
$007764_{(8)}$	Lower		$E0_{(H)}$	Byte address: $01E0_{(H)} \rightarrow 000740_{(8)} \rightarrow \sqsupset 0740$
$007765_{(8)}$	Upper		$01_{(H)}$	
$007766_{(8)}$		File number	$00_{(H)}$	File number 0
$007767_{(8)}$	D_7		$80_{(H)}$	Output flag

D_7: Output flag : ON / Do not output flag : OFF

Remarks

· The PC's input/output relays, auxiliary relays, registers etc. are all allocated individual byte addresses for each item. However, the JW-20CM can assign these addresses with file addressees allocated throughout the memory.



· The usable file numbers will vary with the memory module that is installed on the PC.

Name of memory module	Usable file numbers
ZW-1MA, JW-1MAH	0 or 1※
ZW-2MA, JW-2MAH	0 or 1
ZW-3MA, JW-3MAH	0, 1, 2
ZW-4MA, JW-4MAH	0, 1, 2, 3, 4, 5, 6, 7

※ If file number is 1, file address shall be within 000000 to $037777_{(8)}$. (See page 13·20 and 21 for other cases.)

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Enter communication error detection interval **[DCM (decimal), byte]**

· If the JW-20CM does not receive data from a station within the specified time (initial value: 250 ms when fewer than 32 stations are connected, 450 ms when more than 33 stations are connected), it turns OFF the communication monitor flag corresponding to this station. The specified time can be changed by entering a different value at parameter address $007771_{(8)}$ (communication error detection time). Use the same value for all the stations.
Normally, this value does not need to be changed. Use the modules with the initial value ($00_{(H)}$).

Set value$_{(D)}$	Communication error detection time (ms)
000	Initial value: 250 ms for fewer than 32 stations, 450 ms for more than 33 stations.
001	100
002	200
003	300
004	400
005	500
006	600
⋮	⋮
010	1000
⋮	⋮
255	2500

* Detection time precision:
–100 ms to +0 ms

Ex.: If the PC scan time is extremely long (exceeds the time specified above), the communication monitor flag will turn OFF, even though there is no communication error. In this case, change the value at parameter address $007771_{(8)}$ to a larger number.

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Writing to the EEPROM of the JW-20CM, start operation **[HEX (hexadecimal), byte]**

· Write "$81_{(H)}$" into parameter address $007777_{(8)}$ and write the set parameter contents into the EEPROM of the JW-20CM. Then start the JW-20CM.
· After starting operation, the setting value changes to "$01_{(H)}$."

Setting value (H)	Contents
0 0	Stop operation of the JW-20CM
0 1	Start operation of the JW-20CM
8 0	Writing to the EEPROM of the JW-20CM, stop operation
8 1	Writing to the EEPROM of the JW-20CM, start operation
0 8	Initialize parameters

Display the contents of address 007777(8)

Write 81(H)

Screen display of JW-13PG

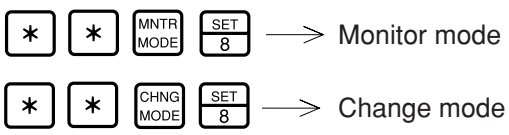
```
 07775     HEX     00
 07776     HEX     EC
I PARAM.
>07777     HEX     81
```

Remarks

· Writing time to EEPROM is approximately 0.7 sec. When any error is found for parameter settings, the JW-20CM lights the error code ($6F_{(H)}$) by the indication lamp.
When error code $6F_{(H)}$ lights,
① Check flag top address
② If the master station also lights up with error code $6F_{(H)}$, check the top address and number of bytes in the relay link and register link in the master station which corresponds to the slave station in which the error occurred.
· Written contents into the EEPROM are automatically transferred to the RAM of the JW-20CM when turning ON the power of the PC. At transferring, the PC checks BCC and compares BCC check code of the parameter memory address ($007776_{(8)}$). When an error is found, the JW-20CM lights the error code ($6E_{(H)}$) by the indication lamp.
· If "parameter initialization" is selected, the module initializes parameter addresses 004000 to $007776_{(8)}$.

PC operation

Turning a slave module to monitor or change mode (PC operation).
(Operation example of using JW-13PG)



Screen display of JW-13PG

```
C00000
>
```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9-7 Setting contents of master station parameters

[1] Setting contents

When the JW-20CM is used as a master station, set the following items for parameters after setting switches.

For details of the parameter memory, see pages 13·9 to 15.

※ Corresponding signs on pages 9·35 to 37

	Item	Address (8)	Initial value (H)	Contents (setting range)		※
①	Top address of relay link area on the master station	004000 to 004001	00	Set file address by octal notation (File 0: 000000 to 007777)		a_0
②	Function	004002	00	Set to 01(H)		—
③	Number of connected stations	004003	00	Set number of stations including master stations by decimal (2 to 64)		—
④	Relay link area top address or number of offset bytes on slave station 01 to 77(8)	004004 to 004377	00	When a slave station is data link (standard function), set the top address by file address (8) (See page 13・20 and 21)	When a slave station is data link (memory save function), set the number of offset bytes by decimal. (000000 to 00256(D))	a_1 to a_{77}
⑤	Register link area top address on the master station	004400 to 004403	00	Set file address by octal notation File 0: 000000 to 15777(8) File 1 to 7: 000000 to 177777(8)		b_0
⑥	Register link area top address or number of offset bytes on slave station 01 to 77(8)	004404 to 004777	00	When a slave station is data link (standard function), set the top address by file address (8) (See page 13-20 and 21)	When a slave station is data link (memory save function), set the number of offset bytes by decimal. (000000 to 02048(D))	b_1 to b_{77}
⑦	Number of relay link sending bytes of master station	005000 to 005001	00	Set the number of bytes by decimal (0 to 256, within 0 to 256 in total)		c_0
⑧	Set number of relay link seding bytes of slave station 01 to 77(8)	005002 to 005177	00	Set the number of bytes by decimal (0 to 256, within 0 to 256 in total)		c_1 to c_{77}
⑨	Number of register link sending bytes of master station	005200 to 005201	00	Set the number of bytes by decimal (0 to 2048, within 0 to 2048 in total)		d_0
⑩	Set number of relay link seding bytes of slave station 01 to 77(8)	005002 to 005377	00	Set the number of bytes by decimal (0 to 2048, within 0 to 2048 in total)		d_1 to d_{77}
⑪	Time-out time of SEND/RECEIVE instruction	007501 to 007577	00	Set time-out time in decimal [001 (0.1 sec.) to 255 (25.5 sec.)]		—
⑫	Set PC type of each station in SEND/RECEIVE function	007601 to 007677	91	Select from "00, 80, 81, or 91" by hexadecimal		
⑬	Select system of each channel	007700 to 007703	00	Select instruction system or data memory starting system in CH0 to CH3		
⑭	Top addresses in communication information storage area when using data memory starting system.	007710 to 007713	00	Set by file number and file address - Setting range of communication information storage area (64 bytes) File 0: 000000 to 015777(8) File 1 to 7: 000000 to 177777(8)		

※ 1

※ 1 : Set only when the PC is a JW model using the SEND/RECEIVE function.

9

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※ Corresponding signs on pages 9·35 to 37

	Item	Address (8)	Initial value (H)	Contents (setting range)		※
⑮	Connection status of slave station (error code output)	007750 to 007757	00	Turn ON a bit corresponding to each station (See page 13-15)		—
⑯	Whether or not to output the station number information V5	007763	00	Store the number of own station in the data memory when setting on 01(H) (storage area of 1 byte follows flag area of 24 bytes, valid when 007767(8) is 80(H)		
⑰	Flag area top address (communication and PC operation condition monitor flag)	007764	E0	File address lower bits	Initial value: 01E0(H) ↓ 000740(a) (⊐0740)	e0
		007765	01	File address upper bits		
		007766	00	File number (00(H) only)		
		007767	80	Flag output (Yes: 80(H), No: 00(H))		
⑱	Communication error detection time	007771	00	Settable detection time with 100 ms pitch		—
⑲	- Start/stop operation - Write to EEPROM	007777	01	00(H): Stop operation		—
				01(H): Start operation		
				80(H): Stop writing to EEPROM/operation		
				81(H): Start writing to EEPROM/operation		
				08(H): Initialize parameter		

• ① to ⑲ correspond to numbers in page 9·38.

9

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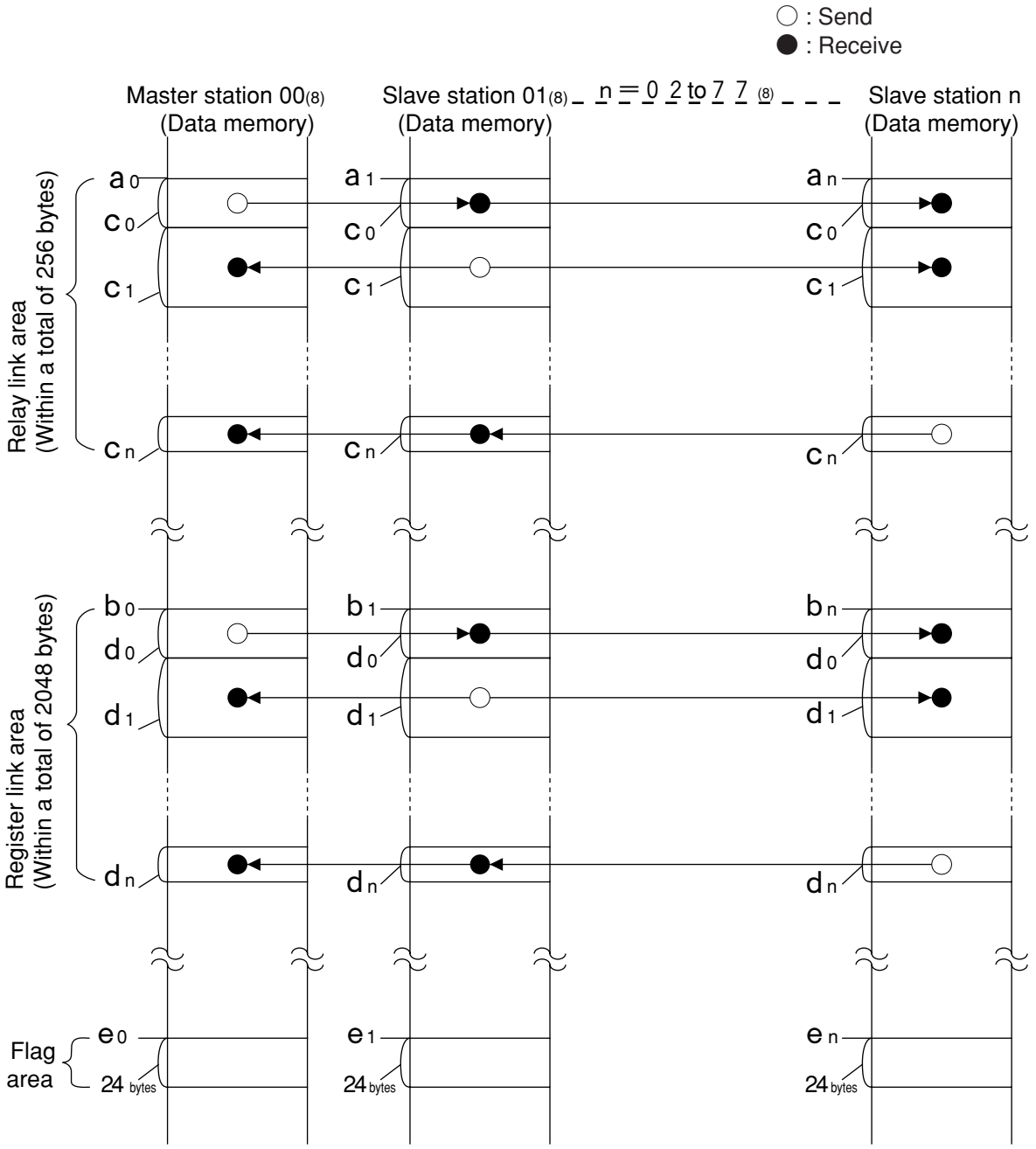
[2] Communication area map

(1) In case that setting data link (the standard function) when the master station and all slave stations are JW-20CM.



- Set the relay link area, register link area, flag area within the setting range nominated in page 13·20, 21. However, be careful not to double any address allocation of these.
- Set a_0 to e_n for parameters of master station and slave station. (See page 9·22, 33 and 34)

Parameter for setting in master station	Parameter for setting in slave station
Top address of relay link area a_0, a_1 to a_n	Top address of flag area (slave station) e_1 to e_n
Top address of register link area b_0, b_1 to b_n	
Number of sending bytes of relay link area c_0, c_1 to c_n	
Number of sending bytes of register link area d_0, d_1 to d_n	
Top address of flag area (master station) e_0.	

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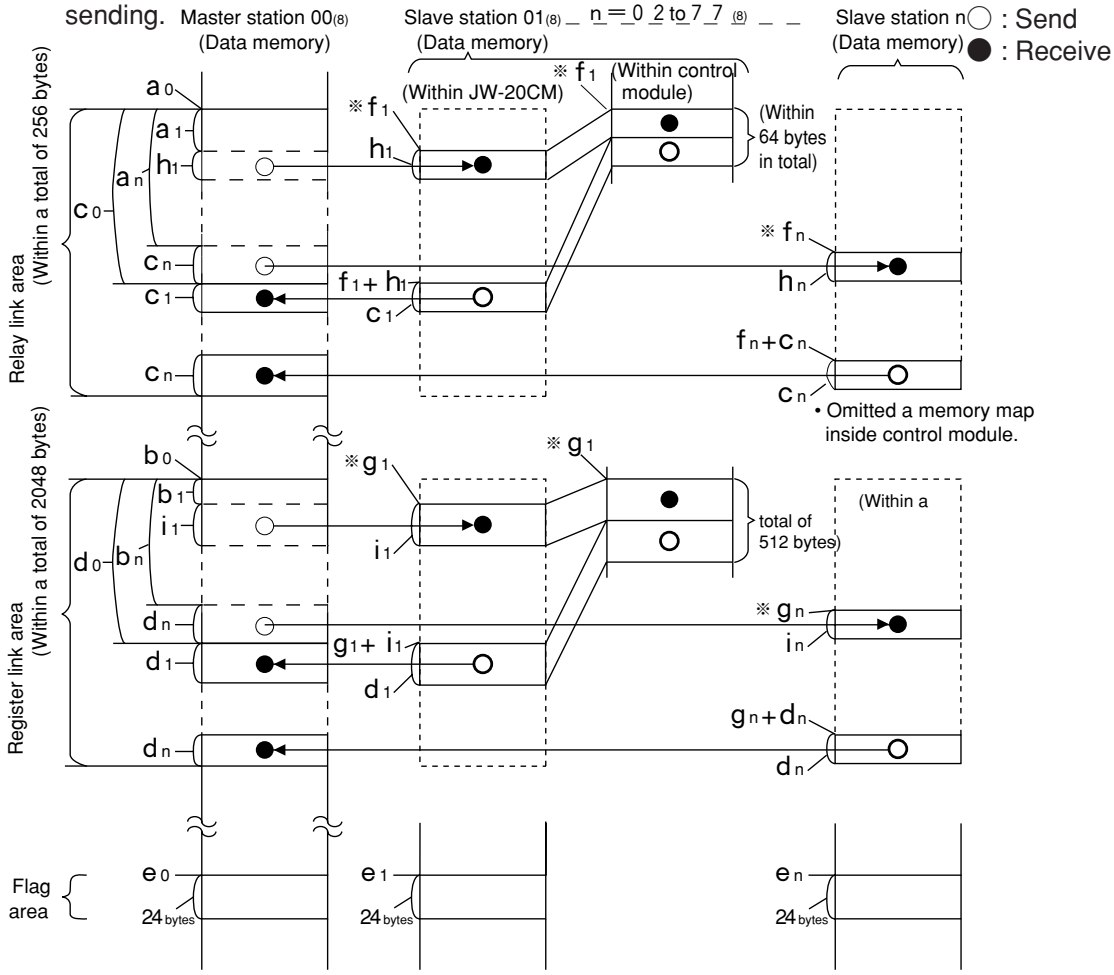
(2) In case that setting the data link (V5 memory capacity save function) when the master station and all slave stations are JW-20CM.

Memory addresses inside control module of slave station continue in order of receiving and sending.



- Set the relay link area, the register link area, and the flag area within the settings range of page 13·20, 21. Be careful not to double any address allocation of these.
- Set "a_0" to "i_n" above for parameters of master station and slave station (see page 9·22, 33 and 34).

Parameter for setting in master station	Parameter for setting in slave station
Top address of relay link area a_0, a_1 to a_n	Top address of flag area (slave station) e_1 to e_n
Top address of register link area b_0, b_1 to b_n	Number of receiving bytes of relay link area h_1 to h_n
Number of sending bytes of relay link area c_0, c_1 to c_n	Number of receiving bytes of register link area i_1 to i_n
Number of sending bytes of register link area d_0, d_1 to d_n	
Top address of flag area (master station) e_0.	

- Set the receiving area for save memory function within the range of the link area.
  - $0 \leqq \mathbf{a}_1 \leqq$ Total number of bytes of relay link area -$\mathbf{h}_1$
  - $0 \leqq \mathbf{a}_n \leqq$ Total number of bytes of relay link area -$\mathbf{h}_n$
  - $0 \leqq \mathbf{b}_1 \leqq$ Total number of bytes of register link area -$\mathbf{i}_1$
  - $0 \leqq \mathbf{a}_n \leqq$ Total number of bytes of register link area -$\mathbf{i}_n$

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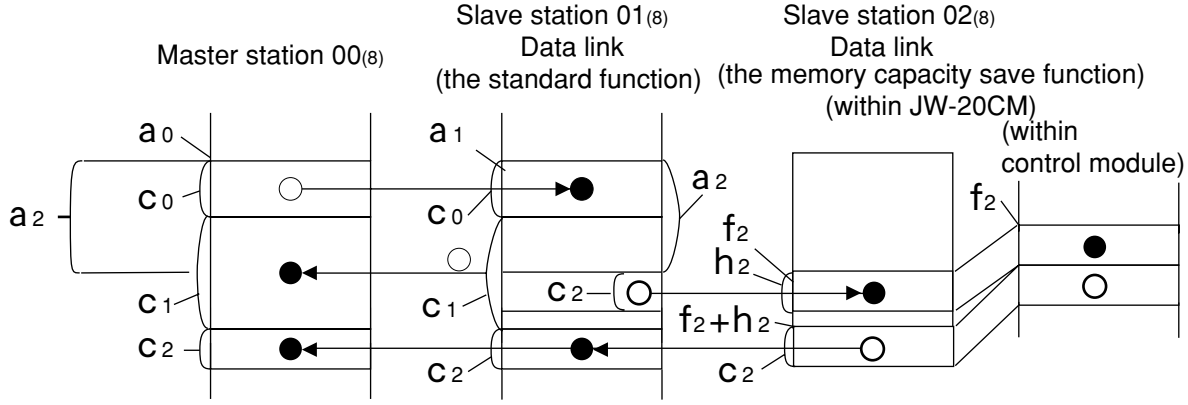
• Number of receiving bytes of slave station (h1 to hn, i1 to in)
Select self-setting or "same as number of sending bytes (c_1 to c_n, d_1 to d_n)" according to parameter (007720 to 007723) of slave station.
• Number of offset bytes can be set exceeding the number of sending bytes of the master station.
$a_1, a_n \geqq c_0$ and $b_1, b_n \geqq d_0$

(3) When the master station and slave stations are all JW-20CM and both data link (the standard function) and data link (V5 memory capacity save function) are set among slave stations.

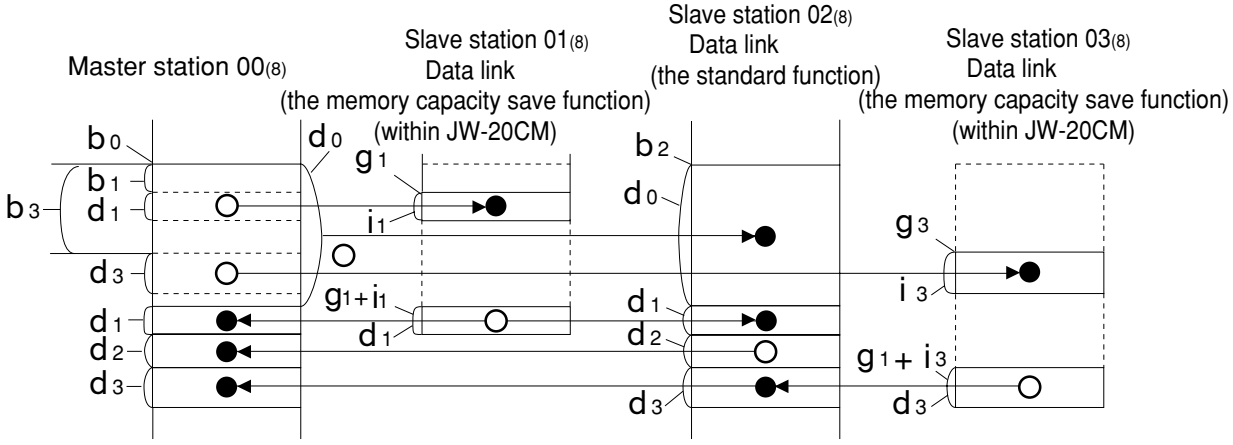
Set signs below by the parameters of the master station (page 9·22, 33 and 34).

• An example of a relay link area map for the setting of the data link (standard function) for slave station 01 and the data link (memory capacity save function) to slave station 02.



Total number of bytes of relay link area ($C_0 + C_1 + C_2$) ≦ 256 bytes
$c_2 + h_2 \leqq 64$ bytes $0 \leqq a_2 \leqq c_0 + c_1$

• An example of register link area map for the setting of the data link (the save memory function) to slave station 01 and 03 and data link (the standard function) to slave station 02.



Total number of bytes of register link area ($d_0 + d_1 + d_2 + d_3$) ≦ 2048 bytes
$0 \leqq b_1 \leqq d_0 + d_2 + d_3$ $0 \leqq b_3 \leqq d_0 + d_1 + d_2$
$i_1 + d_1 \leqq 512$ $i_3 + d_3 \leqq 512$

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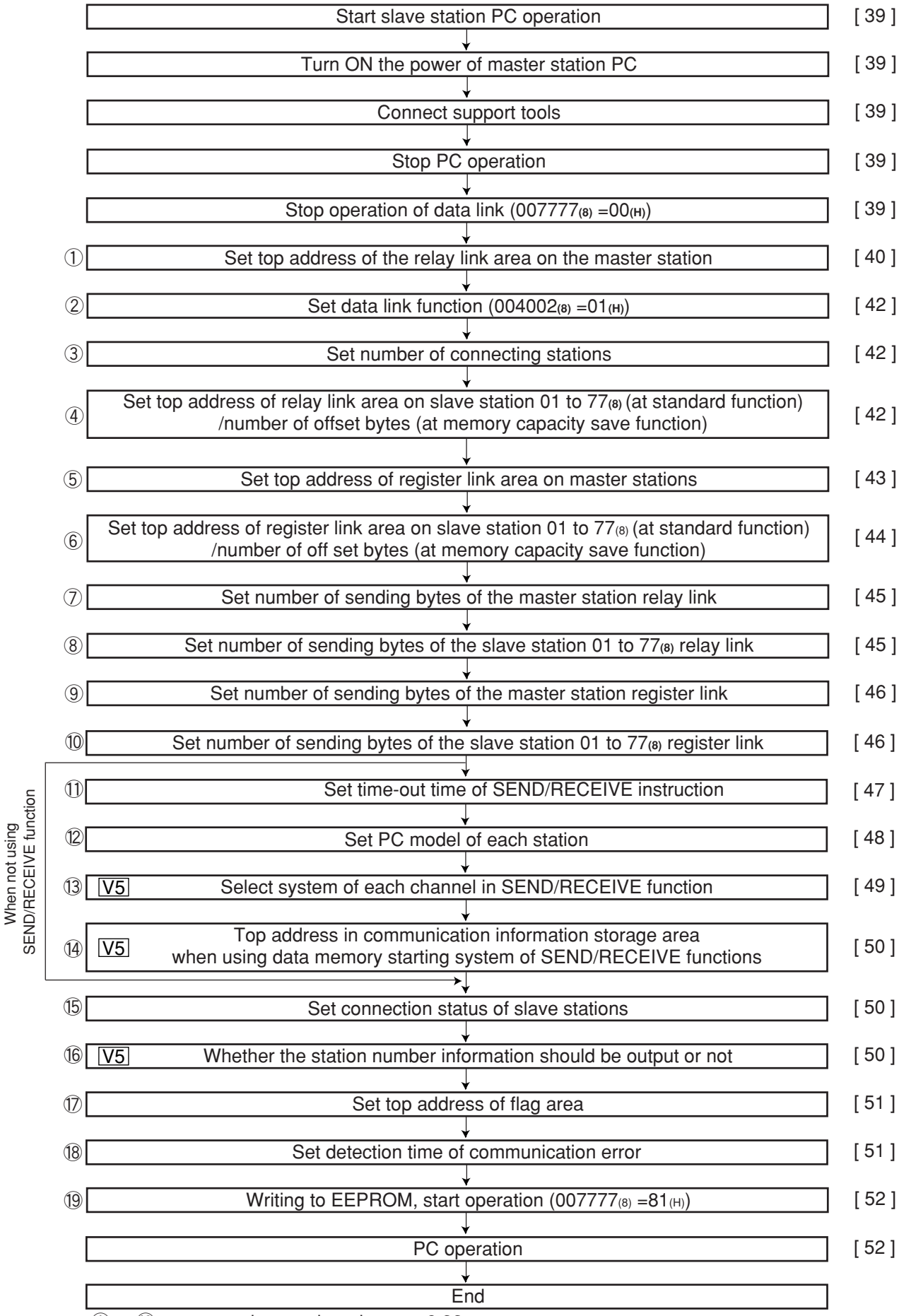
[3] Setting procedure

In brackets: See page in chapter 9



① to ⑲ correspond to numbers in page 9·33.

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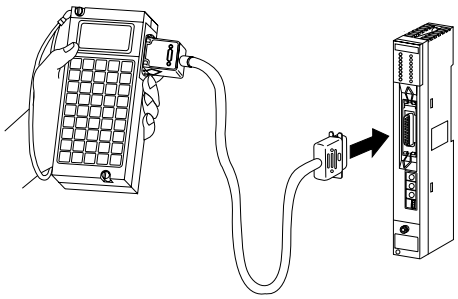
"Run" the slave station PC

↓

Turn "ON" the power of the master station PC and connect support tools

• Connect a support tool with the JW-20CM and prepare the setting parameter.



<Usable support tools>
JW-13PG/12PG
JW-50SP
JW-50PG, Z-100LP2S

• For operation of each support tool, see the instruction manual attached. The following describes an example of JW-13PG's key operation.

Stop PC operation

• Turn to program mode (stop PC operation). Setting of parameters is only available when the PC is in program mode.
(Operation example of JW-13PG)

[*] [*] [PROG MODE] [SET 8] → Stop PC operation

[クリア CLR] [*] [*] [シフト SHIFT] [INTL DISP] [SET 8] [B 1] → Select parameter setting mode.

Select initial mode — (Parameter setting)

Stop operation of data link **[HEX (hexadecimal), byte]**

• Setting of the parameter is only available when the operation of the JW-20CM is stopped.
• Write "$00_{(H)}$" to parameter address $007777_{(8)}$ and stop operation of the JW-22CM.
(Operation example of JW-13PG)

[7] [7] [7] [7] [モニタ MNTR] [A 0] [書込 ENT]

Display the contents of parameter address 007777 by hexadecimal.

(Write $00_{(H)}$.)

Screen display of JW-13PG

```
 07775     HEX     00
 07776     HEX     00
I PARAM.
>07777     HEX     00
```

Reference Function of JW-13PG

• [変換 CONV] key: Changeover unit of figures

→ $HEX_{(hexadecimal)}$ → $OCT_{(octal)}$ → $DCM_{(decimal)}$ → Bit pattern →

• [FORCE LNGTH] key: Byte display ⟷ Changeover word display

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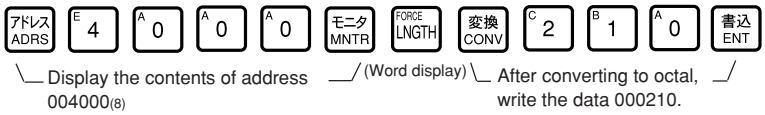
Set top address of the relay link area on the master station **[OCT (octal), word]**

• Set file address$_{(8)}$ to parameter address 004000 to 004001$_{(8)}$.
These top addresses should not overlap the register link area, flag area, or any area used by other option module.

In case of setting ⊐0210 (file address 000210$_{(8)}$) using JW-13PG : Example for slave station of page 9·41.

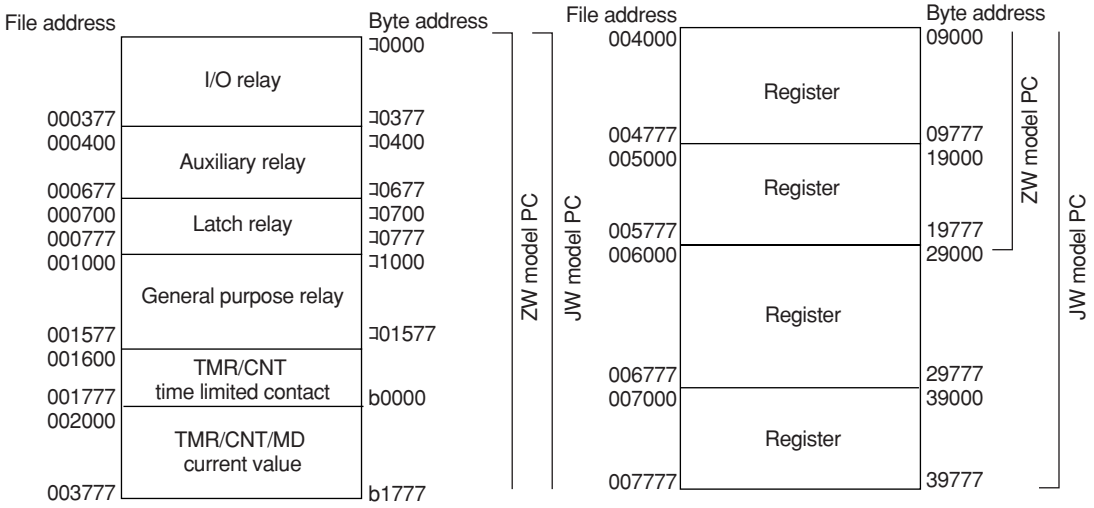


Screen display of JW-13PG

```
 03774     0    000000
 03776     0    000000
I PARAM.
>04000     0    000210
```

Remarks

· The PC's input/output relays, auxiliary relays, registers etc. are all allocated individual byte addresses for each item. However, the JW-20CM can assign these addresses with file addressees allocated throughout the memory.



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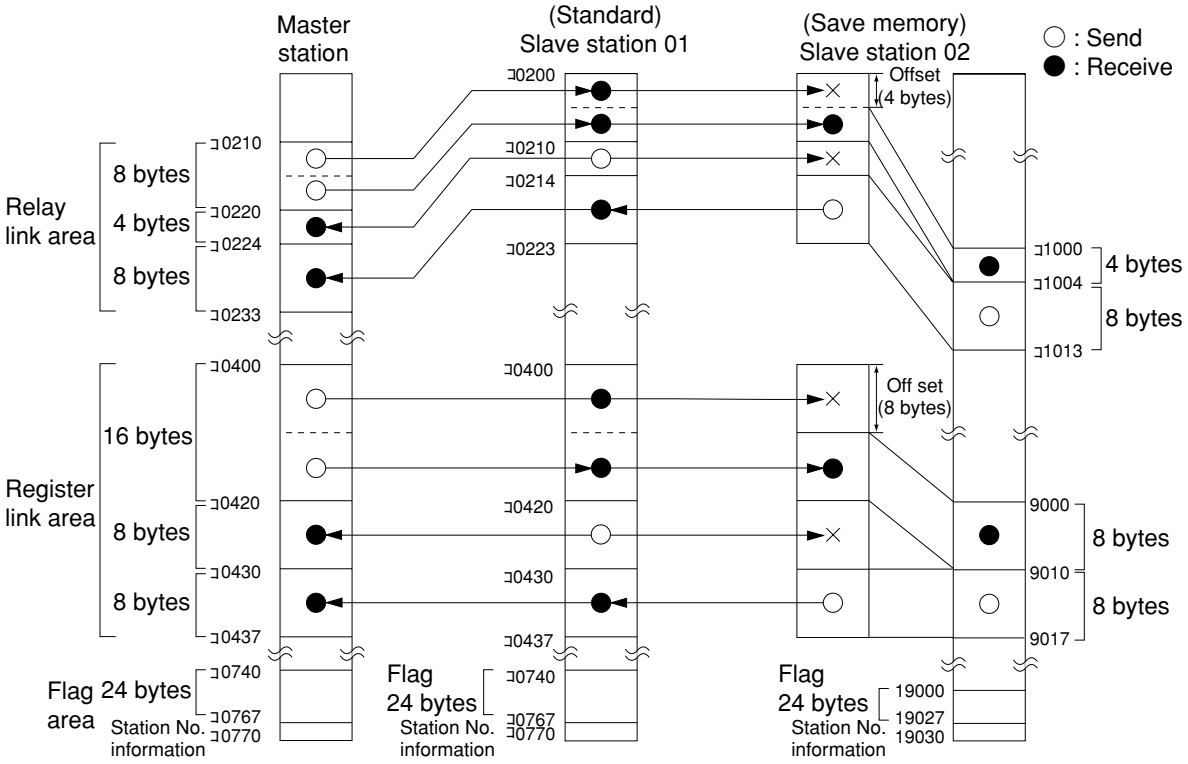
[Example for setting]

The master station and slave station 01 and 02 are JW-20CM.

It shows example for setting that slave station 01 is data link (standard function) and slave station 02 is data link (memory capacity save function : V5).



	Maser station	Slave station 1 (standard)	Slave station 2 (save memory)
Top address of relay link area	⊐0210	⊐0200	※ ⊐1000
Number of off set bytes of relay link area	–	–	4 bytes
Number of sending bytes of relay link	8 bytes	4 bytes	8 bytes
Number of receiving bytes of relay link	–	–	※ 4 bytes
Top address of register link area	⊐0400	⊐0400	※ 09000
Number of off set bytes of register link area	–	–	8 bytes
Number of sending bytes of register link	16 bytes	8 bytes	8 bytes
Number of receiving bytes of register link	–	–	※ 8 bytes
Top address of flag area	⊐0740	※ ⊐0740	※ 19000
Station number information output	Yes	※ Yes	※ Yes

No mark -- Setting by parameter of master station

※ ---------- Setting by parameter of slave station

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Data link function setting **[HEX (hexadecimal), byte]**

• Set "$01_{(H)}$ ($=001_{(8)}$)" in parameter address $004002_{(8)}$ and change to "relay/register link."

(Operation example of JW-13PG)

STEP (+) → FORCE LNGTH → B 1 → 書込 ENT → Write $001_{(8)}$ to $004002_{(8)}$

Screen display of JW-13PG

```
 04000      HEX   880
 04001      HEX   00F
I PARAM.
>04002      HEX   01
```

Set number of connecting stations **[DCM (decimal), byte]**

• Set the number of connecting stations (02 to $64_{(D)}$) including the master station in the parameter address $004003_{(8)}$ by octal.

• If you try to set values other than 02 to $64_{(D)}$, JW-20CM the displays $6F_{(H)}$ error code.

STEP (+) → 変換 CONV → D 3 → 書込 ENT → After converting into decimal notation in $004003_{(8)}$, write "003."

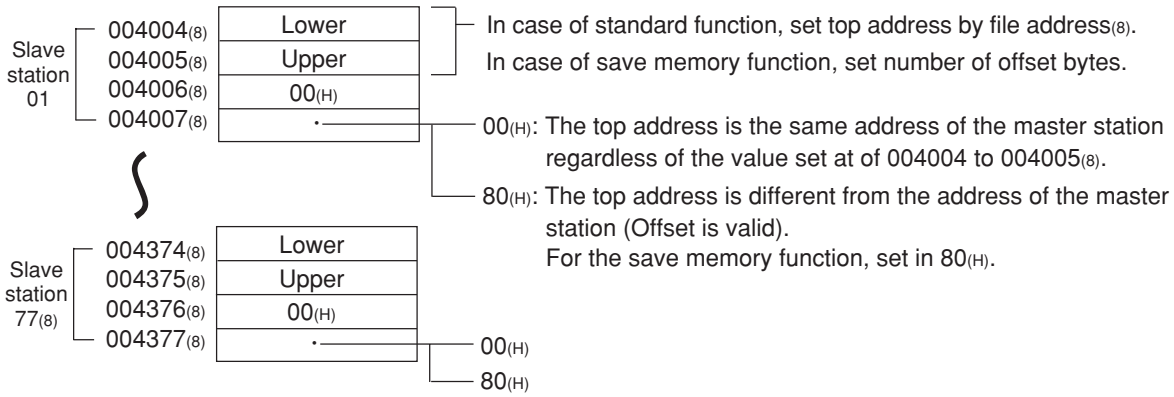
Screen display of JW-13PG

```
 04001      DCM   000
 04002      DCM   001
I PARAM.
>04003      DCM   003
```

Set top address of relay link area on slave station (01 to 77) (at standard function)/number of offset bytes (memory capacity save function)

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte
Set the "same" as or "different" from the master station: HEX (hexadecimal) , bytes.

• Set in parameter addresses 004004 to $004377_{(8)}$. These top addresses should not overlap the register link area, flag area, or any area used by other option module.



• In case of setting ⊐0200 (file address $000200_{(8)}$) in parameter addresses 004004 to $004007_{(8)}$ (slave station 01) and set 4 (number of off set bytes) in $004010_{(8)}$ to $004013_{(8)}$ (slave station 02). (Example for page 11·10.)

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Slave station 01

STEP (+) → FORCE LNGTH (Word display) → 変換 CONV → 変換 CONV → 変換 CONV (Convert to octal figures) → C 2 → A 0 → A 0 → 書込 ENT → Write 000200(8) in parameter addresses 004004 to 004005(8).

STEP (+) → FORCE LNGTH (Byte display) → A 0 → A 0 → A 0 → 書込 ENT → Write 000(8) (=00(H)) in parameter address 004006(8).

STEP (+) → 変換 CONV → 変換 CONV → 変換 CONV (Convert to hexadecimal figures) → SET 8 → A 0 → 書込 ENT → Write 80(H) (the top address is not same as the master station) in parameter address 004007(8).

Slave station 02

STEP (+) → FORCE LNGTH → 変換 CONV → 変換 CONV → E 4 → 書込 ENT → Write 00004(D) (offset 4) in parameter addresses 004010 to 004011(8).

STEP (+) → FORCE LNGTH → 変換 CONV → 変換 CONV → A 0 → A 0 → A 0 → 書込 ENT → Write 00(H) in parameter address 004012(8).

STEP (+) → SET 8 → A 0 → 書込 ENT → Write 80(H) (offset valid) in parameter address 004013(8).

Screen display of JW-13PG

```
 04011      HEX   00
 04012      HEX   00
I PARAM.
>04013      HEX   80
```

Set top address of register link area on the master station

File address: OCT (octal), word
File number: HEX (hexadecimal) , bytes.

Set on the parameter address (004400 to 004403(8)) in the file address(8). These top addresses should not overlap the register link area, flag area, or any area used by other option modules.

004400(8)	Lower
004401(8)	Upper
004402(8)	File number
004403(8)	▬▬▬

File address

• In case of setting ⊐0400 (file address 000400(8)) in parameter addresses 004400 to 004403(8) and set 0 (file number) in 004402(8). (Example for page 9·41).

アドレス ADRS → FORCE LNGTH → E 4 → E 4 → A 0 → A 0 → モニタ MNTR → Display the contents of parameter addresses 004400 to 004401(8)

変換 CONV → E 4 → A 0 → A 0 → 書込 ENT → Write 000400(8) after converting to octal.

STEP (+) → FORCE LNGTH → 変換 CONV → 変換 CONV → 変換 CONV → A 0 → 書込 ENT → Write file no 0 in parameter address 004402(8).

Screen display of JW-13PG

```
 04400      OCT   000
 04401      OCT   001
I PARAM.
>04402      OCT   000
```

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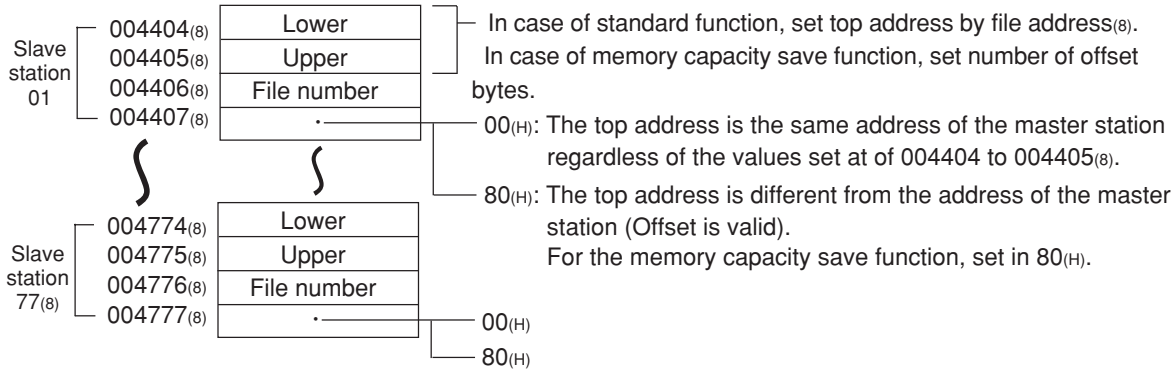
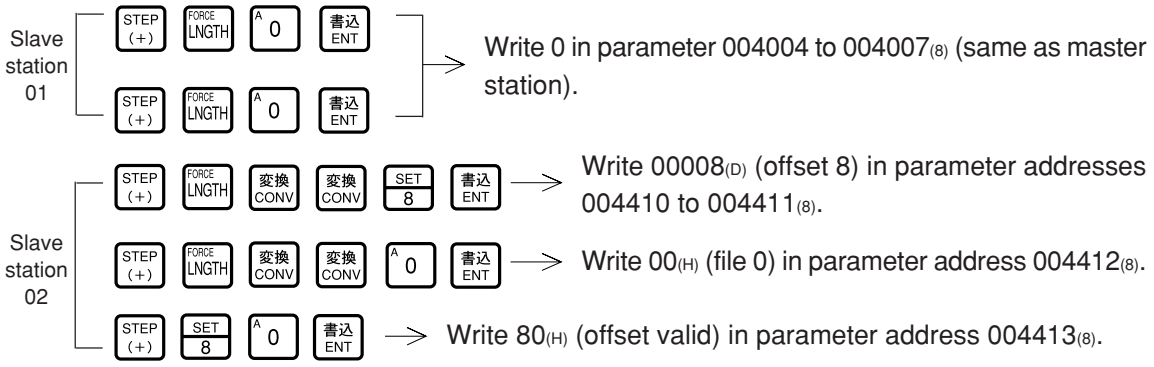
Set top address of register link area on slave station 01 to 77(8) (at standard function)/ number of offset bytes (at memory capacity save function)

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte
Set the "same" as or "different" from the master station: HEX (hexadecimal) , bytes.

Set in parameter addresses 004404 to 004777(8). These top addresses should not overlap the register link area, flag area, or any area used by other option module.



• In case of setting 0 (the top address is ⊐0440, the same as the address of the master station) in parameter addresses 004404 to 004407(8) (slave station 01) and the offset byte number 8 and "offset valid" on the parameter address 004410 to 004413(8) (slave station 02). (Example for 9·40)



Screen display of JW-13PG

```
 04011      HEX   00
 04012      HEX   00
I PARAM.
>04013      HEX   80
```

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Set the number of sending bytes of the master station relay link [DCM (decimal), word]

• Set in parameter addresses 005000 to $005001_{(8)}$.

$005000_{(8)}$	Lower
$005001_{(8)}$	Upper

• These top addresses should not overlap the register link area, or the flag area, or exceed the setting range (0 to 256 bytes for each station, 256 bytes for all stations in total).

In case of setting 8 bytes: Using JW-13PG example for page 9·41

アドレス ADRS → F 5 → A 0 → A 0 → A 0 → モニタ MNTR ⟶ Display the contents of parameter addresses 005000 to $005001_{(8)}$

変換 CONV → 変換 CONV → SET 8 → 書込 ENT ⟶ Write $00008_{(D)}$ after converting to decimal.

Screen display of JW-13PG

```
 04774      D  00000
 04776      D  00000
I PARAM.
>05000      D  00008
```

Set the number of sending bytes of the slave station (01 to 77) relay link [DCM (decimal), word]

• Set the number of sending bytes in decimal on the parameter addresses 005002 to $005177_{(8)}$. (set in each station, 2 bytes for each station).
These top addresses should not overlap the register link area, or the flag area, or exceed the setting range (0 to 256 bytes for each station, 256 bytes for all stations in total).

Slave station $01_{(8)}$	$005002_{(8)}$	Lower	Enter by decimal
	$005003_{(8)}$	Upper	
	to	to	
Slave station $77_{(8)}$	$005176_{(8)}$	Lower	Enter by decimal
	$005177_{(8)}$	Upper	

(In case of setting 4 bytes for slave station 01, and set 8 bytes for slave station 02: Example of page 9·41)

Slave station 01 → STEP (+) → E 4 → 書込 ENT ⟶ Write $00004_{(D)}$ in parameter addresses 005002 to $005003_{(8)}$.

Slave station 02 → STEP (+) → SET 8 → 書込 ENT ⟶ Write $00008_{(D)}$ in parameter addresses 005004 to $005005_{(8)}$.

Screen display of JW-13PG

```
 05000      D  00008
 05002      D  00004
I PARAM.
>05004      D  00008
```

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Set the number of sending bytes of the master station register link [DCM (decimal), word]

- Set the number of sending bytes in decimal on the parameter addresses 005200 to $005201_{(8)}$.
- These top addresses should not overlap the relay link area or the flag area, or exceed the setting value (0 to 2048 bytes for each station, 2048 bytes for all stations in total).

$005200_{(8)}$	Lower
$005201_{(8)}$	Upper

} Enter by decimal

(In case of setting 16 bytes using JW-13PG: Example of page 9·41)

アドレス ADRS → F 5 → C 2 → A 0 → A 0 → モニタ MNTR → Display the contents of parameter addresses 005200 to $005201_{(8)}$

B 1 → 6 → 書込 ENT → Write $00016_{(D)}$ in decimal notation.

Screen display of JW-13PG

```
 05174      D  00000
 05176      D  00000
I PARAM.
>05200      D  00016
```

Set the number of sending bytes of the slave station (01 to $77_{(8)}$) register link [DCM (decimal), word]

- Set the number of sending bytes in decimal on the parameter addresses 005202 to $005377_{(8)}$. (set in each station, 2 bytes for each station).
  These top addresses should not overlap the resister link area, or the flag area, or exceed the setting range (0 to 2048 bytes for each station, 2048 bytes for all stations in total).

Slave station 01	$005202_{(8)}$	Lower
	$005203_{(8)}$	Upper
	to	to
Slave station $77_{(8)}$	$005376_{(8)}$	Lower
	$005377_{(8)}$	Upper

(In case of setting 8 bytes both for slave station 01 and 02: example of page 9·41)

Slave station 01: STEP (+) → SET 8 → 書込 ENT → Write $00008_{(D)}$ in parameter addresses 005202 to $005203_{(8)}$.

Slave station 02: STEP (+) → SET 8 → 書込 ENT → Write 00008(D) in parameter addresses 005204 to $005205_{(8)}$.

Screen display of JW-13PG

```
 05200      D  00016
 05202      D  00008
I PARAM.
>05204      D  00008
```

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"When PC is JW model and the SEND/RECEIVE function is used"

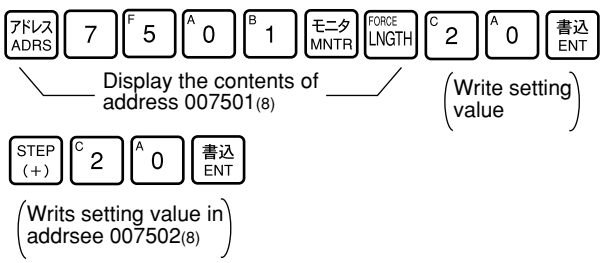
Set time-out time of SEND/RECEIVE function [DCM (decimal), byte]

- When the own station uses the SEND/RECEIVE instructions, set the time-out time on each communication target station.
- Setting range is 001 (0.1 sec.) to 255 (25.5 sec.) by decimal. $00_{(H)}$ of initial value is 1 second.

Address (8)	Station No. (8)	Address (8)	Station No. (8)	Address (8)	Station No. (8)	Address (8)	Station No. (8)
—	—	007520	2 0	007540	4 0	007560	6 0
007501	0 1	007521	2 1	007541	4 1	007561	6 1
007502	0 2	007522	2 2	007542	4 2	007562	6 2
007503	0 3	007523	2 3	007543	4 3	007563	6 3
007504	0 4	007524	2 4	007544	4 4	007564	6 4
007505	0 5	007525	2 5	007545	4 5	007565	6 5
007506	0 6	007526	2 6	007546	4 6	007566	6 6
007507	0 7	007527	2 7	007547	4 7	007567	6 7
007510	1 0	007530	3 0	007550	4 8	007570	7 0
007511	1 1	007531	3 1	007551	5 1	007571	7 1
007512	1 2	007532	3 2	007552	5 2	007572	7 2
007513	1 3	007533	3 3	007553	5 3	007573	7 3
007514	1 4	007534	3 4	007654	5 4	007574	7 4
007515	1 5	007535	3 5	007555	5 5	007575	7 5
007516	1 6	007536	3 6	007556	5 6	007576	7 6
007517	1 7	007537	3 7	007557	5 7	007577	7 7

Initial value: $00_{(H)}$ in all address (1 second)

(In case of setting $020_{(D)}$ (2 sec.) both for slave station 01 and 02 using JW-13PG)



Screen display of JW-13PG

```
 07500      DCM    000
 07501      DCM    020
I PARAM.
>07502      DCM    020
```

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"When PC is JW model and the SEND/RECEIVE function is used"

Set PC model of each station [HEX (hexadecimal), byte]

• Assign model type of the communication target station from ZW and JW PCs, ZW-20CM with JW applied or not, or JW-22CM (JW20/JW20H, JW30H)

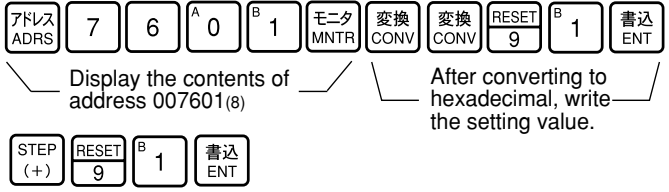
PC of target station / Communication module of target station	ZW model	JW model
ZW-20CM (without JW applied sign)	00, 80	00, 80
ZW-20CM (with JW applied sign)	81	91
JW-20CM	81	91
JW-22CM	91	

Set values(H)

Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)	Address (8)	Station number (8)
—	—	007620	2 0	007640	4 0	007660	6 0
007601	0 1	007621	2 1	007641	4 1	007661	6 1
007602	0 2	007622	2 2	007642	4 2	007662	6 2
007603	0 3	007623	2 3	007643	4 3	007663	6 3
007604	0 4	007624	2 4	007644	4 4	007664	6 4
007605	0 5	007625	2 5	007645	4 5	007665	6 5
007606	0 6	007626	2 6	007646	4 6	007666	6 6
007607	0 7	007627	2 7	007647	4 7	007667	6 7
007610	1 0	007630	3 0	007650	4 8	007670	7 0
007611	1 1	007631	3 1	007651	5 1	007671	7 1
007612	1 2	007632	3 2	007652	5 2	007672	7 2
007613	1 3	007633	3 3	007653	5 3	007673	7 3
007614	1 4	007634	3 4	007654	5 4	007674	7 4
007615	1 5	007635	3 5	007655	5 5	007675	7 5
007616	1 6	007636	3 6	007656	5 6	007676	7 6
007617	1 7	007637	3 7	007657	5 7	007677	7 7

1. Initial value: $91_{(H)}$ all address.
2. Entering both $00_{(H)}$ and $88_{(H)}$ will produce the identical result. The SEND communication instruction (writing data) is not available with this setting.
3. You cannot program SEND/RECEIVE instructions in a ZW model PC. However, the ZW model PC will respond to SEND/RECEIVE instructions from a JW model PC.

Ex.: When you want to enter $91_{(H)}$ at both the slave station 01 and 02 (if the PC a JW model and the I/O is a ZW-20CM with a sticker indicating that it can be used with the JW model or JW-20CM).



Screen display of JW-13PG

```
 07600      HEX   00
 07601      HEX   91
I PARAM.
>07602      HEX   91
```

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"When PC is JW model and the SEND/RECEIVE function is used"

Select system in each channel in SEND/RECEIVE function

• Select the method of each channel (instruction or data memory starting) on the parameter address 007700 to $007703_{(8)}$.

$007700_{(8)}$	CH 0
$007701_{(8)}$	CH 1
$007702_{(8)}$	CH 2
$007703_{(8)}$	CH 3

1. When using 1 channel alone

Channel	Setting value (H)	System
CH 0	0 0	Instruction system
	8 0	Data memory starting system
CH 1	0 0	Instruction system
	8 1	Data memory starting system
CH 2	0 0	Instruction system
	8 2	Data memory starting system
CH 3	0 0	Instruction system
	8 3	Data memory starting system

2. When using connected channels

In the SEND/RECEIVE function, the JW-20CM can send and receive a maximum of 256 bytes of data for each channel. For the data memory starting system, the amount of communication data can be increased by connecting channels.

Set the data amount with $8X_{(H)}$ (X is 0 to 3, determined depending on which channel is used for the connector.)

When using connected channels, these should be consecutive channels. For example, channel 0 and 1, or channel 2 and 3 can be connected to each other, but channel 1 and 3 can not be connected to each other.

[Example 1] When all channels are used for the data memory starting system (using 1 channel alone)

CH 0	$007700_{(8)}$	8 0 (H)
CH 1	$007701_{(8)}$	8 1 (H)
CH 2	$007702_{(8)}$	8 2 (H)
CH 3	$007703_{(8)}$	8 3 (H)

[Example 2] When channel 0 is used for the instruction system, and channel 1 to 3 are the data memory starting system and used connected.
(In this case, channel 2 and 3 can not be used.)

CH 0	$007700_{(8)}$	8 0 (H)
CH 1	$007701_{(8)}$	8 1 (H)
CH 2	$007702_{(8)}$	8 1 (H)
CH 3	$007703_{(8)}$	8 1 (H)

If you enter values other than "$00_{(H)}$, $81_{(H)}$ to $83_{(H)}$" the JW-20CM ignores the entry.

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"When PC is JW model and the SEND/RECEIVE function is used"

V5

Set top address in communication information storage area when using data memory starting system of SEND/RECEIVE functions

Set address of communication information storage area in parameter addresses 007710 to $007713_{(8)}$.

$007710_{(8)}$	Lower
$007711_{(8)}$	Upper
$007712_{(8)}$	File number of communication information storage area
$007713_{(8)}$	This setting is valid by $80_{(H)}$

Top address of communication information storage area (file address)

Set connection status of slave station **[bit pattern, byte]**

• In the initial settings of the data link function, the JW-20CM will not display errors (on the LEDs on the panel, or in the system memory) even if it detects a communication error in a slave station. In order to display the error when a slave station communication error is detected, set bit 0(E) at parameter address $007750_{(8)}$ to ON. Each bit at addresses 00751 to $007757_{(8)}$ corresponds to a slave station. Turn ON the respective bit if required. (See page 13·15.)
With the setting above, the JW-20CM will display errors when a slave station whose corresponding bit is ON produces a communication error.

Ex.: Setting the bits to output errors for slave stations 01 and 02 using the JW-13PG.

$007750_{(8)}$

7	6	5	4	3	2	1	0
0	0	0	0	0	1	1	1

アドレス ADRS → 7 → 7 → F 5 → A 0 → モニタ MNTR →

変換 CONV → 変換 CONV → 変換 CONV → B 1 →

B 1 → B 1 → 書込 ENT →

Screen display of JW-13PG

```
 07746
 07747
I PARAM.
>07750
```

· If a bit corresponding to a slave station is turned OFF, the module will not display an error code for a slave station which has an error.

V5

Set whether the station number information should be output or not

• Set whether the station number information should be output or not on the parameter address $007763_{(8)}$.

$007763_{(8)}$ — Whether the station number information should be output or not

- $00_{(H)}$: Do not output
- $01_{(H)}$: Output

The station number information is output on the next byte of the flag area (24 bytes.)

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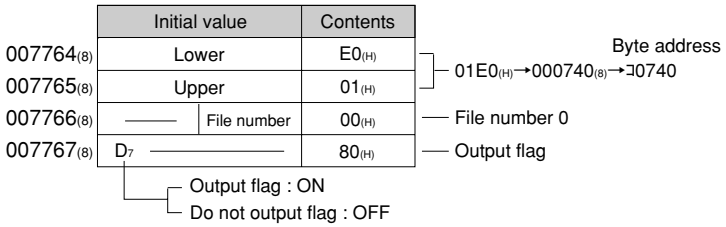
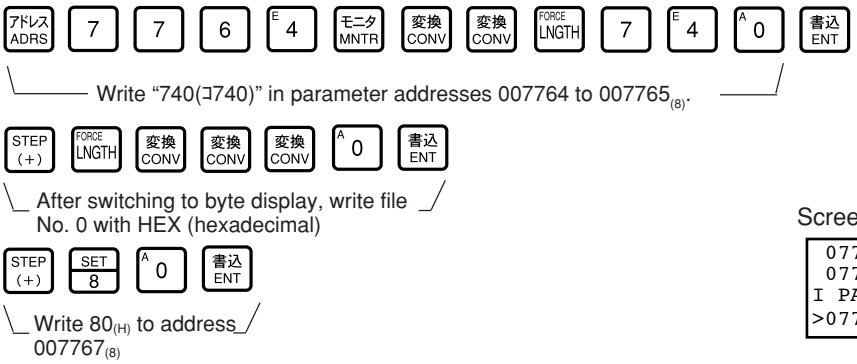
Set top address of flag area

File address: OCT (octal), word
File number/flag: HEX (hexadecimal), byte

- Set the top address of the flag area (24 bytes) in order to monitor the communication condition and PC operation condition on the parameter address 007764 to $007767_{(8)}$.
- Flag area uses 24 bytes regardless number of connecting stations.



- In case of setting "⊐0740, output flag" using JW-13PG.



Screen display of JW-13PG

```
 07765      HEX   01
 07766      HEX   00
I PARAM.
>07767      HEX   80
```

Enter communication error detection interval [DCM (decimal), byte]

- If the JW-20CM does not receive data from a station within the specified time (initial value: 250 ms when fewer than 32 stations are connected, 450 ms when more than 33 stations are connected), it turns OFF the communication monitor flag corresponding to this station. The specified time can be changed by entering a different value at parameter address $007771_{(8)}$ (communication error detection time). Use the same value for all the stations.
  Normally, this value does not need to be changed. Use the modules with the initial value ($00_{(H)}$).

Set value(D)	Communication error detection time (ms) ※
000	Initial value: 250 ms for fewer than 32 stations, 450 ms for more than 33 stations.
001	100
⋮	⋮
010	1000
⋮	⋮
255	2500

※ Detection time precision : —100 ms to +0 ms

Ex.: If the PC scan time is extremely long (exceeds the time specified above), the communication monitor flag will turn OFF, even though there is no communication error. In this case, change the value at parameter address $007771_{(8)}$ to a larger number.

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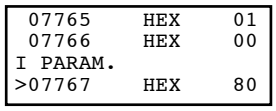
Writing to the EEPROM of the JW-22CM, start operation **[HEX (hexadecimal), byte]**

- Write "$81_{(H)}$" into parameter address $007777_{(8)}$ and write the set parameter contents into the EEPROM of the JW-20CM.
- Then start the JW-20CM. After starting operation, the setting value changes to "$01_{(H)}$."

Setting value (H)	Contents
0 0	Stop operation of the JW-20CM
0 1	Start operation of the JW-20CM
8 0	Writing to the EEPROM of the JW-20CM, stop operation
8 1	Writing to the EEPROM of the JW-20CM, start operation
0 8	Initialize parameters

(Operation example of JW-13PG)

Screen display of JW-13PG



Remarks

· Writing time to EEPROM is approximately 0.7 sec. When any error is found for parameter settings, the JW-20CM lights the error code ($6F_{(H)}$) by the indication lamp. To recover from this condition.

■ Treatment when error code $6F_{(H)}$ appears and COMM is turned OFF.

① Check number of top addresses/bytes of master station "relay link" and "register link."
② Check the set value for number of connected stations.
③ Check the set value for master station flag top address.
④ Check whether the function is set to "relay register link."

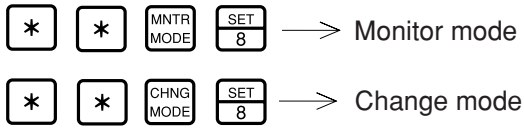
· Written contents into the EEPROM are automatically written to the RAM of the JW-22CM when turning ON the power of the PC. At reading, the PC checks BCC and compares BCC check code of the parameter memory address ($007776_{(8)}$). When an error is found, the JW-20CM lights the error code ($6E_{(H)}$) by the indication lamp.

· If "parameter initialization" is selected, the module initializes parameter addresses 004000 to $007776_{(8)}$.

PC operation

Turning a master module to monitor or change mode (PC operation).

(Operation example of JW-13PG)



Screen display of JW-13PG

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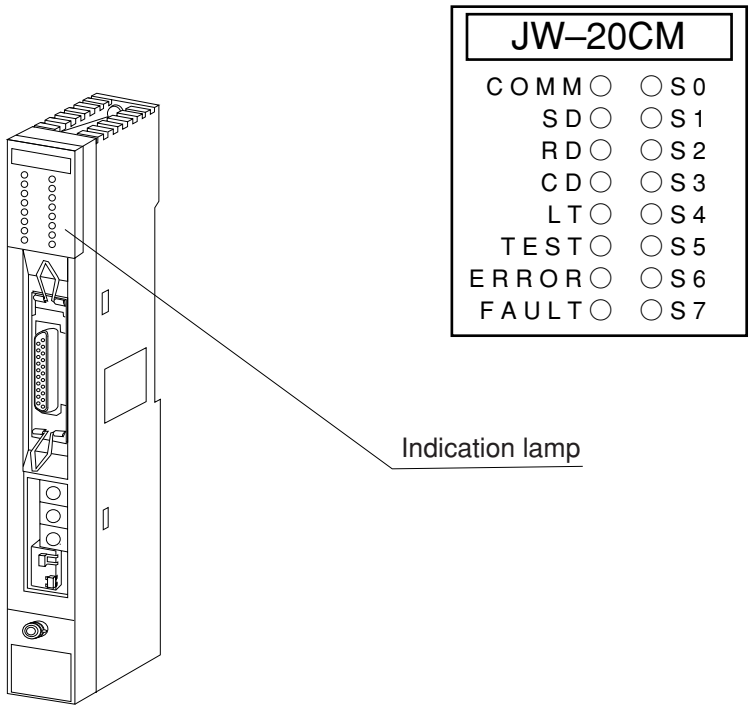
9-8 Error and treatment

Operation status of the JW-20CM can be check by indication lamps, flags, or system memory.

(1) Indication lamp



Name	Operation	Recovery
COMM	Lights while the remote I/O is operating	———
SD	Flickers while sending data	———
RD	Flickers while receiving data	———
CD	Flickers while detecting a carrier	———
LT	Lights when the termination resistance switches turned ON	———
TEST	Lights while testing	———
ERROR	Lights while an error is detected (Indicate error code by S0 to S7 LEDs)	· Check disconnection of communication cable · Check settings of switches · Check settings of parameter · Check power supply voltage.
FAULT	Lights when the watchdog timer is time up (JW-20CM is faulty)	Replace the JW-20CM
S0 to S7	Indicates error codes by hexadecimal when an error is occurred	See the next page

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(Error code)

● : ON, ○ : OFF

LED name								Error code (HEX)	Cause	Measure
80	40	20	10	8	4	2	1			
○	○	○	○	○	○	○	●	$01_{(H)}$	ROM error, upper CPU	Replace the JW-20CM
○	○	○	○	○	○	●	○	$02_{(H)}$	RAM error, upper CPU	
○	○	○	○	○	○	●	●	$03_{(H)}$	2 port RAM error against PC, upper CPU	
○	○	○	○	○	●	○	○	$04_{(H)}$	2 port RAM error against communication CPU, upper CPU	
○	○	○	●	○	○	○	●	$11_{(H)}$	ROM error, communication CPU	• Check the communication cable • Check for doubled allocation of slave station number • Replace the JW-20CM
○	○	○	●	○	○	●	○	$12_{(H)}$	RAM error, communication CPU	
○	○	○	●	●	○	○	○	$18_{(H)}$	Communication LSI error, communication CPU	
○	○	○	●	●	●	●	●	$1F_{(H)}$	No response, communication CPU	
○	○	●	○	○	○	○	○	$20_{(H)}$	More than one token detected	Check the parameter setting, switch
○	○	●	○	○	○	○	●	$21_{(H)}$	Doubled address detected	
○	○	●	○	○	○	●	○	$22_{(H)}$	Fault of sending section	Replace the JW-20CM
○	○	●	○	○	○	●	●	$23_{(H)}$	Token does not return within the rated interval	Check the communication cable
○	○	●	○	●	○	●	○	$2A_{(H)}$	Over flow of receiving buffer. Occurs when the upper CPU processing is delayed.	Check the communication cable
○	○	●	○	●	○	●	●	$2B_{(H)}$	Flame length error • Occurs because of a media execution error or noise from outside.	
○	○	●	○	●	●	○	○	$2C_{(H)}$	Media error	
○	○	●	●	○	○	○	○	$30_{(H)}$	EEPROM error	Check the communication cable Replace the JW-20CM
●	○	●	●	●	●	●	○	$BE_{(H)}$	BCC error	Check the parameter contents
●	○	●	●	●	●	●	●	$BF_{(H)}$	Parameter setting error	
●	●	○	○	○	○	○	●	※$C1_{(H)}$	Communication error • After converting into octal, the lower two digits represent the slave station number of the current error. (Ex. $C1_{(H)} = 301_{(8)}$ = slave station 01)	Check the communication cable and slave module
to								to		
●	●	●	●	●	●	●	●	※$FF_{(H)}$		

※ You need to select the "output error code for a slave station connection condition" at the master station parameter addresses 007750 to $007757_{(8)}$. If more than one slave station has an error, the slave station with the lowest station number will be displayed.

Remarks

- Error codes “23” and “$2A_{(H)}$” may occur when applying power. This is not an error.
- To check the communication cable, remove both connectors and short the connector terminals at one end. Then measure the conductivity using a tester.
- Check the parameter and switch settings for all stations. If the settings are correct, replace the JW-20CM or JW-20RS.

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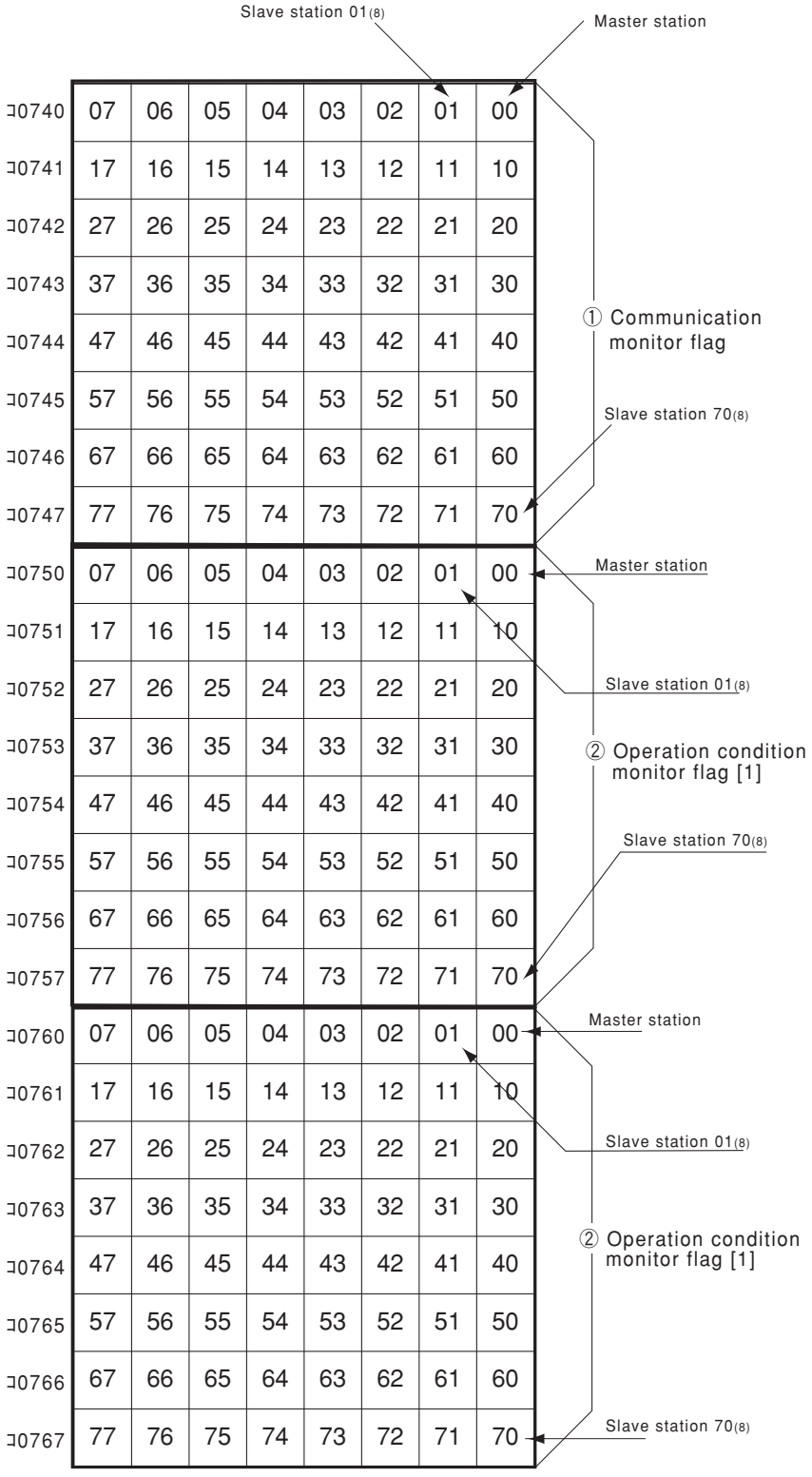
(2) Flag

Flag area is 24 bytes from the “flag top address” set in the master station/slave station parameters.

① **Flag table** [In case of flag top address is ⊐0740 (initial value)]



Remarks

- Even a slave station can monitor 24 bytes of flag.

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② **In the case of a master station (PC 00)**

· **Communication monitor flag**

This flag is used to monitor the communication condition with other stations. Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag (master station)	When the link start switch is set to “01(H),” and the master station is operating normally.	ON
	When the link start switch is set to “00(H).”	OFF
	Improper setting of parameter, BCC check error, or other errors.	

Flag	Condition for flag operation	Flag operation	
Other station’s flag (01 to 77)	Normal communication with slave stations.	ON	Specific slave station
	Stopped communication or unable to communicate with slave stations.	OFF	
	Communication monitor flag (1) of the master station is turned “OFF.”		All slave stations

The master station periodically executes communication recovery operation with the communication error slave station. When the error situation is recovered, the master station returns to normal communication.

· **Operation condition monitor flag [1]**

This flag is used to monitor the operation condition of slave stations when the communication with each slave station is normal.

Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag (master station)	Communication monitor flag (1) of the master station is turned “ON.”	※ON
	Communication monitor flag (1) of the master station is turned “OFF.”	OFF

Flag	Condition for flag operation	Flag operation	
Other station’s flag (01 to 77)	Slave station is operating.	ON	Specific slave station
	Slave station stops operation (not by an error cause).	OFF	
	Communication monitor flag (1) of the master station is turned “OFF.”		All slave stations
	Slave station that communication monitor flag (1) is turned to “OFF.”	Not specified	

※ Even if a master station PC has stopped operation normally or by an error, the JW-20CM turns “ON” this flag while communicating.

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· **Operation condition monitor flag [2]**

This flag is used to monitor the abnormal stop of each slave station when the communication with each slave station is normal.

Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag (master station)	Communication monitor flag (1) of the master station is turned “ON.”	※ON
	Communication monitor flag (1) of the master station is turned “OFF.”	OFF

Flag	Condition for flag operation	Flag operation	
Other station’s flag (01 to 77)	Each slave station is normal.	ON	Specific slave station
	Any of the slave stations is faulty (caused to be stopped abnormally).	OFF	
	Communication monitor flag (1) of the master station is turned “OFF.”		All slave stations
	Slave station that communication monitor flag (1) is turned to “OFF.”	Not specified	

※ Even if a master station PC has stopped operation normally or by an error, the JW-20CM turns “ON” this flag while communicating.

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③ **In the case of slave station (PC 01 to $77_{(8)}$)**

· **Communication monitor flag**

This flag is used to monitor the communication condition with other stations. Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag	When the link start switch is set to “$01_{(H)}$,” and at communicating with a master station normally.	ON
	When the link start switch is set to “$00_{(H)}$.”	OFF
	When link start switch “$00_{(H)}$” of the master station is OFF.	

Flag	Condition for flag operation	Flag operation	
Other station’s flag	Normal communication with each station.	ON	Specific station
	Stopped communication or unable to communication with each station.	OFF	
	Communication monitor flag (1) of the master station is turned “OFF.”		All stations

· **Operation condition monitor flag [1]**

This flag is used to monitor the operation condition of each station when the communication with each station is normal.

Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag	Communication monitor flag (1) of the own station is turned “ON.”	※ON
	Communication monitor flag (1) of the own station is turned “OFF.”	OFF

Flag	Condition for flag operation	Flag operation	
Other station’s flag	Each station is operating.	ON	Specific station
	Each station stops operation (not by an error cause).	OFF	
	Communication monitor flag (1) of the own station is turned “OFF.”		All slave stations
	Slave station that communication monitor flag (1) is turned to “OFF.”	Not specified	

※ Even if the own station PC has stopped operation normally or by an error, the JW-20CM turns “ON” this flag while communicating.

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· **Operation condition monitor flag [2]**

This flag is used to monitor the abnormal stop of each station when the communication with each station is normal.

Non-connected station keeps this flag as “OFF.”

Flag	Condition for flag operation	Flag operation
Own station flag	Communication monitor flag (1) of the own station is turned “ON.”	※ON
	Communication monitor flag (1) of the own station is turned “OFF.”	OFF

Flag	Condition for flag operation	Flag operation	
Other station’s flag	Each station is normal.	ON	Specific station
	Any of the stations is faulty (caused to be stopped abnormally).	OFF	
	Communication monitor flag (1) of the own station is turned “OFF.”		All stations
	Slave station that communication monitor flag (1) is turned to “OFF.”	Not specified	

※ Even if a own station PC has stopped operation normally or by an error, the JW-20CM turns “ON” this flag while communicating.

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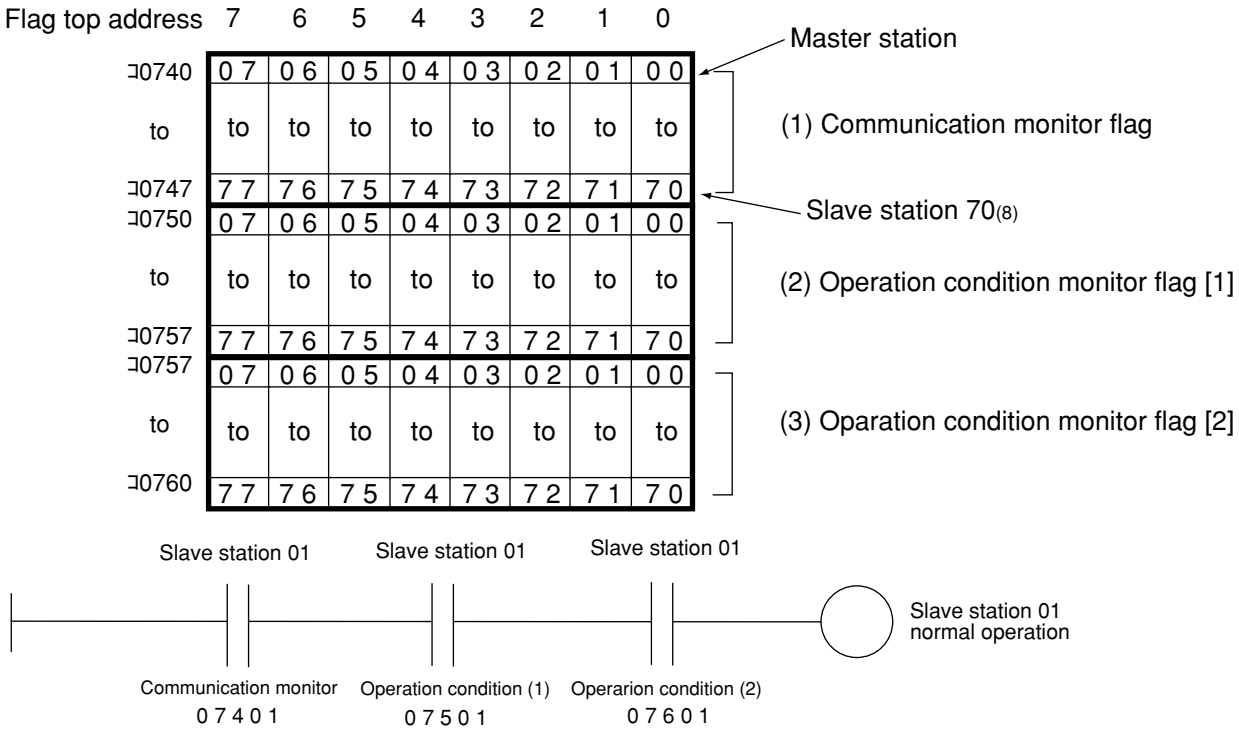
④ **Monitor operation condition by each station PC**

By creating a program having the flags shown below in each station's PC, the JW-20CM can monitor the operation condition of each station's PC.

[Ex.: In this case the flag top address is ⊐0740]



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(3) Error code

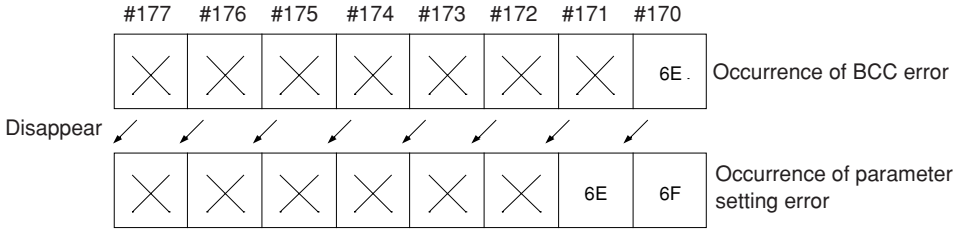
When an error occurs in the JW-20CM, it stores the occurred error's code to system memory #170 of each station's PC.

Error code (HEX)	Cause	Error code stored to system memory$_{(H)}$		Measure
		#160	#170 to 177	
01	ROM error, upper CPU	53	———	Replace the JW-20CM
02	RAM error, upper CPU			
03	2 port RAM error against PC, upper CPU			
04	2 port RAM error against communication CPU, upper CPU			
11	ROM error, communication CPU			• Check the communication cable • Check for doubled allocation of slave station number • Replace the JW-20CM
12	RAM error, communication CPU			
18	Communication LSI error, communication CPU			
1F	No response	———	1F	
20	More than one token detected	———	20	Check the parameter setting
21	Doubled address detected	———	21	
22	Fault of sending section	———	22	Replace the JW-20CM Check the communication cable
23	Token does not return within the rated interval	———	23	
2A	Over flow of receiving buffer.	———	2A	Check the communication cable
2B	Flame length error of receiving	———	2B	
2C	Media error	———	2C	
30	EEPROM error	———	30	Replace the JW-20CM
6E	BCC error	———	6E	Check the parameter setting
6F	Parameter setting error	———	6F	
C1 to FF	Communication error • After converting into octal, the lower two digits represent the slave station number of the current error. (Ex. C1$_{(H)}$ = 301$_{(8)}$= slave station 01)	———	C1 to FF	Check the communication cable and slave module

· In some cases, error code 23$_{(H)}$ or 2A$_{(H)}$ is stored when inputting power. This is not an error.

Remarks

• The error code stored in the system memory #170 is shifted to #170 to #177 one after the other as new errors occur. Thus, the system memory can store up to 8 errors. When the PC is operating by RAM, these error codes do not disappear even after turning OFF the power.
The contents of system memory #170 to #177 are kept storing after the JW-20CM recovers from the error.



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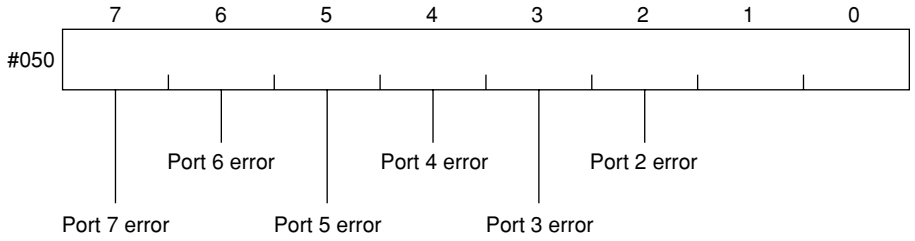
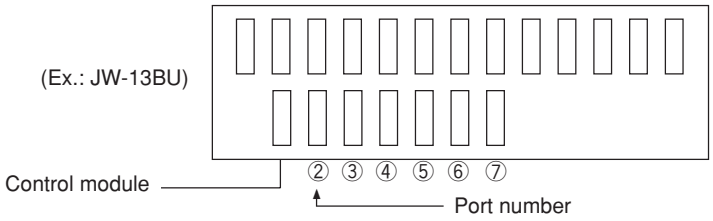
- When any of errors "$01_{(H)}$" to "$18_{(H)}$" occurs among the error codes listed on the previous page, the JW-20CM stores error code "$53_{(H)}$" (optional error) in the system memory #160. It does not store any error code in system memory #170.
- In the case of an option error "53," when you monitor system memory #050, the bit of error option module switches ON. When more than 1 bit is error, these bits switch ON. The each ON bit becomes OFF by recovering from the error condition. But the last ON bit does not become OFF even if the error condition recovers.



- The option slot port numbers are assigned in the order 2, 3, 4, 5, 6, 7, and so on, starting from the position closet to the control module.



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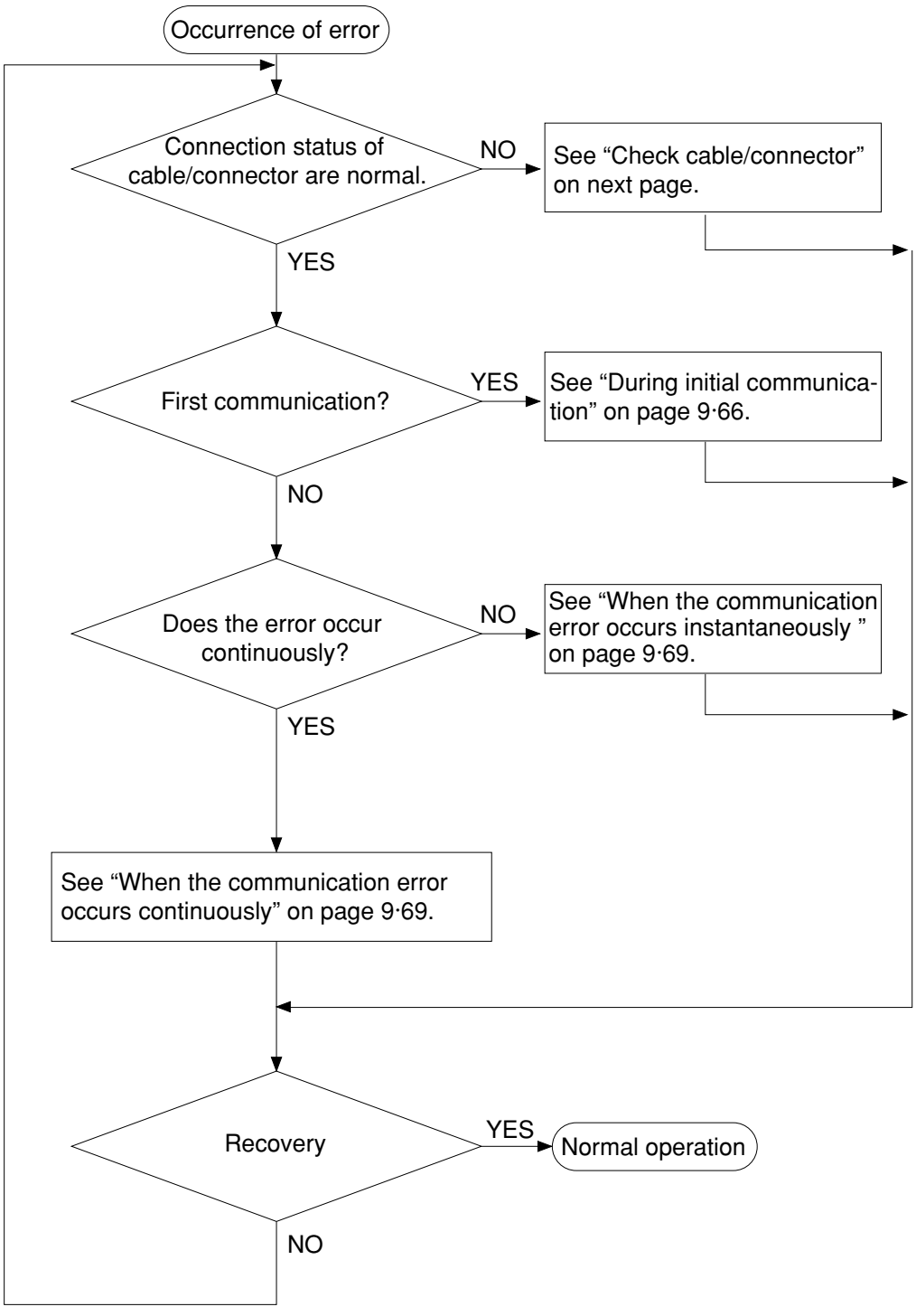
(4) Recovery method at communication errors

① Check flow chart



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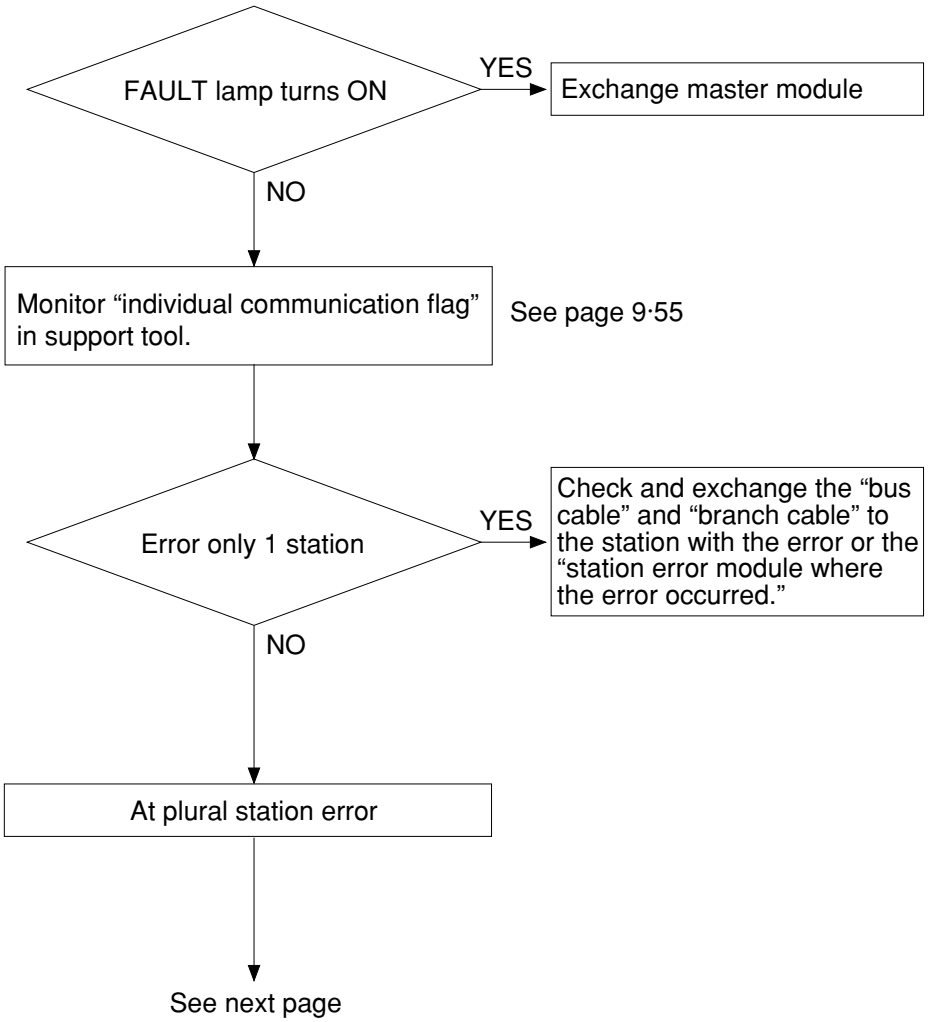
② **Check cable/connector**

As errors on the junction from the main cable to the drop cable or the contact failure on the connecting point of each station or errors of the master module are assumed, check with the following procedure.



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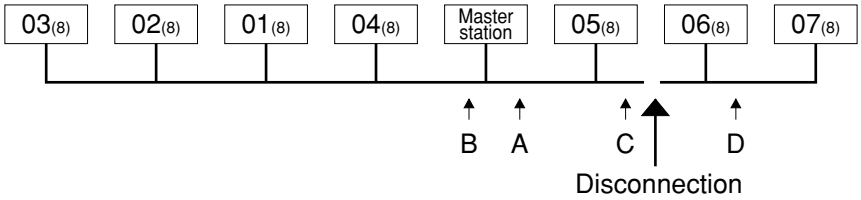
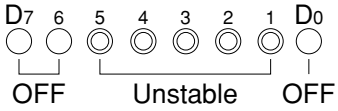
• If the bus cable between the slave station 05(8) and 06(8) is disconnected in the following system.

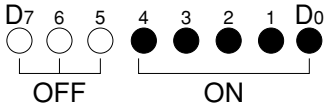


State of an individual communication flag



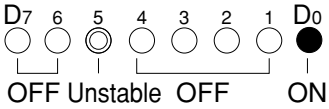
Remove the connector on point A, and turn ON the termination resistance of the master station.

As the communication possible stations 03(8), 02(8), 01(8), and 04(8) are normal, the state of communication monitoring flag is as follows.



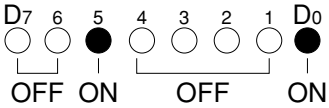
Connect the A connector, and then remove the connector on point B.

As the one side of the termination resistance is lost, all of the communication possible stations 05(8), 06(8), and 07(8) are abnormal, and the station 05(8) is unstable.



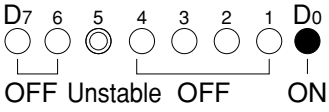
Remove the connector on point C and make sure the B connector is not connected. Turn ON the termination resistance of the slave module 05(8).

As the communication possible station 05(8) is normal, abnormal points exists ahead of the point C.



Connect the C connector and make sure the B connector is not connected, and remove the connector at the next point to the point D.
Turn OFF the termination resistance of the slave station 05(8), and turn ON the termination resistance of the end station 06(8).

As the one side of the termination resistance is lost, the station 05(8) and 06(8) become communication possible stations, but the station 05(8) is unstable and the station 06(8) is turned to OFF, so the abnormal states occur between the point C and the point D.



Cause	Countermeasure
Disconnection in the bus cable and the branch cable between the station 05(8) and 06(8), or contact failure of the connectors	Remove both the bus cable and the branch cable connectors. After that, shorten one of these connectors and check conductivity using a tester.
Error on the slave station 06(8)	Exchange the slave module.

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③ **During initial communication (start-up of the system)**

Lighting error code $6F_{(H)}$

· When the master station indicates error code $6F_{(H)}$ and the COMM lamp is OFF.
The cause may be a parameter setting error of the master station. Check the master station parameters below.

Parameter address$_{(8)}$	Contents	Setting range
004000 to 004001	Relay link top address of master station	ㅋ0000 to 39777$_{(8)}$ (File 0 : 000000 to 007777$_{(8)}$)
004003$_{(8)}$	Amount of connectable stations	2 to 64$_{(D)}$
004400 to 004403	Register link top address of master station	ㅋ0000 to 99777$_{(8)}$ (File 0 : 000000 to 015777$_{(8)}$) 000000 to 177777$_{(8)}$ (File 1 to 7)
005000 to 005177$_{(8)}$	Relay link sending bytes of each station	0 to 256$_{D)}$ Total : 256 max.
005200 to 005377	Register link sending bytes of each station	0 to 2048$_{(D)}$ Total : 2048 max.
007764 to 007767	Flag top address	ㅋ0000 to 99777$_{(8)}$ (File 0 : 000000 to 015777$_{(8)}$) 000000 to 177777$_{(8)}$ (File 1 to 7)

· When the master station indicates error code $6F_{(H)}$ and the COMM lamp lights.
The cause may be a setting error of any of the slave stations which are set in the parameter. Check the following master station parameters.

Parameter address$_{(8)}$	Contents	Setting range
004004 to 004377	Relay link top address of slave station	ㅋ0000 to 39777$_{(8)}$ (File 0 : 000000 to 007777$_{(8)}$)
	Relay link offset bytes of slave station	00000 to 00256$_{(D)}$
004404 to 004777	Register link top address of slave station	ㅋ0000 to 99777$_{(8)}$ (File 0 : 000000 to 015777$_{(8)}$) 000000 to 177777$_{(8)}$ (File 1 to 7)
	Register link offset bytes of slave station	00000 to 02048$_{(D)}$
005000 to 005177	Relay link top address sending bytes of each station	0 to 256$_{D)}$ Total : 256 max.
005200 to 005377	Register link sending bytes of each station	0 to 2048$_{(D)}$ Total : 2048 max.
007764 to 007767	Flag top address	ㅋ0000 to 99777$_{(8)}$ (File 0 : 000000 to 015777$_{(8)}$) 000000 to 177777$_{(8)}$ (File 1 to 7)

When slave station is JW-22CM, see “JW-22CM users manual” for setting range.

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· When the master station is normal and the error code $6F_{(H)}$ of a slave station lights.
The cause may be a faulty setting of the slave station parameter. Check the following slave station parameters.

Parameter address(8)	Contents	Setting range
007720, 007721	Relay link receiving bytes of slave station	0 to $256_{D)}$ Total : 256 max. In case of "0", same as number of sending bytes
007722, 007723	Register link receiving bytes of slave station	0 to $2048_{(D)}$ Total : 256 max. In case of "0", same as number of sending bytes
007730 to 007733	Relay link top address of slave station	⊐0000 to $39777_{(8)}$ (File 0 : 000000 to $007777_{(8)}$)
007734 to 007737	Register link top address of slave station	⊐0000 to $99777_{(8)}$ (File 0 : 000000 to $015777_{(8)}$) 000000 to $177777_{(8)}$ (File 1 to 7)
007764 to 007767	Flag top address	⊐0000 to $99777_{(8)}$ (File 0 : 000000 to $015777_{(8)}$) 000000 to $177777_{(8)}$ (File 1 to 7)

※

※ In case of using memory capacity save function

When slave station is JW-22CM, see “JW-22CM users manual” for setting range.

When the COMM lamp of the master station is OFF (SD,RD,CD are flickering).

Check the following master station’s parameters.

Parameter address(8)	Contents	Setting value
$004002_{(8)}$	Data link function	01
$007777_{(8)}$	Start switch	01

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Other cases

- Check the switches of the JW-20CM (see check item)
- Check optional cable of PC (The JW-20CM does not operate normally without an optional cable.)
- Check cable and connector (see check item)
- Check error code

[Switches required check in the JW-20CM]

①Station number (STA NO.)
②Mode switch (MODE)
③Termination resistance switch (LT)
④Shield ground switch (LG)
If there are errors in the station number and the mode switch, change the setting with the power OFF, and then turn ON the power.

[Check items of cables and connectors]

①No looseness or removal of connectors (turn the connector right until it completely locks).
②Connectors are appropriately fixed on the cables (When any faults such as extrusion of pins or connector being easily removed by pulling, reinstall these connectors.)
③Wiring conditions are appropriate (See chapters 6 and 7).
④Not too long branch lines (shorter than 400 mm).
⑤Termination resistance are correctly connected.
(Turn “ON” the termination resistance switch of the termination stations or install a termination tool.)

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④ **When the communication error occurs instantaneously.**

Cause may be:

- Noise on the communication line.
- Fault of a communication module.
- Fault of a communication cable.

Check the error's timing.

When the error occurs synchronous with a peripheral industrial robot's operation, noise to the communication line may be a cause. Consider arrangement of the wiring route.

Identify the error station.

When the error occurs at only the specific station, the cause may be the station or nearby. Check the following items.

- Setting of the LT (termination resistance) switch.
- Cable (See page 9·64 "check items of cables and connectors")
- Error code (See page 9·54)

When identification of the cause is difficult.

Condition of the circuit may be unstable. (See page 9·64 "check items of cables and connectors")

⑤ **When the communication error occurs continuously.**

Identify the error station.

Specify the error's station using the communication flag etc., and check this station.

- Check the power of the error's station.
- Check the error code of the error's station.
- Check cables near the error's station. (See page 9·64 "check items of cables and connectors")

When identification of the cause is difficult.

Condition of the whole circuit may be unstable. Check cables and connectors.
(See page 9·64 "check items of cables and connectors")

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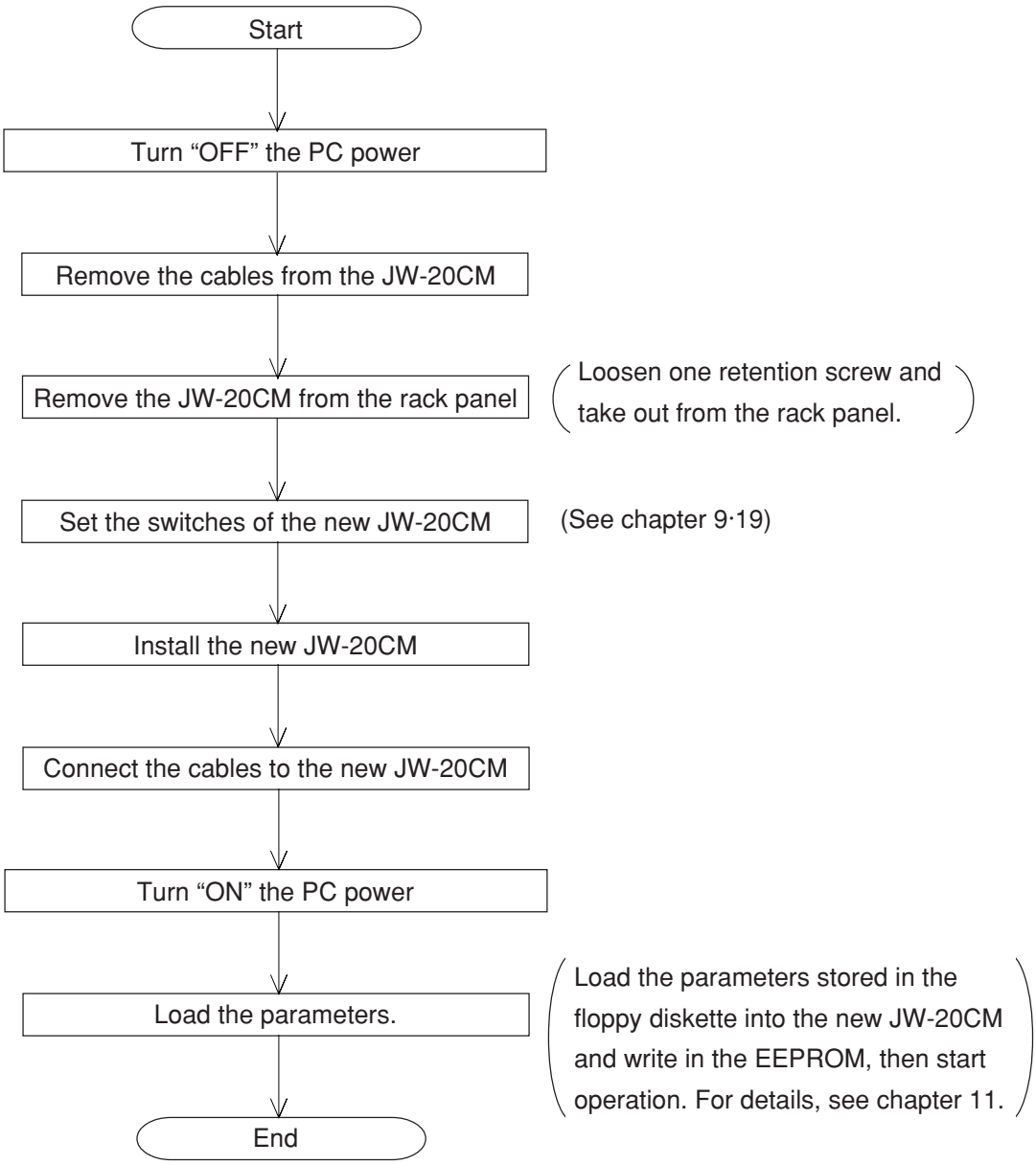
(5) Module replacement procedure

When you want to change the JW-20CM due to an operation fault (lighting FT lamp) etc., follow the procedures below.

Make sure to store the set parameters onto a floppy diskette using a support tools. (See the next page)

Operation procedure



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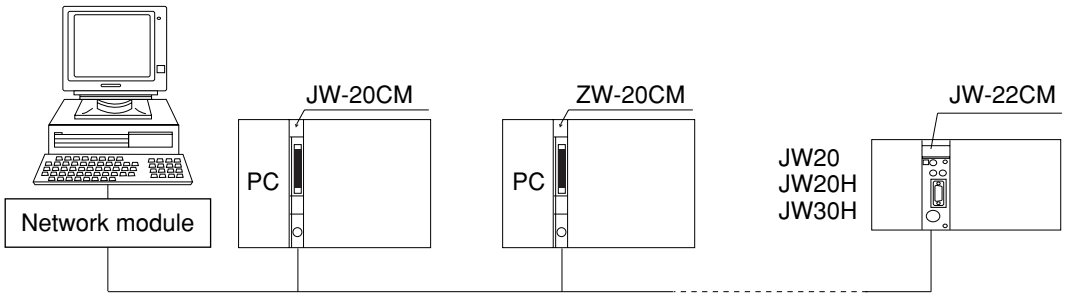
Chapter 10 Computer link

10-1 Description for computer link

· You can transmit data between JW-20CM and host computer having a network module ZW-98CM/ZW-20AX and the like.
· Computer link function can not be used separate mode, but simultaneously with operation of data link function.
· Both JW and ZW model PCs can be connected on the same cable.



(64 stations max., Total length: 1km max.)

· In order to use the computer link function, you must use application software which can send a command from the host computer and receive a response from the opposite station.
See “Instruction manual of network module ZW-98CM/ZW-20AX etc.” and the like for operation method on host computer side.

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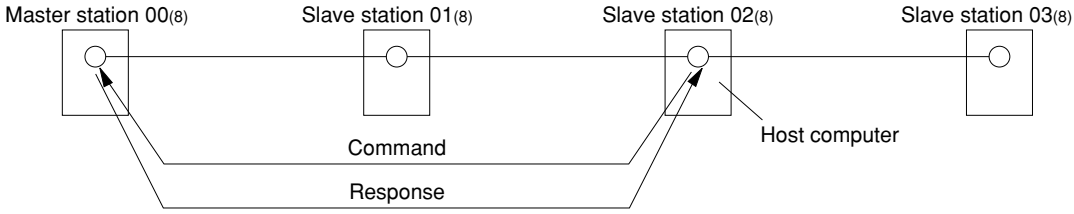
10-2 Communication method

The host computer communicates with each station number one by one.

① The host computer instructs station number/communication contents/memory address/data etc. of the communicating station as a “command.”

② The “command” receiving station processes this data and returns the result as “response.”

(**System example**)



On the computer link, the host computer can communicate with any required station regardless of whether it is the master or slave station.

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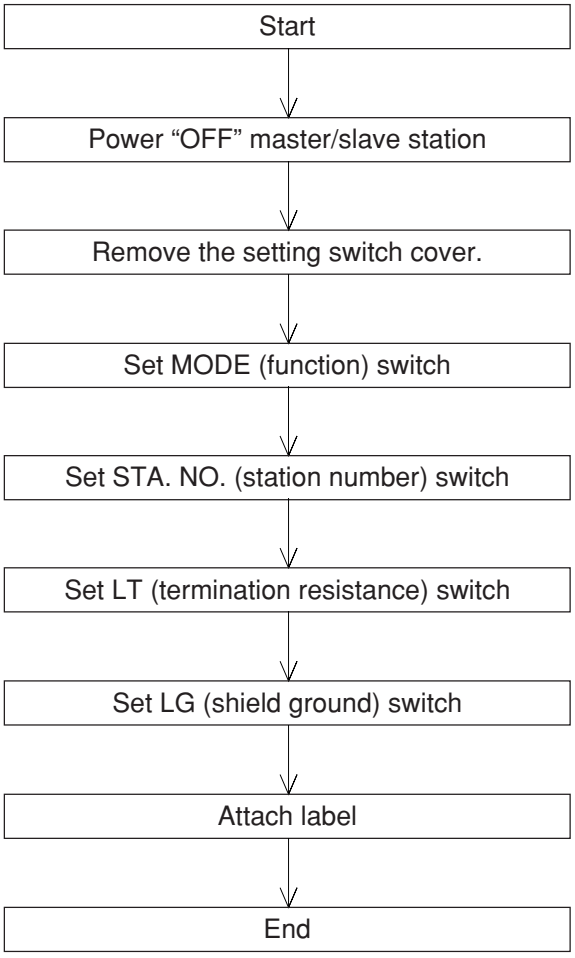
10-3 Switch setting

Same as setting switch of data link. (See page 9·17 to 9·21)
When you was already used for data link, setting switch is unnecessary.

Operation procedure



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10-4 Command

For communication format etc., see network module ZW-98CM/ZW-20AX etc. instruction manual of host computer side.

Read out relay (1 point unit)

Function	Read out ON ($01_{(H)}$)/OFF ($00_{(H)}$) status of specified relay.
Command code	$00_{(H)}$ (MRL)
Writing mode assignment	No
Operation condition of PC	Unrelated
Assignable address	00000 to $15777_{(8)}$

Letters in brackets are command name of BASIC mode.

Set/reset relay (1 point unit)

Function	Set ($01_{(H)}$)/reset ($00_{(H)}$) the specified relay.
Command code	$10_{(H)}$ (SRR)
Writing mode assignment	No
Operation condition of PC	Unrelated
Assignable address	00000 to $15777_{(8)}$

Letters in brackets are command name of BASIC mode.

10

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out current value of register/file register (1024 bytes max./ one time)

Function	Read out current value that specified register/file register
Command code	$00_{(H)}$ (MRG, RFLF)
Writing mode assignment	No
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode.

When PC is ZW model	
⊐0000 to ⊐1577	b0000 to b1777
09000 to 09777	19000 to 19777
※ File 1 to 7 : 000000 to 177777	

When PC is JW model	
⊐0000 to ⊐1577	b0000 to b1777
09000 to 09777	19000 to 19777
29000 to 29777	39000 to 39777
49000 to 49777	59000 to 59777
69000 to 69777	79000 to 79777
89000 to 89777	99000 to 99777
E9000 to E9777	E1000 to E1777
※ File 1 to 7 : 000000 to 177777	

※ Usable file number varies with memory module using for PC. (See page 13·21)

Write in register/file register (1024 bytes max./ one time)

Function	Write in manual data that specified register/file register
Command code	$13_{(H)}$ (SRT)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode.

When PC is ZW model	
⊐0000 to ⊐1577	b0000 to b1777
09000 to 09777	19000 to 19777
※ File 1 to 7 : 000000 to 177777	

When PC is JW model	
⊐0000 to ⊐1577	b0000 to b1777
09000 to 09777	19000 to 19777
29000 to 29777	39000 to 39777
49000 to 49777	59000 to 59777
69000 to 69777	79000 to 79777
89000 to 89777	99000 to 99777
E9000 to E9777	E1000 to E1777
※ File 1 to 7 : 000000 to 177777	

※ Usable file number varies with memory module using for PC. (See page 13·21)

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Write in same data to register/file register

Function	Write in same data that specified register/file register
Command code	$12_{(H)}$ (FRG)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode, but unavailable for writing in same data to file register.

When PC is ZW model	
ㅁ0000 to ㅁ1577	b0000 to b1777
09000 to 09777	19000 to 19777
※ File 1 to 7 : 000000 to 177777	

※ Usable file number varies with memory module using for PC. (See page 13·21)

When PC is JW model	
ㅁ0000 to ㅁ1577	b0000 to b1777
09000 to 09777	19000 to 19777
29000 to 29777	39000 to 39777
49000 to 49777	59000 to 59777
69000 to 69777	79000 to 79777
89000 to 89777	99000 to 99777
E9000 to E9777	E1000 to E1777
※ File 1 to 7 : 000000 to 177777	

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out current value of timer/counter/MD

Function	Read out current value that specified timer/counter/MD
Command code	$03_{(H)}$ (MTC)
Writing mode assignment	No
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode.

: When PC is except for JW50H/70H/100H
0000 to $0777_{(8)}$

: When PC is JW50H/70H/100H
0000 to $0777_{(8)}$

Set/reset timer/counter (1 points unit)

Function	Set (timeup, countup) or reset (return to setting value) that specified timer/counter
Command code	$13_{(H)}$ (SRT)
Specify writing mode	1 or 2
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode.

: When PC is except for JW50H/70H/100H
0000 to $0777_{(8)}$

: When PC is JW50H/70H/100H
0000 to $0777_{(8)}$

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
0: Writing prohibited
1: Enable writing only to data memory
2: Enable writing all data.
No setting: Enable writing in any mode

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Read out current value of system memory (256 bytes max./one time)

Function	Read out current value that specified system memory
Command code	$04_{(H)}$ (RSM)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Assignable address	

Letters in brackets are command name of BASIC mode.

When PC is ZW model	When PC is JW model
Segment 0 00000 to $00177_{(8)}$	Segment 0 00000 to $00177_{(8)}$
Segment 8 00200 to $00377_{(8)}$	Segment 8 00200 to $02177_{(8)}$

Write in system memory (256 bytes max./one time)

Function	Write in manual data to specified system memory
Command code	$14_{(H)}$ (WSM)
Writing mode assignment	2
Operation condition of PC	Stopping
Assignable address	

Letters in brackets are command name of BASIC mode.

When PC is ZW model	When PC is JW model
Segment 0 00000 to $00177_{(8)}$	Segment 0 00000 to $00177_{(8)}$
Segment 8 00200 to $00377_{(8)}$	Segment 8 00200 to $02177_{(8)}$

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out program memory (512 steps max./one time)

Function	Read out contents that specified program memory using machine language.
Command code	$05_{(H)}$ (RPM)
Writing mode assignment	No
Operation condition of PC	Unrelated
Assignable address	When PC is ZW model: 000000 to $076777_{(8)}$ When PC is JW50, JW50H: 000000 to $016777_{(8)}$ When PC is JW70/100, JW70H/100H: 000000 to $076777_{(8)}$, 100000 to $176777_{(8)}$

Address varies with memory capacity.

Letters in brackets are command name of BASIC mode.

Write in program memory (512 steps max./one time)

Function	Write in manual instruction words to specified program memory.
Command code	$15_{(H)}$ (WPM)
Writing mode assignment	2
Operation condition of PC	Stopping
Assignable address	When PC is ZW model: 000000 to $076777_{(8)}$ When PC is JW50, JW50H: 000000 to $016777_{(8)}$ When PC is JW70/100, JW70H/100H: 000000 to $076777_{(8)}$, 100000 to $176777_{(8)}$

Address varies with memory capacity.

Letters in brackets are command name of BASIC mode.

10

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Change the setting value of timer/counter (1 point unit)

Function	Change the assigned value of the timer/counter to any value.
Command code	$16_{(H)}$ (CTC)
Writing mode assignment	2
Operation condition of PC	Unrelated
Assignable address	When PC is ZW model Segment 8 000000 to $076777_{(8)}$ When PC is JW model Segment 9 000000 to $076777_{(8)}$

Letters in brackets are command name of BASIC mode.

10

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out operation status of PC

Function	Read out PC operation status of specified stations.
Command code	$20_{(H)}$ (MPC)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Operation condition of PC	Data
During operating	$00_{(H)}$
Stop by other option module	$01_{(H)}$
Stop by HALT($30_{(H)}$) command	$02_{(H)}$

Stop/restart operation of PC

Function	Stop or restart PC's operation of specified stations.
Command code	$30_{(H)}$ (HLT, RUN)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Operation condition of PC	Data
Stop operation	$00_{(H)}$
Restart operation	$01_{(H)}$

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out program memory capacity

Function	Read out program memory capacity of specified stations.
Command code	$21_{(H)}$ (VLM)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Memory capacity	Data
7.5 K Words	$00_{(H)}$
15.5 K Words	$01_{(H)}$
23.5 K Words	$02_{(H)}$
31.5 K Words	$03_{(H)}$
63 K Words	$04_{(H)}$

Set program memory capacity

Function	Write in system memory #204 for memory capacity that specified station.
Command code	$30_{(H)}$ (SVL)
Writing mode assignment	No
Operation condition of PC	Stopping
Data	

Letters in brackets are command name of BASIC mode.

Memory capacity	Data
7.5 K Words	$00_{(H)}$
15.5 K Words	$01_{(H)}$
23.5 K Words	$02_{(H)}$
31.5 K Words	$03_{(H)}$
63 K Words	$04_{(H)}$

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out status of write mode

Function	Read out status of write mode that specified stations.
Command code	$22_{(H)}$ (SWE)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Write mode	Data
0	$00_{(H)}$
1	$01_{(H)}$
2	$02_{(H)}$

Set write mode

Function	Set write mode that specified stations.
Command code	$32_{(H)}$ (EWR)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Write mode	Data
0	$00_{(H)}$
1	$01_{(H)}$
2	$02_{(H)}$

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out bit status of parameter memory

Function	Read out parameter memory status of ZW/JW-20CM that specified stations.
Command code	$08_{(H)}$ (PML)
Operation condition of PC	Unrelated
Set at link operation (Parameter address $007777_{(8)}$ of ZW/JW-20CM)	Unrelated
Assignable address	000000 to $007777_{(8)}$

Letters in brackets are command name of BASIC mode.

Data

Bit condition	Data
0 (OFF)	$00_{(H)}$
1 (ON)	$01_{(H)}$

Set bit position

Bit position	Data
0	$00_{(H)}$
to	to
7	$07_{(H)}$

Set/reset bit of parameter memory

Function	Set/reset parameter memory bit of ZW/JW-20CM that specified stations.
Command code	$18_{(H)}$ (PWL)
Operation condition of PC	Stopping
Set at link operation (Parameter address $007777_{(8)}$ of ZW/JW-20CM)	Stop (Unrelated in case that set/reset of address $007777_{(8)}$)
Assignable address	000000 to $007777_{(8)}$

Letters in brackets are command name of BASIC mode.

Data

Bit condition	Data
0 (OFF)	$00_{(H)}$
1 (ON)	$01_{(H)}$

Set bit position

Bit position	Data
0	$00_{(H)}$
to	to
7	$07_{(H)}$

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Read out parameter memory contents

Function	Read out parameter memory contents of ZW/JW-20CM that specified stations.
Command code	$09_{(H)}$ (PMR)
Operation condition of PC	Unrelated
Set at link operation (Parameter address $007777_{(8)}$ of ZW/JW-20CM)	Unrelated
Assignable address	000000 to $007777_{(8)}$

Letters in brackets are command name of BASIC mode.

Write in parameter memory

Function	Write in manual data for parameter memory of ZW/JW-20CM that specified stations.
Command code	$19_{(H)}$ (PMR)
Operation condition of PC	Stopping
Set at link operation (Parameter address $007777_{(8)}$ of ZW/JW-20CM)	Stop (Unrelated in case that write in address $007777_{(8)}$)
Assignable address	000000 to $007777_{(8)}$

Letters in brackets are command name of BASIC mode.

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Read out date (PC of JW model)

Function	Read out date that specified stations.
Command code	$23_{(H)}$ (MDY)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Year	Month	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
00 to 99	01 to 12	01 to 31	00	01	02	03	04	05	06

Write in date (PC of JW model)

Function	Set date that specified stations.
Command code	$33_{(H)}$ (SDY)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Year	Month	Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
00 to 99	01 to 12	01 to 31	00	01	02	03	04	05	06

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out times (PC of JW model)

Function	Read out times that specified stations.
Command code	$24_{(H)}$ (MTM)
Writing mode assignment	No
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Time	Minute	Second
00 to 23	00 to 59	00 to 59

Write in times (PC of JW model)

Function	Set times that specified stations.
Command code	$34_{(H)}$ (STM)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Time	Minute	Second
00 to 23	00 to 59	00 to 59

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Correct time (PC of JW model)

Function	Correct time that specified stations.
Command code	$35_{(H)}$ (ACL)
Writing mode assignment	1 or 2
Operation condition of PC	Unrelated
Data	

Letters in brackets are command name of BASIC mode.

Operate clock	Stop clock	Correct 30 sec.
00	01	08

10

· "Writing mode assignment" is used to show whether writing to the PC memory has been enabled or disabled.
  0: Writing prohibited
  1: Enable writing only to data memory
  2: Enable writing all data.
  No setting: Enable writing in any mode

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Read out data by F-200 instruction

Function	Read out data that specified station using application instructions F-200.
Command code	$40_{(H)}$ (F200)
Operation condition of PC	Unrelated

Letters in brackets are command name of BASIC mode.

Write in data by F-201 instruction

Function	Write in data that specified station using application instructions F-201.
Command code	$50_{(H)}$ (F201)
Operation condition of PC	Unrelated

Letters in brackets are command name of BASIC mode.

Read out data by SEND instructions (PC of JW model)

Function	Read out data that specified station using SEND instructions.
Command code	$41_{(H)}$ (SNDF)
Operation condition of PC	Unrelated

Letters in brackets are command name of BASIC mode.

Read out data by RECEIVE instructions (PC of JW model)

Function	Request data that specified station using RECEIVE instructions.
Command code	$51_{(H)}$ (RCVF)
Operation condition of PC	Unrelated

Letters in brackets are command name of BASIC mode.

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Chapter 11 Support Tools

The following support tools are available to record (store), and load the contents of the parameter memory. (Make sure to save the set parameters onto a floppy diskette.)

Model name	Applicable floppy diskettes
Ladder software (JW-50SP)	3.5-inch 2DD/2HD, 5-inch 2DD/2HD
Multipurpose programmer (JW-50PG)	3.5-inch 2DD
Ladder processor II (Z-100LP2S)	3.5-inch 2DD

11-1 Record and load by ladder software (JW-50SP)

(1) Record

① **Stop operation of the JW-20CM**

Select “PC TRANS.”

↓

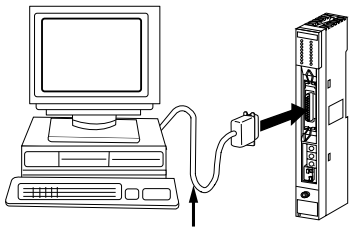
Select “Read.”

↓

Select “DL. M. stn. PARAM.” or “DL. S. stn. PARAM.”

↓ Set as the function setting condition of the connected network module.

After selecting “PC stop,” press the “Enter” key.



· Communication adaptor supplied with JW-50SP
Convertor supplied with JW-50SP
· Control module connection cable

② **Record onto the personal computer**

After stopping operation, record the parameters of the JW-20CM onto the memory of the personal computer.

Select “Read out PARAM” and press the “Enter” key.

↓

Start reading to memory of the personal computer.

③ **Start operation of the JW-20CM**

After recording the parameters onto the personal computer, start operation of the JW-20CM.

After selecting “Start write EEPROM” or “Execution start,” press the “Enter” key.

↓

Start operation of the JW-20CM

↓

After selecting “PC Run,” press the “Enter” key.

↓

Start PC operation

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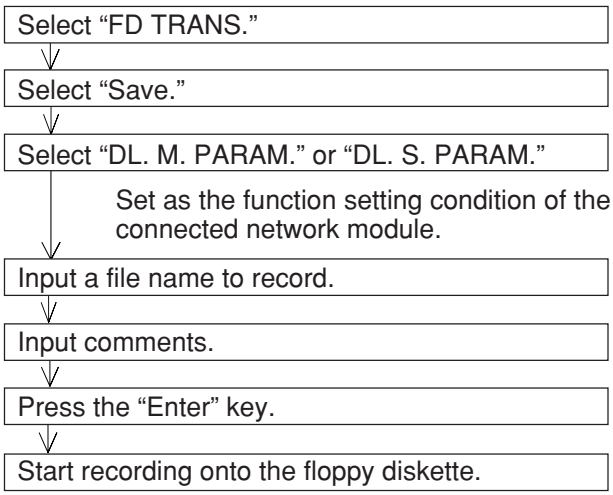
④ **Record onto a floppy diskette**

Write (record) the memory contents of the personal computer onto a floppy diskette.



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(2) **Load**

① **Load to the personal computer**

Load the contents of the floppy diskette into the memory of the personal computer.

Select “FD TRANS.”

↓

Select “Load.”

↓

Select a file name.

↓

Press the “Enter” key.

↓

Start loading into the personal computer.

② **Stop operation of the JW-22CM**

After stopping operation, load the memory contents of the personal computer into the JW-20CM.

Select “PC TRANS.”

↓

Select “Write.”

↓

Select “DL M. stn. PARAM.” or “DL S. stn. PARAM.”

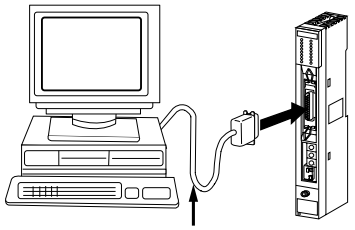
↓

Set as the function setting condition of the connected network module.

After selecting “PC stop,” press the “Enter” key.

↓

After selecting “Execution stop,” press the “Enter” key.



- Communication adaptor supplied with JW-50SP
  Convertor supplied with JW-50SP
- Control module connection cable

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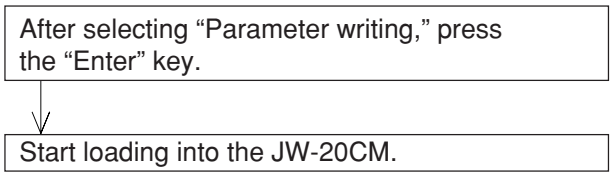
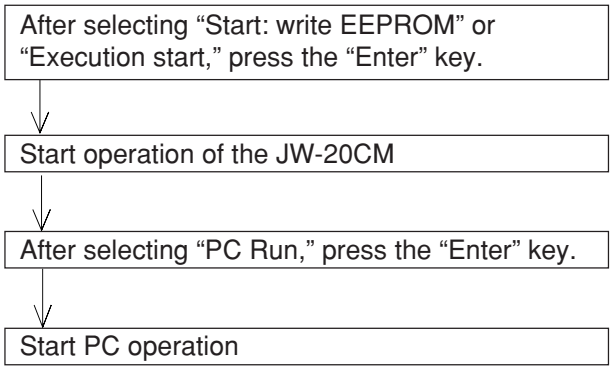
③ **Load to the JW-20CM**

After stopping operation, load the memory contents of the personal computer into the JW-20CM.



④ **Start operation of the JW-20CM**

After loading the parameters from the personal computer, start operation of the JW-20CM.



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11-2 Remote function

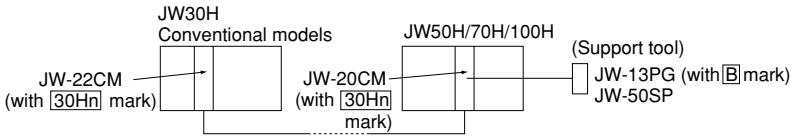
(1) Remote programming and remote monitor

This paragraph describes the operation procedure of any other station's PC which is connected in the satellite net. The following support tools are available:

Hand-held programmer JW-13PG/12PG
Multipurpose programmer JW-50PG
Ladder software JW-50SP

Note 1

• If the JW-20CM remotely programs or monitors the new JW30H model (JW-31CUH1/32CUH1/33CUH1/33CUH2/33CUH3), they should be used in the combination below.

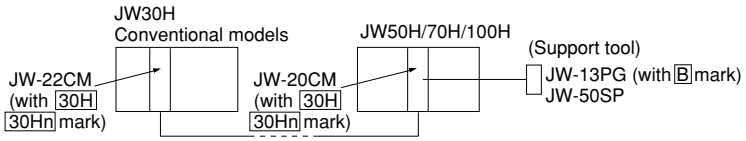


If the JW-20CM, to which a support tool is connected, has a 30H sticker, the JW-20CM will identify the new JW30H model as conventional model (JW-31CUH/32CUH/33CUH).
If the JW-20CM, to which a support tool is connected, does not have a 30H 30Hn sticker, it must be used with the following limitations.

Ex.:

· If the JW-13PG has a B sticker, it will identify the new JW30H model as JW20H (JW-22CU).
· If a support tool JW-50SP is used, it will identify the new JW30H model properly. However, it cannot handle the secret function.

• If the JW-20CM remotely programs or monitors the conventional JW30H model (JW-31CUH/32CUH/33CUH), they should be used in the combination below.



If the JW-20CM, to which a support tool is connected, does not have a 30H 30Hn sticker, it must be used with the following limitations.

Ex.:

· If a support tool JW-13PG is used, it will identify the conventional JW30H model as JW20H (JW-22CU).
· If a support tool JW-50SP is used, it will identify the conventional JW30H model properly. However, it cannot handle the secret function.

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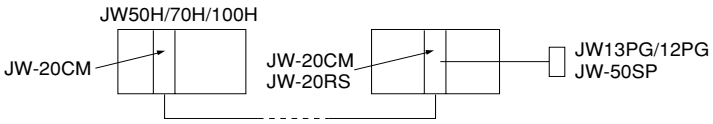
Note 2

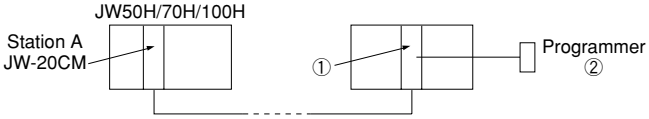
• If you want to use the remote programming and monitoring functions with the JW50H/70H/100H, use the modules in the combinations shown below. If they are arranged in some other fashion, you cannot use the JW50H/70H/100H expansion function properly (with the JW50/70/100).



Ex.: If remote programming or remote monitoring is executed with the combination below (enter $200_{(8)}$ or $201_{(8)}$ at station A system memory address #0201), there are the following limitations:

· TMR/CNT1000 to 1777 will not be displayed properly.

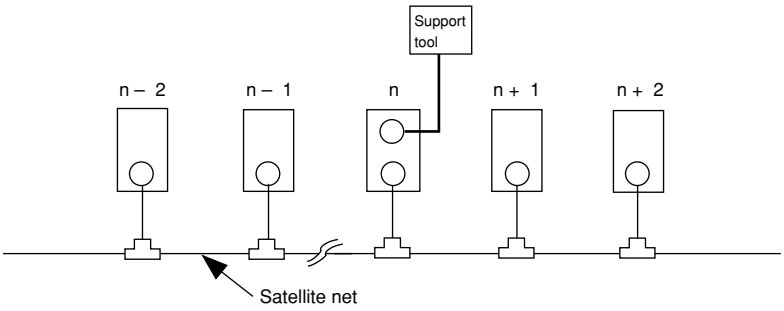
· You will be unable to write/insert/delete programs using the TMR/CNT instructions.



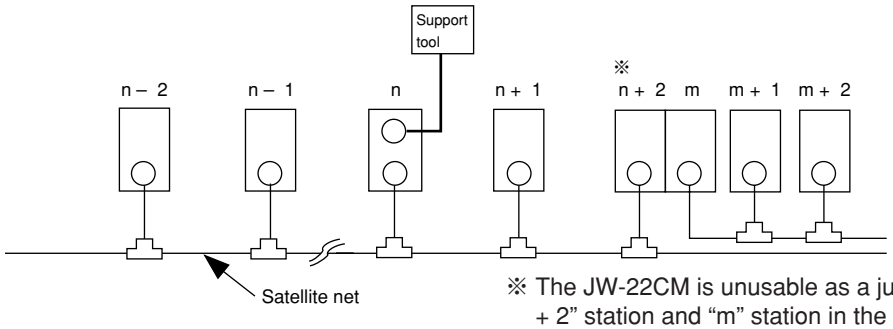
(· If ① is a ZW-20CM and ② is a JW-12PG.
· If ① is a ZW/JW-20CM and ② is a JW-11PG.)

① **Function**

<Standard network connection>



<Expansion network connection>



※ The JW-22CM is unusable as a junction station ("n + 2" station and "m" station in the figure above). Use JW30H (JW-22CM), JW50H/70H/100H (JW-20CM)

The following operations are possible for "n" station and other stations using a support tool which is connected to the "n" station for standard/expansion network connection.

· Change program
· Monitor
(Writing data (change program) during operation of the PC is not available for hazard prevention reasons. Stop operation of the PC prior to writing data.)
· Change of parameter memory (only available for JW-13PG/12PG)

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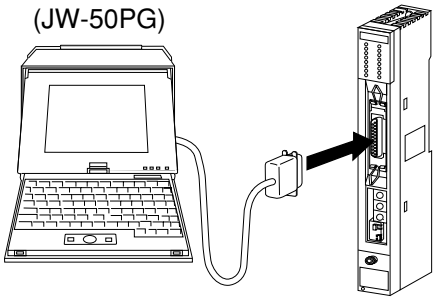
② **Operation example**

This paragraph describes an operation example using the multipurpose programmer: JW-50PG. For operations with other support tools, see the attached instruction manuals.

• Connect the JW-50PG to the JW-20CM on the satellite net.



• Set communication mode

Set the communication mode of the JW-50PG to “Network CONCT.” and this enables remote programming and remote monitor.

Select “Initial setting.”

↓

Select “COM. set.”

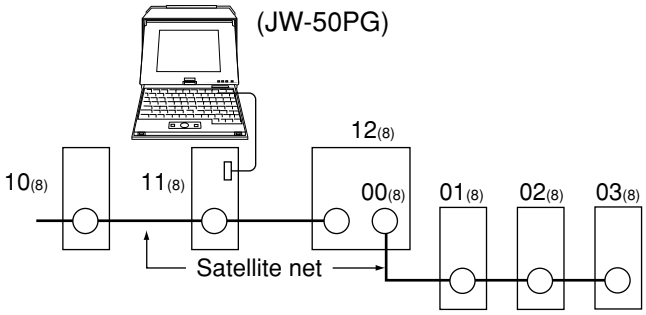
↓

Select “Network CONCT.”

• Network setting

Select whether the target station for remote programming or remote monitor is on the standard network connection or on the extension network connection.

In the case below, 10 to $12_{(8)}$ are standard network connections. 01 to $03_{(8)}$ are extension network connections.



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<Standard network connection>

Set “standard” in network configuration.

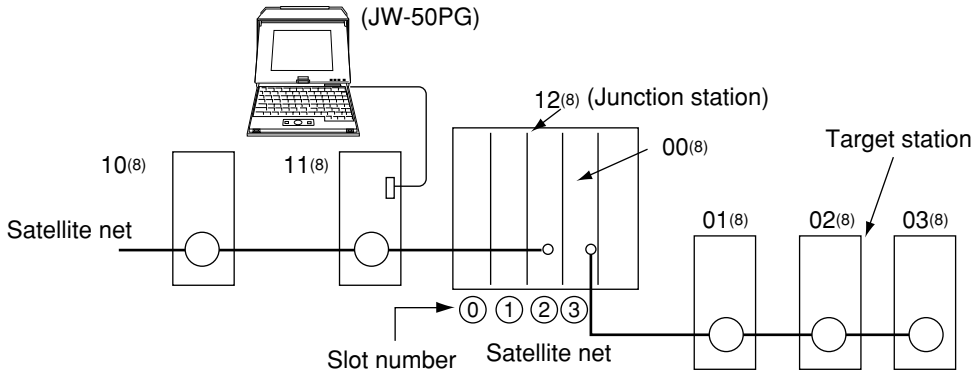
↓

Set “satellite net” or “SUMINET” in target station model.

↓

Set the target station number (00 to $77_{(8)}$).

<Expansion network connection>



Set “extension” in network configuration.

↓

Set “satellite net” or ”SUMINET” in junction station model.

↓

Set the target station number (00 to $77_{(8)}$).

↓ (In the case of the above figure: $02_{(8)}$)

Set the junction station number (00 to $77_{(8)}$).

↓ (In the case of the above figure: $12_{(8)}$)

Set the junction station rack number.

↓ (Keep the initial value “0”)

Set the station slot number.

(Set the installed slot number of the master station on the target station side. In the case of the above figure: 3.)

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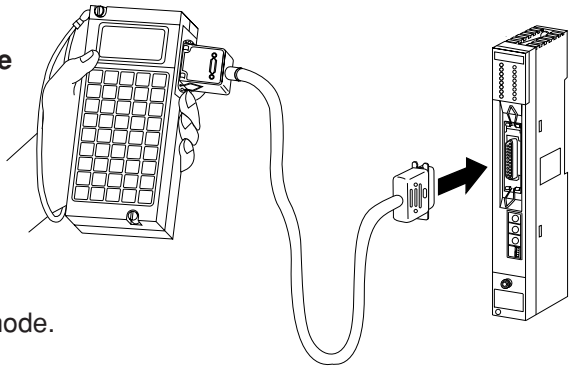
(2) Parameter setting by remote function

This paragraph describes how to set the parameters of other stations' network module connected on the satellite net.

This is only available when the target station is within the standard network connection.

Usable support tools are JW-13PG/12PG.

<An operation example using the JW-13PG>



① **Connect the programmer to the network module**

Connect the programmer to the network module on the satellite net.

② **Setting mode**

Select initial mode.

[*] [*] [シフト SHIFT] [INTL DISP] [SET 8] → Display initial mode.

③ **Assign the link**

Assign the parameter setting remotely.

[A 0] → Select "LINK" in initial.

[A 0] → Select display mode of "1PG, 2PG1 MODE" in specified link.

[B 1] → Select "TARGET STA." in 1PG, 2PG1 MODE.

④ **Setting target station**

Select the target station to set the parameter remotely.

[変換 CONV] → Change the code from hexadecimal$_{(H)}$ display to octal$_{(O)}$ display and input the target station ($00_{(8)}$ to $77_{(8)}$).

⑤ **Communication with the target station**

[,] → Initiate communication with the target station.

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⑥ **Setting parameter**

After finishing communication with the target station, set the parameters remotely.

[解除 ESC] → Return to initial menu.

Turn the PC of the target station to program mode (stop PC operation).

Select “PARAM.” in the initial mode.

<<In case of remote I/O function>>

[D 3] [7] [7] [7] [モニタ MNTR] → Display contents of parameter address $003777_{(8)}$.

[A 0] [書込 ENT] → Write in $00_{(H)}$, stop operation of the JW-20CM.

<<In case of data link function>>

[7] [7] [7] [7] [モニタ MNTR] → Display contents of parameter address $007777_{(8)}$.

[A 0] [書込 ENT] → Write in $00_{(H)}$, stop operation of the JW-20CM.

Input address [モニタ MNTR] → Display contents of address to set the parameters.

Input setting value [書込 ENT] → Setting parameter remotely.

⑦ **Writing to the EEPROM, start operation**

After setting the parameter remotely in step ⑥, write $81_{(H)}$ at parameter address $003777_{(8)}$ (when at remote I/O function), or at $00777_{(8)}$ (when at data link function), to start the "writing operation to EEPROM."

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Chapter 12 Specifications

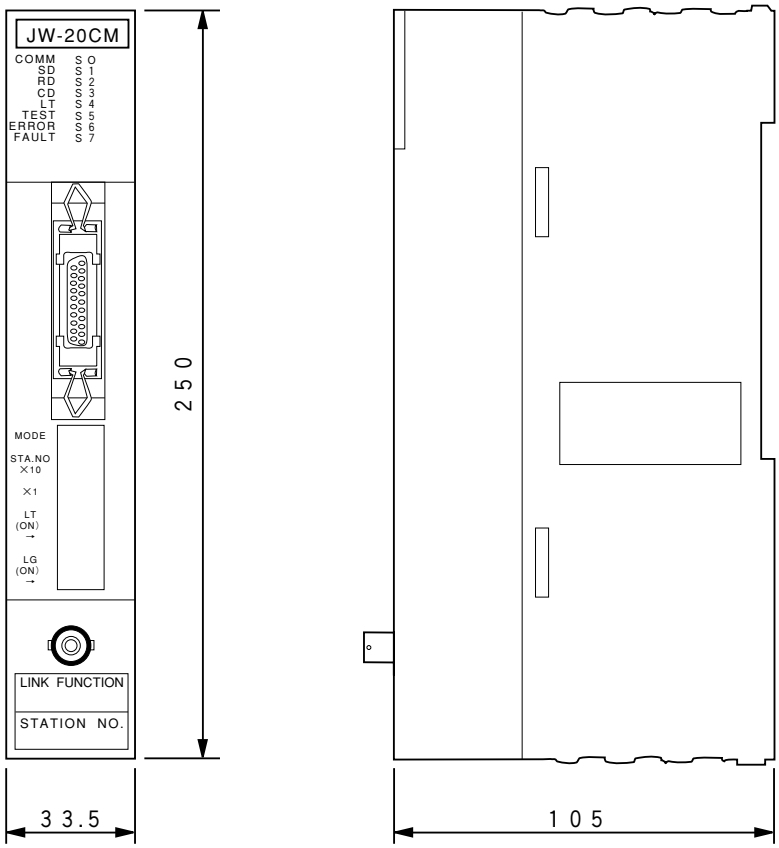
12-1 JW-20CM

(1) General specifications

Item	Specifications
Storage temperature	– 20 to + 70° C
Ambient temperature	0 to + 55° C
Ambient humidity	35 to 90%RH (without moisture condensation)
Vibration resistance	JIS-C-0911 equivalent (X,Y, Z, 2 hours in each)
Shock resistance	JIS-C-0911 equivalent
Internal power consumption	465 mA (5VDC)
Weight	Approx. 450g
Accessories	One instruction manual , One setting label

[Outline dimension drawings]

(Unit : mm)



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(2) Communication specifications

Item	Specification
Communication method	Token/passing
Transmission rate	1.25M bits/s
Transmission format	JIS X-5014 high level data link control procedure (HDLC) frame configuration compatible
Coding method	NRZI (Non Return To Zero Inverted)
Check method	CRC
Sync method	Bit synchronous
Modulation method	Continuous frequency phase modulation (FSK)
Communication network system	Bus type
Connectors	Module side: BNC receptacle (jack) Line side: BNC plug
Transmission line	Coaxial cable: 5C-2V (JIS · C-3501) Characteristics impedance: 75 ohm Total cable distance: 1 km max.

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(3) Specifications of each function

① Specifications of remote I/O slave station

Item	Specification	
No. of remote I/O slave station	63 sets max.	
Total no. of remote I/O points	4096 points max.	
No. of remote I/O points	Fix allocation	Per station 64 points : Total of 63 stations 4032 points
		Per station 128 points : Total of 32 stations 4096 points
	Manual allocation	Per station 8 to 1024 points : Total of 4096 points
Synchronous method with PC operation	Operation synchronous	Communicates synchronously with the PC's I/O processing cycle.
	Operation asynchronous	Communicates separate with the PC's I/O processing cycle.

② Data link specifications

Item		Specification	
		Relay link	Register link
No. of data link stations		64 sets max.	
Link area	ZW-PC	File 0 (000000 to $005777_{(8)}$)	File 0 (000000 to $015777_{(8)}$) File 1 to 7 (000000 to $177777_{(8)}$)
	JW-PC	File 0 (000000 to $007777_{(8)}$)	
Total no. of link points		2048 points max. (256 bytes)	2048 bytes max.
Total no. of sending/receiving points per slave station	Standard function	2048 points max. (256 bytes)	2048 bytes max.
	Memory capacity save function	512 points max. (64 bytes)	512 bytes max.
Communication mode		N:M communication	

③ Computer link specifications

Item	Specification
No. of link stations	64 sets max.
Communication data size	1024 bytes max./packet *
Communication control	According to the host computer command
Control contents	Read/write of data memory Read/write of program memory PC control

* The amount of data attributed to the command, or response. The term "packet" refers to the value for each station.

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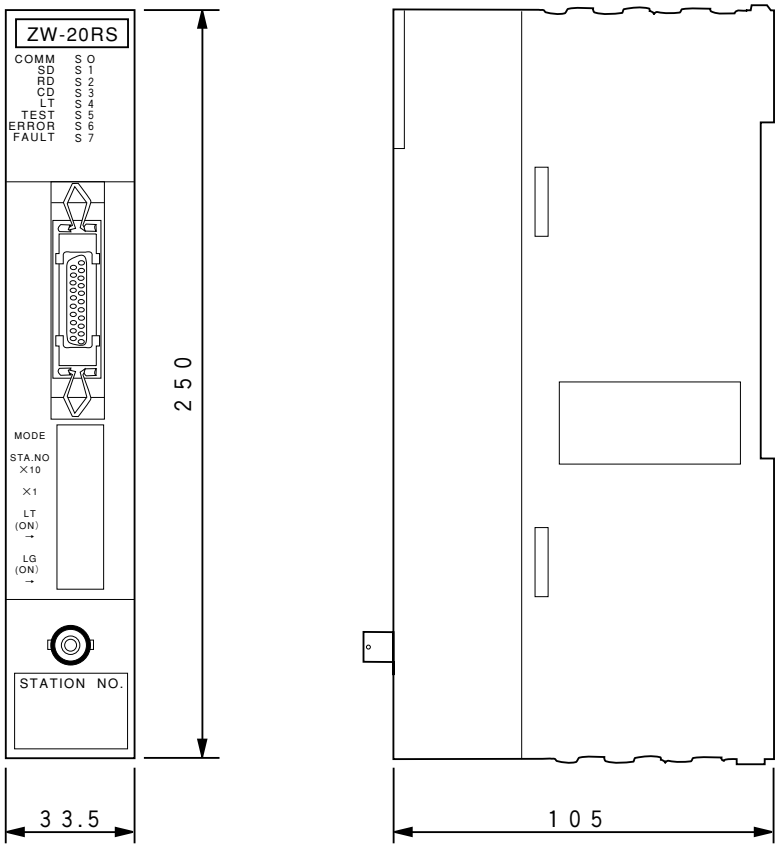
12-2 JW-20RS

(1) General specifications

Item	Specifications
Storage temperature	– 20 to + 70° C
Ambient temperature	0 to + 55° C
Ambient humidity	35 to 90%RH (without moisture condensation)
Vibration resistance	JIS-C-0911 equivalent (X,Y, Z , 2 hours in each)
Shock resistance	JIS-C-0911 equivalent
Internal power consumption	600 mA (5VDC)
Weight	Approx. 570g

[Outline dimension drawings]

(Unit : mm)



(2) Communication specifications

Communication specifications is same as JW-20CM.

(See page 12·2)

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Chapter 13 Appendix

13-1 Maintenance and check

Check wiring, installation, and switch settings.

	Check item	System configuration				
		( )	( )	( )	( )	( )
Communication cable	Not parallel with or proximate to high voltage lines or strong power lines.					
	Branch lines (drop cable) are within 400 mm.					
	Total length is less than 1 km.					
	No damage or breaks in cables.					
	Connectors are securely assembled.					
	Connectors are securely connected and locked.					
	Insulation covers are put on connectors.					
Power supply module	Securely tighten the module retention screws.					
	A ground line is connected with the GND terminal.					
Control module	Securely tighten the module retention screws.					
	Memory module is appropriately installed.					
I/O module	Securely tighten the module retention screws.					
	No other cables than the communication cable and DC input cables are input in the same duct.					
Basic rack panel is appropriately installed.						
JW-20CM/20RS	Securely tighten the module retention screws.					
	Mode switches are appropriately set.					
	Station number switches are appropriately set (00 to $77_{(8)}$).					
	Termination resistance switches are appropriately set.	ON				
	Shield ground switches are appropriately set.					
	Parameters are appropriately set.					

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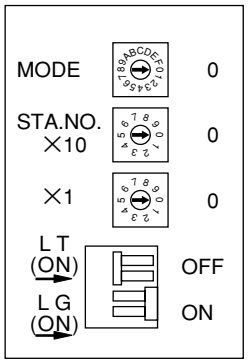
13-2 Switch setting table

(1) JW-20CM (network module)

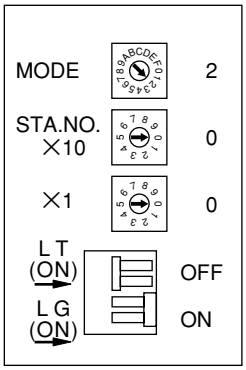
Set at delivery



Remote I/O	Data link (standard function) computer link			Data link (memory capacity save function) computer link	
	Master station	Slave station		Slave station	
1	2	2		0	
0	0	0 to 7	01 to 77(8)	0 to 7	01 to 77(8)
0	0	0 to 7		0 to 7	
Turn ON both ends stations of the communication circuit. Turn OFF other stations.	Turn ON both ends stations of the communication circuit. Turn OFF other stations.				
Set ON/OFF shield grand	Set ON/OFF shield grand				

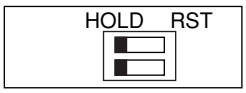
(2) JW-20RS (remote I/O slave module)

Set at delivery



When a ZW model I/O module is used	When a JW model I/O module is used
1	2
0 to 7 0 to 7	(01 to 77(8))
Turn ON both ends stations of the communication circuit. Turn OFF other stations.	
Set ON/OFF shield grand	

Output holding switch



When a ZW model I/O module is used	When a JW model I/O module is used
HOLD · · · Latch output RST · · · Output all OFF	HOLD

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13-3 Parameter memory table

(1) JW-20CM

① Remote I/O

○ : Setting is necessary (1/6)

Address(8)	Set contents	Setting method (value, example)			JW-PC		ZW-PC	
					Fix	Manual	Fix	Manual
000000	Remote I/O operation mode	001(8)	(Operations when a slave station error occurs) • Remote I/O operation (communication) stops • The PC continues operation. (Mode 1)	(Communication method) Asynchronous	○	○	○	○
		002(8)	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)					
		004(8)	• Remote I/O operation (communication) stops • The PC continues operation. (Mode 0)	Synchronism				
		005(8)	• Remote I/O operation (communication) stops • The PC continues operation. (Mode 1)					
		006(8)	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)					
		011(8)	• Remote I/O operation (communication) stops • The PC continues operation. (Mode 1)	Asynchronous				
		012(8)	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)					
		014(8)	• Remote I/O operation (communication) stops • The PC also stops operation. (Mode 0)	Synchronism				
		015(8)	• Remote I/O operation (communication) stops • The PC continues operation. (Mode 1)					
		016(8)	• Only normal slave stations will continue operation (communication). • The PC continues operation. (Mode 2)					
000001	No. of slave station connected (1 to 63 sets)	(Decimal, bytes)	In case of 30 sets → 030(D)					

• Initial value of the address 000000, 000001(8) are 00(H).

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Address(8)	Set contents	Setting method (value, example)		JW-PC		ZW-PC	
				Fix	Manual	Fix	Manual
000002	• When using the fixed allocation mode, put the top address of the remote I/O in this register. • When using the manual allocation mode, put the top address of the remote I/O in the slave station 01 in this register.	(Octal, word)	When ⊐0200, set to 000200(8)	○	○	○	○
000003							
000004	Set remote I/O top address of slave station 02	(Octal, word)	When ⊐0300, set to 000300(8)	—	○	—	○
000005							

- Use the addresses 000006 to 000177(8) listed below when the manual allocation mode is selected. These addresses cannot be used in the fixed allocation mode.

Address(8)	Set contents
000006, 000007	Remote I/O top address of slave station 03 (same as 000004, 000005)
000010, 000011	04 (same as 000004, 000005)
000012, 000013	05 (same as 000004, 000005)
000014, 000015	06 (same as 000004, 000005)
000016, 000017	07 (same as 000004, 000005)
000020, 000021	10 (same as 000004, 000005)
000022, 000023	11 (same as 000004, 000005)
000024, 000025	12 (same as 000004, 000005)
000026, 000027	13 (same as 000004, 000005)
000030, 000031	14 (same as 000004, 000005)
000032, 000033	15 (same as 000004, 000005)
000034, 000035	16 (same as 000004, 000005)
000036, 000037	17 (same as 000004, 000005)
000040, 000041	20 (same as 000004, 000005)
000042, 000043	21 (same as 000004, 000005)
000044, 000045	22 (same as 000004, 000005)
000046, 000047	23 (same as 000004, 000005)
000050, 000051	24 (same as 000004, 000005)
000052, 000053	25 (same as 000004, 000005)
000054, 000055	26 (same as 000004, 000005)
000056, 000057	27 (same as 000004, 000005)
000060, 000061	30 (same as 000004, 000005)
000062, 000063	31 (same as 000004, 000005)
000064, 000065	32 (same as 000004, 000005)
000066, 000067	33 (same as 000004, 000005)
000070, 000071	34 (same as 000004, 000005)
000072, 000073	35 (same as 000004, 000005)
000074, 000075	36 (same as 000004, 000005)
000076, 000077	37 (same as 000004, 000005)

Address (8)	Set contents
000100, 000101	Remote I/O top address of slave station 40 (same as 000004, 000005)
000102, 000103	41 (same as 000004, 000005)
000104, 000105	42 (same as 000004, 000005)
000106, 000107	43 (same as 000004, 000005)
000110, 000111	44 (same as 000004, 000005)
000112, 000113	45 (same as 000004, 000005)
000114, 000115	46 (same as 000004, 000005)
000116, 000117	47 (same as 000004, 000005)
000120, 000121	50 (same as 000004, 000005)
000122, 000123	51 (same as 000004, 000005)
000124, 000125	52 (same as 000004, 000005)
000126, 000127	53 (same as 000004, 000005)
000130, 000131	54 (same as 000004, 000005)
000132, 000133	55 (same as 000004, 000005)
000134, 000135	56 (same as 000004, 000005)
000136, 000137	57 (same as 000004, 000005)
000140, 000141	60 (same as 000004, 000005)
000142, 000143	61 (same as 000004, 000005)
000144, 000145	62 (same as 000004, 000005)
000146, 000147	63 (same as 000004, 000005)
000150, 000151	64 (same as 000004, 000005)
000152, 000153	65 (same as 000004, 000005)
000154, 000155	66 (same as 000004, 000005)
000156, 000157	67 (same as 000004, 000005)
000160, 000161	70 (same as 000004, 000005)
000162, 000163	71 (same as 000004, 000005)
000164, 000165	72 (same as 000004, 000005)
000166, 000167	73 (same as 000004, 000005)
000170, 000171	74 (same as 000004, 000005)
000172, 000173	75 (same as 000004, 000005)
000174, 000175	76 (same as 000004, 000005)
000176, 000177	

- Initial value of the address 000002 to 000177(8) are all 00(H).

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Address(8)	Set contents	Setting method (value, example)		JW-PC		ZW-PC	
				Fix	Manual	Fix	Manual
000200	Slave station I/O points	$00_{(H)}$	64 points (8 bytes), no. of slave stations: max. 63 sets.	○	—	○	—
		$01_{(H)}$	128 points (16 bytes), no. of slave stations: max. 32 sets.				
000201	Number of I/O bytes of slave station 01 (1 to 128 bytes)	(Decimal, bytes)	In case of 50 bytes → $050_{(D)}$	—	○	—	○

- Use the addresses 000202 to $000277_{(8)}$ listed below when the manual allocation mode is selected. These addresses cannot be used in the fixed allocation mode.

Address(8)	Set contents
000202	Number of I/O bytes of slave station 02 (same as 000201)
000203	03 (same as 000201)
000204	04 (same as 000201)
000205	05 (same as 000201)
000206	06 (same as 000201)
000207	07 (same as 000201)
000210	10 (same as 000201)
000211	11 (same as 000201)
000212	12 (same as 000201)
000213	13 (same as 000201)
000214	14 (same as 000201)
000215	15 (same as 000201)
000216	16 (same as 000201)
000217	17 (same as 000201)
000220	20 (same as 000201)
000221	21 (same as 000201)
000222	22 (same as 000201)
000223	23 (same as 000201)
000224	24 (same as 000201)
000225	25 (same as 000201)
000226	26 (same as 000201)
000227	27 (same as 000201)
000230	30 (same as 000201)
000231	31 (same as 000201)
000232	32 (same as 000201)
000233	33 (same as 000201)
000234	34 (same as 000201)
000235	35 (same as 000201)
000236	36 (same as 000201)
000237	

Address(8)	Set contents
000240	Number of I/O bytes of slave station 40 (same as 000201)
000241	41 (same as 000201)
000242	42 (same as 000201)
000243	43 (same as 000201)
000244	44 (same as 000201)
000245	45 (same as 000201)
000246	46 (same as 000201)
000247	47 (same as 000201)
000250	50 (same as 000201)
000251	51 (same as 000201)
000252	52 (same as 000201)
000253	53 (same as 000201)
000254	54 (same as 000201)
000255	55 (same as 000201)
000256	56 (same as 000201)
000257	57 (same as 000201)
000260	60 (same as 000201)
000261	61 (same as 000201)
000262	62 (same as 000201)
000263	63 (same as 000201)
000264	64 (same as 000201)
000265	65 (same as 000201)
000266	66 (same as 000201)
000267	67 (same as 000201)
000270	70 (same as 000201)
000271	71 (same as 000201)
000272	72 (same as 000201)
000273	73 (same as 000201)
000274	74 (same as 000201)
000275	75 (same as 000201)
000276	76 (same as 000201)
000277	

- Initial value of the address 000200 to $000277_{(8)}$ are all $00_{(H)}$.

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Address(8)	Set contents	Setting method (value, example)		JW-PC		ZW-PC	
				Fix	Manual	Fix	Manual
000301	Blanks between slave stations 1 and 2 (0 to 255 bytes)	(Decimal, bytes)	In case of 100 bytes → 100(D)	○	—	○	—

- Use the addresses 000302 to 000376(8) listed below when the fixed allocation mode is selected. These addresses cannot be used in the manual allocation mode.

Address(8)	Set contents
000302	Blanks between slave stations 2 and 3 (same as 000301)
000303	3 and 4 (same as 000301)
000304	4 and 5 (same as 000301)
000305	5 and 6 (same as 000301)
000306	6 and 7 (same as 000301)
000307	7 and 10 (same as 000301)
000310	10 and 11 (same as 000301)
000311	11 and 12 (same as 000301)
000312	12 and 13 (same as 000301)
000313	13 and 14 (same as 000301)
000314	14 and 15 (same as 000301)
000315	15 and 16 (same as 000301)
000316	16 and 17 (same as 000301)
000317	17 and 20 (same as 000301)
000320	20 and 21 (same as 000301)
000321	21 and 22 (same as 000301)
000322	22 and 23 (same as 000301)
000323	23 and 24 (same as 000301)
000324	24 and 25 (same as 000301)
000325	25 and 26 (same as 000301)
000326	26 and 27 (same as 000301)
000327	27 and 30 (same as 000301)
000330	30 and 31 (same as 000301)
000331	31 and 32 (same as 000301)
000332	32 and 33 (same as 000301)
000333	33 and 34 (same as 000301)
000334	34 and 35 (same as 000301)
000335	35 and 36 (same as 000301)
000336	36 and 37 (same as 000301)
000337	37 and 40 (same as 000301)
000340	40 and 41 (same as 000301)

Address (8)	Set contents
000341	Blanks between slave stations 41 and 42 (same as 000301)
000342	42 and 43 (same as 000301)
000343	43 and 44 (same as 000301)
000344	44 and 45 (same as 000301)
000345	45 and 46 (same as 000301)
000346	46 and 47 (same as 000301)
000347	47 and 50 (same as 000301)
000350	50 and 51 (same as 000301)
000351	51 and 52 (same as 000301)
000352	52 and 53 (same as 000301)
000353	53 and 54 (same as 000301)
000354	54 and 55 (same as 000301)
000355	55 and 56 (same as 000301)
000356	56 and 57 (same as 000301)
000357	57 and 60 (same as 000301)
000360	60 and 61 (same as 000301)
000361	61 and 62 (same as 000301)
000362	62 and 63 (same as 000301)
000363	63 and 64 (same as 000301)
000364	64 and 65 (same as 000301)
000365	65 and 66 (same as 000301)
000366	66 and 67 (same as 000301)
000367	67 and 70 (same as 000301)
000370	70 and 71 (same as 000301)
000371	71 and 72 (same as 000301)
000372	72 and 73 (same as 000301)
000373	73 and 74 (same as 000301)
000374	74 and 75 (same as 000301)
000375	75 and 76 (same as 000301)
000376	76 and 77 (same as 000301)

- Initial value of the address 000301 to 000376(8) are all 00(H).

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Address(8)	Set contents	Setting method (value, example)									JW-PC		ZW-PC	
											Fix	Manual	Fix	Manual
000400 to 000407	Slave station I/O type • Use 0 (OFF, for ZW models) or 1 (ON, for JW models) in the corresponding bits for each station number listed on the right.	Bit address	7	6	5	4	3	2	1	0	• When the slave station 01 to 04(8) I/Os are ZW models and slave station 05 to 77(8) I/Os are JW models. (Address) (Bit pattern) 000400 — 11100000 000401 — 11111111 to to 000407 — 11111111	○	○	—	—
		000400	07	06	05	04	03	02	01	—				
		000401	17	16	15	14	13	12	11	10				
		000402	27	26	25	24	23	22	21	20				
		000403	37	36	35	34	33	32	31	30				
		000404	47	46	45	44	43	42	41	40				
		000405	57	56	55	54	53	52	51	50				
		000406	67	66	65	64	63	62	61	60				
		000407	77	76	75	74	73	72	71	70				
000600 to 000603	Data register address of special I/O module (No. 1)	000600	Slave station number (00 to 77(8))											
		000601	Upper 4 bits: rack number (0, 1) Lower 4 bits: slot number (00 to 0F(H))											
		000602	Number of data bytes (01 to 64(D))											
		000603	Register top address (file address) D7 bit: 1 (Set), 0 (Not set)											

• Set the addresses 000600 to 000777(8) when the master station PC is JW model and uses a special I/O module for slave station.

Address(8)	Set contents
000604 to 000607	Data register address of special I/O (No. 2) (same as 000600 to 000603)
000610 to 000613	(same as 000600 to 000603) (No. 3)
000614 to 000617	(same as 000600 to 000603) (No. 4)
000620 to 000623	(same as 000600 to 000603) (No. 5)
000624 to 000627	(same as 000600 to 000603) (No. 6)
000630 to 000633	(same as 000600 to 000603) (No. 7)
000634 to 000637	(same as 000600 to 000603) (No. 8)
000640 to 000643	(same as 000600 to 000603) (No. 9)
000644 to 000647	(same as 000600 to 000603) (No.10)
000650 to 000653	(same as 000600 to 000603) (No.11)
000654 to 000657	(same as 000600 to 000603) (No.12)
000660 to 000663	(same as 000600 to 000603) (No.13)
000664 to 000667	(same as 000600 to 000603) (No.14)
000670 to 000673	(same as 000600 to 000603) (No.15)
000674 to 000677	(same as 000600 to 000603) (No.16)
000700 to 000703	(same as 000600 to 000603) (No.17)

Address(8)	Set contents
000704 to 000707	Data register address of special I/O (No.18) (same as 000600 to 000603)
000710 to 000713	(same as 000600 to 000603) (No.19)
000714 to 000717	(same as 000600 to 000603) (No.20)
000720 to 000723	(same as 000600 to 000603) (No.21)
000724 to 000727	(same as 000600 to 000603) (No.22)
000730 to 000733	(same as 000600 to 000603) (No.23)
000734 to 000737	(same as 000600 to 000603) (No.24)
000740 to 000743	(same as 000600 to 000603) (No.25)
000744 to 000747	(same as 000600 to 000603) (No.26)
000750 to 000753	(same as 000600 to 000603) (No.27)
000754 to 000757	(same as 000600 to 000603) (No.28)
000760 to 000763	(same as 000600 to 000603) (No.29)
000764 to 000767	(same as 000600 to 000603) (No.30)
000770 to 000773	(same as 000600 to 000603) (No.31)
000774 to 000777	(same as 000600 to 000603) (No.32)

• Initial value of the address 000400 to 000407(8) are all FF(H). Initial value of 000600 to 000777(8) are all 00(H).

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Address(8)	Set contents		Setting method (value, example)		JW-PC		ZW-PC	
					Fix	Manual	Fix	Manual
003764 to 003767	Flag top address	003764	(Octal, word)	When ⊐0200, set to 000200(8) (Set by file address)	○	○	—	—
		003765						
		003766	(Hexadecimal byte)	When file No. 2, set to 02(H)				
		003767		00(H): Do not output flag 80(H): Output flag				
003777	Stop operation of the remote I/O		00(H)	———				
	Start operation of the remote I/O		01(H)					
	Writing to EEPROM or operation of the module/stop operation		80(H)					
	Writing to EEPROM or operation of the module/start operation		81(H)					
	Initialize parameter setting value		08(H)					

• Initial value of the address 003764 to 003767(8) are all 00(H). Initial value of 003777(8) are all 01(H).

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② Data link master station

(1/7)

Address(8)	Set contents		Setting method (value, example)	
000000	Store the mis-setting slave station number in the master station		—	—
004000 004001	Top address of relay link area in the master station		(Octal, word)	When ∃1000, set to 001000(8) (Set by file address)
004002	Set function (relay/register link)		01(H)	Fixed to 01(H)
004003	Amount of connectable stations (2 to 64 stations)		(Decimal, byte)	When 12 stations, set to 012(D)
004004 to 004007	• When slave station 01(8) is set to data link (the standard function), top address of the relay link area on slave station 01(8) are as shown at right.	004004 004005	(Octal, word)	When ∃1200, set to 001200(8) (Set by file address) ※
		004006	00(H)	00(H): In this case the same as the master station
		004007	●	80(H): In this case different from the master station
	• When slave station 01(8) is set to data link (the memory capacity save function), number of offset bytes of relay link area on slave station 01(8) are shown at right.	004004 004005	(Decimal, word)	When 100 bytes, set to 00100(D)
		004006	00(H)	
		004007	80(H)	

※ When 00(H) is set, the value becomes the same top address of the master station regardless of the setting value of 004004 to 004005(8).

Address(8)	Set contents
004010 to 004013	Top address or number of offset bytes on slave station 02(8) (same as 004004 to 004007).
004014 to 004017	03(8) (same as 004004 to 004007)
004020 to 004023	04(8) (same as 004004 to 004007)
004024 to 004027	05(8) (same as 004004 to 004007)
004030 to 004033	06(8) (same as 004004 to 004007)
004034 to 004037	07(8) (same as 004004 to 004007)
004040 to 004043	10(8) (same as 004004 to 004007)
004044 to 004047	11(8) (same as 004004 to 004007)
004050 to 004053	12(8) (same as 004004 to 004007)
004054 to 004057	13(8) (same as 004004 to 004007)
004060 to 004063	14(8) (same as 004004 to 004007)
004064 to 004067	15(8) (same as 004004 to 004007)
004070 to 004073	16(8) (same as 004004 to 004007)
004074 to 004077	17(8) (same as 004004 to 004007)
004100 to 004103	20(8) (same as 004004 to 004007)
004104 to 004107	21(8) (same as 004004 to 004007)
004110 to 004113	22(8) (same as 004004 to 004007)
004114 to 004117	23(8) (same as 004004 to 004007)
004120 to 004123	24(8) (same as 004004 to 004007)
004124 to 004127	25(8) (same as 004004 to 004007)
004130 to 004133	26(8) (same as 004004 to 004007)
004134 to 004137	27(8) (same as 004004 to 004007)
004140 to 004143	30(8) (same as 004004 to 004007)
004144 to 004147	31(8) (same as 004004 to 004007)
004150 to 004153	32(8) (same as 004004 to 004007)
004154 to 004157	33(8) (same as 004004 to 004007)
004160 to 004163	34(8) (same as 004004 to 004007)
004164 to 004167	35(8) (same as 004004 to 004007)
004170 to 004173	36(8) (same as 004004 to 004007)
004174 to 004177	37(8) (same as 004004 to 004007)

Address(8)	Set contents
004200 to 004203	Top address or number of offset bytes on slave station 40(8) (same as 004004 to 004007).
004204 to 004207	41(8) (same as 004004 to 004007)
004210 to 004213	42(8) (same as 004004 to 004007)
004214 to 004217	43(8) (same as 004004 to 004007)
004220 to 004223	44(8) (same as 004004 to 004007)
004224 to 004227	45(8) (same as 004004 to 004007)
004230 to 004233	46(8) (same as 004004 to 004007)
004234 to 004237	47(8) (same as 004004 to 004007)
004240 to 004243	50(8) (same as 004004 to 004007)
004244 to 004247	51(8) (same as 004004 to 004007)
004250 to 004253	52(8) (same as 004004 to 004007)
004254 to 004257	53(8) (same as 004004 to 004007)
004260 to 004263	54(8) (same as 004004 to 004007)
004264 to 004267	55(8) (same as 004004 to 004007)
004270 to 004273	56(8) (same as 004004 to 004007)
004274 to 004277	57(8) (same as 004004 to 004007)
004300 to 004303	60(8) (same as 004004 to 004007)
004304 to 004307	61(8) (same as 004004 to 004007)
004310 to 004313	62(8) (same as 004004 to 004007)
004314 to 004317	63(8) (same as 004004 to 004007)
004320 to 004323	64(8) (same as 004004 to 004007)
004324 to 004327	65(8) (same as 004004 to 004007)
004330 to 004333	66(8) (same as 004004 to 004007)
004334 to 004337	67(8) (same as 004004 to 004007)
004340 to 004343	70(8) (same as 004004 to 004007)
004344 to 004347	71(8) (same as 004004 to 004007)
004350 to 004353	72(8) (same as 004004 to 004007)
004354 to 004357	73(8) (same as 004004 to 004007)
004360 to 004363	74(8) (same as 004004 to 004007)
004364 to 004367	75(8) (same as 004004 to 004007)
004370 to 004373	76(8) (same as 004004 to 004007)
004374 to 004377	77(8) (same as 004004 to 004007)

- Initial value of the address 004000 to 004377(8) are all 00(H).

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Address(8)	Set contents		Setting method (value, example)	
004400	Top address of register link area in the master station		(Octal, word)	When 09000(8), set to 004000(8) (Set by file address)
004401				
004402			(Hexadecimal, byte)	
004403			00(H)	
004404 to 004407	• When slave station 01(8) is set to data link (the standard function), top address of the register link area on slave station 01(8) are as shown at right.	004404	(Octal, word)	When 29000, set to 006000(8) (Set by file address) ※ 00(H): In this case the same as the master station 80(H): In this case different from the master station
		004405		
		004406	(Hexadecimal, byte)	
		004407	●	
	• When slave station 01(8) is set to data link (the memory capacity save function), number of offset bytes of register link area on slave station 01(8) are shown at right.	004404	(Decimal, word)	When 100 bytes, set to 00100(D)
		004405		
		004406	00(H)	
		004407	80(H)	

※ When 00(H) is set, the value becomes the same top address of the master station regardless of the setting value of 004404 to 004405(8).

Address(8)	Set contents
004410 to 004413	Top address or number of offset bytes on slave station 02(8) (same as 004404 to 004407).
004414 to 004417	03(8) (same as 004404 to 004407)
004420 to 004423	04(8) (same as 004404 to 004407)
004424 to 004427	05(8) (same as 004404 to 004407)
004430 to 004433	06(8) (same as 004404 to 004407)
004434 to 004437	07(8) (same as 004404 to 004407)
004440 to 004443	10(8) (same as 004404 to 004407)
004444 to 004447	11(8) (same as 004404 to 004407)
004450 to 004453	12(8) (same as 004404 to 004407)
004454 to 004457	13(8) (same as 004404 to 004407)
004460 to 004463	14(8) (same as 004404 to 004407)
004464 to 004467	15(8) (same as 004404 to 004407)
004470 to 004473	16(8) (same as 004404 to 004407)
004474 to 004477	17(8) (same as 004404 to 004407)
004500 to 004503	20(8) (same as 004404 to 004407)
004504 to 004507	21(8) (same as 004404 to 004407)
004510 to 004513	22(8) (same as 004404 to 004407)
004514 to 004517	23(8) (same as 004404 to 004407)
004520 to 004523	24(8) (same as 004404 to 004407)
004524 to 004527	25(8) (same as 004404 to 004407)
004530 to 004533	26(8) (same as 004404 to 004407)
004534 to 004537	27(8) (same as 004404 to 004407)
004540 to 004543	30(8) (same as 004404 to 004407)
004544 to 004547	31(8) (same as 004404 to 004407)
004550 to 004553	32(8) (same as 004404 to 004407)
004554 to 004557	33(8) (same as 004404 to 004407)
004560 to 004563	34(8) (same as 004404 to 004407)
004564 to 004567	35(8) (same as 004404 to 004407)
004570 to 004573	36(8) (same as 004404 to 004407)
004574 to 004577	37(8) (same as 004404 to 004407)

Address(8)	Set contents
004600 to 004603	Top address or number of offset bytes on slave station 40(8) (same as 004404 to 004407).
004604 to 004607	41(8) (same as 004404 to 004407)
004610 to 004613	42(8) (same as 004404 to 004407)
004614 to 004617	43(8) (same as 004404 to 004407)
004620 to 004623	44(8) (same as 004404 to 004407)
004624 to 004627	45(8) (same as 004404 to 004407)
004630 to 004633	46(8) (same as 004404 to 004407)
004634 to 004637	47(8) (same as 004404 to 004407)
004640 to 004643	50(8) (same as 004404 to 004407)
004644 to 004647	51(8) (same as 004404 to 004407)
004650 to 004653	52(8) (same as 004404 to 004407)
004654 to 004657	53(8) (same as 004404 to 004407)
004660 to 004663	54(8) (same as 004404 to 004407)
004664 to 004667	55(8) (same as 004404 to 004407)
004670 to 004673	56(8) (same as 004404 to 004407)
004674 to 004677	57(8) (same as 004404 to 004407)
004700 to 004703	60(8) (same as 004404 to 004407)
004704 to 004707	61(8) (same as 004404 to 004407)
004710 to 004713	62(8) (same as 004404 to 004407)
004714 to 004717	63(8) (same as 004404 to 004407)
004720 to 004723	64(8) (same as 004404 to 004407)
004724 to 004727	65(8) (same as 004404 to 004407)
004730 to 004733	66(8) (same as 004404 to 004407)
004734 to 004737	67(8) (same as 004404 to 004407)
004740 to 004743	70(8) (same as 004404 to 004407)
004744 to 004747	71(8) (same as 004404 to 004407)
004750 to 004753	72(8) (same as 004404 to 004407)
004754 to 004757	73(8) (same as 004404 to 004407)
004760 to 004763	74(8) (same as 004404 to 004407)
004764 to 004767	75(8) (same as 004404 to 004407)
004770 to 004773	76(8) (same as 004404 to 004407)
004774 to 004777	77(8) (same as 004404 to 004407)

- Initial value of the address 004400 to 004777(8) are all 00(H).

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Address(8)	Set contents	Setting method (value, example)	
005000	Number of sending bytes of master station relay link area	(Decimal, word)	When 8 bytes, set to 00008(D)
005001			
005002	Number of sending bytes of slave station 01(8) relay link area	(Decimal, word)	
005003			

Address(8)	Set contents
005004 to 005005	Number of sending bytes of slave station 02(8) relay link area (same as 005002 to 005003).
005006 to 005007	03(8) (same as 005002 to 005003)
005010 to 005011	04(8) (same as 005002 to 005003)
005012 to 005013	05(8) (same as 005002 to 005003)
005014 to 005015	06(8) (same as 005002 to 005003)
005016 to 005017	07(8) (same as 005002 to 005003)
005020 to 005021	10(8) (same as 005002 to 005003)
005022 to 005023	11(8) (same as 005002 to 005003)
005024 to 005025	12(8) (same as 005002 to 005003)
005026 to 005027	13(8) (same as 005002 to 005003)
005030 to 005031	14(8) (same as 005002 to 005003)
005032 to 005033	15(8) (same as 005002 to 005003)
005034 to 005035	16(8) (same as 005002 to 005003)
005036 to 005037	17(8) (same as 005002 to 005003)
005040 to 005041	20(8) (same as 005002 to 005003)
005042 to 005043	21(8) (same as 005002 to 005003)
005044 to 005045	22(8) (same as 005002 to 005003)
005046 to 005047	23(8) (same as 005002 to 005003)
005050 to 005051	24(8) (same as 005002 to 005003)
005052 to 005053	25(8) (same as 005002 to 005003)
005054 to 005055	26(8) (same as 005002 to 005003)
005056 to 005057	27(8) (same as 005002 to 005003)
005060 to 005061	30(8) (same as 005002 to 005003)
005062 to 005063	31(8) (same as 005002 to 005003)
005064 to 005065	32(8) (same as 005002 to 005003)
005066 to 005067	33(8) (same as 005002 to 005003)
005070 to 005071	34(8) (same as 005002 to 005003)
005072 to 005073	35(8) (same as 005002 to 005003)
005074 to 005075	36(8) (same as 005002 to 005003)
005076 to 005077	37(8) (same as 005002 to 005003)

Address(8)	Set contents
005100 to 005101	Number of sending bytes of slave station 40(8) relay link area (same as 005002 to 005003).
005102 to 005103	41(8) (same as 005002 to 005003)
005104 to 005105	42(8) (same as 005002 to 005003)
005106 to 005107	43(8) (same as 005002 to 005003)
005110 to 005111	44(8) (same as 005002 to 005003)
005112 to 005113	45(8) (same as 005002 to 005003)
005114 to 005115	46(8) (same as 005002 to 005003)
005116 to 005117	47(8) (same as 005002 to 005003)
005120 to 005121	50(8) (same as 005002 to 005003)
005122 to 005123	51(8) (same as 005002 to 005003)
005124 to 005125	52(8) (same as 005002 to 005003)
005126 to 005127	53(8) (same as 005002 to 005003)
005130 to 005131	54(8) (same as 005002 to 005003)
005132 to 005133	55(8) (same as 005002 to 005003)
005134 to 005135	56(8) (same as 005002 to 005003)
005136 to 005137	57(8) (same as 005002 to 005003)
005140 to 005141	60(8) (same as 005002 to 005003)
005142 to 005143	61(8) (same as 005002 to 005003)
005144 to 005145	62(8) (same as 005002 to 005003)
005146 to 005147	63(8) (same as 005002 to 005003)
005150 to 005151	64(8) (same as 005002 to 005003)
005152 to 005153	65(8) (same as 005002 to 005003)
005154 to 005155	66(8) (same as 005002 to 005003)
005156 to 005157	67(8) (same as 005002 to 005003)
005160 to 005161	70(8) (same as 005002 to 005003)
005162 to 005163	71(8) (same as 005002 to 005003)
005164 to 005165	72(8) (same as 005002 to 005003)
005166 to 005167	73(8) (same as 005002 to 005003)
005170 to 005171	74(8) (same as 005002 to 005003)
005172 to 005173	75(8) (same as 005002 to 005003)
005174 to 005175	76(8) (same as 005002 to 005003)
005176 to 005177	77(8) (same as 005002 to 005003)

- Initial value of the address 005000 to 005177(8) are all 00(H).

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Address(8)	Set contents	Setting method (value, example)	
005200	Number of sending bytes of master station register link area	(Decimal, word)	When 64 bytes, set to 00064(D)
005201			
005202	Number of sending bytes of slave station 01(8) register link area	(Decimal, word)	
005203			

Address(8)	Set contents
005204 to 005205	Number of sending bytes of slave station 02(8) register link area (same as 005202 to 005203).
005206 to 005207	03(8) (same as 005202 to 005203)
005210 to 005211	04(8) (same as 005202 to 005203)
005212 to 005213	05(8) (same as 005202 to 005203)
005214 to 005215	06(8) (same as 005202 to 005203)
005216 to 005217	07(8) (same as 005202 to 005203)
005220 to 005221	10(8) (same as 005202 to 005203)
005222 to 005223	11(8) (same as 005202 to 005203)
005224 to 005225	12(8) (same as 005202 to 005203)
005226 to 005227	13(8) (same as 005202 to 005203)
005230 to 005231	14(8) (same as 005202 to 005203)
005232 to 005233	15(8) (same as 005202 to 005203)
005234 to 005235	16(8) (same as 005202 to 005203)
005236 to 005237	17(8) (same as 005202 to 005203)
005240 to 005241	20(8) (same as 005202 to 005203)
005242 to 005243	21(8) (same as 005202 to 005203)
005244 to 005245	22(8) (same as 005202 to 005203)
005246 to 005247	23(8) (same as 005202 to 005203)
005250 to 005251	24(8) (same as 005202 to 005203)
005252 to 005253	25(8) (same as 005202 to 005203)
005254 to 005255	26(8) (same as 005202 to 005203)
005256 to 005257	27(8) (same as 005202 to 005203)
005260 to 005261	30(8) (same as 005202 to 005203)
005262 to 005263	31(8) (same as 005202 to 005203)
005264 to 005265	32(8) (same as 005202 to 005203)
005266 to 005267	33(8) (same as 005202 to 005203)
005270 to 005271	34(8) (same as 005202 to 005203)
005272 to 005273	35(8) (same as 005202 to 005203)
005274 to 005275	36(8) (same as 005202 to 005203)
005276 to 005277	37(8) (same as 005202 to 005203)

Address(8)	Set contents
005300 to 005301	Number of sending bytes of slave station 40(8) register link area (same as 005202 to 005203).
005302 to 005303	41(8) (same as 005202 to 005203)
005304 to 005305	42(8) (same as 005202 to 005203)
005306 to 005307	43(8) (same as 005202 to 005203)
005310 to 005311	44(8) (same as 005202 to 005203)
005312 to 005313	45(8) (same as 005202 to 005203)
005314 to 005315	46(8) (same as 005202 to 005203)
005316 to 005317	47(8) (same as 005202 to 005203)
005320 to 005321	50(8) (same as 005202 to 005203)
005322 to 005323	51(8) (same as 005202 to 005203)
005324 to 005325	52(8) (same as 005202 to 005203)
005326 to 005327	53(8) (same as 005202 to 005203)
005330 to 005331	54(8) (same as 005202 to 005203)
005332 to 005333	55(8) (same as 005202 to 005203)
005334 to 005335	56(8) (same as 005202 to 005203)
005336 to 005337	57(8) (same as 005202 to 005203)
005340 to 005341	60(8) (same as 005202 to 005203)
005342 to 005343	61(8) (same as 005202 to 005203)
005344 to 005345	62(8) (same as 005202 to 005203)
005346 to 005347	63(8) (same as 005202 to 005203)
005350 to 005351	64(8) (same as 005202 to 005203)
005352 to 005353	65(8) (same as 005202 to 005203)
005354 to 005355	66(8) (same as 005202 to 005203)
005356 to 005357	67(8) (same as 005202 to 005203)
005360 to 005361	70(8) (same as 005202 to 005203)
005362 to 005363	71(8) (same as 005202 to 005203)
005364 to 005365	72(8) (same as 005202 to 005203)
005366 to 005367	73(8) (same as 005202 to 005203)
005370 to 005371	74(8) (same as 005202 to 005203)
005372 to 005373	75(8) (same as 005202 to 005203)
005374 to 005375	76(8) (same as 005202 to 005203)
005376 to 005377	77(8) (same as 005202 to 005203)

• Initial value of the address 005200 to 005377(8) are all 00(H).

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Set addresses 007501 to $007577_{(8)}$ when a JW model is used. The setting is not required when a ZW model is used. (5/7)

Address(8)	Set contents	Setting method (value, example)	
007501	Time out time of SEND/RECEIVE instruction of slave station $01_{(8)}$ (0.1 to 25.5 sec.)	(Decimal, byte)	When 10 second, set to $100_{(D)}$

Address(8)	Set contents
007502	Time out time of SEND/RECEIVE instruction of slave station $02_{(8)}$ (Same as 007501)
007503	$03_{(8)}$ (same as 007501)
007504	$04_{(8)}$ (same as 007501)
007505	$05_{(8)}$ (same as 007501)
007506	$06_{(8)}$ (same as 007501)
007507	$07_{(8)}$ (same as 007501)
007510	$10_{(8)}$ (same as 007501)
007511	$11_{(8)}$ (same as 007501)
007512	$12_{(8)}$ (same as 007501)
007513	$13_{(8)}$ (same as 007501)
007514	$14_{(8)}$ (same as 007501)
007515	$15_{(8)}$ (same as 007501)
007516	$16_{(8)}$ (same as 007501)
007517	$17_{(8)}$ (same as 007501)
007520	$20_{(8)}$ (same as 007501)
007521	$21_{(8)}$ (same as 007501)
007522	$22_{(8)}$ (same as 007501)
007523	$23_{(8)}$ (same as 007501)
007524	$24_{(8)}$ (same as 007501)
007525	$25_{(8)}$ (same as 007501)
007526	$26_{(8)}$ (same as 007501)
007527	$27_{(8)}$ (same as 007501)
007530	$30_{(8)}$ (same as 007501)
007531	$31_{(8)}$ (same as 007501)
007532	$32_{(8)}$ (same as 007501)
007533	$33_{(8)}$ (same as 007501)
007534	$34_{(8)}$ (same as 007501)
007535	$35_{(8)}$ (same as 007501)
007536	$36_{(8)}$ (same as 007501)
007537	$37_{(8)}$ (same as 007501)

Address (8)	Set contents
007540	Time out time of SEND/RECEIVE instruction of slave station $40_{(8)}$ (Same as 007501)
007541	$41_{(8)}$ (same as 007501)
007542	$42_{(8)}$ (same as 007501)
007543	$43_{(8)}$ (same as 007501)
007544	$44_{(8)}$ (same as 007501)
007545	$45_{(8)}$ (same as 007501)
007546	$46_{(8)}$ (same as 007501)
007547	$47_{(8)}$ (same as 007501)
007550	$50_{(8)}$ (same as 007501)
007551	$51_{(8)}$ (same as 007501)
007552	$52_{(8)}$ (same as 007501)
007553	$53_{(8)}$ (same as 007501)
007554	$54_{(8)}$ (same as 007501)
007555	$55_{(8)}$ (same as 007501)
007556	$56_{(8)}$ (same as 007501)
007557	$57_{(8)}$ (same as 007501)
007560	$60_{(8)}$ (same as 007501)
007561	$61_{(8)}$ (same as 007501)
007562	$62_{(8)}$ (same as 007501)
007563	$63_{(8)}$ (same as 007501)
007564	$64_{(8)}$ (same as 007501)
007565	$65_{(8)}$ (same as 007501)
007566	$66_{(8)}$ (same as 007501)
007567	$67_{(8)}$ (same as 007501)
007570	$70_{(8)}$ (same as 007501)
007571	$71_{(8)}$ (same as 007501)
007572	$72_{(8)}$ (same as 007501)
007573	$73_{(8)}$ (same as 007501)
007574	$74_{(8)}$ (same as 007501)
007575	$75_{(8)}$ (same as 007501)
007576	$76_{(8)}$ (same as 007501)
007577	$77_{(8)}$ (same as 007501)

- Initial value of the address 007501 to $007577_{(8)}$ are all $00_{(H)}$.

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Set addresses 007601 to $007677_{(8)}$ when a JW model is used. The setting is not required when a ZW model is used. (6/7)

Address(8)	Set contents	Setting method (value, example)	
007601	PC model of slave station $01_{(8)}$	$00_{(H)}$	PC is ZW model or JW model, ZW-20CM is without JW sign.
		$80_{(H)}$	
		$81_{(H)}$	PC is ZW model, ZW-20CM is with JW sign and JW-20CM.
		$91_{(H)}$	PC is JW model, ZW-20CM is with JW model and JW-20CM/JW-22CM

Address(8)	Set contents
007602	PC model of slave station $02_{(8)}$ (Same as 007601)
007603	$03_{(8)}$ (same as 007601)
007604	$04_{(8)}$ (same as 007601)
007605	$05_{(8)}$ (same as 007601)
007606	$06_{(8)}$ (same as 007601)
007607	$07_{(8)}$ (same as 007601)
007610	$10_{(8)}$ (same as 007601)
007611	$11_{(8)}$ (same as 007601)
007612	$12_{(8)}$ (same as 007601)
007613	$13_{(8)}$ (same as 007601)
007614	$14_{(8)}$ (same as 007601)
007615	$15_{(8)}$ (same as 007601)
007616	$16_{(8)}$ (same as 007601)
007617	$17_{(8)}$ (same as 007601)
007620	$20_{(8)}$ (same as 007601)
007621	$21_{(8)}$ (same as 007601)
007622	$22_{(8)}$ (same as 007601)
007623	$23_{(8)}$ (same as 007601)
007624	$24_{(8)}$ (same as 007601)
007625	$25_{(8)}$ (same as 007601)
007626	$26_{(8)}$ (same as 007601)
007627	$27_{(8)}$ (same as 007601)
007630	$30_{(8)}$ (same as 007601)
007631	$31_{(8)}$ (same as 007601)
007632	$32_{(8)}$ (same as 007601)
007633	$33_{(8)}$ (same as 007601)
007634	$34_{(8)}$ (same as 007601)
007635	$35_{(8)}$ (same as 007601)
007636	$36_{(8)}$ (same as 007601)
007637	$37_{(8)}$ (same as 007601)

Address (8)	Set contents
007640	PC model of slave station $40_{(8)}$ (Same as 007601)
007641	$41_{(8)}$ (same as 007601)
007642	$42_{(8)}$ (same as 007601)
007643	$43_{(8)}$ (same as 007601)
007644	$44_{(8)}$ (same as 007601)
007645	$45_{(8)}$ (same as 007601)
007646	$46_{(8)}$ (same as 007601)
007647	$47_{(8)}$ (same as 007601)
007650	$50_{(8)}$ (same as 007601)
007651	$51_{(8)}$ (same as 007601)
007652	$52_{(8)}$ (same as 007601)
007653	$53_{(8)}$ (same as 007601)
007654	$54_{(8)}$ (same as 007601)
007655	$55_{(8)}$ (same as 007601)
007656	$56_{(8)}$ (same as 007601)
007657	$57_{(8)}$ (same as 007601)
007660	$60_{(8)}$ (same as 007601)
007661	$61_{(8)}$ (same as 007601)
007662	$62_{(8)}$ (same as 007601)
007663	$63_{(8)}$ (same as 007601)
007664	$64_{(8)}$ (same as 007601)
007665	$65_{(8)}$ (same as 007601)
007666	$66_{(8)}$ (same as 007601)
007667	$67_{(8)}$ (same as 007601)
007670	$70_{(8)}$ (same as 007601)
007671	$71_{(8)}$ (same as 007601)
007672	$72_{(8)}$ (same as 007601)
007673	$73_{(8)}$ (same as 007601)
007674	$74_{(8)}$ (same as 007601)
007675	$75_{(8)}$ (same as 007601)
007676	$76_{(8)}$ (same as 007601)
007677	$77_{(8)}$ (same as 007601)

- Initial value of the address 007601 to $007677_{(8)}$ are all $91_{(H)}$.

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<table>
<tr><th>Address(8)</th><th colspan="2">Set contents</th><th colspan="3">Setting method (value, example)</th></tr>
<tr><td rowspan="8">007700
to
007703</td><td rowspan="8">System of each cannel in SEND/RECEIVE function V5</td><td>007700</td><td>CH0</td><td>00(H)</td><td>Instruction system</td></tr>
<tr><td></td><td></td><td>80(H)</td><td>Data memory start system</td></tr>
<tr><td>007701</td><td>CH1</td><td>00(H)</td><td>Instruction system</td></tr>
<tr><td></td><td></td><td>81(H)</td><td>Data memory start system</td></tr>
<tr><td>007702</td><td>CH2</td><td>00(H)</td><td>Instruction system</td></tr>
<tr><td></td><td></td><td>82(H)</td><td>Data memory start system</td></tr>
<tr><td>007703</td><td>CH3</td><td>00(H)</td><td>Instruction system</td></tr>
<tr><td></td><td></td><td>83(H)</td><td>Data memory start system</td></tr>
<tr><td rowspan="4">007710
to
007713</td><td rowspan="4">Top addresses in communication information storage area when using data memory starting system of SEND/RECEIVE functions V5</td><td>007710</td><td colspan="2" rowspan="2">(Octal, word)</td><td rowspan="2">When ⊐1100 to set to 001100(8)
(Set by file address)</td></tr>
<tr><td>007711</td></tr>
<tr><td>007712</td><td colspan="2">(Hexadecimal, byte)</td><td>When file number is 0, set to 00(H)</td></tr>
<tr><td>007713</td><td colspan="3">This setting is valid by 80(H)</td></tr>
<tr><td>007750
to
007757</td><td>Connection condition of slave station
• Turn ON the corresponding bit of connected station number (01 to 77(8)) from the list at right.
• 00(8) of master station (0 bit of address 000750)
At ON: Output error code
At OFF: Do not output error code.</td><td colspan="2"><table><tr><th>Bit address</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td>007750</td><td>07</td><td>06</td><td>05</td><td>04</td><td>03</td><td>02</td><td>01</td><td>00</td></tr><tr><td>007751</td><td>17</td><td>16</td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td></tr><tr><td>007752</td><td>27</td><td>26</td><td>25</td><td>24</td><td>23</td><td>22</td><td>21</td><td>20</td></tr><tr><td>007753</td><td>37</td><td>36</td><td>35</td><td>34</td><td>33</td><td>32</td><td>31</td><td>30</td></tr><tr><td>007754</td><td>47</td><td>46</td><td>45</td><td>44</td><td>43</td><td>42</td><td>41</td><td>40</td></tr><tr><td>007755</td><td>57</td><td>56</td><td>55</td><td>54</td><td>53</td><td>52</td><td>51</td><td>50</td></tr><tr><td>007756</td><td>67</td><td>66</td><td>65</td><td>64</td><td>63</td><td>62</td><td>61</td><td>60</td></tr><tr><td>007757</td><td>77</td><td>76</td><td>75</td><td>74</td><td>73</td><td>72</td><td>71</td><td>70</td></tr></table></td><td>• When connecting slave station 00 to 04(8) and output error code:
(Address) (Bit pattern)
007750 — 00011111
007751 — 00000000
to to
007757 — 00000000</td></tr>
<tr><td>007763</td><td colspan="2">Whether the station number information should be output or not V5</td><td colspan="2">00(H)</td><td>Do not output</td></tr>
<tr><td></td><td></td><td colspan="2">01(H)</td><td>Output</td></tr>
<tr><td rowspan="4">007764
to
007767</td><td rowspan="4">Flag area top address on the master station</td><td>007764</td><td colspan="2" rowspan="2">(Octal, word)</td><td rowspan="2">When ⊐0200, set to 000200(8)
(Set by file address)</td></tr>
<tr><td>007765</td></tr>
<tr><td>007766</td><td colspan="2">(Hexadecimal, byte)</td><td>When file number is 2, set to 02(H)</td></tr>
<tr><td>007767</td><td colspan="2">●</td><td>00(H): Do not output flag
80(H): Output flag</td></tr>
<tr><td>007771</td><td colspan="2">Communication error detection interval</td><td colspan="2">(Decimal, bytes)</td><td>When 600 ms, set to 006(D)</td></tr>
<tr><td rowspan="5">007777</td><td colspan="2">Stop operation of the data link</td><td colspan="2">00(H)</td><td rowspan="5">Set in 100 ms unit

———</td></tr>
<tr><td colspan="2">Start operation of the data link</td><td colspan="2">01(H)</td></tr>
<tr><td colspan="2">Writing to EEPROM or operation stop operation</td><td colspan="2">80(H)</td></tr>
<tr><td colspan="2">Writing to EEPROM or operation start operation</td><td colspan="2">81(H)</td></tr>
<tr><td colspan="2">Initialize parameter setting value</td><td colspan="2">08(H)</td></tr>
</table>

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• See page 9·33 for initial value of the addresses above.

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③ Data link slave station

(1/2)

Address(8)	Set contents		Setting method (value, example)		
007500	Time out time of SEND/RECEIVE instruction of master station (0.1 to 25.5 sec.)		(Octal, byte) When 10 second, set to 100(D)		
007501 to 007577	Time out time of SEND/RECEIVE instruction of slave station 01 to 77(8) (See page 13·13 same as data link master station)				
007600	PC model of master station		00(H)		PC is ZW model or JW model, ZW-20CM is without JW sign.
			80(H)		
			81(H)		PC is ZW model, ZW-20CM is with JW sign and JW-20CM.
			91(H)		PC is JW model, ZW-20CM is with JW sign and JW-20CM/JW-22CM
007601 to 007677	PC model of slave station 01 to 77(8) (See page 8·6 same as data link master station)		Same as 007600		
007700 to 007703	System of each cannel in SEND/RECEIVE function V5	007700	CH0	00(H)	Instruction system
				80(H)	Data memory start system
		007701	CH1	00(H)	Instruction system
				81(H)	Data memory start system
		007702	CH2	00(H)	Instruction system
				82(H)	Data memory start system
		007703	CH3	00(H)	Instruction system
				83(H)	Data memory start system
007710 to 007713	Top addresses in communication information storage area when using data memory starting system of SEND/RECEIVE functions V5	007710	(Octal, word)		
		007711			
		007712	(Hexadecimal, byte)		
		007713	This setting is valid by 80(H)		
007720 007721	Number of receiving bytes of relay link in memory capacity save function V5		(Octal, byte)		Set 00008(D) for 8 bytes
007722 007723	Number of receiving bytes of register link in memory capacity save function V5		(Octal, byte)		Set 00064(D) or 64 bytes
007730 to 007733	Top address of relay link area in memory capacity save function V5	007730	(Octal, word)		When ㅋ1200 set to 001200(8) (Set by file address)
		007731			
		007732	00(H)		
		007733	00(H)		
007734 to 007737	Top address of register link area in memory capacity save function V5	007734	(Octal, word)		When 09000 set to 004000(8) (Set by file address)
		007735			
		007736	(Hexadecimal, byte)		When file number is 0, set to 00(H)
		007737	00(H)		
007763	Whether the station number information should be output or not V5		00(H)		Do not output
			01(H)		Output
007764 to 007767	Top address of flag area on each slave station	007764	(Octal, word)		When ㅋ0600, set to 000600(8) (Set by file address)
		007765			
		007766	(Hexadecimal, byte)		When file number is 2, set to 02(H)
		007767	●		00(H): Do not output flag 80(H): Output flag
007771	Communication error detection interval		00(D)		32 stations max.: 250 ms, 33 stations min.: 450 ms
			001 to 255(D)		Set in 100 ms unit
007777	Stop operation of the data link		00(H)		———
	Start operation of the data link		01(H)		
	Writing to EEPROM or operation stop operation		80(H)		
	Writing to EEPROM or operation start operation		81(H)		
	Initialize parameter setting value		08(H)		

※ Set in case that slave station is JW-20CM only.

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(2) JW-20RS

○ : Setting is necessary (1/2)

Address(8)	Set contents	Setting method (value)		JW-I/O	ZW-I/O
000000	Set number of dummy I/O points Rack number: 0 D7 6 5 4 3 2 1 0 Slot: 1 | Slot: 0 • Set vacant 2 slots • Set only in case of manual I/O table registration • For address 000000(8), set 00(H)	00(H)	Dummy I/O points is none	○	—
		01(H)	Dummy I/O points is 16 (2 bytes)		
		02(H)	Dummy I/O points is 32 (4 bytes)		
		03(H)	Dummy I/O points is 48 (6 bytes)		
		04(H)	Dummy I/O points is 64 (8 bytes)		
		05(H)	Dummy I/O points is 80 (10 bytes)		
		06(H)	Dummy I/O points is 96 (12 bytes)		
		07(H)	Dummy I/O points is 112 (14 bytes)		
		08(H)	Dummy I/O points is 128 (16 bytes)		
		09(H)	Dummy I/O points is 144 (18 bytes)		
		0A(H)	Dummy I/O points is 160 (20 bytes)		
		0B(H)	Dummy I/O points is 176 (22 bytes)		
		0C(H)	Dummy I/O points is 192 (24 bytes)		
		0D(H)	Dummy I/O points is 208 (26 bytes)		
		0E(H)	Dummy I/O points is 224 (28 bytes)		
		0F(H)	Dummy I/O points is 240 (30 bytes)		

• Use addresses 000001 to 000017(8) listed below when the I/Os are the JW type.
If ZW type I/Os are used, no setting is required.

Address(8)	Set contents
000001	Set number of dummy I/O points Rack number: 0 D7 6 5 4 3 2 1 0 Slot: 3 | Slot: 2 (Setting method is same as 000000(8).)
000002	Slot: 5 | Slot: 4
000003	Slot: 7 | Slot: 6
000004	Slot: 9 | Slot: 8
000005	Slot: B | Slot: A
000006	Slot: D | Slot: C
000007	Slot: F | Slot: E

Address(8)	Set contents
000010	Set number of dummy I/O points Rack number: 1 D7 6 5 4 3 2 1 0 Slot: 1 | Slot: 0 (Setting method is same as 000000(8).)
000011	Slot: 3 | Slot: 2
000012	Slot: 5 | Slot: 4
000013	Slot: 7 | Slot: 6
000014	Slot: 9 | Slot: 8
000015	Slot: B | Slot: A
000016	Slot: D | Slot: C
000017	Slot: F | Slot: E

• Initial value of the address 000000 to 000017(8) are all 00(H).

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Address(8)	Set contents	Setting method (value)		JW-I/O	ZW-I/O
000100	Set kinds of I/O module Rack number: 0 Slot number: 0 • Set 1 slot • Set only in case of manual I/O registration • For address 000100(8), set 00(H)	91(H)	16 points output (JW-12S, JW-13S, JW-32S)	○	—
		92(H)	32 points output (JW-32SC, JW-33S, JW-34S, JW-35S)		
		94(H)	64 points output (JW-62SC)		
		00(H)	Vacant slot 00 ↑ Lower bits are dummy I/O points		
		A1(H)	16 points output (JW-11N, JW-12N, JW-13N		
		A2(H)	32 points output (JW-31N, JW-32N, JW-34N, JW-34NC)		
		A4(H)	64 points output (JW-64NC)		
		D1(H)	Special I/O module (JW-2DA, JW-8AD, JW-31LM		
		F1(H)	Special I/O module (JW-2HC, JW-11DU/12DU		

- Use addresses 000101 to 000137(8) listed below when the I/Os are the JW type, and the register module type and number of dummy I/O points can be set using the arbitrary I/O registration mode.
  If ZW type I/Os are used, no setting is required.

Address(8)	Set contents
000101	Set kinds of I/O module Rack number: 0 Slot number: 1 • For address 000100(8), set 00(H) (Setting method is same as 000100)※
000102	Rack number: 0, Slot number: 2 ※
000103	Rack number: 0, Slot number: 3 ※
000104	Rack number: 0, Slot number: 4 ※
000105	Rack number: 0, Slot number: 5 ※
000106	Rack number: 0, Slot number: 6 ※
000107	Rack number: 0, Slot number: 7 ※
000110	Rack number: 0, Slot number: 8 ※
000111	Rack number: 0, Slot number: 9 ※
000112	Rack number: 0, Slot number: A ※
000113	Rack number: 0, Slot number: B ※
000114	Rack number: 0, Slot number: C ※
000115	Rack number: 0, Slot number: D ※
000116	Rack number: 0, Slot number: E ※
000117	Rack number: 0, Slot number: F ※

Address(8)	Set contents
000120	Set kinds of I/O module Rack number: 0 Slot number: 1 • For address 000100(8), set 00(H) (Setting method is same as 000100)※
000121	Rack number: 0, Slot number: 1 ※
000122	Rack number: 0, Slot number: 2 ※
000123	Rack number: 0, Slot number: 3 ※
000124	Rack number: 0, Slot number: 4 ※
000125	Rack number: 0, Slot number: 5 ※
000126	Rack number: 0, Slot number: 6 ※
000137	Rack number: 0, Slot number: 7 ※
000130	Rack number: 0, Slot number: 8 ※
000131	Rack number: 0, Slot number: 9 ※
000132	Rack number: 0, Slot number: A ※
000133	Rack number: 0, Slot number: B ※
000134	Rack number: 0, Slot number: C ※
000135	Rack number: 0, Slot number: D ※
000136	Rack number: 0, Slot number: E ※
000137	Rack number: 0, Slot number: F ※

- Initial value of the address 000100 to 000137(8) are all 00(H).

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Address(8)	Set contents	Setting method (value, example)		JW-I/O	ZW-I/O
000100	Max. rack, slot number	Upper 4 bits: rack number Lower 4 bits: rack number	D7 6 5 4 3 2 1 0 Slot: 1 | Slot: 0	○	—
000100	Normal I/O table registration	60(H)	Both the number of dummy IO points, and the type of I/O modules can be set arbitrarily.		
		64(H)	Set the number of dummy I/O points arbitrarily, and set the type of I/O modules autumatically.		
		65(H)	Set the number of dummy I/O points arbitrarily, and set the type of I/O modules automatically.		
		00(H)	This normally ends the setting procedure.		
001002	Auto I/O table registaration when power lights ON	00(H)	Auto registration		
		03(H)	Prohibit auto registration		
001004 001005	Remote I/O top address	(Octal, word)	When ⊐0200, set to 000200(8) by file address	—	○
003750	Check No. of I/O bytes	00(H)	No check		
		45(H)	Check		
003752 003753	No. of I/O bytes (0 to 128 bytes) • When 003750 is set to "00(H): Do not check," these addresses do not have to be set.	(Decimal, word)	When 100 bytes, set to 00100(D)		
003777	Stop operation of the remote I/O	00(H)	———	○	○
	Stop operation of the remote I/O	01(H)			
	Writing to EEPROM or operation of the module/stop operation	80(H)			
	Writing to EEPROM or operation of the module/stop operation	81(H)			
	Initialize parameter setting value	08(H)			

• Set page 8·19 for initial values of the addresses above.

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13-4 Address map of data memory

(File 0)

	Memory address			Setting range	
	Bit address(8) 1 address = 1 points	Byte address(8) 1 address = 8 points	File address(8) 1 address = 8 points	W70H W100H	JW50/70/100 JW50H/70H/100H
I/O relay	00000 to 03777	⊐0000 to ⊐3777	000000 to 000377	Relay link area Register link area Flag area	Relay link area Register link area Flag area
Auxilialy relay	04000 to 06777	⊐0400 to ⊐0677	000400 to 000677		
Latched relay	07000 to 07777	⊐0700 to ⊐0777	000700 to 000777		
General purpose relay	10000 to 15777	⊐1000 to ⊐1577	001000 to 001577		
TMR/CNT contact	T· C000 to T· C777		001600 to 001777		
TMR/CNT/-MD current value		b1000 to b1777	002000 to 003777		
Register		09000 to 09777	004000 to 004777		
Register		19000 to 19777	005000 to 005777		
Register		29000 to 29777	006000 to 006777		
Register		39000 to 39777	007000 to 007777		
Register		49000 to 49777	010000 to 010777		
Register		59000 to 59777	011000 to 011777		
Register		69000 to 69777	012000 to 012777		
Register		79000 to 79777	013000 to 013777		
Register		89000 to 89777	014000 to 014777		
Register		99000 to 99777	015000 to 015777		

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	Memory address			Setting range	
	Bit address(8) 1 address = 1 points	Byte address(8) 1 address = 8 points	File address(8) 1 address = 8 points	W70H W100H	JW50/70/100 JW50H/70H/100H
File 1 Register			000000 to 177777		
File 2 Register			000000 to 177777		
File 3 Register			000000 to 177777		Register link area
File 4 Register			000000 to 177777		Flag area
File 5 Register			000000 to 177777		
File 6 Register			000000 to 177777		
File 7 Register			000000 to 177777		

· Addresses 07300 to 07377(8) and addresses 15760 to 15767(8) (bit address) are special relay areas. Do not use them as a data link area.
· The addresses that can be used vary with the PC model and capacity. For details, see the instruction manual for reach model.
· The usable file numbers will vary with the memory module that is installed on the PC.

Name of memory module	Usable file numbers
ZW-1MA, JW-1MAH	0 or 1※
ZW-2MA, JW-2MAH	0 or 1
ZW-3MA, JW-3MAH	0, 1, 2
ZW-4MA, JW-4MAH	0, 2, 2, 3, 4, 5, 6, 7

※ If file number is 1, file address shall be within 000000 to 037777(8).

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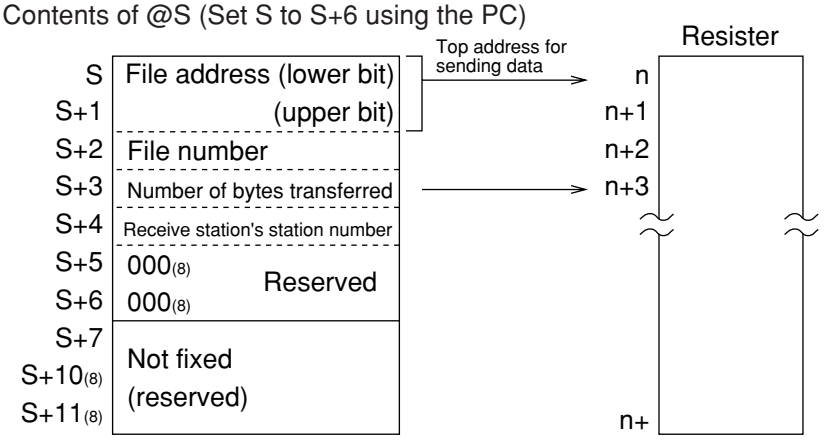
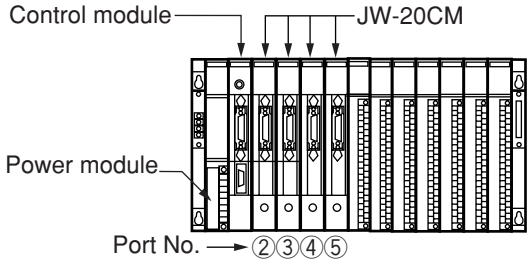
13-5 Instructions used with the F200 and F201 link function

(1) F-200

F-200 → PORT

Write to a port

[※ 1]

Symbol	F-200 →POR | TASKn | @ S | PORTn
Function	Transfer task number "n" and PC memory data (set the top address using @S) to a ZW/JW-20CM at port "n."
Operation contents	Contents of @S (Set S to S+6 using the PC)  S to S+2: Set the top address for sending data using the file number and file address. S+3: Number of data bytes to transfer from the PC to JW-20CM. Set to 000 to $255_{(D)}$. ($000_{(D)}$ equals 256 bytes.) S+4: Station number at which data is received. Set 000 to $077_{(8)}$ using octal notation. S+5, S+6: Reserved area. Set $000_{(8)}$. S+7 to S+$11_{(8)}$: Reserved area. Status from a port (not fixed).
Setting range for TASK "n"	Set to TASK 0.
Setting range for PORT "n"	Set a port number for the PC basic rack panel on which the ZW/JW-20CM is installed. (Ex.: JW-13BU) 

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Setting range for "S"	PC model name	W701H/100H	JW50/70/100, JW50H/70H/100H
	Setting range [※ 2]	⊐0000 to ⊐1566 b0000 to b1766 09000 to 09766 19000 to 19766	⊐0000 to ⊐1566 b0000 to b1766 09000 to 09766 99000 to 99766 E0000 to E1766
Operation conditions	· Rising edge of the input signal (OFF to ON) [※ 3] · S+3 to S+11 are transferred regardless of the input signal condition.		

Flag	Contents	Non-carry 07354	Error 07355	Carry 07356	Zero 07357
	No ZW/JW-20CM on the option board	0	1	0	0
	Waiting for a data transfer to a ZW/JW-20CM on the option board	1	0	0	0
	Completed a data transfer to a ZW/JW-20CM on the option board	0	0	1	0
	None of the above.	0	0	0	0

[※ 1] The description for this instruction is for the ZW/JW-20CM only. It is different from the contents in the PC programming manual. The F-200 instruction can only be used for one ZW/JW-20CM module.

[※ 2] Use ⊐0730 to ⊐0737 for special relays.

[※ 3] When the F-200 instruction is turned ON, the non carry (07354) will be kept ON until the data transfer to the number 2 port memory is complete. If the F-200 instruction is turned ON while the non carry is ON, the data following this instruction will be invalid.

Note: The F-200 instruction will not receive a response from the opposite station. Use the data link information for the response. Or, create a system for the data receive station to respond to the reception of the F-200 instruction.

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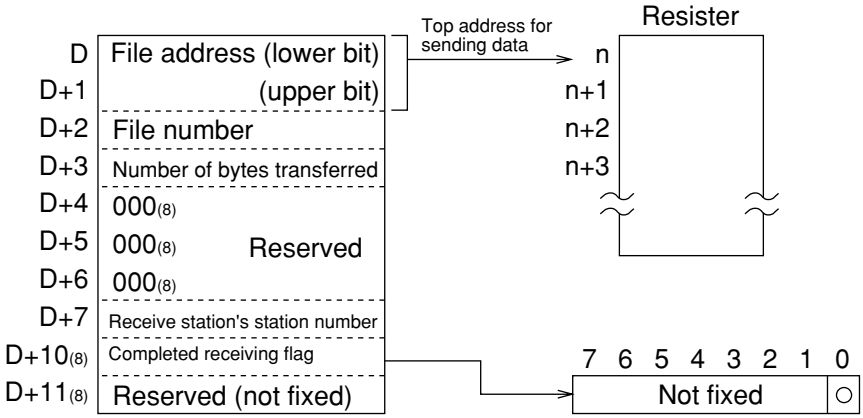
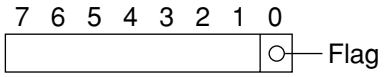
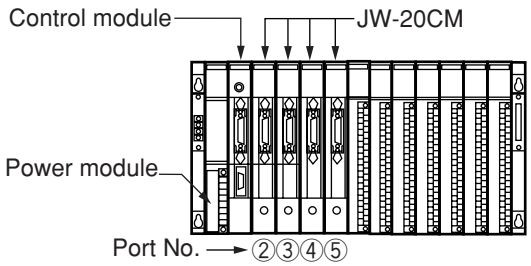
(2) F-201

F-201 PORT →

Read from a port

Symbol	F-201 POR→ | TASKn | PORTn | @ D
Function	Transfer task number "n" and PC memory data (set the top address using @S) to a ZW/JW-20CM at port "n."
Operation contents	Contents of @S (Set S to S+6 using the PC)  D to D+2: Set the top address for sending data using the file number and file address. D+3: Number of data bytes to transfer from the PC to JW-20CM. Set to 000 to 255(D). (000(D) equals 256 bytes.) D+4 to D+6: Reserved area. Set 000(8). D+7: Station number at which data is sent. Set from ZW/JW-20CM D+10(8): Station number at which data is sent. Set from ZW/JW-20CM  D+11(8): Reserved area. Status from a port (not fixed). M
Setting range for TASK "n"	Set to TASK 1.
Setting range for PORT "n"	Set a port number for the PC basic rack panel on which the ZW/JW-20CM is installed. (Ex.: JW-13BU) 

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Setting range for "S"	PC model name	W70H/100H	JW50/70/100, JW50H/70H/100H
	Setting range [※ 2]	ㅋ0000 to ㅋ1566 b0000 to b1766 09000 to 09766 19000 to 19766	ㅋ0000 to ㅋ1566 b0000 to b1766 09000 to 09766 29000 to E1766
Operation conditions	· Rising edge of the input signal (OFF to ON) [※ 3]		

Flag [※4]	Contents	Non-carry 07354	Error 07355	Carry 07356	Zero 07357
	No ZW/JW-20CM on the option board	0	1	0	0
	Waiting for a data transfer from a ZW/JW-20CM	1	0	0	0
	Completed a data transfer from a ZW/JW-20CM	0	0	1	0
	None of the above.	0	0	0	0

[※ 1] The description for this instruction is for the ZW/JW-20CM only. It is different from the contents in the PC programming manual. The F-201 instruction can only be used for one ZW/JW-20CM module.

[※ 2] Use ㅋ0732 to ㅋ0737 for special relays.

[※ 3] When the F-200 instruction is turned ON, the non carry (07354) will be kept ON until the data transfer to the number 2 port memory is complete. Even if the JW-20CM receives data from an other station using the F-200 instruction, it will remain inside the ZW/JW-20CM until the F-201 input signal changes ON from OFF, and the following data sent by the F-200 instruction will not be received. If the PC power is turned OFF, the data currently being received will be turned OFF.

[※ 4] If the JW-20CM receives data using a continuous stream of F-200 instruction, the receive completion flag $D+10_{(8)}$ may not turn OFF. In this case use both the receive completion flag and the carry (07356) when programming.

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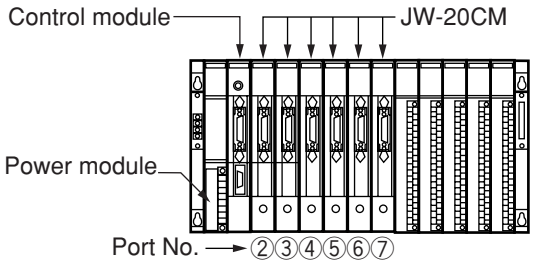
13-6 Application instruction using instruction system

(1) F-202

F-202 OPCH Open Channel

Symbol	F-202 OPCH | PORT CH·ST | file N | n
Function	Specify the target station for inter-PC data communications to be performed across the satellite net (ZW/JW-20CM). These instructions are used in conjunction with the F-204 (SEND) or F-205 (RCV) instructions.
Range of PORT	Input the port number of rack panel that installed on ZW/JW-20CM. Example: JW-13BU 
Range of CH	0 to 3 : Channel number for the specified port number. Available for use four times by classifying the same port numbers into CH0, CH1, CH2, and CH3 in the PC program.
Range of ST	00 to $77_{(8)}$: Communication target station number. Set by octal.
Range of file N	0 to 7 : Specify the PC data area (file number) of the communication target station. [※]
Range of n	000000 to $177777_{(8)}$: Specify the PC data top address (file address) of the communication target station. [※]
Condition	When an input signal is ON, keep it ON until the flag is changed.
Flag	Refer to F-204 and F-205 for the combination of F-204 and F-205. [※]

- After turning ON the input signal of F-202, keep it ON until the finish of the execution of the instruction. If the input signal is turned OFF during execution of the instruction, the instruction ends in an incomplete condition. Under this condition, next, when an F-202 instruction is given, it will come to a “communication jam,” and the instruction will not be executed. Turn the power OFF and then ON again for recovery.

[※] F-202 instructions must always be used in conjunction with the F-204 (SEND) or F-205 (RCV) instruction.

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(2) F-204

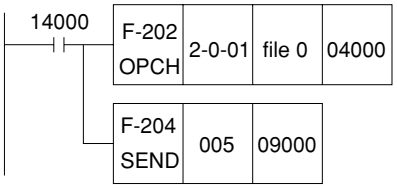
F-204 SEND — Send Data

Symbol	F-204 SEND | n | s
Function	Specify the first address and byte count of the send data for transmission across the satellite net.
Operation	S to S + n - 1 → Specified station
Range of n	000 to 377(8) (256 bytes for 000(8))
Range of S [*1]	]0000 to]1577 : @]0000 to @]1574 b0000 to b1777 : @b0000 to @b1774 09000 to 09777 : @09000 to @09774 : : : 99000 to 99777 : @99000 to @99774 E0000 to E1777 : @E0000 to :
Condition	When input signal is ON.
After operation — Contents of S	Unchanged

After operation — Flag

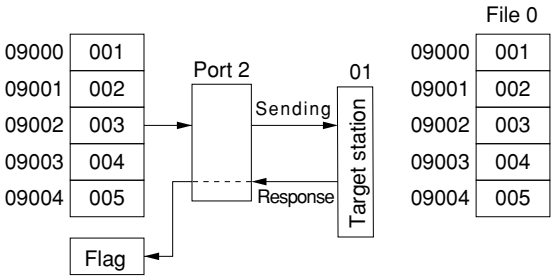
Communication contents	Zero 07357	Carry 07356	Error 07355	Non-carry 07354
No response from port [*2]	0	0	1	0
Communication jam [*3]	0	0	0	1
Communication busy (waiting for response from target station)	1	0	0	1
Nomal end	0	1	0	0
Abnomal end [*4] (communication error)	0	1	1	0
Remote station write protected	1	1	1	0

[Explanation]



Instruction
F-202
P.2
C.0
5.01
04000
F-204
005
09000

When the input condition of 14000 changes from OFF to ON, this instruction sends the contents (5 bytes data) of registers 09000 to 09004 file 0's file area beginning with address 04000 (register 09000) on satellite net station 01, via CH0 of port No. 2.



- Even addresses must always be used for indirect addressing (@⊐0001, @b0173, etc. are prohibited).
- For details of indirect addressing, see PC's programming manual.
- F-204 instruction must always be used in conjunction with the F-202 (OPCH) instruction.
- After turning ON the input signal of F-204, keep it ON until the finish of the execution of the instruction. If the input signal is turned OFF during execution of the instruction, the instruction ends in an incomplete condition. Under this condition, next, when an F-204 instruction is given, it will come to a “communication jam,” and the instruction will not be executed. Turn the power OFF and then ON again for recovery.

[*1] Setting range of “S” is for JW model PCs. For ZW model PCs, setting range is ⊐0000 to 19777.

[*2] In case that the network module of the assigned module number is not installed.

[*3] In case that the channel is used with the other SEND/RECEIVE instruction.
This instruction is executed after end of execution of the previously given instruction, and flag sign is changed into “communication busy” from “communication jam.”

[*4] In case that response from the target station does not come within the time-out time.

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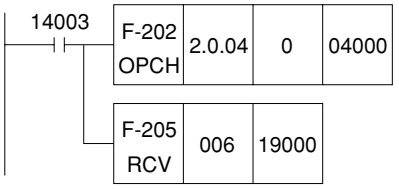
(3) F-205

F-205 RCV Receive Data

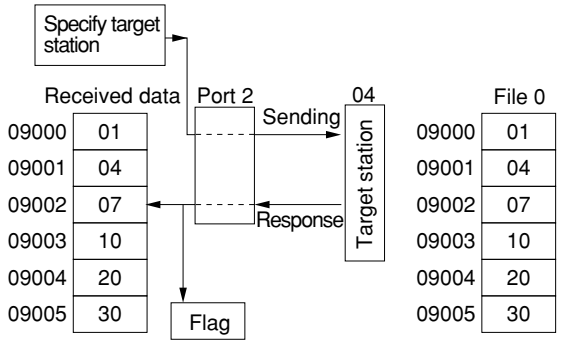
Symbol	F-205 RCV	n	D		
Function	Specify the first address and byte count of the receive data for transmission across satellite net.				
Operation	Specified station → D to D + n - 1				
Range of n	000 to 377(8) (256 bytes for 000(8))				
Range of D [*1]	]0000 to]1577 : @]0000 to @]1574 b0000 to b1777 : @b0000 to @b1774 09000 to 09777 : @09000 to @09774 : : : 99000 to 99777 : @99000 to @99774 E0000 to E1777 : @E0000 to @E1774				
Condition	When input signal is ON.				
After operation: Contents of D	Unchanged				
After operation: Communication contents	Zero 07357	Carry 07356	Error 07355	Non-carry 07354	
No response from module [*2]	0	0	1	0	
Communication jam [*3]	0	0	0	1	
Communication busy (waiting for response from target station)	1	0	0	1	
Nomal end	0	1	0	0	
Abnomal end [*4] (communication error)	0	1	1	0	

[Explanation]



Instruction	
S T R	
F-202	P.2
	C.0
	S.04
	0
F-205	04000
006	
	19000

When the input condition of 14003 changes from OFF to ON, this instruction reads 6 bytes of data from file 0's file area beginning with file address 04000 on satellite net station 04, via CH0 of port No. 2. The data read is stred to registers 19000 to 19005.



- Even addresses must always be used for indirect addressing (@∫0001, @b0173, etc. are prohibited).
- For details of indirect addressing, see PC's programming manual.
- F-205 instruction must always be used in conjunction with the F-202 (OPCH) instruction.
- After turning ON the input signal of F-205, keep it ON until the finish of the execution of the instruction. If the input signal is turned OFF during execution of the instruction, the instruction ends in an incomplete condition. Under this condition, next, when an F-205 instruction is given, it will come to a “communication jam,” and the instruction will not be executed. Turn the power OFF and then ON again for recovery.

[*1] Setting range of “S” is for JW model PCs. For ZW model PCs, setting range is ⊐0000 to 19777.

[*2] In case that the network module of the assigned module number is not installed.

[*3] In case that the channel is used with the other SEND/RECEIVE instruction.
This instruction is executed after end of execution of the previously given instruction, and flag sign is changed into “communication busy” from “communication jam.”

[*4] In case that response from target station does not come within the time-out time.

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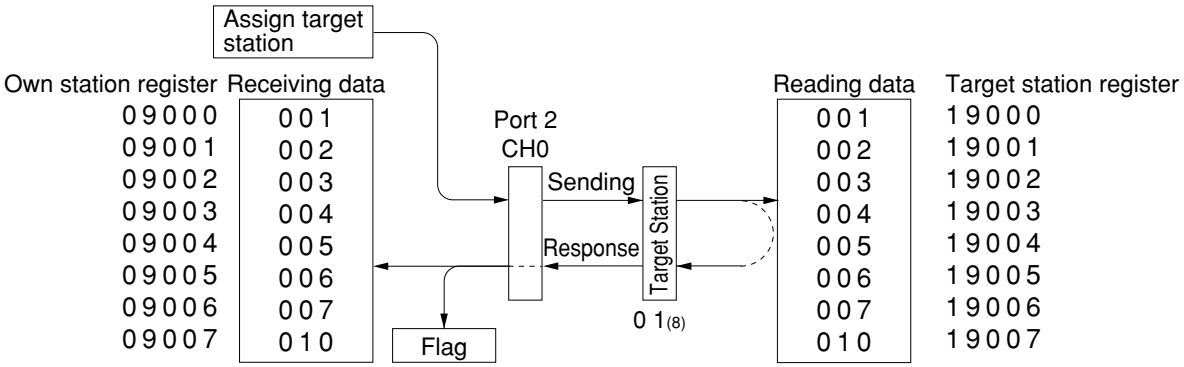
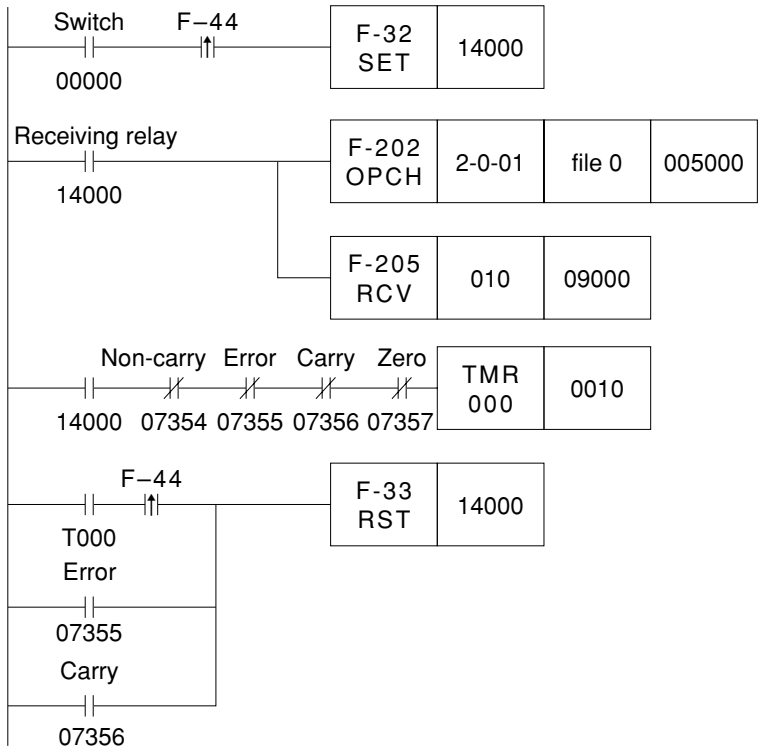
[Example 2] In case of reading data of 8 bytes to slave station 01(8)

Module number installing own station JW-20CM : 2
Channel number using own station JW-20CM : 0
Data area of slave station 01(8) : 0 (file number)
Send top address of slave station 01(8) : Register 19000 (file address 05000(8))
Receive data top address of own station : 09000



■ **PC program**



Set receiving relay (14000)

Port No.2, CH0, station number 01(8)
File number 0
File address 05000(8)

Receiving data of 8 bytes stored register 09000 and after

Detect non-execution after turning ON power (Flag does not change for 1 second)

End of execution and the program resets 14000

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