SHARP

SHARP Programmable Controller

Model Name

ME-NET module

JW-20MN

Instruction Manual

Thank you for purchasing the ME-NET module (JW-20MN) for the SHARP programmable controller.
Read this manual thoroughly to completely familiarize yourself with the operation according to the examples.
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-20MN with 30Hn mark in front of the module. The new functions is added for the JW-20MN without [30Hn] marks.
   In this manual, additional functions are represented by the V5 mark.
★ In this manual, programmable controller is referred to as "PC." Number and symbol in parentheses added to address or setting value indications represent the following:
   Octal·················· (8)
   Hexadecimal······ (H)
   Decimal············· (D) or no indication

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.

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.

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.

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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.

ME-NET module JW-20MN

- User's Manual -

Table of contents

Chapter 1: Outline

By installing this module in a programmable controller used to control a facility, you can configure an ME-NET system with various devices, such as personal computers and industrial robots, to create a factory automation (FA) system. Using this module, you can easily transmit and receive ON/OFF signals and data with other devices that have a network module compatible with the ME-NET specifications.

1-1 Example of system configuration

① Basic system
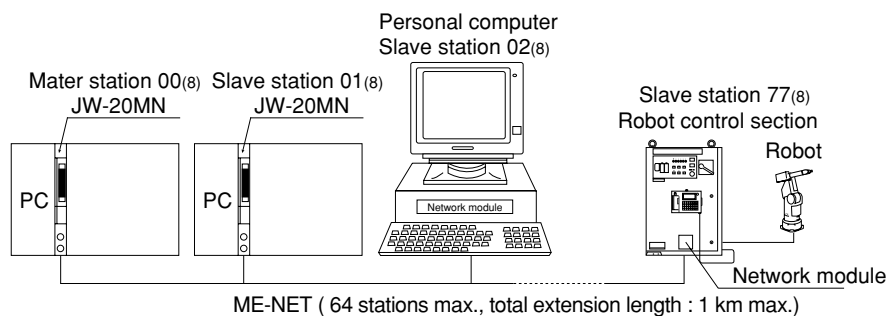
② Expansion system (extention of communication stations)
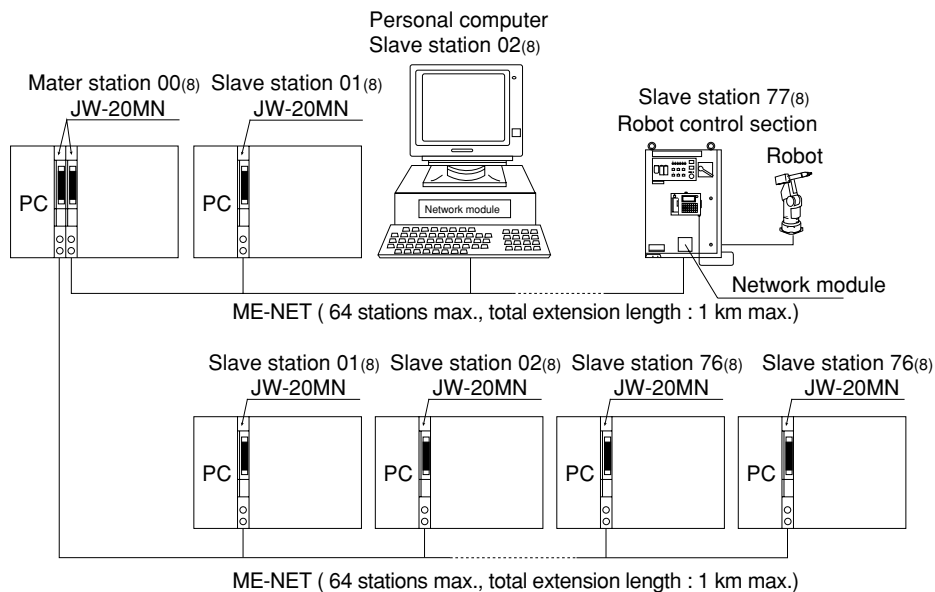
Reference

ME-NET is a communication network to link different brands of devices and equipment with different models of facility control equipment. It has been developed under the support of Toyota Motor Co., Ltd.

1-2 Function

(1) Data link function

① Send and receive an ON/OFF signal (relay link) and data (register link) between modules on the ME-NET.

Linkage method	Number of linkage points
Relay link	2048 (256 bytes) in total
Register link	2048 bytes in total

* The amount of data that can be transmitted and received by one station is a maximum of 1024 bytes, including both relay links and register links.

V5 ② In order to use the memory effectively, the JW-20MN has a memory save function. When this function is enabled, it only needs to receive the specifically required data.

③ Since the JW-20MN manages the serial communications, no special program is needed to connect a PC.

(2) Computer link function

① Triggered on commands (instructions) from a host computer which has a network module compatible with the ME-NET specifications, the JW-20MN starts reading and writing the memory in the PC.

② After an instruction is received from the host computer, the JW-20MN returns a response. Therefore, the host computer needs an application program. For a detailed description of how to transmit instructions and receive responses, see the instruction manual for the host computer.

(3) The method is available for communication of up to 64 stations. By using a cable, it can be extended up to 1 km.

Chapter 2: Safety Precautions

2-1 Installation

● Do not install or store the JW-20MN 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-20MN, make sure to turn OFF the power supply to the JW-20MN.

● 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. Cable and connector installation and changes must be performed only by specialists approved by the ME-NET bureau.

● 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.)

"T" jacket (insulation cover)

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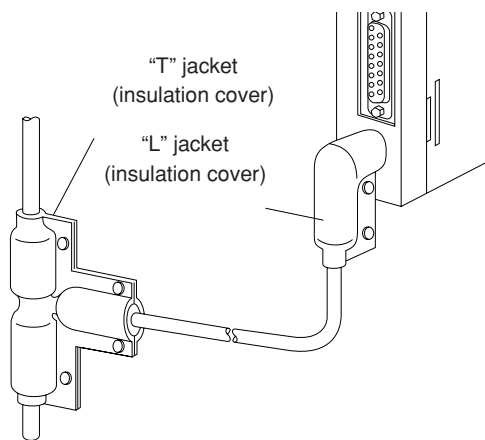
● Do not connect the ground terminal of the power supply module together with other equipment's ground lines. Make sure to provide class-3 grounding. When the JW-20MN is used without connecting a class-3 grounding, malfunctions by noise may occur.

● 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.

● 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.
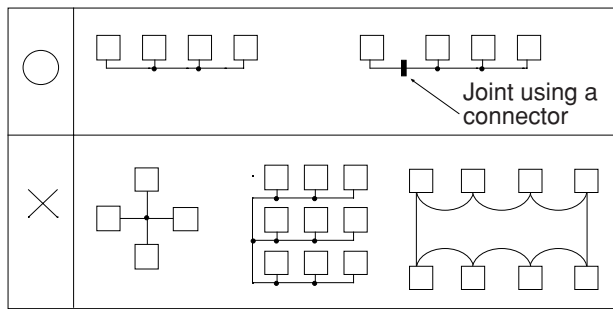
● Arrange total cable length within 1 km.

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

● Prior to any electric welding around the JW-20MN, take out the coaxial cable from the JW-20MN. While the coaxial cable is connected to the JW-20MN, any electric welding nearby the JW-20MN will cause the welding current to enter the JW-20MN and may damage part of its circuit pattern.
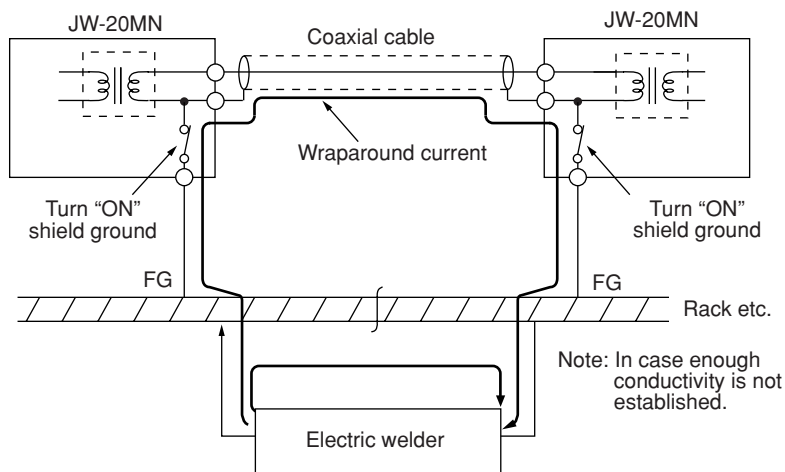
2-3 Treatment

● 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-20MN 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-20MN's PC board. Therefore, prior to accessing the JW-20MN, touch your hand to a grounded piece of metal to discharge the static current in your body.

2-5 Cleaning

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

Chapter 3: Name and Function of Each Part
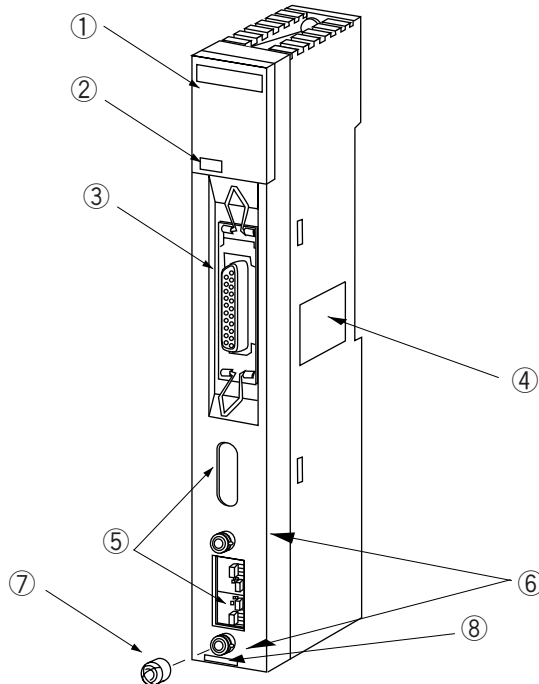
① Indicator lamps

Lamps light ON/OFF indicates operation condition.

```
        ME-NET

C O M M ○   ○ S 0
    S D ○   ○ S 1
    R D ○   ○ S 2
    C D ○   ○ S 3
    L T ○   ○ S 4
 T E S T ○   ○ S 5
C O M. E ○   ○ S 6
U N T. E ○   ○ S 7

 30Hn    JW-20MN
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Name	Operation
COMM	Lights when data link operating
SD	Blinks when data sending*
RD	Blinks when data receiving*
CD	Blinks when detecting carrier*
LT	Lights when turning ON the termination resistance
TEST	Lights during testing
COM.E	Lights when detecting error
UNT.M	Lights at time up of the watchdog timer (JW-20MN error)
S0 to S7	Lights error code when error occurs.

* "Flickering" means that the LED is flashing ON and OFF.

② 30Hn mark (applied to JW30H)

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

JW-20MNs 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.

③ A connector for support tool

Connects to various support tools for entering parameters.

④ Rating plate

⑤ Setting switch

Set functions of JW-20MN.

Set at delivery
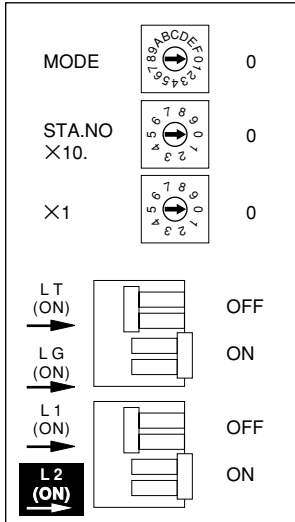
· MODE switch·········Select functions

Switch setting	Function
0	Don't set in this mode.
1	Don't set in this mode.
2	Data link (standard function)
	Computer link
3	Data link (memory capacity save function)
	Computer link
4 to F	Test mode A service man will use these switches for adjustment. Don't set in this mode.

*Be sure to set to "2" or "3."

· Station number switch (STA.NO. × 10, × 1)

.... Set the station address.

· Termination resistance (LT) ....Set ON/OFF of termination resistance
· Shield ground switch (LG) ....Set shield ground of communication cable
· Communication line 1 switch (L1) .....Set ON/OFF of communication line 1
· Communication line 1 switch (L2) .....Set ON/OFF of communication line 2

⑥ Connection connector

BNC type receptacle (jack)

L1: Communication line 1

L2: Communication line 2

⑦ Connector protective cap

⑧ Version label

Indicates the version of the communication
board inside.
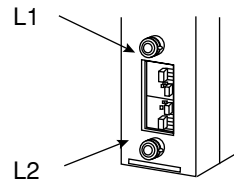
Chapter 4: Installation

4-1 Installation of cable for option module

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

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

4

[Example] When to install a basic rack panel JW-4BU to ZW-2CC

① Bend the optional cable

Basic rack panel side

Install the cable in a manner that it may be slack towards the rack panel.
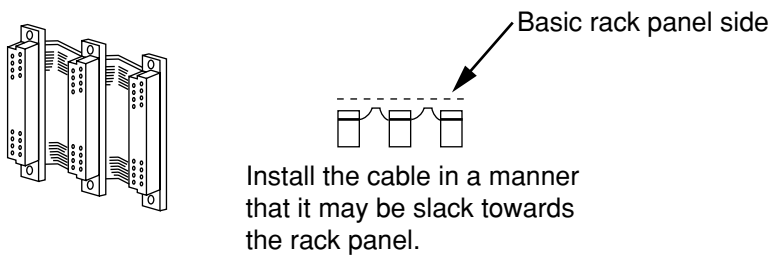
② Attach the connectors in the optional cable one after another, starting from the left side.

Basic rack panel JW-4BU

Pay close attention to the installation of the connector.

Cable for option module ZW-2CC

6 mounting screws
(Attached to cable for option module)
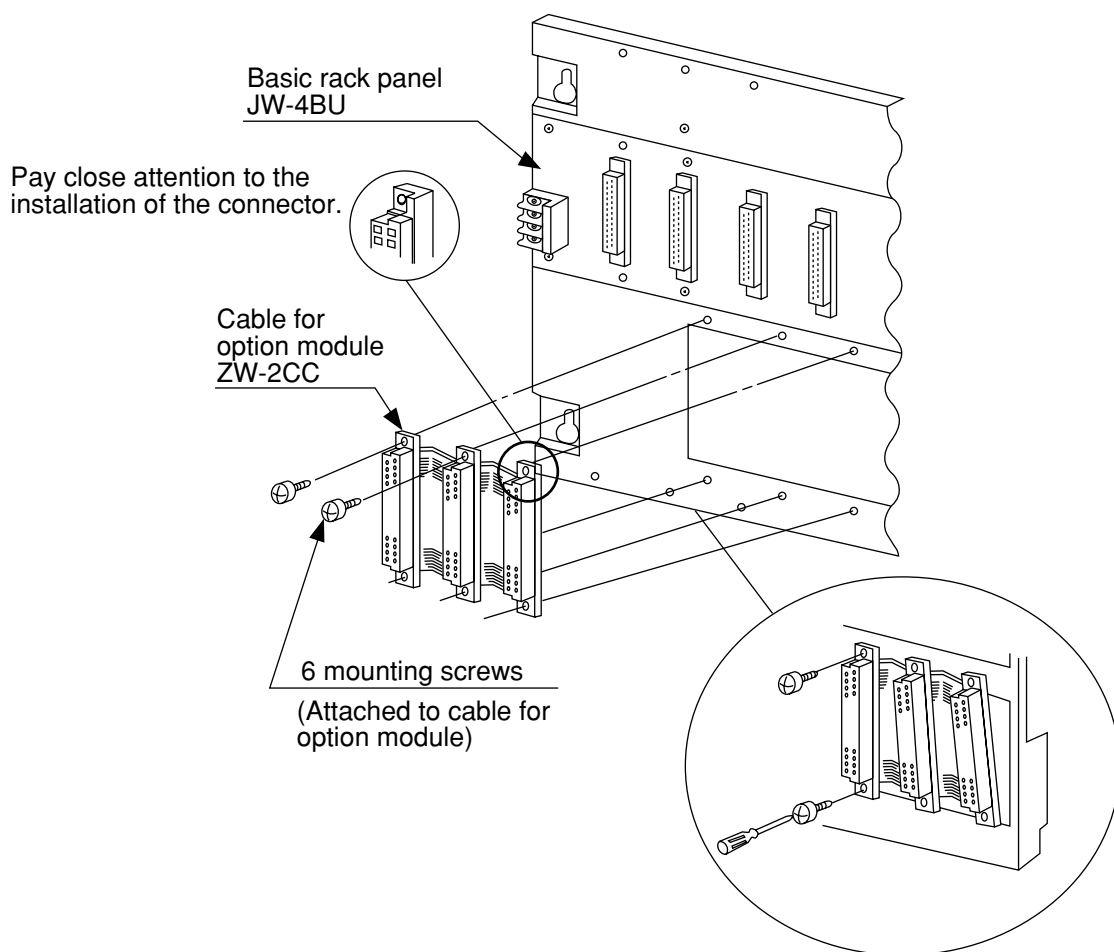
4-2 Installation of JW-20MN

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.

Philips screwdriver

Optional slot

Control module installation positioning

Basic rack panel
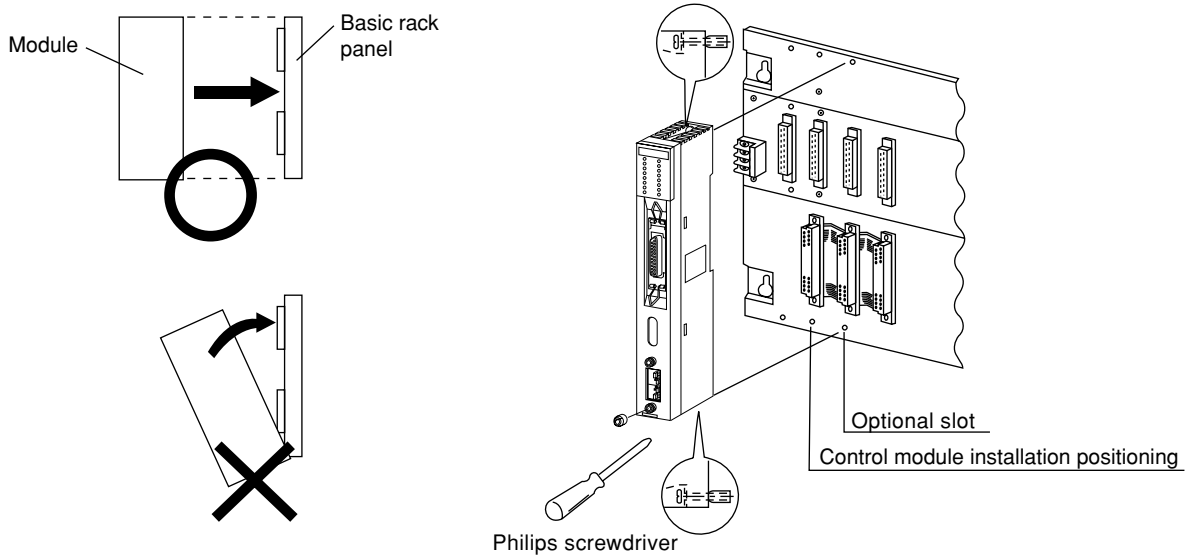
Module

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

Unavailable communication between A and C.
Available communication between A and B, B and C, B and B, and C and C.
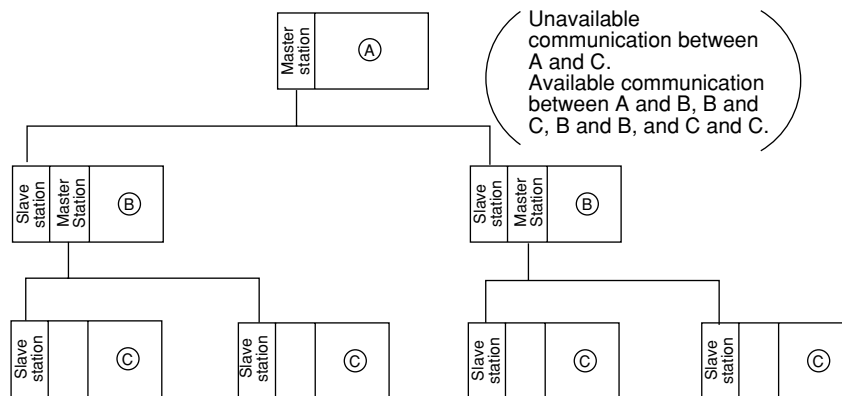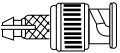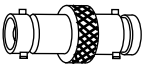
· Optional slots have each port numbers. When an error occurs, the JW-20MN stores the port number corresponding to the error occurred module into system memory #050 in the PC.

(Ex.: JW-13BU)

Control module

② ③ ④ ⑤ ⑥ ⑦

Port number
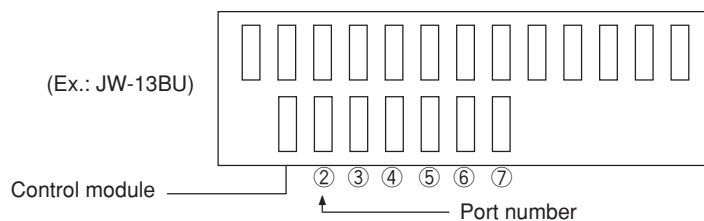
Chapter 5: Processing of Cables

Make sure to use the qualified products shown below for cables and connectors. Cable and connector installation and changes must be performed only by specialists approved by the ME-NET bureau.

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	

5-1 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>
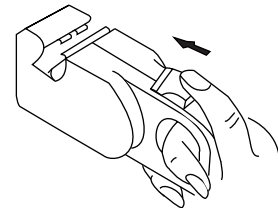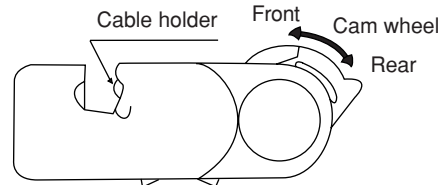
Set the operation range of the cable holder by moving the slider at the bottom of the body. Move to the left to increase pressure.
In this example, set the slider to the cam wheel side's end (right side) to set the pressure to low.

<Adjustment of blade cutting depth>
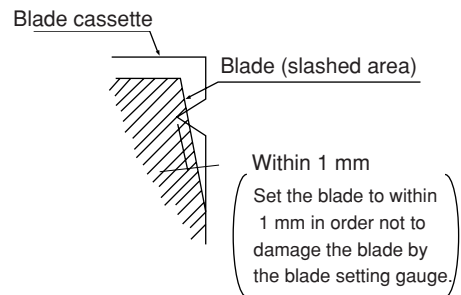
Adjust the cutting depth of the blade by turning the two screws at both ends of the screw holder. Set the blade position to within 1 mm from the cutting surface of the blade cassette prior to adjusting the cutting depth. For the cutting depth adjustment, use the "blade setting gauge" supplied as an accessory 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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Cable holder   Front   Cam wheel
Rear

Blade cassette

Blade (slashed area)

Within 1 mm
Set the blade to within 1 mm in order not to damage the blade by the blade setting gauge.

Cam wheel

Left

Slider   Right

Screw holder

Blade setting gauge

Internal conductor
(annealed copper single wire)

Coating
(black)

External conductor
(meshed annealed copper wire)

Insulator
(semi-transparent)
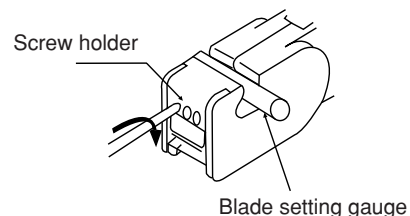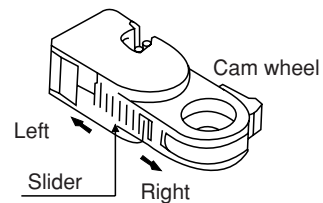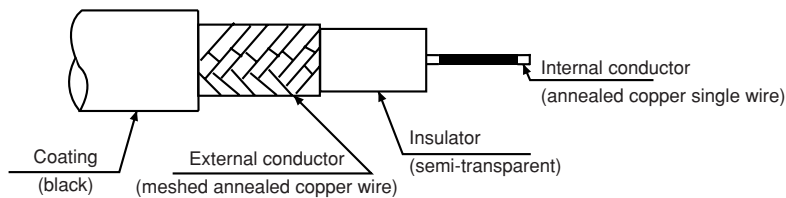
From the previous page

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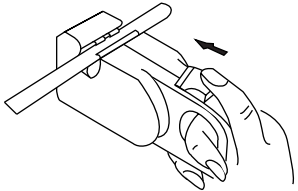
Step 1   Press the cam wheel forward 3 times and turn the stripper in the direction of arrow 2 to 3 times.

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.

10 mm

<Removal of coating, external conductor, and insulator>
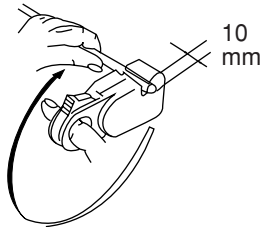
While holding the coaxial cable with your left hand, grip the cable stripper so that it keeps a right angle against the coaxial cable, and press out the cable stripper with your left hand's thumb.
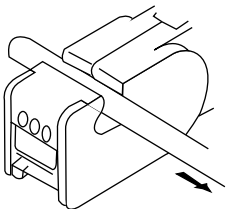
When the adjustment of the blade is not required

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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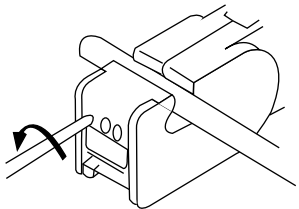
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<Display of blade setting>

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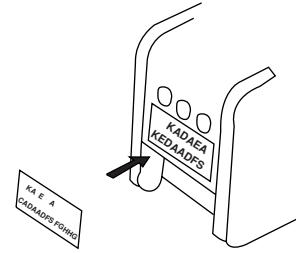
Hold up the upper section of the screw holder with a minus driver, and open the screw holder. Remove the blade cassette and reinsert by turning the current blade back side front or insert a new blade cassette from its top.

Blade cassette

Screw holder

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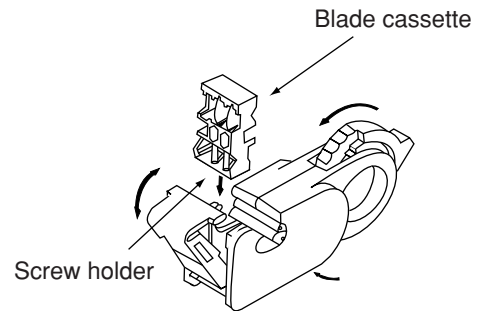
Cut the internal conductor of the coaxial cable, which is already cut by the stripper, using a nipper etc. to the optimum dimension of 4 mm.

10 mm±0.5 mm

A | B

A: 10±0.5 mm
B: 4±0.5 mm
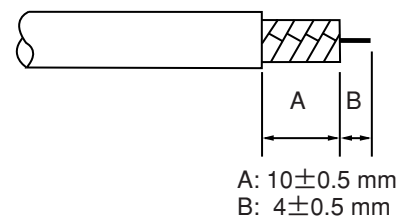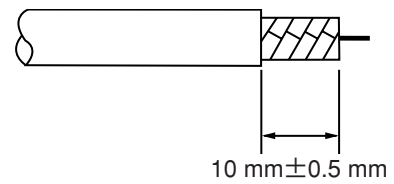
5-2 Connector crimping procedure

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

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

Connector parts

Sleeve   Contact   Shell
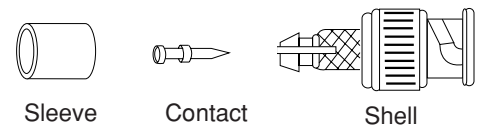
② **Connector: ME-GP-01**

③ **Processing procedure**

\<Insert a sleeve\>

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

A
B

A: 10±0.5 mm
B: 4±0.5 mm

Sleeve

\<Crimping contact\>
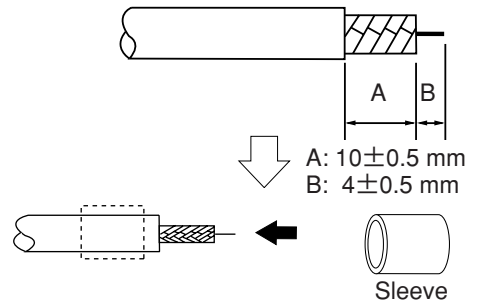
Insert a contact into the internal conductor and crimp.

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)
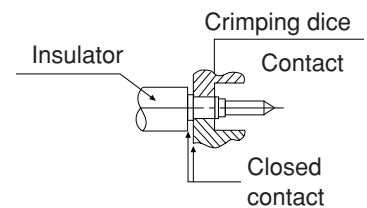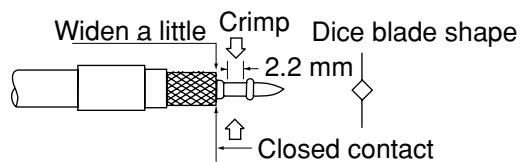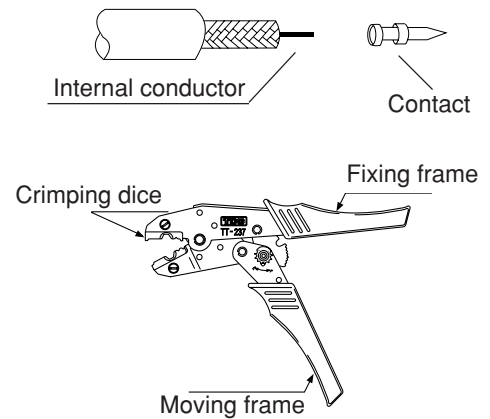
Internal conductor   Contact

Crimping dice   Fixing frame

Moving frame

Widen a little Crimp Dice blade shape

2.2 mm

Closed contact

Insulator   Crimping dice   Contact

Closed contact

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

To the next page

5·5
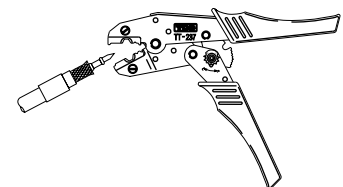
From the previous page

<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.

Shell

Widen a little

Crimping section

Sleeve

Finger

<Crimping external conductor>
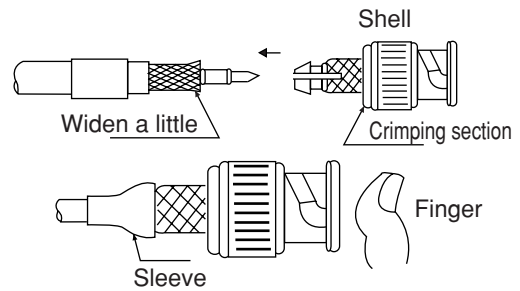
Crimp the external conductor.

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)

Completely put into the crimping section.
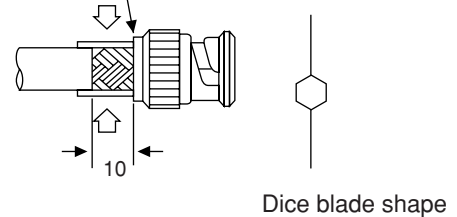
10

Dice blade shape

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

Crimping dice   Closed contact

Dice blade shape looking from this side

Push

<Insulation test>
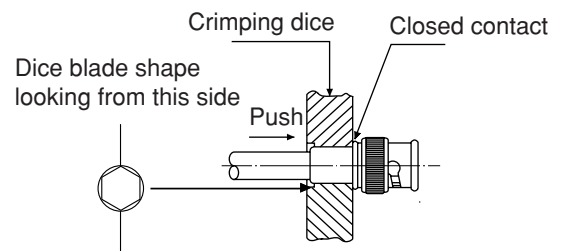
Insulation test of shell and contact

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>
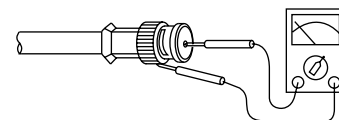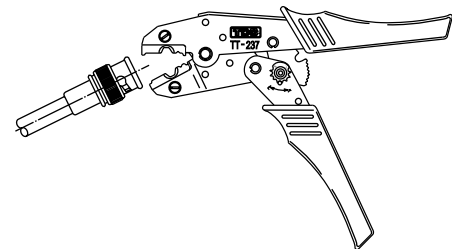
Conductivity test

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

5
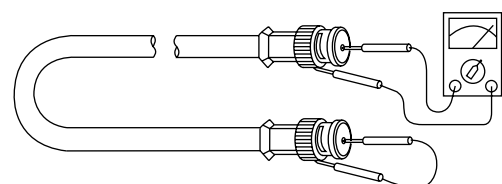
Chapter 6: Wiring

6-1 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.
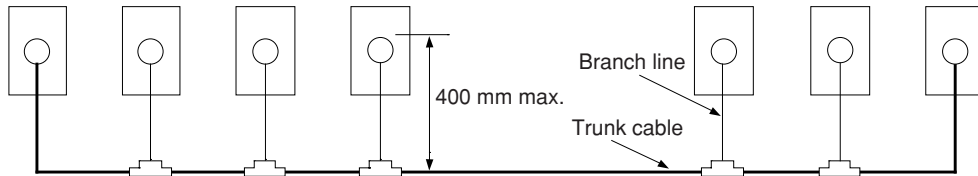
② The length of branch lines branched from the trunk should be within 400 mm.
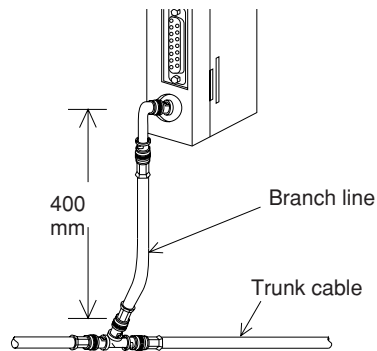
③ Total cable length should be within 1 km.

6-2 Relaying of trunk cables

① To relay trunk cables, use the straight joint (ME-JJ-01).
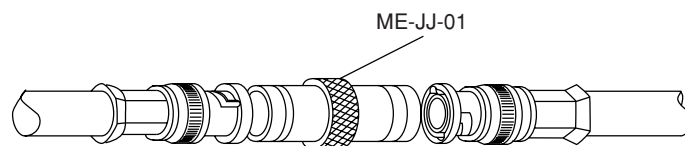
② Relaying of trunk cables should be limited to indispensable cases only. Inadvertent relaying of trunk cables may cause a communication fault such as a weakened signal level due to contact resistance in the junction connector (straight).
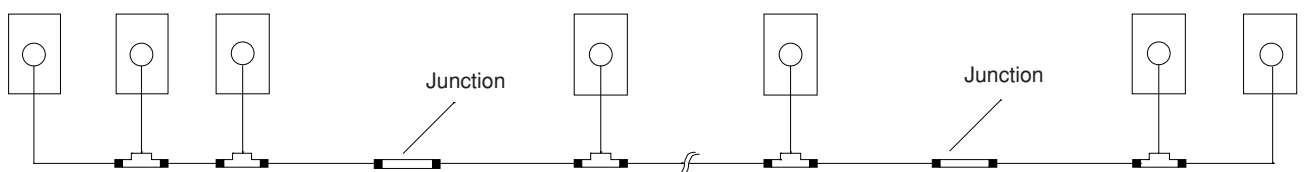
6-3 Cable wiring procedure in control panel

[1] Fixing of the cable

In order not to put any force on the cable and the JW-20MN, fasten the cable to an line nearby input of a control panel or a "T" branch point to the JW-20MN using saddles etc.
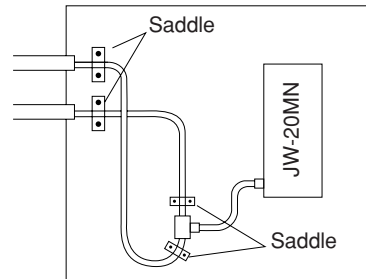
[2] Extra length of cable

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.
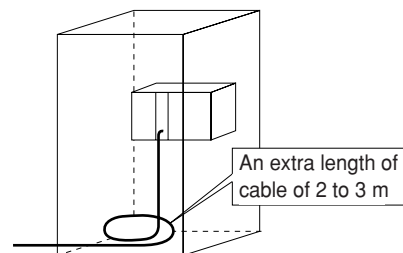
[3] Connection to the JW-20MN

The connector to the JW-20MN should be turned right to secure locking, not merely inserted.
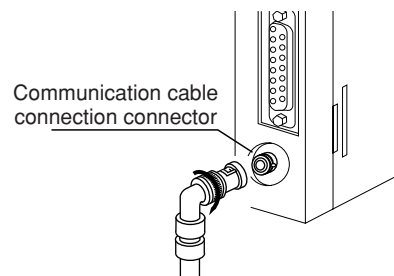
[4] Insulation cover

When the connector touches with a high voltage section or external enclosures, communication errors may occur. Make sure to install an insulation cover.
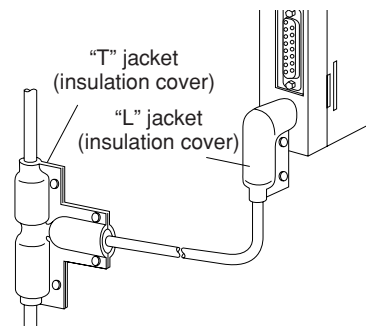
[5] Grounding of power supply module (JW-1PU etc.)

Make sure to connect the GND terminal of the power supply module using the ME-NET and the like to a class-3 grounding.

• If the power supply module is not grounded, the JW-20MN cannot conduct with the ground after turning "ON" the shield ground switch (LG·).

Detail of the terminal block
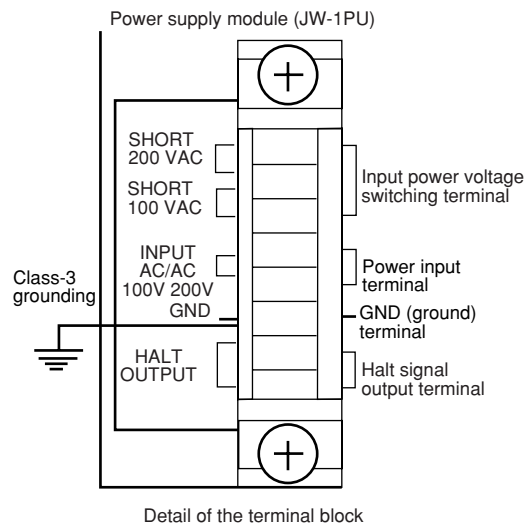
In case of AC power supply module (JW-1PU)

6

6-4 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.

T's
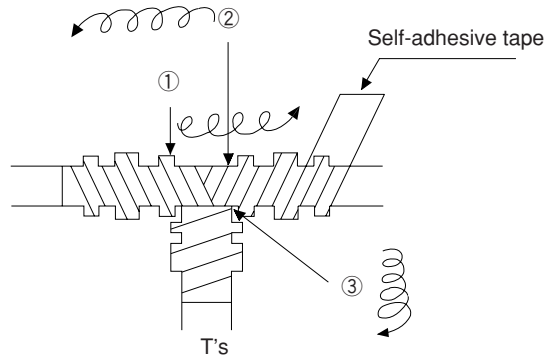
[2] Straight connector

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

Straight
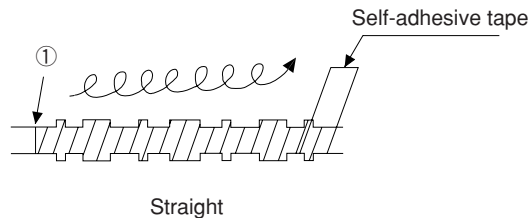
Remarks

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.

6-5 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-20MN due to inductive lightning or atmospheric charge during lightning.
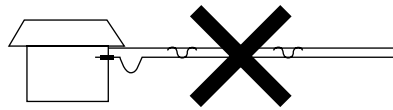
6-6 Check after wiring

Check the items below after completion of wiring.

	Check contents
1	The ME-NET qualified connector types are used.
2	The connectors are securely locked.
3	The connectors are insulated by T jacket or L jacket.
4	The ME-NET qualified 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.

6

6-7 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.
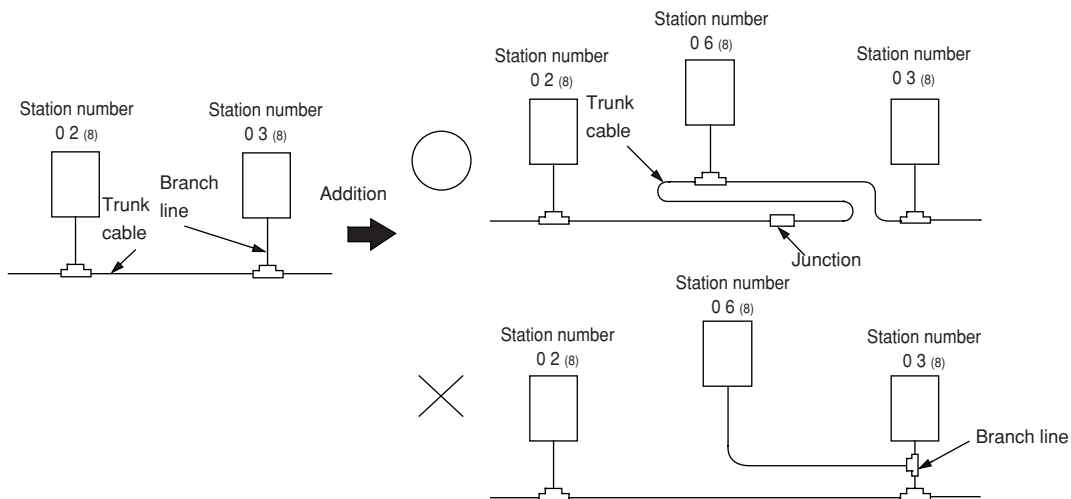
[2] Station number of the additional station

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.
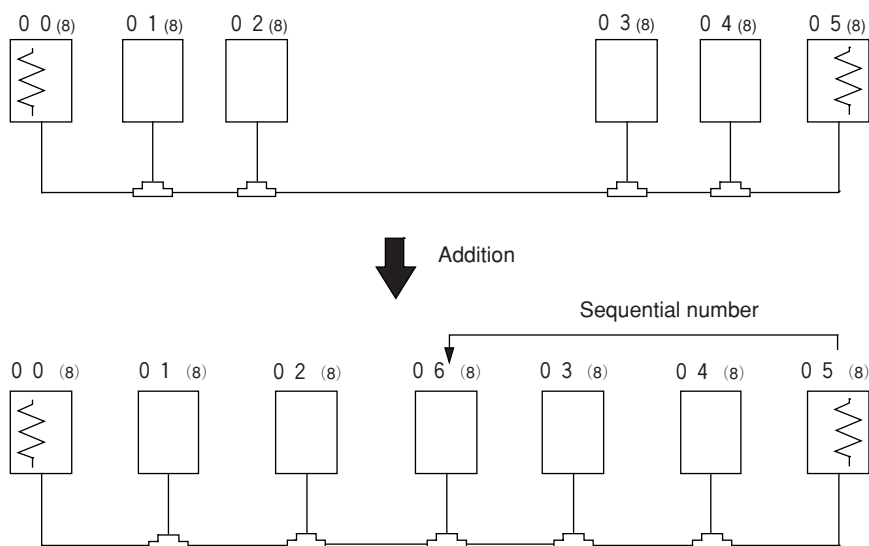
$\lessgtr$ means the LT (termination resistance) being turned "ON."

[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.

6

Chapter 7: Memory Addresses on the ME-NET

The ME-NET employs a system for addressing individual memory banks in all of the connected equipment by allocating address throughout the ME-NET. Therefore, the top address in any link area which will contain in the data link parameters and memory addresses used for computer link instructions must be a valid memory address in the ME-NET.

The relationship between memory addresses in Sharp PCs and those on the ME-NET are shown below. **For details, see "15-4 Data memory address map" on pages 15·11 to 15·14.**

7-1 Memory address for data links (link area top address, flag top address)

The memory addresses on the ME-NET correspond to the file addresses $_{(8)}$ in a Sharp PC.

File address		Byte address	File address		Byte address
000000	Input/output relay	⊐0000	004000	Register	09000
000377		⊐0377			
000400	Auxiliary relay	⊐0400	004777		09777
000677		⊐0677	005000	Register	19000
000700	Latch relay	⊐0700			
000777		⊐0777	005777		19777
001000	General-purpose relay	⊐1000	006000		29000
001577		⊐1577			
001600	TMR·CNT timed contact				
001777		b0000	015000	Register	99000
002000	TMR·CNT·MD current value				
003777		b1777	015777		99777

Enter a byte address at a file address in file number 0.
For file numbers 1 to 7, enter both a file number and a file address.

7-2 Memory addresses for computer links

· Data memory byte addresses in the computer link must be entered the same way a data link address is entered.

· The relay numbers are the same for the ME-NET.

· Program addresses $000000_{(8)}$ to $076777_{(8)}$ correspond to addresses $000000_{(8)}$ to $076777_{(8)}$ in file (segment) 8. Program addresses $100000_{(8)}$ to $176777_{(8)}$ correspond to addresses $000000_{(8)}$ to $076777_{(8)}$ in file (segment) 9.

For details about the absolute addresses to use on the host computer, see the instruction manual for the host computer.

Chapter 8: Description of the Data Link Operation

The data link function communicates data by using one PC module or FA device on the ME-NET as a master station. All other devices are slave stations. A maximum of 64 PCs and FA devices can be connected on a single ME-NET. The amount of data that each station can transfer is a maximum of 1024 bytes.

Each station must have an area used exclusively for its data link. This area is divided into the number of stations connected.

Each station will transmit the data in its sending area in turn. It stores the data received from other stations in its receive area.

This communication does not need any PC special program since the JW-20MN automatically manages communications.

The data link consists of the relay link and the register link. Both links can be used at the same time.

8-1 Communication method

The link area, top address, number of bytes to send, and the number of stations connected are sent to the master station and slave stations as data link parameters.

[1] Data link (standard function)

Station number $00_{(8)}$ Station number $01_{(8)}$ Station number $02_{(8)}$ Station number $03_{(8)}$

○ : Sending area
● : Receiving area
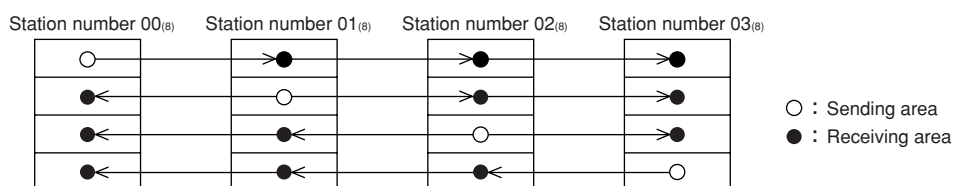
Function		Contents
Relay link	N: M communication	Total No. of link points : 2048 max. (256 bytes)
Register link	N: M communication	Total No. of link bytes : 2048 max.

(1) Relay link

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.

○ : Send   ● : Receive

Master station (PC00)   Slave station (PC01)   Slave station (PC02)

]0200
]0201
]0202

PC00 Program   PC01 Program   PC02 Program

02000   02000   02000

02010   02010   02010

02020   02020   02020
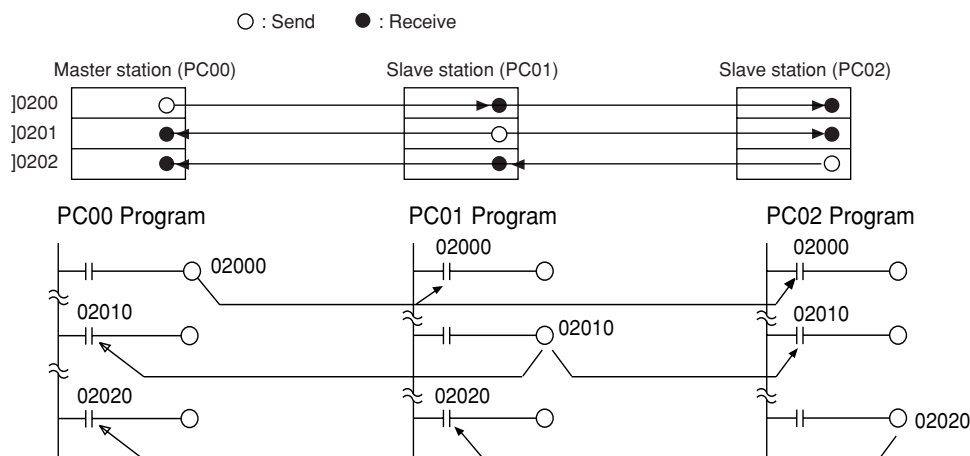
· The link relay of the receiving station must be programmed as input signal by the PC programming. Also, it may be used as source (S) side of application instruction.

· The sending and receiving data correspond in bits of one point unit.

Is the same value as ⊐0200 of the master station.

Is the same value as ⊐0201 of the slave station.
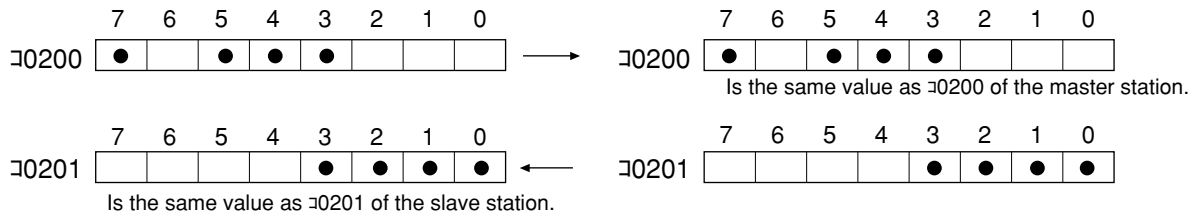
(2) Register link function

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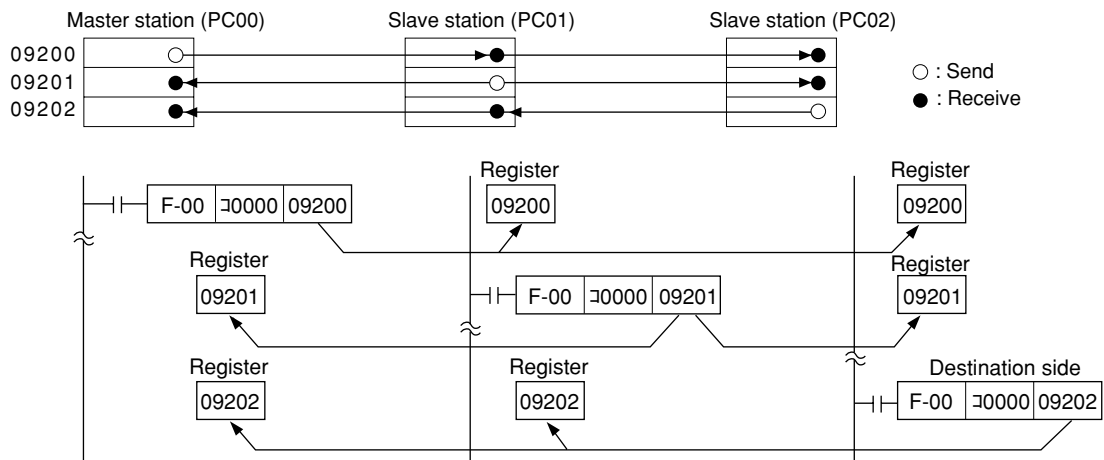
• The register link area of the sending station may be used as D (Destination) side of the application instruction of the PC program.

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

(3) To connect a slave station which has limited data link area

PC: Programable controller
RC: Robot controller

○ : Send
● : Receive
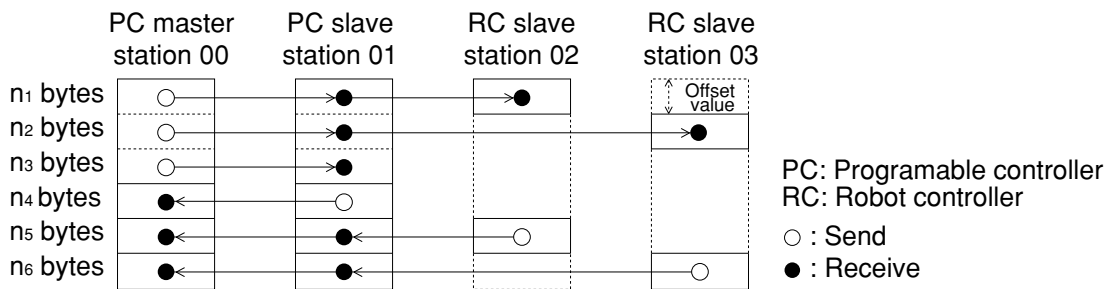
· Slave stations 02 and 03 only receive data sent from the master station. Enter the offset value for the area of the maser station from which the slave stations will receive data.

· In the case of the figure above, slave station 02 receives data from the top of the data sent from the master station. Therefore, the offset value should be "0 bytes." In the same manner, the offset value for slave station 03 should be "n_1 bytes."

· Enter the offset value for each slave station in the registers of slave station links top addresses inside the master station. Enter a different value for each slave station.

· For details about the offset value, see the instruction manual for each device. When the JW-20MN "memory capacity save function" is enabled, the offset value must be set. For details, see the next page.

[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.

To specify top address of the data receive area in a slave station, enter number of offset bytes from the top of the link area

(0 ≤ number of offset bytes ≤ total number of bytes of the link area)

Memory in
JW-20MN

Memory in
control module

Adresses continues in order of
receiving and sending sequentially.

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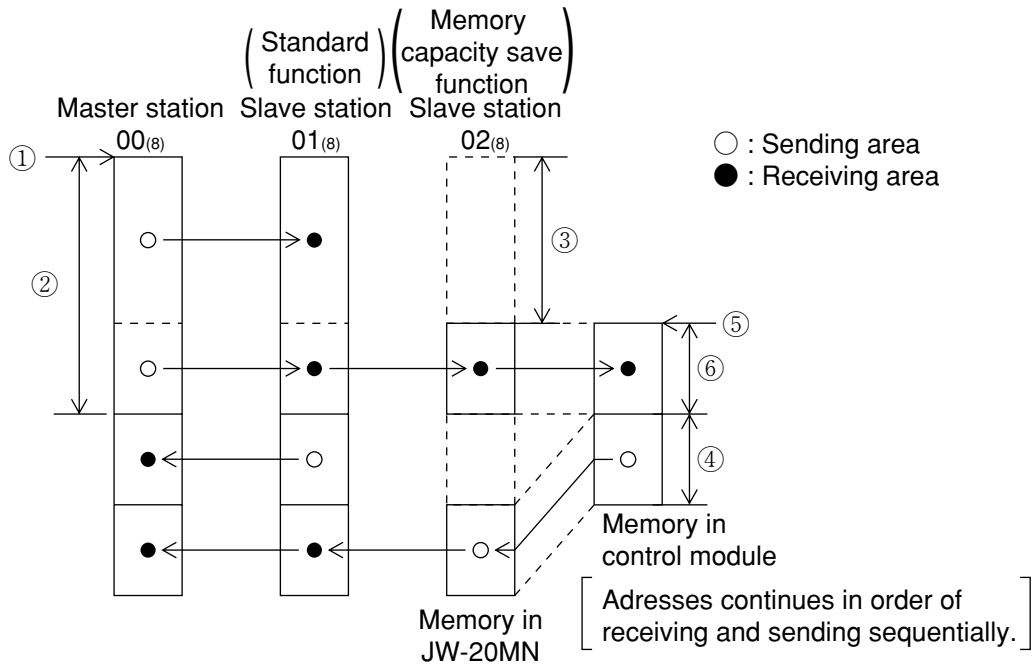
Function		Contents
Relay link	N: M communication	Total link number of points: Maximum 2048 points (256 bytes) Total number of points of sending/receiving data per slave station: Maximum 512 points (64 bytes)
Register link	N: M communication	Total link number of points: Maximum 2048 bytes Total number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

8

8-2 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 : Transfer speed: 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.
    $$\alpha = 3.5 \times \text{number of error stations ms}$$
- 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,

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

$$+ 2.5 \times 2 \text{ stations} + 16 = 21.32 \text{ ms}$$
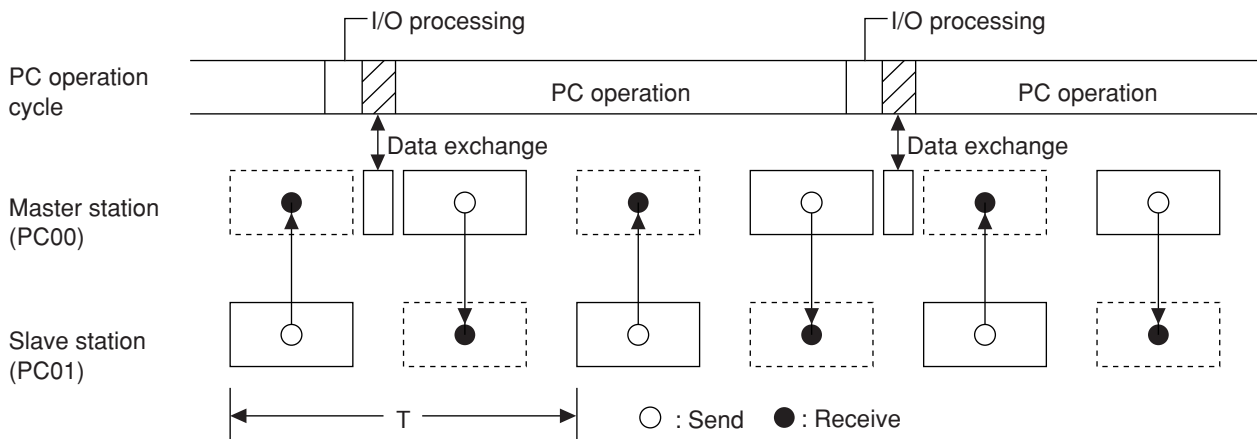
(2) Communication delay time

The communication data on the ME-NET may have the delay shown below.
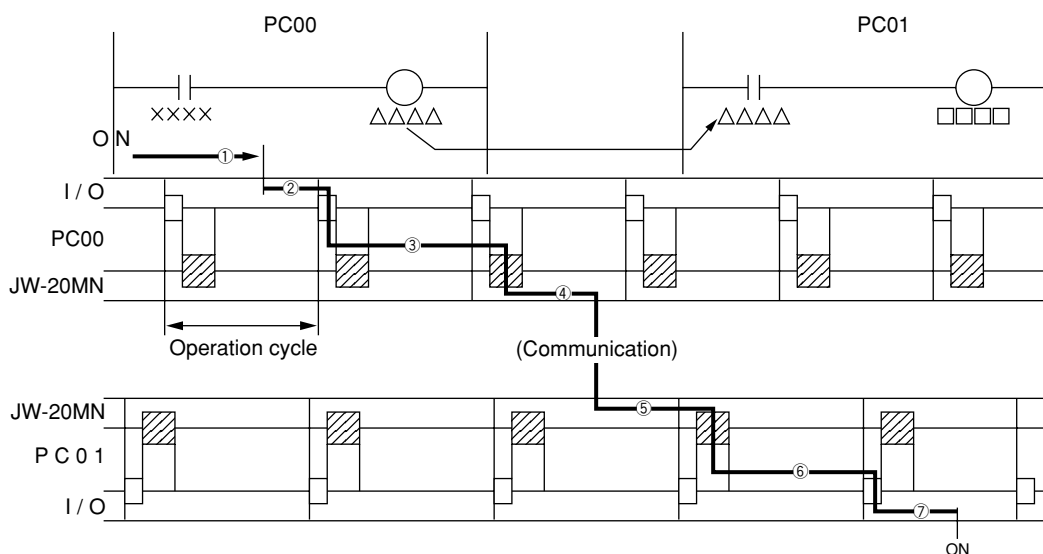
① Delay of input module
② Time required for PC to detect input state (one operation cycle max.)
③ Operation time of sending PC (one operation cycle)
④ Time to complete sending of operation result (one communication cycle max.)
⑤ Time required for receiving PC to write receive data in PC data memory
   (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.

Remarks

The buffer memory contents of the JW-20MN 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.

(3) Data transmission between master PC and slave PC

Providing synchronous transfer gives positive data communication.

[An example of synchronized transfer by OUT instruction]

Master station (PC00)   Slave station (PC01)

⅃ 0200   ⅃ 0200
⅃ 0203   ⅃ 0203

○ : Send   ● : Receive
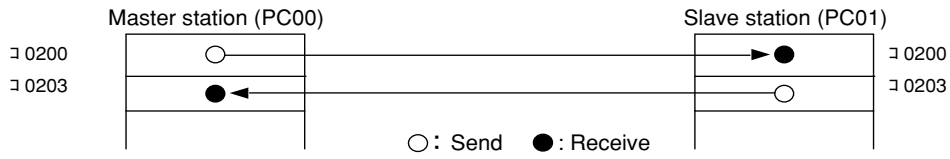
Program in master station   Program in slave station
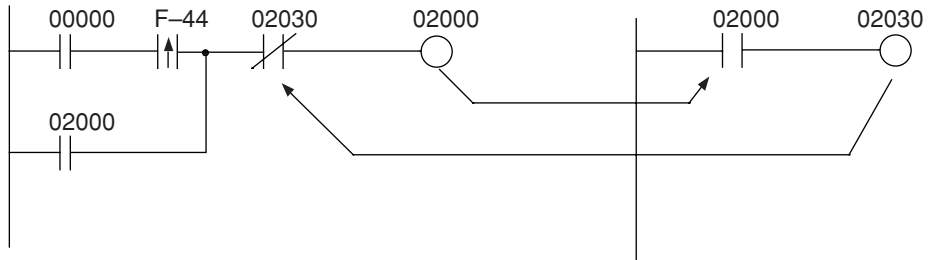
- 00000 is turned "ON" at the master station side. (OUT 02000 is a self-latch circuit.)
- When 02000 is turned "ON" at the slave station side, OUT 02030 is also turned "ON." This is sent back to the master station side.

8

8·6

8-3 Expansion of network

The JW-20MN 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-20MN

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

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

□ : Master station   ○ : Slave station
Slave station number 01 to 77(8)
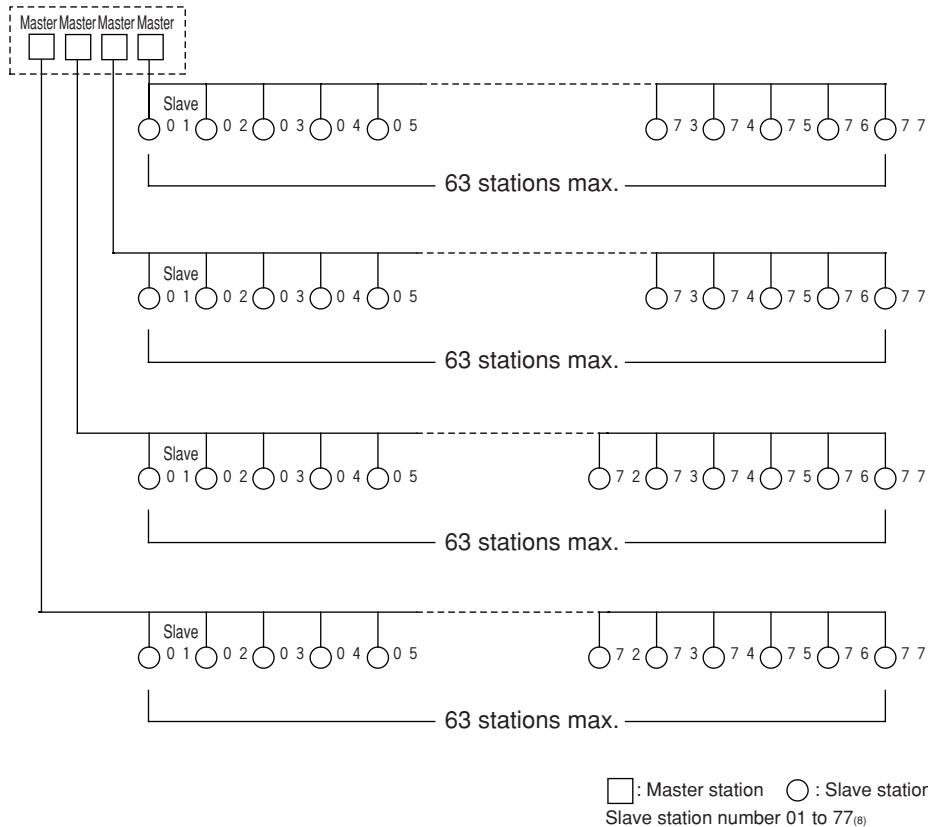
Remarks

- 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-20MN can be mounted on single basic rack panel, they cannot directly communicate with other stations beyond one network.

(2) Hierarchical link

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

☐: Master station ◯: Slave station

Slave station number 01 to 77(8)

Group C

Group A

Group B

This PC is the master of group A while serving as a slave in group C.

This PC is the master of group B while serving as a slave in group C.
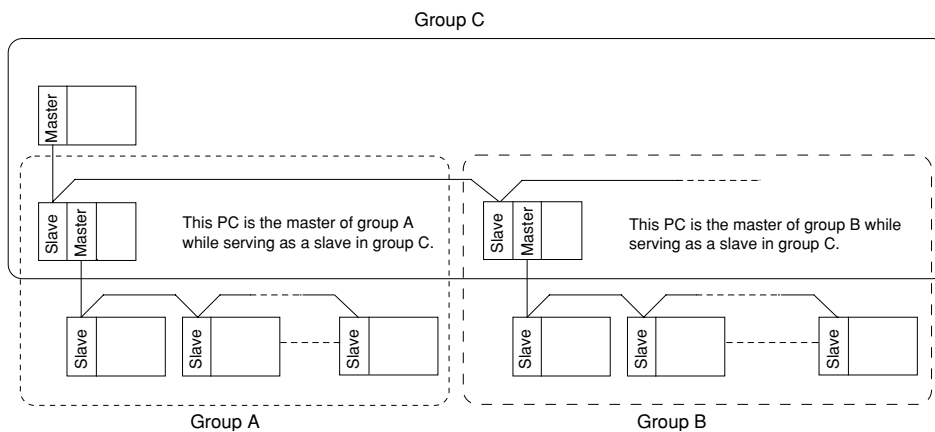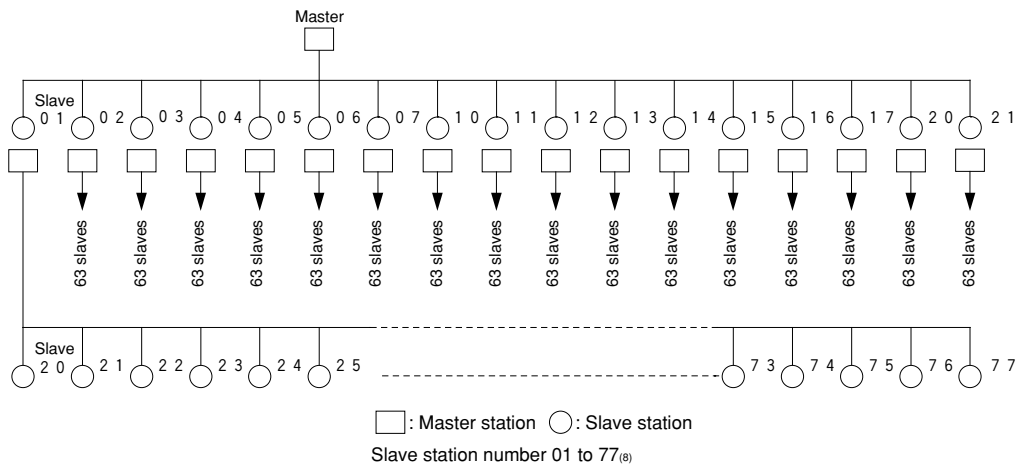
⬭ Remarks

- 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-20MN can be mounted on single basic rack panel, they cannot directly communicate with other stations beyond one network.

Chapter 9: Description of the Computer Link Operation

When connected to a host computer with a network module that is compatible with the ME-NET specifications, the JW-20MN can transfer data.

9-1 Computer link function

Instructions from the host computer are referred to as "commands." Replies to the commands from each of the connected devices are referred to as "responses."

In order to use the computer link function, you must use application software which can send commands and receive responses from the oppsite stations. Concerning how to use the host computer, see the respective instruction manual.

ME-NET computer link commands are classified into two categories as follows:

① Basic commands

Commands mainly used with PCs. (See page 9·3)

These commands are the functions used to read and write relays and registers. The JW-20MN supports all of the basic commands (for both the 47 and 57 family).

Reference

The 47 and 57 family: ME-NET computer link commands are divided into the 47 and 57 families of commands, which use different communication formats. However, you do not need to be concerned about the differences in these families when using the computer link function.

② Optional commands

Commands other than the basic commands. These are individual commands specific to each device. (See page 9·5)

9

This manual describes the meaning of each command and the range of usable memory address. For details about the transmission method used for each command, see the instruction manual for the host computer.

9-2 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**）

Master station 00(8)   Slave station 01(8)   Slave station 02(8)   Slave station 03(8)

Host computer

Command

Response
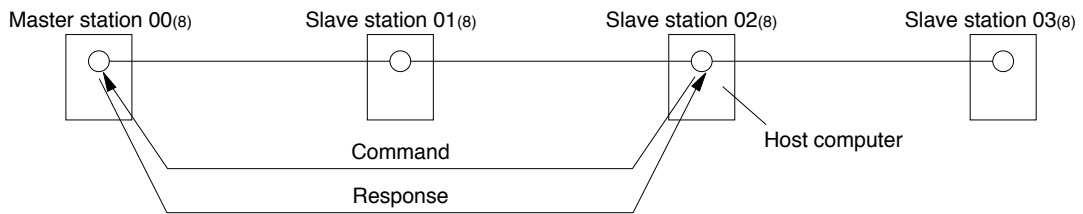
On the computer link, the host computer can communicate with any required station regardless of whether it is the master or slave station.

* For details about the computer link function, see the instruction manual that came with the network module for the computer.

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9·2

9-3 Basic command

The meaning and usable memory address range of each command are shown below:

· The number for each command is the command identification number which is assigned by the ME-NET specifications.

· When a W70H/100H PC is used, reading and writing is limited to the file registers marked with asterisks "*".

· Reading and writing to/from registers can be performed in blocks up to 1024 bytes in one instruciton.

· To write to certain registers, you have to prepare data length equal to number bytes of the registers to write.

· Writing mode assignment is used to show whether writing to the PC memory has been enabled or desibles.

       0 : Writing prohibited

       1 : Enable writing only to data memory

       2 : Enable writing all data.

       (See command number F9$_{(H)}$)

Command	Assignable address range and precautions	Write mode assignment
Read relay 20$_{(H)}$	00000 to 15777 (relay), T0000 to T0777 (TMR, CTR contact points) T or C0000 to 0777 (TMR, CTR contacts at W70H/100H, JW50H/70H/100H) T or C1000 to 1777 (TMR, CTR contacts at JW50H/70H/100H) Assign in units of individual point	None
Set or reset relay 30$_{(H)}$	00000 to 15777 (relay), SET=1, RESET=0, Assign in units of individual point	1 or 2
Read the current register 24$_{(H)}$	コ 0000 to コ 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 E0000 to E0777 E1000 to E1777	None
Write to register 34$_{(H)}$	コ 0000 to コ 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 E0000 to E0777 E1000 to E1777	1 or 2
Write the same data to register 35$_{(H)}$	コ 0000 to コ 1577 (*) b0000 to b1777 (*) 09000 to 09777 (*) 19000 to19777 (*) 29000 to 29777 39000 to 39777 49000 to 49777 59000 to 59777 69000 to 69777 79000 to 79777 89000 to 89777 99000 to 99777	
Set / reset TMR, CTR 32$_{(H)}$	0000 to 0777 (When using W70H/100H, JW50/70/100) 0000 to 1777 (When using JW50H/70H/100H) SET=1, RESET=0 Assign in units of individual contact point.	

Command	Assignable address range and precautions	Write mode assignment
Read the file register current value 24(H)	File 0　　　　　000000 to 017777 (*) File 1, 2　　　　000000 to 177777 (*) File 3 to 7　　　000000 to 177777 Assignable up to 1024 bytes at a time	None
Write to file register 34(H)	File 0　　　　　000000 to 017777 (*) File 1, 2　　　　000000 to 177777 (*) File 3 to 7　　　000000 to 177777	1 or 2
Read program memory 04(H)	Assignable up to 1024 bytes at a time W70H/100H　　　000000 to 076777 JW50, JW50H　 000000 to 016777 JW70/100 ⎱ JW70H/100H ⎰ 000000 to 076777, 100000 to 176777 (Addresses may vary with memory size) Assignable up to 512 steps at a time The JW-20CM reads out data in machine codes.	None
Write to program memory 14(H)	W70H/100H　　　000000 to 076777 JW50, JW50H　　000000 to 016777 JW70/100 ⎱ JW70H/100H ⎰ 000000 to 076777, 100000 to 176777 (Addresses may vary with memory size) Assignable up to 512 steps at a time This command cannot be executed unless the PC operation has been stopped by the 「PC operation halt」 command or 「write mode assignment: 2.」	2
Read the PC operating status E8(H)	─────────	None
Halt the PC operation F8(H)	When this command is executed, the PC cannot be started by a trigger from support tools attached to the PC.	
Restart the PC operation F8(H)	This command is only effective when the communication has been stopped by the 「PC operation halt」 command. If the PC stops operation for any other reason, this command is not effective.	
Read the write mode status E9(H)	─────────	
Assign a write mode F9(H)	Select any of the following: Write prohibited　　　　　　　 = 0 Enables writing to data memory　 = 1 Enables writing to all memory　 = 2	
Read the brand code 6F(H)	The JW-20MN returns the brand code (CL = Sharp) and model code (A = JW-20MN).	

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9-4 Optional commands

The JW-20MN optional commands are any commands not specified in the ME-NET specifications. These are commands specific to the JW-20MN. The host computer may use these optional commands for communication between JW-20MNs and PCs with a JW-21MN installed. The table below shows optional commands (1) to (10) for the JW-20MN.

Optional command	Reference page
(1) Monitor TMR, CNT, and MD	9·6
(2) Read PC mode	9·7
(3) Set PC mode	9·7
(4) Read system memory	9·8
(5) Write system memory	9·9
(6) Read date	9·10
(7) Set date	9·10
(8) Read time	9·11
(9) Set time	9·11
(10) Correct time	9·12

[Communication format, basic pattern]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	C.TEXT

■ Response (normal)

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	R.TEXT

(Response on error: See page 9·12)

Symbol	Data	Contents
"+"	$2B_{(H)}$	Optional command
"C"	$43_{(H)}$	Sharp brand ID code
"L"	$4C_{(H)}$	
"A"	$41_{(H)}$	Model code (JW-20MN)
CMD	*1	Function code
SUB	*2	Sub code
ATTR	$00_{(H)}$	Always set to $00_{(H)}$
C. TEXT	*3	Instruction contents for each optional command
R. TEXT		
ACK	$00_{(H)}$	When normal, the response should be $00_{(H)}$

*1, *2, *3
See each optional command (9·6 to 9·12)

9

(1) Monitor TMR, CNT, and MD

Read out the current value and attribute data from TMR, CNT, and MD in the specified area.

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	TMRNO	N

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	TMRNO	N

D1	...	DN	TA1	...	TAN

Symbol	Data	Contents	
CMD	$42_{(H)}$	Function code	
SUB	$23_{(H)}$	Sub code	
TMRNO	000 to $777_{(8)}$	TMR, CNT, and MD numbers (two data bytes in sequential order, L, then H)	
N	0000 to $0100_{(H)}$	Amount of data read (two data bytes in sequential order, L, then H)	
D1 to DN	See the example	Read current data value (two data bytes x the number of values read)	
TA1 to TAN	$00_{(H)}$	Do not use as TMR, CNT, or MD	One data byte x number of values read
	$01_{(H)}$	ZW/JW MD	
	$02_{(H)}$	ZW CNT	
	$04_{(H)}$	ZW TMR	
	$08_{(H)}$	DTMR (BCD)	
	$09_{(H)}$	DTMR (BIN)	
	$0A_{(H)}$	UTMR (BCD)	
	$0B_{(H)}$	UTMR (BIN)	
	$0C_{(H)}$	DCNT (BCD)	
	$0D_{(H)}$	DCNT (BIN)	
	$0E_{(H)}$	UCNT (BCD)	
	$0F_{(H)}$	UCNT (BIN)	

(See page 9·5 for other symbols not described above)

[Example] Read the current value of TMR, CNT, and MD at addresses 000 to $002_{(8)}$

(The data in cells are in hexadecimal notation)

■ Command

2B	43	4C	41	42	23	00	00	00	03	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	$000_{(8)}$		3 pieces	

■ Response

2B	00	43	4C	41	42	23	00	00	00	03	00
	ACK				CMD	SUB	ATTR	$000_{(8)}$		3 pieces	

65	38	32	60	14	73	08	0C	0E
Current value of No. 000 3685		Current value of No. 001 6032		Current value of No. 002 7314		DTMR 000 (BCD)	DCNT 001 (BCD)	UCNT 002 (BCD)

(2) PC mode reading

Read PC's mode

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	MODE

Symbol	Data	Contents
CMD	43(H)	Function code
SUB	4E(H)	Sub code
MODE	00(H)	Monitor mode
	02(H)	Change mode
	03(H)	Program mode

(See page 9·5 for other symbols not listed on the left)

[Example] When the PC reads the program mode,

(Data in cells: Hexadecimal notation)

Command

2B	43	4C	41	43	4E	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR

Response

2B	00	43	4C	41	43	4E	00	03
	ACK				CMD	SUB	ATTR	Program Mode

(3) PC mode setting

Set the PC to an assigned mode

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	MODE

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR

Symbol	Data	Contents
CMD	43(H)	Function code
SUB	5E(H)	Sub code
MODE	00(H)	Monitor mode
	02(H)	Change mode
	03(H)	Program mode

(See page 9·5 for other symbols not listed on the left)

[Example] When to set the PC to the change mode.

(Data in cells: Hexadecimal notation)

Command

2B	43	4C	41	43	5E	00	02
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	Change mode

Response

2B	00	43	4C	41	43	5E	00
	ACK				CMD	SUB	ATTR

(4) Reading system memory

Read the specified number of bytes of data from the specified address in system memory.

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SADR		N	

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SADR		N		D1

		DN
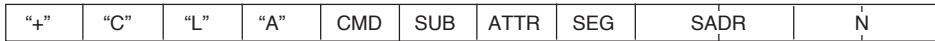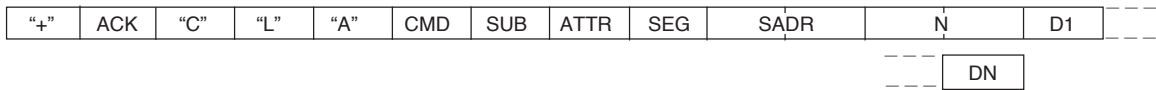
CMD	$43_{(H)}$	Function code
SUB	$4E_{(H)}$	Sub code
SEG	$08_{(H)}$	Segment to read
SADR	0000 to $00FF_{(H)}$	Address to read #000 to $#377_{(8)}$ (two data bytes in sequential order, L, then H)
N	0001 to $00FF_{(H)}$	Number of bytes of read (two data bytes in sequential order, L, then H)
D1 to DN	See the example	Data to read the system memory. (One byte X number of bytes to read)

[Example] To read data from system memory addresses #201 and #202

(Data in cells: Hexadecimal notation)

Command

2B	43	4C	41	43	44	00	08	81	00	02	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SADR		N	

Response

2B	00	43	4C	41	43	44	00	08	81	00	02	00	01	01
	ACK				CMD	SUB	ATTR	SEG	SADR		N		#201	#202

Read data

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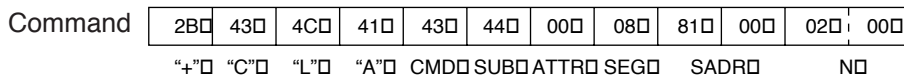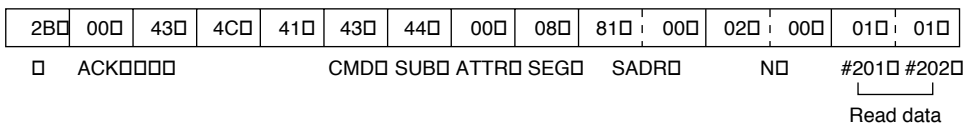
(5) Write to system memory

Write the specified number of bytes of data from the specified address in system memory.

[Write mode assignment] 2 (When the PC has been stopped with a "halt PC operation F8$_{(H)}$" command)

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SA	DR	N	D1	- - -

		DN	

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SA	DR	N
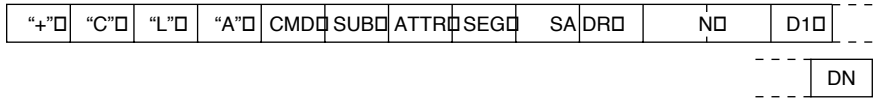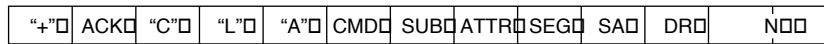
Symbol	Data	Contents
CMD	43$_{(H)}$	Function code
SUB	54$_{(H)}$	Sub code
SEG	08$_{(H)}$	Segment to write
SADR	0000 to 00FF$_{(H)}$	Address to write #000 to #377$_{(8)}$ (two data bytes in sequential order, L, then H)
N	0001 to 00FF$_{(H)}$	Number of bytes to write (two bytes of data. The reserved area is prohibited to write.)
D1 to DN	See the example	Data to write in the system memory (One byte x number of bytes to write)

[Example] To write data 01$_{(H)}$, 01$_{(H)}$ to data from system memory addresses #201 and #202
(201$_{(8)}$ = 81$_{(H)}$ Data in cells: Hexadecimal notation)

Command

2B	43	4C	41	43	54	00	08	81	00	02	00	01	01
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	SADR		N		#201	#202

Write data

Response

2B	00	43	4C	41	43	54	00	08	81	00	02	00
	ACK				CMD	SUB	ATTR	SEG	SADR		N	

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(6) Read out date

Read out date (year, month, day, day of week.)

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	SEG	ATTR	Y	M	D	DW

Symbol	Data	Contents
CMD	$43_{(H)}$	Function code
SUB	$4E_{(H)}$	Sub code
Y	00 to $99_{(H)}$	00 to 99 (Lower two digits of western year)
M	01 to $12_{(H)}$	January to December
D	01 to $31_{(H)}$	1st to 31st in month
DW	00 to $06_{(H)}$	Day of week (Sunday: $00_{(H)}$ Monday: $01_{(H)}$ Tuesday: $02_{(H)}$ Wednesday: $03_{(H)}$ Thirsday: $04_{(H)}$ Friday: $05_{(H)}$ Saturday: $06_{(H)}$)

[Example] Reading out April 25, 1990 (Wednesday). (The data in cells are in hexadecimal notation)

Command

2B	43	4C	41	45	A2	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR

Response

2B	00	43	4C	41	45	A2	00	90	04	25	03
	ACK				CMD	SUB		1990	April	25	Wednesday

(7) Set date

Set date (year, month, day, day of week).

[Write mode assignment] 1 or 2

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	Y	M	D	DW

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR

Symbol	Data	Contents
CMD	$45_{(H)}$	Function code
SUB	$B2_{(H)}$	Sub code
Y,M D, DW	Same operation as "reading the date" above.	

(See page 9·5 for other symbols not listed on the left.)

[Example] Setting the date to May 1, 1990 (Tuesday).
(The data in the cells are in hexadecimal notation)

Command

2B	43	4C	41	45	B2	00	90	05	01	02
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	1990	May	1	Tuesday

Response

2B	00	43	4C	41	45	B2	00
	ACK				CMD	SUB	

(8) Read out time

Read out time (hour, minute, second) of clock.

[Write mode assignment] No

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR	H	M	S

Symbol	Data	Contents
CMD	$45_{(H)}$	Function code
SUB	$A3_{(H)}$	Sub code
H	00 to $23_{(H)}$	00 to 23 hour
M	00 to $59_{(H)}$	00 to 59 minutes
S	00 to $59_{(H)}$	00 to 59 seconds

(See page 9·5 for other symbols not listed on the left)

[Example] Reading a time of 8 : 30 : 30 AM. (The data in cells are in hexadecimal notation)

Command

2B	43	4C	41	45	A3	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR

Response

2B	00	43	4C	41	45	A3	00	08	30	30
	ACK				CMD	SUB		8:	30:	30AM

(7) Set time

Set time (hour, minute, second) of clock.

[Write mode assignment] 1 or 2

[Communication format]

■ Command

"+"	"C"	"L"	"A"	CMD	SUB	ATTR	H	M	S	CTRL

■ Response

"+"	ACK	"C"	"L"	"A"	CMD	SUB	ATTR

Symbol	Data	Contents
CMD	$45_{(H)}$	Function code
SUB	$B3_{(H)}$	Sub code
H, M, S		Same method as "reading the time" above.
CTRL	$00_{(H)}$	At operation of the clock
	$01_{(H)}$	Stop operation of the clock
	$02_{(H)}$	Reset the seconds
	$08_{(H)}$	Correct to 30 seconds (0 to 29 seconds will reset to 0, 30 to 59 seconds will reset to one minute)

[Example] When the time is 13 : 30 : 00. (The data in cells are in hexadecimal notation)

Command

2B	43	4C	41	45	B3	00	13	30	00	00
"+"	"C"	"L"	"A"	CMD	SUB	ATTR	13	30	00	At operation

Response

2B	00	43	4C	41	45	B3	00
	ACK				CMD	SUB	

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9·11

(10) Correct the clock time.

Correct time of clock.

[Write mode assignment] 1 or 2

[Communication format]

■ Command

| "+" | "C" | "L" | "A" | CMD | SUB | ATTR | CTRL |

■ Response

| "+" | ACK | "C" | "L" | "A" | CMD | SUB | ATTR |

Symbol	Data	Contents
CMD	$45_{(H)}$	Function code
SUB	$B4_{(H)}$	Sub code
CTRL	$00_{(H)}$	At operation of the clock
	$01_{(H)}$	Stop operation of the clock
	$02_{(H)}$	Reset the seconds
	$08_{(H)}$	Correct to 30 seconds (0 to 29 seconds will reset to 0, 30 to 59 seconds will reset to one minute)

[Example] To stop the clock. (The data in cells are in hexadecimal notation)

Command

| 2B | 43 | 4C | 41 | 45 | B4 | 00 | 01 |
| "+" | "C" | "L" | "A" | CMD | SUB | ATTR | Stop operation |

Response

| 2B | 00 | 43 | 4C | 41 | 45 | B4 | 00 |
| | ACK | | | | CMD | SUB | |

(11) Response on error

When a station that has received data encounters an error while processing data after receiving an optional command from the host computer, it will send a response as follows.

■ Response (response)

| "+" | ACK | "C" | "L" | "A" | CMD | ERR |

ACK data	ERR data	Contents
$01_{(H)}$	None	The command data format is not appropriate
$06_{(H)}$	None	The PC has not stopped operation
$07_{(H)}$	None	The data is not written properly
$0F_{(H)}$	None	Time out while accessing memory
$10_{(H)}$	None	Write mode is not appropriate
$11_{(H)}$	None	The assigned address is outside the program area.
$FF_{(H)}$	$02_{(H)}$	The assigned address is other than the set values for TMR, CNT, or MD.
	$04_{(H)}$	Set or reset the MD.
	$05_{(H)}$	The set value for the number of bytes exceeds the rated range.
	$13_{(H)}$	Set or reset the TMR or CNT while the PC is stopped.
	$52_{(H)}$	Start/end block error
	$53_{(H)}$	System memory is not correct

· Symbols other than above

"+," "C," "L" and "A" : Same as the description on page 9·5.

CMD: Function code for each optional command

(See pages 9·6 to 9·12.)

Chapter 10: Outline of Switch and Parameter Setting Procedure

10-1 Operation procedure

```
              ( Start )
                  |
    ┌─────────────────────────────┐
    │ Power "OFF" master and slave stations │
    └─────────────────────────────┘
                  |
    ┌─────────────────────────────┐
    │ Set switches of master and slave stations │ -------- See page 10·2
    └─────────────────────────────┘
                  |
    ┌─────────────────────────────┐
    │    Power "ON" slave station │
    └─────────────────────────────┘
                  |
    ┌─────────────────────────────┐
    │  Set parameters of slave station │ -------- See page 10·6
    └─────────────────────────────┘
                  |
    ┌─────────────────────────────┐
    │    Power "ON" master station │
    └─────────────────────────────┘
                  |
    ┌─────────────────────────────┐
    │  Set parameter of master station │ -------- See page 10·13
    └─────────────────────────────┘
                  |
              ( End )
```

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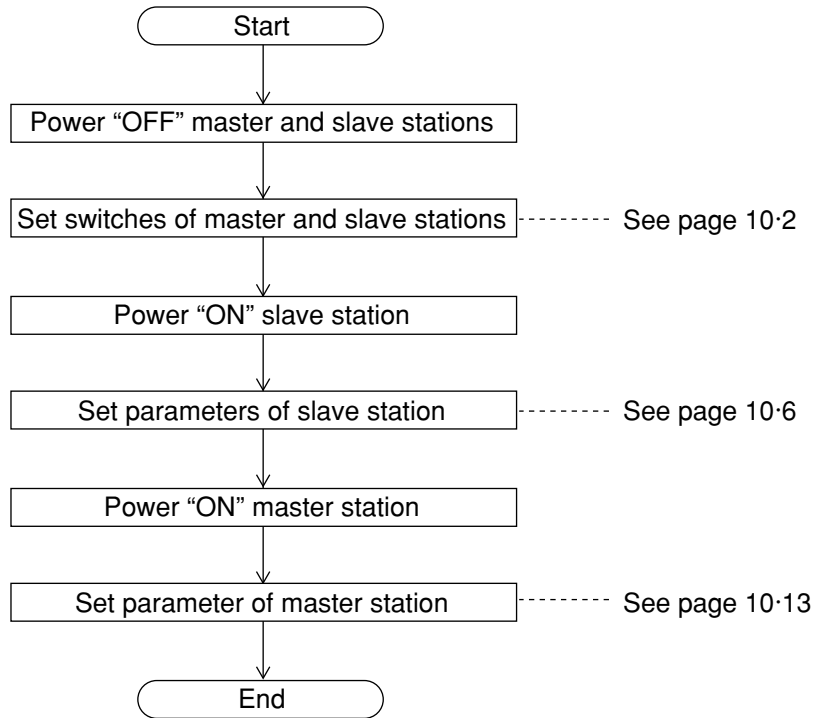
Remarks

· Make sure to turn "OFF" the power of the PC prior to setting the switches.
· Prior to setting the parameters of the JW-20MN, set its operation mode to "program mode."
· Make sure to write the set parameters into the EEPROM in the JW-20MN after setting.

10-2 Switch setting of master station and slave station

Set the switches below before using the JW-20MN.

(1) Mode switch (MODE)

Make sure to set to "2" or "3."

Setting value	Function
0	Do not select this position.
1	Do not select this position.
2	Data link (standard function)
2	Computer link
3	Data link (memory capacity save function)
3	Computer link
4 to F	Test mode A service man will use these switches for adjustment.
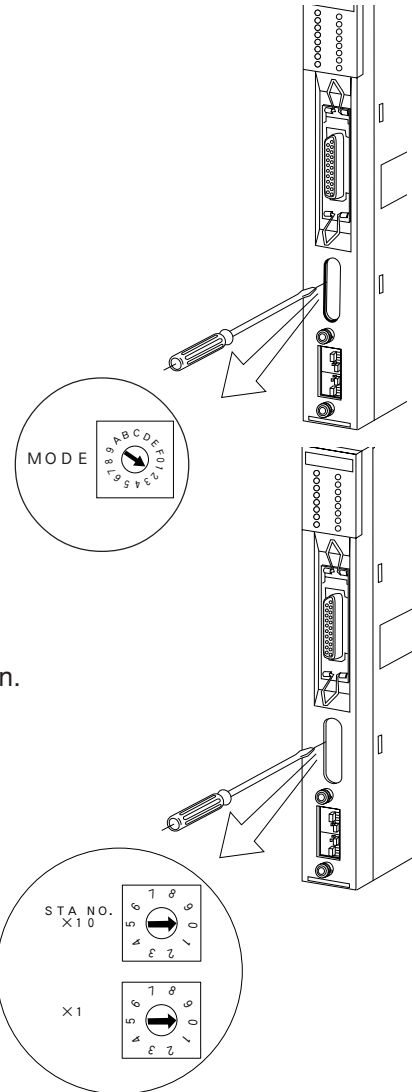
(2) Station number switch (STA NO. ✕ 10, ✕ 1)

· Make sure to set the master station number to "00."

· For slave stations, set from "01" to "77" sequential in octal notation.

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Remarks

• Maximum amount of slave stations to be connected is 63.

• As the station number should be assigned using octal notation, setting of the following values causes errors and the JW-20MN cannot communicate.

08, 09, 18, 19, 28, 29, 38, 39, 48, 49, 58, 59, 68, 69, and 78 to 99.

Be careful that there is no doubly allocated number and no number has been skipped.

(3) Set LT (termination resistance) switch

When the JW-20MN is at either end the communication line, make sure to set the termination resistance switch "ON."

Turn ON the termination resistance switches on these two stations.
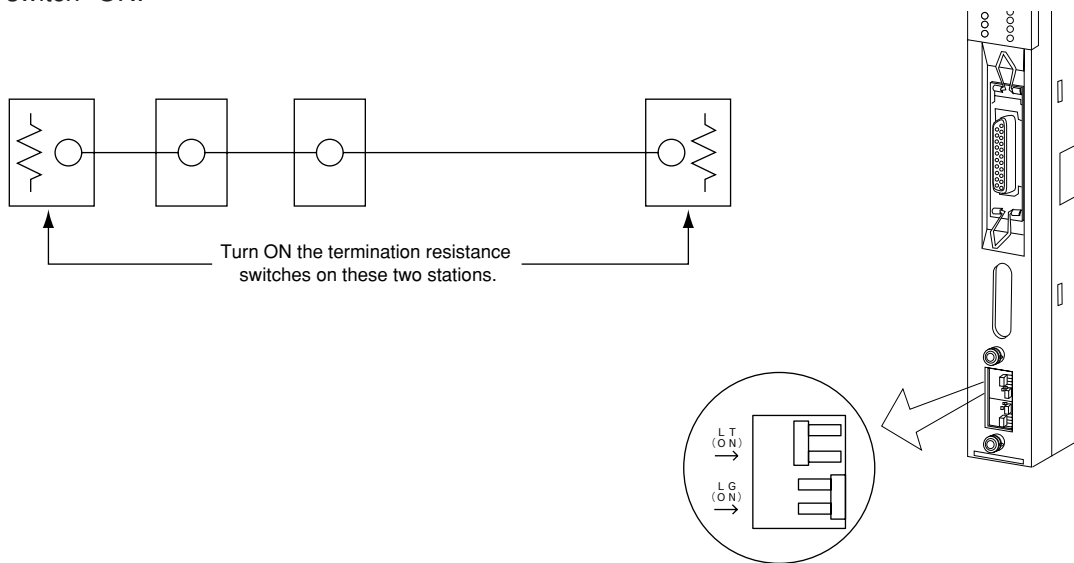
Setting	Condition of the JW-20MN
ON	Insert a termination resistance.
OFF	Do not insert a termination resistance

· 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.

Termination   Termination

1 km max.
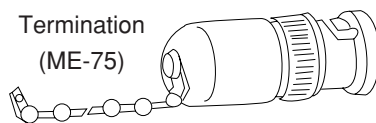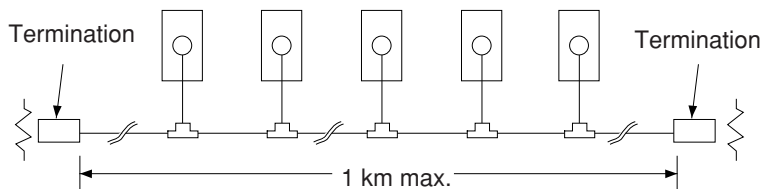
Termination
(ME-75)

Reference   **Need for the termination resistance**

When a termination resistance is not provided at a communication circuit end, the end of the circuit generates reflection waves. These reflection waves collide with sending signals and abnormal communication may occur. The termination resistance prevents the occurrence of these reflection waves. On the other hand, when an intermediate station has its termination resistance switch turned "ON," this station causes reflection and attenuates signals and causes abnormal communication.

(4) Shield ground switch (LG)

For communication lines, use a coaxial cable.

As coaxial cable is an unbalanced circuit, ground its shield by turning "ON" the shield ground switch.

Turn "ON" shield ground switch   Coaxial cable   Turn "ON" shield ground switch
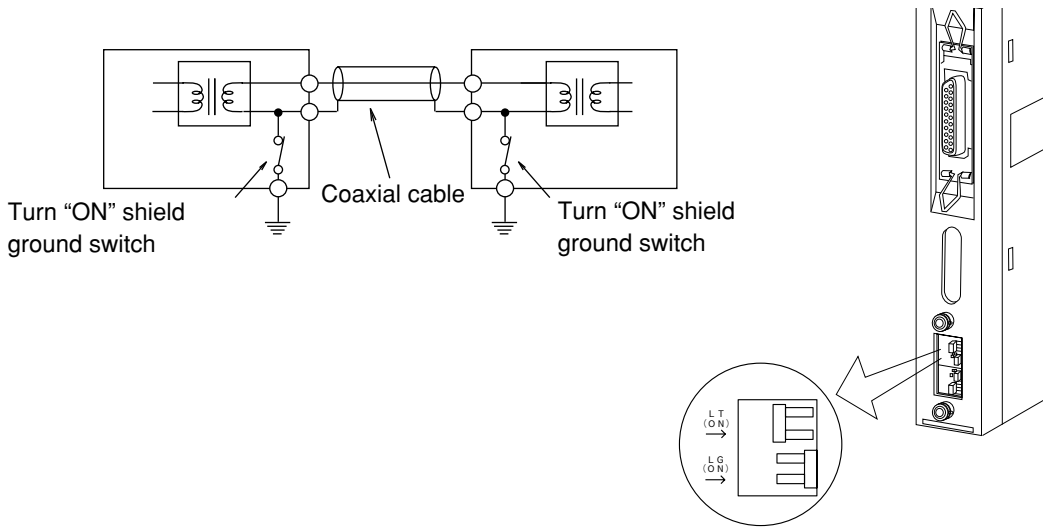
Setting	Condition of the JW-20MN
ON	Conductive between the shield and FG of the JW50H/70H/100H
OFF	Not conductive between the shield and FG of the JW50H/70H/100H

• Make sure to provide a class-3 grounding for the GND terminal of the power module. Without grounding the power module, the JW-20MN cannot become conductive with the ground after turning "ON" the shield ground switch. (See page 6·3.)

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

JW-20MN   Coaxial cable   JW-20MN

Turn "ON" shield ground switch   Wrap around current   Turn "ON" shield ground switch

FG   Note: Rack etc.

Note: In case enough conductivity is not established.

Electric welder

10·4
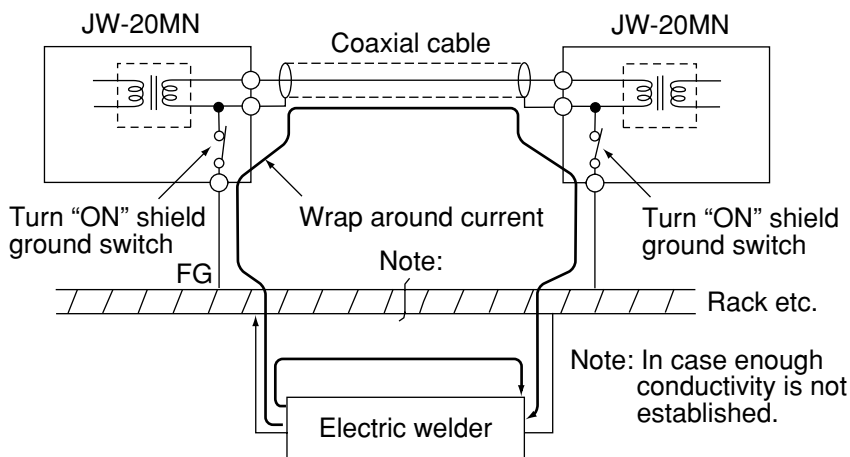
(5) Switches used to select between communication line 1 and 2 (L1, L2)

Select communication line.

Turn ON either of the L1 or L2 switch in order to select the communication line to be used.

Make sure to select the same line for all stations.

When all the stations have their L1 switches ON, their L2 switches should be turned OFF.

When all the stations have their L2 switches ON, their L1 switches should be turned OFF.

Connect a cable to the appropriate connector for the selected communication line.
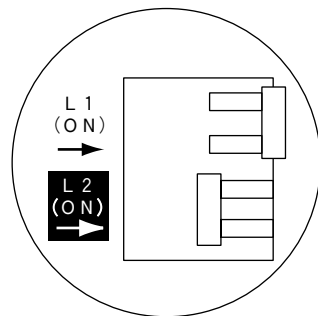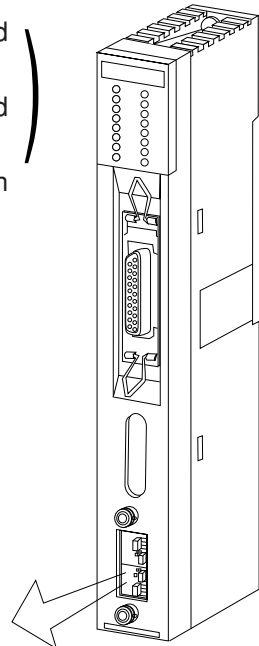
Remarks

· Setting examples using the system shown below.
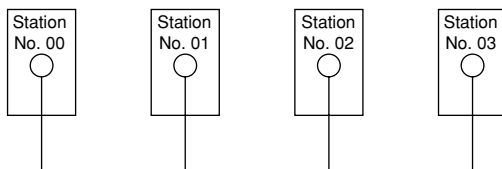
Switch		Station No.00	Station No.01	Station No.02	Station No.03	Operation
○	L1	ON	ON	ON	ON	Normal communication on line 1 (L1). (Connect a coaxial cable to the L1 connector.)
	L2	OFF	OFF	OFF	OFF	
○	L1	OFF	OFF	OFF	OFF	Normal communication on line 2 (L2). (Connect a coaxial cable to the L2 connector.)
	L2	ON	ON	ON	ON	
✕	L1	OFF	ON	ON	ON	The station No. 00 communication line is opened its circuit and the system cannot communicate normally.
	L2	OFF	OFF	OFF	OFF	
✕	L1	ON	ON	ON	ON	Since both L1 and L2 are turned ON, station No. 00 cannot communicate normally due to feedback and other similar problems.
	L2	ON	OFF	OFF	OFF	
✕	L1	ON	OFF	ON	ON	Since the L1 switch on station No. 01 is turned OFF, it cannot communicate.
	L2	OFF	ON	OFF	OFF	

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10-3 Setting contents of slave station parameters (common for all slave stations)

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

[1] Setting contents

	Setting item	Address(8)	Initial value (H)	Contents		Corresponding signs on pages 11·7 and 11·8
①	Number of receiving bytes of relay link 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
②	Number of receiving bytes of register link 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
③	Top address of relay link area V5	007730 to 007733	00	Set file address in octal notation (see page 15·11 and 15·12)		f_1 to f_n
④	Top address of register link area V5	007734 to 007737	00	Set file address in octal notation (see page 15·11 and 15·12)		g_1 to g_n
⑤	*2 Whether the station number information should be output or not V5	007763	00	Store the number of own statin in the data memory when setting on 01(H). (storage area of 1 byte follows flag area of 24 bytes)		——
⑥	Top address of flag area (communication and PC operation condition monitor flag)	007764	E0	Lower digits of file address	Hexadecimal: 01E0(H) ↓ Octal: 000740	e_1 to e_n
		007765	01	Upper digits of file address		
		007766	00	File number (00 + 007)		
		007767	80	Flag output (Yes: 80(H) No: 00(H))		
⑦	· Start/stop operation of the JW-20MN · Writing to EEPROM of the JW-20MN	007777	01	00(H): Stop operation		——
				01(H): Start operation		
				80(H): Writing to the EEPROM, stop operation		
				81(H): Writing to the EEPROM, start operation		
				08(H): Parameter initializing		

*1 Set only when the memory capacity save function is used.

*2 "Whether the station number information should be output or not" is a unique function of the JW-20MN.
① to ⑦ are equivalent to number of next page.

Notes

· Twenty four bytes can be used for the flag area, starting from the top. Set the area so that it is within the specified range (see pages 15·11 and 15·12).

· Set the top address of the flag area using the file addresses which are assigned throughout the network. Input and output relays, auxiliary relays, and PC registers are assigned a byte address for each individual item.

· Make sure that the flag area does not overlap the relay link area or the register link area set by the master station parameters.

Operation procedure

	Turn ON the power of master station PC	[8]
	Connect support tools	[8]
	Stop PC operation	[8]
	Stop operation of data link $(007777_{(8)}=00_{(H)})$	[8]

When not using the memory capacity save function.

① | V5 Set number of receiving bytes of relay link | [9]

② | V5 Set number of receiving bytes of register link | [9]

③ | V5 Set the top address of relay link area | [10]

④ | V5 Set the top address of register link area | [10]

⑤ | V5 Set whether the station number information should be output or not | [10]

⑥ | Set top address of flag area | [11]

⑦ | Writing to EEPROM, start operation $(007777_{(8)}=81_{(H)})$ | [12]

| PC operation | [12]

| End |
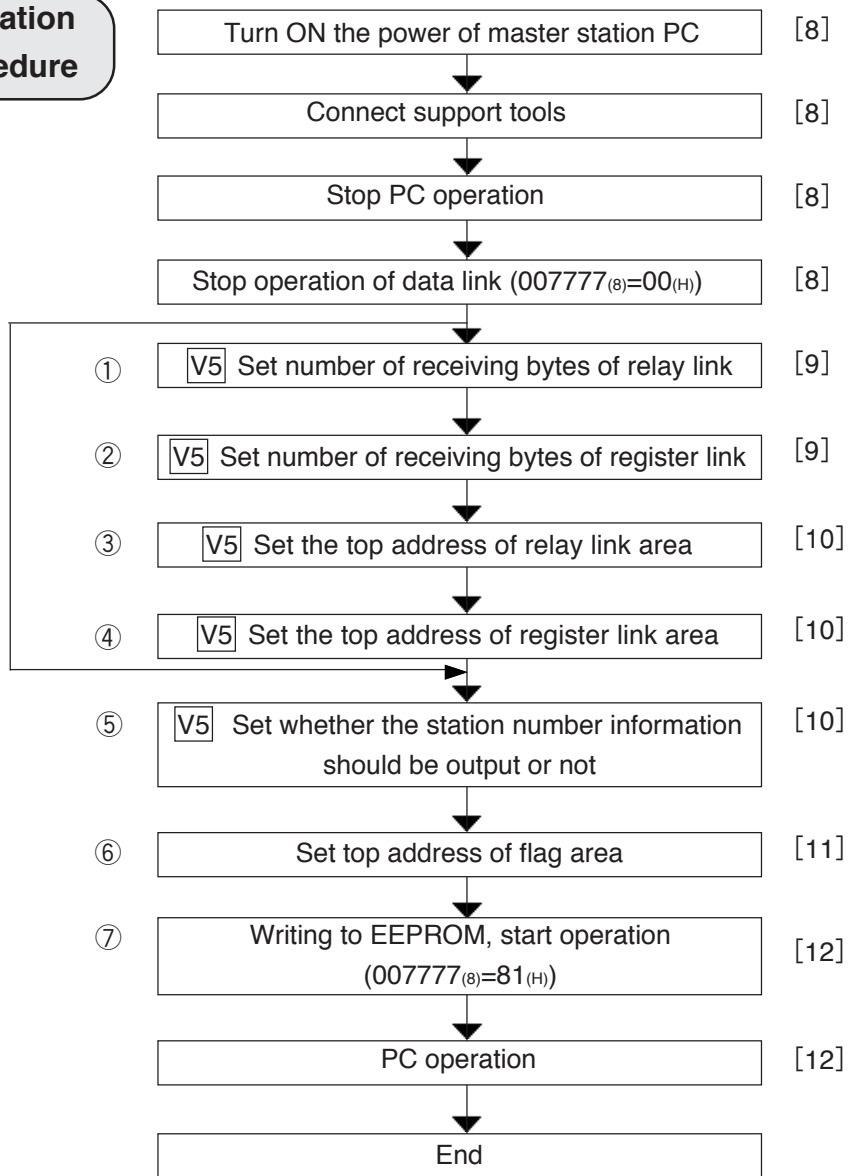
① to ⑦ are equivalent to number of previous page.

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Turn "ON" the power of slave module.

Connect support tools

・Connect a support tool with the JW-20MN
  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

└─── 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-20MN is
  stopped.

・Write "$00_{(H)}$" to parameter address $007777_{(8)}$ and stop operation of the JW-
  20MN.

(Operation example of JW-13PG)   Screen display of JW-13PG

| 7 | 7 | 7 | 7 | モニタ MNTR | A 0 | 書込 ENT |

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

```
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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V5 | **Set the number of sending bytes of the relay link**   [DCM (decimal), word]

・Set the number of sending bytes in decimal on the parameter address 007720 to 007721(8).

007720(8)	Lower
007721(8)	Upper

(In case of setting 4 bytes using JW-13PG: Example for slave station 02 of page 10·21)
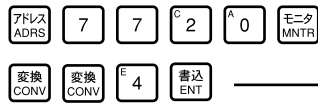
[アドレス ADRS] [7] [7] [C 2] [A 0] [モニタ MNTR] ⟶ Display the contents of parameter addresses 007720 to 007721(8)

[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) | 0 0 0 0 4 (D) |

V5 | **Set the number of receiving bytes of register link**   [DCM (decimal), word]

・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 10·21)
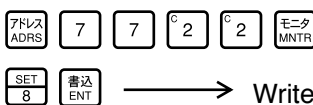
[アドレス ADRS] [7] [7] [C 2] [C 2] [モニタ MNTR] ⟶ Display the contents of parameter addresses 007722 to 007723(8)

[SET 8] [書込 ENT] ⟶ Write 00008(D) after converting to decimal

Screen display of JW-13PG

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

007722(8)
007723(8) | 0 0 0 0 8 (D) |

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"Only when the memory capacity save function is used."

| V5 | **Set top address of relay link area.** | File address: OCT (octal), word
File number: 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)	————	
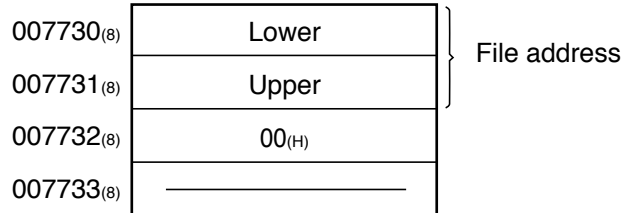
In case of setting ⊐1000 (file address 001000(8)) using JW-13PG: Example for slave station 02

of page 10·21.

[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
```

"Only when the memory capacity save function is used."

| V5 | **Set register link area of register link area.** | File address: OCT (octal), word
File number: HEX (hexadecimal), byte |

・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)	————	
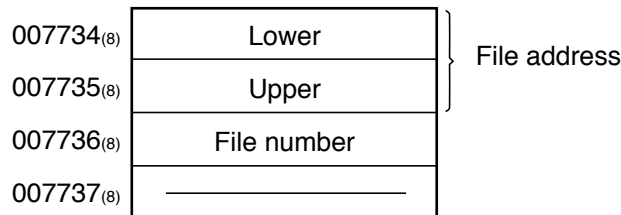
In case of setting 09000 (file address 004000(8) using JW-13PG: Example for slave station 02 of

page 10·21.

[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

```
07732    0   000000
07734    0   004000
I PARAM.
>07736   0   000000
```

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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.)

Set top address of flag area ⎡ **File address: OCT (octal), word** ⎤
⎣ **File number: 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 $007767_{(8)}$. (Setting area: See page 15·11, 12.)

・ Flag area uses 24 bytes regardless number of connecting stations.

	Contents	Initial value
$007764_{(8)}$	Lower	$E0_{(H)}$
$007765_{(8)}$	Upper	$01_{(H)}$
$007766_{(8)}$	File number	$00_{(H)}$
$007767_{(8)}$	D7 ——————	$80_{(H)}$

Byte address
$01E0_{(H)}$ → $000740_{(8)}$ → �</0740

File number 0
Output flag

┌ Output flag: ON
└ Do not output flag: OFF

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| Writing to the EEPROM of the JW-20MN, 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-20MN. Then start the JW-20MN.

・After starting operation, the setting value changes to "01$_{(H)}$."

Setting value $_{(H)}$	Contents
00	Stop operation of the JW-20MN
01	Start operation of the JW-20MN
80	Writing to the EEPROM of the JW-20MN, stop operation
81	Writing to the EEPROM of the JW-20MN, start operation
08	Initialize parameters

(Operation example of using JW-13PG) Screen display of JW-13PG

アドレス ADRS [7] [7] [7] [7] モニタ MNTR SET/8 B/1 書込 ENT

＼___ Display the contents of ___／ ＼_ Write 81$_{(H)}$ _／
      address 007777$_{(8)}$

```
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-20MN lights the error code (6F$_{(H)}$) by the indicator 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-20MN 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-20MN lights the error code (6E$_{(H)}$) by the indicator 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

[∗] [∗] MNTR MODE SET/8 ⟶ Monitor mode

[∗] [∗] CHNG MODE SET/8 ⟶ Change mode

```
C00000
>
```

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10-4 Setting contents of master station parameters

[1] Setting contents

When the JW-20MN 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 symbols on pages 10·15 to 17

	Item	Address (8)	Initial value (H)	Contents (setting range)		*
①	Top address of relay link area on the master station	004000 to 004001	$00_{(H)}$	Set file address by octal notation (See pages 15·11, 15·12.)		a_0
②	Function	004002	$00_{(H)}$	Set to $01_{(H)}$		—
③	Number of connected stations	004003	$00_{(H)}$	Set number of stations including master stations by decimal (002 to $064_{(D)}$)		—
④	Relay link area top address or number of offset bytes on slave station 01 to $77_{(8)}$	004004 to 004377	$00_{(H)}$	· When a slave station is data link (standard function), set the top address by file address (8) (See pages 15·11 and 12)	· When a slave station is data link (memory save function), set the number of offset bytes by decimal. (00000 to $00256_{(D)}$)	a_1 to a_{77}
⑤	Register link area top address on the master station	004400 to 004403	$00_{(H)}$	Set file address by octal notation (See pages 15·11 and 12)		b_0
⑥	Register link area top address or number of offset bytes on slave station 01 to $77_{(8)}$	004404 to 004777	$00_{(H)}$	· When a slave station is data link (standard function), set the top address by file address (8) (See pages 15·11 and 12)	· When a slave station is data link (memory save function), set the number of offset bytes by decimal. (00000 to $02048_{(D)}$)	b_1 to b_{77}
⑦	Number of relay link sending bytes of master station	005000 to 005001	$00_{(H)}$	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	$00_{(H)}$	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	$00_{(H)}$	Set the number of bytes by decimal (0 to 1024, within 0 to 2048 in total)		d_0
⑩	Set number of register link seding bytes of slave station 01 to $77_{(8)}$	005202 to 005377	$00_{(H)}$	Set the number of bytes by decimal (0 to 1024, within 0 to 2048 in total)		d_1 to d_{77}
⑪	*1 Connection conditon of slave stations (error code output)	007750 to 007757	$00_{(H)}$	Turn ON a bit corresponding to each bit. (See pages 15·10)		—

* 1: "Connection condition of slave stations" is a unique function of the JW-20MN.

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	Item	Address (8)	Initial value (H)	Contents (setting range)	*
⑫	* 1 Whether the station number information should be output or not	007763	00 (H)	When 01 (H) is entered, the JW-20MN stores own station number to the data memory (storage area = one byte next to 24 bytes of the flag area, effective when 007767 (8) is 80 (H).	—
⑬	Flag area top address (communication and PC operation monitor flag)	007764	E0 (H)	Select file address and output in octal. (See page 15·10)	e0
		007765	01 (H)		
		007766	00 (H)		
		007767	80 (H)		
⑭	· Start/stop operation of the JW-20MN · Write data to EEPROM of the JW-20MN	007777	01 (H)	Select from "00, 01, 08, 80, 81" with hexadecimal.	—

* 1 : "Whether the station number information should be output or not" is a unique function of the JW-20MN.

① to ⑭ correspond to numbers in page 10·18.

Notes

· Make sure that the relay link area, the register link area, and flag area do not overlap each other.
· Set the top address of the relay link area, register link area, and flag area using the file addresses assigned throughout the network. Input and output relays, auxiliary relays, and PC registers are assigned a byte address for each individual item.
· The total number of bytes sent or received by each station must be in the range 0 to 1024, including relay and register links.

10

[2] Communication area map

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

○ : Send   ● : Receive
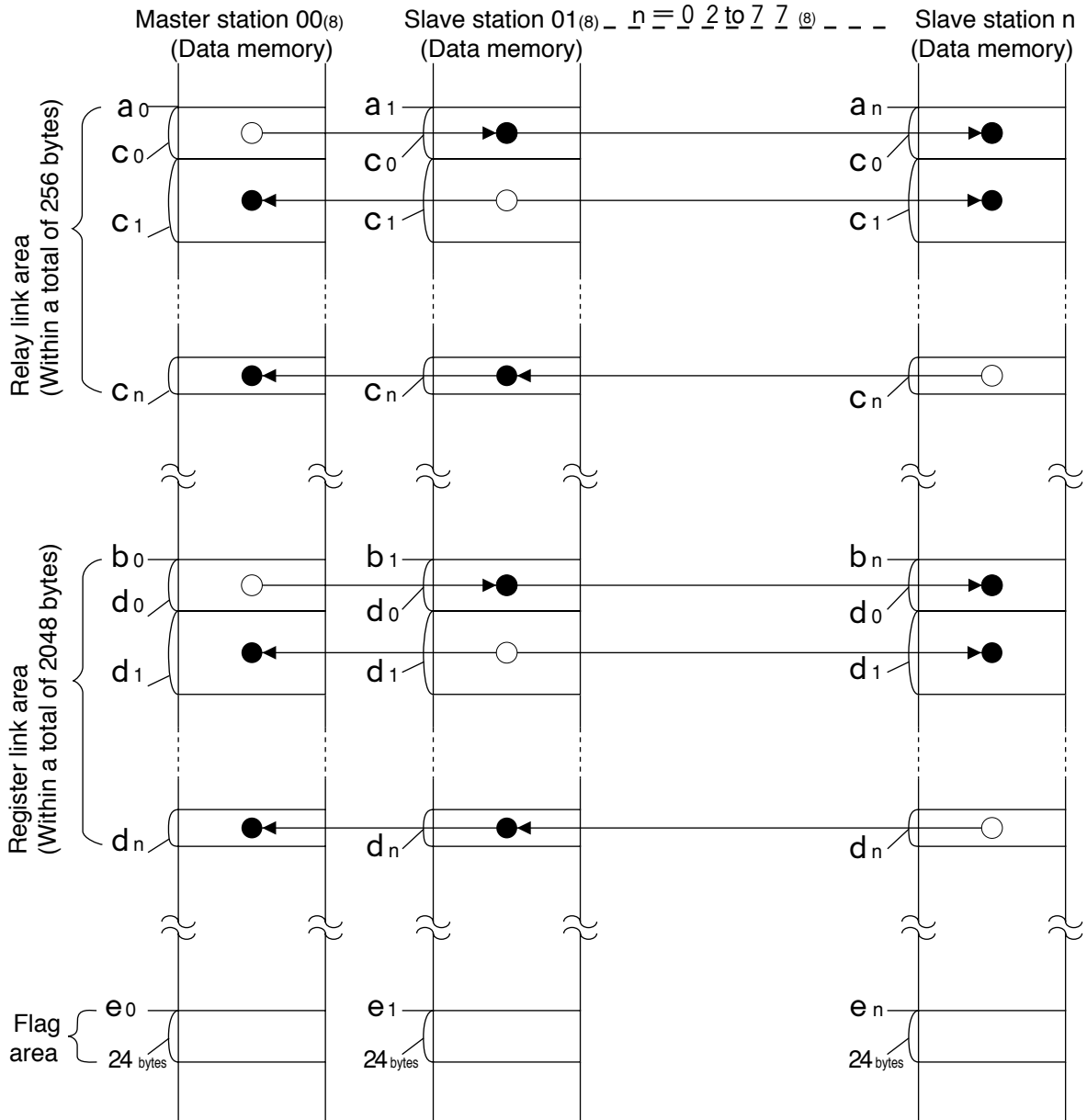
· Set the relay link area, register link area, flag area within the setting range nominated in page 15·11, 12. However, be careful not to double any address allocation of these.

· A maximum of 1024 bytes can be sent to or received by each station, including relay and register links.

$c_0 + d_0$, $c_1 + d_1$, $c_n + d_n = 0$ to 1024 bytes

· Set a_0 to e_n parameters of master station and slave station. (See page 10·6, 13.)

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.	

(2) In case that setting the data link ($\boxed{V5}$ memory capacity save function) when the master station and all slave stations are JW-20MN.

Memory addresses inside control module of slave station continue in order of receiving and sending.
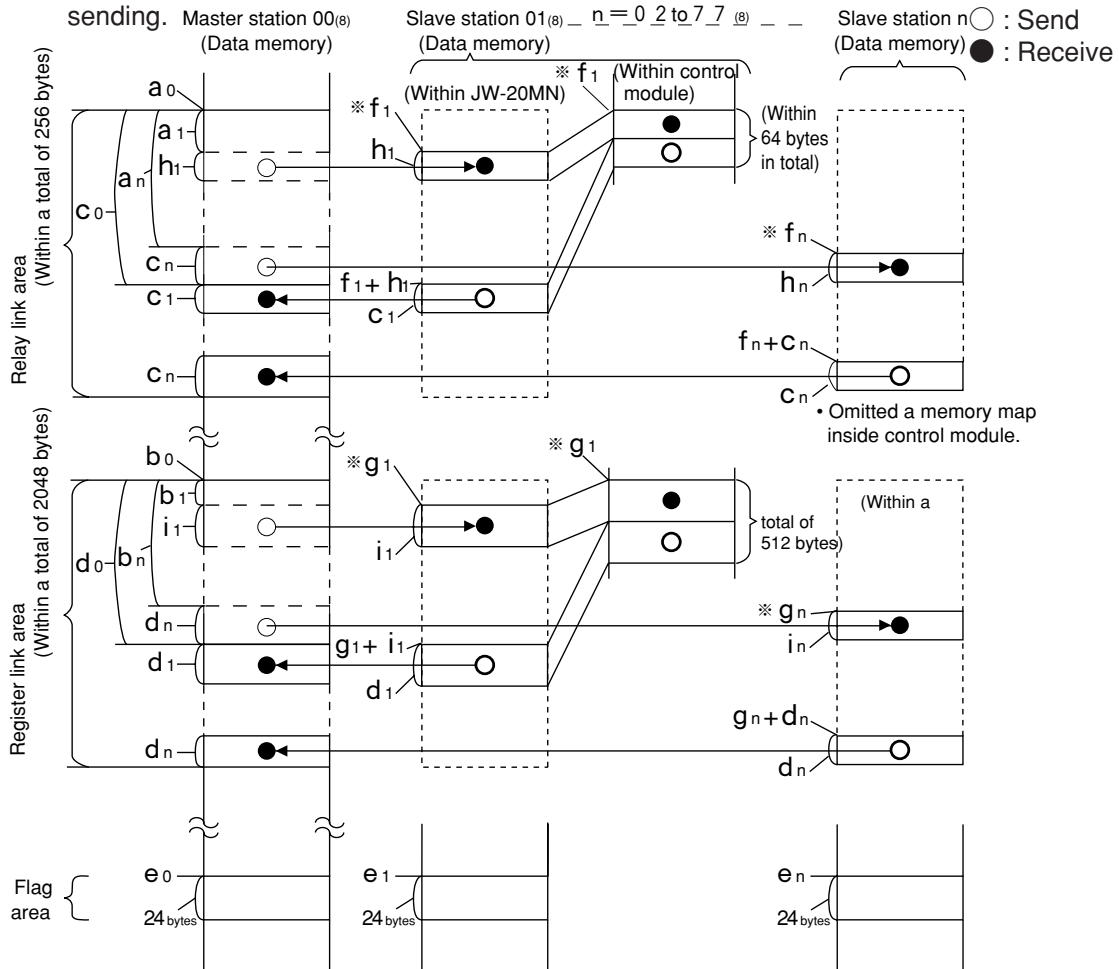
- Set the relay link area, the register link area, and the flag area within the settings range of page 15·11 and 15·12. Be careful not to double any address allocation of these.
- Set "a_0" to "i_n" above for parameters of master station and slave station (see page 10·6 and 10·13.)

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 f_1 to f_n
Number of sending bytes of relay link area c_0, c_1 to c_n	Number of receiving bytes of register link area g_1 to g_n
Number of sending bytes of register link area d_0, d_1 to d_n	Number of receiving bytes of relay link area h_1 to h_n
Top address of flag area (master station) e_0.	Number of receiving bytes of register link area i_1 to i_n

- Set the receiving area for memory capacity save function within the range of the link area.

$0 \leqq a_1 \leqq$ Total number of bytes of relay link area $-h_1$

$0 \leqq a_n \leqq$ Total number of bytes of relay link area $-h_n$

$0 \leqq b_1 \leqq$ Total number of bytes of register link area $-i_1$

$0 \leqq a_n \leqq$ Total number of bytes of register link area $-i_n$

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• Number of receiving bytes of slave station (h_1 to h_n, i_1 to i_n)

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.

$$a_1, a_n \geqq c_0 \text{ and } b_1, b_n \geqq d_0$$

(3) When the master station and slave stations are all JW-20MN and both data link (the standard function) and data link ($\boxed{V5}$ memory capacity save function) are set among slave stations.

Set signs below by the parameters of the master station and slave station (page 10·6 and 10·13).

• 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.
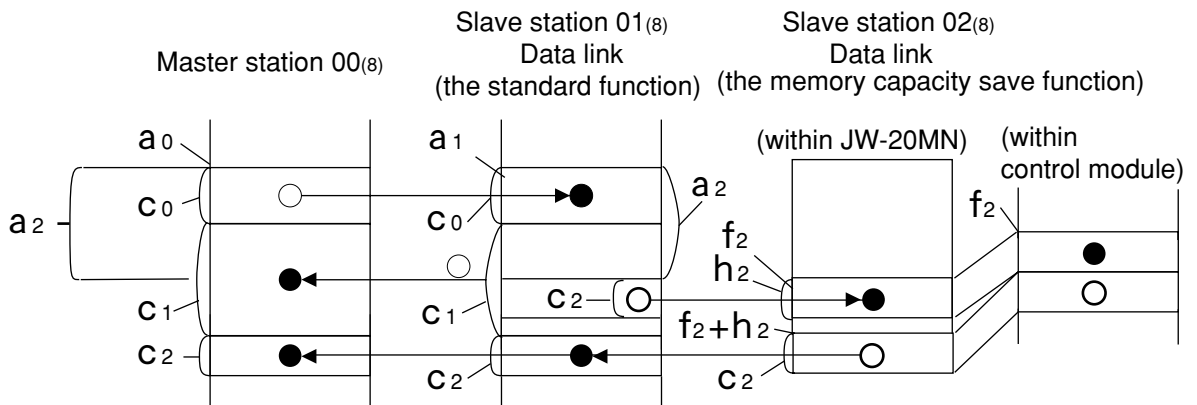
$$\left\langle \begin{array}{l} \text{Total number of bytes of relay link area } (C_0 + C_1 + C_2) \leqq 256 \text{ bytes} \\ C_2 + h_2 \leqq 64 \text{ bytes} \qquad 0 \leqq a_2 \leqq C_0 + C_1 \end{array} \right\rangle$$

• An example of register link area map for the setting of the data link (the memory capacity save function) to slave station 01 and 03 and data link (the standard function) to slave station 02.
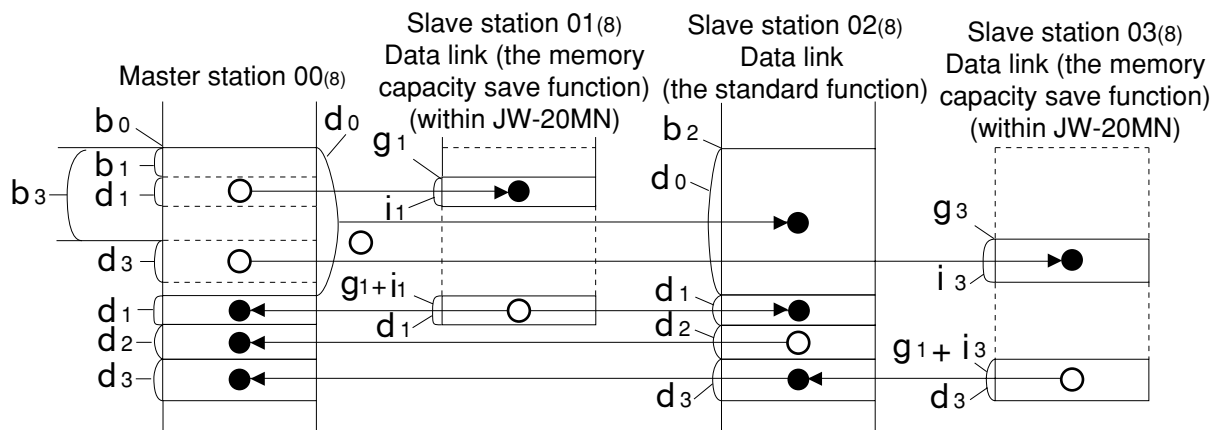
$$\left\langle \begin{array}{l} \text{Total number of bytes of register link area } (d_0 + d_1 + d_2 + d_3) \leqq 2048 \text{ bytes} \\ 0 \leqq b_1 \leqq d_0 + d_2 + d_3 \qquad 0 \leqq b_3 \leqq d_0 + d_1 + d_2 \\ i_1 + d_1 \leqq 512 \qquad i_3 + d_3 \leqq 512 \end{array} \right\rangle$$

10

[3] Setting procedure

	Start slave station PC operation	[19]
	Turn ON the power of master station PC	[19]
	Connect support tools	[19]
	Stop PC operation	[19]
	Stop operation of data link (007777(8)=00(H))	[19]
①	Set top address of the relay link area on the master station	[20]
②	Set data link function (004002(8) =01(H))	[22]
③	Set number of connecting stations	[22]
④	Set top address of relay link area on slave station 01 to 77(8) (at standard function)/number of offset bytes (at memory capacity save function)	[22]
⑤	Set top address of register link area on master stations	[23]
⑥	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)	[24]
⑦	Set number of sending bytes of the master station relay link	[25]
⑧	Set number of sending bytes of the slave station 01 to 77(8) relay link	[25]
⑨	Set number of sending bytes of the master station register link	[26]
⑩	Set number of sending bytes of the slave station 01 to 77(8) register link	[26]
⑪	Set connection status of slave stations	[27]
⑫	V5 Whether the station number information should be output or not	[27]
⑬	Set top address of flag area	[28]
⑭	Writing to EEPROM, start operation (007777(8) =81(H))	[29]
	PC operation	[30]
	End	

・ ① to ⑭ correspond to numbers in page 10·13 and 10·14.

10

| "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-20MN 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.
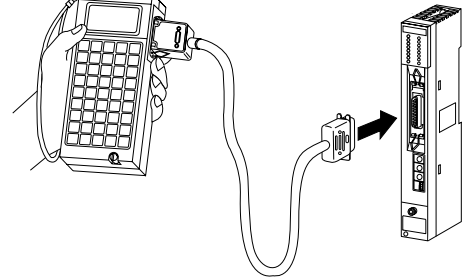
| Stop PC operation |

- 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)

$\boxed{*}$ $\boxed{*}$ $\boxed{\text{PROG MODE}}$ $\boxed{\frac{\text{SET}}{8}}$ $\longrightarrow$ Stop PC operation

$\boxed{\text{クリア CLR}}$ $\boxed{*}$ $\boxed{*}$ $\boxed{\text{シフト SHIFT}}$ $\boxed{\text{INTL DISP}}$ $\boxed{\frac{\text{SET}}{8}}$ $\boxed{^{B}1}$ $\longrightarrow$ 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-20MN is stopped.
- Write "$00_{(H)}$" to parameter address $007777_{(8)}$ and stop operation of the JW-20MN.
  (Operation example of JW-13PG)

$\boxed{7}$ $\boxed{7}$ $\boxed{7}$ $\boxed{7}$ $\boxed{\text{モニタ MNTR}}$ $\boxed{^{A}0}$ $\boxed{\text{書込 ENT}}$

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

- $\boxed{\text{変換 CONV}}$ key: Changeover unit of figures

  → HEX$_{(hexadecimal)}$ → OCT$_{(octal)}$ → DCM$_{(decimal)}$ → Bit pattern

- $\boxed{\text{FORCE LNGTH}}$ key: Byte display ⟷ Changeover word display

To the next page

| 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. (Setting area : See page 15·11 and 15·12.)

  In case of setting ⊐0210 (file address 000210$_{(8)}$) using JW-13PG : Example of the next page.

| アドレス ADRS | E 4 | A 0 | A 0 | A 0 | モニタ MNTR | FORCE LNGTH | 変換 CONV | C 2 | B 1 | A 0 | 書込 ENT |

└─ Display the contents of address   ─/ (Word display) └─ After converting to octal,   ─/
   004000$_{(8)}$ write the data 000210.

Screen display of JW-13PG

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

10

10·20

[Example for setting]

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

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).
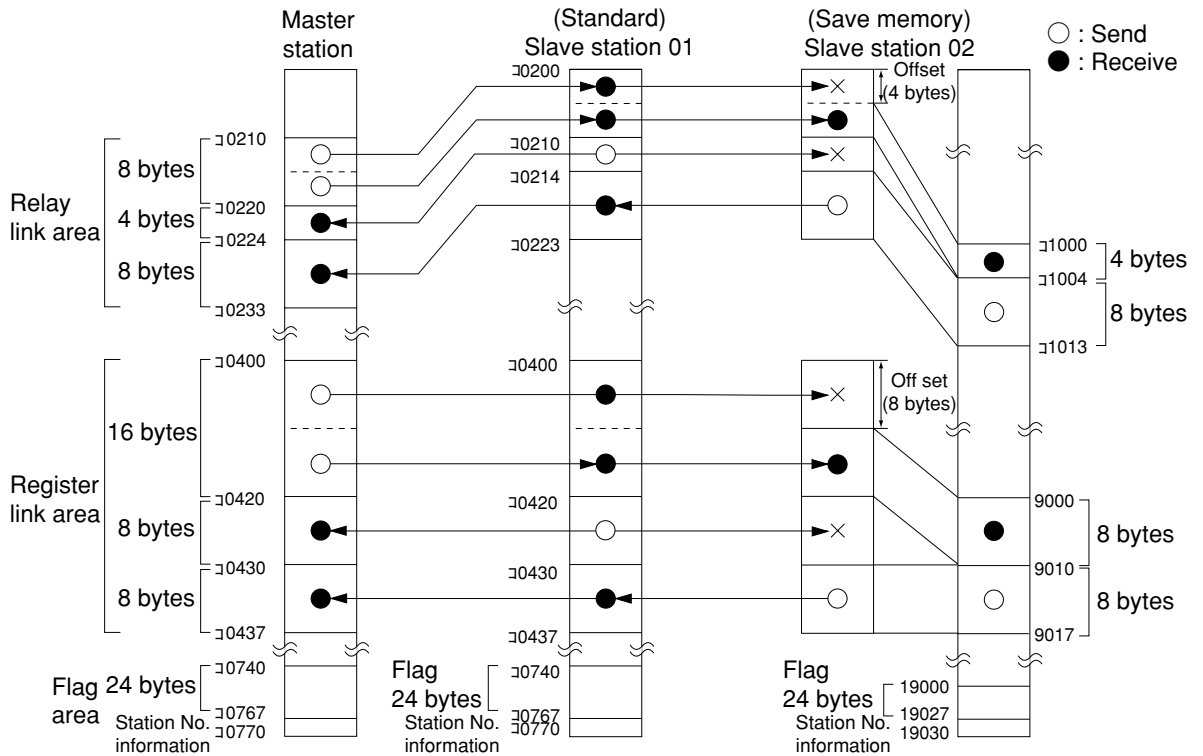
	Maser station	**Slave station 1 (standard)**	**Slave station 2 (save memory)**
Top address of relay link area	⊐0210	⊐0200	* ⊐1000
Number of offset bytes of relay link area	–	–	4 bytes
Number of sending bytes of relay link	8 bytes	4 bytes	8 bytes
Number of receiving bytes of relay link	–	–	* 4 bytes
Top address of register link area	⊐0400	⊐0400	* 09000
Number of offset 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

10

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

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

(Operation example of JW-13PG)
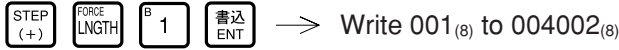
Screen display of JW-13PG

```
 04000    OCT    210
 04001    OCT    000
I PARAM.
>04002    OCT    001
```

$\boxed{\text{STEP}\atop(+)}$ $\boxed{\text{FORCE}\atop\text{LNGTH}}$ $\boxed{^{B}1}$ $\boxed{書込\atop\text{ENT}}$ $\longrightarrow$ Write $001_{(8)}$ to $004002_{(8)}$

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

• Set the number of connecting stations including the master station in the parameter address $004003_{(8)}$ by octal.
• If you try to set values other than 02 to $64_{(D)}$, the JW-20MN displays $6F_{(H)}$ error code.

(When to set number of connected stations
to 3 using the JW-13PG.)
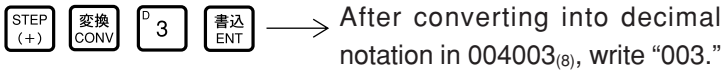
Screen display of JW-13PG

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

$\boxed{\text{STEP}\atop(+)}$ $\boxed{変換\atop\text{CONV}}$ $\boxed{^{D}3}$ $\boxed{書込\atop\text{ENT}}$ $\longrightarrow$ After converting into decimal notation in $004003_{(8)}$, write "003."

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

File address: OCT (octal), word
Number of offset bytes: $DCM_{(D)}$, word
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.

Slave station 01
$004004_{(8)}$	Lower
$004005_{(8)}$	Upper
$004006_{(8)}$	$00_{(H)}$
$004007_{(8)}$	·

In case of standard function, set top address by file address$_{(8)}$.
In case of memory capacity save function, set number of offset bytes.

$00_{(H)}$: The top address is the same address of the master station regardless of the value set at of 004004 to $004005_{(8)}$.

$80_{(H)}$: The top address is different from the address of the master station (Offset is valid).
For the memory capacity save function, set in $80_{(H)}$.

Slave station $77_{(8)}$
$004374_{(8)}$	Lower
$004375_{(8)}$	Upper
$004376_{(8)}$	$00_{(H)}$
$004377_{(8)}$	·

$00_{(H)}$
$80_{(H)}$

• 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 in the previous page.)

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

(Word display) (Convert to octal figures)

Slave station 01

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

(Byte display)

| STEP (+) | 変換 CONV | 変換 CONV | 変換 CONV | 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).

(Convert to hexa-decimal figures)

| 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).

Slave station 02

| 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). (Setting area : See page 15·11 and 15·12.)
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)	
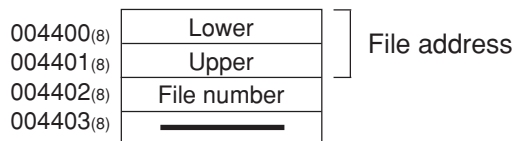
File address

• 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 10·21).

| 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).
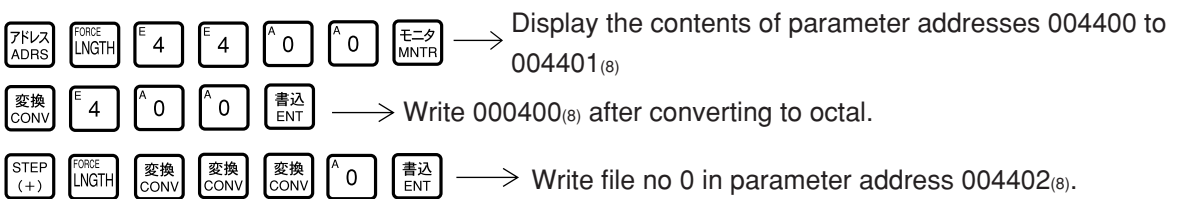
Screen display of JW-13PG

```
 04400      OCT     00
 04401      OCT     01
I PARAM.
>04402      OCT     00
```

10

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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: HEX (hexadecimal), byte
Number of offset bytes: DCM$_{(D)}$, word
Set the "same" as or "different" from the master station: HEX (hexadecimal) , bytes.

- Set in parameter addresses 004404 to 004777$_{(8)}$. (Setting area : See page 15·11 and 15·12.) These top addresses should not overlap the register link area, flag area, or any area used by other option module.

Slave station 01	004404$_{(8)}$	Lower
	004405$_{(8)}$	Upper
	004406$_{(8)}$	File number
	004407$_{(8)}$	·

In case of standard function, set top address by file address$_{(8)}$. In case of memory capacity save function, set number of offset bytes.

00$_{(H)}$: The top address is the same address of the master station regardless of the values set at of 004404 to 004405$_{(8)}$.

80$_{(H)}$: The top address is different from the address of the master station (Offset is valid). For the memory capacity save function, set in 80$_{(H)}$.

Slave station 77$_{(8)}$	004774$_{(8)}$	Lower
	004775$_{(8)}$	Upper
	004776$_{(8)}$	File number
	004777$_{(8)}$	·

00$_{(H)}$
80$_{(H)}$

- 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 10·21)
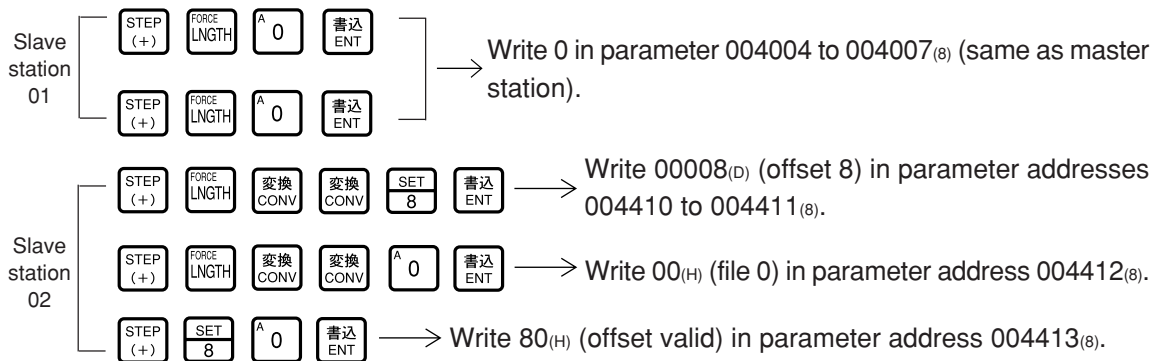
Slave station 01

[STEP (+)] [FORCE LNGTH] [A 0] [書込 ENT]
[STEP (+)] [FORCE LNGTH] [A 0] [書込 ENT]
→ Write 0 in parameter 004004 to 004007$_{(8)}$ (same as master station).

Slave station 02

[STEP (+)] [FORCE LNGTH] [変換 CONV] [変換 CONV] [SET 8] [書込 ENT]
→ Write 00008$_{(D)}$ (offset 8) in parameter addresses 004410 to 004411$_{(8)}$.

[STEP (+)] [FORCE LNGTH] [変換 CONV] [変換 CONV] [A 0] [書込 ENT]
→ Write 00$_{(H)}$ (file 0) in parameter address 004412$_{(8)}$.

[STEP (+)] [SET 8] [A 0] [書込 ENT]
→ Write 80$_{(H)}$ (offset valid) in parameter address 004413$_{(8)}$.

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 10·21

[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 10·21)

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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10

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 | } Enter by decimal |
| $005201_{(8)}$ | Upper | |
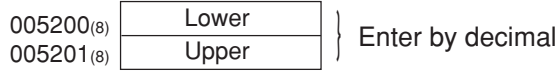
(In case of setting 16 bytes using JW-13PG: Example of page 10·21)

アドレス/ADRS 5[F] 2[C] 0[A] 0[A] モニタ/MNTR ⟶ Display the contents of parameter addresses 005200 to $005201_{(8)}$

1[B] 6 書込/ENT ⟶ Write $00016_{(D)}$ in decimal notation.
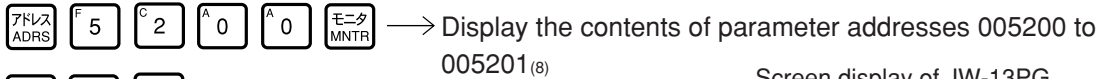
Screen display of JW-13PG

```
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
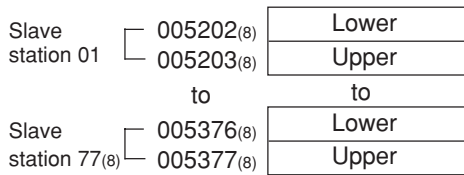
(In case of setting 8 bytes both for slave station 01 and 02: example of page 10·21)

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 $005205_{(8)}$.
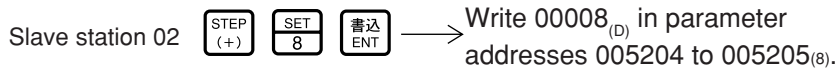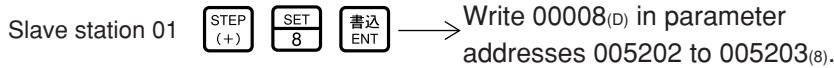
Screen display of JW-13PG

```
05200      D   00016
05202      D   00008
I PARAM.
>05204     D   00008
```

10

Set connection status of slave station **[Bit pattern, byte]**

・In the initial settings of the data link function, the JW-20MN 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 15·10.)

With the setting above, the JW-20MN 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 | 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 | ⟶ |
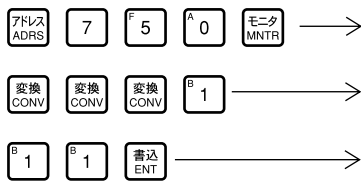
Screen display of JW-13PG

```
0 7 7 4 6  □□□□□□□□
0 7 7 4 7  □□□□□□□□
Ⅰ  PARAM.
＞0 7 7 5 0  □□□□□■■■
```

・When the JW-20MN is set to "Turn OFF a bit correspond to the slave station number," its slave station error code will not be displayed on the indicator lamp.

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.)

10

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 $007767_{(8)}$. (See page 15·11 and 15·12 for setting range)
- Flag area uses 24 bytes regardless number of connecting stations.

	Contents		Initial value
$007764_{(8)}$	Lower		$E0_{(H)}$
$007765_{(8)}$	Upper		$01_{(H)}$
$007766_{(8)}$		File number	$00_{(H)}$
$007767_{(8)}$	D7		$80_{(H)}$

Byte address
$01E0_{(H)} \rightarrow 000740_{(8)} \rightarrow ⊐0740$

File number 0

Output flag

Output flag : ON
Do not output flag : OFF

- In case of setting "⊐0740, output flag" using JW-13PG.

| アドレス ADRS | 7 | 7 | 6 | E 4 | モニタ MNTR | 変換 CONV | 変換 CONV | FORCE LNGTH | 7 | E 4 | A 0 | 書込 ENT |

Write "740(⊐740)" in parameter addresses 007764 to $007765_{(8)}$.

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

After switching to byte display, write file No. 0 with HEX (hexadecimal)

| STEP (+) | SET 8 | A 0 | 書込 ENT |

Write $80_{(H)}$ to address $007767_{(8)}$

Screen display of JW-13PG

```
07765      HEX    01
07766      HEX    00
I PARAM.
>07767     HEX    80
```

10

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↓

| **Writing to the EEPROM of the JW-20MN, 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-20MN.
- Then start the JW-20MN. After starting operation, the setting value changes to "01$_{(H)}$."

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

(Operation example of JW-13PG)

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

Display the contents of address 007777$_{(8)}$ Write 81$_{(H)}$

Screen display of JW-13PG

```
 07765    HEX    01
 07766    HEX    00
I PARAM.
>07767    HEX    80
```

Remarks

- Writing time to EEPROM is approximately 0.7 sec. When any error is found for parameter settings, the JW-20MN lights the error code (6F$_{(H)}$) by the indication lamp.
- ■ 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-20MN 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-20MN lights the error code (6E$_{(H)}$) by the indication lamp.
- If "parameter initialization" is selected, the module initializes parameter addresses 004000 to 007776$_{(8)}$.

10

To the next page

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From the previous page

PC operation

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

Screen display of JW-13PG

[✻] [✻] [MNTR MODE] [SET 8] ⟶ Monitor mode

[✻] [✻] [MNTR MODE] [SET 8] ⟶ Change mode

```
C00000
>
```

10

Chapter 11: Error and Treatment

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

11-1 Indicator lamp

Name	Operation	Recovery
COMM	Lights while the operating data link	————————
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	————————
COM.E	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-20MN is faulty)	Replace the JW-20MN
S0 to S7	Indicates error codes by hexadecimal when an error is occurred	See the next page.

```
         ME-NET

COMM ○        ○ S0
  SD ○        ○ S1
  RD ○        ○ S2
  CD ○        ○ S3
  LT ○        ○ S4
TEST ○        ○ S5
COM.E ○       ○ S6
UNT.E ○       ○ S7

        JW-20MN
```

Indicator lamp
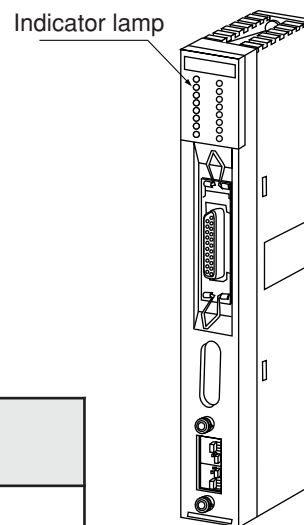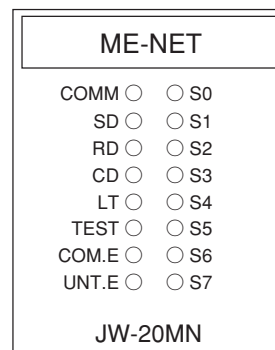
(Error code) Error codes are expressed with bit patterns from S0 to S7.

Error code (HEX)	Cause	Measure
01	ROM error, upper CPU	Replace the JW-20MN
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-20MN
12	RAM error, communication CPU	
18	Communication LSI error, communication CPU	
1F	No response, communication CPU	
20	More than one token detected	Check the parameter setting
21	Doubled address detected	
22	Fault of sending section	Replace the JW-20MN
23	Token does not return within the rated interval	Check the communication cable
2A	Overflow of receiving buffer. Occurs when the upper CPU processing is delayed.	Check the communication cable
2B	Frame length error — Occurs because of a media execution error or noise from outside.	
2C	Media error —	
30	EEPROM error	Replace the JW-20MN
*6E	BCC error	Check the parameter contents
6F	Parameter setting error	
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)	Check the communication cable and slave module

* Error codes $6E_{(H)}$ and C1 to $FF_{(H)}$ are special error codes used only by the JW-20MN. Other error codes are specified by the ME-NET specifications.

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11-2 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 コ0740 (initial value)]

Address								
コ0740	07	06	05	04	03	02	01	00
コ0741	17	16	15	14	13	12	11	10
コ0742	27	26	25	24	23	22	21	20
コ0743	37	36	35	34	33	32	31	30
コ0744	47	46	45	44	43	42	41	40
コ0745	57	56	55	54	53	52	51	50
コ0746	67	66	65	64	63	62	61	60
コ0747	77	76	75	74	73	72	71	70
コ0750	07	06	05	04	03	02	01	00
コ0751	17	16	15	14	13	12	11	10
コ0752	27	26	25	24	23	22	21	20
コ0753	37	36	35	34	33	32	31	30
コ0754	47	46	45	44	43	42	41	40
コ0755	57	56	55	54	53	52	51	50
コ0756	67	66	65	64	63	62	61	60
コ0757	77	76	75	74	73	72	71	70
コ0760	07	06	05	04	03	02	01	00
コ0761	17	16	15	14	13	12	11	10
コ0762	27	26	25	24	23	22	21	20
コ0763	37	36	35	34	33	32	31	30
コ0764	47	46	45	44	43	42	41	40
コ0765	57	56	55	54	53	52	51	50
コ0766	67	66	65	64	63	62	61	60
コ0767	77	76	75	74	73	72	71	70

Slave station 01(8)

Master station

① Communication monitor flag

Slave station 70(8)

Master station

Slave station 01(8)

② Operation condition monitor flag [1]

Slave station 70(8)

Master station

Slave station 01(8)

② Operation condition monitor flag [1]

Slave station 70(8)

Remarks

- Even a slave station can monitor 24 bytes of flag.

(2) In the case of a master station $00_{(8)}$

① 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 parameter address $007777_{(8)}$ of the master station is set to "$01_{(H)}$." and the master station is operating normally.	ON
	When the parameter address $007777_{(8)}$ of the master station 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.

② 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-20MN turns "ON" this flag while communicating.

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③ **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-20MN turns "ON" this flag while communicating.

[3] In the case of slave station 01 to 77$_{(8)}$

① 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 parameter address 007777$_{(8)}$ of each slave station is set to "01$_{(H)}$," and at communicating with a master station normally.	ON
	When the parameter address 007777$_{(8)}$ of each slave station is "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

② 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-20MN turns "ON" this flag while communicating.

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③ **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-20MN turns "ON" this flag while communicating.

(4) Monitor operation condition by each station PC

By creating a program having the flags shown below in each station's PC, the JW-20MN can monitor the operation condition of each station's PC.

[Example] In this case the flag top address is ⌐0740]

Flag top address

	7	6	5	4	3	2	1	0
⌐0740	07	06	05	04	03	02	01	00
to	to	to	to	to	to	to	to	to
⌐0747	77	76	75	74	73	72	71	70
⌐0750	07	06	05	04	03	02	01	00
to	to	to	to	to	to	to	to	to
⌐0757	77	76	75	74	73	72	71	70
⌐0757	07	06	05	04	03	02	01	00
to	to	to	to	to	to	to	to	to
⌐0760	77	76	75	74	73	72	71	70

Master station

① Communication monitor flag

Slave station 70$_{(8)}$

② Operation condition monitor flag (1)

③ Oparation condition monitor flag (2)

Slave station 01   Slave station 01   Slave station 01

Slave station 01 normal operation

Communication monitor   Operation condition (1)   Operarion condition (2)
07401   07501   07601

11-3 Storage of error code

When an error occurs in the JW-20MN, it stores the occurred error's code to system memory #160 and #170 of each station's PC.

Error code (HEX)	Cause		Error code stored to system memory		Mesure
			#160	#170 to #177	
01	ROM error, upper CPU		53$_{(H)}$	———	Replace the JW-22MN
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 station number • Replace the JW-20MN
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
21	Doubled address detected		———	21$_{(H)}$	
22	Fault of sending section		———	22$_{(H)}$	Replace the JW-20MN
23	Token does not return within the rated interval		———	23$_{(H)}$	Check the communication cable
2A	Over flow of receiving buffer. Occurs when the upper CPU processing isis delayed.		———	2A$_{(H)}$	
2B	Flame length error	· Occurs because of a media execution error or noise from outside.	———	2B$_{(H)}$	
2C	Media error		———	2C$_{(H)}$	
30	EEPROM error		———	30$_{(H)}$	Replace the JW-20MN
6E	BCC error		———	6E$_{(H)}$	Check the parameter setting
6F	Parameter setting error		———	6F$_{(H)}$	
C1 to FF	Communication error · After converting into octals, 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

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· In some cases, error code 23$_{(H)}$ or 2A$_{(H)}$ is stored when inputting power. This is not an error.

· Error codes 6E$_{(H)}$ and C1 to FF$_{(H)}$ are special error codes used only by the JW-20MN. Other error codes are specified by the ME-NET specifications.

• 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-20MN recovers from the error.

#177	#176	#175	#174	#173	#172	#171	#170	
✕	✕	✕	✕	✕	✕	✕	6E	Occurrence of BCC error

Disappear

✕	✕	✕	✕	✕	✕	6E	6F	Occurrence of parameter setting error
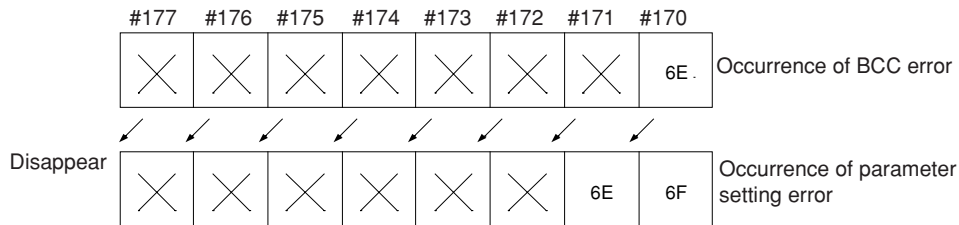
• When any of errors "$01_{(H)}$" to "$18_{(H)}$" occurs among the error codes listed on the previous page, the JW-20MN stores error code "$53_{(H)}$" (optional error) in the system memory #160. It does not store any error code in system memory #170.

• 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.

	7	6	5	4	3	2	1	0
#050								

Port 6 error   Port 4 error   Port 2 error

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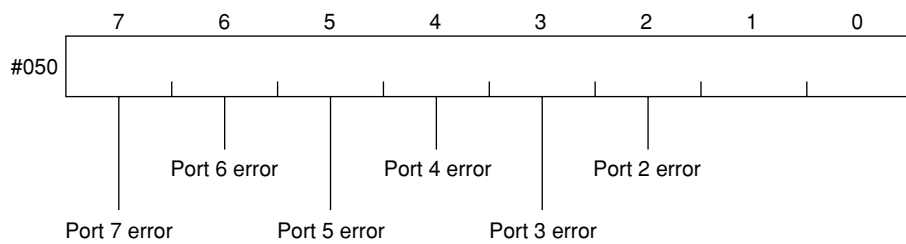
• The option slot port numbers are assigned in the order 2, 3, 4, 5, 6, 7, and so on, starting from the position closet to the control module.

(Ex.: JW-13BU)

Control module ──────

② ③ ④ ⑤ ⑥ ⑦
└──────── Port number

11
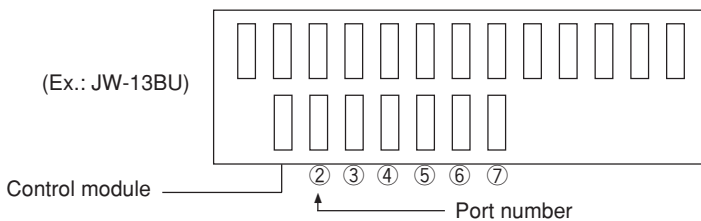
Chapter 12: Replacement of the JW-20MN

When you want to change the JW-20MN due to an operation fault (lighting UNT・E 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

```
              ( Start )
                 │
                 ▼
┌─────────────────────────────────┐
│   Turn "OFF" the PC's power      │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Remove the cables from the JW-20MN │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Remove the JW-20MN from the rack panel │   ( Loosen one retention screw and take out from the rack panel. )
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Set the switches of the new JW-20MN │   (See chapter 10)
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│     Install the new JW-20MN      │   (See page 4・3)
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Connect the cables to the new JW-20MN │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│   Turn "ON" the PC's power       │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│       Load the parameters.       │   ( Load the parameters stored in the floppy diskette into the new JW-20MN and write in the EEPROM, then start operation. For details, see chapter 13. )
└─────────────────────────────────┘
                 │
                 ▼
              ( End )
```

12

Chapter 13: Register and Load Parameters

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 for backup.)

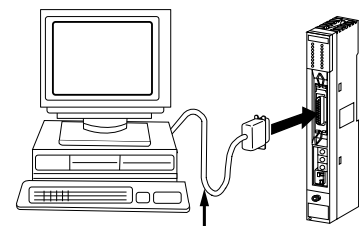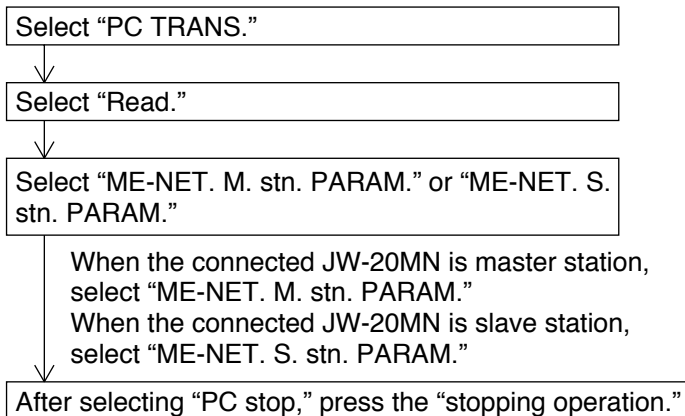| Model name	Applicable floppy diskettes
Ladder software (JW-50SP)	3.5-inch 2DD/2HD, 5-inch 2DD/2HD
Multipurpose programmer (JW-50PG)	3.5-inch 2DD
Ladder processor II (Z-100LP2S)	3.5-inch 2DD

・**Record and load using ladder software (JW-50SP)**
 (1) Record
  ① **Stop operation of the JW-20MN**

Select "PC TRANS."

↓

Select "Read."

↓

Select "ME-NET. M. stn. PARAM." or "ME-NET. S. stn. PARAM."

> When the connected JW-20MN is master station, select "ME-NET. M. stn. PARAM."
> When the connected JW-20MN is slave station, select "ME-NET. S. stn. PARAM."

↓

After selecting "PC stop," press the "stopping operation."

・ JW-50SP with a communi-
cation adaptor and a 9-pin/
25-pin conversion connector
・ Control module connection
cable

② **Record onto a personal computer**
After stopping operation, record the parameters of the JW-20MN onto the memory of the personal computer.

Select "Read out PARAM" and press the "Enter" key.

↓

Start reading to memory of the personal computer.
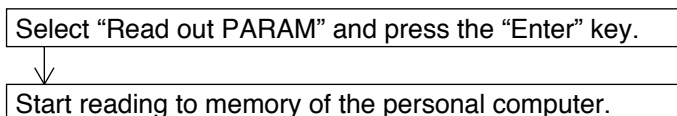
③ **Start operation of the JW-20MN**
After recording the parameters onto the personal computer, start operation of the JW-20MN.

Start operation of the JW-20MN

↓

Start PC operation
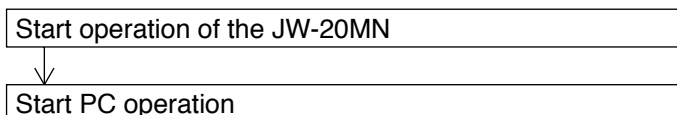
④ **Record onto a floppy diskette**
Write (record) the memory contents of the personal computer onto a floppy diskette.

Select "FD TRANS."

↓

Select "Save."

↓

Select "ME-NET. M. stn. PARAM." or "ME-NET. S. stn. PARAM."

> When the memory contents of the personal computer are for master station, select "ME-MET. M. stn. PARAM."
> When the memory contents of the personal computer are for slave station, select "ME-MET. S. stn. PARAM."

↓

Input a file name to record.

↓

Input comments.

↓

Press the "Enter" key.

↓

Start recording onto the 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.
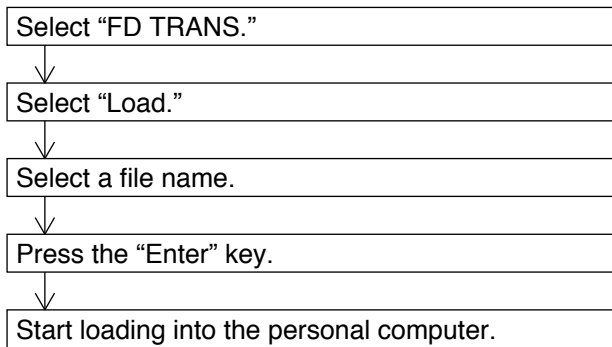
Select "FD TRANS."

↓

Select "Load."

↓

Select a file name.

↓

Press the "Enter" key.

↓

Start loading into the personal computer.

② **Stop operation of the JW-20MN**

After stopping operation, load the memory contents of the personal computer into the JW-20MN.

Select "PC TRANS."

↓

Select "Write."

↓

Select "ME-NET. M. stn. PARAM." or "ME-NET. S. stn. PARAM."

> When the connected JW-20MN is master station, select "ME-NET. M. stn. PARAM."
> When the connected JW-20MN is slave station, select "ME-NET. S. stn. PARAM."

↓

After selecting "PC stop," press the "Enter" key.

↓

After selecting "Execution stop," press the "Enter" key.

(· JW-50SP with a communi-
  cation adaptor and a 9-pin/
  25-pin conversion connector
· Control module connection
  cable)

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13·3

③ **Load to the JW-20MN**

After stopping operation, load the memory contents of the personal computer into the JW-20MN.

After selecting "Parameter writing," press the "Enter" key.

↓
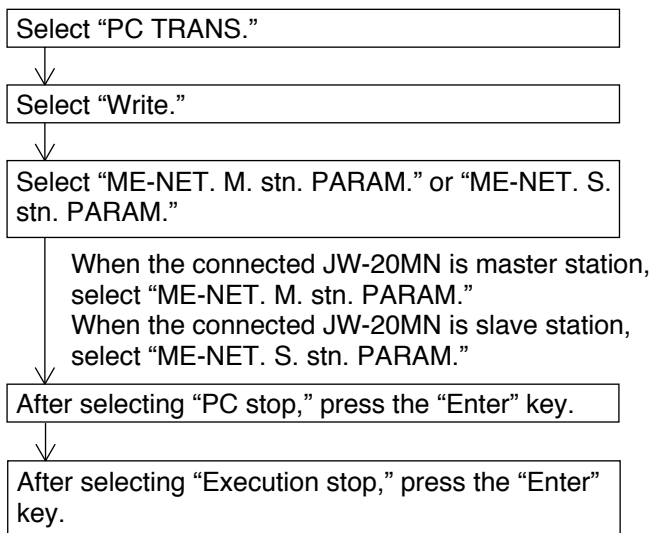
Start loading into the JW-20MN.
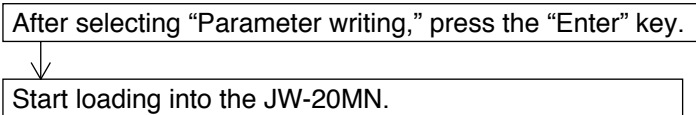
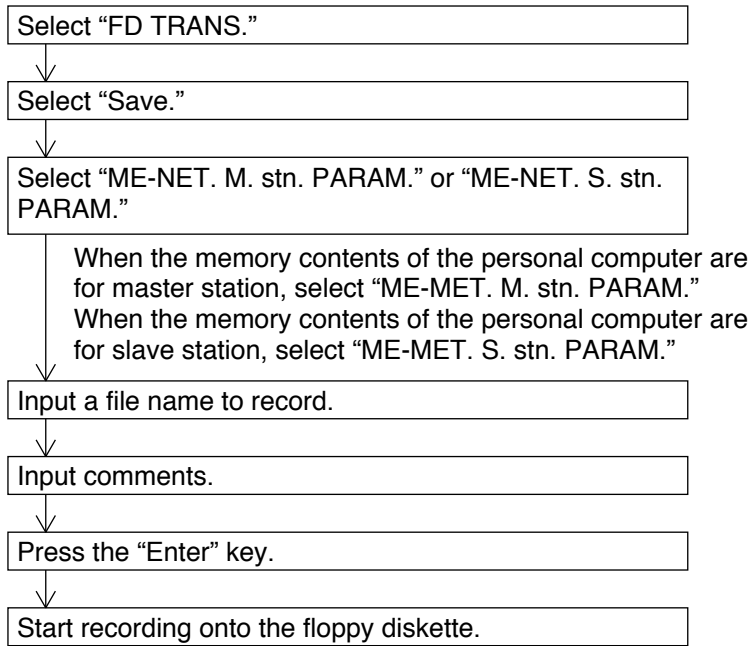④ **Start operation of the JW-20MN**

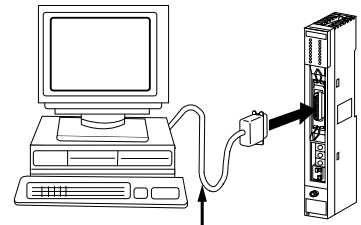After loading the parameters from the personal computer, start operation of the JW-20MN.

After selecting "Start: write EEPROM" or "Execution start"

↓

Start operation of the JW-20MN

↓

After selecting "PC Run," press the "Enter" key.

↓

Start PC operation

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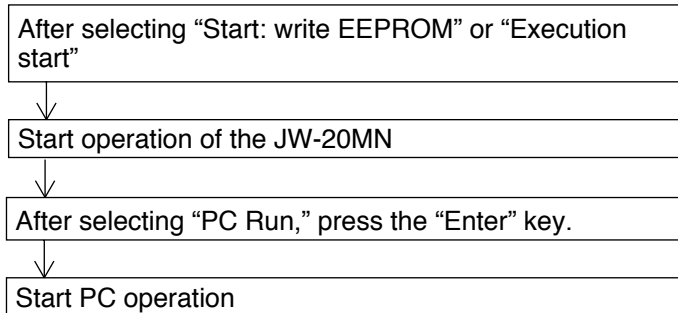
Chapter 14: Specifications

14-1 General specifications

Item	Specification
Storage temperature	−20 to ＋70℃
Ambient temperature	0 to ＋55℃
Ambient humidity	35 to 90%RH (without moisture condensation)
Vibration resistance	JIS-C-0911 equivalent (X, Y, Z, 2 hours each)
Shock resistance	JIS-C-0912 equivalent
Internal power consumption	600mA (DC5V)
Weight	Approx. 520g
Accessory	One instruction manual
Optional component	Optional cable (for two options)・・・・・ZW-2CC Optional cable (for four options)・・・・・ZW-4CC Optional cable (for six options)・・・・・・ZW-6CC

[Outside dimensional drawings]

(Unit: mm)
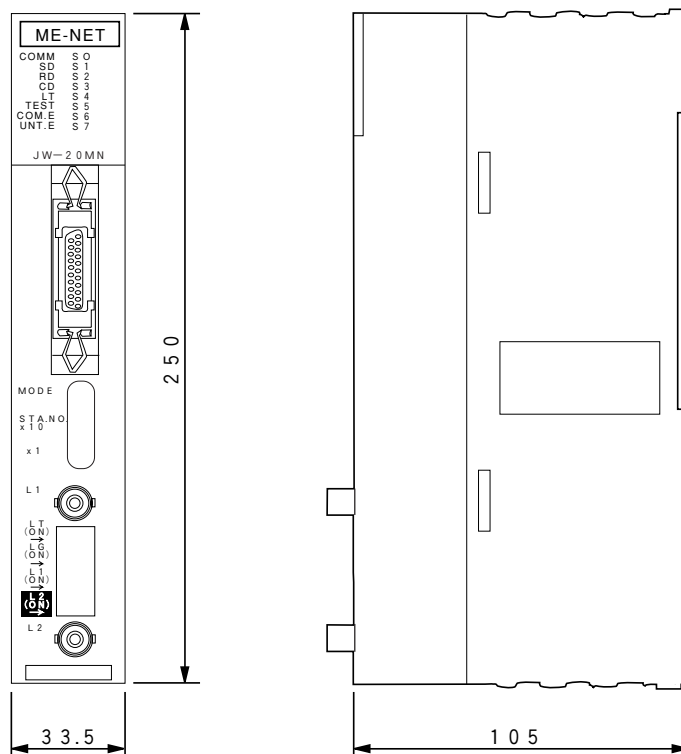
14-2 Communication specifications

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
Synchronous method	Bit synchronous
Modulation method	Continuous frequency phase modulation (FSK)
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 : 1km max.

· Data link specifications

Item		Specification	
		Relay link	Register link
No. of data link stations		64 sets max.	
Link area		File 0 ($000000_{(8)}$ to $007777_{(8)}$)	File 0 ($000000_{(8)}$ to $015777_{(8)}$) File 1 to 7 ($000000_{(8)}$ to $177777_{(8)}$)
Total No. of link points		2048 points max. (256 bytes)	2048 bytes max.
Total No. of sending/rec-eiving points per slave station	Standard function	1024 bytes max in total of link relays and register link.	
	Memory capacity save function	64 points max.	512 points max.
Communication mode		N: M communication	

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· Computer link specifications

Item	Specification
Number of link stations	64 stations max.
Communication data size	Maximum 1024 bytes per command
Communication control	According to the host computer command
Control functions	Data memory read/write Program memory read/write PC control Expansion function using the optional commands

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Chapter 15: Appendix

15-1 Maintenance and check

Check wiring, installation, and switch settings.

System configuration / Check item		( )	( )	( )	( )	( )
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-20MN	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.					
	Setting of L1 (communication line 1) is the same for all stations.					
	Setting of L2 (communication line 1) is the same for all stations.					
	Parameters are appropriately set.					

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15-2 Recovery method at communication errors

The method used to check and recover from errors, varies with the conditions in which the communication error occurred.

(1) During initial communication (start-up of the system)

① **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
$004000_{(8)}$ to $004001_{(8)}$	Relay link top address of master station	
$004003_{(8)}$	The number of connectable stations	
$004400_{(8)}$ to $004402_{(8)}$	Register link top address of master station	See page 10·13 and 10·14
$005000_{(8)}$ to $005177_{(8)}$	The number of relay link sending bytes of each station	
$005200_{(8)}$ to $005377_{(8)}$	The number of register link sending bytes of each station	
$007764_{(8)}$ to $007767_{(8)}$	Flag top address	

● 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
$004004_{(8)}$ to $004377_{(8)}$	Relay link top address of slave station	
	Relay link offset bytes of slave station	
$004404_{(8)}$ to $004777_{(8)}$	Register link top address of slave station	See page 10·13 and 10·14
$005000_{(8)}$ to $005177_{(8)}$	Number of relay link top address sending bytes of each station	
$005200_{(8)}$ to $005377_{(8)}$	Number of register link sending bytes of each station	

· When slave station is a communication module of other brand than Sharp, set appropriate in accordance with the specified set range of each module.

● 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$_{(8)}$	Number of relay link receiving bytes of slave station	See page 10· 6
007722, 007723$_{(8)}$	Number of register link receiving bytes of slave station	
007730 to 007733$_{(8)}$	Relay link top address of slave station	
007734 to 007737$_{(8)}$	Register link top address of slave station	
007764 to 007767$_{(8)}$	Flag top address	

* In case of using memory capacity save function

② **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$_{(8)}$	Function (relay/register link)	$01_{(H)}$
007777$_{(8)}$	Start/stop operation of the JW20MN	$01_{(H)}$

③ **Other cases**
· Check optional cable of PC (The JW-20MN does not operate normally without an optional cable.)
· Check error code (See page 11·1)
· Check switches of the JW-20MN
[Switches required check in the JW-20MN]
  ① Station number (STA NO.)
  ② Mode switch (MODE)
  ③ Line changeover switches (L1/L2)
  ④ Termination resistance switch (LT)
  ⑤ Shield 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.
    * For details of switch settings, see Chapter 10.
· Check cables and connectors
[Check items of cables and connectors]
  ① No looseness or removal of connectors (turn the connector right until it completely locks).
  ② Connectors are appropriately fixed on the cables (When any faults such as extrusion of pins or connector being easily removed by pulling, reinstall these connectors.)
  ③ Wiring conditions are appropriate (See chapters 5 and 6).
  ④ Not too long branch lines (shorter than 400 mm).
  ⑤ Termination resistance are correctly connected. (Turn "ON" the termination resistance switch of the termination stations or install a terminator.)

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(2) When the communication error occurs instantaneously.
Cause may be:
· Noise on the communication line.
· Fault of a communication module.
· Fault of a communication cable.

① **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.

② **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 *
● Error code (See page 11·1)

③ **When identification of the cause is difficult.**
Condition of the circuit may be unstable.*

(3) When the communication error occurs continuously.

① **Identify the error station.**
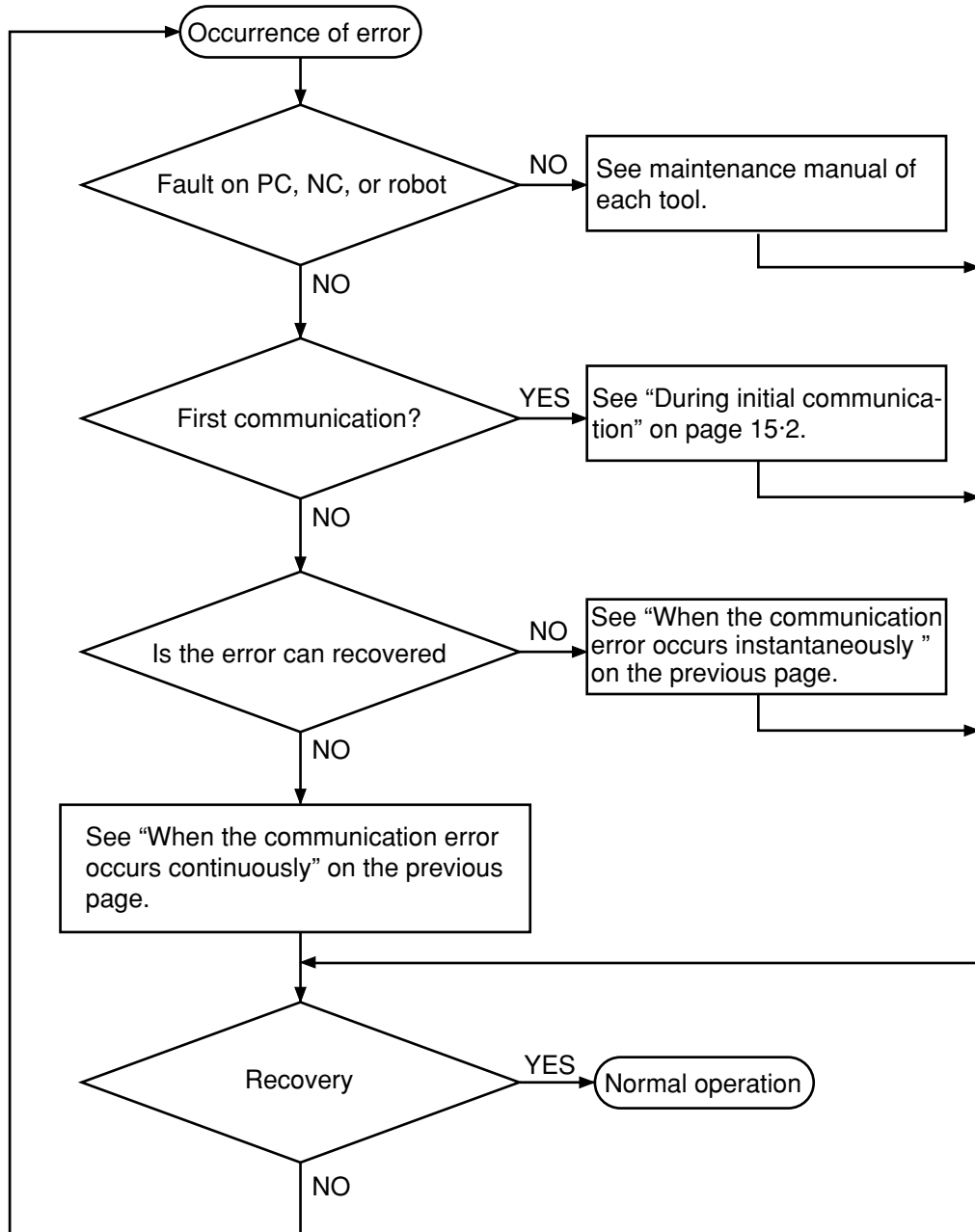Specify the error's station using the communication flag etc., and check this station.
· Check the power of the error's station.
· Check the error code of the error's station.
· Check cables near the error's station.*

② **When identification of the cause is difficult.**
Condition of the whole circuit may be unstable. Check cables and connectors.*

*: See [Check items of cables and connectors] in the previous page.

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(4) Recovery method at communication errors

```
                    ( Occurrence of error )
                              │
                              ▼
                   ╱◇╲                         NO    ┌──────────────────────────┐
              Fault on PC, NC, or robot ─────────────▶│ See maintenance manual of │
                   ╲◇╱                                │ each tool.                │
                              │ NO                    └──────────────────────────┘
                              ▼
                   ╱◇╲                        YES    ┌──────────────────────────┐
               First communication? ──────────────────▶│ See "During initial communica- │
                   ╲◇╱                                │ tion" on page 15·2.        │
                              │ NO                    └──────────────────────────┘
                              ▼
                   ╱◇╲                         NO    ┌──────────────────────────┐
            Is the error can recovered ─────────────▶│ See "When the communication │
                   ╲◇╱                                │ error occurs instantaneously " │
                              │ NO                    │ on the previous page.      │
                              ▼                       └──────────────────────────┘
              ┌──────────────────────────┐
              │ See "When the communication error │
              │ occurs continuously" on the previous │
              │ page.                     │
              └──────────────────────────┘
                              │
                              ▼
                   ╱◇╲                        YES    ( Normal operation )
                    Recovery  ──────────────────────▶
                   ╲◇╱
                              │ NO
```

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15·5

15-3 Table of parameter memory

(1) Master station

Address(8)	Set contents		Setting method (value, example)	
000000	Store the mis-setting slave station number in the master station		—	—
004000	Top address of relay link area in the master		(Octal, word)	When ⊐1000, set to 001000(8) by file
004001	station			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	(Octal, word)	When ⊐1200, set to 001200(8) (Set by file address)
		004005		
		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	(Decimal, word)	When 100 bytes, set to 00100(D)
		004005		
		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	Address (8)	Set contents
004010 to 004013	Top address or number of offset bytes on slave station 02(8) (same as 004004 to 004007).	004200 to 004203	Top address or number of offset bytes on slave station 40(8) (same as 004004 to 004007).
004014 to 004017	03(8) (same as 004004 to 004007)	004204 to 004207	41(8) (same as 004004 to 004007)
004020 to 004023	04(8) (same as 004004 to 004007)	004210 to 004213	42(8) (same as 004004 to 004007)
004024 to 004027	05(8) (same as 004004 to 004007)	004214 to 004217	43(8) (same as 004004 to 004007)
004030 to 004033	06(8) (same as 004004 to 004007)	004220 to 004223	44(8) (same as 004004 to 004007)
004034 to 004037	07(8) (same as 004004 to 004007)	004224 to 004227	45(8) (same as 004004 to 004007)
004040 to 004043	10(8) (same as 004004 to 004007)	004230 to 004233	46(8) (same as 004004 to 004007)
004044 to 004047	11(8) (same as 004004 to 004007)	004234 to 004237	47(8) (same as 004004 to 004007)
004050 to 004053	12(8) (same as 004004 to 004007)	004240 to 004243	50(8) (same as 004004 to 004007)
004054 to 004057	13(8) (same as 004004 to 004007)	004244 to 004247	51(8) (same as 004004 to 004007)
004060 to 004063	14(8) (same as 004004 to 004007)	004250 to 004253	52(8) (same as 004004 to 004007)
004064 to 004067	15(8) (same as 004004 to 004007)	004254 to 004257	53(8) (same as 004004 to 004007)
004070 to 004073	16(8) (same as 004004 to 004007)	004260 to 004263	54(8) (same as 004004 to 004007)
004074 to 004077	17(8) (same as 004004 to 004007)	004264 to 004267	55(8) (same as 004004 to 004007)
004100 to 004103	20(8) (same as 004004 to 004007)	004270 to 004273	56(8) (same as 004004 to 004007)
004104 to 004107	21(8) (same as 004004 to 004007)	004274 to 004277	57(8) (same as 004004 to 004007)
004110 to 004113	22(8) (same as 004004 to 004007)	004300 to 004303	60(8) (same as 004004 to 004007)
004114 to 004117	23(8) (same as 004004 to 004007)	004304 to 004307	61(8) (same as 004004 to 004007)
004120 to 004123	24(8) (same as 004004 to 004007)	004310 to 004313	62(8) (same as 004004 to 004007)
004124 to 004127	25(8) (same as 004004 to 004007)	004314 to 004317	63(8) (same as 004004 to 004007)
004130 to 004133	26(8) (same as 004004 to 004007)	004320 to 004323	64(8) (same as 004004 to 004007)
004134 to 004137	27(8) (same as 004004 to 004007)	004324 to 004327	65(8) (same as 004004 to 004007)
004140 to 004143	30(8) (same as 004004 to 004007)	004330 to 004333	66(8) (same as 004004 to 004007)
004144 to 004147	31(8) (same as 004004 to 004007)	004334 to 004337	67(8) (same as 004004 to 004007)
004150 to 004153	32(8) (same as 004004 to 004007)	004340 to 004343	70(8) (same as 004004 to 004007)
004154 to 004157	33(8) (same as 004004 to 004007)	004344 to 004347	71(8) (same as 004004 to 004007)
004160 to 004163	34(8) (same as 004004 to 004007)	004350 to 004353	72(8) (same as 004004 to 004007)
004164 to 004167	35(8) (same as 004004 to 004007)	004354 to 004357	73(8) (same as 004004 to 004007)
004170 to 004173	36(8) (same as 004004 to 004007)	004360 to 004363	74(8) (same as 004004 to 004007)
004174 to 004177	37(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).

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) by file address	
004401					
004402			(Hexadecimal, byte)	When file No.1 = 01(H)	
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) When file No. 2 = 02(H) 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	Address (8)	Set contents
004410 to 004413	Top address or number of offset bytes on slave station 02(8) (same as 004404 to 004407).	004600 to 004603	Top address or number of offset bytes on slave station 40(8) (same as 004404 to 004407).
004414 to 004417	03(8) (same as 004404 to 004407)	004604 to 004607	41(8) (same as 004404 to 004407)
004420 to 004423	04(8) (same as 004404 to 004407)	004610 to 004613	42(8) (same as 004404 to 004407)
004424 to 004427	05(8) (same as 004404 to 004407)	004614 to 004617	43(8) (same as 004404 to 004407)
004430 to 004433	06(8) (same as 004404 to 004407)	004620 to 004623	44(8) (same as 004404 to 004407)
004434 to 004437	07(8) (same as 004404 to 004407)	004624 to 004627	45(8) (same as 004404 to 004407)
004440 to 004443	10(8) (same as 004404 to 004407)	004630 to 004633	46(8) (same as 004404 to 004407)
004444 to 004447	11(8) (same as 004404 to 004407)	004634 to 004637	47(8) (same as 004404 to 004407)
004450 to 004453	12(8) (same as 004404 to 004407)	004640 to 004643	50(8) (same as 004404 to 004407)
004454 to 004457	13(8) (same as 004404 to 004407)	004644 to 004647	51(8) (same as 004404 to 004407)
004460 to 004463	14(8) (same as 004404 to 004407)	004650 to 004653	52(8) (same as 004404 to 004407)
004464 to 004467	15(8) (same as 004404 to 004407)	004654 to 004657	53(8) (same as 004404 to 004407)
004470 to 004473	16(8) (same as 004404 to 004407)	004660 to 004663	54(8) (same as 004404 to 004407)
004474 to 004477	17(8) (same as 004404 to 004407)	004664 to 004667	55(8) (same as 004404 to 004407)
004500 to 004503	20(8) (same as 004404 to 004407)	004670 to 004673	56(8) (same as 004404 to 004407)
004504 to 004507	21(8) (same as 004404 to 004407)	004674 to 004677	57(8) (same as 004404 to 004407)
004510 to 004513	22(8) (same as 004404 to 004407)	004700 to 004703	60(8) (same as 004404 to 004407)
004514 to 004517	23(8) (same as 004404 to 004407)	004704 to 004707	61(8) (same as 004404 to 004407)
004520 to 004523	24(8) (same as 004404 to 004407)	004710 to 004713	62(8) (same as 004404 to 004407)
004524 to 004527	25(8) (same as 004404 to 004407)	004714 to 004717	63(8) (same as 004404 to 004407)
004530 to 004533	26(8) (same as 004404 to 004407)	004720 to 004723	64(8) (same as 004404 to 004407)
004534 to 004537	27(8) (same as 004404 to 004407)	004724 to 004727	65(8) (same as 004404 to 004407)
004540 to 004543	30(8) (same as 004404 to 004407)	004730 to 004733	66(8) (same as 004404 to 004407)
004544 to 004547	31(8) (same as 004404 to 004407)	004734 to 004737	67(8) (same as 004404 to 004407)
004550 to 004553	32(8) (same as 004404 to 004407)	004740 to 004743	70(8) (same as 004404 to 004407)
004554 to 004557	33(8) (same as 004404 to 004407)	004744 to 004747	71(8) (same as 004404 to 004407)
004560 to 004563	34(8) (same as 004404 to 004407)	004750 to 004753	72(8) (same as 004404 to 004407)
004564 to 004567	35(8) (same as 004404 to 004407)	004754 to 004757	73(8) (same as 004404 to 004407)
004570 to 004573	36(8) (same as 004404 to 004407)	004760 to 004763	74(8) (same as 004404 to 004407)
004574 to 004577	37(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		Address (8)	Set contents
005004 to 005005	Number of sending bytes of slave station 02(8) relay link area (same as 005002 to 005003).		005100 to 005101	Number of sending bytes of slave station 40(8) relay link area (same as 005002 to 005003).
005006 to 005007	03(8) (same as 005002 to 005003)		005102 to 005103	41(8) (same as 005002 to 005003)
005010 to 005011	04(8) (same as 005002 to 005003)		005104 to 005105	42(8) (same as 005002 to 005003)
005012 to 005013	05(8) (same as 005002 to 005003)		005106 to 005107	43(8) (same as 005002 to 005003)
005014 to 005015	06(8) (same as 005002 to 005003)		005110 to 005111	44(8) (same as 005002 to 005003)
005016 to 005017	07(8) (same as 005002 to 005003)		005112 to 005113	45(8) (same as 005002 to 005003)
005020 to 005021	10(8) (same as 005002 to 005003)		005114 to 005115	46(8) (same as 005002 to 005003)
005022 to 005023	11(8) (same as 005002 to 005003)		005116 to 005117	47(8) (same as 005002 to 005003)
005024 to 005025	12(8) (same as 005002 to 005003)		005120 to 005121	50(8) (same as 005002 to 005003)
005026 to 005027	13(8) (same as 005002 to 005003)		005122 to 005123	51(8) (same as 005002 to 005003)
005030 to 005031	14(8) (same as 005002 to 005003)		005124 to 005125	52(8) (same as 005002 to 005003)
005032 to 005033	15(8) (same as 005002 to 005003)		005126 to 005127	53(8) (same as 005002 to 005003)
005034 to 005035	16(8) (same as 005002 to 005003)		005130 to 005131	54(8) (same as 005002 to 005003)
005036 to 005037	17(8) (same as 005002 to 005003)		005132 to 005133	55(8) (same as 005002 to 005003)
005040 to 005041	20(8) (same as 005002 to 005003)		005134 to 005135	56(8) (same as 005002 to 005003)
005042 to 005043	21(8) (same as 005002 to 005003)		005136 to 005137	57(8) (same as 005002 to 005003)
005044 to 005045	22(8) (same as 005002 to 005003)		005140 to 005141	60(8) (same as 005002 to 005003)
005046 to 005047	23(8) (same as 005002 to 005003)		005142 to 005143	61(8) (same as 005002 to 005003)
005050 to 005051	24(8) (same as 005002 to 005003)		005144 to 005145	62(8) (same as 005002 to 005003)
005052 to 005053	25(8) (same as 005002 to 005003)		005146 to 005147	63(8) (same as 005002 to 005003)
005054 to 005055	26(8) (same as 005002 to 005003)		005150 to 005151	64(8) (same as 005002 to 005003)
005056 to 005057	27(8) (same as 005002 to 005003)		005152 to 005153	65(8) (same as 005002 to 005003)
005060 to 005061	30(8) (same as 005002 to 005003)		005154 to 005155	66(8) (same as 005002 to 005003)
005062 to 005063	31(8) (same as 005002 to 005003)		005156 to 005157	67(8) (same as 005002 to 005003)
005064 to 005065	32(8) (same as 005002 to 005003)		005160 to 005161	70(8) (same as 005002 to 005003)
005066 to 005067	33(8) (same as 005002 to 005003)		005162 to 005163	71(8) (same as 005002 to 005003)
005070 to 005071	34(8) (same as 005002 to 005003)		005164 to 005165	72(8) (same as 005002 to 005003)
005072 to 005073	35(8) (same as 005002 to 005003)		005166 to 005167	73(8) (same as 005002 to 005003)
005074 to 005075	36(8) (same as 005002 to 005003)		005170 to 005171	74(8) (same as 005002 to 005003)
005076 to 005077	37(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)

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· Initial value of the address 005000 to 005177(8) are all 00(H).

Address (8)	Set contents	Setting method (value, example)
005200	Number of sending bytes of master station register link area	(Decimal, word)
005201		
005202	Number of sending bytes of slave station 01(8) register link area	(Decimal, word)
005203		

When 64 bytes, set to 00064(D)

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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Address (8)	Set contents	Setting method (value, example)		

007750 to 007757	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 007750)
	At ON: Output error code
	At OFF: Do not output error code.
		Bit address 7 6 5 4 3 2 1 0
		007750 07 06 05 04 03 02 01 00
		007751 17 16 15 14 13 12 11 10
		007752 27 26 25 24 23 22 21 20
		007753 37 36 35 34 33 32 31 30
		007754 47 46 45 44 43 42 41 40
		007755 57 56 55 54 53 52 51 50
		007756 67 66 65 64 63 62 61 60
		007757 77 76 75 74 73 72 71 70
			• When connecting slave station 01 to 04(8) and output error code:
			  (Address) (Bit pattern)
			  007750 — 00011111
			  007751 — 00000000
			    to to
			  007757 — 00000000	

007763	Whether the station number information should be output or not V5	00(H)	Do not output	
		01(H)	Output	
007764 to 007767	Flag area top address on the master station	007764	(Octal, word)	When ⊐0200, set to 000200(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
007777	Stop operation of the data link	00(H)		
	Start operation of the data link	01(H)		
	Writing to EEPROM or operation of the JW-20MN/stop operation	80(H)	———	
	Writing to EEPROM or operation of the JW-20MN/start operation	81(H)		
	Initialize parameter settings	08(H)		

· For initial values of above address, see page 10·13.

(2) Slave station (01 to 77$_{(8)}$)

Address $_{(8)}$	Set contents		Setting method (value, example)	
007720 007721	Number of receiving bytres of relay link in memory capacity save function V5		(Decimal, word)	When 8 bytes, set to 00008$_{(D)}$
007722 007723	Number of receiving bytes of register link in memory capacity save function V5		(Decimal, word)	When 64 bytes, set to 00064$_{(D)}$
007730 to 007733	Top address of relay link area in memory capacity save function V5	007730	(Octal, byte)	When ⊐10200, 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, byte)	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
			00$_{(H)}$	Output
007764 to 007767	Top address of flag area on each slave station	007764	(Octal, word)	When ⊐0600, 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
007777	Stop operation of the data link		00$_{(H)}$	
	Start operation of the data link		01$_{(H)}$	
	Writing to EEPROM or operation of the JW-20MN / stop operation		80$_{(H)}$	
	Writing to EEPROM or operation of the JW-20MN / start operation		81$_{(H)}$	—————
	Initialize parameter settings		08$_{(H)}$	

· For initial values of above address, see page 10· 6.

15-4 Address map of data memory

(1) Date link

(File 0)

	I/O address of Sharp PC			ME-NET address		Setting range	
	Bit address(8) 1 address = 1 point	Byte address(8) 1 address = 8 points	File address(8) 1 address = 8 points	Hexadecimal in units of byte	Octal in units of byte	W70H W100H	JW50/70/100 JW50H/70H/100H
I/O relay	00000 to 03777	⊐0000 to ⊐0377	000000 to 000377	0000 to 00FF	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	0100 to 016F	000400 to 000677		
Latched relay	07000 to 07777	⊐0700 to ⊐0777	000700 to 000777	0170 to 01FF	000700 to 000777		
General purpose relay	10000 to 15777	⊐0100 to ⊐1577	001000 to 001577	0200 to 037F	001000 to 001577		
TMR/CNT contact	T·C000 to T·C777		001600 to 001777	0380 to 03FF	001600 to 001777		
TMR/CNT /MD current value		b0000 to b1777	002000 to 003777	0400 to 07FF	002000 to 003777		
Register		09000 to 09777	004000 to 004777	0800 to 09FF	004000 to 004777		
Register		19000 to 19777	005000 to 005777	0A00 to 0BFF	005000 to 005777		
Register		29000 to 29777	006000 to 006777	0C00 to 0DFF	006000 to 006777		
Register		39000 to 39777	007000 to 007777	0E00 to 0FFF	007000 to 007777		
Register		49000 to 49777	010000 to 010777	1000 to 11FF	010000 to 010777		
Register		59000 to 59777	011000 to 011777	1200 to 13FF	011000 to 011777		
Register		69000 to 69777	012000 to 012777	1400 to 15FF	012000 to 012777		
Register		79000 to 79777	013000 to 013777	1600 to 17FF	013000 to 013777		
Register		89000 to 89777	014000 to 014777	1800 to 19FF	014000 to 014777		
Register		99000 to 99777	015000 to 015777	1A00 to 1BFF	015000 to 015777		
Register		E0000 to E1777	016000 to 016777	1C00 to 1FFF	016000 to 017777		

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	I/O address of Sharp PC			ME-NET address		Setting range	
	Bit address$_{(8)}$ 1 address = 1 point	Byte address$_{(8)}$ 1 address = 8 points	File address$_{(8)}$ 1 address = 8 points	Hexadecimal in units of byte	Octal in units of byte	W70H W100H	JW50/70/100 JW50H/70H/100H
File 1 Register			000000 to 177777	0000 to FFFF	000000 to 177777	Register link area / Flag area	Register link area / Flag area
File 2 Register			000000 to 177777	0000 to FFFF	000000 to 177777		
File 3 Register			000000 to 177777	0000 to FFFF	000000 to 177777		
File 4 Register			000000 to 177777	0000 to FFFF	000000 to 177777		
File 5 Register			000000 to 177777	0000 to FFFF	000000 to 177777		
File 6 Register			000000 to 177777	0000 to FFFF	000000 to 177777		
File 7 Register			000000 to 177777	0000 to FFFF	000000 to 177777		

· Set addresses of the relay link area, register link area, and flag area so that they will not doubled.
· When the data memory is used as relay link area, register link area, or flag area, make sure that its address is not used for other purpose. Especially the following addresses are already reserved for specific applications. These cannot use for other applications.
    Special relay area (073000 to 07377$_{(8)}$, 15760 to 15767$_{(8)}$)
    TMR, CNT contact (T·C000 to T·C777)
    TMR, CNT, MD current value (b0000 to b1777) etc.
· In case of JW50/70/100 and JW50H/70H/100H, usable file numbers vary with a memory module used.

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$_{(8)}$ to 037777$_{(8)}$.

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
(2) Commputer link

	PC memory address(8)	ME-NET address(8)	Capacity	Remarks
I/O relay	00000 to 03777	00000 to 03777	2048 points	Bit address
Auxilialy relay	04000 to 06777	04000 to 06777	1536 points	
Latched relay	07000 to 07777	07000 to 07777	512 points	
General purpose relay	10000 to 15777	10000 to 15777	3072 points	
TMR/CNT contact	T0000 to T0777	16000 to 17777 Odd number address only	512 points	
I/O relay	∃0000 to ∃0377	SEG0 00000 to 00377	256 bytes	Byte address
Auxilialy relay	∃0400 to ∃0677	SEG0 00400 to 00677	192 bytes	
Latched relay	∃0700 to ∃0777	SEG0 00700 to 00777	64 bytes	
General purpose relay	∃1000 to ∃1577	SEG0 01000 to 01577	384 bytes	
TMR/CNT current value	b0000 to b1777	SEG0 02000 to 03777	1024 bytes	
Register	09000 to 09777	SEG0 04000 to 04777	512 bytes	
	19000 to 19777	SEG0 05000 to 05777	512 bytes	
	29000 to 29777	SEG0 06000 to 06777	512 bytes	
	39000 to 39777	SEG0 07000 to 07777	512 bytes	
	49000 to 49777	SEG0 10000 to 10777	512 bytes	

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	PC memory address$_{(8)}$	ME-NET address$_{(8)}$	Capacity	Remarks
Register	59000 to 59777	SEG0 11000 to 11777	512 bytes	Byte address
	69000 to 69777	SEG0 12000 to 12777	512 bytes	
	79000 to 79000	SEG0 13000 to 13777	512 bytes	
	89000 to 89777	SEG0 14000 to 14777	512 bytes	
	99000 to 99777	SEG0 15000 to 15777	512 bytes	
	E0000 to E1777	SEG0 16000 to 17777	1024 bytes	
	File 1 to 7 000000 to 177777	SEG 1 to 7 000000 to 177777	60 K bytes each	
TMR/CNT number	0000 to 0777	0000 to 0777	512	
Program address	000000 to 076777	SEG8 000000 to 076777	32256 steps	
	100000 to 176777	SEG9 000000 to 076777	32256 steps	

· Addresses 07300$_{(8)}$ to 07377$_{(8)}$ and addresses 15760$_{(8)}$ to 15767$_{(8)}$ (bit address) are special relay areas.
· The addresses that can be used vary with the PC model and capacity. For details, see the instruction manual for each model.

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15-5 Switch setting table

Settings when delivered

	Data link (standard function), computer link		Data link (save memory capacity function), computer link
	Master station	**Slave station**	**Slave station**
MODE → 0	2	2	3
STA.NO. ×10 → 0	0	0 to 7	0 to 7
×1 → 0	0	0 to 7	0 to 7

STA.NO. combined: 01 to 77$_{(8)}$ (for standard Slave station), 01 to 77$_{(8)}$ (for save memory Slave station)

Switch	Description
L T (ON) → OFF	Turn ON this switch on both of the end stations in the communication circuit. Turn this switch OFF for all other stations.
L G (ON) → ON	Select ON or OFF to ground the shield line.
L 1 (ON) → OFF	When communication line 1 is used, turn this switch ON for all of the stations. Turn OFF the L2 switch for all of the stations.
L 2 (ON) → ON	When communication line 2 is used, turn this switch ON for all of the stations. Turn OFF the L1 switch for all of the stations.

15-6 Table for connecting cables and the connector parts

	Name	Model	Manufacturer
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 tool	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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15-7 Special functions unique to the JW-20MN

The functions below are not covered by the ME-NET specifications. They can only be used with PCs which are equipped with a JW-20MN, ZW-20CM2, or JW-21MN.

(1) Remote programming and remote monitor

This paragraph describes the operation procedure of any other station's PC which is connected on the ME-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-20MN remotely programs or monitors the new JW30H model (JW-31CUH1/32CUH1/33CUH1/33CUH2/33CUH3), they should be used in the combination below.
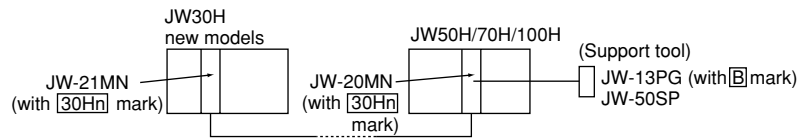
If the JW-20MN, to which a support tool is connected, has a 30H sticker, the JW-20MN will identify the new JW30H model as conventional model (JW-31CUH/32CUH/33CUH).
If the JW-20MN, to which a support tool is connected, does not have a 30H 30Hn sticker, it must be used with the following limitations.

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-20MN remotely programs or monitors the conventional JW30H model (JW-31CUH/32CUH/33CUH), they should be used in the combination below.
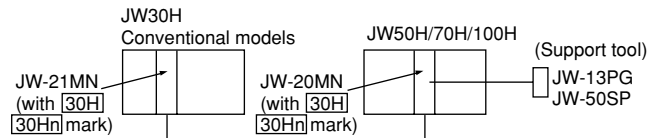
If the JW-20MN, to which a support tool is connected, does not have a 30H 30Hn sticker, it must be used with the following limitations.

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-92SP is used, it will identify the conventional JW30H model properly. However, it cannot handle the secret function.

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• 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).

JW50H/70H/100H

JW-20MN — JW-20MN JW-20RS — JW13PG/12PG JW-92SP, JW-52SP
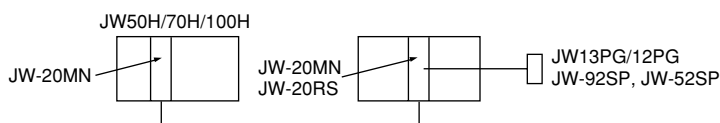
Ex.: If remote programming or remote monitoring is executed with the combination below (enter $200_{(8)}$ or $201_{(8)}$ at station A system memory address #0201), there are the following limitations:
　　· TMR/CNT1000 to 1777 will not be displayed properly.
　　· You will be unable to write/insert/delete programs using the TMR/CNT instructions.

Station A JW-20CM

JW50H/70H/100H

① ② Programmer
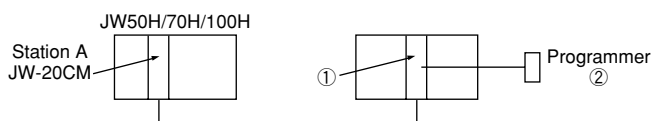
$\left(\begin{array}{l} \text{· If ① is a ZW-20CM and ② is a} \\ \text{JW-12PG.} \\ \text{· If ① is a ZW/JW-20MN and ②} \\ \text{is a JW-11PG.} \end{array} \right)$

① **Function**
   < Standard network connection >

Support tool

n − 2　　n − 1　　n　　n + 1　　n + 2

ME-NET

< Expansion network connection >

Support tool

n − 2　　n − 1　　n　　n + 1　　n + 2　m　　m + 1　　m + 2

*

ME-NET
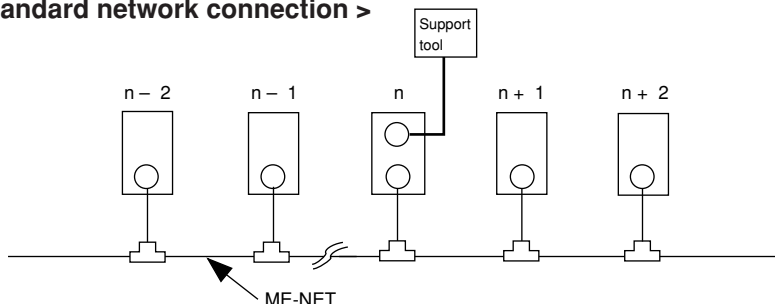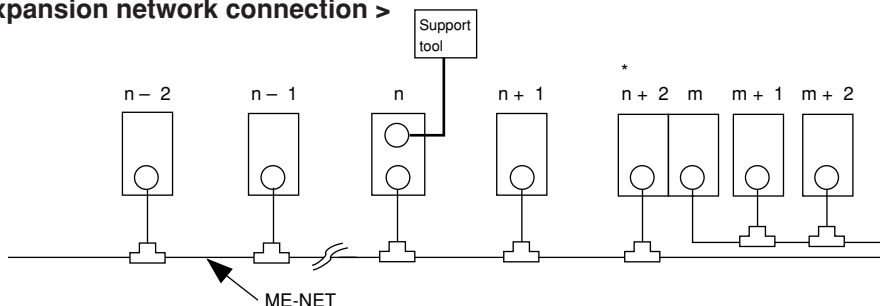
* The JW-21MN is unusable as a junction station ("n + 2" station and "m" station in the figure above). Use JW30H (JW-22CM), JW50H/70H/100H (JW-20CM).

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 $\left(\begin{array}{l} \text{Writing data (change program) during operation of the PC is not} \\ \text{available for hazard prevention reasons. Stop operation of the PC} \\ \text{prior to writing data.} \end{array} \right)$
　　· 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.
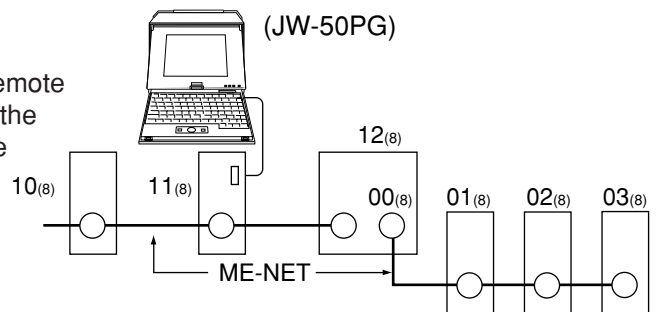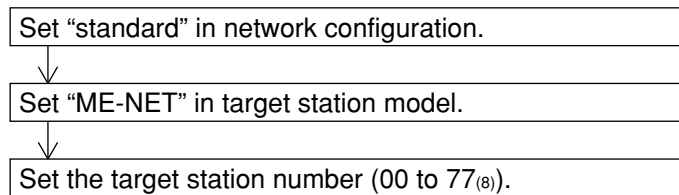
· Connect the JW-50PG to the JW-20CM on the ME-NET.
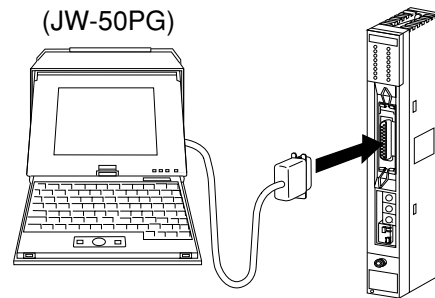
(JW-50PG)

· Set communication mode
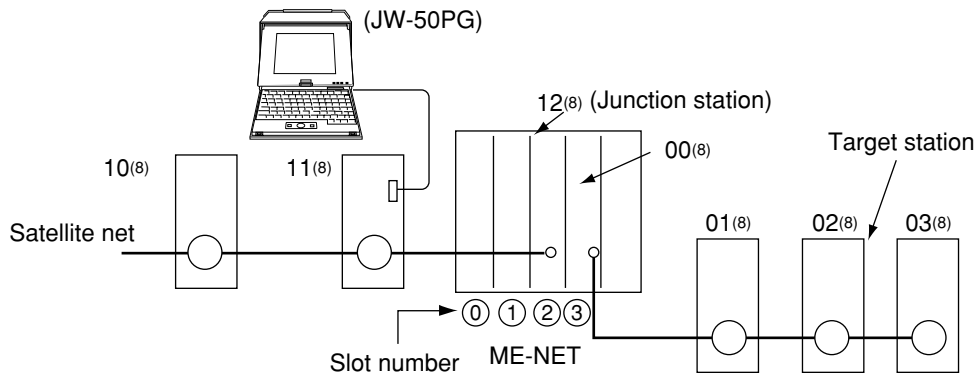Set the communication mode of the JW-50PG to "Network CONCT." and this enables remote programming and remote monitor.

Select "Initial setting."

↓

Select "COM. set."

↓

Select "Network CONCT."
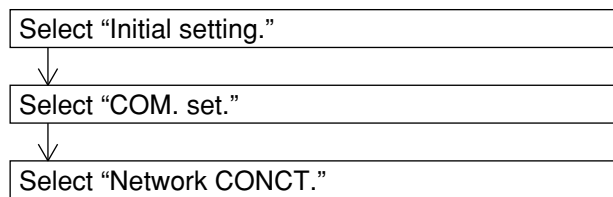
· Network setting
Select whether the target station for remote programming or remote monitor is on the standard network connection or on the extension network connection.
In the case below, 10 to $12_{(8)}$ are standard network connections.
01 to $03_{(8)}$ are extension network connections.

(JW-50PG)

$10_{(8)}$ $11_{(8)}$ $12_{(8)}$ $00_{(8)}$ $01_{(8)}$ $02_{(8)}$ $03_{(8)}$

ME-NET

<Standard network connection>

Set "standard" in network configuration.

↓

Set "ME-NET" in target station model.

↓

Set the target station number (00 to $77_{(8)}$).

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< Expansion network connection >

Set "extension" in network configuration.

Set "ME-NET" in junction station model.

Set the target station number "ME-NET."

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.

$\left(\begin{array}{l}\text{Set the installed slot number of the master station}\\\text{on the target station side. In the case of the above}\\\text{figure: 3.}\end{array}\right)$

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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 ME-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
  Connect the programmer to the JW-20MN on the ME-NET.

  ② Setting mode
  Select initial mode.
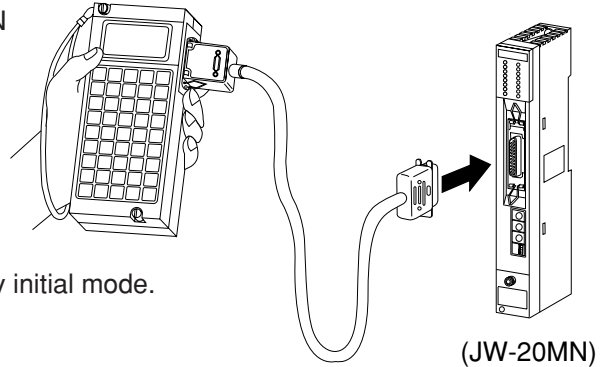
  $\boxed{*}$ $\boxed{*}$ $\boxed{\substack{\text{シフト}\\\text{SHIFT}}}$ $\boxed{\substack{\text{INTL}\\\text{DISP}}}$ $\boxed{\substack{\text{SET}\\8}}$ →   Display initial mode.

(JW-20MN)

  ③ Assign the link
  Assign the parameter setting remotely.

  $\boxed{\substack{A\\0}}$ →   Select "LINK" in initial.

  $\boxed{\substack{A\\0}}$ →   Select display mode of "1PG, 2PG1 MODE" in specified link.

  $\boxed{\substack{B\\1}}$ →   Select "TARGET STA." in 1PG, 2PG1 MODE.

  ④ Setting target station
  Select the target station to set the parameter remotely.

  $\boxed{\substack{\text{変換}\\\text{CONV}}}$ →   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

  $\boxed{,}$ →   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.

[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-20MN.

Input address [モニタ MNTR] → Display contents of address to set the parameters.

Input setting value [書込 ENT] → Setting parameter remotely.

⑦ Start the write operation to an EEPROM
After setting the parameter in section ⑥ above, write $81_{(H)}$ in parameter address $007777_{(8)}$, and then write the parameter contents into the EEPROM of the JW-20MN. Then start operation of the JW-20MN.

(3) Increasing the number of bytes that can be sent by each station in the data link
In a network where all of the stations are JW-20MN, the number of data bytes that can be sent by each station can be increased to 256 bytes for relay link and 2048 bytes for register links.

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