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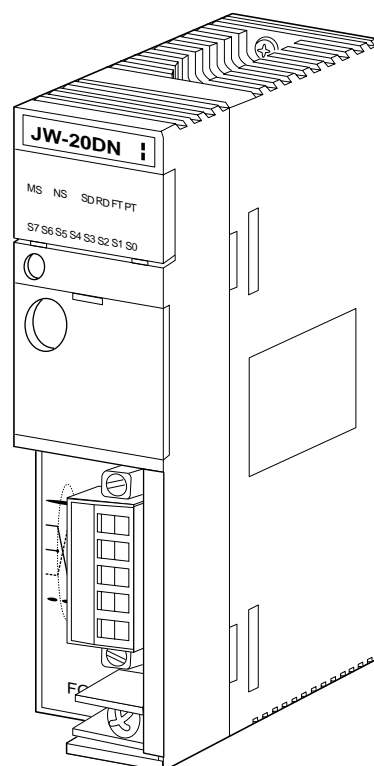
Version 1.0
Produced in April, 2000

Sharp Programmable Controller

NEW Satellite **JW20H/30H**

Model name
DeviceNet Master Module **JW-20DN**

User's Manual



Thank you for purchasing this DeviceNet master module, the JW-20DN for use with the JW20H/30H programmable controller .

This manual describes the specifications, usage etc. of the DeviceNet master module.

Please familiarize yourself with the module by reading this user's manual thoroughly.

Keep this manual handy as well as the instruction manuals that come with each JW-20DN and JW20H/30H control module. We are confident that these manuals will be helpful whenever you face a problem.

In addition to this manual, the following manuals are available for your further study.

JW-20DN —————┐ **User's manual (this book)**
Instruction manual (packed in each box)

JW20H
Control module —————┐ User's manual • hardware version
Programming manual • ladder instruction version

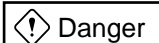
JW30H
Control module —————┐ User's manual • hardware version
Programming manual • ladder instruction version

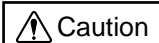
Note

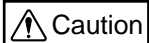
- Should you have any questions or inquires, please feel free to contact one of our dealers, or our service department.
- Copying this manual in part of in total is prohibited.
- The contents of this manual may be revised without notice.

Safety Precautions



Read this manual and the attached documents carefully before installation, operation, maintenance and checking, in order to use the machine correctly. Make sure you understand all of the machine operations, safety information, and cautions before starting to use it. In this user's manual, safety precautions are classified as "danger" or "caution," as follows.



 **Danger** : Incorrect handling may lead to death or serious injury.

 **Caution** : Incorrect handling may lead to property damage or injury.

Even when a  **Caution** is given, serious problems may be experienced, depending on the circumstances. In all cases, important points are discussed. Be sure to follow the advice given.

The symbols that prohibit action or show a required action are explained below.

 : This means don't. For example, when disassembly is prohibited, you will see a .

 : This means an action is required. For example, a required grounding is shown as a .

1) Installation

Caution

- Use this device only in the environments specified in the leaflet, instruction manual, and user's manual.
Electric shock, fire or malfunction may occur when used at high temperature, in high humidity, in a dusty or corrosive atmosphere, or when vibration or shock loading are present.
- Install the device according to the instruction manual and the user's manual.
Incorrect installation may cause the device to fall, breakdown, or malfunction.
- Never allow wire trimmings or foreign matter to land on the device.
If they do a fire may break out, breakdown or a malfunction may occur.

2) Wiring

Requirement

- Be sure to ground the programmable controller.
If the device is not grounded, a electric shock or a malfunction may occur.

Caution

- All wiring and connections should be done by a qualified electrician.
Incorrect wiring may lead to a fire, a breakdown of the product or an electric shock for the user.

3) Use

 **Danger**

- Don't touch the terminal while power is being supplied or you may receive an electric shock.
- Assemble an emergency stop circuit and interlock circuit outside of the programmable controller. Otherwise a machine may malfunction or be damaged by a problem with the programmable controller.

 **Caution**

- Changing a program during operation, or forcing a "Run" or "Stop" command during operation should only be done with particular care and only after confirming the safety of such an operation. Incorrect operation may lead to damage or cause an accident.

4) Maintenance

 **Disassembly prohibited**

- Don't disassemble or modify the modules.
A fire, damage or malfunction may result.

 **Caution**

- Turn OFF the power source before installing or removing the module.
If you don't you may receive an electric shock, or the device may malfunction or the machinery may be damaged.

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Chapter 1: Outline

The DeviceNet master module, JW-20DN (it is also referred to as "this module") is a master module for the JW20H/30H programmable controllers, and it is used in a DeviceNet (an open network). Installing this module on a JW20H/30H, and connecting various DeviceNet slave devices allows you to construct an optimum system with decentralized control.

- **De facto standard network**

By employing the DeviceNet standards, which have a major share of the market in North America, your product will have an advantage in that it can be used in overseas markets, and can share facilities both in Japan and overseas.

- **Reduced wiring by employing exclusive cables.**

One single exclusive cable can be used to connect between nodes (master and slaves). It can also be branched using a "T" branch tap.

- **More than one JW-20DN can be installed in a single JW20H/30H.**

Up to four JW-20DN modules can be installed in a single JW20H/30H. By allocating lines for various systems to different JW-20DN modules, you can reduce the communication time for automated devices and can easily separate one system from others. Also, this module (used as a master) can be connected to up to 63 slave nodes.

(The maximum total number of I/O points is 4096)

- **Easy operation using the scan list editing function**

The scan list editing function integrated in this module can use various types of I/O assignment methods just by changing the switches on this module. You do not need to assign I/O addresses using a configuration system running on a personal computer.

This module is equipped with Polling I/O and Explicit message functions, among the many functions available with DeviceNet devices.

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

Chapter 2: Handling Precautions

Make sure to follow the precautions below while using this module.

(1) Storing

Do not store the JW-20DN in the following conditions.

1. In direct sunlight, or ambient temperatures exceeding the range of -20 to 70 °C.
2. In relative humidity that exceeds the range of 35 to 90%, or in a location subject to sudden temperature changes which may cause condensation.
3. Near corrosive or inflammable gas.
4. In a location subject to vibration or hard jolts.

(2) Installation

Do not install the JW-20DN in the following conditions. In an extremely dry atmosphere, excessive static electricity may be generated in your body. In this case, before touching this module, touch a metal object that is grounded to drain off any static electricity from your body. Then you can touch the module.

1. In direct sunlight, or ambient temperatures exceeding the range of 0 to 55 °C.
2. In relative humidity that exceeds the range of 35 to 90%, or in a location subject to sudden temperature changes which may cause condensation.
3. Near corrosive or inflammable gas.
4. In a location subject to vibration or hard jolts.

(3) Treatment

Make sure to follow the precautions below while using this module.

1. Use a clean, dry cloth when cleaning the JW-20DN. Do not use volatile chemicals such as thinner or alcohol as it may result in deformation and color fading.
2. Holes are provided in the cabinet for ventilation, to prevent the temperature from increasing. Do not block the ventilation holes. Good ventilation is necessary.
3. When a problem or an abnormal condition such as overheating, fumes, or smoke are observed, stop the operation immediately, and call your dealer or our service department.
4. Make sure to turn OFF the power to the JW20H/30H before changing the switch settings.
An imprudent changeover of the switches may cause a malfunction.

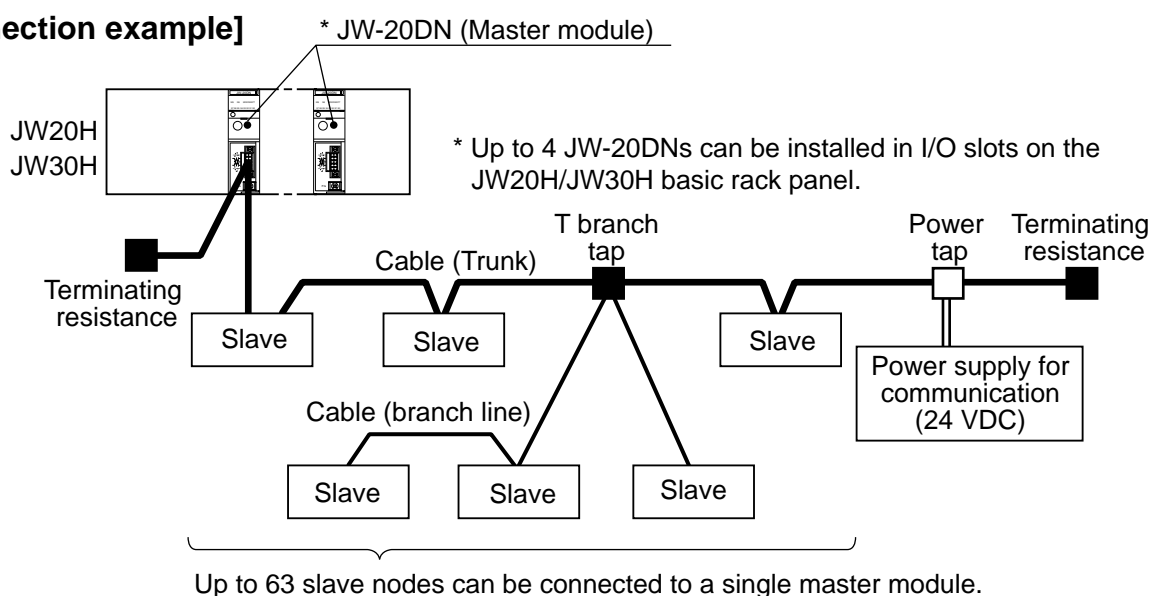
(4) Installation

Make sure to turn OFF the power to the JW20H/30H before removing or installing a module on the basic rack panel.

Please note that this module cannot be installed on the expansion rack panel.

Chapter 3: System Configuration

[Connection example]



[Connecting related devices]

- Use cables, T branch taps, power taps, and terminating resistances that comply with DeviceNet requirements to connect master modules and compatible slave stations. The slave stations should meet the following requirements.

Slave station requirements	Should have a Polling I/O function for communication. Note: In addition to slave stations that can be polled, you can connect slave stations to this system that use other communication methods. However, this system cannot use those functions.
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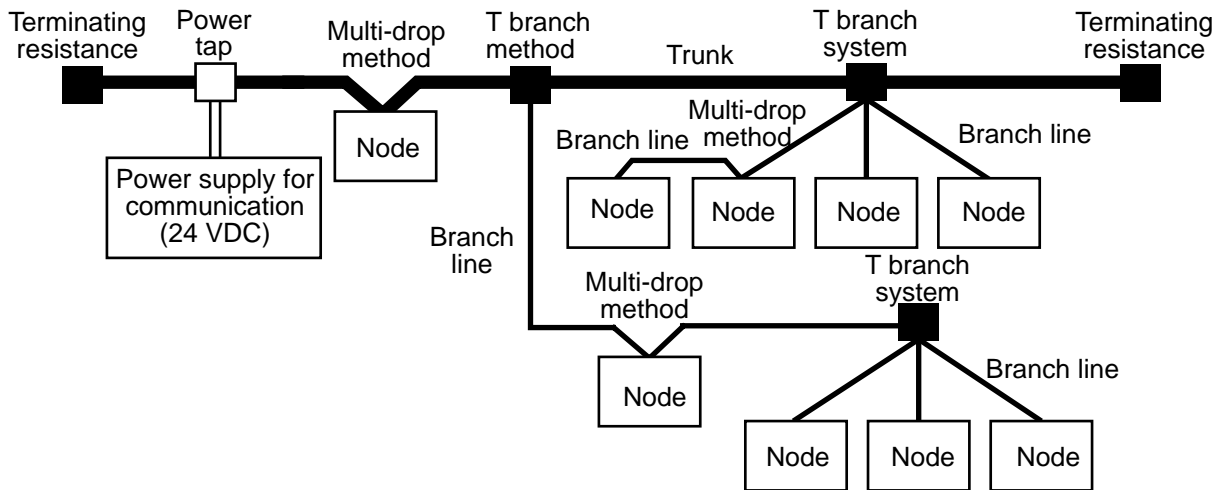
• Communication specifications

Items	Specifications				Reference page
Number of I/O points	4096 points input and output to data tables (512 bytes)				4-3, 7-1
Communication speed	Selectable: 125 k bits/s, 250 k bits/s, or 500 k bits/s.				4-6
Communication distance (maximum)	Communication speed	125 k bits/s	250 k bits/s	500 k bits/s	3-4, 3-6
	Trunk length using a thick cable	500 m	250 m	100 m	
	Trunk length using a thin cable	100 m	100 m	100 m	
	Maximum branch line length	6 m	6 m	6 m	
	Total length of branch lines	156 m	78 m	39 m	
Communication function	Polling I/O function, Explicit message function				Chapter 7, 8
Communication cable type	Proprietary cable (Five conductors: 2 signal wires, 2 power source wires, 1 shield) - Thick cable: For trunks - Thin cable: For trunks or branch lines				3-6
Data table assignment	In the scan list editing mode you can select "allocation in address order," "even number allocation," or "allocation in the order in which vacant nodes are occupied" as the method for I/O data mapping				4-5

[1] Network names and functions

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

[Network example]



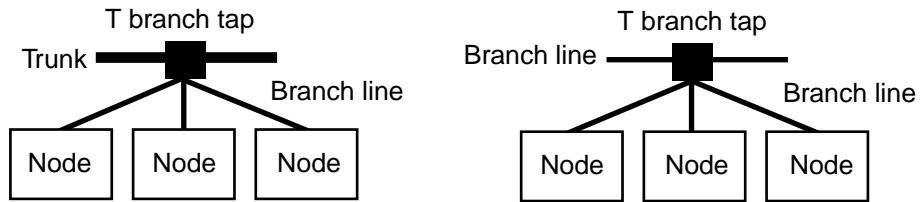
Names	Functions
Node	<p>Master and slave nodes are available on the DeviceNet.</p> <p>Master: Integrates external I/Os from each slave.</p> <p>Slave: provides connections for external I/Os.</p> <ul style="list-style-type: none"> - The JW-20DN (JW20H/30H) will be the master in a system with JW-20DN devices. - Since there are no restrictions in allocating a master and slaves, you can arrange nodes at any location shown above.
Trunk	<p>Cable with a terminating resistor at both ends.</p> <ul style="list-style-type: none"> - Normally, the cable connecting the terminals the furthest distance apart will be a trunk cable. - Use a five conductor cable (2 signal wires, 2 power wires, 1 shield). - The trunk length is not always equal to the maximum length of the network.
Branch line	<p>A cable branching off the trunk.</p> <ul style="list-style-type: none"> - You can add new branch lines to the trunk - Use a five conductor cable (2 signal wires, 2 power wires, 1 shield).
Connection method	<p>There are two methods for connecting nodes: T branch and Multi-drop.</p> <p>T branch method: Uses T branch taps for up to three separate branch lines.</p> <p>Multi-drop method: Connects a node directly to a trunk or to a branch line.</p> <ul style="list-style-type: none"> - Both the T branch method and the Multi-drop method can be used in the same network.
Terminating resistance	<p>Install a terminating resistance on both ends of the trunk, in order to reduce signal reflection and stabilize the communication.</p>
Power supply for communication	<p>Communication power should be supplied to the communication connector on each node through the five conductor cable.</p> <ul style="list-style-type: none"> - Use only a power supply dedicated exclusively to communications. Do not share this power supply with other devices.

[2] Connection method

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

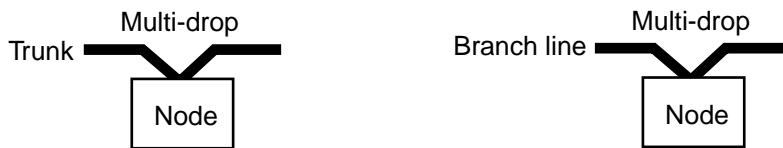
(1) T branch method

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



(2) Multi-drop method

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

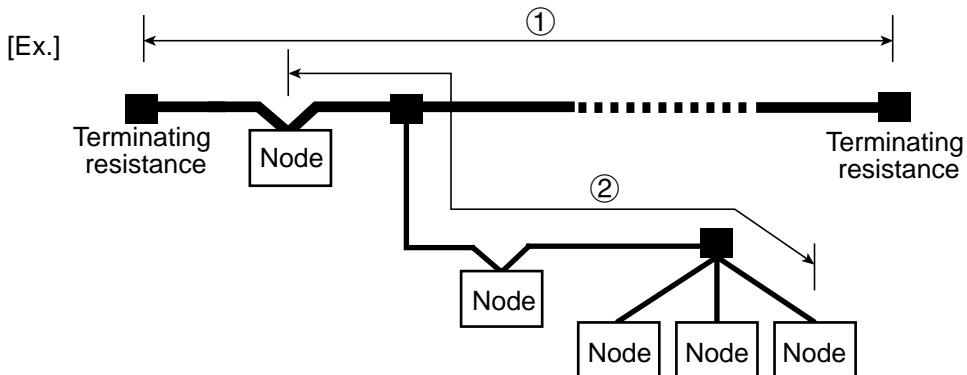


[3] Cable length

(1) Maximum network length

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

1. The distance between the two terminating resistances
2. The distance between the two nodes in the network that are the farthest apart



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

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

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

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

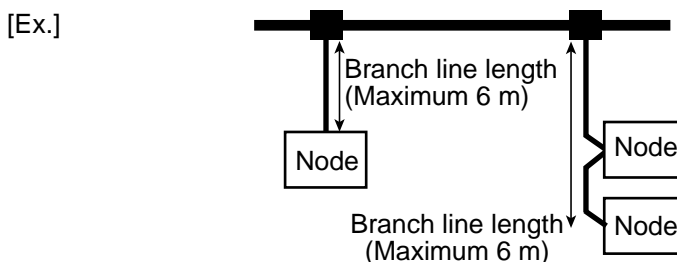
A: Thick cable length
B: Thin cable length

(2) Maximum branch line length

The maximum branch line length is 6 m.

- You can make a new branch line from a branch line.

However, the maximum distance between the branch point on the trunk and the end of the most distant branch line should not be more than 6 m.



(3) Communication speed and communication distance

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

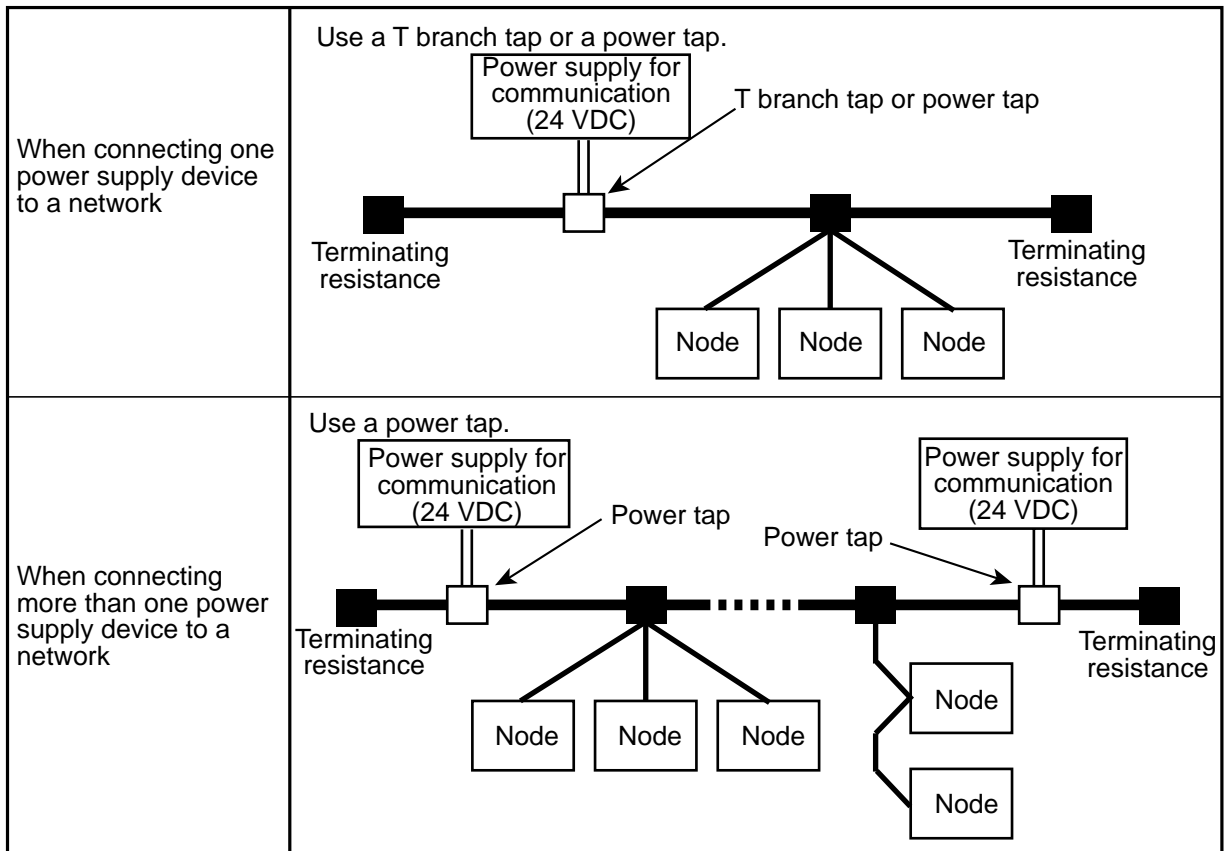
Communication speed	Maximum network length		Branch line length	Total length of branch lines
	Thick cable	Thin cable		
500 k bits/s	100 m or less	100 m or less	6 m or less	39 m or less
250 k bits/s	250 m or less			78 m or less
125 k bits/s	500 m or less			156 m or less

[4] Power supply

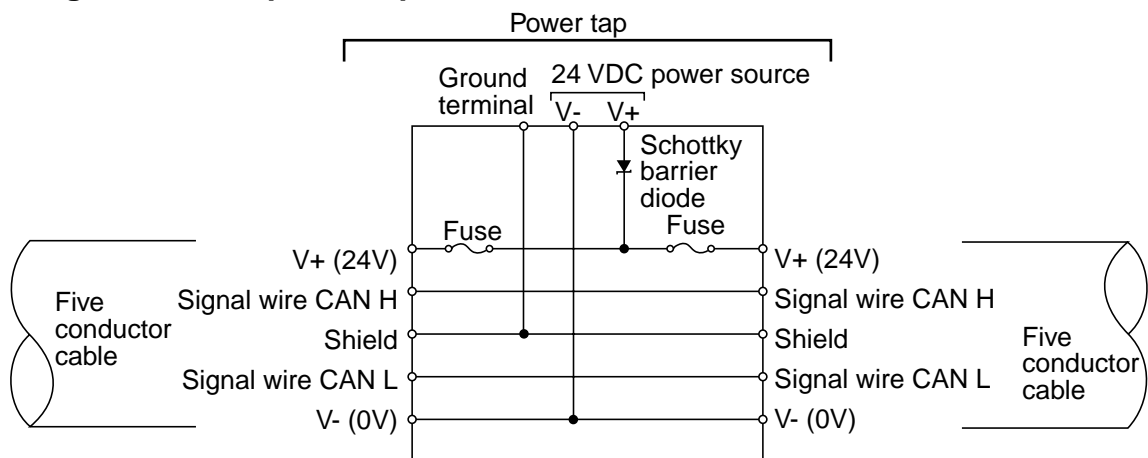
Connect the communication power supply to the trunk.

Two of the five conductors in the cable used for trunk and branch lines are assigned to carry power for communication (24 VDC).

The following methods can be used to connect a communication power source to the trunk.



• Configuration of a power tap



Remarks

- Do not share the communication power source with other devices.
- Do not turn OFF the communication power source while I/O polling is taking place. It may halt the communication abnormally.

[5] Communication related devices

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

(1) Cable

Thick or thin five conductor cable is available.

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

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

(2) T branch tap

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

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

(3) Power tap

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

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

- This tap can be used to connect a single communication power supply to a network.
In this case, you can also use a T branch tap (above), in addition to the power tap.
- When connecting a power supply unit to a network, use this power tap in order to prevent reverse current flowing back to the power supply device, which can be caused by a difference in potential.

(4) Communication connector

This module contains one MSTB 2.5/5-STF-5.08AU (with a screw for securing the connector made by Phoenix Contact).

Model	Remarks	Manufacturers
MSTB 2.5/5-ST-5.08 AU	For connecting a node Without a screw for securing a connector	Phoenix Contact
MSTB 2.5/5-STF-5.08 AU	For connecting a node With a screw for securing a connector	
XW4B-05C1-H1-D	For connecting a T branch tap For connecting a node With a screw for securing a connector	Omron

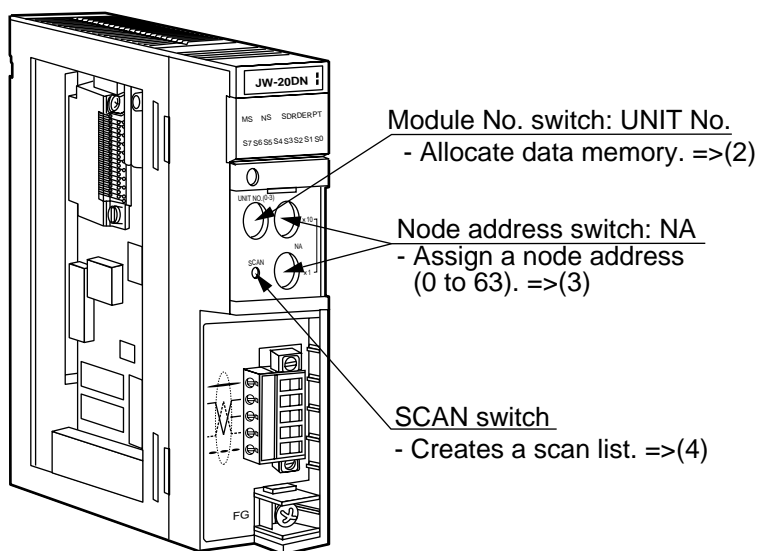
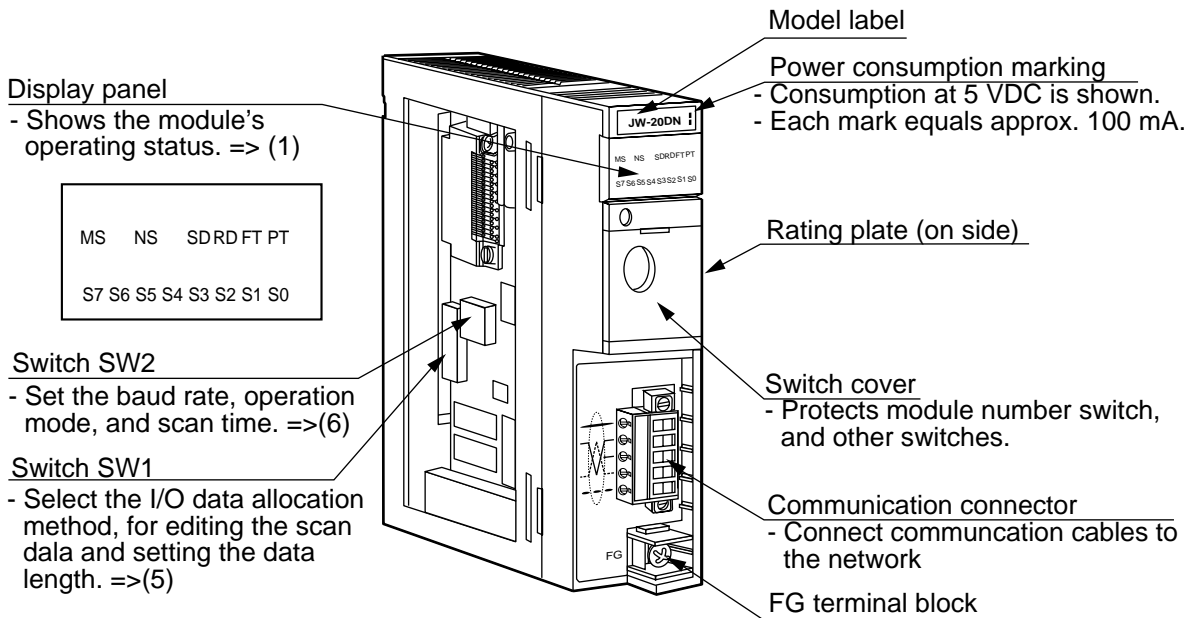
(5) Terminating resistance

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

(6) Communication power supply

Make sure that the communication power supply output voltage is 24 VDC \pm 1% with the AC input isolated from the DC output. Also make sure to select a power supply unit able to put out sufficient current for your system.

Chapter 4: Name and Function of Each Part

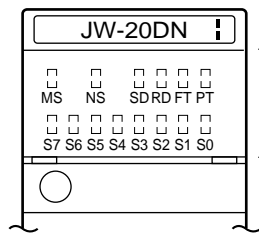


(Shown with the switchcover removed)

- The numbers (1) to (6) refer to sections on pages 4-2 to 4-6.

(1) Display panel

Shows the module's operating status by turning ON and OFF, and blinking.



Display panel on the JW-20DN
- The □ areas are the locations of the lights.

Lamp name	Operation
MS	Indicates the module's status.
NS	Indicates the network status.
SD	Lights when sending data.
RD	Lights when receiving data.
FT	Lights when the module is faulty.
PT	Lights when the module is in the protected mode.
S7 to S0	Displays error codes and the node address when an error occurs.

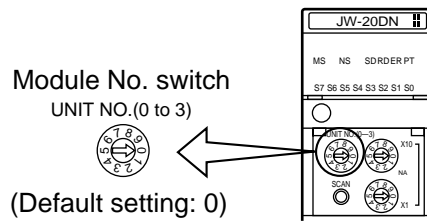
For details, see the table below.

- Details of the MS/NS

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

(2) Module No. switch: UNIT No. (0 to 3)

Assign the data memory addresses used with this module (such as diagnostic data) in the PC (JW20H/30H) on which the module is installed.



- Set the module No. switch to any position between 0 and 3. Setting it to positions from 4 to 9 may cause an error and the module will not function.
- Be careful not to assign the same memory area twice by using the same module No. on another module, including another JW-20DN.

Ex.: When you install a JW-23LMH on the same basic rack panel with a JW-20DN.

Make sure to set the module No. switch of the JW-20DN to a number between 1 and 3. If you set it to 0, it will try to use the same I/O link area as the JW-23LMH.

• When the PC is a JW20H

Table	No. of bytes	Module No. switch setting			
		0	1	2	3
Input/output data	512	□ 0100 to □ 0727 (408 bytes)	□ 1000 to □ 1477 (320 bytes)	69000 to 69777	79000 to 79777
Diagnostic data	256	□ 1500 to □ 1507 (8 bytes) *	□ 1510 to □ 1517 (8 bytes) *	89000 to 89337	99000 to 99337
Host explicit message data (request)	118	/	/	89400 to 89565	99400 to 99565
Host explicit message data (response)	118	/	/	89600 to 89765	99600 to 99765
Scan list data	512	29000 to 29777	39000 to 39777	49000 to 49777	59000 to 59777

* Only the communication monitor table exists.

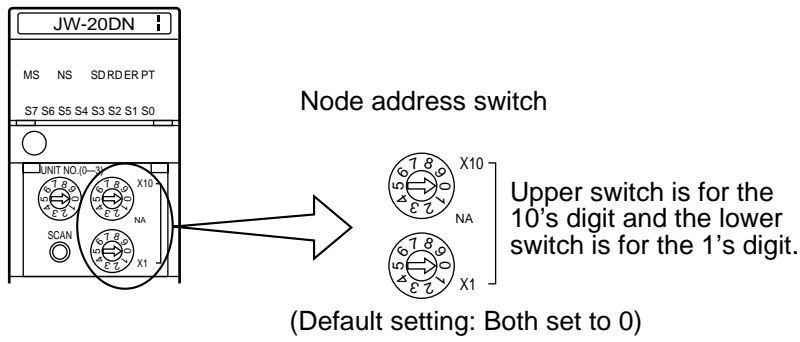
• When the PC is a JW30H

Table	No. of bytes	Module No. switch setting			
		0	1	2	3
Input/output data	512	□ 2000 to □ 2777	□ 5000 to □ 5777	□ 6000 to □ 6777	79000 to 79777
Diagnostic data	256	39000 to 39377	49000 to 49377	59000 to 59377	69000 to 69377
Host explicit message data (request)	118	39400 to 39565	49400 to 49565	59400 to 59565	69400 to 69565
Host explicit message data (response)	118	39600 to 39765	49600 to 49765	59600 to 59765	69600 to 69765
Scan list data	512	E0000 to E0777	E1000 to E1777	E2000 to E2777	E3000 to E3777

- When you are working with a JW-31CUH1, it uses addresses 59000 to 89777 and E0000 to E5777 for its structuring program. Therefore, the JW-20DN cannot use its structuring program at the same time with the JW-31CUH1.

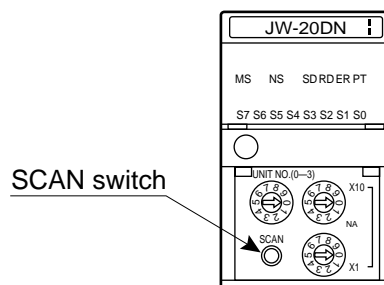
(3) Node address switch: NA

Assign a node address from 0 to 63 (decimal)



(4) SCAN switch

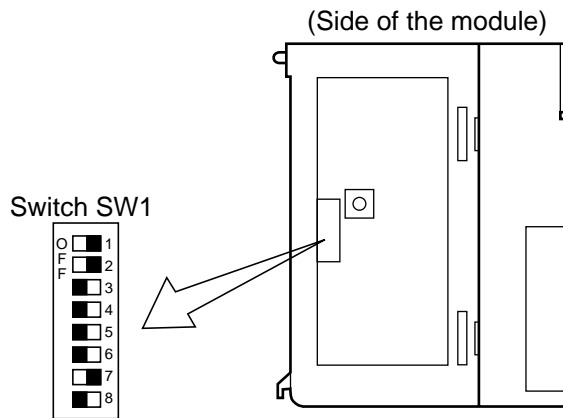
Press and hold this switch for at least 3 seconds. The module will create a scan list (This function is disabled when the JW-20DN is in the protected mode.)



- For details about editing the scan list, see page 7-8.

(5) Switch SW1

Select the I/O data allocation method and data length while editing the scan list.

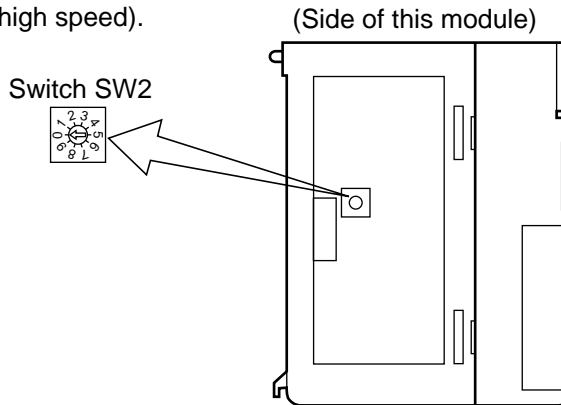


Switch No.	Set details															
SW1-1	<p>Operation when a slave communication error occurs. - Select whether or not to continue operation of JW20H/30H control module when a communication error occurs while communicating with a slave station.</p> <table border="1"> <tr> <td>OFF</td> <td>The control module continues operation.</td> </tr> <tr> <td>ON</td> <td>The control module stops operation and enters the program mode. (Default setting)</td> </tr> </table>	OFF	The control module continues operation.	ON	The control module stops operation and enters the program mode. (Default setting)											
OFF	The control module continues operation.															
ON	The control module stops operation and enters the program mode. (Default setting)															
SW1-2	<p>Synchronous/asynchronous operation - Select whether or not to synchronize the communication with the operation cycle.</p> <table border="1"> <tr> <td>OFF</td> <td>Not synchronized.</td> </tr> <tr> <td>ON</td> <td>Synchronized with the operation (default setting)</td> </tr> </table>	OFF	Not synchronized.	ON	Synchronized with the operation (default setting)											
OFF	Not synchronized.															
ON	Synchronized with the operation (default setting)															
SW1-3, 4	<p>I/O data allocation method - I/O data table allocation method set by editing the scan list.</p> <table border="1"> <thead> <tr> <th>SW1-4</th> <th>SW1-3</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>Address order allocation (default setting)</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>Even number allocation</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>Allocation in the order in which vacant nodes are occupied</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>Allocation prohibited</td> </tr> </tbody> </table>	SW1-4	SW1-3	Details	OFF	OFF	Address order allocation (default setting)	OFF	ON	Even number allocation	ON	OFF	Allocation in the order in which vacant nodes are occupied	ON	ON	Allocation prohibited
SW1-4	SW1-3	Details														
OFF	OFF	Address order allocation (default setting)														
OFF	ON	Even number allocation														
ON	OFF	Allocation in the order in which vacant nodes are occupied														
ON	ON	Allocation prohibited														
SW1-5, 6	<p>Data length while editing the scan list (for each node) - Select the data length for each node when "even allocation" is selected, and select the vacant node data length when "sequential allocation to empty nodes" has been selected.</p> <table border="1"> <thead> <tr> <th>SW1-6</th> <th>SW1-5</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>1 byte (default setting)</td> </tr> <tr> <td>OFF</td> <td>ON</td> <td>2 bytes</td> </tr> <tr> <td>ON</td> <td>OFF</td> <td>4 bytes</td> </tr> <tr> <td>ON</td> <td>ON</td> <td>8 bytes</td> </tr> </tbody> </table>	SW1-6	SW1-5	Details	OFF	OFF	1 byte (default setting)	OFF	ON	2 bytes	ON	OFF	4 bytes	ON	ON	8 bytes
SW1-6	SW1-5	Details														
OFF	OFF	1 byte (default setting)														
OFF	ON	2 bytes														
ON	OFF	4 bytes														
ON	ON	8 bytes														
SW1-7	<p>Host message data exchange function - Select whether or not to use the Explicit message send function.</p> <table border="1"> <tr> <td>OFF</td> <td>Does not use the Explicit message send function.</td> </tr> <tr> <td>ON</td> <td>Uses the Explicit message send function</td> </tr> </table>	OFF	Does not use the Explicit message send function.	ON	Uses the Explicit message send function											
OFF	Does not use the Explicit message send function.															
ON	Uses the Explicit message send function															

- SW 1-8 is not used. (Default setting: OFF)

(6) Switch SW2

Set the communication speed (125/250/500 k bit/s), operation mode (normal/protected), and scan time (low speed/high speed).



SW2 setting	Communication speed (kbits/s)	Operation mode	Scan time
0 (Default setting)	125	Normal mode	Low speed
1	250		
2	500		
4	125	Protected mode	
5	250		
6	500		
8	125	Normal mode	High speed
9	250		
A	500		
C	125	Protected mode	
D	250		
E	500		

Note: Do not set switch SW2 to positions 3, 7, or B, as it may cause a malfunction.

• Details of the operation mode

Normal mode	Press and hold the SCAN switch for three seconds while the control module operation is stopped. The JW-20DN will enter the editing mode. - The scan list is created by collecting slave information from the slave stations. - When the control module first starts operation, the JW-20DN starts Polling I/O operation.
Protected mode	The SCAN switch is disabled in this mode. - This is used to avoid halting the Polling I/O operation accidentally by mis-use of the SCAN switch.

• Scan time details

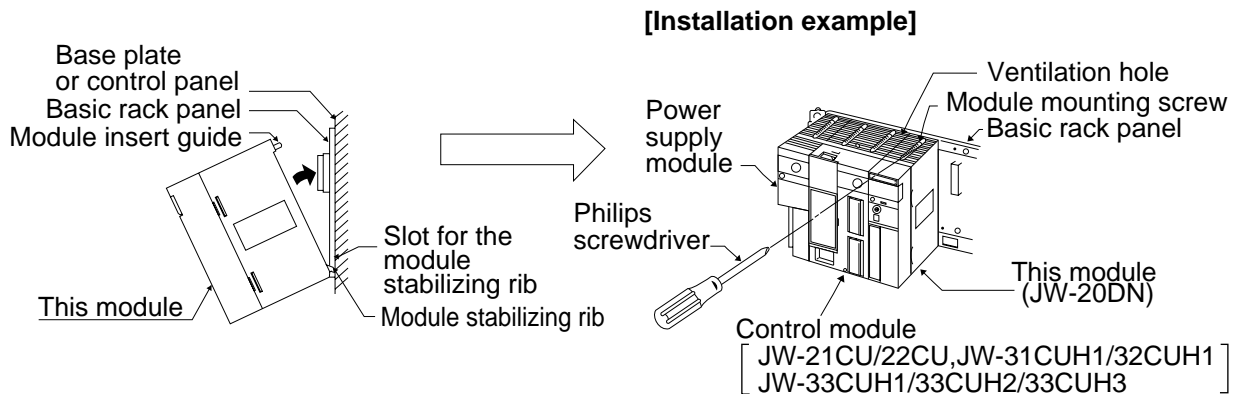
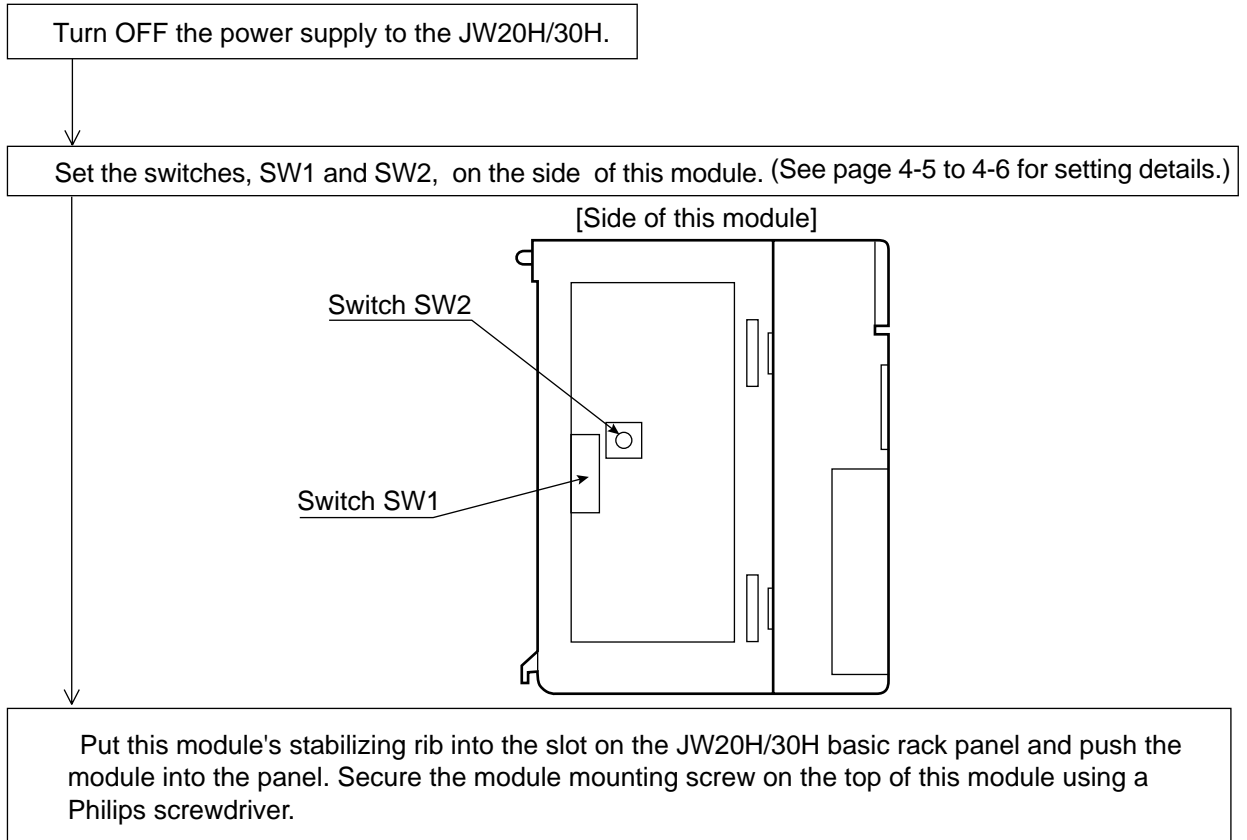
Select high speed or low speed for the time-out time of a single I/O operation cycle.

The scan time will be determined by the number of slave stations connected.

Number of slave stations	Scan time (ms)	
	Low speed	High speed
1 to 15	80	40
16 to 31	120	60
32 to 47	160	80
48 to 63	200	100

Chapter 5: Installation Method

This chapter describes how to attach this module to the JW20H/30H basic rack panel.



Remarks

- This module cannot be installed in an expansion rack panel.
- More than one optional module can be installed in the same control module (JW20H/30H basic rack panel). Do not use a node station number that is already assigned to the I/O link master module (JW-23LMH). (See page 4-3.)
- Secure the module mounting screw tightly. If the screw becomes loose, it may cause a malfunction.
- When you use the JW-20DN for the first time, you are required to edit the scan list. (See page 7-8).

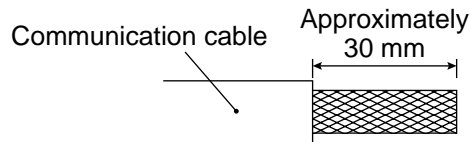
Chapter 6: Wiring Method

6-1 Preparing a communication cable

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

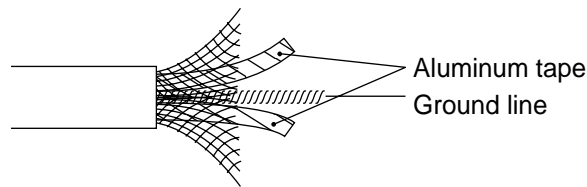
Remove approximately 30 mm of insulation from the communication cable

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



Unwrap the wires in the coaxial shield carefully

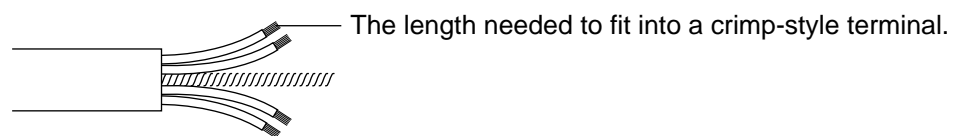
- Under the coaxial shield there is one signal line, one power line, and one ground line. The signal line and power lines are wrapped in aluminum tape.



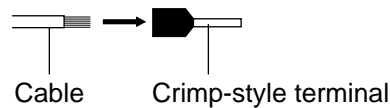
Cut off the excess coaxial shield and peel back the aluminum tape on the signal line and power line.

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

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



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



- Shown below are the recommended crimp-style terminals

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

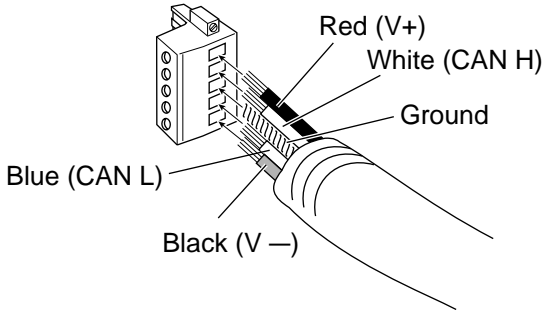
To the next page

From the previous page

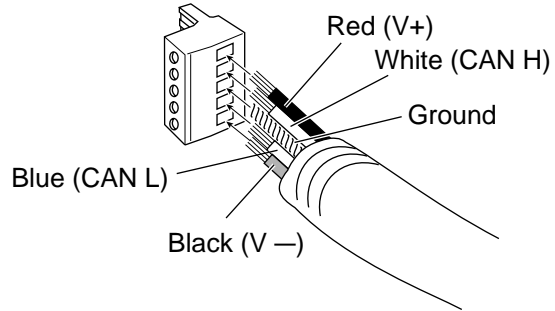
Insert the signal line, power line, and the ground line into the appropriate connector holes.

- Insert the wires from the top down, in the following order: red, white, ground, blue, and black. Pay strict attention to the connector orientation.
- Before inserting the wires, loosen the screws on the connector enough to insert the wires easily.
- There are two types of connectors. One type has screws to secure the wires and the other doesn't. The wiring methods are the same. The connectors supplied with the JW-20DN is the type with screws.

[Connector with screws]

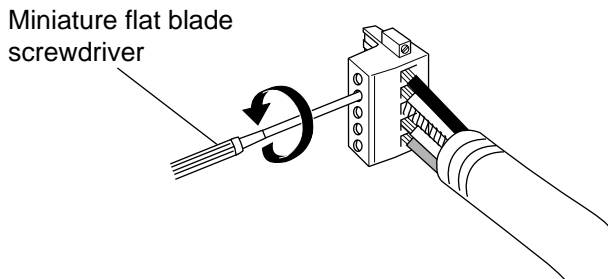


[Connector without screws]



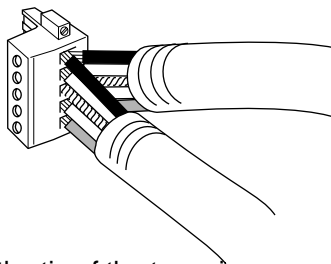
Secure each wire tightly using the wire retention screws of the connector.

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



• **When connecting two thin cables in a multi-drop system**

Insert the wires from each cable with the same color insulation into the same hole.



- Crimp a terminal to the tip of the two wires.

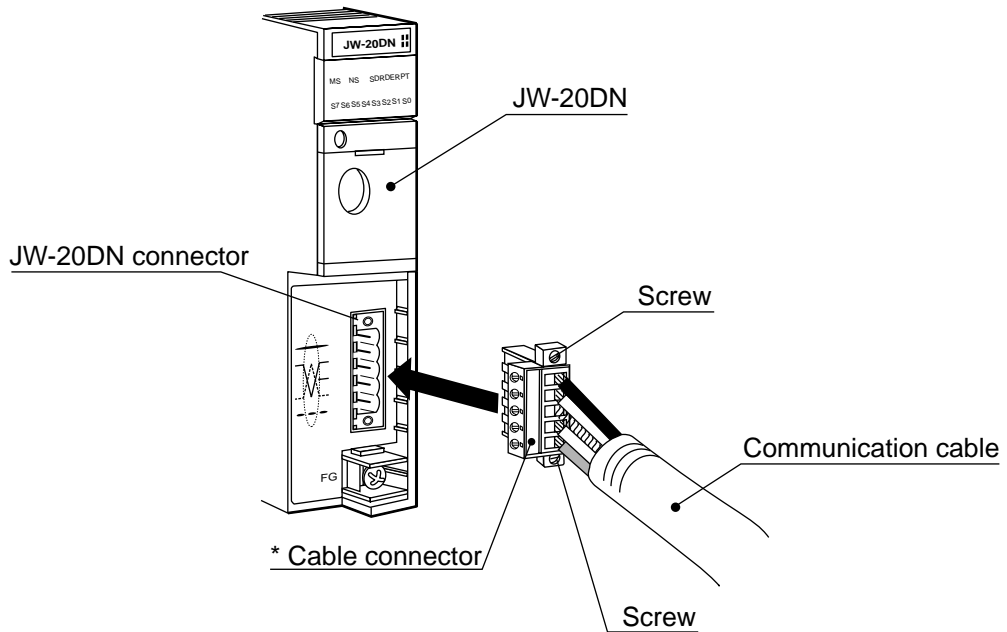
Remarks

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

6-2 Communication connections

This section describes how to plug a connector that has been installed on the communication cable into the JW-20DN.

Match the orientation of the connector on the cable with the female connector on the JW-20DN and insert the male cable connector as far as it will go. After inserting it all the way, tighten the screws on the male connector. The appropriate tightening torque is 0.3 N-m of force.



- * One male connector is supplied with the JW-20DN.
- Model name: MSTB2.5/5-STF-5.08AU (made by Phoenix Contact)

Chapter 7: Polling I/O Function

Polling I/O is used to exchange input/output data automatically between a JW20H/30H control module equipped with a JW-20DN and its slave stations.

The input/output data table addresses used for I/O polling are assigned according to the module No. switch on the JW-20DN. (=> See page 4-3.)

• Input/output data table addresses

PC in which the JW-20DN is installed	No. of bytes	Module No. switch setting			
		0	1	2	3
JW20H	512	10100 to 10727 (408 bytes)	11000 to 11477 (320 bytes)	69000 to 69777	79000 to 79777
JW30H	512	12000 to 12777	135000 to 135777	16000 to 16777	79000 to 79777

7-1 Input/output data table allocation

The JW-20DN can select from several allocation methods for the slave station input/output data table. The choices are “allocation in address order,” “even number allocation,” and “allocation in the order in which vacant nodes are occupied.” No matter which allocation method is selected, you have to start the master module JW-20DN in the scan list edit mode, collect the data from slave stations, and create a scan list. The scan list classifies slave station inputs and outputs, data lengths, and addresses. Therefore, a separate configuration program is not needed for the input/output data table allocation.

Allocation method	Input/output data table allocation details	Details
Address order allocation	<ol style="list-style-type: none"> 1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Enter the number of bytes required by each slave station. 3. A slave station that does not have a Polling I/O function is not assigned a data length. 4. Any slave station number (node address), that does not have hardware connected is not assigned a data length. 	Page 7-2
Even number allocation	<ol style="list-style-type: none"> 1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Enter the number of bytes required by each slave station. For any slave station that needs more data than the default data length, increase the size in multiples of the default number of bytes. 3. A slave station that does not have a Polling I/O function is not assigned a data length. 4. Any slave station number (node address), that does not have hardware connected is not assigned a data length. 	Page 7-4
Allocation in the order in which vacant nodes are occupied	<ol style="list-style-type: none"> 1. Assign data lengths (number of bytes) in node address order for slave stations. 2. Enter the number of bytes required by each slave station with a Polling I/O function. 3. A slave station that does not have a Polling I/O function is not assigned a data length. 4. Any slave station number (node address), that does not have hardware connected, is assigned the default data length. 	Page 7-6

- Set the default data length used in the “Even number allocation” and “Allocation in the order in which vacant nodes are occupied” modes to 1, 2, 4, or 8 bytes. Set the default data length using Switch 1 (dip switches 5 and 6). => See page 4-5

Three allocation examples are shown below.

- Node address 0 : The JW-20DN (master)			
- Node address 1 : Slave station	<table border="1"> <tr> <td>Polling I/O input data = 1 byte</td> </tr> <tr> <td>Polling I/O output data = 1 byte</td> </tr> </table>	Polling I/O input data = 1 byte	Polling I/O output data = 1 byte
Polling I/O input data = 1 byte			
Polling I/O output data = 1 byte			
- Node address 2 : Not connected			
- Node address 3 : Slave station	<table border="1"> <tr> <td>Polling I/O input data = 3 bytes</td> </tr> <tr> <td>Polling I/O output data = 3 bytes</td> </tr> </table>	Polling I/O input data = 3 bytes	Polling I/O output data = 3 bytes
Polling I/O input data = 3 bytes			
Polling I/O output data = 3 bytes			
- Node address 4 : Slave station	(No Polling I/O function)		
- Node address 5 : Slave station	<table border="1"> <tr> <td>Polling I/O input data = 3 bytes</td> </tr> <tr> <td>Polling I/O output data = 0 byte</td> </tr> </table>	Polling I/O input data = 3 bytes	Polling I/O output data = 0 byte
Polling I/O input data = 3 bytes			
Polling I/O output data = 0 byte			

(1) Address order allocation

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

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

• **Allocation example**

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

Address *	Input/output data table	
1st byte (I2000)	Node address 1 (slave station)	Input
2nd byte (I2001)		Output
3rd byte (I2002)	Node address 3 (slave station)	Input
4th byte (I2003)		
5th byte (I2004)		Output
6th byte (I2005)		
7th byte (I2006)	Node address 5 (slave station)	Input
8th byte (I2007)		
9th byte (I2010)		
10th byte (I2011)	Not used	
11th byte (I2012)		
12th byte (I2013)		

* The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

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

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

The scan list data table will be as follows:

Address *	Value (hexadecimal): Details (=> See page 7-9)	
1st byte (E0000)	FF: This JW-20DN station (master)	Node address 0
2nd byte (E0001)	All zeroes	
3rd byte (E0002)		
4th byte (E0003)		
5th byte (E0004)		
6th byte (E0005)		
7th byte (E0006)		
8th byte (E0007)		
9th byte (E0010)		02: A slave station with a Polling I/O function
10th byte (E0011)	00: Not used	
11th byte (E0012)	01: 1 byte (input data length)	
12th byte (E0013)	01: 1 byte (output data length)	
13th byte (E0014)	00: 1st byte	
14th byte (E0015)	00: (input data offset)	
15th byte (E0016)	01: 2nd byte	
16th byte (E0017)	00: (output data offset)	
17th byte (E0020)	00: Not connected	Node address 2
18th byte (E0021)	All zeroes	
19th byte (E0022)		
20th byte (E0023)		
21st byte (E0024)		
22nd byte (E0025)		
23rd byte (E0026)		
24th byte (E0027)		
25th byte (E0030)		02: A slave station with a Polling I/O function
26th byte (E0031)	00: Not used	
27th byte (E0032)	03: 3 bytes (input data length)	
28th byte (E0033)	03: 3 bytes (output data length)	
29th byte (E0034)	03: 3rd byte	
30th byte (E0035)	00: (input data offset)	
31st byte (E0036)	06: 6th byte	
32nd byte (E0037)	00: (output data offset)	
33rd byte (E0040)	01: A slave station without a Polling I/O function	Node address 4
34th byte (E0041)	All zeroes	
35th byte (E0042)		
36th byte (E0043)		
37th byte (E0044)		
38th byte (E0045)		
39th byte (E0046)		
40th byte (E0047)		
41st byte (E0050)		02: A slave station with a Polling I/O function
42nd byte (E0051)	00: Not used	
43rd byte (E0052)	03: 3 bytes (input data length)	
44th byte (E0053)	00: 0 byte (output data length)	
45th byte (E0054)	08: 9th byte	
46th byte (E0055)	00: (input data offset)	
47th byte (E0056)	0B: 12th byte	
48th byte (E0057)	00 (output data offset)	

Address *	Value _H : Details	
49th byte (E0060)	All zeroes	Node address 6
50th byte (E0061)		
51st byte (E0062)		
52nd byte (E0063)		
53rd byte (E0064)		
54th byte (E0065)		
55th byte (E0066)		
56th byte (E0067)		
57th byte (E0070)	All zeroes	Node address 7
58th byte (E0071)		
59th byte (E0072)		
60th byte (E0073)		
61st byte (E0074)		
62nd byte (E0075)		
63rd byte (E0076)		
64th byte (E0077)		

* The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

(2) Even number allocation

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

1. Set the predetermined data length for slave stations to an even number of bytes.
If an individual slave station needs more than the default amount of data, the JW-20DN can be used to assign a different data length in terms of multiples of the default data length.
2. The JW-20DN assigns the default data length to slave stations that do not have a Polling I/O function.
3. The JW-20DN also assigns the default data length to slave station numbers (node addresses) that do not have any hardware connected to them.
- Set the default data length (1, 2, 4, or 8 bytes) between 1 and 3, using switch SW1 (5, 6) on the JW-20DN. => See page 4-5.

• Allocation example

The allocation results from assigning data lengths by “even number allocation” are as shown on page 7-2, as follows.

- The default data length is 2 bytes.

Address *	Input/output data table	
1st byte (J2000)	Node address 1 (slave station)	Input
2nd byte (J2001)		Output
3rd byte (J2002)	Node address 2 (not connected)	Not used
4th byte (J2003)		
5th byte (J2004)	Node address 3 (slave station)	Input
6th byte (J2005)		
7th byte (J2006)		Output
8th byte (J2007)		
9th byte (J2010)	Node address 4 (slave station)	Not used
10th byte (J2011)		
11th byte (J2012)	Node address 5 (slave station)	Input
12th byte (J2013)		
13th byte (J2014)		Not used
14th byte (J2015)		
15th byte (J2016)	Not used	
16th byte (J2017)		
17th byte (J2020)	Not used	
to		

* The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

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

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

- The needed data length (2 bytes) is assigned to slave station 1.
- Slave station 2 (not connected) and slave station 4 (does not have a Polling I/O function) are assigned the default data length (2 bytes).
- Slave stations 3 and 5 need a larger number of bytes than the default data length. (2 bytes).

Therefore, in these cases, a different data length is assigned which is a multiple of the default data length (2 bytes).

- Slave station 3 needs 6 bytes and is assigned 6 bytes (2 x 3)
- Slave station 5 needs 3 bytes and is assigned 4 bytes (2 x 2)

The scan list data table for this example will be as follows:

Address * 1	Value (hexadecimal): Details (=> See page 7-9)	
1st byte (E0000)	FF: This JW-20DN station (master)	Node address 0
2nd byte (E0001)	All zeroes	
3rd byte (E0002)		
4th byte (E0003)		
5th byte (E0004)		
6th byte (E0005)		
7th byte (E0006)		
8th byte (E0007)		
9th byte (E0010)		02: A slave station with a Polling I/O function
10th byte (E0011)	00: Not used	
11th byte (E0012)	01: 1 byte (input data length)	
12th byte (E0013)	01: 1 byte (output data length)	
13th byte (E0014)	00: 1st byte	
14th byte (E0015)	00: (input data offset)	
15th byte (E0016)	01: 2nd byte	
16th byte (E0017)	00: (output data offset)	
17th byte (E0020)	00: Not connected	Node address 2
18th byte (E0021)	00: Not used	
19th byte (E0022)	00: 0 byte (input data length)	
20th byte (E0023)	00: 0 byte (output data length)	
21st byte (E0024)	02: 3rd byte	
22nd byte (E0025)	00: (input data offset)	
23rd byte (E0026)	02: 3rd byte	
24th byte (E0027)	00: (output data offset)	
25th byte (E0030)	02: A slave station with a Polling I/O function	Node address 3
26th byte (E0031)	00: Not used	
27th byte (E0032)	03: 3 bytes (input data length)	
28th byte (E0033)	03: 3 bytes (output data length)	
29th byte (E0034)	04: 5th byte	
30th byte (E0035)	00: (input data offset)	
31st byte (E0036)	07: 8th byte	
32nd byte (E0037)	00: (output data offset)	
33rd byte (E0040)	01: A slave station without a Polling I/O function	Node address 4
34th byte (E0041)	00: Not used	
35th byte (E0042)	00: 0 byte (input data length)	
36th byte (E0043)	00: 0 byte (output data length)	
37th byte (E0044)	0A: 11th byte	
38th byte (E0045)	00: (input data offset)	
39th byte (E0046)	0A: 11th byte	
40th byte (E0047)	00: (output data offset)	
41st byte (E0050)	02: A slave station with a Polling I/O function	Node address 5
42nd byte (E0051)	00: Not used	
43rd byte (E0052)	03: 3 bytes (input data length)	
44th byte (E0053)	00: 0 byte (output data length)	
45th byte (E0054)	0C: 13th byte	
46th byte (E0055)	00: (input data offset)	
47th byte (E0056)	0F: 16th byte	
48th byte (E0057)	00: (output data offset)	

Address * 1	Value _H : Details	
49th byte (E0060)	00	Node address 6
50th byte (E0061)	00	
51st byte (E0062)	00	
52nd byte (E0063)	00	
53th byte (E0064)	11 * 2	
54th byte (E0065)	00	
55th byte (E0066)	11 * 2	
56th byte (E0067)	00	
57th byte (E0070)	00	Node address 7
58th byte (E0071)	00	
59th byte (E0072)	00	
60th byte (E0073)	00	
61st byte (E0074)	13 * 2	
62nd byte (E0075)	00	
63rd byte (E0076)	13 * 2	
64th byte (E0077)	00	

* 1 : * The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

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

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

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

1. Assign the required data length to slave stations with a Polling I/O function.
2. The JW-20DN does not allocate any data length for slave stations that do not have a Polling I/O function.
3. The JW-20DN will allocate the default data length to any slave station number (node address) that does not actually have hardware connected.
 - Select the default data length (1, 2, 4, or 8 bytes), using Switch SW1 (5, 6) on the JW-20DN. => See page 4-5.

• Allocation example

The results of “ allocation in the order in which vacant nodes are occupied, “ for the example shown on page 7-2, are as follows.

- The default data length was set to 2 bytes.

Address *	Input/output data table	
1st byte (I2000)	Node address 1 (slave)	Input
2nd byte (I2001)		Output
3rd byte (I2002)	Node address 2 (not connected)	Not used
4th byte (I2003)		Not used
5th byte (I2004)	Node address 3 (slave)	Input
6th byte (I2005)		Input
7th byte (I2006)		Output
8th byte (I2007)	Node address 5 (slave)	Output
9th byte (I2010)		Output
10th byte (I2011)		Output
11th byte (I2012)	Node address 5 (slave)	Input
12th byte (I2013)		Input
13th byte (I2014)	Node address 5 (slave)	Input
14th byte (I2015)		Input
to	Not used	

* The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

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

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

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

The scan list data table for this example will be as follows:

Address * 1	Value (hexadecimal): Details (=> See page 7-9)	
1st byte (E0000)	FF: This JW-20DN station (master)	Node address 0
2nd byte (E0001)	All zeroes	
3rd byte (E0002)		
4th byte (E0003)		
5th byte (E0004)		
6th byte (E0005)		
7th byte (E0006)		
8th byte (E0007)		
9th byte (E0010)	02: A slave station with a Polling I/O function	Node address 1
10th byte (E0011)	00: Not used	
11th byte (E0012)	00: 1 byte (input data length)	
12th byte (E0013)	01: 1 byte (output data length)	
13th byte (E0014)	00: 1st byte	
14th byte (E0015)	00: (input data offset)	
15th byte (E0016)	01: 2nd byte	
16th byte (E0017)	00: (output data offset)	
17th byte (E0020)	00: Not connected	Node address 2
18th byte (E0021)	00: Not used	
19th byte (E0022)	00: 0 byte (input data length)	
20th byte (E0023)	00: 0 byte (output data length)	
21st byte (E0024)	02: 3rd byte	
22nd byte (E0025)	00: (input data offset)	
23rd byte (E0026)	02: 3rd byte	
24th byte (E0027)	00: (output data offset)	
25th byte (E0030)	02: A slave station with a Polling I/O function	Node address 3
26th byte (E0031)	00: Not used	
27th byte (E0032)	03: 3 bytes (input data length)	
28th byte (E0033)	03: 3 bytes (output data length)	
29th byte (E0034)	04: 5th byte	
30th byte (E0035)	00: (input data offset)	
31st byte (E0036)	07: 8th byte	
32nd byte (E0037)	00: (output data offset)	
33rd byte (E0040)	01: A slave station without a Polling I/O function	Node address 4
34th byte (E0041)	All zeroes	
35th byte (E0042)		
36th byte (E0043)		
37th byte (E0044)		
38th byte (E0045)		
39th byte (E0046)		
40th byte (E0047)		
41st byte (E0050)	02: A slave station with a Polling I/O function	Node address 5
42nd byte (E0051)	00: Not used	
43rd byte (E0052)	03: 3 bytes (input data length)	
44th byte (E0053)	00: 0 byte (output data length)	
45th byte (E0054)	0A: 11th byte	
46th byte (E0055)	00: (input data offset)	
47th byte (E0056)	0D: 14th byte	
48th byte (E0057)	00: (output data offset)	

Address * 1	Value _H : Details	
49th byte (E0060)	00	Node address 6
50th byte (E0061)	00	
51st byte (E0062)	00	
52nd byte (E0063)	00	
53th byte (E0064)	0F * 2	
54th byte (E0065)	00	
55th byte (E0066)	0F * 2	
56th byte (E0067)	00	
57th byte (E0070)	00	Node address 7
58th byte (E0071)	00	
59th byte (E0072)	00	
60th byte (E0073)	00	
61st byte (E0074)	11 * 2	
62nd byte (E0075)	00	
63rd byte (E0076)	11 * 2	
64th byte (E0077)	00	

* 1 : * The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

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

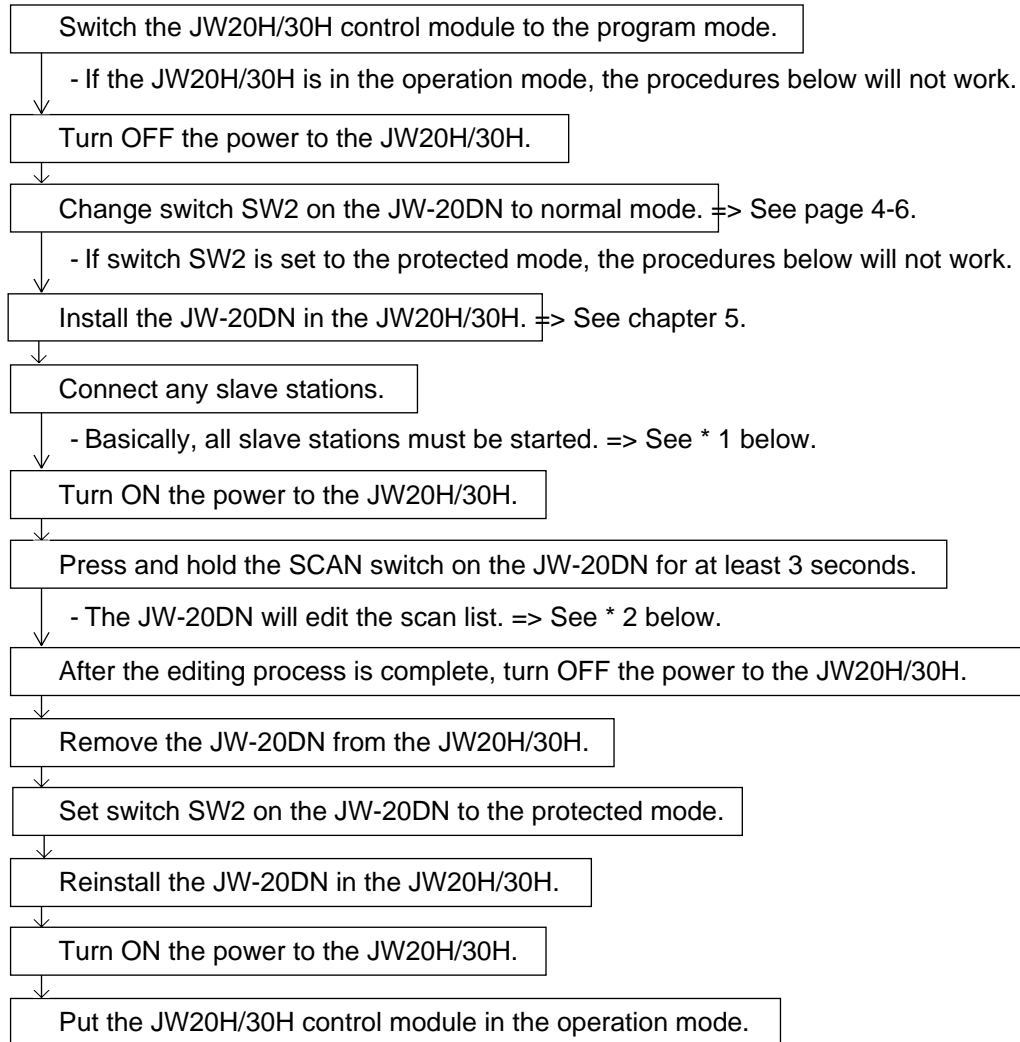
7-2 Editing the scan list

Before using the JW-20DN for the first time, you will have to edit the scan list (to allocate I/O data).

[1] Editing procedure

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

[Procedures]



* 1: Connecting the slave stations mentioned in step 5 above

- When “even number allocation” or “allocation in the order in which vacant nodes are occupied” is selected for the I/O data allocation method, and some node addresses are not occupied by slave stations, those node address will be assigned the default number of bytes. This will make operation possible with only the connected slave stations.

When a slave station is connected at a vacant address, and if this station needs more than the default number of bytes for I/O, the I/O addresses thereafter can be incremented by editing the next time a scan list is created.

* 2: Scan list editing procedure mentioned in step 7

- When the JW-20DN is in the normal operation mode and you change the JW20H/30H to the operation mode, the JW-20DN will start I/O communication. However, when you press the SCAN switch immediately after communication is started, the JW-20DN will start editing the scan list. This may cause a malfunction. Therefore, we recommend that you change to the protected mode as described in step 8 above.

[2] Scan list data table

Addresses in the scan list data table are assigned using the module No. switch on the JW-20DN.

(=> See page 4-3.)

• Addresses in the scan list data table

PC in which the JW-20DN is installed	No. of bytes	Module No. switch setting			
		0	1	2	3
JW20H	512	29000 to 29777	39000 to 39777	49000 to 49777	59000 to 59777
JW30H	512	E0000 to E0777	E1000 to E1777	E2000 to E2777	E3000 to E3777

- When a JW-31CUH1 is used for the PC, it will use addresses 59000 to 89777 and E0000 to E5777 for the structuring program. Therefore, the JW-20DN cannot share the structuring program at the same time.

• Details of the scan list data table

Address * 1	Details			Node address 0 information
1st byte (E0000)	Slave information flag * 2			
2nd byte (E0001)	Not used			
3rd byte (E0002)	Input data length	- Data length for the data which slave stations will send and receive in Polling I/O messages.		
4th byte (E0003)	Output data length			
5th byte (E0004)	Input data offset	- These indicate the byte mappings in the I/O data table (page 7-1) that data will be sent from or received into using Polling I/O messages. * 4.		
6th byte (E0005)				
7th byte (E0006)	Output data offset			
8th byte (E0007)				
9th byte (E00010) to to 16th byte (E00017)	Node address 1 details (same as node address 0)			
17th byte (E0020) to to 24th byte (E0027)	Node address 2 details (same as node address 0)			
505th byte (E0770) to to 512th byte (E0777)	Node address 63 details (same as node address 0)			

* 1 : *The addresses shown in parentheses are correct when a JW30H is used for the PC and the JW-20DN is set to 0 using its module No. switch.

* 2 : Slave information flag

Value _H	Details
00	Node not connected
01	Node connected, does not have a Polling I/O function
02	Node connected with a Polling I/O function
FF	JW-20DN's node address

* 3 : Information from the input data length (E0002) will be valid when the slave information flag (E0000) changed to 02.

* 4 : The position of an address from the top byte is expressed by a byte + 1.

(Ex.: When the value is 0, it is the 1st byte. When the value is 2, it is the 3rd byte.)

Chapter 8: Explicit Message Function

This function is not needed when you use the Polling I/O function. If you need to use this function because you will be using a special slave station, read the description below.

The JW-20DN can send a request for service to any device made by another manufacturer that uses the Explicit message function defined in the DeviceNet specifications. This function uses the Explicit message data table (118 bytes for both request and response) in the PC (JW20H/30H).

- An Explicit message data table request issues an Explicit message defined by DeviceNet, and asks any corresponding device to provide service.
 - The Explicit message data table response stores the service data details from the slave station.
- The address of the Explicit message data table is assigned using the module No. switch on the JW-20DN.
(=> See page 4-3.)

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

PC	Table	No. of bytes	Module No. switch setting			
			0	1	2	3
JW20H	Requests	118			89400 to 89565	99400 to 99565
	Responses	118			89600 to 89765	99600 to 99765
JW30H	Requests	118	39400 to 39565	49400 to 49565	59400 to 59565	69400 to 69565
	Responses	118	39600 to 39765	49600 to 49765	59600 to 59765	69600 to 69765

- When a JW-31CUH1 is used for the PC, it will use addresses 59000 to 89777 and E0000 to E5777 for its structuring program. Therefore, the JW-20DN cannot share the structuring program at the same time.

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

A module side reading flag, host side writing flag, and other parameters are described.

Address *	Parameter name	Details
1st byte (39400)	Module side reading flag	When the module has finished reading the contents being sent, the data in memory is automatically inverted. (Inverting data changes 0s to 1s, and vice-versa.)
2nd byte (39401)	Host side writing flag	When the data has been inverted, the host will send a request message to the slave station.
3rd byte (39402)	Status	The device status and response information are stored.
4th byte (39403)	TXID (transaction ID)	Assign an ID when creating a request.
5th byte (39404)	Size	Set the request data length.
6th byte (39405)	Reserved area	Use prohibited.
7th byte (39406)	MAC ID	Set a node address for the transaction object.
8th byte (39407)	Service code	Service code for the DeviceNet request.
9th byte (39410) 10th byte (39411)	Class ID	Assign a class ID to the Explicit message sending target.
11th byte (39412) 12th byte (39413)	Instance ID	Assign an instance ID to the Explicit message sending target.
13th byte (39414) • • 118th byte (39565)	Service data (106 bytes)	Assign data that is defined by a service code.

* The addresses in parentheses are correct when a JW30H is used for the PC and the module No. switch on the JW-20DN is set to 0. (For the addresses of the other settings => See page 8-3.)

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

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

A host side reading flag, module side writing flag, and other parameters are described.

Address *	Parameter name	Details
1st byte (39600)	Host side reading flag	When reading the received data, the same data is written to the JW-20DN.
2nd byte (39601)	Module side writing flag	When the JW-20DN receives a response from a slave station, the JW-20DN inverts the data. (Inverting data changes 0s to 1s, and vice-versa.)
3rd byte (39602)	Status	The device status and response information are stored.
4th byte (39603)	TXID (transaction ID)	Transaction ID of the response data.
5th byte (39604)	Size	Response data length.
6th byte (39605)	Reserved area	Use prohibited.
7th byte (39606)	MAC ID	Node address that will be the target for the transaction.
8th byte (39607)	Service code	Service code for the Device Net request.
9th byte (39610) 118th byte (39765)	Response data (110 bytes)	A received data message, as defined by the service code, is returned.

* The addresses in parentheses are correct when a JW30H is used for the PC and the module No. switch on the JW-20DN is set to 0. (For the addresses of the other settings => See page 8-3.)

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

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

Shown below are the parameter addresses for each PC model and the module No. switch setting.

PC model	JW20H				JW30H				Parameter name	
	Module No. switch setting	0	1	2	3	0	1	2		
Address			89400	99400	39400	49400	59400	69400	Module side reading flag	Request
			89401	99401	39401	49401	59401	69401	Host side writing flag	
			89402	99402	39402	49402	59402	69402	Status	
			89403	99403	39403	49403	59403	69403	Status/TXID (transaction ID)	
			89404	99404	39404	49404	59404	69404	Size	
			89405	99405	39405	49405	59405	69405	Reserved area	
			89406	99406	39406	49406	59406	69406	MAC ID	
			89407	99407	39407	49407	59407	69407	Service code	
			89410	99410	39410	49410	59410	69410	Class ID	
			89411	99411	39411	49411	59411	69411		
			89412	99412	39412	49412	59412	69412	Instance ID	
			89413	99413	39413	49413	59413	69413		
			89414	99414	39414	49414	59414	69414	Service data (106 bytes)	
			•	•	•	•	•	•		
			•	•	•	•	•	•		
			89565	99565	39565	49565	59565	69565		
			89600	99600	39600	49600	59600	69600	Host side reading flag	Response
			89601	99601	39601	49601	59601	69601	Module side writing flag	
			89602	99602	39602	49602	59602	69602	Status	
			89603	99603	39603	49603	59603	69603	TXID (transaction ID)	
	89604	99604	39604	49604	59604	69604	Size			
	89605	99605	39605	49605	59605	69605	Reserved area			
	89606	99606	39606	49606	59606	69606	MAC ID			
	89607	99607	39607	49607	59607	69607	Service code			
	89610	99610	39610	49610	59610	69610	Response data (110 bytes)			
	•	•	•	•	•	•				
	•	•	•	•	•	•				
	89765	99765	39765	49765	59765	69765				

(4) Example

Shown below is an example of reading the vendor ID of the identified object in a slave station.

(PC: JW30H, Module No. switch setting on the JW-20DN: 0)

Explicit message data table
(requests)

Address	Parameter name	Value _H
39400	Module side reading flag	00
39401	Host side writing flag	00
39402	Status	00
39403	TXID	00
39404	Size	06
39405	Reserved area	00
39406	MAC ID	00
39407	Service code	00
39410	Class ID	01
39411		00
39412	Instant ID	01
39413		00
39414	Service data	01
39415		00



Explicit message data table
(responses)

Address	Parameter name	Value _H
39600	Host side reading flag	00
39601	Module side writing flag	00
39602	Status	01
39603	TXID	00
39604	Size	02
39605	Reserved area	00
39606	MAC ID	01
39607	Service code	8E
39610	Response data	68
39611		00

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

Setting (hex.)

Set the values above and write to the register at 39401 (host side writing flag) (invert the flag).

=> Send a request message to the slave station.

Setting (hex.)

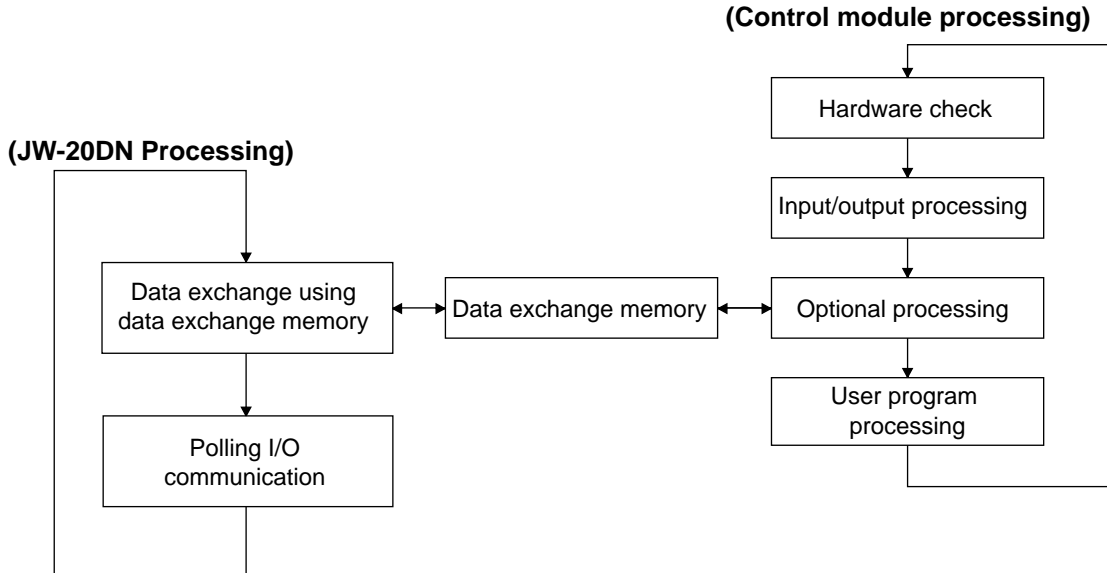
When a slave station sends a response to the request on the left,

- The value in register 39600 (host side reading flag) will be inverted.
- Register 39601 (module side writing flag) turns ON.
- Data from the slave station is stored in the registers starting at address 39602.

Chapter 9: Communication Timing

This chapter describes the communication between the control module (JW20H/30H), the JW-20DN, and the slave stations.

To exchange data between the JW-20DN and the JW20H/30H control module, the JW-20DN uses optional processing by the JW20H/30H.



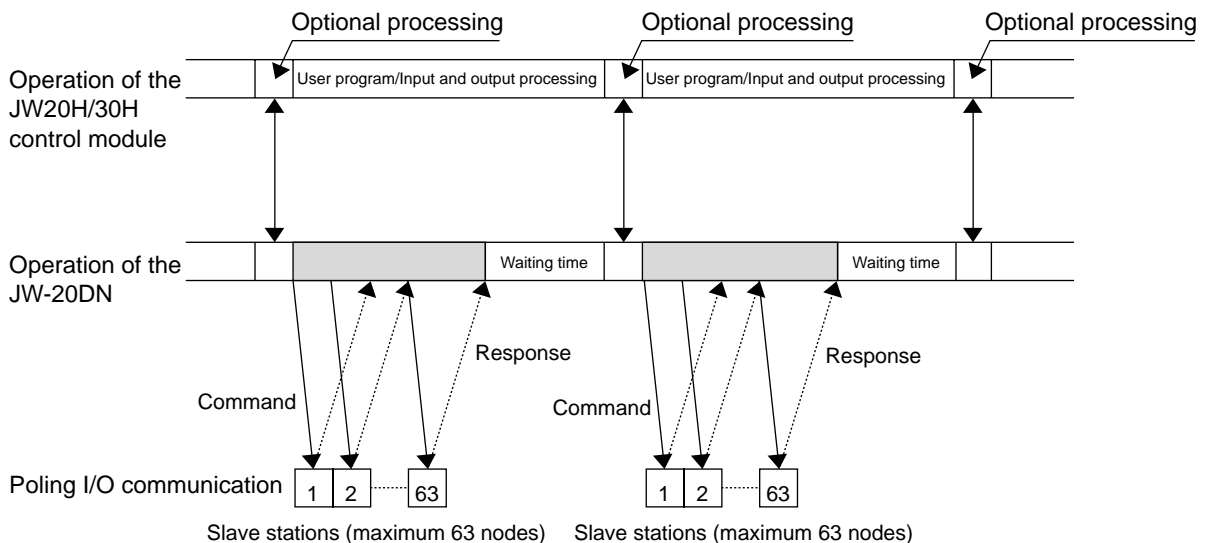
The JW-20DN receives responses from all slave stations. If not, after a communication time out, it will complete one Polling I/O communication cycle, and exchange data with the JW20H/30H control module.

- The time-out time is the normal time required after the JW-20DN completes sending commands to all of the slave stations, until it receives responses from all of the slave stations. The actual communication time-out period is determined by the setting of Switch SW2 on the JW-20DN and the number of slave stations connected. (See page 4-6.)

The division of the communication timing between the Polling I/O communication time and the operation time of the JW20H/30H is as follows.

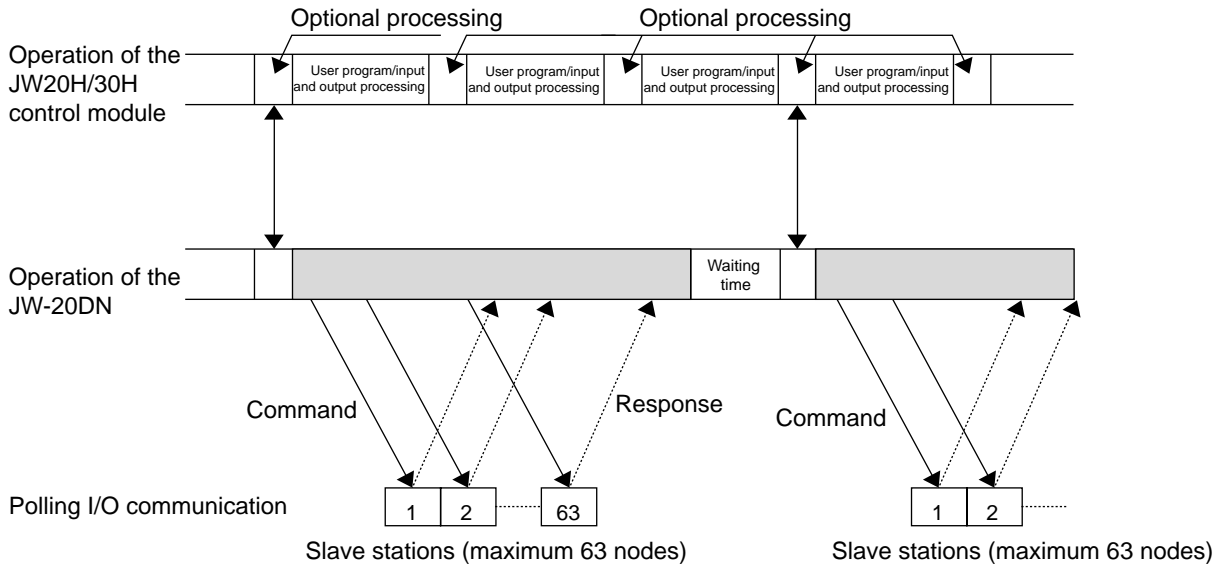
[1] When the Polling I/O communication time is shorter than the JW20H/30H cycle operation time

- Communication cycle: Asynchronous/synchronous

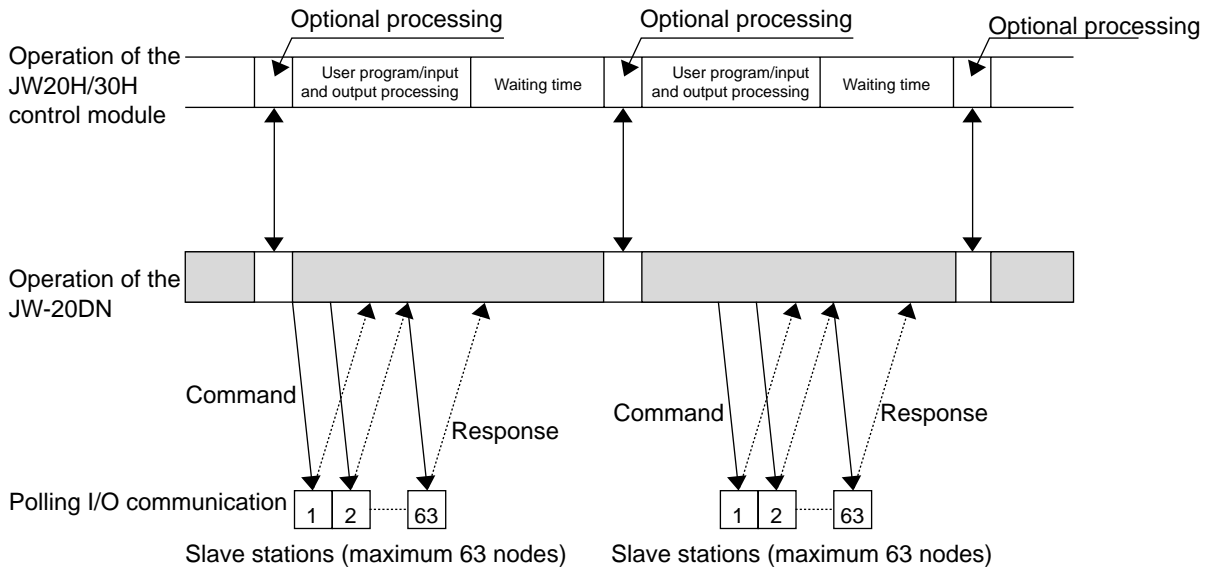


[2] When the Polling I/O communication time is longer than the JW20H/30H cycle operation time

(1) Communication cycle: Asynchronous



(2) Communication cycle: Synchronous

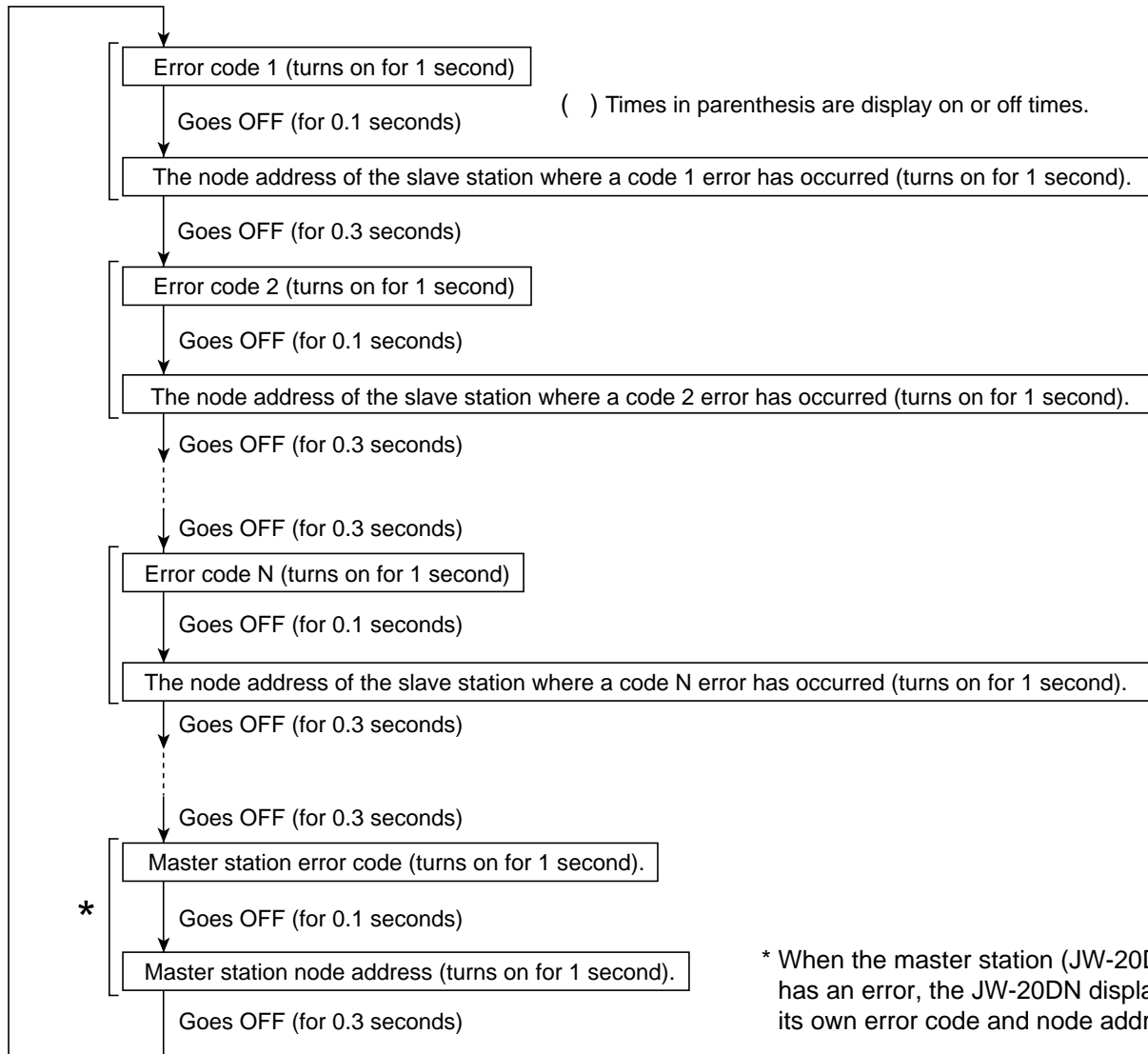
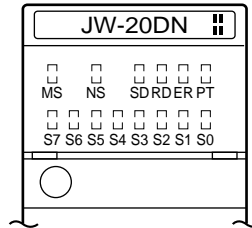


Chapter 10: Error Handling

When an error occurs during communication with the JW-20DN, check the error details by referring to the display lamps and the diagnostic data table. Then take the appropriate action.

10-1 Display lamp

When an error occurs on a node (master and slave station), the error code and the node address will be displayed on the JW-20DN display panel (S0 to S7).



- There is no priority order for displaying errors. The JW-20DN will repeatedly display all errors in the order in which they occurred.
- See the following pages for the details of the display appearance and the error codes, as well as the display appearance of the node address.

[1] Error code

(1) Error code display

The JW-20DN displays error codes using lights S0 to S7 on the display panel.

S0 to S7 lamp status (: Lit, : Off)								Error code (hexadecimal)
S7	S6	S5	S4	S3	S2	S1	S0	
								D 1
								D 2
								D 5
								D 6
								D 9
								E 0
								E 2
								F 0
								F 1
								F 2
								F 3
								F 4
								F 7
								F 8

(2) Error details

The error code details and actions are as follows.

MS/NS lamp	Error code (error node)	Error details		Operation of JW-20DN	Master status *1	Treatment
MS: Keeps the current status NS: Red lamp blinks	D2 (slave station)	Configu- ration error	The I/O area of one slave station exceeds 64 bytes	Do not open communica- tion with the error slave station.	D4 turns ON * 2	Reset the slave node addresses.
	D5 (slave station)	Verifi- cation error	- There is no slave data table at all. - The slave does not exist.	Open communica- tion with the error slave station.	D16 and D3 turn ON * 2	- Check whether the slaves are properly connected. - Recreate the scan list after checking the slave connections and node assignments.
	D6 (slave station)		The slave's I/O data size does not match the scan list register details.			After checking the number of I/O bytes used by the slaves, recreate the scan list.
	D9 (slave station)	Communi- cation error	- A slave time out has occurred 6 times in a row while waiting for a response. - A fragmen- tation protocol error has occurred 3 times.		D16 and D2 turn ON * 2	Check the following: - Make sure the communication speed of the master station and slave stations are the same. - Make sure there are no disconnected or loose cables. - Make sure there is not too much electrical noise. - Make sure the cable lengths (trunk and branches) are appropriate. - Make sure the terminating resistances are connected to both ends and only to the ends.

To the next page

* 1 : Master status => See page 10-9

* 2 : D17 will turn ON when the JW-20DN is connected to more than 1 slave station. (If the master station detects a problem or is unable to establish connection with all slave stations, D17 will turn OFF.)

MS/NS lamp	Error code (error node)	Error details		Operation of JW-20DN	Master status *	Treatment
MS: Keeps the current status NS: Red lamp lights	F0 (master)	A node address has been used twice	The master station node address has been assigned to another node.	Operation stopped	D16 and D1 turn ON.	Check the other node addresses. Eliminate the duplicated node address and restart the master module (JW-20DN).
	F1 (master)	Detected a Bus OFF	The JW-20DN Bus OFF status is active (communication was stopped due to frequent data errors).			Check the following: - Make sure the communication speed of the master station and slave stations are the same. - Make sure there are no disconnected or loose cables. - Make sure there is not too much electrical noise. - Make sure the cable lengths (trunk and branches) are appropriate. - Make sure the terminating resistances are connected both ends and only to the ends.
MS: Red lamp blinks NS: Goes OFF	F2 (master)	Node address error	Some of the switches on the JW-20DN are set incorrectly.		D16 and D0 turn ON.	Check the node address switch.
	F3 (master)	Communication speed error				Check the SW2 switch settings.
	F4 (master)	Module No. error				Check the Module No. switch settings.
MS: Red lamp lights NS: Goes OFF	F7 (master)	Scan list data error	The EEPROM has a memory error. - Unable to read or write the scan list parameters since no data table exists on the master module.		—	Recreate the scan list and recreate the data table in the master module (JW-20DN). Or, replace the JW-20DN.
	F8 (master)	Serial No. error				
	F9 (master)	RAM error	An error occurred during a RAM check of the master module.			
	FA (master)	ROMSUM error	An error occurred during a ROM check of the master module.			
	FB (master)	DPRAM error	An error occurred during a common RAM check of the master module.			
MS: Green lamp lights NS: Goes OFF	E0 (master)	Network power error	Communication power is not being supplied correctly from the network.	Waiting for the network to supply power.	D16 and D0 turn ON.	Check the network power and cable wiring.
MS: Keeps the current status NS: Keeps the current status	Goes OFF	Watchdog timer error	A watchdog timer error occurred on the master station.	Operation stopped	—	Replace the JW-20DN.
		CU watchdog timer error	A watchdog timer error occurred on the JW20H/30H control module.			See the user's manual for the JW20H/30H control module.

* Master status => See page 10-9.

[2] Display of node addresses

The JW-20DN displays node addresses using the S0 to S7 lamps on the display panel.

S0 to S7 lamp status (: Lit, : Off)								Node address (decimal)	S0 to S7 lamp status (: Lit, : Off)								Node address (decimal)
S7	S6	S5	S4	S3	S2	S1	S0		S7	S6	S5	S4	S3	S2	S1	S0	
								0								46	
								1								47	
								2								48	
								3								49	
								4								50	
								5								51	
								6								52	
								7								53	
								8								54	
								9								55	
								10								56	
								11								57	
								12								58	
								13								59	
								14								60	
								15								61	
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								42									
								43									
								44									
								45									

10-2 Diagnostic data table

Using the diagnostic data table created on the PC (JW20H/30H), you can check the communication status of the nodes (master and slave stations). Assign the address of the diagnostic table (256 bytes) using the module No. switch on the JW-20DN. (See page => 4-3.)

• Diagnostic data table addresses (256 bytes)

PC model used	Module No. switch settings			
	0	1	2	3
JW20H	11500 to 11507 (8 bytes) * 1	11510 to 11517 (8 bytes) * 1	89000 to 89337	99000 to 99337
JW30H * 2	39000 to 39377	49000 to 49377	59000 to 59377	69000 to 69377

* 1 : Only the communication monitor table exists.

* 2 : When you are working with a JW-31CUH1, it uses addresses 59000 to 89777 and E0000 to E5777 for its structuring program. Therefore, the JW-20DN cannot use its structuring program at the same time as the JW-31CUH1. (=> See page 4-3.)

[1] Diagnostic data table details

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

Address * 1	Bit number							
	D7	D6	D5	D4	D3	D2	D1	D0
1st byte (39000)	7	6	5	4	3	2	1	0
2nd byte (39001)	15	14	13	12	11	10	9	8
3rd byte (39002)	23	22	21	20	19	18	17	16
4th byte (39003)	31	30	29	28	27	26	25	24
5th byte (39004)	39	38	37	36	35	34	33	32
6th byte (39005)	47	46	45	44	43	42	41	40
7th byte (39006)	55	54	53	52	51	50	49	48
8th byte (39007)	63	62	61	60	59	58	57	56
9th byte (39010)	Reserved area * 2							
32nd byte (39037)	D7	D6	D5	D4	D3	D2	D1	D0
33rd byte (39040)	7	6	5	4	3	2	1	0
34th byte (39041)	15	14	13	12	11	10	9	8
35th byte (39042)	23	22	21	20	19	18	17	16
36th byte (39043)	31	30	29	28	27	26	25	24
37th byte (39044)	39	38	37	36	35	34	33	32
38th byte (39045)	47	46	45	44	43	42	41	40
39th byte (39046)	55	54	53	52	51	50	49	48
40th byte (39047)	63	62	61	60	59	58	57	56
41st byte (39050)	Reserved area * 2							
64th byte (39077)	Node 0							
65th byte (39100)	Node 1							
66th byte (39101)	Node 2							
127th byte (39176)	Node 62							
128th byte (39177)	Node 63							
129th byte (39200)	D7	D6	D5	D4	D3	D2	D1	D0
130th byte (39201)	D17	D16	D15	D14	D13	D12	D11	D10
131th byte (39202)	Reserved area * 2							
256th byte (39377)	Reserved area * 2							

Diagnostic data (256 bytes)

Communication monitor table (8 bytes)

- The node addresses are numbered 0 to 63.
- The communication status of each node is indicated by turning the bits in these 8 bytes ON and OFF.

ON: Normal
OFF: Abnormal

=> See the next page.

- A bit representing the JW-20DN (master module) status will turn OFF when any of the slave stations is abnormal.

Operating status monitor table (8 bytes)

- The node addresses are numbered 0 to 63.
- The operating status of each node is indicated by turning the bits in these 8 bytes ON and OFF.

ON: The slave station is operating
OFF: The slave station is idle.

=> See the next page.

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

Device status table (64 bytes)

- The status of the slave station devices can be monitored by keeping track of the device status codes assigned to each node address. 00_(H) is normal.

=> See page 10-7.

Master status (2 bytes)

- The error information and operating status of the master station is indicated by turning bits ON and OFF.

=> See page 10-9.

* 1 : The addresses in parentheses are correct when the PC is a JW30H and the Module No. switch on the JW-20DN is set to 0.

* 2 : Do not change any values in the reserved area. If you do, the JW-20DN will malfunction.

[2] Diagnostic data table addresses

Shown below are the addresses of the diagnostic data table (communication monitor table, etc.) for each PC model (JW20H/30H) and each Module No. switch setting.

(1) Address of the communication monitor table

PC model	JW20H				JW30H				Node address (bit)							
	Module No. switch setting	0	1	2	3	0	1	2	3	D7	D6	D5	D4	D3	D2	D1
Address	11500	11510	89000	99000	39000	49000	59000	69000	7	6	5	4	3	2	1	0
	11501	11511	89001	99001	39001	49001	59001	69001	15	14	13	12	11	10	9	8
	11502	11512	89002	99002	39002	49002	59002	69002	23	22	21	20	19	18	17	16
	11503	11513	89003	99003	39003	49003	59003	69003	31	30	29	28	27	26	25	24
	11504	11514	89004	99004	39004	49004	59004	69004	39	38	37	36	35	34	33	32
	11505	11515	89005	99005	39005	49005	59005	69005	47	46	45	44	43	42	41	40
	11506	11516	89006	99006	39006	49006	59006	69006	55	54	53	52	51	50	49	48
	11507	11517	89007	99007	39007	49007	59007	69007	63	62	61	60	59	58	57	56

The bits at node addresses 0 to 63 indicate the communication status of each node.

(ON: Normal, OFF: Abnormal)

(2) Operating status monitor table addresses

PC model	JW20H				JW30H				Node address (bit)							
	Module No. switch setting	0	1	2	3	0	1	2	3	D7	D6	D5	D4	D3	D2	D1
Address	/		89040	99040	39040	49040	59040	69040	7	6	5	4	3	2	1	0
		89041	99041	39041	49041	59041	69041	15	14	13	12	11	10	9	8	
		89042	99042	39042	49042	59042	69042	23	22	21	20	19	18	17	16	
		89043	99043	39043	49043	59043	69043	31	30	29	28	27	26	25	24	
		89044	99044	39044	49044	59044	69044	39	38	37	36	35	34	33	32	
		89045	99045	39045	49045	59045	69045	47	46	45	44	43	42	41	40	
		89046	99046	39046	49046	59046	69046	55	54	53	52	51	50	49	48	
		89047	99047	39047	49047	59047	69047	63	62	61	60	59	58	57	56	

The bits at node addresses 0 to 63 indicate the operating status of each node.

(ON: Slave station is operating, OFF: Slave station is idle)

(3) Device status table addresses

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

PC model	JW20H				JW30H				Node address (bit)
Module No. switch setting	0	1	2	3	0	1	2	3	
Address			89100	99100	39100	49100	59100	69100	0
			89101	99101	39101	49101	59101	69101	1
			89102	99102	39102	49102	59102	69102	2
			89103	99103	39103	49103	59103	69103	3
			89104	99104	39104	49104	59104	69104	4
			89105	99105	39105	49105	59105	69105	5
			89106	99106	39106	49106	59106	69106	6
			89107	99107	39107	49107	59107	69107	7
			89110	99110	39110	49110	59110	69110	8
			89111	99111	39111	49111	59111	69111	9
			89112	99112	39112	49112	59112	69112	10
			89113	99113	39113	49113	59113	69113	11
			89114	99114	39114	49114	59114	69114	12
			89115	99115	39115	49115	59115	69115	13
			89116	99116	39116	49116	59116	69116	14
			89117	99117	39117	49117	59117	69117	15
			89120	99120	39120	49120	59120	69120	16
			89121	99121	39121	49121	59121	69121	17
			89122	99122	39122	49122	59122	69122	18
			89123	99123	39123	49123	59123	69123	19
			89124	99124	39124	49124	59124	69124	20
			89125	99125	39125	49125	59125	69125	21
			89126	99126	39126	49126	59126	69126	22
			89127	99127	39127	49127	59127	69127	23
			89130	99130	39130	49130	59130	69130	24
			89131	99131	39131	49131	59131	69131	25
			89132	99132	39132	49132	59132	69132	26
			89133	99133	39133	49133	59133	69133	27
			89134	99134	39134	49134	59134	69134	28
			89135	99135	39135	49135	59135	69135	29
			89136	99136	39136	49136	59136	69136	30
			89137	99137	39137	49137	59137	69137	31
			89140	99140	39140	49140	59140	69140	32
			89141	99141	39141	49141	59141	69141	33
			89142	99142	39142	49142	59142	69142	34
			89143	99143	39143	49143	59143	69143	35
			89144	99144	39144	49144	59144	69144	36
			89145	99145	39145	49145	59145	69145	37
			89146	99146	39146	49146	59146	69146	38
			89147	99147	39147	49147	59147	69147	39
			89150	99150	39150	49150	59150	69150	40
			89151	99151	39151	49151	59151	69151	41
			89152	99152	39152	49152	59152	69152	42
			89153	99153	39153	49153	59153	69153	43
			89154	99154	39154	49154	59154	69154	44
			89155	99155	39155	49155	59155	69155	45
			89156	99156	39156	49156	59156	69156	46
			89157	99157	39157	49157	59157	69157	47
			89160	99160	39160	49160	59160	69160	48
			89161	99161	39161	49161	59161	69161	49
			89162	99162	39162	49162	59162	69162	50
			89163	99163	39163	49163	59163	69163	51
		89164	99164	39164	49164	59164	69164	52	

PC model	JW20H				JW30H				Node address (bit)
Module No. switch setting	0	1	2	3	0	1	2	3	
Address	/	89165	99165	39165	49165	59165	69165	53	
		89166	99166	39166	49166	59166	69166	54	
		89167	99167	39167	49167	59167	69167	55	
		89170	99170	39170	49170	59170	69170	56	
		89171	99171	39171	49171	59171	69171	57	
		89172	99172	39172	49172	59172	69172	58	
		89173	99173	39173	49173	59173	69173	59	
		89174	99174	39174	49174	59174	69174	60	
		89175	99175	39175	49175	59175	69175	61	
		89176	99176	39176	49176	59176	69176	62	
		89177	99177	39177	49177	59177	69177	63	

• Device status code

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

(4) Master status address

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

PC model	JW20H				JW30H				Diagnostic details
Module No. switch setting	0	1	2	3	0	1	2	3	
Address			89200	99200	39200	49200	59200	69200	Error information (D0 to D7)
			89201	99201	39201	49201	59201	69201	Operation status (D10 to D17)

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

*

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

10-3 Slave station status when the PC has stopped operation

When the PC is in the program mode (operation has stopped), the JW-20DN sends out status information that the JW-20DN is in idle. For details about the operation of each slave station, see the respective manual for the slave station device.

Chapter 11: Specifications

(1) General specifications

Item	Specification
Storage temperature	-20 to +70° C
Ambient operating temperature	0 to +55° C
Ambient humidity	35 to 90%RH (non condensing)
Vibration resistance	Equivalent to JIS C 0911. Oscillation distance: 0.15 mm (10 to 58 Hz), 9.8 m/s ² (58 to 150 Hz) (2 hours each for X, Y, and Z directions.)
Shock resistance	Equivalent to JIS C0912. 98 m/s ² (3 times each in the X, Y, and Z directions)
Communication power voltage	11 to 25 VDC
Internal power consumption	200 mA max. (5 VDC)
Communication power consumption	50 mA max.
Number of internally installed module	Install up to 4 modules in the JW20H/30H.
Weight	Approximately 180 g
Accessories	One instruction manual.

(2) Communication specifications

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

(3) External dimension drawings

