● Temporary installation of wireless slave station
Set the switches as shown below, and temporarily fix the master station in the determined location.

Slave station
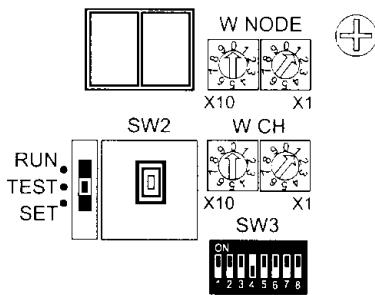
- SW3 = bit4 ON (installation test)
- Mode select switch = TEST
- WNODE = WNODE for each wireless slave station (WNODE = 01 to 02 for this example.)

Connect a DeviceNet cable prepared for a micro-connector, and connect the DC24V communications power supply.

● Performing the installation test
Perform the positioning test. (Refer to "5-2 Positioning Test" for details concerning the procedure.) Once you have confirmed that wireless communications are stable, ensure that they remain stable by securing the wireless unit in position. In this example, an installation test is performed between the wireless master station and slave station 1, and the wireless master station and slave station 2.

2-3 Hardware Settings and Wiring

Settings and wiring to be performed before turning on the power supply to the system are explained in this section.

■ DeviceNet wireless master station settings and installation

● Settings

An example setting for a wireless master station is shown below. Refer to "4-1 DeviceNet Wireless Master station Specifications" for details concerning setting procedures. All DeviceNet settings apart from the node address must match the master unit, and therefore the default settings should be used.

DeviceNet master unit
Model C200HW-DRM21-V1
(NNODE=00)

DeviceNet Network

Wireless master station
Model WD30-M

SW3=bit6 ON
SW1=bit3 ON
WNODE=01
NNODE=10
Mode select switch = SET
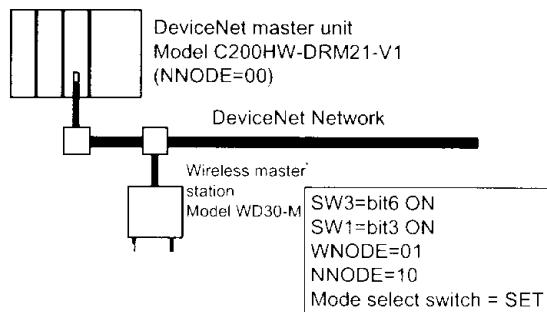
● Installation

Use screws to firmly fix the wireless master station that has already been temporarily installed. Refer to "4-1 DeviceNet Wireless Master station Specifications" for details.

Hardware Settings and Checking of Operations

■ DeviceNet wireless slave station settings and installation

● Settings

Settings example for each wireless slave station are shown below. Refer to "4-2 DeviceNet Wireless Slave Station Specifications" for details concerning the setting procedure.

In this example, the default settings should be used for all DeviceNet settings apart from the node address. Refer to the "DeviceNet Slave Manual" (SBCD 305□) for details concerning the settings for each DeviceNet slave.
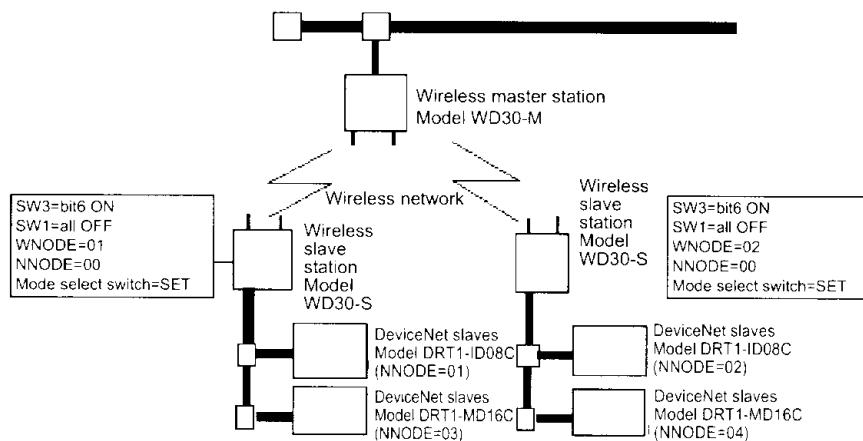
● Installation

Use screws to firmly fix the wireless slave stations that have already been temporarily installed. Refer to "4-2 DeviceNet Wireless Slave Station Specifications" for details.

■ Installation of connection equipment

Connection equipment that requires installation is listed below.
- Shielded T-type branch connector
- Shielded terminal registor
- Communications power supply (DC24V)

Terminal registor installation

Terminal registors are required not only for the wireless master station, but also on both ends of the wireless slave stations' DeviceNet network.

■ Cable connections

Connect a DeviceNet cable prepared for micro-connectors to the wireless master and slave stations.

Connect the cables to the DeviceNet master (C200HW-DRM21-V1) and the DeviceNet slave (environment-resistant terminal) to create the complete physical system network.

Example 1:
Connecting the cable on the side and installing a terminal registor
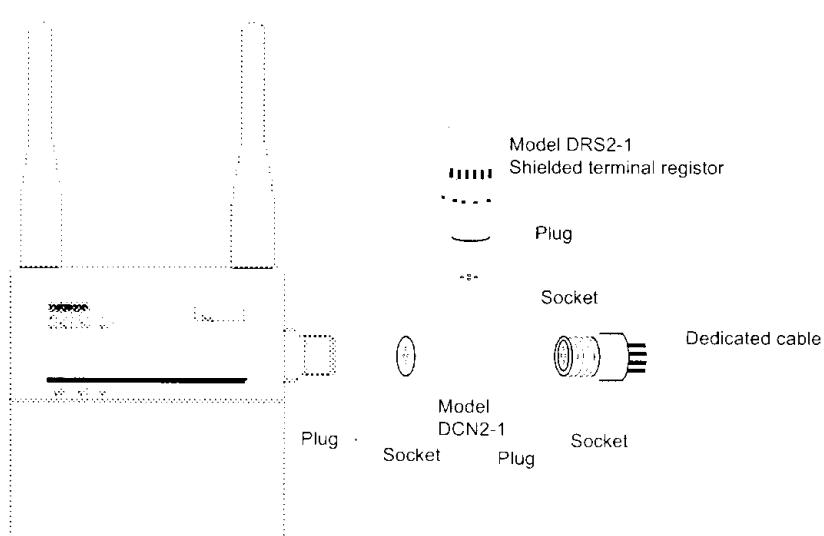
Example 2:
Connecting the cable to the top, and installing a terminal registor
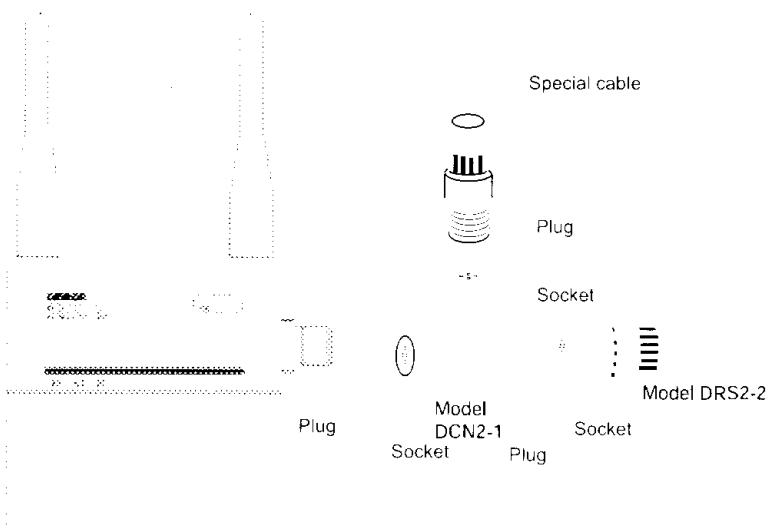
Example 3:
Connecting the cable to the bottom. and installing a terminal registor

Model DRS2-1
Shielded terminal registor

Plug

Socket

Model DCN2-1

Plug

Socket

Plug   Socket   Socket

Dedicated cable
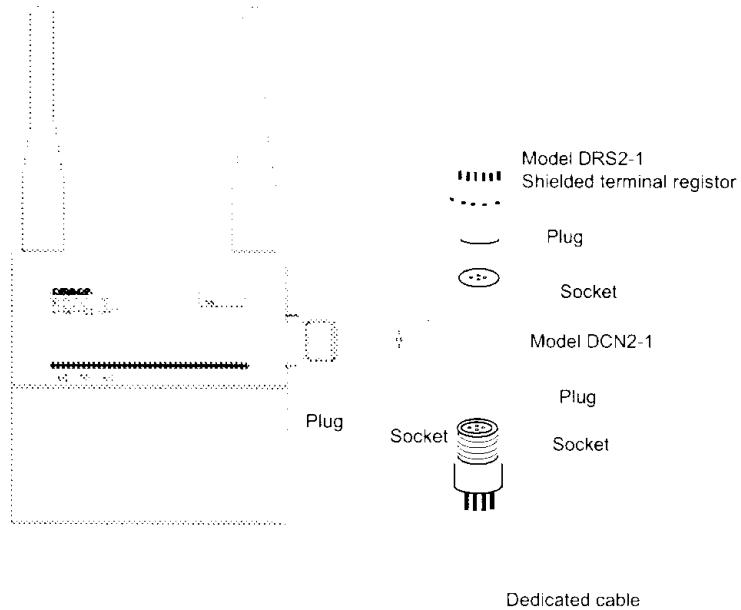
2-4 System Initial Setting and Starting Communications

The required entries, and deletion and initialization procedures following system start are explained in this section.

■ System start

Turn on the communications power source and the node power supply in the following order.

(1) DeviceNet slave (environment resistant terminal) external power supply

(2) DeviceNet master (C200HW-DRM21-V1) power supply

It is also OK to turn all power supplies on simultaneously.

■ DeviceNet slave registration

Register the number of DeviceNet slave I/O points in the wireless slave station.

If the same system configuration as for the network default settings (Refer to "1-2 Basic Functions of the DeviceNet Wireless Unit".) is used, there is no need to do this registration.

The specifics of this example are explained below.

First, begin with the WNODE = 1 wireless slave station.
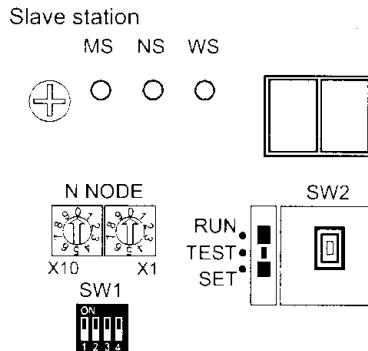
Slave station

(1) Confirm that the slave station node address (NNODE) is not doubled with the DeviceNet slave. In this example, NNODE = 00 is OK.
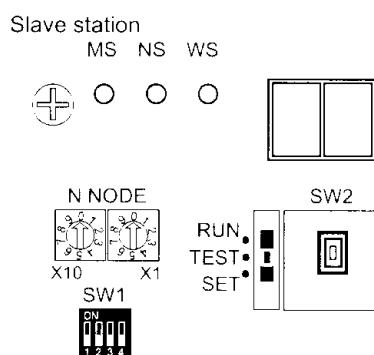
Slave station

(2) Check if the communications rate for the slave station and the DeviceNet slave is the same. In this example, since default settings (125kbps) are used, all of the bits for SW1 should be OFF.

Slave station
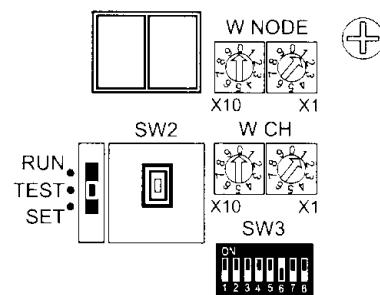
(3) Since the DeviceNet slave is registered, set SW3 to "bit 6 = ON".

Slave station
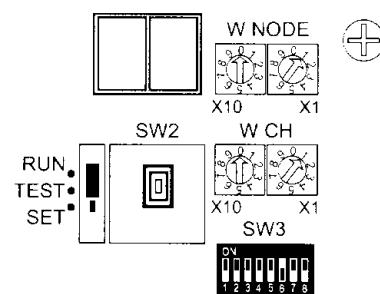
(4) Set the mode select switch to "SET".
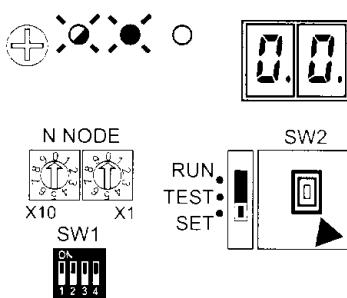
Slave station

(5) Turn ON the wireless slave station communications power supply.
After confirming that the LED display shows a decimal point display (scan list invalid mode) and the NS LED lights green, push SW2.

Slave station
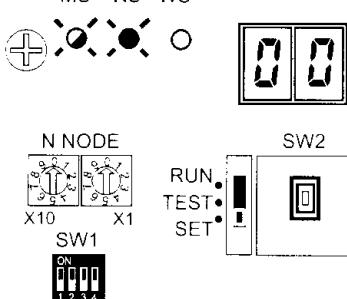
(6) Once the decimal point display has disappeared from the LED display, DeviceNet slave entry is complete. (scan list valid mode)

Slave station

(7) Set SW3 to "bit 6 = OFF".

Slave station
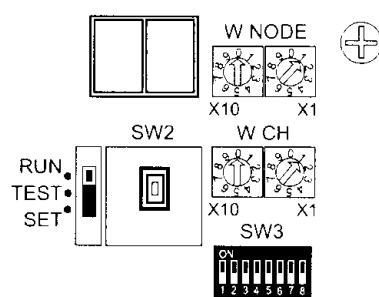
(8) Set the mode select switch to "RUN".
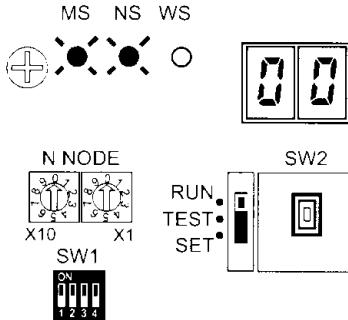
Slave station

(9) If the NS LED lights green and the LED display shows the node address, the system is in RUN operation status.

The operation for the WNODE = 2 wireless slave station is the same as steps (1) through (9) above.

Hardware Settings and Checking of Operations

# ■ DeviceNet wireless slave station registration

Entry the wireless slave station in the wireless master station.
If the same system configuration as for the network default settings (Refer to "1-2 DeviceNet Wireless Unit Basic Functions".) is used, there is no need to do this registration. In addition, when not using the WNODE = 1 wireless slave station (entry is complete with default settings when sent from the factory), it must be deleted before proceeding with entry.
The specifics of this example are explained below.
First, begin with the WNODE = 1 wireless slave station.

Master station
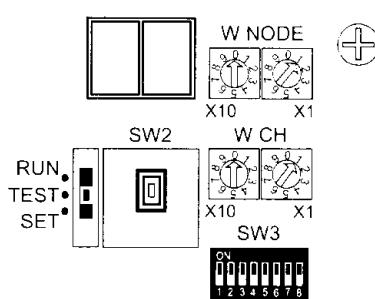
(1) Use the wireless master station WNODE = 1.

Master station
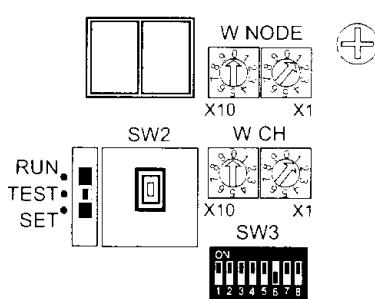

(2) To entry the wireless slave station, set SW3 to "bit 6 = ON".

Master station
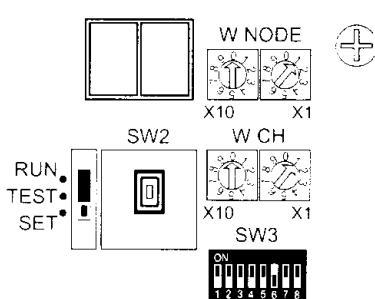
(3) Set the wireless master station mode select switch to "SET".

Master station

MS NS WS

N NODE

X10 X1

SW1

RUN
TEST
SET

SW2
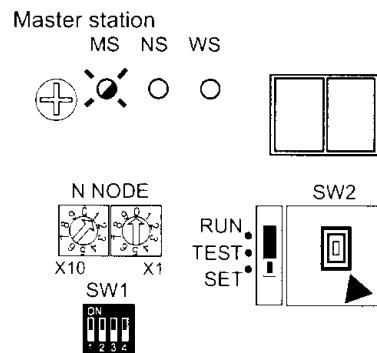
(4) Turn ON the wireless master station communications power supply. Once the MS LED flashes green and SW2 is pressed, the addition of the wireless slave station begins.

Master station

MS NS WS

N NODE

X10 X1

SW1

RUN
TEST
SET

SW2
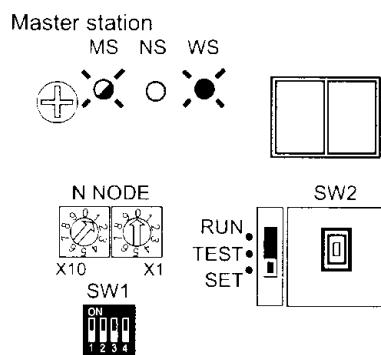
(5) Once communication has begun with the wireless slave station, the WS LED lights green, the number of IN/OUT points are acquired, and a check is performed on the total number of points. If the check is OK, entry is performed automatically.

Master station

MS NS WS

N NODE

X10 X1

SW1

RUN
TEST
SET

SW2
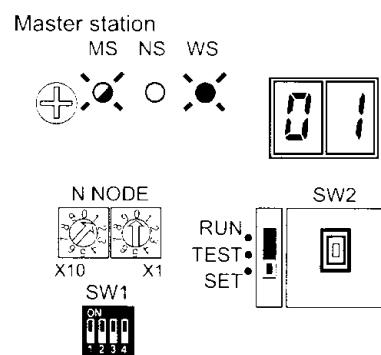
(6) If entry is completed correctly, the registered WNODE (01 for this example) is shown in the LED display.

Master station

MS NS WS

N NODE

X10 X1

SW1

RUN
TEST
SET

SW2
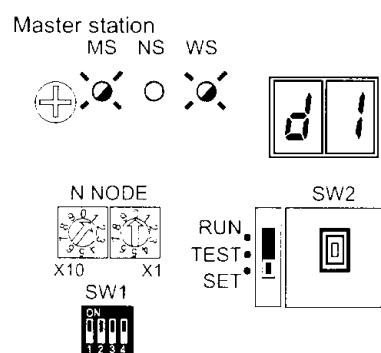
(7) If entry fails, the WS LED flashes red, and the error condition is shown in the LED display.

Hardware Settings and Checking of Operations

(8) The registration for the WNODE = 2 wireless slave station is the same as steps (1) through (7) above. This procedure completes the registration of all wireless slave stations.

Master station
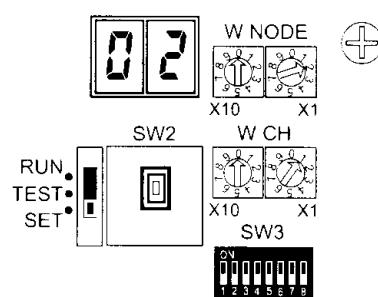
(9) Set SW3 to "bit 6 = OFF".

Master station
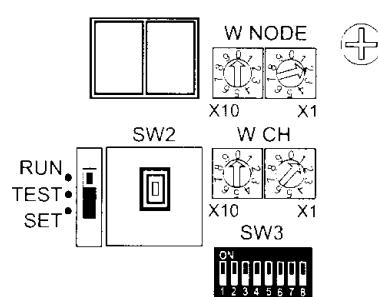
(10) Set the mode select switch to "RUN".

Master station
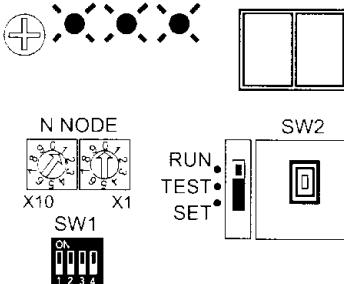
MS NS WS

(11) If the MS, NS, and WS LEDs all light green and nothing is shown in the LED display, the system is in RUN operation status.

Slave station

MS NS WS
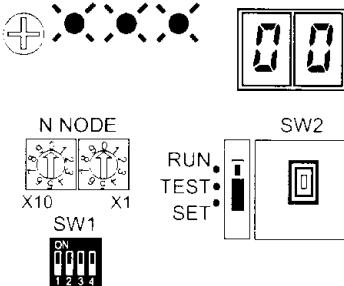
(12) At this point, the MS, NS, and WS LEDs on each wireless slave station light green, too, and the node addresses (NNODE = 0) are shown in the LED displays.

■ Scan list valid settings

Scan list creation and entry and the scan list valid mode are performed from the DeviceNet master (C200HW-DRM21-V1). Refer to the "DeviceNet User's Manual" (SCCC-308□) for details.

2-5 Operation Confirmation

The confirmation procedure for whether or not remote I/O communications are performed correctly is explained in this section.

■ Unit LED confirmation

If the MS and NS LEDs on all DeviceNet slaves (environment-resistant terminals) light green, the node address is shown on the DeviceNet master (C200HW-DRM21-V1) LED display (the decimal display disappears), and the MS and NS LEDs light green, wireless remote I/O communications are operating correctly in scan list enable mode.

■ Status confirmation

If the STATUS setting is made, status information is automatically assigned to the 2CH at the top of the IN area. (The position is fixed.)
The IN/OUT data for the DeviceNet slave (environment-resistant terminal) is assigned to the IN areas and OUT areas of both the wireless slave stations as the WNODE order rises and the wireless master stations as the NNODE (1 to 4 in this example) order rises.
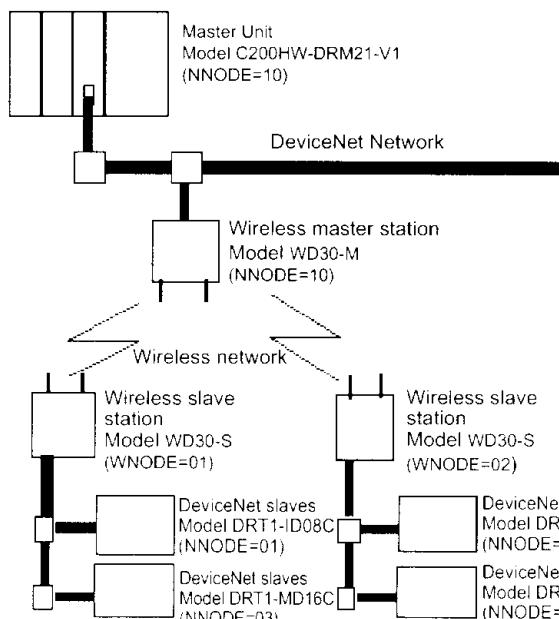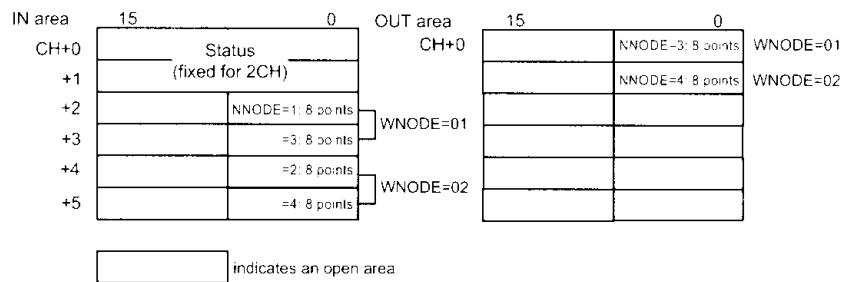
■ Confirmation by reading/writing data

Connect the computer's peripheral tools to the master, read and write from and to the OUT and IN areas of the DeviceNet master unit (C200HW-DRM21-V1), and confirm that this is reflected correctly on the DeviceNet slave (environment-resistant terminal).

Hardware Settings and Checking of Operations

2-6 Other Operations

■ DeviceNet wireless slave station deletion

Wireless slave stations you want to remove from the system can be deleted. When creating a system that does not use a WNODE = 1 wireless slave station, the WNODE = 1 slave station (registered as the default before being shipped from the factory) should be deleted before performing the entry procedure.

● Deletion example

Delete the WNODE = 1 wireless slave station from the system shown below.
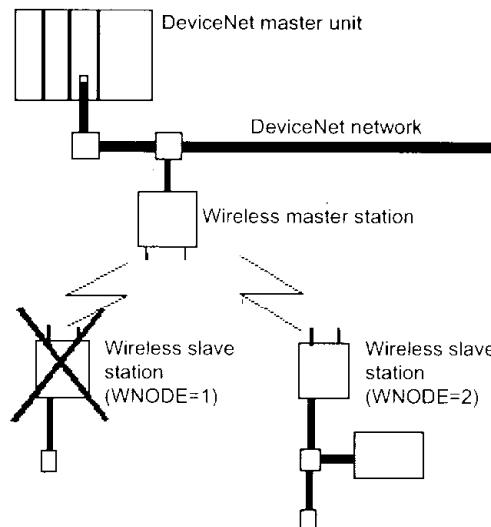
● Procedure

Master station
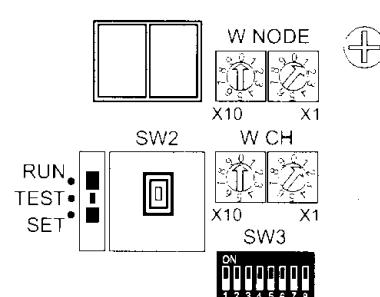
(1) Align with the wireless slave station WNODE = 1 that will delete the wireless master station WNODE.

Master station
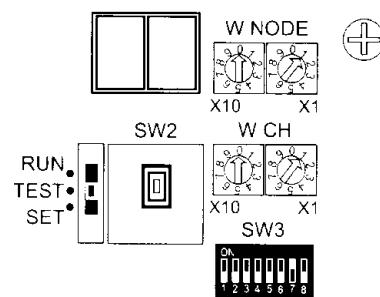
(2) To delete the wireless slave station, set SW3 to "bit 7 = ON".

Master station
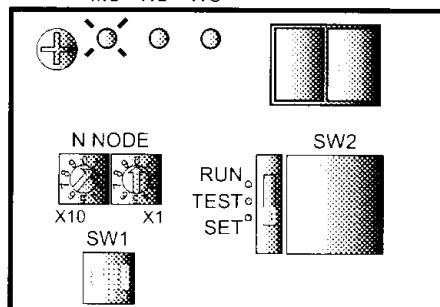
(3) Set the wireless master station mode select switch to "SET". The NS LED goes off, and the MS LED flashes green.

Master station
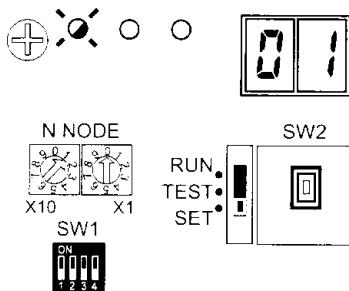
(4) "01", the item to be deleted, will be shown in the LED display.
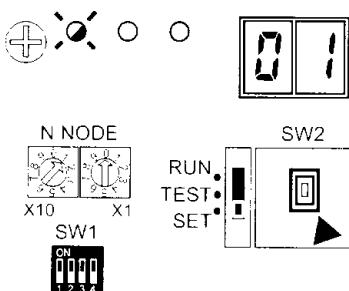
Master station

(5) Push SW2 to delete the item.

Master station
MS NS WS
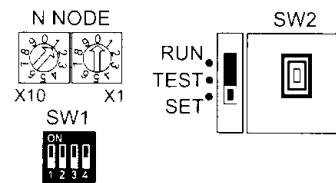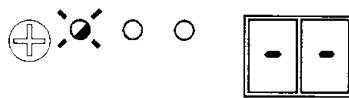
(6) Once deletion is complete, "--" is shown in the LED display.

N NODE
X10   X1
SW1

SW2
RUN
TEST
SET

Master station

(7) Set SW3 to "bit 7 = OFF".

W NODE
X10   X1

SW2
RUN
TEST
SET

W CH
X10   X1
SW3
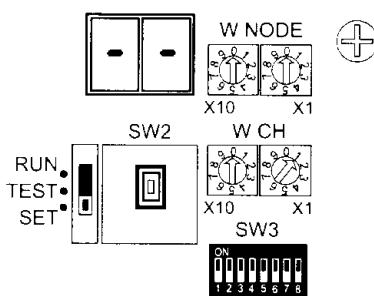
Master station

(8) Set the mode select switch to "RUN".

W NODE
X10   X1

SW2
RUN
TEST
SET

W CH
X10   X1
SW3
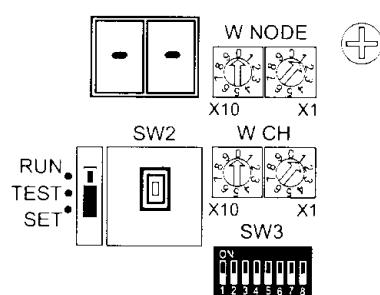
Master station
MS NS WS
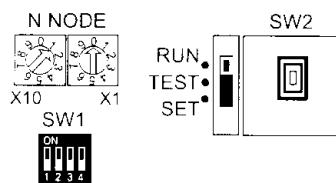
(9) If all MS, NS, and WS LEDs light green and the LED display goes off, the system is in RUN operation status.

N NODE
X10   X1
SW1

SW2
RUN
TEST
SET

■ DeviceNet wireless master station initialization

Initialize all registered IN/OUT points to their default settings.

Wireless master station
I/O points: IN IN1CH (16 points)
OUT OUT1CH (16 points)
Registered wireless slave station: 1 node

Wireless slave station
WNODE=01
IN/OUT=1CH (16 points)/1CH (16 points)

DeviceNet slaves   DeviceNet slaves
NNODE=01   NNODE=02
IN/OUT=16 points/0 point IN/OUT=0 point/16 points

● Procedure

Master station

W NODE
X10   X1

SW2   W CH
RUN
TEST   X10   X1
SET   SW3
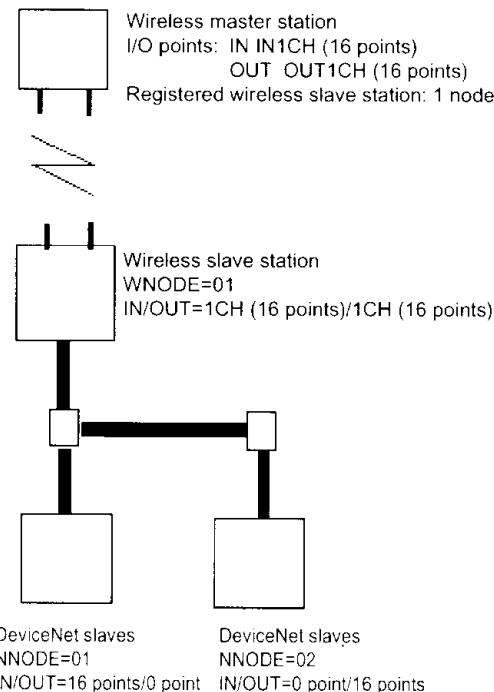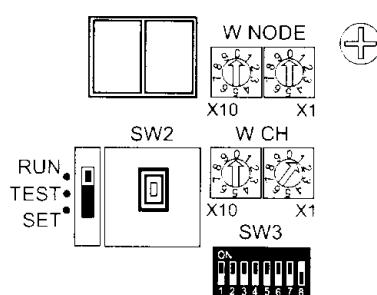
(1) Set SW3 to "bit 8 = ON".

Master station
MS NS WS
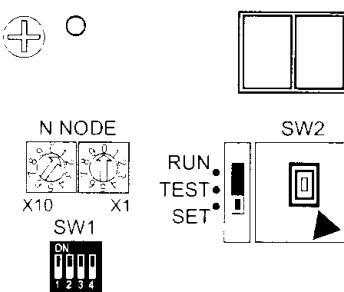
(2) While holding down SW2, set the mode select switch to "SET".
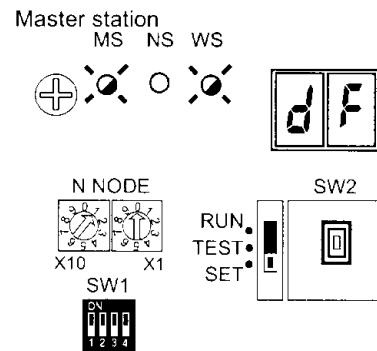
N NODE
X10   X1   SW2
SW1   RUN
             TEST
             SET

Master station

MS NS WS

N NODE

X10   X1

SW1

RUN

TEST

SET

SW2

(3) Once initialization is complete,
     "dF" is shown in the LED
     display, the MS and WS LEDs
     flash green, and the NS LED
     goes off.

Master station

W NODE

X10   X1

SW2   W CH

RUN

TEST

SET

X10   X1

SW3

(4) Set SW3 to "bit 8 = OFF".

Master station

W NODE

X10   X1

SW2   W CH

RUN

TEST

SET

X10   X1

SW3

(5) Set the mode select switch to
     "RUN".

Master station

MS NS WS

N NODE

X10   X1

SW1

RUN

TEST

SET

SW2
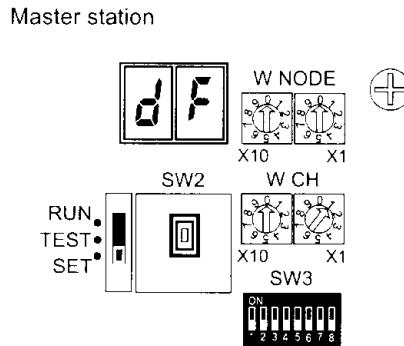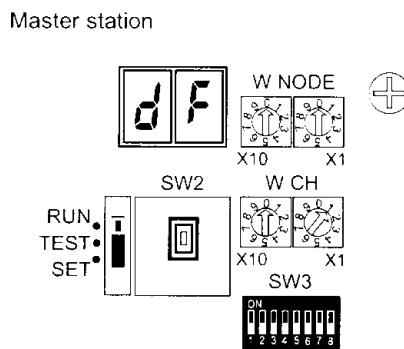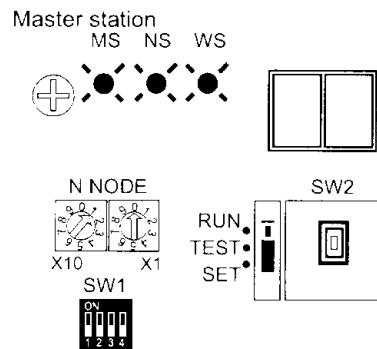
(6) If all MS and NS LEDs light
     green and the LED display
     goes off, the system is in RUN
     operation status. However,
     while the WS LED lights
   green, "E2" is shown in the
     LED display.

■ DeviceNet wireless slave stations initialization

Initialize all entried IN/OUT points to their default settings.

Wireless slave station
IN/OUT=1CH (16 points)/1CH (16 points)

DeviceNet slave
NNODE=01
IN/OUT =16 points/0 point

DeviceNet slave
NNODE=02
IN/OUT =0 point/16 points
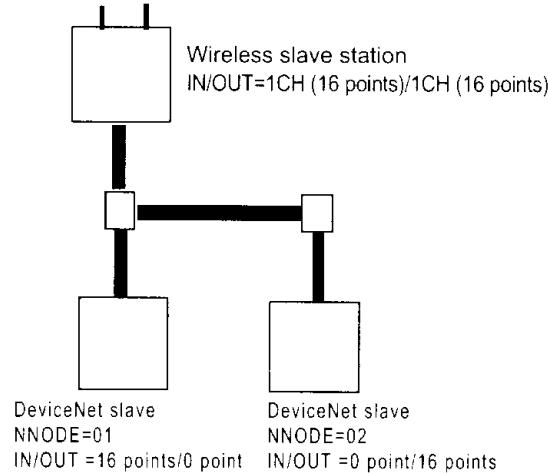
● Procedure

Slave station

W NODE
X10   X1

SW2
W CH
X10   X1

RUN
TEST
SET
SW3
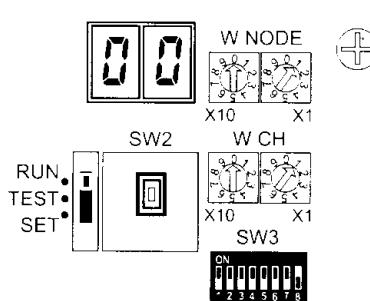
(1)   Set SW3 to "bit 8 = ON".

Slave station
MS NS WS
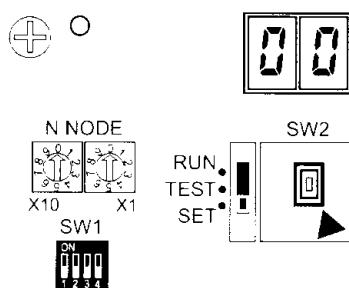
N NODE
X10   X1
SW1

SW2
RUN
TEST
SET

(2)   While holding down SW2, set the mode select switch to "SET".

Slave station

MS NS WS

(3) Once initialization is complete, "dF" is shown in the LED display, the MS and WS LEDs flash green, and the NS LED goes off.

Slave station


(4) Set SW3 to "bit 8 = OFF".

Slave station

(5) Set the mode select switch to "RUN".

Slave station

MS NS WS

(6) If all MS and NS LEDs light green and the node address is shown in the LED display, the system is in RUN operation status.

SECTION 3

Sample Program

3-1 Sample Program

An example status monitoring program for the DeviceNet wireless unit is explained in this section.

Check the status of the DeviceNet wireless unit at the PLC CPU unit. If an error flag has occurred, an Explicit message command read from the DeviceNet master status in the lower network where the wireless slave station is connected will be issued.

In order to assign a status to the IN area, bit 3 of SW1 on the wireless slave station should already be turned ON.

Master unit
Model C200HW-DRM21-V1
(node address = 63, device address = FE)

Wireless master station
Model WD30-M
(WNODE=00, SW1=bit3 ON, NNODE=10)

Wireless slave station
Model WD30-S
(WNODE=01)

Lower DeviceNet network
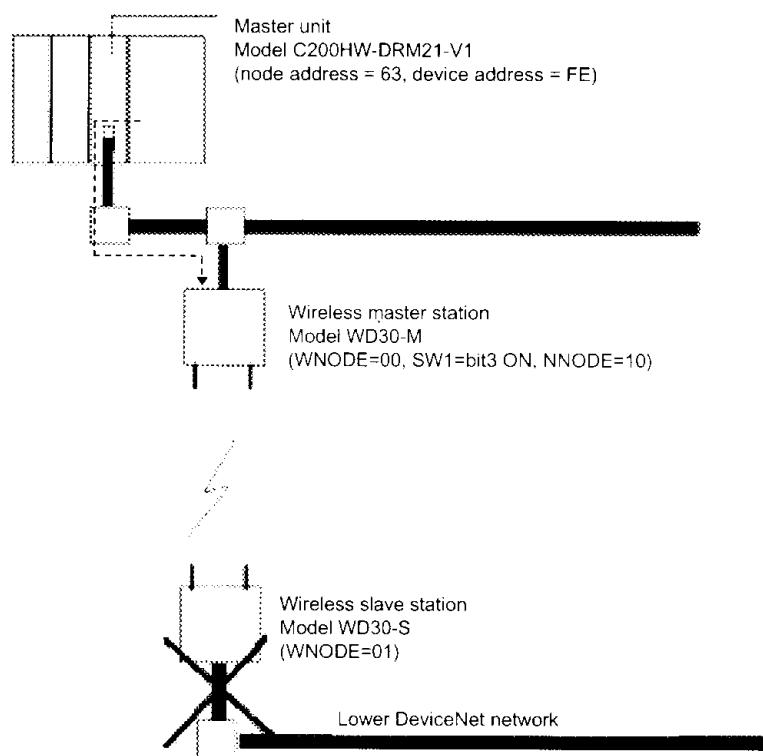
■ Reading the DeviceNet master status of the lower network

Monitor the status (360ch) assigned to the IN area of the master. Since the bit for WNODE = 1 is 1, set InstanceID to "01" and issue an Explicit message (DeviceNet master status read) command to the wireless slave station.

Ladder program

Rung	Contacts	Instruction	Comment
0000	25315 1 cycle ON	BSET (71) #0000 DM0 DM2999	Clear the response storage channels (DM000 - 2999ch) when starting the program and when beginning reading.
0002	25315 1 cycle ON	MOV (21) #3FFE DM0	Set #3FFE to DM0 (Transmission destination node address: 3F, Transmission destination station address: FE)
		MOV (21) #8207 DM1000	Response storage channel = DM2000ch (82Hex: DM, 07D0Hex: 2000ch, 00Hex: channel data)
		MOV (21) #D000 DM1001	
		MOV (21) #0064 DM1002	Response monitoring time = 10s
		MOV (21) #0009 DM1003	Number of command data bytes = 9 bytes
		MOV (21) #2801 DM1004	Explicit message transmission command code (FINS) = 2801Hex
		MOV (21) #000E DM1005	Transmission destination node address = 00Hex (wireless master station)
		MOV (21) #00AA DM1006	ClassID=AAHex
		MOV (21) #0001 DM1007	InstanceID=01Hex (WNODE)
		MOV (21) #6700 DM1008	AttributeID=67Hex
00013	0.02 101.12 "Message transmission possible" flag (comes ON if a message transmission response is received during the previous cycle)	CMP (20) #0000 DM2001	If an IOWR command is performed and completed without error during the previous cycle, DM2001 contents are compared with #0000.
	25506 Comparison result =	MOV (21) DM2001 DM6	If the comparison result is not "equal", (error end) it is transferred to DM6.
		ASR (26) 0	0ch contents shift 1 bit to the right.
		ASR (26) 0	0ch contents shift 1 bit to the right.
00020	36000 Communication error flag	TIMC00 #0010 1 minute timer	
00022	Performance conditions 0.00 101.12 TIM000 "Message communication possible" flag Comes ON if the communication error flag is ON for more than 1 second	ASL (25) 0	0ch contents shift 1 bit to the left
		IOWR (66) DM0 DM1000 #0009	9ch command data is transferred from the node DM1000 to the master unit.
00027	0.01 25506 IOWR command write not completed	ASR (26) 0	If command write by IOWR command is not completed. 0ch contents shift 1 bit to the right
	25506 IOWR command write complete	ASL (25) 0	If command write by IOWR command is complete. 0ch contents shift 1 bit to the left.
00032		END (01)	

Responses

If reading is performed without error, the following responses are stored.

Channel	Contents (Hex)	Definition
DM2000CH	28 01	Explicit message command code = 28 01 Hex
DM2001 CH	00 00	End code (0000 Hex: normal end)
DM2002 CH	00 04	Number of bytes received (data length after DM2003 ch) = 6 bytes
DM2003 CH	00 8E	Transmission source node address 00, ServiceCode = 8E Hex
DM2004 CH	XXXX	Status of read DeviceNet master

SECTION 4

**DeviceNet Wireless Unit
Station Specifications**

4-1 DeviceNet Wireless Master Station Specifications

■ Part identifications and functions

● External

Antennas

Main unit

Micro-connector
(plug)

Cover

Try removing the cover. As
shown in the figure on the left,
use a fingernail in the area
shown to lift the cover in the
direction of the arrow.

Pull here with your fingernail.
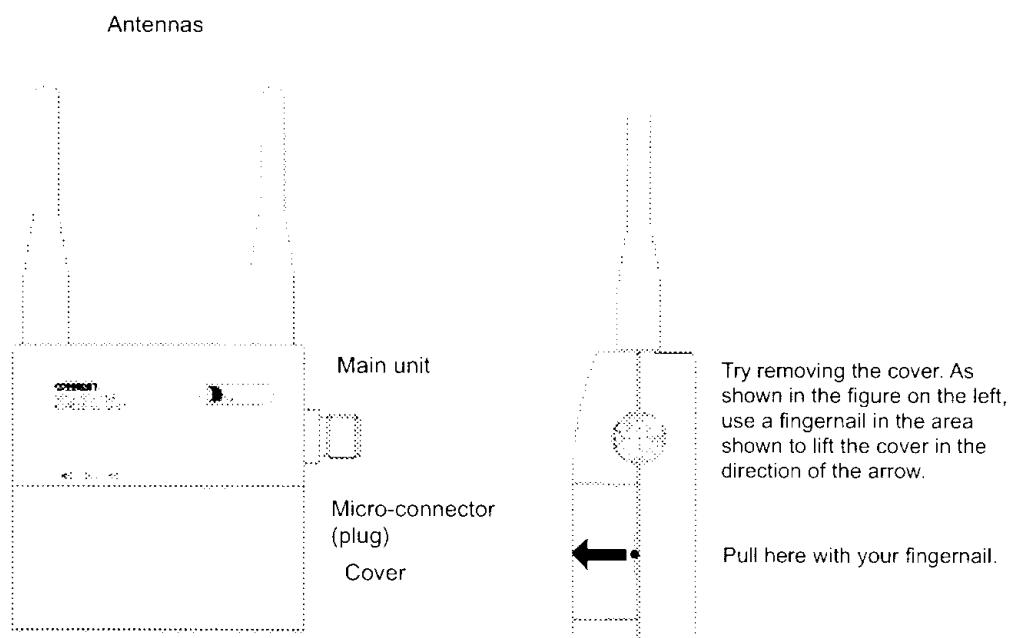
● Internal (with cover removed)

OMRON
WD30-M
WIRELESS UNIT

Status LEDs

MS NS WS

LED display

NNODE switch
Set the DeviceNet
node address here.

DeviceNet setting switch
Make settings other than
the node address here.

N NODE   SW2   W CH
X10 X1   X10 X1
SW1   SW3

W NODE
X10 X1

WNODE switch
Set the wireless I/F node
address here.

WCH switch
Set the wireless group
frequency here.

Wireless setting switch
Make wireless settings
here.

Mode select switch
Select between
RUN/TEST/SET here.

Push button
Push for operations such
as parameter entry.

■ Settings

● NNODE switch (DeviceNet node address setting switch)

Set the DeviceNet interface node address here. Set the switches before turning on the power supply. Only the setting values detected immediately after the power supply has been turned on are enabled. Changes to switch settings after the power supply has been turned on are ignored.

N NODE

X10   X1
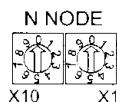
● DeviceNet setting switch (SW1)

Set the communication speed and status of the DeviceNet interface here. Set the switches before turning on the power supply. Only the setting values detected immediately after the power supply has been turned on are enabled. Changes to switch settings after the power supply has been turned on are ignored.

SW1

No.	Contents	
1	Communication speed selection	(MODE1)
2		(MODE2)
3	Status/No status	
4	(Usually OFF)	

· DeviceNet communication speed settings

Communication speed (bps)	DIP switch status		Remarks
	1	2	
	MODE1	MODE2	
125k	OFF	OFF	Length of main line: 500m
250k	ON	OFF	Length of main line: 250m
500k	OFF	ON	Length of main line: 100m
-	ON	ON	Settings prohibited, no communication

No.	Contents	ON	OFF
3	Status/No status	Status	No status

● Wireless setting switch (SW3)

Perform the various settings for TEST and SET modes. Set the switches before turning on the power supply. Only the setting values detected immediately after the power supply has been turned on are enabled. Changes to switch settings after the power supply has been turned on are ignored.

SW3

No.	Contents	ON	OFF
1	(Usually OFF)	-	-
2	(Usually OFF)	-	-
3	Wireless channel monitor	Performed	Not performed
4	Installation test	Performed	Not performed
5	Confirmation test	Performed	Not performed
6	Wireless slave station entry	Entries	Does not entry
7	Wireless slave station deletion	Deletes	Does not delete
8	Default configuration	Default settings used	Default settings not used

● WCH switch

Set the frequencies for the wireless interface group addresses. The settings should be made in decimals in a range from 01 to 34. 00 will result in a switch setting error. For normal operation modes, settings outside of the valid range will result in switch setting errors. Set the switches before turning on the power supply. Only the setting values detected immediately after the power supply has been turned on are enabled. Changes to switch settings after the power supply has been turned on are ignored.

W CH

X10   X1

**Preventing interference with wireless indoor motion detectors**

To prevent wave interference on floors where wireless indoor motion detectors are used, set the frequency to a channel other than 12 to 30.

SW status		Group address	Frequency	Remarks (center frequency: MHz)
10s position	1s position			
0	1	1	1	2401.0
0	2	2	2	2403.4
0	3	3	3	2405.8
0	4	4	4	2408.2
0	5	5	5	2410.6
0	6	6	6	2413.0
0	7	7	7	2415.4
0	8	8	8	2417.8
0	9	9	9	2420.2
0	0	10	10	2422.6
1	1	11	11	2425.0
1	2	12	12	2427.4
1	3	13	13	2429.8
1	4	14	14	2432.2
1	5	15	15	2434.6
1	6	16	16	2437.0
1	7	17	17	2439.4
1	8	18	18	2441.8
1	9	19	19	2444.2
2	0	20	20	2446.6
2	1	21	21	2449.0
2	2	22	22	2451.4
2	3	23	23	2453.8
2	4	24	24	2456.2
2	5	25	25	2458.6
2	6	26	26	2461.0
2	7	27	27	2463.4
2	8	28	28	2465.8
2	9	29	29	2468.2
3	0	30	30	2470.6
3	1	31	31	2473.0
3	2	32	32	2475.4
3	3	33	33	2477.8
3	4	34	34	2480.2

● WNODE switch

Set the wireless interface node address. During normal operation, the setting for this switch is ignored by the wireless master station and a node address of 00 is used for operation.

W NODE

X10   X1
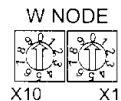
● Mode select switch

Set the wireless master station operation mode. (3 positions)

RUN
TEST
SET

Operation mode	SW status
Normal mode	RUN
Test mode	TEST
Setting mode	SET

● Push button "SW2"

Used as a trigger for making various settings while in Setting mode.

SW2
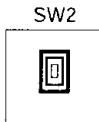
Tips for using the mode select switch — The software is reset (switch settings are reread) when the mode select switch is changed. It should be used when you want to enable the switch changes on the main unit.

■ Displays

● Status LED

LED	Color	Status		Meaning (primary error)
MS (Module Status)	Green	On	Normal conditions	Communication is normal.
		Flashing	Test/Setting mode	Test mode or Setting mode has been activated.
	Red	On	Critical malfunction	A critical error has occurred that can not be recovered. The unit must be replaced.
		Flashing	Minor malfunction	An error has occurred that can be recovered by resetting the system.
	-	Off	No power supply	Power is not being supplied, or the system is resetting.
NS (Network Status)	Green	On	Online/communication connection complete	Remote I/O communications are established while online. Or, message communications are established.
		Flashing	Online/communication connection not complete	Although the system is online, remote I/O communications and message communications are not established.
	Red	On	Critical communication error	Communication is not possible.
		Flashing	Minor communication error	Communication timeout
	-	Off	Offline, power turned off	The system is not online.
WS (Wireless Status)	Green	On	Wireless communication connection complete	Transmissions have been established between the wireless systems.
		Flashing	Wireless communication connection not complete	Wireless systems are communicating when the system is started, or there are no wireless slave stations.
	Red	On	Critical wireless communication error	A critical error has occurred that can not be recovered.
		Flashing	Minor wireless communication error	An error has occurred that can be recovered.
	-	Off	Current not sent	No current has been sent.

Refer to "10-2 Troubleshooting" for troubleshooting details.