## Reading addition information of the wireless slave station

Reads the addition information of the wireless slave station.

● Command format

00	0E	00	A7	00	01	6B

ServiceCode ↑ (0E)
ClassID (00 A7)
InstanceID (00 01)
Destination node address (00)
AttributeID (6B)

● Response format

00	06	00	8E	4 bytes

No. of received bytes (00 06)
Source node address (00)
ServiceCode (8E)
Data (4 bytes)
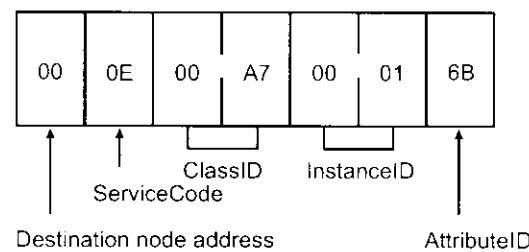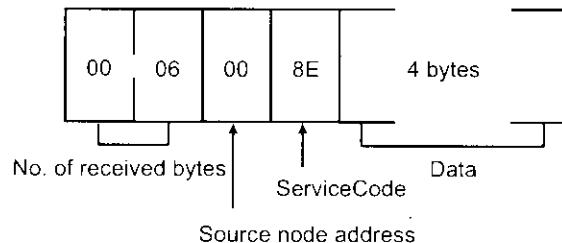
● Parameter details

The read addition information of the wireless slave station is stored. The data consists of 4-byte character codes.

D7	D6	D5	D4	D3	D2	D1	D0
8	7	6	5	4	3	2	1
16	15	14	13	12	11	10	9
24	23	22	21	20	19	18	17
35	31	30	29	28	27	26	25

If the wireless slave station of the above node address is 1, an slave station is added, and if 0, not added.

Message Communication Function

Entry/delete wireless slave station

Entries or deletes a specified wireless slave station to or from the wireless network.

● Command format

```
┌────┬────┬────┬────┬────┬────┬────┬────┐
│ 00 │ 10 │ 00 │ A8 │    │    │ 64 │    │
└────┴────┴────┴────┴────┴────┴────┴────┘
```
```
                ClassID   InstanceID
          ServiceCode              Data
Destination node address    AttributeID
```

● Response format

```
┌────┬────┬────┬────┐
│ 00 │ 02 │ 00 │ 90 │
└────┴────┴────┴────┘
```
```
No. of received bytes
              ServiceCode
      Source node address
```
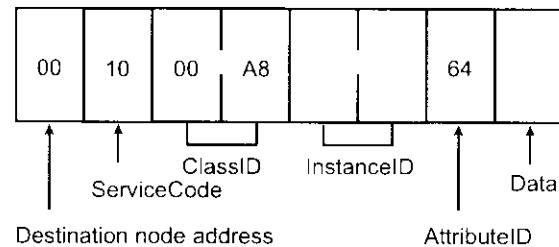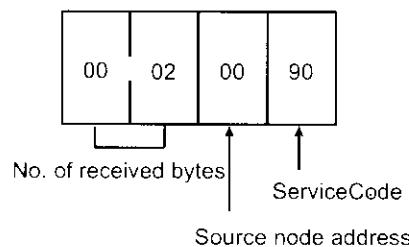
● Parameter details

"InstanceID" (command)
Sets WNODE:0001 - 0020 Hex of a specified wireless slave station.
"Data" (command)
Select registration or deletion as follows. The data consists of 1-bit character code.
80 Hex: Entry
00 Hex: Delete

Setting the IN points

Sets the IN points of a specified wireless slave station.
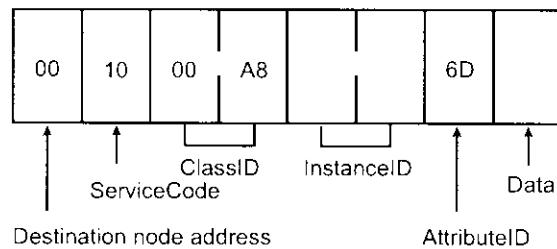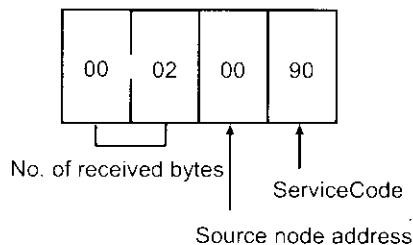
● Command format

```
| 00 | 10 | 00 | A8 |    |    | 6D |    |
```

ClassID — InstanceID
ServiceCode — Data
Destination node address — AttributeID

● Response format

```
| 00 | 02 | 00 | 90 |
```

No. of received bytes
ServiceCode
Source node address

● Parameter details

"InstanceID" (command)
Sets WNODE:01 - 20 Hex of a specified wireless slave station.
"Data" (command)
Sets the IN points (512 at maximum) as follows. The data consists of 1 byte character codes.

D7	D6	D5	D4	D3	D2	D1	D0
0	0	IN points (no. of channels)					

Reading the IN points

Reads the IN points of a specified wireless slave station.
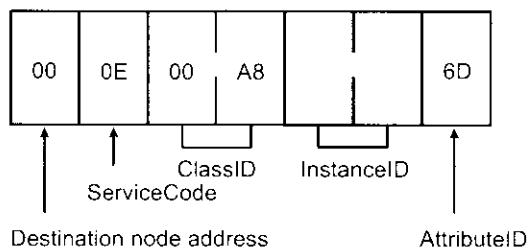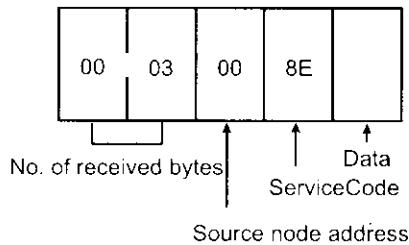
● Command format

00	0E	00	A8		6D

ClassID
ServiceCode
InstanceID
Destination node address
AttributeID

● Response format

00	03	00	8E	

No. of received bytes
Data
ServiceCode
Source node address

● Parameter details

"InstanceID" (command)

Sets WNODE:01　20 Hex of a specified wireless slave station.

"Data" (response)

The read IN points (512 at maximum) are stored as follows. The data consists of 1-byte character codes.

| D7	D6	D5	D4	D3	D2	D1	D0
0	0	IN points (no. of channels)					

Message Communication Function
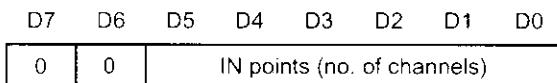
Setting the OUT points

Sets the number of OUT points of a specified wireless slave station.
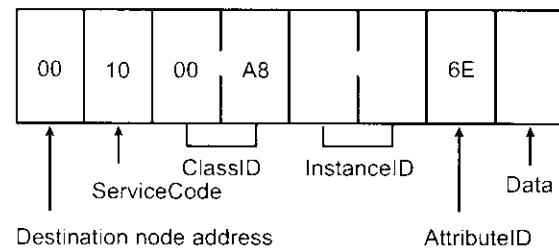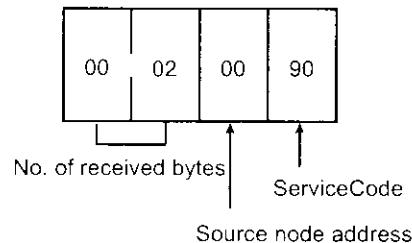
● Command format

00	10	00	A8			6E	

ServiceCode
ClassID
InstanceID
Data
Destination node address
AttributeID

● Response format

00	02	00	90

No. of received bytes
ServiceCode
Source node address

● Parameter details
"InstanceID" (command)
Sets WNODE:01 — 20 Hex of a specified wireless slave station.
"Data" (command)
Sets the OUT points (512 at maximum) as follows. The data consists of 1-byte character codes.

D7	D6	D5	D4	D3	D2	D1	D0
0	0	OUT points (no. of channels)					

Message Communication Function

Reading the OUT points

Reads the OUT points of a specified wireless slave station.
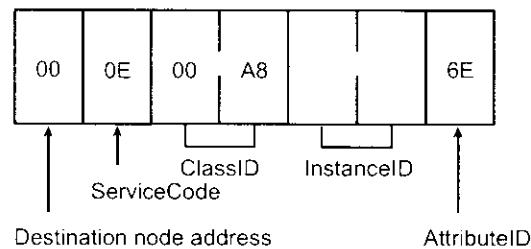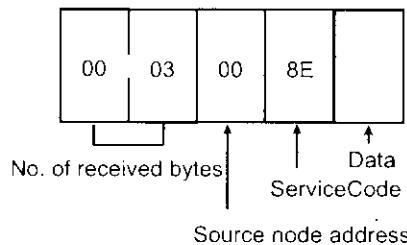
● Command format

00	0E	00	A8		6E

ServiceCode
ClassID
InstanceID
Destination node address
AttributeID

● Response format

00	03	00	8E	

No. of received bytes
Source node address
ServiceCode
Data

● Parameter details

"InstanceID" (command)

Sets WNODE:01 - 20 Hex of a specified wireless slave station.

"Data" (response)

The read number of OUT points (512 at maximum) are stored as follows.
The data consists of 1-bit character codes.
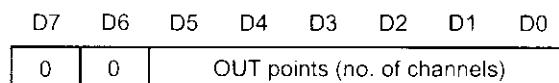
D7	D6	D5	D4	D3	D2	D1	D0
0	0	OUT points (no. of channels)					

Message Communication Function

Sets the node address of the upper station on the relay route of a specified wireless slave station.

● Command format

00	10	00	A8		6F	

ClassID
ServiceCode
InstanceID
Date
Destination node address
AttributeID

● Response format

00	02	00	90

No. of received bytes
ServiceCode.
Source node address
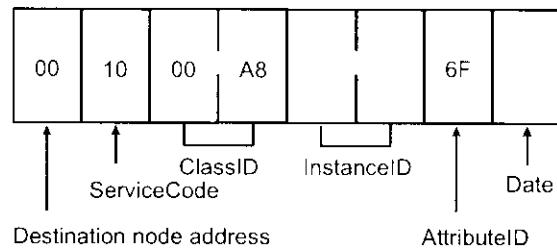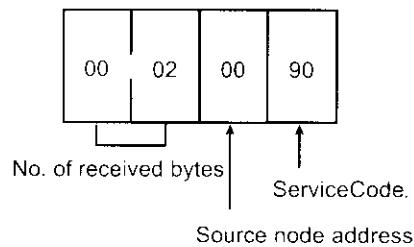
● Parameter details

"InstanceID" (command)
Sets WNODE:01 - 20 Hex of a specified wireless slave station.
"Data" (command)
Sets the node address of the upper station as follows. The data consists of 1 byte character code.

| D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	Upper station node address			
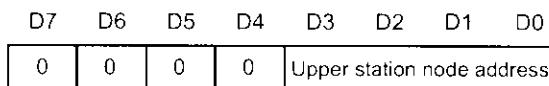
Reading upper station node address

Reads the node address of the upper station on the relay route of a specified wireless slave station.

● Command format

00	0E	00	A8			6E

ServiceCode — 0E
ClassID — 00 A8
InstanceID
Destination node address — 00
AttributeID — 6E

● Response format

00	03	00	8E	

No. of received bytes — 00 03
Source node address — 00
ServiceCode — 8E
Data
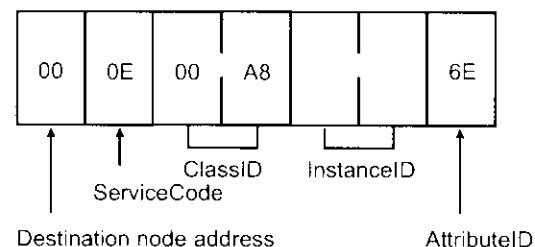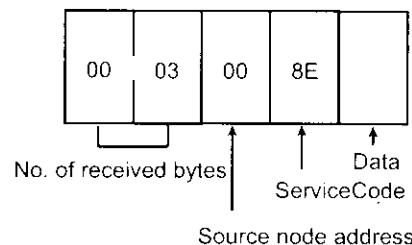
● Parameter details

"InstanceID" (command)

Sets WNODE:01 - 20 Hex of a specified wireless slave station.

"Data" (response)

The read node address of the upper station is stored as follows. The data consists of 1-byte character codes.

| D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	Upper station node address			
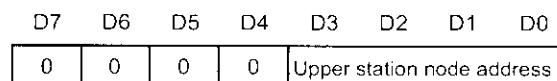
Reading wireless network status

Reads the status information of wireless network between the master station and a specified wireless slave station.
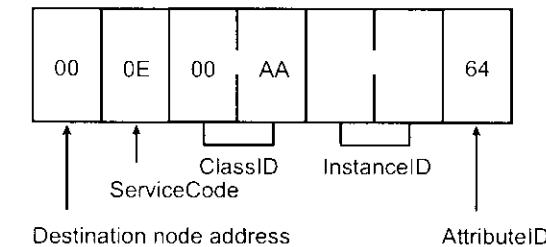
● Command format

```
| 00 | 0E | 00 | AA |    |    | 64 |
```

ServiceCode
ClassID
InstanceID
Destination node address
AttributeID

● Response format

```
| 00 | 03 | 00 | 8E |    |
```

No. of received bytes
ServiceCode
Source node address
Data
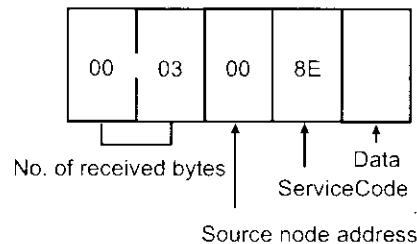
● Parameter details

"InstanceID" (command)
Sets WNODE:01   20 Hex of a specified wireless slave station.
"Data" (response)
The read wireless network status is stored as follows. The data consists of
1-byte character codes.

D7	D6	D5	D4	D3	D2	D1	D0
0	0	0	0	Routing error	I/O structural error	0	Addition/Separation

Reading wireless error counts

Reads the error counts between the master station and a specified wireless slave station.
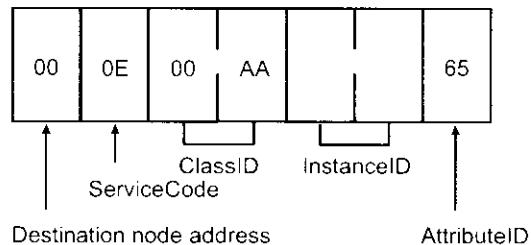
● Command format

| 00 | 0E | 00 | AA | | 65 |

ServiceCode
ClassID
InstanceID
Destination node address
AttributeID

● Response format

| 00 | 04 | 00 | 8E | |

No. of received bytes
ServiceCode
Data
Source node address
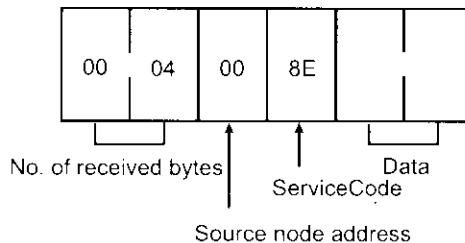
● Parameter details

"InstanceID" (command)
Sets WNODE:01 - 20 Hex of a specified wireless slave station.
"Data" (response)
The number of the read wireless error counts is stored. The data consists of 2-byte character codes.

| Error count (lower) |
| Error count (upper) |
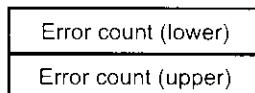
Reading DeviceNet master status

Reads the DeviceNet master status of a specified wireless slave station.
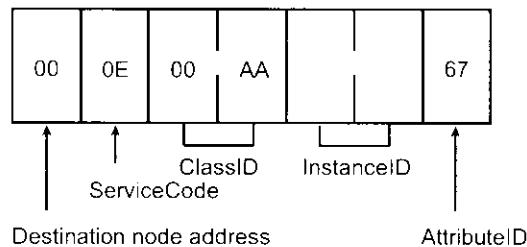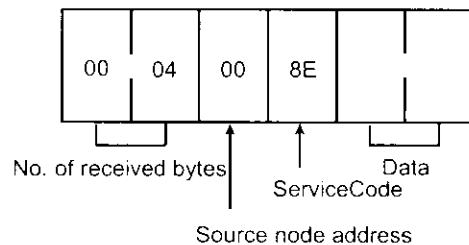
● Command format

00	0E	00	AA		67

ClassID — ServiceCode
InstanceID
Destination node address
AttributeID

● Response format

00	04	00	8E	

No. of received bytes
Data
ServiceCode
Source node address

● Parameter details

InstanceID" (command)
Sets WNODE:01 - 20 Hex of a specified wireless slave station.
"Data" (response)
The read DeviceNet master status is stored. The data consists of 2 byte character codes.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Remote I/O communication stop status

Scan list operation completion

Scan list operation error

Communication error stop reset completion

Message communication enable flag

Scan list invalid mode is in operation

Error: Remote I/O communication is being stopped due to an error

Remote I/O communication is in operation

Incorrect switch setting/EEPROM error

Node address duplication/Bus off detection

Configuration error

Construction error

Send error

Communication error

Verify error

Writing settings/soft reset

Writes the settings in EEPROM or executes soft reset.

● Command format

| 00 | 10 | 00 | AC | | 01 | 64 | |

- Destination node address
- ServiceCode
- ClassID
- InstanceID
- AttributeID
- Data
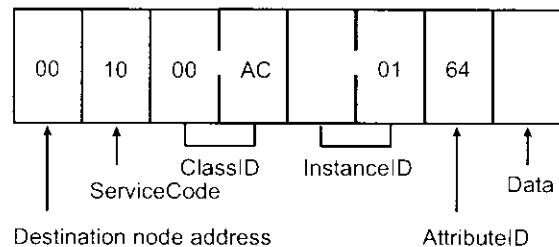
● Response format (not for when executing soft reset)

| 00 | 02 | 00 | 90 | |

- No. of received bytes
- Source node address
- ServiceCode
- Data
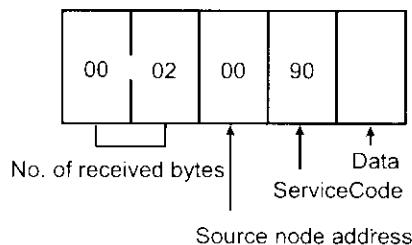
● Parameter details

"Data" (command)

| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| | | | 0 | 0 | 0 | 0 | 0 |

- 1: Writing settings
- 1: Soft reset
- 1: Writing settings confirmation

(response)

| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| | 0 | | 0 | 0 | 0 | 0 | 0 |

- 1: Settings check OK
- 1: Writing settings completion/
  0: EEPROM error
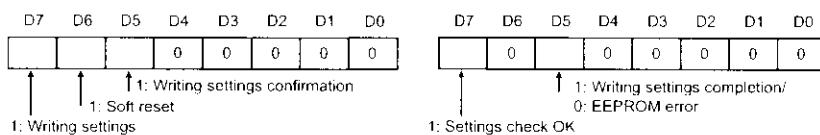
● Error code

The error codes of when setting check NG are as shown in the following table.

Errors	Error code	Additional error code
I/O points error	19 Hex	01 Hex
Routing error	19 Hex	02 Hex

Message Communication Function

7 19 at bottom

7 19

SECTION 8

8-1 Remote I/O Communications Performances

This section describes the performances of remote I/O communications when the DeviceNet wireless unit is used. Specifying communications timing as calculated is difficult in a wireless network compared to a wire communication network. Thus, the timings presented here are in accordance with the standard expressions and the actually measured data resulting from the OMRON system test. This unit is not applicable for applications requiring real time control. Instead, use this data as a scale to determine if this unit is applicable to your need.

The equations provided here are valid under the following conditions:

- The DeviceNet Master Unit is an OMRON product.
- The Master Unit is operating with the scan list valid mode.
- All of the required wireless slave stations and DeviceNet slaves have been added in communications.
- No errors are being indicated at either the DeviceNet master unit or wireless units.
- Messages are not being produced in the Network (from another company's configurator, for example).

NOTE

- The values provided by these calculations may not be accurate if another company's DeviceNet Master or Slave unit is being used.
- This manual only refers to parts related to the wireless unit. For details about the DeviceNet Master unit or the entire DeviceNet system, refer to the "DeviceNet User's Manual" (SCC-308□), and for details about Slaves, refer to the "DeviceNet Slave Manual" (SBCD-305□).

■ I/O Response Time

The I/O response time is the time it takes from the reception of an input signal at an Input Slave (REMORTE I/O TERMINAL) to the output of the corresponding output signal at an Output Slave (REMORTE I/O TERMINAL) via the process by the ladder program in the PLC module.

Since the wireless master station operates as a DeviceNet slave virtually, and the wireless slave station operates as the DeviceNet master, also virtually, a time delay among wireless network is not noticeable in the operation from the PLC. However, the actual I/O response time depends on the number of wireless slave stations, and if relayed, on the number of relay stages due to the time delay among wireless networks and 1:N polling communication.

The following describes the maximum I/O response time.
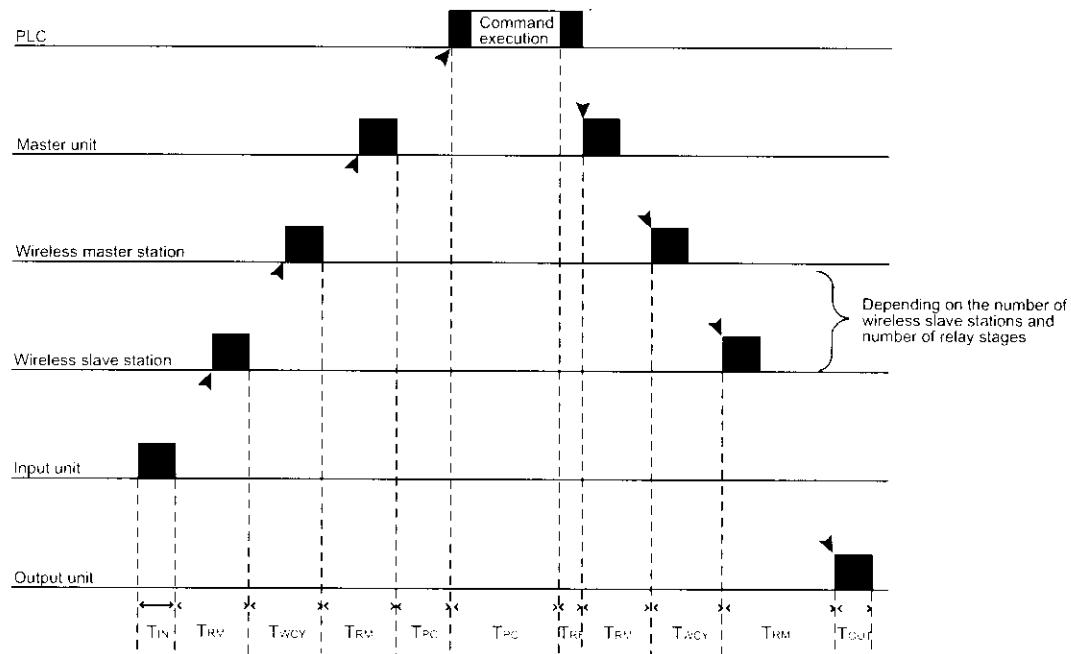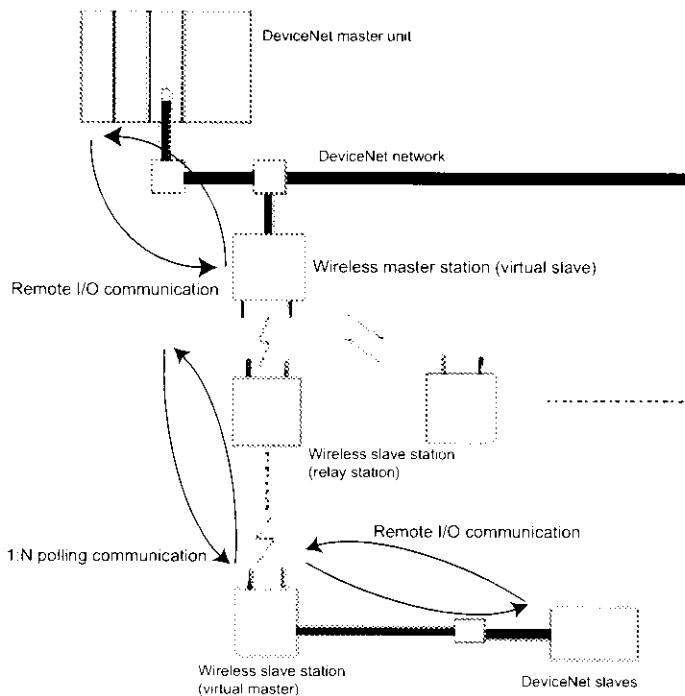
T_{IN} : Input I/O unit ON (OFF) delay time
T_{OUT} : Output I/O unit ON (OFF) delay time
T_{RM} : Communication cycle time (DeviceNet)
T_{WCY} : Wireless communication delay time
T_{PC} : Peripheral devices execution system cycle time at the PLC
T_{RF} : DeviceNet unit refresh time at the PLC

For details on the Input I/O Unit input delay time and the Output I/O Unit output delay time, refer to the information in the "DeviceNet Slave Manual" (SBCD 305□); for details on the communication cycle and refresh processing time, refer to the information of the remote I/O communication performance in the "DeviceNet User's Manual" (SCCC-308□). Refer to the PLC Operation Manual for details on the PLC cycle time.

The maximum I/O response time (T MAX) can be obtained from the following expression:

$$T_{MAX} = T_{IN} + T_{OUT} + 4 \times T_{RM} + 2 \times T_{WCY} + 2 \times T_{PC} + T_{RF}$$

■ Wireless communication cycle time (T_{WCY})

Wireless communication delay time occurs in a wireless network when using wireless units. The wireless communication delay time becomes longer depending on the increase in the number of wireless slave stations and relay stages. The unit is ms.

$T_{WCY} = \sum_{WNODE}$ (Total cycle time of wireless slave stations)

$= \sum_{WNODE} [\{(Tx\_LEN<WNODE>+Rx\_LEN<WNODE>)/12+2+2\} \times$ (No. of relay stages+1)]

Command send overhead ◄─┘ ┐
Response send overhead ◄─┘

Tx_LEN<WNODE>: Command data length
Rx_LEN<WNODE>: Response data length

Tx LEN<WNODE>=29+OUTSIZE [byte] + No. of relay stages(No. of stages = byte)
Command header

Rx LEN<WNODE>=41+INSIZE [byte] + No. of relay stages (No. of stages = byte)
Response header

OUTSIZE [byte]: Add 1, if an odd number results when even numbers, slave 8-point output, etc. are used.

INSIZE [byte]: Add 1, if an odd number results when even numbers, slave 8-point input, etc. are used.

■ Actually measured reference data

Use the following values of the I/O response time (IN input PLC processing - OUT output) measured by the OMRON system test as reference.

The data described is the smallest and largest values resulting from 30 times of continuous testing. The actual measurements could be longer than the largest value depending on the environment where the measurements were taken. Thus, use the results only as a reference.

(Ex. 1) 1 wireless master station: 1 slave station: 2 DeviceNet slaves >
Min. 30ms. Max. 48ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave station
WD30-S

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-OD16
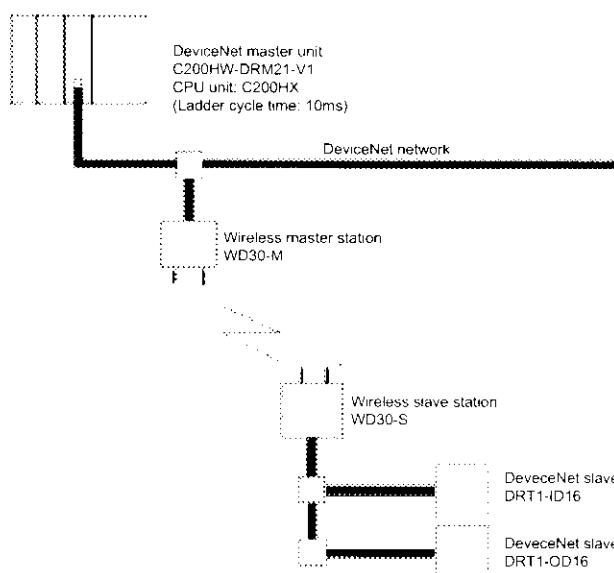
(Ex. 2) 1 wireless master station: 1 slave station: 62 DeviceNet slaves -->
Min. 70ms. Max. 105ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave station
WD30-S

DeveceNet slave
DRT1-ID16

30 units

32 units

DeveceNet slave
DRT1-OD16

Communications Timing

(Ex. 3) 1 wireless master station: 4 slave station: 2 DeviceNet slaves >
Min. 72ms, Max. 105ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave
station WD30-S

Wireless slave
station WD30-S

Wireless slave
station WD30-S

Wireless slave
station WD30-S

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

(Ex. 4) 1 wireless master station: 1 relay station: 4 slave stations:
2 DeviceNet slaves --> Min. 155ms, Max. 225ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave station
(relay station)
WD30-S

Wireless slave
station WD30-S

Wireless slave
station WD30-S

Wireless slave
station WD30-S

Wireless slave
station WD30-S

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-ID16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

DeveceNet slave
DRT1-OD16

Communications Timing

(Ex. 5) 1 wireless master station: 2 relay station: 4 slave stations:
2 DeviceNet slaves --> Min. 250ms, Max. 365ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave station
(1st stage relay station)
WD30-S

Wireless slave station
(2nd stage relay station)
WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

(Ex. 6) 1 wireless master station: 3 relay station: 4 slave stations:
2 DeviceNet slaves --> Min. 380ms, Max. 740ms

DeviceNet master unit
C200HW-DRM21-V1
CPU unit: C200HX
(Ladder cycle time: 10ms)

DeviceNet network

Wireless master station
WD30-M

Wireless slave station
(1st stage relay station)
WD30-S

Wireless slave station
(2nd stage relay station)
WD30-S

Wireless slave station
(3rd stage relay station)
WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

Wireless slave station WD30-S

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-ID16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

DeveceNet slave DRT1-OD16

SECTION 9

Troubleshooting

When the DeviceNet wireless unit is operating normally, the status will be as follows.

■MS/NS/WS LED display

MS (Module Status) LED indicates the conditions of nodes.
NS (Network Status) LED indicates the conditions of the DeviceNet network.
WS (Wireless Status) LED indicates the conditions of the wireless zone.
In normal conditions, all three LEDs turn on green in both master and slave stations.

● Wireless master station LEDs

| LED	Color	Status			Meaning (primary error)
MS (Module Status)	Green	MS	On	Normal conditions	Communication is normal.
		MS	Flashing	Test/Setting mode	Test mode or Setting mode has been activated.
	Red	MS	On	Critical fault	A critical error has occurred that can not be recovered. The unit must be replaced.
		MS	Flashing	Minor fault	An error has occurred that can be recovered by resetting the system.
	-	MS	Off	No power supply	Power is not being supplied, or the system is resetting.
NS (Network Status)	Green	NS	On	Online/communication connection complete	If online, the remote I/O communication with the slave registered on the scan list has been established. Or, the message communication has been established.
		NS	Flashing	Online/communication connection not complete	Although the system is online, remote I/O communications and message communications are not established.
	Red	NS	On	Critical communication error	Communication is not possible.
		NS	Flashing	Minor communication error	Communication timeout
	-	NS	Off	Offline, power supply turned off	The system is not online.
WS (Wireless Status)	Green	WS	On	Wireless communication connection complete	Communications have been established between the wireless systems.
		WS	Flashing	Wireless communication connection not complete	During startup, wireless master station is adding an slave station or there is no remote I/O slave.
	Red	WS	On	Critical wireless communication error	A critical error has occurred that can not be recovered.
		WS	Flashing	Minor wireless communication error	An error has occurred that can be recovered.
	-	WS	Off	Radio wave not sent	No radio wave has been sent.

● Wireless slave station LEDs

LED	Color	Status		Meaning (primary error)
MS (Module Status)	Green	MS On	Normal conditions	Communication is normal.
		MS Flashing	Test/Setting mode	Test mode or Setting mode has been activated.
	Red	MS On	Critical fault	A critical error has occurred that can not be recovered. The unit must be replaced.
		MS Flashing	Minor fault	An error has occurred that can be recovered by resetting the system.
	-	MS Off	No power supply	Power is not being supplied, or the system is resetting.
NS (Network Status)	Green	NS On	Online/communication connection complete	If online, the remote I/O communication slave registered on the scan list has been established. Or, the message communication has been established.
		NS Flashing	Online/communication connection not complete	Although the system is online, remote I/O with the slave registered on the scan list has been establishd. Or, the message communicationhas been established.
	Red	NS On	Critical communication error	Communication is not possible.
		NS Flashing	Minor communication error	Communication timeout
	-	NS Off	Offline. power supply turned off	The system is not online.
WS (Wireless Status)	Green	WS On	Adding in the wireless network	Communications have been established between the wireless systems
		WS Flashing	Waiting for permission to be added to wireless network	The slave wireless station is waiting for permission to be added to wireless network.
	Red	WS On	Critical wireless communication error	A critical error has occurred that can not be recovered.
		WS Flashing	Minor wireless communication error	An error has occurred that can be recovered.
	-	WS Off	Radio wave not sent	No radio wave has been sent.

■ LED display

Under normal conditions, the LED of the wireless master station goes off and the wireless slave station displays the node numbers (NNODE). In the wireless slave station, the right and left dot LEDs come on in the scan list invalid mode and go off in the scan list valid mode.

Under error conditions, "error code + error occurrence node" are displayed sequentially, according to the error codes in the order of detection. The error codes are conform to DeviceNet error codes. In addition, the receiving wave level is displayed during the test.

▼

Error code

Error occurrence node   This is omitted if there is no error occurrence node.

▼

Error code

Error occurrence node

▼

Error code

Error occurrence node

▼

~

▼

Error code

Error occurrence node
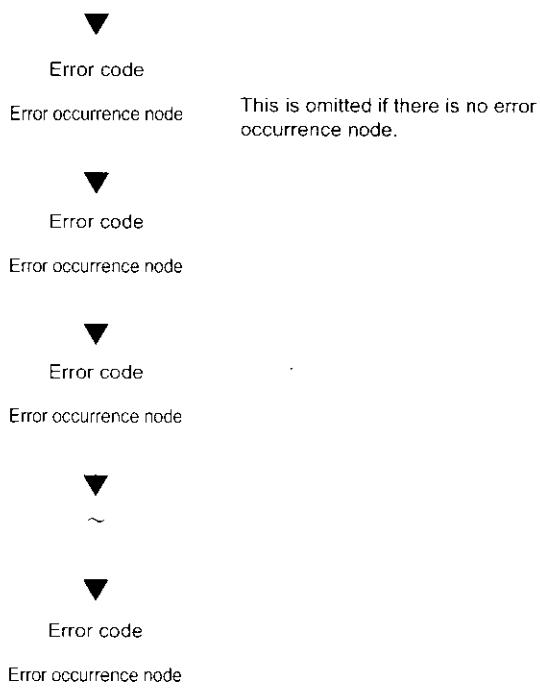
9-2 Troubleshooting

This section explains the causes of errors, how to determine their locations, and the actions to be taken when errors occur in a DeviceNet wireless unit.

■ How to locate errors when the system is having trouble

Trouble assumable in the system using the DeviceNet wireless can be roughly classified into the following two cases.

(1) Hardware error in each unit

(2) Communication error in each network (the upper DeviceNet network between the DeviceNet master unit and wireless master station, the wireless network between the wireless master station and a wireless slave station, the lower DeviceNet network between a wireless slave station and the DeviceNet slave connected with a wireless slave station)

Hardware errors in each unit can be determined either by the LEDs of the unit or by the fact that a unit is not added to the upper unit (this could be a wireless slave station if it is a DeviceNet slave connected with the end of a wireless slave station, the wireless master station if it is a wireless slave station, or a DeviceNet master if it is the wireless master station) to which the unit should have been added.

(Ex. 1) A hardware error occurs in a DeviceNet slave:

DeviceNet master

Upper DeviceNet network

Wireless master station

Wireless network

Determined by the LEDs (NS LED, LED display) of the wireless slave station that is the network master station.

Wireless slave station

The LED (MS) of the unit indicates a hardware error

Lower DeviceNet network
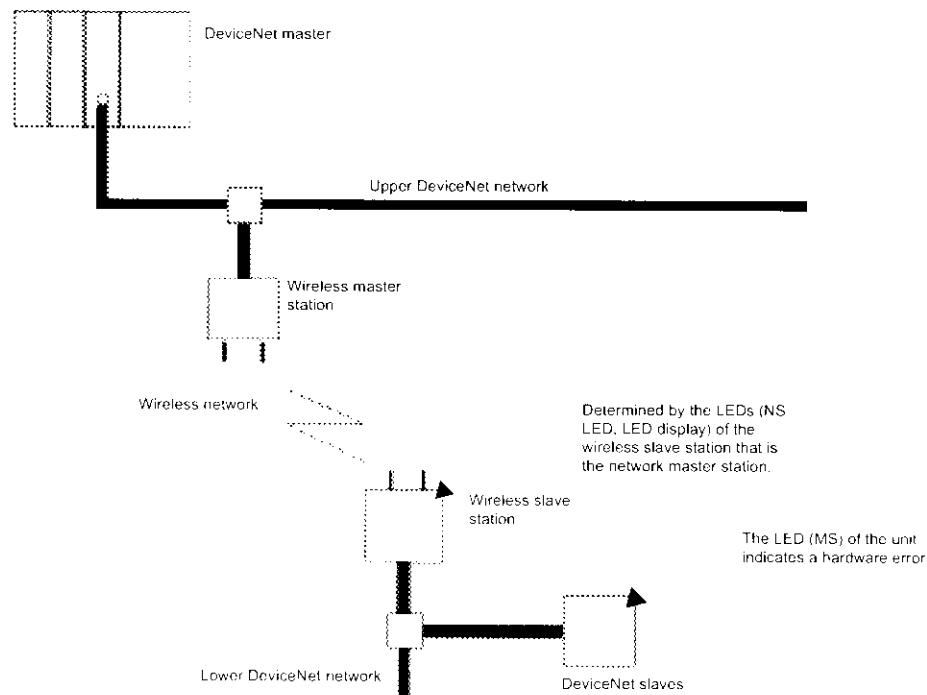
DeviceNet slaves

(Ex. 2) A hardware error is present in a wireless slave station:

DeviceNet master

Upper DeviceNet network

Wireless master station

Wireless network

The LED (MS) of the unit indicates a hardware error.

Wireless slave station

Lower DeviceNet network
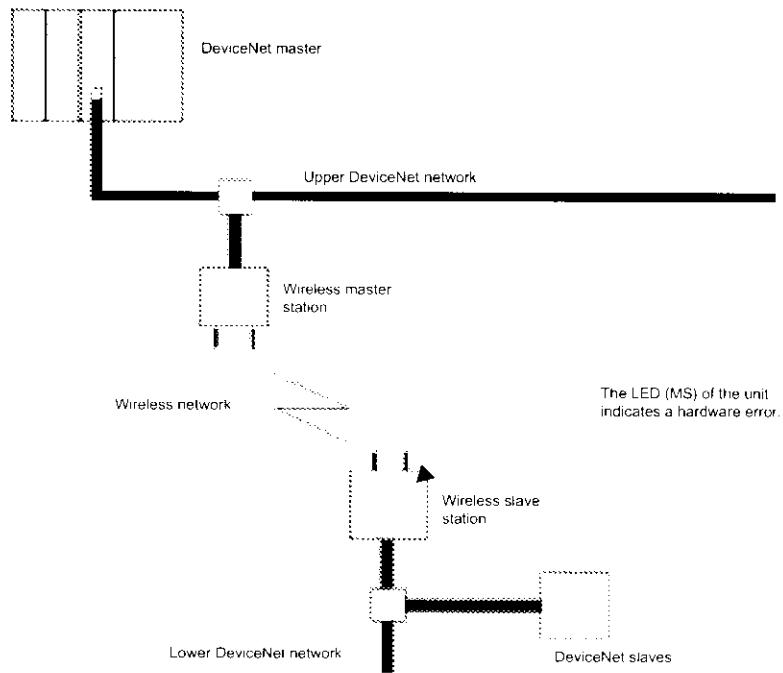
DeviceNet slaves

Hardware errors in each unit can be determined either by the LEDs or the status of the master station of each network (this could be a wireless slave station if it is the lower DeviceNet network, the wireless master station if it is the wireless network, or the DeviceNet master if it is the upper DeviceNet network). When an error unit is found in each network, the cause can be pin down by implementing the communication test on each network after the settings of the unit in concern have been checked.

(Ex. 3) A hardware error is present in the lower DeviceNet network:

DeviceNet master

Upper DeviceNet network

Wireless master station

Wireless network

The error is determined by the LEDs (NS LED, LED display) of a wireless slave station, which is the network master station.

Wireless slave station

Lower DeviceNet network

DeviceNet slaves
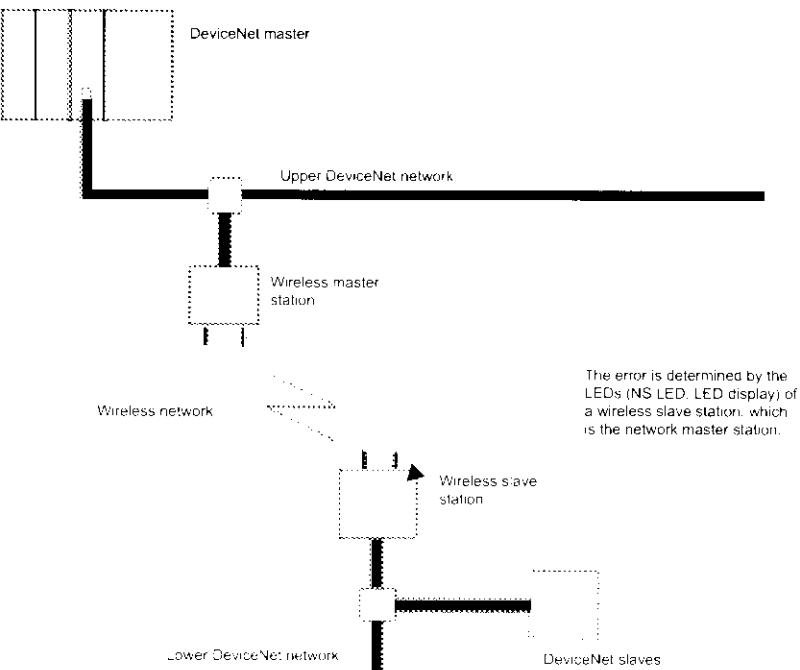
(Ex. 4) A communication error is present in the wireless network:

DeviceNet master

When a wireless slave station is added during startup, the error can be determined by the LEDs (WS LED LED display) of the wireless master station, which is the master station of the network. Since wireless communication errors cannot be determined by the LEDs due to the interference wave in the middle of communication, this is made possible by using the test function of the wireless unit, etc.

Upper DeviceNet network

Wireless master station

Wireless network

Wireless slave station

Lower DeviceNet network

DeviceNet slaves

■ Check by LED display and remedy

The wireless unit has LEDs indicating its status.
Inspecting the LEDs allows you to pinpoint the content and cause of the error.
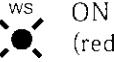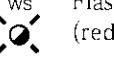
● Causes of wireless master station errors and remedies by MS LED

MS LED status	LED display	Condition	Cause	Remedy
MS ◯ OFF	OFF	Power OFF	The power is not being supplied.	Check if the power is properly supplied from the communication power supply.
MS ● ON (red)	F8 F9 FA F7 OFF	Unrecoverable error	Hardware error during startup (EEPROM error, etc.)	Reset the power supply or initialize the unit. If the error persists, contact our sales department for assistance.
MS ◑ Flashing (red)	F3	Recoverable error	Incorrect switch setting	Check the switch setting and reset correctly.
	F8		EEPROM SUM error	Initialize the unit. If the error persists, the unit needs to be replaced. Contact our sales department for assistance.
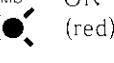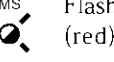
● Causes of wireless master station errors and remedies by NS LED

| NS LED status	LED display	Condition	Cause	Remedy
NS ● ON (red)	OFF E2	DeviceNet Busoff detection error	Communication interruption due to multiple data errors DeviceNet node address duplicates.	After reviewing the following items, restart the unit. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise · Node address duplication
NS ◑ Flashing (red)	OFF E2	Recoverable error	Communication time out	After reviewing the following items, restart the unit. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise

● Causes of wireless master station errors and remedies by WS LED
(LEDs with a "*" mark display error occurrence node addresses alternately.)

WS LED status	LED display	Condition	Cause	Remedy
WS ON (red)	E9	Unrecoverable error	Carrier sense error An electric wave of the other WD30-M is output to the same wireless channel.	Reset the power supply or change the WCH to the other wireless channel, and then restart the system.
WS Flashing (red)	D1	Recoverable error (wireless zone configuration error)	Total I/O size over	Check the switch setting and reset correctly.
	D6*		Discrepancy I/O size	
	E5		Routing pass	
	E8		No registered slave	

● Causes of wireless slave station errors and remedies by MS LED
(LEDs with a "*" mark display error occurrence node addresses alternately.)

| MS LED status	LED display	Condition	Cause	Remedy
MS OFF	OFF	Power OFF	The power is not being supplied.	Check if the power is properly supplied from the communication power supply.
MS ON (red)	F8 F9 FA F7 OFF	Unrecoverable error	Hardware error during startup (EEPROM error, etc.)	Reset the power supply once or initialize the unit. If the error persists, contact our sales department for assistance.
MS Flashing (red)	F3*	Recoverable error	Incorrect switch setting	Check the switch setting and reset correctly.
	E8		EEPROM SUM error	Initialize the unit. If the error persists, the unit needs to be replaced. Contact our sales department for assistance.

● Causes of wireless slave station errors and remedies by NS LED
(LEDs with a "*" mark display error occurrence node addresses alternately.)

NS LED status	LED display	Condition	Cause	Remedy
NS ON (red)	F0*	Unrecoverable error (DeviceNet node address duplication.)	DeviceNet node address duplication.	Check the settings and reset correctly.
	F1*	Unrecoverable error (Busoff status)	Communication stop due to multiple data errors	After reviewing the following items, restart the unit. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise
NS Flashing (red)	D0*	Unrecoverable error (communication timeout)	I/O area duplication	Reset node address of the slave.
	D1*		I/O area zone over	
	D2*		Unsupported slave	
	D5*		No slave	After reviewing the following items, restart the unit. · Power supply to the slave · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise · Contents of registered DeviceNet slave
	D6*		Discrepancy slave I/O size	After checking the slave, initialize the unit and register the slave again.
	D9*		Remote I/O communication timeout	After reviewing the following items, restart the unit. · Power supply to the slave · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise

Troubleshooting

● Causes of wireless slave station errors and remedies by WS LED
  (LEDs with a "*" mark display error occurrence node addresses alternately.)

WS LED status	LED display	Condition	Cause	Remedy
ws ON (red)	NNODE E2	Unrecoverable error	Node address duplication in wireless zone, verify error, routing error	Check the settings and reset correctly.
ws Flashing (red)	E2	Recoverable error	Wireless zone timeout	Set the unit so the wireless communication is stabilized by changing the frequency (WCH) or implementing the setup test.
ws ON (red)	OFF	Unrecoverable error	Relay station Node address duplication in wireless zone. verify error, routing error	Check the settings and reset correctly.
ws Flashing (red)	OFF	Unrecoverable error	Relay station Wireless zone timeout	Set the unit so the wireless communication is stabilized by changing the frequency (WCH) or implementing the setup test.

■ Check by status area and remedy

When "Status " is selected in the DIP switch settings of the wireless master station, the status area that displays the wireless slave station status is available in the first two channels of the input area in the Master. The contents and causes of errors can be found by checking this area.

To be concrete, an error flag is allocated for each wireless station in the status area, as shown in the following diagram.

Status begins CH + 0

Status begins CH + 1

15													1	0
—				Slave error flag									—	

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
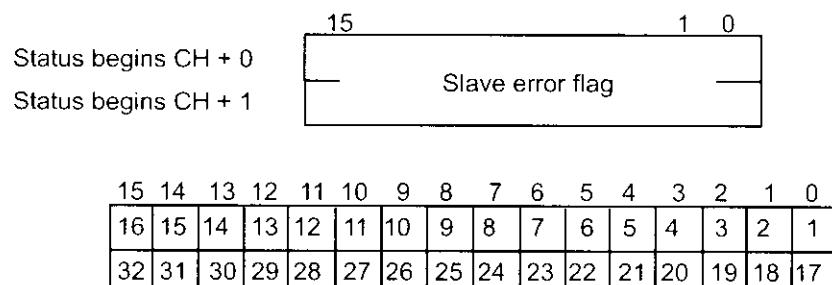
Each of the following for the DeviceNet master status of added wireless slave stations is set to an OR value.

    Incorrect switch setting/EEPROM error (bit address 00)
    Repetitive node address/Busoff detection (bit address 01)
    Configuration error (bit address 03)
    Structural error (bit address 04)
    Sending error (bit address 05)
    Communication error (bit address 06)
    Verify error (bit address 07)

Also, if a wireless slave station has been registered by not added, the bit will be 1. For example, if a wireless slave station error occurs for WNODE = 16, the highest bit for "status begin ch + 0" (16) becomes 1.

Troubleshooting

9-12

If you issue a command (Explicit message) to the wireless slave station to which an error flag is set, the detailed contents of the error can be obtained. (See "Chapter 3 Sample Program".)

After the details are obtained, take action according to the following table.

Error content	Bit address	Cause	Remedy
Incorrect switch setting/EEPROM error	00	Incorrect DIP switch setting or EEPROM hardware error	Check the switch settings. Reset the power supply. If the error persists, the unit needs to be replaced. Contact our sales window for assistance.
Node address duplication/Busoff detection	01	A node address (NNODE) duplication or the unit is in Busoff status (Communication stop due to multiple data errors).	Check the node address of other nodes. Review the following items. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise
Configuration error	03	Configuration data error	Initialize the unit and register the slave again.
Structural error	04	I/O area duplication, I/O area zone over, and unsupported slave	Check the node address of the slave and reset correctly.
Send error	05	Network power supply error, send timeout	Check the network power supply and the network cable wiring. Review the following items. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise
Communication error	06	Remote I/O communication timeout	Review the following items. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise
Verify error	07	Discrepancy slave I/O size, no slave	After checking the slave, initialize the unit and re-entry the slave again. · Communication speed · Cable length (main/branch) · Broken or loose cable · Terminal resistor should only be installed on both ends of the main line. · Excessive noise

Troubleshooting

9-3 Maintenance

This section describes the routine cleaning and inspection and the equipment handling procedure for replacement.

■ Cleaning

Clean the network regularly as described below in order to keep it in its optimal operating condition.
- Wipe the Unit with a dry, soft cloth for regular cleaning.
- When a spot cannot be removed with a dry cloth, dampen the cloth with a neutral cleaner (diluted to 2%), wring out the cloth, and wipe the Unit.
- A smudge may remain on the Unit from gum, vinyl, or tape that was left on for a long time. Remove the smudge when cleaning.

CAUTION Never use volatile solvents such as paint thinner or benzene or chemical wipes. These substances could damage the surface of the Unit.

■ Inspection

Be sure to inspect the system periodically to keep it in its optimal operating condition. In general, inspect the system once every 6 to 12 months, but inspect more frequently if the system is used at high temperatures or humidity or under dirty/dusty conditions.

Inspection Equipment

Prepare the following equipment before inspecting the system.

● Required equipment
- Standard and Phillips screwdrivers
- Multimeter (or digital volt meter)
- Alcohol and all-cotton cloth

● Equipment that could be needed
- Synchroscope
- Oscilloscope (pen-writing type)
- Thermometer, hygrometer

Inspection Item

Check the items in the following table to make sure they meet the standard. If they do not, improve the surrounding environment so they meet the standard or adjust this unit.

Item	Inspection contents	Standard	Inspection method
Environmental conditions	Ambient and in-panel temperature	See below.	Thermometer
	Ambient and in-panel humidity	See below.	Thermometer
	Dust/dirt accumulation	None	Visual
Installation	Are the units installed securely?	No looseness	
	Are the communications cables securely connected?	No looseness	
	Is the antenna tight?	No looseness	

● The following table shows the operating ambient temperature and humidity ranges for each unit

Unit	Acceptable temperature	Acceptable humidity
DeviceNet wireless master station	-10 to 50℃	25% to 85% (with no condensation or icing)
DeviceNet wireless slave station	-10 to 50℃	25% to 85% (with no condensation or icing)

■ Replacing nodes

Each node (master, slave, wireless master station, wireless slave station) makes up the network. The entire network is affected when a node is faulty, so a faulty node must be repaired or replaced quickly. We recommend having spare parts available to restore network operation as quickly as possible.

Precautions

Observe the following precautions when replacing a faulty unit.
* After replacement make sure there are no errors with the new unit.
* When a unit is being returned for repair, attach a sheet of paper detailing the problem and return the unit to your OMRON dealer listed at the end of this manual.
* If there is a faulty contact, try wiping the contact with a clean, lint-free cloth dampened with alcohol.

CAUTION To prevent electric shock when replacing a unit, be sure to turn OFF the power supplies to all of the nodes (master and slaves) before removing the faulty unit.

Appendices

Appendix-1 Device Profiles

Refer to the specifications and device profile in this manual when connecting an Omron DeviceNet wireless master station to another company's master.

■ Device profile of DeviceNet wireless unit master station (WD30-M)

General data	Applicable DeviceNet Specifications	Volume I-Release2.0 Volume II-Release2.0	
	Vender name	OMRON Corporation	Vender ID = 47
	Device profile	Slaves : Communication Adapter	Device profile = 12
	Product catalog number	Manual number	
	Product revision	1.0	
Physical conformance data	Network current consumption		
	connector type	Open plug	
	Physical insulation	Yes	
	Supported indicator	Module Network Wireless	
	MAC ID setting	Rotary switch	
	Default MAC ID	0	
	Transmission communication speed setting	DIP switch	
	Supported transmission communication speeds	125 kbps 250 kbps 500 kbps	
Communications data	Predefined Master/ Slave connection set	Group 2 only server	
	Dynamic connection support (UCMM)	No	
	Explicit message fragmentation support	Yes	

Object Loading

● Identity Object (0 x 01)

Object class	Attribute	Not supported
	Service	Not supported

Object instance	Attribute	ID content	Get	Set	Value
		1 Vendor		×	47
		2 Product type		×	12
		3 Product code		×	502 (WD30-M)
		4 Revision		×	2.1
		5 Status (bits supported)		×	Unique for each unit
		6 Serial number		×	Bit 0 only
		7 Product name		×	WD30-M
		8 State	×	×	
	Service	DeviceNet service	Parameter option		
		05 Reset	No		
		OE Get_Attribute_Single	No		

● Message Router Object (0 x 02)

Object class	Attribute	Not supported
	Service	Not supported
Object instance	Attribute	Not supported
	Service	Not supported
Vender fix specification addition		No

Appendices

● DeviceNet Object (0 x 03)

Object class	Attribute	Not supported
	Service	Not supported

Object instance	Attribute	ID content	Get	Set	Value
		1 MAC ID		×	
		2 Communication speed		×	
		3 BOI		×	00H
		4 Bus-off counter		×	
		5 Allocation Information		×	
		6 MAC ID switch changed	×	×	
		7 Communication speed switch changed	×	×	
		8 MAC ID switch value	×	×	
		9 Communication speed switch	×	×	
	Service	DeviceNet service	Parameter option		
		0E Get_Attribute_Single	No		
		4B Allocate Master/Slave_ Connection_Set	No		
		Release_Master/Slave_ Connection_Set	No		

● Connection Object (0 x 05)

Object class	Attribute	Not supported
	Service	Not supported
	Max. number of active connections	1

Object instance1	Section	Information	Max. number of instances
	Instance type	Explicit Message	1
	Production trigger	Cyclic	
	Transport type	Server	
	Transport class	3	
	Attribute	ID content	Get Set Value
		1 State	×
		2 Instance type	× 0000H
		3 Transport class trigger	× 8300H
		4 Produced connection ID	×
		5 Consumed connection ID	×
		6 Initial comm. characteristics	× 2100H
		7 Produced connection size	× FF00H
		8 Consumed connection size	× FF00H
		9 Expected packet rate	
		12 Watchdog time-out action	× 0100H
		13 Produced connection path length	× 0000H
		14 Produced connection path	×
		15 Consumed connection path length	× 0000H
		16 Consumed connection path	
	Service	DeviceNet service	Parameter option
		05 Reset	No
		0E Get_Attribute_Single	No
		10 Set_Attribute_Single	No

Object instance2	Section	Information	Max. number of instances
	Instance type	Polled I/O	1
	Production trigger	Cyclic	
	Transport type	Server	
	Transport class	2	
	Attribute	ID content	Get Set Value
		1 State	×
		2 Instance type	＼ 0100H
		3 Transport class trigger	× 8200H
		4 Produced connection ID	＼
		5 Consumed connection ID	＼
		6 Initial comm. characteristics	× 0100H
		7 Produced connection size	× *1
		8 Consumed connection size	× *1
		9 Expected packet rate	
		12 Watchdog time-out action	× 0000H
		13 Produced connection path length	＼ 0000H
		14 Produced connection path	×
		15 Consumed connection path length	＼ 0000H
		16 Consumed connection path	
	Service	DeviceNet service	Parameter option
		05 Reset	No
		0E Get_Attribute_Single	No
		10 Set_Attribute_Single	No

*1 This is the total number of DeviceNet slaves connected to the wireless slave station.

Object instance3	Section	Information	Max. number of instances
	Instance type	Bit Strobed I/O	1
	Production trigger	Cyclic	
	Transport type	Server	
	Transport class	2	
	Attribute	ID content	Get Set Value
		1 State	$\times$
		2 Instance type	$\times$ 0100H
		3 Transport class trigger	$\times$ 8200H
		4 Produced connection ID	$\times$
		5 Consumed connection ID	$\times$
		6 Initial comm. characteristics	$\times$ 0100H
		7 Produced connection size	$\times$ 0400H
		8 Consumed connection size	$\times$ 0800H
		9 Expected packet rate	
		12 Watchdog time-out action	$\times$ 0000H
		13 Produced connection path length	$\times$ 0000H
		14 Produced connection path	$\times$ No
		15 Consumed connection path length	$\times$ 0000H
		16 Consumed connection path	No
		17 Production inhibit time	$\times$ 0000H
	Service	DeviceNet service	Parameter option
		0E Get_Attribute_Single	No
		10 Set_Attribute_Single	No

Appendix-2 Connection-related Devices Model List

■ Basic unit

Model	Specifications	Manufacturer
WD30-M	DeviceNet wireless master station	OMRON
WD30-S	DeviceNet wireless slave station	OMRON

■ Configurator

Model	Specifications	Manufacturer
3G8F5-DRM21	ISA board compatible configurator	OMRON
3G8E2-DRM21	PCMCIA card compatible configurator	OMRON

■ Connection cable for DeviceNet

Model	Specifications	Manufacturer
DCA1-5CN□□F1	Connection cable for DeviceNet Cable with connector at one side (socket side)	OMRON

■ Power supply for communication

Model	Specifications	Manufacturer
S82K-□□□□	Switching・power supply	OMRON
S82J-□□□□	Switching・power supply	OMRON

■ Connector with terminal resisters

Model	Specifications	Manufacturer
DRS2-1	Shielded terminating registors (plug)	OMRON
DRS2-2	Shielded terminating registors (socket)	OMRON

■ T-branch connector

Model	Specifications	Manufacturer
DCN2-1	Shielded T-branch connector	OMRON

Appendix-3 Current Consumption List

■ Current Consumption List

Model	*1 Total current consumption
WD30-M	Max. 220mA
WD30-S	Min. 220mA

*1 The wireless unit receives the total power supply from the communication power supply via the dedicated DeviceNet cable. Thus, the total power supply listed here does not distinguish the internal circuit area from the communication area.

Index

Index