MITSUBISHI ELECTRIC

800 series

INVERTER

Plug-in option
FR-A8NF
INSTRUCTION MANUAL

FL remote communication function

Thank you for choosing this Mitsubishi inverter plug-in option.
This Instruction Manual provides handling information and precautions for use of this product. Incorrect handling might cause an unexpected fault. Before using this product, always read this Instruction Manual carefully to use this product correctly.
Please forward this Instruction Manual to the end user.

Safety instructions

Do not attempt to install, operate, maintain or inspect the product until you have read through this Instruction Manual and appended documents carefully and can use the equipment correctly. Do not use this product until you have a full knowledge of the equipment, safety information and instructions. In this Instruction Manual, the safety instruction levels are classified into "Warning" and "Caution".

⚠ Warning　Incorrect handling may cause hazardous conditions, resulting in death or severe injury.

⚠ Caution　Incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause only material damage.

The　**⚠ Caution**　level may even lead to a serious consequence according to conditions. Both instruction levels must be followed because these are important to personal safety.

◆ **Electric shock prevention**

⚠ Warning

- While the inverter power is ON, do not open the front cover or the wiring cover. Do not run the inverter with the front cover or the wiring cover removed. Otherwise you may access the exposed high voltage terminals or the charging part of the circuitry and get an electric shock.
- Do not remove the inverter front cover even if the power supply is disconnected. The only exception for this would be when performing wiring and periodic inspection. You may accidentally touch the charged inverter circuits and get an electric shock.
- Before wiring or inspection, LED indication of the inverter unit operation panel must be switched OFF. Any person who is involved in wiring or inspection shall wait for at least 10 minutes after the power supply has been switched OFF and check that there is no residual voltage using a tester or the like. For some time after the power-OFF, a high voltage remains in the smoothing capacitor, and it is dangerous.
- Any person who is involved in wiring or inspection of this equipment shall be fully competent to do the work.
- The plug-in option must be installed before wiring. Otherwise you may get an electric shock or be injured.
- Do not touch the plug-in option or handle the cables with wet hands. Otherwise you may get an electric shock.
- Do not subject the cables to scratches, excessive stress, heavy loads or pinching. Otherwise you may get an electric shock.

◆ **Injury prevention**

⚠ Caution

- The voltage applied to each terminal must be the ones specified in the Instruction Manual. Otherwise a burst, damage, etc. may occur.
- The cables must be connected to the correct terminals. Otherwise a burst, damage, etc. may occur.
- The polarity (+ and -) must be correct. Otherwise a burst or damage may occur.
- While power is ON or for some time after power OFF, do not touch the inverter as it will be extremely hot. Touching these devices may cause a burn.

◆ **Additional instructions**
The following instructions must be also followed. If the product is handled incorrectly, it may cause unexpected fault, an injury, or an electric shock.

⚠ Caution

Transportation and mounting
- Do not install or operate the plug-in option if it is damaged or has parts missing.
- Do not stand or rest heavy objects on the product.
- The mounting orientation must be correct.
- Foreign conductive objects must be prevented from entering the inverter. That includes screws and metal fragments or other flammable substance such as oil.
- If halogen-based materials (fluorine, chlorine, bromine, iodine, etc.) infiltrate into a Mitsubishi product, the product will be damaged. Halogen-based materials are often included in fumigant, which is used to sterilize or disinfest wooden packages. When packaging, prevent residual fumigant components from being infiltrated into Mitsubishi products, or use an alternative sterilization or disinfection method (heat disinfection, etc.) for packaging. Sterilization of disinfection of wooden package should also be performed before packaging the product.

Trial run
- Before starting operation, each parameter must be confirmed and adjusted. A failure to do so may cause some machines to make unexpected motions.

⚠ Warning

Usage
- Do not modify the equipment.
- Do not perform parts removal which is not instructed in this manual. Doing so may lead to fault or damage of the product.

⚠ Caution

Usage
- When parameter clear or all parameter clear is performed, the required parameters must be set again before starting operations. Because all parameters return to their initial values.
- To avoid damage due to static electricity, static electricity in your body must be discharged before you touch the product.

Maintenance, inspection and parts replacement
- Do not carry out a megger (insulation resistance) test.

Disposal
- The product must be treated as industrial waste.

General instruction
- Many of the diagrams and drawings in this Instruction Manual show the inverter without a cover or partially open for explanation. Never operate the inverter in this manner. The cover must be reinstalled and the instructions in the Instruction Manual must be followed when operating the inverter.

— CONTENTS —

5 FL REMOTE COMMUNICATION FUNCTION

6 CYCLIC TRANSMISSION

7 MESSAGE TRANSMISSON

8 DESCRIPTION AND CORRECTIVE ACTION OF FAULT INDICATION   92

9 TROUBLESHOOTING   93

1 PRE-OPERATION INSTRUCTIONS

1.1 Unpacking and product confirmation

Take the plug-in option out of the package, check the product name, and confirm that the product is as you ordered and intact.
This product is a plug-in option for the FR-A800/F800 series inverter.

1.1.1 Product confirmation

Check the enclosed items.

Plug-in option 1	Mounting screw (M3 × 8mm) .... 3 (Refer to **page 15**)	Communication option LED display cover.............................1 (Refer to **page 14**)	Earth plate ....1 (Refer to **page 15**)

NOTE

• Ethernet is a registered trademark of Fuji Xerox Corporation in Japan.

1.1.2　SERIAL number check

The FR-A8NF can be used for the inverter models listed below with the following SERIAL number or later. Check the SERIAL number indicated on the inverter rating plate or package.

Rating plate example

```
  ╱╲ MITSUBISHI      INVERTER   ( PASSED )
 ╱──╲ ELECTRIC
 MODEL FR-A820-0.4K-1
 INPUT   : XXXXX
 OUTPUT  : XXXXX
 SERIAL  : XXXXXXXXX
 MADE in XXXXX
```

SERIAL number

Country of origin

```
  □       ○       ○       ○○○○○○
Symbol   Year    Month   Control number
               SERIAL
```
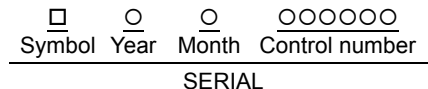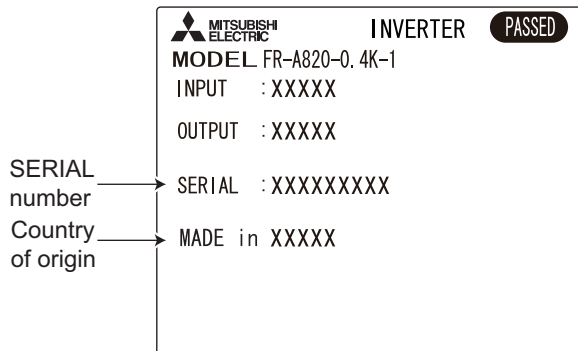
The SERIAL consists of one symbol, two characters indicating the production year and month, and six characters indicating the control number.
The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).

FR-A800 series

Model	Country of origin indication	SERIAL number
FR-A820-00046(0.4K) to 04750(90K) FR-A840-00023(0.4K) to 06830(280K) FR-A842-07700(315K) to 12120(500K) FR-A846-00023(0.4K) to 03610(132K)	MADE in Japan	□5Y○○○○○○ or later
	MADE in China	□5Z○○○○○○ or later

FR-F800 series

Model	Country of origin indication	SERIAL number
FR-F820-00046(0.75K) to 04750(110K) FR-F840-00023(0.75K) to 06830(315K) FR-F842-07700(355K) to 12120(560K)	MADE in Japan	□5Y○○○○○○ or later
	MADE in China	□5Z○○○○○○ or later

1.2 Component names

Front view   **Rear view**
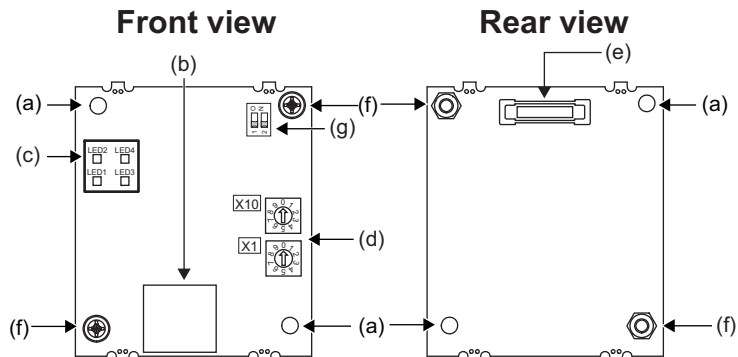
Symbol	Name	Description	Refer to page
a	Mounting hole	Fixes the option to the inverter with the mounting screws.	**15**
b	Connector for communication	Connect the FL-net dedicated cable to connect the option to the network.	**21**
c	LED (operation status indication)	Lit/flicker/off of the LED indicate inverter operation status.	**9**
d	Node address switch (SW1, SW2)	Set the node address.	**18**
e	Connector	Connect to the inverter option connector.	**15**
f	Spacer	Used for a stable connection to the inverter.	—
g	Switch for manufacturer setting (SW3)	Do not change the initial setting (switches 1 and 2: OFF).	—

1.3 LED status

Each LED indicates the operating status of the option unit and network according to the indication status.
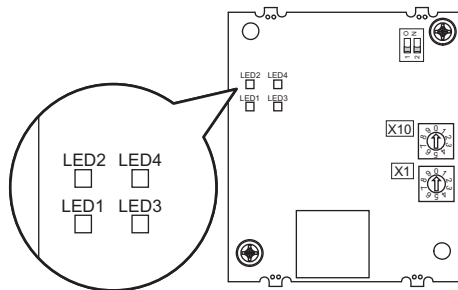
LED1 : Reception/transmission LED (TX/RX)
LED2 : Communication set status LED (CHG)
LED3 : Remote status LED (RMT)
LED4 : Device status LED (DEV)

1.3.1 Device status LED (DEV), remote status LED (RMT)

LED status		Node status	Description
DEV	RMT		
□	□	Power is OFF	The inverter power is OFF.
■	□	Hardware fault	• Node address is out of range (other than 1 to 64). • Optional board fault • The option is installed to the inverter which is not compatible with the FR-A8NF. (Refer to **page 7** for the inverter which is compatible with the FR-A8NF.) • A contact fault occurs in an option connector between the inverter and communication option.
□	□	FL remote network is not connected	Although hardware is normal, the inverter is not connected to the FL remote network.
□	□ ↔ □	FL remote network at a remote stop	The inverter is correctly set to connect to the FL remote network and waiting for remote I/O control.
		FL remote network during remote connection processing	Although remote I/O control started, initial processing is in progress.
		Master is not present	The master is disconnected from the FL remote network.
□	□	FL remote network during remote operation	During remote I/O control
□	■ ↔ □	Own node is disconnected	The own node is disconnected from the FL remote network.
□	■ ↔ □	Setting error	Although the inverter is connected to the FL remote network, setting error is found. (The inverter is set as a slave but not the right destination for the master.)
□	■	Duplicate node	The own node address is duplicate with the other node addresses.

□: OFF, ■: Red, □: Green, ■ ↔ □: Red, flashing, □ ↔ □: Green, flashing, ■ ↔ □: Alternating red/green

1.3.2 Transmitting (TX)/receiving (RX) LED

LED status	Node status	Description
☐	Not transmitting (TX)/ not receiving (RX)	—
☐	Transmitting (TX)/receiving (RX)	Flickers at high speed during continuous transmitting/receiving.

☐: OFF, ☐: Green

1.3.3 Communication set status LED (CHG)

LED status	Node status	Description
☐	Communication setting is not changed	—
■ ↔ ☐	Communication setting is changed	The red LED flickers when the applied setting and the node address switch setting differ. The setting value of the node address switch is applied by re-powering ON the inverter in this status, then communication setting status LED turns OFF.

☐: OFF, ■ ↔ ☐: Red, flashing

1.4　Specifications

1.4.1　Inverter option specifications

Power supply	Supplied from the inverter
Type	Inverter plug-in option (can be installed/removed to/from the inverter front face.)
FL-net dedicated cable	Refer to **page 20**.

1.4.2　Communication specifications

Maximum number of connectable inverters	64 units maximum
Communication speed	Auto negotiation (auto detection) (10 Mbps/100 Mbps)
Topology	• Star (connection with a hub in the center) • Star bus (connection with multiple hubs)
Communication distance	• Between node and hub: 100 m maximum (Node indicates the master and the inverters.) • Between hubs: 100 m maximum • Overall length: 2000 m maximum
Electrical interface	Conforms to IEEE802.3u (conforms to CSMA/CD)
Transmission protocol	FL remote
Node address setting	Can be set with node address switch. (Refer to **page 18**.) The setting is applied to IP address as well. (192.168.250.node address)
I/O points	Input 64 points, output 64 points

2 INSTALLATION

2.1 Pre-installation instructions

Check that the inverter's input power and the control circuit power are both OFF.

> ⚠ **Caution**
> - With input power ON, do not install or remove the plug-in option. Otherwise, the inverter and plug-in option may be damaged.
> - To avoid damage due to static electricity, static electricity in your body must be discharged before you touch the product.

2.2   Installation procedure

◆ Installing the communication option LED display cover

(1) Remove the inverter front cover. (Refer to Chapter 2 of the Instruction Manual (Detailed) of the inverter for details on how to remove the front cover.) Mount the cover for displaying the operation status indication LED for the communication option on the inverter front cover.

(2) Cut off hooks on the rear of the inverter front cover with nipper, etc. and open the window for fitting the LED display cover.

Cut off with a nipper, etc.

Cut off with a nipper, etc.
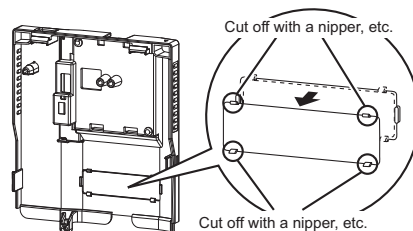
(3) Fit the communication option LED display cover to the front side of the front cover. Align the LED display cover with the LED position on the circuit board of the option. Push the LED display cover until it is fixed with the hooks.
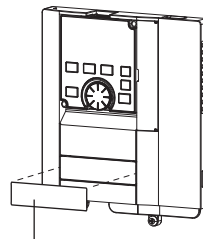
Communication option LED display cover

⚠Caution

● **Take care not to hurt your hand and such with portions left by cutting hooks of the rear of the front cover.**

◆ Installing the option

(1) Fit the connector of the plug-in option to the guide of the connector on the inverter unit side, and insert the plug-in option as far as it goes. (Insert it to the inverter option connector 1.)
(2) Fit the one location on the left of the earth plate (as shown in the next page) securely to the inverter unit by screwing in the supplied mounting screw. (tightening torque 0.33 N·m to 0.40 N·m)
(3) Fit the one location on the left of the plug-in option securely to the inverter unit and the right of the plug-in option to the inverter unit together with the earth plate by screwing in the supplied mounting screws. (tightening torque 0.33 N·m to 0.40 N·m) If the screw holes do not line up, the connector may not be inserted deep enough. Check the connector.

Inverter side option connector

Earth plate
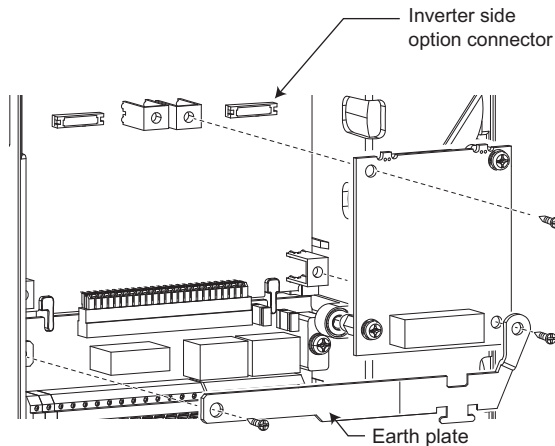
Example of installation to connector 1

Do not insert the plug-in option to the connector 2 or 3

Connector 3

Mounting screw

Connector 2   Connector 1

Mounting screw

Mounting screw

Earth plate

Insertion positions for screws
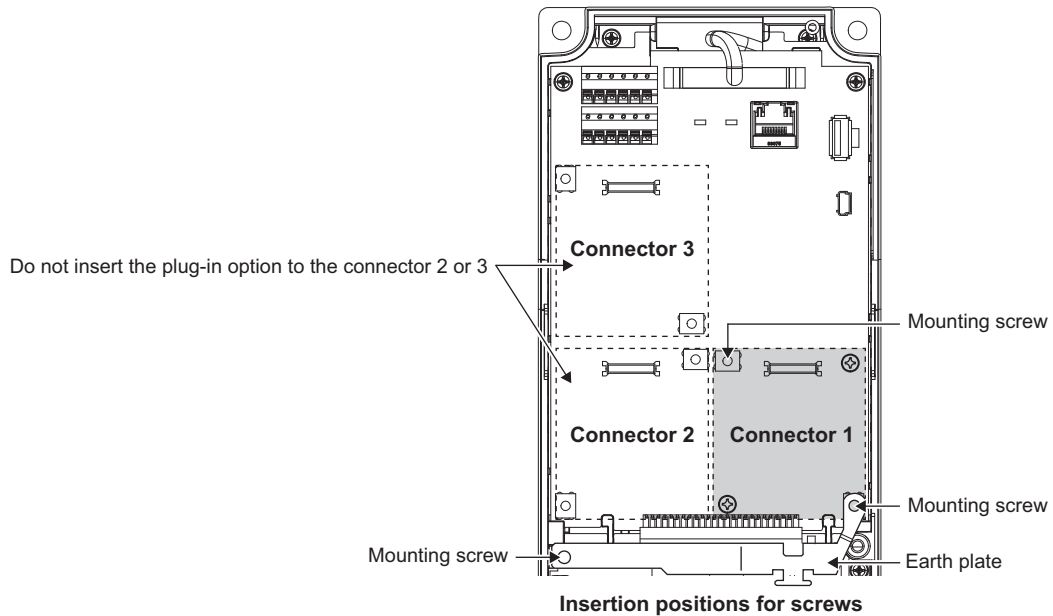
NOTE

- When mounting/removing the plug-in option, hold the sides of the option. Do not press on the parts on the option circuit board. Stress applied to the parts by pressing, etc. may cause a failure.
- Caution must be applied to mounting screws falling off when removing and mounting the plug-in option.
- When using this plug-in option, insert it to the inverter option connector 1. If it is inserted to the option connector 2 or 3, the protective function (E.2 or E.3) is activated and the inverter will not operate.
  Even if the option is inserted to the option connector 1, when the inverter cannot recognize that the option is mounted due to improper installation, etc., the protective function (E.1) is activated.

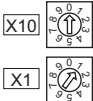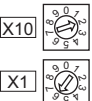| Mounted position	Fault indication
Option connector 1	$E.\quad 1$
Option connector 2	$E.\quad 2$
Option connector 3	$E.\quad 3$

- When removing the plug-in option, remove the two screws on the left and right, then pull it straight out. Pressure applied to the connector and to the option board may break the option.
- Always attach the earth plate because a malfunction due to noises may occur without it.

2

2.3   Node address setting

Set the node address between "1 to 64" using node address switches on the FR-A8NF (refer to **page 8**).
The setting is applied at the next power-on.

Set the arrow ($\Uparrow$) of the corresponding switches to the number to set a desired node address.
• Setting example

| Node address 1:
Set the arrow ($\Uparrow$) of X10 (SW2) to "0" and the arrow ($\Uparrow$) of X1 (SW1) to "1". | X10
 X1 | Node address 26:
Set the arrow ($\Uparrow$) of X10 (SW2) to "2" and the arrow ($\Uparrow$) of X1 (SW1) to "6". | X10
 X1 |

• NOTE

- Set the inverter node address before switching ON the inverter and do not change the setting while power is ON. Otherwise you may get an electric shock.
- Set the node address switches so that the arrow points the exact position. If the switch is set between numbers, normal data communication can not be established.

Good example   Bad example
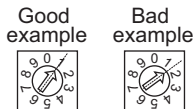
- If the node address switch is set to a value other than "1 to 64", it is invalid due to outside of setting range. In this case, DEV LED of the option is lit red and E.OPT appears on the operation panel of the inverter.
- You cannot set the same node address to other devices on the network. (Doing so disables proper communication.)
- Changes in the node address setting are applied only at the next power-ON. Therefore, if the node address setting is changed, make sure to power OFF and ON the inverter power.

3 WIRING

3.1 Connection to network

(1) Be sure to check the following before connecting the inverter to the network.
  - Check that the FR-A8NF is correctly mounted to the inverter. (Refer to **page 15**.)
  - Check that the correct node address is set. (Refer to **page 18**.)
  - Check that the FL-net dedicated cable is correctly connected to the FR-A8NF. (Refer to **page 21**.)

(2) System configuration

Overall length: 2000m maximum
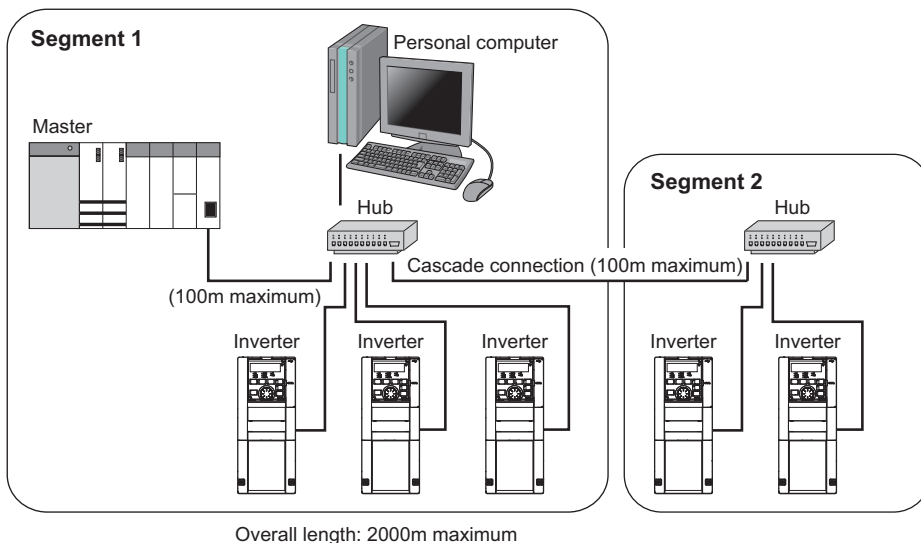
3.2 Connection cable specifications

Connect the FR-A8NF to the FL remote network using the FL-net dedicated cable below.

Item	Description
Cables	TPCC5 or more (Twisted Pair Communication Cable for LAN Category 5) For the shape, use STP (Shielded Twisted Pair) (according to the 100BASE-TX (IEEE802.3u) standard)
Maximum wiring length	100 m maximum between hub and inverter. (according to the 100BASE-TX (IEEE802.3u) standard)

• Designated product (as of February 2015)

Type	Cable Length (m)	Maker
FLG-S-[]*1	1 to 100 m	Shinwa Co., Ltd.

∗1   The cable length is indicated in the brackets (FLG-S-010 for 1 m length, FLG-S-1000 for 100 m length).

3.3 Precautions for system configuration

Enough safety measures are necessary when installing the FL-net dedicated cable and connecting to the FL remote network.
Consult the network provider and network administrator (person in charge of network planning and IP address management) including terminal treatment of connection cable, construction of trunk cable, etc.
We are not responsible for system troubles from connecting to the FL remote network.

3.4   Wiring

This section explains connection of the FL-net dedicated cable and the relevant precautions.
For the details of the network configuration and the cables used for wiring, refer to **page 19** and **20**.

3.4.1   Connecting the FL-net dedicated cable

◆ Connecting the cable
(1) Turn OFF the inverter power supply.
(2) Remove the front cover.
(3) Check the orientation of the connectors. Insert the
    connector part of the FL-net dedicated cable to the
    communication connector of the FR-A8NF until it clicks.

◆ Disconnecting the cable
(1) Turn OFF the inverter power supply.
(2) Remove the front cover.
(3) Pull out the FL-net dedicated cable while holding the
    release tab of the connector part.

Communication connector
of the FR-A8NF

FL-net dedicated cable
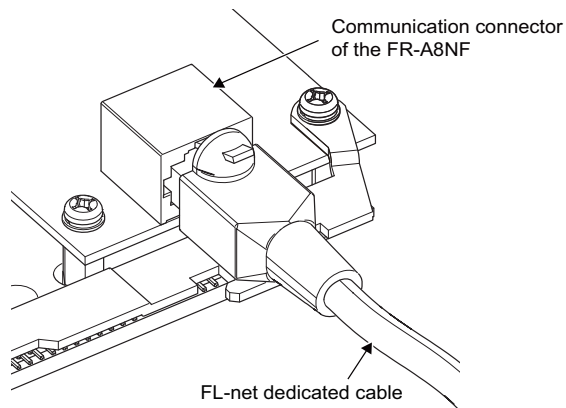
⚠**Caution**

● **Do not connect the parameter unit (FR-PU07, etc.) to the FR-A8NF communication connector. Doing so will damage the option.**
● **After wiring, wire offcuts must not be left in the inverter. Wire offcuts can cause an alarm, failure or malfunction.**

4 INVERTER SETTING

4.1 Parameter list

◆ **Parameters related to the communication option (FR-A8NF)**

Pr.	Pr. group	Name	Setting range	Minimum setting increments	Initial value	Refer to page
501∗1	N012∗1	Communication error occurrence count display	0	1	0	**32**

∗1 Available when the plug-in option (FR-A8NF) is connected.

◆ Parameters whose functions are always the same

When the FR-A8NF is installed to the inverter, each function of some parameters is fixed as follows.
(Changed setting is invalid even if the setting value is changed.)

Pr.	Pr. group	Name	Setting (fixed)	Function	Refer to page
76	M510	Fault code output selection	0	Without fault code output	*2
79	D000	Operation mode selection	7	PU operation interlock	**26**
180	T702	RL terminal function selection	0	Low-speed operation command	*2
181	T703	RM terminal function selection	1	Middle-speed operation command	*2
182	T704	RH terminal function selection	2	High-speed operation command	*2
183	T705	RT terminal function selection	3	Second function selection	*2
184	T706	AU terminal function selection	9999	- (no function)	*2
185	T707	JOG terminal function selection	9999*6	- (no function)	*2
186	T708	CS terminal function selection	9999	- (no function)	*2
187	T709	MRS terminal function selection	24*5	Output stop	*2
188	T710	STOP terminal function selection	9999	- (no function)	*2
189	T711	RES terminal function selection	12	PU operation interlock	*2

4

Pr.	Pr. group	Name	Setting (fixed)		Function	Refer to page
190	M400	RUN terminal function selection	0		Inverter running	∗2
191	M401	SU terminal function selection	1		Up to frequency	∗2
192	M402	IPF terminal function selection	2∗3	9999∗4	Instantaneous power failure/undervoltage	∗2
193	M403	OL terminal function selection	3		Overload alarm	∗2
194	M404	FU terminal function selection	4		Output frequency detection	∗2
195	M405	ABC1 terminal function selection	99		Fault output	∗2
196	M406	ABC2 terminal function selection	9999		- (no function)	∗2
338	D010	Communication operation command source	0		Operation command source communication	30
339	D011	Communication speed command source	0		Frequency command source communication	30
340	D001	Communication startup mode selection	10		Started in the Network operation mode. Operation mode can be changed between the PU operation mode and Network operation mode from the operation panel.	26
342	N001	Communication EEPROM write selection	0		Parameter values written by communication are written to the EEPROM and RAM.	∗2
500∗1	N011∗1	Communication error execution waiting time	0		There is no waiting time (0 s) since the communication line fault occurrence until communication error. Note that actual time depends on the detection time on the FL remote network.	∗2

Pr.	Pr. group	Name	Setting (fixed)	Function	Refer to page
502*1	N013*1	Stop mode selection at communication error	1	The inverter decelerates to stop at communication fault occurrence, when provide a fault output.	**33**
550	D012	NET mode operation command source selection	9999	Automatic communication option recognition Normally, control source of the RS-485 terminal is valid. When a communication option is mounted, the control source of the communication option is valid.	*2
551	D013	PU mode operation command source selection	2	Selects the PU connector as the PU operation mode operation source.	*2

    *1   Available when the plug-in option (FR-A8NF) is connected.
    *2   Refer to the Instruction Manual (Detailed) of the inverter.
    *3   For the standard model and the IP55 compatible model.
    *4   For the separated converter type.
    *5   For the separated converter type, the setting (fixed) remains "24". However, the X10 signal (Inverter run enable signal (FR-HC2/FR-CV/FR-CC2 connection)) operation is performed.
    *6   When the FR-A8TP is installed to the separated converter type, the setting (fixed) remains "9999". However, the X10 signal operation is performed.

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: 🐾 NOTE :
`. • • • • • • •`

    • Functions that use terminal AU, JOG, CS, or STOP are not available. Also, signals not listed in the table cannot be assigned to the I/O terminals.

4.2 Operation mode setting

Powering ON the inverter with the communication option (FR-A8NF) installed starts the inverter in the Network operation mode. (The operation mode cannot be changed to the External operation mode when the FR-A8NF is installed.)

◆ Operation mode switching conditions
Check the following before switching the operation mode.
• The inverter is at a stop.
• Both the STF and STR signals are turned OFF.

◆ Operation mode switchover method
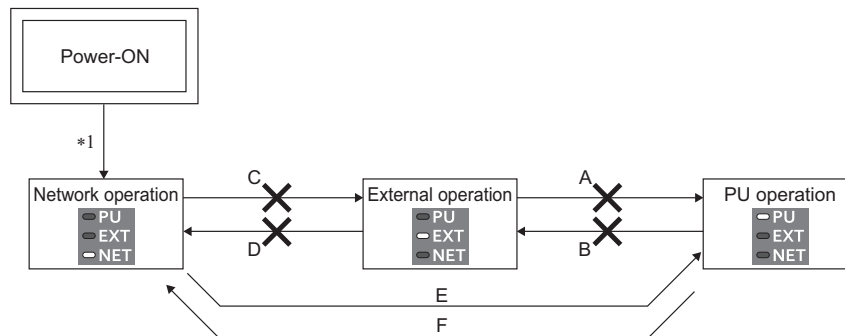
*1   When powered ON with the FR-A8NF installed, the inverter starts in the Network operation mode.

Symbol	Operation mode switchover	Switchover method
A	External operation →PU operation	The operation mode can not be switched in power-ON status. After powering OFF the inverter, remove the FR-A8NF and power ON the inverter again. Then, press the $\boxed{\dfrac{PU}{EXT}}$ key on the operation panel.
B	PU operation →External operation	The operation mode can not be switched in power-ON status. After powering OFF the inverter, remove the FR-A8NF and power ON the inverter again.
C	Network operation →External operation	
D	External operation →Network operation	The operation mode can not be switched in power-ON status. After powering OFF the inverter, install the FR-A8NF to the option connector 1 and power ON the inverter again.
E	Network operation →PU operation	Turn ON the X12 signal (Bit 11) which enables operation command through the FL remote communication, and press the $\boxed{\dfrac{PU}{EXT}}$ key on the operation panel. (Refer to **page 28**.)
F	PU operation →Network operation	Turn OFF the X12 signal (Bit 11), which gives operation commands through the FL remote communication. (Refer to **page 28**.)

4

◆ Operation mode switching by the PU operation interlock signal (X12)

PU operation interlock is a function that forcefully changes the operation mode to the Network operation mode at turn-OFF of the X12 signal (Bit 11), which gives operation commands through the FL remote communication.

This function prevents the operation mode from being accidentally unswitched from the PU operation mode. If the operation mode left unswithced from the PU operation mode, the inverter does not reply to the commands sent through the FL remote communication.

X12 signal	Function/operation	
	Operation mode	**Parameter write**
ON	Operation mode (PU, NET) switching is enabled. Output stops during the Network operation.	Parameter write is enabled. (It depends on **Pr.77 Parameter write selection** and each parameter write conditions. Refer to the Instruction Manual (Detailed) of the inverter.)
OFF	Operation mode is forcibly switched to the Network. Network operation is enabled. Switching to the PU operation mode is disabled.	Parameter write is disabled. (Note that the **Pr.297** setting is available when **Pr.296** ≠ "9999.")

- Function/operation changed by switching ON-OFF the X12 signal

Operating condition		X12 signal	Operation mode	Operating status	Switching to PU operation mode
Operation mode	Status				
PU	During stop	ON→OFF∗1	Network∗2	If Network operation frequency setting and start signal are entered, operation is performed in that status.	Disallowed
	Running	ON→OFF∗1			Disallowed
Network	During stop	OFF→ON		During stop	Allowed
		ON→OFF			Disallowed
	Running	OFF→ON		During operation → output stop	Disallowed
		ON→OFF		Output stop → operation	Disallowed

∗1 The operation mode switches to the Network operation mode independently of whether the start signal (STF, STR) is ON or OFF. Therefore, the motor is run in the Network operation mode when the X12 signal is turned OFF with either of STF and STR ON.

∗2 At fault occurrence, pressing [STOP/RESET] of the operation panel resets the inverter.

NOTE

- If the X12 signal is ON, the operation mode cannot be switched to the PU operation mode when the start signal (STF, STR) is ON.
- The X12 signal is valid only when it is input via the FL remote communication. (The X12 signal is invalid when it is input from a control circuit terminal of the inverter.)
- When the FR-A8NF is installed, **Pr.79 Operation mode selection** and **Pr.340 Communication startup mode selection** settings are invalid.

4

4.3 Selection of control source for the Network operation mode

- As control sources, there are operation command source that controls signals related to the start command and function selection of the inverter and speed command source that controls signals related to frequency setting.
- The commands from external terminal and communication are listed below when the FR-A8NF is installed.

Operation command			Command source	Remarks
Running frequency via communication			NET	
Fixed functions (Functions equivalent to terminals)	Terminal 2		—	—
	Terminal 4		—	—
	Terminal 1		Compensation	—
	Terminal RL	Low-speed operation command/ remote setting clear	NET	**Pr.59** = "0" (multi-speed) **Pr.59** = "1, 2" (remote)
	Terminal RM	Middle-speed operation command/ remote setting deceleration	NET	
	Terminal RH	High-speed operation command/ remote setting acceleration	NET	
	Terminal RT	Second function selection	NET	—
	Terminal RES (X12)	PU operation interlock	NET	—
	Terminal MRS	Output stop	Combined	—

Operation command			Command source	Remarks
Operation command through the FL remote communication	STF signal	Forward rotation command	NET	—
	STR signal	Reverse rotation command	NET	—
	RL signal	Low-speed operation command/ remote setting clear	NET	**Pr.59** = "0" (multi-speed) **Pr.59** = "1, 2" (remote)
	RM signal	Middle-speed operation command/ remote setting deceleration	NET	
	RH signal	High-speed operation command/ remote setting acceleration	NET	
	RT signal	Second function selection	NET	—
	X12 signal	PU operation interlock	NET	—
	MRS signal	Output stop	NET	—
	Error reset	Error reset	NET	—

[Descriptions of the command source in the table]

NET: Control only via communication is valid.

Combined: Control via either external terminal or communication is valid.

–: Control via either external terminal or communication is invalid.

Compensation: Control only by signal via external terminal is valid if **Pr.28 Multi-speed input compensation selection** is set to "1".

NOTE

- The settings of **Pr.338 Communication operation command source** and **Pr.339 Communication speed command source** are invalid when the FR-A8NF is installed.

4.4 Operation at communication error occurrence

4.4.1 Operation selection at communication error occurrence (Pr.501, Pr.502)

The operation at communication error occurrences can be selected according to the settings of **Pr.501** and **Pr.502** under the Network operation.

◆ Display and erasure of communication error occurrence count

The cumulative count of communication error occurrences can be displayed. Write "0" to clear the cumulative count.

Pr.	Name	Setting range	Minimum setting increments	Initial value
501	Communication error occurrence count display	0	1	0

Count timing depending on communication line status

| Normal | Error | Normal | Error | |

Incremented by 1   Incremented by 1
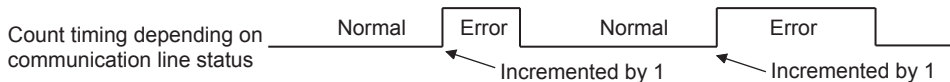
At the point of communication line error occurrence, the value in **Pr.501 Communication error occurrence count display** is incremented by 1.

NOTE

- Communication error count is temporarily stored in the RAM memory. The error count is stored in EEPROM only once per hour. If power reset or inverter reset is performed, **Pr.501** setting will be the one that is last stored to EEPROM depending on the reset timing.

◆ Inverter operation at a communication error occurrence

If a communication line error or an error in the option unit itself occurs. When the FR-A8NF is installed, the inverter operates in the same manner as when **Pr.502 Stop mode selection at communication error** = "1" regardless of setting value of **Pr.502**.

• Operation at error occurrence

Error type	Operation	Indication	Fault output
Communication line	Decelerated to stop	"E.OP1" after stop	Provided after stop
Communication option	Decelerated to stop	"E.1" after stop	Provided after stop

• Operation at error removal

Error type	Operation	Indication	Fault output
Communication line	Stopped, continuously	"E.OP1", continuously	Output, continuously
Communication option	Stopped, continuously	"E.1", continuously	Output, continuously

NOTE

- The protective function [E.OP1 (fault data: HA1)] is activated at error occurrences on the communication line. The protective function [E.1 (fault data: HF1)] is activated at error occurrences in the communication circuit inside the option.
- Fault output indicates the fault (ALM) signal and fault bit output.
- When the fault output setting is active, fault records are stored in the faults history. (A fault record is written to the faults history at a fault output.)
  When the fault output setting is not active, fault record is overwritten to the faults history temporarily but not stored. After the error is removed, the fault indication is reset, changing the display back to normal, and the last fault is displayed in the faults history.
- The normal deceleration time setting (in **Pr.8**, **Pr.44**, **Pr.45**, etc.) is applied to deceleration time in such cases.

4.4.2　Fault and measures

◆ Inverter operation in each operation mode at error occurrences

Source	Status		Operation mode		
			Network operation	External operation	PU operation
Inverter	Inverter operation		Inverter trip	Inverter trip	Inverter trip
	Data communication		Continued	Continued	Continued
Communication line	Inverter operation		Decelerated to stop	Continued	Continued
	Data communication		Stop	Stop	Stop
Communication option	Communication option connection error	Inverter operation	Decelerated to stop	Inverter trip	Inverter trip
		Data communication	Continued	Continued	Continued
	Error of communication option itself	Inverter operation	Decelerated to stop	Continued	Continued
		Data communication	Stop	Stop	Stop

◆ Measures at fault occurrences

Check the operation panel of the inverter and the LED indication of the FR-A8NF to identify the cause and take countermeasures. (Refer to **page 93**.)

4.5 Inverter reset

◆ Operation conditions of inverter reset

The following table shows the availability of the inverter reset in each operation mode.

Resetting method		Operation mode		
		Network operation	**External operation**	**PU operation**
Reset command via network	Inverter reset	Disabled∗1	Disabled∗3	Disabled
	Error reset at inverter fault (Refer to **page 51**.)∗2	Enabled	Disabled∗3	Disabled
Turning ON the inverter RES signal∗4		Enabled	Enabled	Enabled
Powering OFF the inverter		Enabled	Enabled	Enabled
Reset command from the PU/ DU	Inverter reset	Enabled	Enabled	Enabled
	Reset at inverter fault	Enabled	Enabled	Enabled

∗1 Inverter reset via network is invalid.
∗2 Reset can be made only when the protective function of the inverter is activated.
∗3 As the FR-A8NF is not installed, reset via network can not be performed.
∗4 Set "62 (RES signal)" **in Pr.178 STF terminal function selection** or **Pr.179 STR terminal function selection** to assign the function to a terminal.

⌇◌ **NOTE**

- • During a communication line error or option fault, the inverter cannot be reset via network.
- • The inverter cannot be controlled for about 1 s after release of a reset command.
- • At reset execution, the inverter is reset but the FR-A8NF continues communication.

4.6 Frequency and speed settings

- For the output/set frequency monitor, frequency setting, and parameter setting through the FR-A8NF, the unit of 0.01 Hz is always applied regardless of the **Pr.37 Speed display** setting. The setting unit for the running speed (actual speed) monitor depends on the **Pr.37** and **Pr.144 Speed setting switchover** settings as shown in the following table. (The initial values are shown within the thick lines.)

Pr.37 setting	Pr.144 setting	Output frequency monitor	Set frequency monitor	Running speed (actual speed) monitor	Frequency setting, parameter setting
0 (initial value)	0	0.01 Hz	0.01 Hz	1 r/min∗1、∗2	0.01 Hz
	2 to 12	0.01 Hz	0.01 Hz	1 r/min∗1、∗2	0.01 Hz
	102 to 112	0.01 Hz	0.01 Hz	1 r/min∗1、∗2	0.01 Hz
1 to 9998	0	0.01 Hz	0.01 Hz	1 (machine speed∗1)	0.01 Hz
	2 to 12	0.01 Hz	0.01 Hz	1 (machine speed∗1)	0.01 Hz
	102 to 112	0.01 Hz	0.01 Hz	1 r/min∗1、∗2	0.01 Hz

∗1 Running speed r/min conversion formula: .... frequency $\times$ 120 / number of motor poles (**Pr.144**)
   Machine speed conversion formula: .... **Pr.37** $\times$ frequency / **Pr.505 Speed setting reference**
   For **Pr.144** in the above formula, the value is "**Pr.144** - 100" when "102 to 112" is set in **Pr.144**; and the value is "4" when **Pr.37** = 0 and **Pr.144** = 0. **Pr.505** is always set as frequency (Hz).
∗2 Use **Pr.811 Set resolution switchover** to change the increment from 1 r/min to 0.1 r/min. (**Pr.811** is only available for the FR-A800 series.)

- When setting a speed through the FR-A8NF, the speed is calculated with the **Pr.144** setting as shown below.

Speed value (1 r/min∗4) = frequency $\times$ 120 / number of motor poles (**Pr.144**∗3)

∗3 When **Pr.144** = "102 to 112," the formula is calculated with the value of (**Pr.144** - 100). When **Pr.144** = "0," the formula is calculated with 4 poles.
∗4 The **Pr.811** setting is invalid. The unit 1 r/min is always applied. (**Pr.811** is only available for the FR-A800 series.)

NOTE

- To change the increments of the running speed (actual speed) monitor to 1 r/min, use the initial values in **Pr.37** and **Pr.811**.
- Refer to the Instruction Manual (Detailed) of the inverter for the details of **Pr.37**, **Pr.144**, **Pr.505** and **Pr.811**.

5 FL REMOTE COMMUNICATION FUNCTION

5.1 Functions

5.1.1 Output from the inverter via network

Main items to be output from the inverter (FR-A8NF) via network and their descriptions are explained below.
(○: with function, ×: without function)

Item	Description	Cyclic transmission	Message transmission	Refer to page
Inverter monitor	Monitor various items such as inverter output current and output voltage.	×	○	**70**
Inverter status	Monitors the output signal of the inverter.	○	○	**54**, **68**
Operation mode read	Reads the operation mode of the inverter.	×	○	**67**
Output frequency read	Monitors the output frequency of the inverter.	○	○	**58**, **70**
Parameter read	Reads parameter settings of the inverter.	×	○	**72**
Fault description	Monitors the fault history of the inverter.	×	○	**76**

NOTE

• Refer to the Instruction Manual (Detailed) of the inverter for functions controllable via network in each operation mode.

5

5.1.2 Input to the inverter via network

Main items which can be commanded via network to the inverter and their descriptions are explained below.
(○: with function, ×: without function)

Item	Description	Cyclic transmission	Message transmission	Refer to page
Run command	Sets the control input command such as forward rotation signal (STF) and reverse rotation signal (STR).	○	×	**50**
Frequency setting	Sets the running frequency of the inverter.	○	×	**52**
Parameter write∗1	Sets parameters of the inverter.	×	○	**72**
Faults history batch clear	Clears the fault of the inverter.	×	○	**76**

∗1   Parameters can be written while the X12 signal (Bit 11), which gives operation commands through the FL remote communication, is ON.

NOTE

• Refer to the Instruction Manual (Detailed) of the inverter for functions controllable via network in each operation mode.

5.2 Types of data communication

The FL remote data communication supports "cyclic transmission" which transmits data periodically (refer to **page 40**) and "message transmission" which transmits data non-periodically (refer to **page 59**).

Cyclic data with token

Message data

Cyclic transmission

Cyclic transmission + message transmission
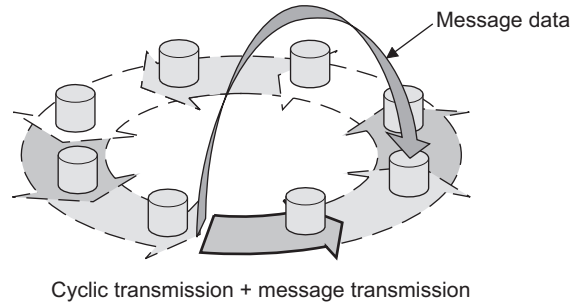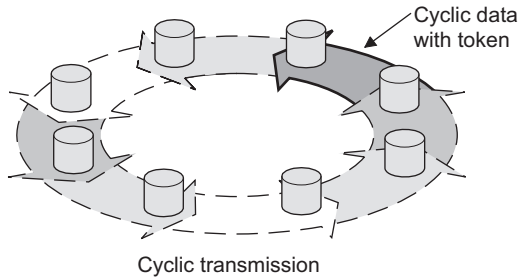
6 CYCLIC TRANSMISSION

Cyclic transmission transmits data periodically. Each node shares data through common memory. (Refer to **page 41** for common memory.)
Data of I/O area is updated periodically by cyclic transmission.

The master controls the inverter by setting run command (control input command, set frequency, etc.) in the output data area. The inverter sets the inverter status (output frequency, output current, various signals, etc.) in the input data area and sends it to the master.
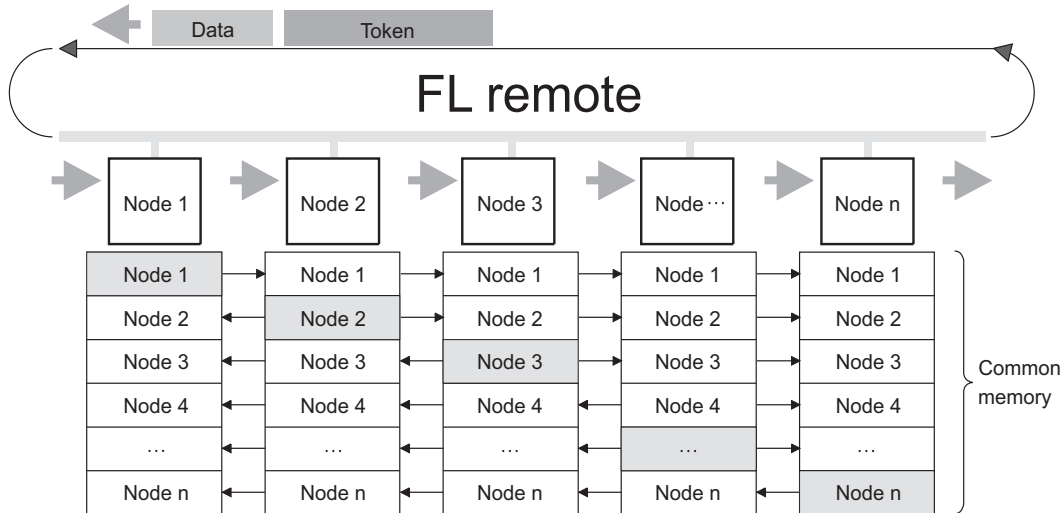
6.1 Common memory

Concept of common memory is stated below.
- The common memory is used as a shared memory between nodes which perform cyclic transmission.
- The common memory has two areas which are "common memory area 1" and "common memory area 2".
  Common memory area 1 is I/O data area. Common memory area 2 is the control information area.
  Two different areas can be assigned to each node.
- When the area each node sends exceed the transmission size (1024 byte) by one frame, data is transmitted by multiple frames.
- When receiving data which are divided into multiple frames, common memory is not updated until all frames sent from one node are received.
  Synchronism per node unit is guaranteed.
- Entire network has an area of 8k bit (0.5k word) + 8k word = 8.5k word.
  The maximum send data capacity per one node is 8.5k word. (Note that one word is 2 byte.)

2^{15} 2^{0}

Common memory area 1
=Input/output data area

0.5k Word

Common memory area 2
=Control information area

8k Word

Common memory area
8.5k Word
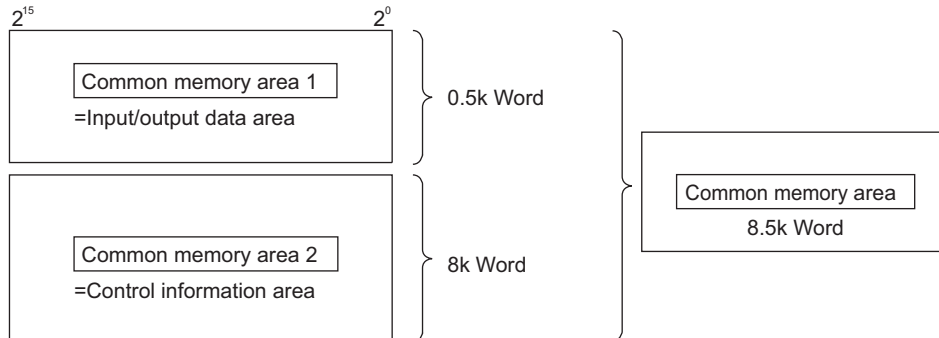
- Among common memory, both common memory area 1 and common memory 2 can be set as a transmission area of one node as desired within the maximum area.
- Each node on the FL remote network can share the same data in the whole system by broadcasting data at a constant period. In addition, each node has own transmission area which does not overlap each other to exchange data. (For common memory function, the transmission area assigned to one node is a receive area for each of the other nodes.)

Common memory of node = 01	Common memory of node = 02	Common memory of node = 03	Common memory of node = 04
(Send)	(Receive)	(Receive)	(Receive)
(Receive)	(Send)	(Receive)	(Receive)
⋮	⋮	⋮	⋮
(Receive)	(Receive)	(Receive)	(Send)
⋮	⋮	⋮	⋮
(Receive)	(Receive)	(Send)	(Receive)
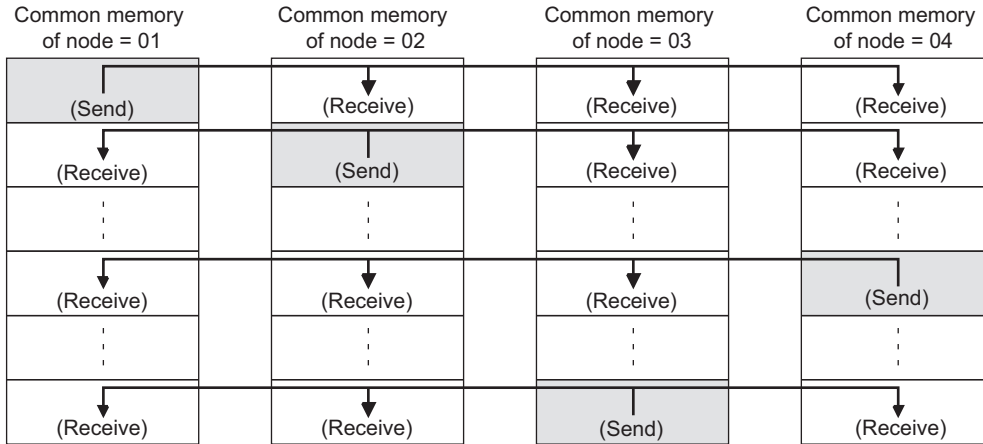
6.1.1 Common memory area 1

	Size	Description	Refer to page
Input data (Inverter→master)	256 words (512 byte)	Data to be sent from inverter to master (4 words). The data includes inverter status, output frequency, etc.	53
Output data (Master→inverter)	256 words (512 byte)	Data to be sent from master to inverter (4 words). The data includes start command, frequency command, etc.	49

	Virtual address (byte boundary)	Applications		
		Address (word boundary)	Size (word boundary)	Description (Number in parentheses indicates node address)
Input data (Inverter→master)	H00000000	0	4	Input data (#1)
	H00000008	4	4	Input data (#2)
	H00000010	8	4	Input data (#3)
	to			
	H000001F0	248	4	Input data (#63)
	H000001F8	252	4	Input data (#64)

6

	Virtual address (byte boundary)	Applications		
		Address (word boundary)	Size (word boundary)	Description (Number in parentheses indicates node address)
Output data (Master→inverter)	H00000200	256	4	Output data (#1)
	H00000208	260	4	Output data (#2)
	H00000210	264	4	Output data (#3)
	to			
	H000003F0	504	4	Output data (#63)
	H000003F8	508	4	Output data (#64)

∗1   When accessing a message, the access size should be the size stated in the table above.

NOTE

- When node status is other than "during the FL remote network remote operation", all output data is changed to "0". (Refer to **page 10** for change of the setting.)
- When transmitting a message, common memory area 1 and 2 are read only. (Refer to **page 63**.)

6.1.2　Common memory area 2

	Size
Control information (inverter→master)	1024 word (2048 byte)
Control information (master→inverter)	1024 word (2048 byte)

	Virtual address (byte boundary)	Applications		
		Address (word boundary)	Size (word boundary)	Description (Number in parentheses indicates node address.)
Control information (inverter→master)	H00000400	0	1	Slave status (#1)
	H00000402	1	1	Actual status slave type (#1)
	H00000404	2	14	Simple setting check area (#1)
	to			
	H00000BE0	1008	1	Slave status (#64)
	H00000BE2	1009	1	Actual status slave type (#64)
	H00000BE4	1010	14	Simple setting check area (#64)

Virtual address (byte boundary)	Applications		
	Address (word boundary)	Size (word boundary)	Description (Number in parentheses indicates node address.)
Control information (master→inverter)			
	H00000C00	1024	1	Remote control area (#1)
	H00000C02	1025	1	Expected slave type (#1)
	H00000C04	1026	14	Simple setting area (#1)
	to		
	H000013E0	2032	1	Remote control area (#64)
	H000013E2	2033	1	Expected slave type (#64)
	H000013E4	2034	14	Simple setting area (#64)

∗1   When accessing a message, the access size should be the size stated in the table above.

NOTE

- When sending a message, common memory area 1 and 2 are read only. (Refer to **page 63**.)

◆ Control information (inverter→master)

・Slave status

Value	Slave status
0	FL remote network is not connected
1	FL remote network remote at a stop
2	FL remote network remote connection processing
3	FL remote network remote operating
4	Master is not present
5	Own node is disconnected
6	Setting error

・Actual slave type

b15	b14	b13 b12 b11 b10 b9 b8	b7	b6	b5 b4 b3 b2 b1 b0
		Output points H00 to H3F (One point to 64 point)			Input points H00 to H3F (One point to 64 point)

Subsequent area
0: Not used, 1: Used

Subsequent area
0: Not used, 1: Used

0: Output not used (0 point)
1: Output used

0: Input not used (0 point)
1: Input used
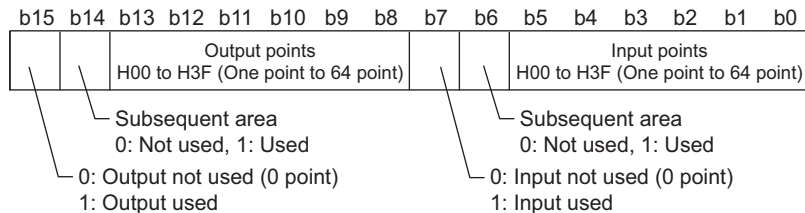
・Simple setting check area
Not used. (Displays data imported in the simple setting area set from the master.)

◆ Control information (master→inverter)

• Remote control area

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Not used															
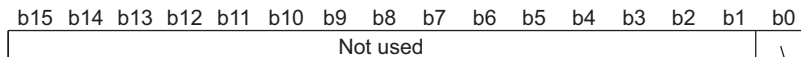
Remote control flag
0: Remote control stop
1: Remote control start

• Expected slave type
Refer to **page 47** for <Actual slave type>.

• Simple setting check area
Not used.

6.2 Output data (master to inverter)

◆ **Master output area (from master → inverter)**

Word	Address (word boundary) (n: node address)		Applications																
		Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	4(n-1)+256		Control input command (Refer to **page 50**.)																
1	4(n-1)+257		- (not used)																
2	4(n-1)+258		Set frequency (0.01 Hz increments) (Refer to **page 50**.)																
3	4(n-1)+259		- (not used)																

6.2.1　Control input command

Set control input command such as forward and reverse rotation commands.

Bit	Name	Description				Related parameter
0	Forward rotation command	**Bit 0**	**Bit 1**	**Command**		—
		Forward rotation: 0	Reverse rotation: 0	Stop command		
1	Reverse rotation command	Forward rotation: 1	Reverse rotation: 0	Forward rotation command		
		Forward rotation: 0	Reverse rotation: 1	Reverse rotation command		
		Forward rotation: 1	Reverse rotation: 1	Stop command		
2	RL signal*1	Low-speed operation command				**Pr.4 to Pr.6, Pr.24 to Pr.27**
3	RM signal*1	Middle-speed operation command				**Pr.4 to Pr.6, Pr.24 to Pr.27**
4	RH signal*1	High-speed operation command				**Pr.4 to Pr.6, Pr.24 to Pr.27**
5	RT signal*1	0: second function selection invalid, 1: second function selection valid				**Pr.44 to Pr.51**
6 to 8	- (not used)	(Always 0)				—
9	MRS signal*1	0: output shut off cancel, 1: output shut off				**Pr.17**
10	- (not used)	(Always 0)				—

Bit	Name	Description				Related parameter
11	X12 signal∗1	PU operation interlock (Refer to **page 28**.)				—
			Bit 11	**Function/operation**		
				Operation mode	**Parameter write**	
			0	• Operation mode is forcibly switched to the Network. • Network operation is enabled. • Switching to the PU operation mode is disabled.	Parameter write is disabled. (Note that the **Pr.297** setting is available when **Pr.296** ≠ "9999.")	
			1	• Operation mode (PU, NET) switching is enabled. • Output stops during the Network operation.	Parameter write is enabled. (It depends on **Pr.77 Parameter write selection** and each parameter write conditions.)	
12 to 14	- (not used)	(Always 0)				—
15	Error reset	Resets the inverter when the setting of Bit 15 is changed from 0 to 1 at occurrence of inverter error. (The FL remote communication continues.)				—

∗1 The signals are fixed. They cannot be changed using parameters.

NOTE

• The values of each bit, "0" and "1," indicate "OFF" and "ON."

6

6.2.2　Set frequency

The set frequency can be set in 0.01 Hz increments.

Bit	Range	Unit
0 to 15	0.00 Hz to 590.00 Hz	0.01 Hz

Example:

If you want to set 120.00 Hz, set 12000, which is the value multiplied by 100.

NOTE

- Regardless of the **Pr.37 Speed display** setting, the value is always set in frequency (Hz).

6.3 Input data (inverter to master)

◆ **Master input area (inverter → master)**

Word	Address (word boundary) (n: node address)	Bit	Applications															
			15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	4(n-1)+0		Inverter status monitor (Refer to **page 54**.)															
1	4(n-1)+1		Life/warning (Refer to **page 56**.)								Fault code (Refer to **page 56**.)							
2	4(n-1)+2		Output frequency monitor (Refer to **page 58**.)															
3	4(n-1)+3		Output current monitor (Refer to **page 58**.)															

6

6.3.1　Inverter status monitor

The output signal of the inverter is monitored via network.

Bit	Name	Description			Related parameter
0	During forward rotation	**Bit 0**	**Bit 1**	**Operation**	—
		Forward rotation: 0	Reverse rotation: 0	During stop	
1	During reverse running	Forward rotation: 1	Reverse rotation: 0	During forward rotation	—
		Forward rotation: 0	Reverse rotation: 1	During reverse running	
		Forward rotation: 1	Reverse rotation: 1	Not used	
2	RUN signal[*1]	Inverter running	When the inverter output frequency reaches or exceeds **Pr.13 Starting frequency**, the value changes to "1".		—
3	SU signal[*1]	Reached the frequency	When the output frequency reaches the set frequency, the value changes to "1".		**Pr.41**
4	IPF signal[*1]	Instantaneous power failure/ undervoltage	When an instantaneous power failure or undervoltage protection activates, the value changes to "1".		**Pr.57**
5	OL signal[*1]	Overload alarm	While stall prevention function is activated, the value changes to "1".		**Pr.22, Pr.23, Pr.66**
6	FU signal[*1]	Output frequency detection	When the output frequency reaches the frequency set in **Pr. 42** (**Pr. 43** for reverse rotation), the value changes to "1".		**Pr.42, Pr.43**
7	ALM signal[*1]	Fault	When the inverter protective function is activated to stop the output (fault), the value changes to "1".		—
8, 9	— (not used)	(Always 0)			—

Bit	Name	Description		Related parameter
10	Edit signal	Edit enabled	0: Parameter change disabled (X12 signal = "0") 1: Parameter change enabled (X12 signal = "1")	—
11	NET signal	0: Command (run command/speed command) can not be given through network. 1: Command (run command/speed command) can be given through network.		—
12	Y12 signal	Output current detection	When the output current is higher than the **Pr.150** setting and persists for longer than the time set in **Pr.151**, the value changes to "1".	**Pr.150, Pr.151**
13	Y13 signal	Zero current detection	When the output current is lower than the **Pr.152** setting and persists for longer than the time set in **Pr.153**, the value changes to "1".	**Pr.152, Pr.153**
14	READY signal	Reset cancel	0: Inverter resetting/starting after power is turned ON 1: Reset canceling	—
15	— (not used)	(Always 0)		—

∗1   The signals are fixed. They cannot be changed using parameters.

NOTE

• The values of each bit, "0" and "1," indicate "OFF" and "ON."

6

6.3.2 Fault code

Description of an alarm that occurred in the inverter can be read.

Bit	Name	Description
0 to 7	Fault code	When a fault occurs in the inverter, fault code is displayed. For the details of protective functions corresponding to the fault codes, refer to the list of fault displays in the Instruction Manual (Detailed) of the inverter.

6.3.3 Life/warning

Whether the control circuit capacitor, main circuit capacitor, cooling fan, and each parts of the inrush current limit circuit have reached the life warning output level or not can be checked.

Bit	Name	Description
8	Control circuit capacitor life	0: without warning, 1: with warning The control circuit capacitor life is calculated from the energization time and temperature according to the operating status, and is counted down from 100%. A warning is output when the control circuit capacitor life falls below 10%. (The setting value goes back to 0 when the part is replaced.)
9	Main circuit capacitor life	0: without warning, 1: with warning On the assumption that the main circuit capacitor capacitance at factory shipment is 100%, the capacitor life is checked every time measurement is made. A warning is output when the measured value falls below 85%. The life check of the main circuit capacitor can be performed by measuring at the maintenance time, etc. After setting "1" in **Pr.259 Main circuit capacitor life measuring**, switch OFF power once, then ON again to check that **Pr. 259** = "3" (measuring completion). (The setting value goes back to 0 when the part is replaced.)
10	Cooling fan life	0: without warning, 1: with warning This function detects that the cooling fan speed falls 50% or below and outputs a warning. (The setting value goes back to 0 when the part is replaced.)

Bit	Name	Description
11	Inrush current limit circuit life	0: without warning, 1: with warning Counts the number of contact (relay, contactor, thyristor) ON times and counts down every 100% (0 times) to 1%/10,000 times. Outputs a warning when the speed reaches 10% (900000 times). (The setting value goes back to 0 when the part is replaced.)
12	FIN signal (Heatsink overheat prealarm)	0: without warning, 1: with warning Output when the heatsink temperature reaches about 85% of the heatsink overheat protection providing temperature.
13	Alarms	0: without display, 1: with display
14	— (not used)	(Always 0)
15	Y95 signal (maintenance timer)	0: normal, 1: maintenance timer has elapsed When the **Pr.503 Maintenance timer 1** setting has elapsed the time (100h increments) set in **Pr.504 Maintenance timer 1 warning output set time**, the value changes to 1. (Turn ON Y95 signal.) When **Pr. 504** = "9999", no function is selected.

NOTE

- The values of each bit, "0" and "1," indicate "OFF" and "ON."

6

6.3.4　Output frequency monitor

The output frequency of the inverter can be monitored in 0.01 Hz increments.

Bit	Range	Unit
0 to 15	0.00 Hz to 590.00 Hz	0.01 Hz

Example:

If the monitor value is 120.00 Hz, 12000 (the value multiplied by 100) is displayed.

NOTE

- Regardless of the **Pr.37 Speed display** setting, the value is always displayed in frequency (Hz).

6.3.5　Output current monitor

The output current of the inverter can be monitored in 0.1 A increments.

Bit	Range	Unit
0 to 15	0.0 A to 3276.7 A	0.1 A

∗1　For the FR-A820-03160(55K) or lower, FR-A840-01800(55K) or lower, FR-F820-02330(55K) or lower, and FR-F840-01160(55K) or lower inverters, increments of output current monitor are rounded from 0.01 A to 0.1 A.

7 MESSAGE TRANSMISSON

Message transmission is a non-periodic data communication method to communicate to a specified node when send request is given.
Basic function of message transmission is as follows.
- When a node receives a token, one frame can be sent before sending cyclic frame.
- The message frame size which can be sent at a time is 1024 byte maximum.

Message frame

1024 byte
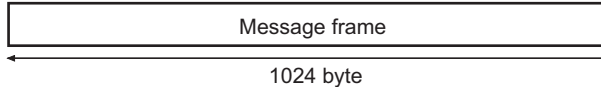
- This method applies algorithm which controls refresh time not exceeding refresh cycle permissible time.
- Two transmission functions are available. One is "one-to-one message transmission" to send to specified nodes, and another is "one-to-n message transmission" to send to all nodes.
- For "one-to-one message transmission", whether the target node has received data correctly or not is checked.
  For "one-to-n message transmission", response is not given after receipt of a message.
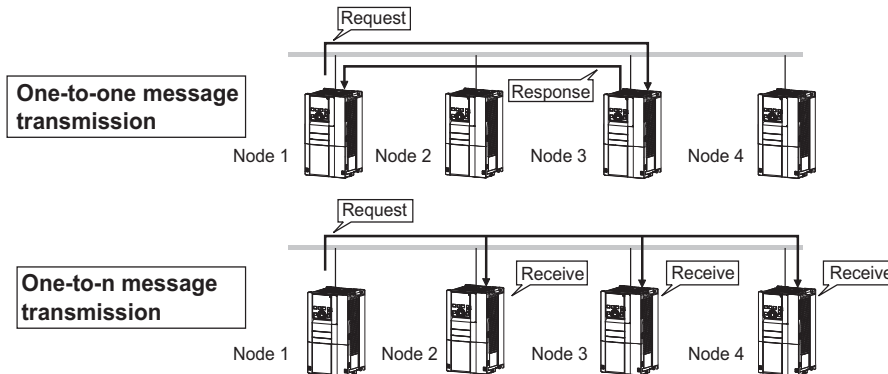
Following functions are provided with a message transmission.

Function	Description	Refer to page
Word block read/write	Performs data read/write per word unit (one address 16 bits) from/to the virtual address space (32-bit address space) of the target nodes via network.	**62**
Network parameter read	Reads network parameter information of the target nodes via network.	**81**
Log data read	Reads log information of the target nodes via network.	**84**
Log data clear	Clears log information (refer to **page 84**) of the target nodes via network.	**87**
Profile read	Reads system parameter of device profile of the target nodes via network.	**88**
Message loopback	Returns message data received then performs message communication test of device.	**91**

7.1 Error response at word block read/write

Error response may be received when reading/writing the product information of connected Mitsubishi inverter.
In such a case, error code is attached to the data portion.
The list of error code is shown below.

Error code	Description	Remarks
H0010	Address error	• Odd address was specified. • Accessed address not defined.
H0020	Size error	• Write size was other than one word.
H0030	Data error	• A value outside the data area was specified. • The range of calibration was too narrow.
H0040	Write disable error	• Attempted to write to monitor data. • Attempted to write to a write-prohibited parameter.
H0060	During reset	• Accessed during inverter reset.

7

7.2 Word block read/write

Performs data read/write per word unit (one address 16-bit unit) to the virtual address space (32 bit address space) of the target nodes via network.

• Word block read

Item		Data portion	
Request		Not applicable	
Response	Normal response	**Offset**	**Bit 15 to Bit 0**
		+0 :	Virtual address space (Refer to **page 63** for details.)
	Error response	**Offset**	**Bit 15 to Bit 0**
		+0	Error code (Refer to **page 61**.)

• Word block write

Item		Data portion	
Request		**Offset**	**Bit 15 to Bit 0**
		+0 :	Virtual address space (Refer to **page 63** for details.)
Response	Normal response	Not applicable	
	Error response	**Offset**	**Bit 15 to Bit 0**
		+0	Error code (Refer to **page 61**.)

7.2.1　Virtual address space of word block read/write

Virtual address (byte boundary)	Applications				Message access		Refer to page
		Address (word boundary)	Size (word boundary)	Description	Read	Write	
H00000000	Common memory area 1	0 to 511	512	Input/output data	○	×	**43**
H00000400	Common memory area 2	0 to 1023	1024	Control information (inverter→master)	○	×	**45**
H00000C00		1024 to 2047	1024	Control information (master→inverter)	○	×	
H00001400		2048 to 8191	6144	Control information (blank)	○	×	
H10000000	Information of individual products	0 to 71	72	Product information	○	×	**64**
H100000C8		100	1	Operation mode	○	×	**67**
H100000DC		110	1	Inverter status	○	×	**68**
H100000F0		120 to 121	2	Set frequency	○	×	**69**
H10000190		200 to 299	100	Inverter monitor	○	×	**70**
H100007D0		1000 to 2499	1500	Parameter (**Pr.0 to Pr.1499**)	○	○∗1	**72**
H100016AC		2902 to 2939	38	Calibration parameters (**Pr.902 to Pr.939**)	○	○∗1	**74**
H10001770		3000 to 3899	900	Fault description	○	○	**76**

∗1　Parameters/calibration parameters can be written while the X12 signal (Bit 11), which gives operation commands through the FL remote communication, is ON.

7

7.2.2　Product information

Product information (the inverter model, inverter capacity, etc) can be read.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H10000000	0	50	Maker name: MITSUBISHI ELECTRIC CORPORATION	○	×
H10000064	50	20	Product name: FR-A800 or FR-F800	○	×
H1000008C	70	1	Inverter capacity : in 0.1 kW increments	○	×

∗1　When accessing a message, the access size should be the size stated in the table above.

• Word block read (maker name)

Item		Data portion
Request		Not applicable
Response	Normal response	Returns "MITSUBISHI ELECTRIC CORPORATION". The rest are the characters for space. <table><tr><td>Offset</td><td>Bit 15 to Bit 8</td><td>Bit 7 to Bit 0</td></tr><tr><td>+0</td><td>Second character</td><td>First character</td></tr><tr><td>+1</td><td>Fourth character</td><td>Third character</td></tr><tr><td colspan="3">to</td></tr><tr><td>+49</td><td>Hundredth character</td><td>Ninety ninth character</td></tr></table>
	Error response	<table><tr><td>Offset</td><td>Bit 15 to Bit 0</td></tr><tr><td>+0</td><td>Error code (Refer to **page 61**.)</td></tr></table>

• Word block read (product name)

Item		Data portion
Request		Not applicable
Response	Normal response	For the 200V class FR-A800, "FR-A820" is returned. The rest are the characters for space.

Normal response table:

Offset	Bit 15 to Bit 8	Bit 7 to Bit 0
+0	Second character	First character
+1	Fourth character	Third character
to		
+19	Fortieth character	Thirty ninth character

Error response table:

Offset	Bit 15 to Bit 0
+0	Error code (Refer to **page 61**.)

- Word block read (inverter capacity)

Item		Data portion
Request		Not applicable
Response	Normal response	Inverter capacity is returned.
	Error response	

Inverter capacity is returned.

Offset	Bit 15 to Bit 0
+0	Inverter Capacity

Inverter capacity	Value
0.4kW	4
0.75kW	7
to	
560kW	5600

Offset	Bit 15 to Bit 0
+0	Error code (Refer to **page 61**.)

7.2.3 Operation mode

The operation mode of the inverter can be read via network.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H100000C8	100	1	Operation mode	○	×

∗1　When accessing a message, the access size should be the size stated in the table above.

• Word block read (operation mode)

Item		Data portion
Request		Not applicable
Response	Normal response	Operation mode is returned.
	Error response	

Normal response:

Offset	Bit 15 to Bit 0
+0	Operation mode

Operation mode	Value
PU operation	H0001
PUJOG operation	H0003
Network operation	H0004

Error response:

Offset	Bit 15 to Bit 0
+0	Error code (Refer to **page 61**.)

7

7.2.4   Inverter status

The output signal of the inverter is monitored via network.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H100000DC	110	1	Inverter status	O	×

∗1   When accessing a message, the access size should be the size stated in the table above.

• Word block read (operation mode)

Item		Data portion
Request		Not applicable
Response	Normal response	Inverter status is returned. (Refer to **page 54** for details.)
		<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0</td><td>Inverter status</td></tr></table>
	Error response	<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0</td><td>Error code (Refer to **page 61**.)</td></tr></table>

7.2.5 Set frequency

Set frequency can be read from RAM or EEPROM in 0.01 Hz increments.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H100000F0	120	1	Set frequency (EEPROM/RAM)	○	×
H100000F2	121	1	Set frequency (RAM)	○	×

∗1   When accessing a message, the access size should be the size stated in the table above.

• Word block read (set frequency (EEPROM/RAM))
• Word block read (set frequency (RAM))

Item		Data portion
Request		Not applicable
Response	Normal response	Set frequency is returned. H0000 to HFFFF (0.01 Hz increments) | Offset	Bit 15 to Bit 0 | |---|---| | +0 | Set frequency |
	Error response		Offset	Bit 15 to Bit 0 | |---|---| | +0 | Error code (Refer to **page 61**.) |

NOTE

• Regardless of the **Pr.37 Speed display** setting, the value is always displayed in frequency (Hz).

7

7.2.6　Inverter monitor

Inverter monitored value can be read.

- Word block read (inverter monitor)

Item		Data portion	
Request		Not applicable	
Response	Normal response	Inverter monitor value is returned.	
		Offset	**Bit 15 to Bit 0**
		+0	Inverter monitor value (Refer to **page 71**.)
	Error response	**Offset**	**Bit 15 to Bit 0**
		+0	Error code (Refer to **page 61**.)

The monitor code read via the FL remote communication corresponds to the RS-485 communication dedicated monitor of the inverter. Use the following formula to calculate the monitor code.

Virtual address (byte boundary) of the monitor item to be read = RS-485 communication dedicated monitor $\times$ 2 + H1000018E

Monitor code (virtual address)	RS-485 communication dedicated monitor (hexadecimal)	Item	Increment
H10000190	H01	Output frequency	0.01 Hz
H10000192	H02	Output current	0.01 A/0.1 A
H10000194	H03	Output voltage	0.1 V
H10000198	H05	Frequency setting value	0.01 Hz
H1000019A	H06	Running speed	1
.	.	.	.
.	.	.	.
.	.	.	.

For example, when the output voltage is monitored, the RS-485 communication dedicated monitor for the output voltage is H03. Therefore, the FL remote virtual address (byte boundary) is calculated as H10000194 as shown in the formula below.

H03 $\times$ 2 + H1000018E = H10000194

NOTE

- When accessing a message, the access size should be 2 byte (1 word).
- For the details of the RS-485 communication dedicated monitor codes or monitor items, refer to the description of the monitor display (**Pr.52**) in the Instruction Manual (Detailed) of the inverter.

7

7.2.7   Parameter

Inverter parameters can be read or written via network.

Virtual address (byte boundary)	Applications				Message access	
	Address (word boundary)	Size (word boundary)	Description		Read	Write
H100007D0	1000	1	**Pr.0**		○	○∗1
H100007D2	1001	1	**Pr.1**		○	○∗1
H100007D4	1002	1	**Pr.2**		○	○∗1
to						
H10001384	2498	1	**Pr.1498**		○	○∗1
H10001386	2499	1	**Pr.1499**		○	○∗1

∗1   Parameters can be written while the X12 signal (Bit 11), which gives operation commands through the FL remote communication, is ON.
∗2   When accessing a message, the access size should be the size stated in the table above.

NOTE

• The parameters depend on the inverter. Refer to the Instruction Manual (Detailed) of the inverter for the parameter details.

• Word block read (parameter)

Item		Data portion	
Request		Not applicable	
Response	Normal response	Specified parameter values return.	
		Offset	**Bit 15 to Bit 0**
		+0	Parameter value
	Error response	**Offset**	**Bit 15 to Bit 0**
		+0	Error code (Refer to **page 61**.)

• Word block write (parameter)

Item		Data portion	
Request		Specified parameter values are written.	
		Offset	**Bit 15 to Bit 0**
		+0	Parameter value
Response	Normal response	Not applicable	
	Error response	**Offset**	**Bit 15 to Bit 0**
		+0	Error code (Refer to **page 61**.)

⬤➘ **NOTE**

- Parameters can be written while the X12 signal (Bit 11), which gives operation commands through the FL remote communication, is ON (refer to **page 50**). (Note that the **Pr.77** setting cannot be written through the FL remote communication.)

7

7.2.8   Calibration parameters

Calibration parameter settings (calibration analog values) of the inverter can be read or written via network.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H100016AC	2902	1	**Pr.902**	○	○∗1
to					
H100016F2	2939	1	**Pr.939**	○	○∗1

∗1   Calibration parameters can be written while the X12 signal (Bit 11), which gives operation commands through the FL remote communication, is ON.

∗2   When accessing a message, the access size should be the size stated in the table above.

• NOTE

- The calibration parameters depend on the inverter. Refer to the Instruction Manual (Detailed) of the inverter of each calibration parameters.

• Word block read (calibration parameter)

Item		Data portion
Request		Not applicable
Response	Normal response	Specified calibration parameter values is returned. 	Offset	Bit 15 to Bit 0	 	+0	Calibration parameter value	
	Error response		Offset	Bit 15 to Bit 0	 	+0	Error code (Refer to **page 61**.)	

• Word block write (calibration parameter)

Item		Data portion
Request		Specified calibration parameter values are written. 	Offset	Bit 15 to Bit 0	 	+0	Calibration parameter value	
Response	Normal response	Not applicable
	Error response		Offset	Bit 15 to Bit 0	 	+0	Error code (Refer to **page 61**.)	

7

7.2.9   Fault record

Faults history can be monitored up to eight past faults occurred in the inverter.

Virtual address (byte boundary)	Applications			Message access	
	Address (word boundary)	Size (word boundary)	Description	Read	Write
H10001770	3000	1	Faults history batch clear	×	○
H10001838	3100 to 3899	800	Past eight faults history	○	×
H10001838	3100	1	Fault code	○	×
H1000183A	3101	3	Fault display	○	×
H10001840	3104	1	Output frequency at fault occurrence	○	×
H10001842	3105	1	Output current at fault occurrence	○	×
H10001844	3106	1	Output voltage at fault occurrence	○	×
H10001846	3107	1	Energization time at fault occurrence	○	×
H10001848	3108	2	(blank)	×	×
H1000184C	3110	90	Fault name	○	×
to					
H10001DB0	3800	1	Fault code	○	×
H10001DB2	3801	3	Fault display	○	×
H10001DB8	3804	1	Output frequency at fault occurrence	○	×
H10001DBA	3805	1	Output current at fault occurrence	○	×
H10001DBC	3806	1	Output voltage at fault occurrence	○	×
H10001DBE	3807	1	Energization time at fault occurrence	○	×
H10001DC0	3808	2	(blank)	×	×
H10001DC4	3810	90	Fault name	○	×

Note: "Latest faults history" spans rows 3100–3110; "Past eight faults history" spans rows 3800–3810.

∗1   When accessing a message, the access size should be the size stated in the table above.

• Word block write (fault description all clear)

Item		Data portion
Request		Faults history can be cleared.
		Offset **Bit 15 to Bit 0**
		+0 Any∗1
		∗1 Any value is set
Response	Normal response	Not applicable
	Error response	**Offset** **Bit 15 to Bit 0**
		+0 Error code (Refer to **page 61**.)

• Word block read (fault code)

Item		Data portion
Request		Not applicable
Response	Normal response	Fault code is returned. For the details of protective functions corresponding to the fault codes, refer to the list of fault displays in the Instruction Manual (Detailed) of the inverter.
		Offset **Bit 15 to Bit 0**
		+0 Fault code
	Error response	**Offset** **Bit 15 to Bit 0**
		+0 Error code (Refer to **page 61**.)

• Word block read (fault display)

Item		Data portion
Request		Not applicable
Response	Normal response	Fault display (5 characters) is returned as a character string. The fault indication is the same string as the one indicated on the operation panel when the protective function of the inverter is activated. The rest one character is space character. | Offset	Bit 15 to Bit 8	Bit 7 to Bit 0
+0	Second character	First character
+1	Fourth character	Third character
+2	Sixth character (space character)	Fifth character	
	Error response		Offset	Bit 15 to Bit 0
---	---
+0	Error code (Refer to **page 61**.)	

• Word block read (output frequency (0.01 Hz increments), output current (0.01 A/0.1 A increments∗1), output voltage (0.1 V), energization time (1 h increments) at fault occurrence.)

Item		Data portion
Request		Not applicable
Response	Normal response	Output frequency, output current, output voltage, and energization time at fault occurrence is returned. **Offset** / **Bit 15 to Bit 0**: +0 / Data at fault occurrence
	Error response	**Offset** / **Bit 15 to Bit 0**: +0 / Error code (Refer to **page 61**.)

∗1　The setting depends on the inverter capacity.

- Word block read (fault name)

Item		Data portion
Request		Not applicable
Response	Normal response	Fault name is returned in a character string. The rest are space characters.
	Error response	

Normal response:

Offset	Bit 15 to Bit 8	Bit 7 to Bit 0
+0	Second character	First character
+1	Fourth character	Third character
to		
+89	One hundred eightieth character	One hundred seventy-ninth character

Error response:

Offset	Bit 15 to Bit 0
+0	Error code (Refer to **page 61**.)

7.3　Network parameter read

With this function, network parameter information of the target nodes is read via network.

Item		Data portion			
Request		Not applicable			
Response	Normal response	**Offset**	**Bit 15 to Bit 8**	**Bit 7 to Bit 0**	**Remarks**
		+0	Second character	First character	Node name Character string of "FR-A800" or "FR-F800" is stored. In the reset places, space characters are set.
		+1	Fourth character	Third character	
		+2	Sixth character	Fifth character	
		+3	Eighth character	Seventh character	
		+4	Tenth character	Ninth character	
		+5	Second character	First character	Vender name Character string of "MELCO" is stored. In the reset places, space characters are set.
		+6	Fourth character	Third character	
		+7	Sixth character	Fifth character	
		+8	Eighth character	Seventh character	
		+9	Tenth character	Ninth character	
		+10	Second character	First character	Manufacturer model name Character string of "FR-A8NF" is stored. In the reset places, space characters are set.
		+11	Fourth character	Third character	
		+12	Sixth character	Fifth character	
		+13	Eighth character	Seventh character	
		+14	Tenth character	Ninth character	
		+15	First address of region 1		
		+16	Size of region 1		4 words always
		+17	First address of region 2		
		+18	Size of region 2		16 words always
		+19	(spare)	Token monitoring time out time	10ms always

Item		Data portion			
Response	Normal response	**Offset**	**Bit 15 to Bit 8**	**Bit 7 to Bit 0**	**Remarks**
		+20	(spare)	Minimum permissible clearance	1.0 ms always
		+21	(spare)	Link status	Refer to **page 83**.
		+22	(spare)	Protocol	H80 always
		+23	Higher-layer status		Refer to **page 83**.
		+24	Refresh cycle permissible time setting		0 to 65535 ms Refresh cycle permissible time (120% value of the time the token circulates one ring) of own node.
		+25	Refresh cycle measured value (current value)		0 to 65535 ms
		+26	Refresh cycle measured value (maximum value)		Measured value (current value, maximum value, minimum value) of one cycle of own node.
		+27	Refresh cycle measured value (minimum value)		
	Error response	**Offset**	**Bit 15 to Bit 0**		
		+0	Error code (Refer to **page 61**.)		

• Link status


```
 b7   b6   b5   b4   b3   b2   b1   b0
┌────┬────┬────┬────┬────┬────┬────┬────┐
│    │    │    │    │ 0  │ 0  │    │    │
└────┴────┴────┴────┴────┴────┴────┴────┘
```

Node status   0: Disconnect, 1: Participate
Communication invalid is detection   0: Undetected, 1: Detected
Higher layer operation signal   0: Normal, 1: Error
Common memory data   0: Invalid, 1: Valid
Common memory setting   0: Uncompleted, 1: Completed
Address duplication   0: Undetected, 1: Detected
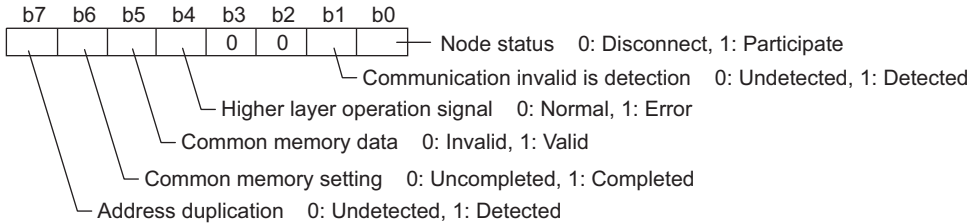
• Higher-layer status
The inverter periodically creates "higher layer status" based on "slave control status of FL remote" and "inverter status". In addition, the inverter reports the "higher layer status" to the master (FA link layer) periodically.


```
b15  b14  b13  b12  b11  b10  b9   b8   b7   b6   b5   b4   b3   b2   b1   b0
┌────┬────┬────┬──────────────────────────────────────────────────────────┐
│    │    │    │                       Not used                            │
└────┴────┴────┴──────────────────────────────────────────────────────────┘
```

Error information
00: NORMAL (Without inverter error)
01: WARNING (Alarm occurrence)
10, 11: ALARM (Inverter error has occurred)

Operation information
0: STOP (Slave control status of FL remote is not operating)
1: RUN (Slave control status of FL remote is operating)

7
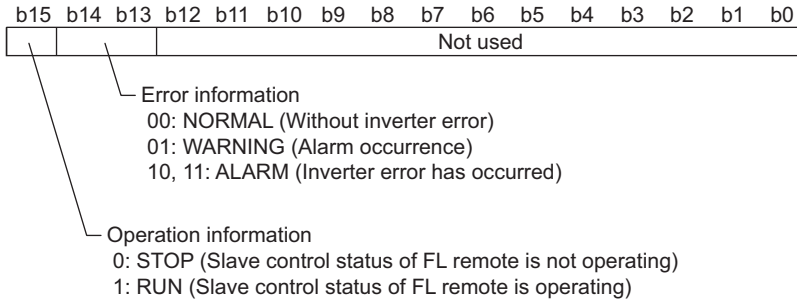
7.4 Log data read

With this function, log information of the target nodes is read via network

Item		Data portion		
Request		Not applicable		
Response	Normal response			
		Offset	**Bit 7 to Bit 0**	**Remarks**
		+0	The number of communication socket transmitting times	
		+4	The number of communication socket transmitting error times	
		+8	The number of Ethernet transmitting error times	
		+12 to +20	—	
		+24	The number of communication socket receiving times	
		+28	The number of communication socket receiving error times	
		+32	The number of Ethernet receiving error times	
		+36 to +44	—	
		+48	The number of token transmitting times	
		+52	The number of cyclic frame transmitting times	
		+56	The number of 1:1 message transmitting times	
		+60	The number of 1:n message transmitting times	
		+64, +68	—	
		+72	The number of token receiving times	
		+76	The number of cyclic frame receiving times	
		+80	The number of 1:1 message receiving times	
		+84	The number of 1:n message receiving times	
		+88, +92	—	
		+96	The number of cyclic transmission receiving error times	
		+100	The number of cyclic address size error times	
		+104	The number of cyclic CBN error times	

Item		Data portion		
		Offset	Bit 7 to Bit 0	Remarks
		+108	The number of cyclic TBN error times	
		+112	The number of cyclic BSIZE error times	
		+116 to +140	—	
		+144	The number of message transmission retransmitting times	
		+148	The number of message transmission retransmitting over times	
		+152 to +164	—	
		+168	The number of message transmission receiving error times	
		+172	The number of message sequence version error times	
		+176	The number of message sequence retransmitting recognition times	
Response	Normal response	+180 to +188	—	
		+192	The number of ACK error times	
		+196	The number of ACK sequence version error times	
		+200	The number of ACK sequence number error times	
		+204	The number of ACK node number error times	
		+208	The number of ACK TCD error times	
		+212 to +236	—	
		+240	The number of token multiplexing recognition times	
		+244	The number of token destroyed times	
		+248	The number of token reissued times	
		+252 to +260	—	
		+264	The number of token hold timeout times	

7

Item		Data portion		

Normal response

Offset	Bit 7 to Bit 0	Remarks
+268	The number of token monitoring timeout times	
+272 to +284	—	
+288	Total operation times	
+292	The number of frame waiting status times	
+296	Entry time	
+300	The number of own node's disconnection times	
+304	The number of disconnection times due to skip	
+308	The number of own node's recognition times of the other nodes' disconnection	
+312 to +332	—	
+336 to +364	List of the member nodes that the own node recognizes	
+368 to +508	—	

Response / Normal response applies to the above table.

Error response

Offset	Bit 15 to Bit 0
+0	Error code (Refer to **page 61**.)

7.5　Log data clear

Clears log information of the target nodes (refer to **page 84**) via network.

Item		Data portion
Request		Not applicable
Response	Normal response	Not applicable
	Error response	<table><tr><td>**Offset**</td><td>**Bit 15 to Bit 0**</td></tr><tr><td>+0</td><td>Error code (Refer to **page 61**.)</td></tr></table>

7.6　Profile read

With this function, system parameter of device profile of the target nodes is read via network.

Item		Data portion
Request		Not applicable
Response	Normal response	<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0 :</td><td>Read data (Refer to **page 89**.)</td></tr></table>
	Error response	<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0</td><td>Error code (Refer to **page 61**.)</td></tr></table>

◆ SYSPARA

Parameter name	Name character		Data type	Parameter description	
	Length	Character		Length	Character
Device profile common specification version	6	"COMVER"	INTEGER	1	1
System parameter recognition character	2	"ID"	PrintableString	7	"SYSPARA"
System parameter change number	3	"REV"	INTEGER	1	0
System parameter change date	7	"REVDATE"	[INTEGER], 2, (0001-9999), [INTEGER], 1, (01-12), [INTEGER], 1, (01-31)	2 1 1	(Example) 2015 (Example) 10 (Example) 1
Device type	10	"DVCATEGORY"	PrintableString	3	"INV"
Vender name	6	"VENDOR"	PrintableString	10	"MELCO "
Product type name	7	"DVMODEL"	PrintableString	10	"FR-A8NF "

◆ INVPARA

Parameter name	Name character		Data type	Parameter description	
	Length	Character		Length	Character
Device specific parameter distinguishing characters	2	"ID"	PrintableString	7	"DEVPARA"
MAC address	10	"MACADDRESS"	INTEGER	6	MAC address (6 byte) (Example) 08 00 70 46 D0 00
Firmware version (Inverter)	7	"INV VER"	PrintableString	5	ROM number
Firmware version (option)	7	"OPT VER"	PrintableString	5	ROM number

7

Arrangement of transfer syntax data (coded)

Identifier	Length	Description						
30	81AA							
		Identifier	Length	Description				
		30	6F					
				Identifier	Length	Description		
				13	06	"COMVER"		
				02	01	1		
				13	02	"ID"		
				13	07	"SYSPARA"		
				13	03	"REV"		
				02	01	0		
				13	07	"REVDATE"		
				Identifier	Length	Description		
				30	0A	Identifier	Length	Description
						02	02	07DF
						02	01	0A
						02	01	01
				Identifier	Length	Description		
				13	0A	"DVCATEGORY"		
				13	03	"INV"		
				13	06	"VENDOR"		
				13	0A	"MELCO "		
				13	07	"DVMODEL"		
				13	0A	"FR-A8NF "		
		Identifier	Length	Description				
		30	39					
				Identifier	Length	Description		
				13	02	"ID"		
				13	07	"DEVPARA"		
				13	0A	"MACADDRESS"		
				02	06	(6 byte data)		
				13	07	"INV VER"		
				13	05	(5 byte data)		
				13	07	"OPT VER"		
				13	05	(5 byte data)		

∗1   Identifier 13 indicates PrintableString type, identifier 02 indicates INTEGER type.

7.7 Message loopback

Perform communication test of device by returning message data received.

Item		Data portion
Request		<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0 :</td><td>Any data up to 1024 byte.</td></tr></table>
Response	Normal response	<table><tr><th>Offset</th><th>Bit 15 to Bit 0</th></tr><tr><td>+0 :</td><td>Same data as request data is sent.</td></tr></table>

7

8 DESCRIPTION AND CORRECTIVE ACTION OF FAULT INDICATION

Description and countermeasure for the fault indication are stated below.

◆ **Fault**

When a fault occurs, the inverter trips and a fault signal is output.

When the protective function is activated, refer to the Instruction Manual (Detailed) of the inverter to take the appropriate countermeasure and reset the inverter to perform operation again.

Operation panel indication	E.OPT	E. OPr	FR-LU08	Option Fault
Name	Option fault			
Description	Appears when node address is out of range (other than 1 to 64) or not correctly set.			
Check point	• Check that node address is within the range of 1 to 64. • Check that the node address switch is not set between numbers.			
Corrective action	• Set the node address within the range of 1 to 64. (Refer to **page 18**.) • Set the node address switch to the number position correctly. (Refer to **page 18**.) • If the problem still persists after taking the above measure, please contact your sales representative.			

9 TROUBLESHOOTING

If a fault occurs and the inverter fails to operate properly, locate the cause of the fault and take proper corrective action by referring to the troubleshooting below. If the corresponding information is not found in the table, the inverter has problem, or the component parts are damaged, contact your sales representative.

Display		Possible causes	Check point	Countermeasure
Operation panel of inverter	**LED of the FR-A8NF**∗1			
E.1	DEV(LED4) ☐ RMT(LED3) ☐	Internal error of the FR-A8NF firmware.	—	Please contact your sales representative.
	DEV(LED4) ■ RMT(LED3) ☐	The FR-A8NF is mounted to the inverter which is not compatible.	Check that the inverter is compatible with the FR-A8NF. (Refer to **page 7**.)	Mount the FR-A8NF to the inverter which is compatible.
		Communication between the inverter and communication option can not be made.	Check that a contact fault is not occurred in an option connector between the inverter and communication option.	Switch the inverter power OFF and remount the FR-A8NF.
E.OPT	DEV(LED4) ■ RMT(LED3) ☐	Node address is out of range (other than 1 to 64).	Check that the node address setting is within the range (1 to 64).	Set the node address within the range (1 to 64). (Refer to **page 18**.)
		Node address is not correctly set.	Check that the node address switch is not set between numbers.	Set the node address switch to the number position correctly. (Refer to **page 18**.)
		Optional board fault	—	Please contact your sales representative.

Display		Possible causes	Check point	Countermeasure
Operation panel of inverter	LED of the FR-A8NF∗1			
E.OP1	DEV(LED4) ☐ RMT(LED3) ☐	The inverter is not participated in the FL remote network and the communication between the FR-A8NF and switching hub is disconnected.	Check that no break in the cable between the FR-A8NF and switching hub.	Make sure to connect the cable between the FR-A8NF and switching hub.
	DEV(LED4) ☐ RMT(LED3) ■ ↔ ☐	After the inverter participated in the FL remote network, the communication between the FR-A8NF and switching hub is disconnected.		
0.00	DEV(LED4) ☐ RMT(LED3) ☐	The FL remote network communication is not established.	Check that node address setting of the inverter and slave station setting of the master are the same.	Set the node address of the inverter and slave station of the master to the same setting.

☐: Off, ■: Red, ☐: Green, ■ ↔ ☐: Red, flashing

∗1   Refer to **page 9** for the LED indications.

MEMO

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INVERTER

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BUILDING 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN