5 EMBEDDED ETHERNET FUNCTION

This chapter describes the specifications of the embedded Ethernet function.

Chapter 5, "EMBEDDED ETHERNET FUNCTION", consists of the following sections:

5.1 EMBEDDED ETHERNET PORT AND PCMCIA ETHERNET CARD

The embedded Ethernet function can be used by selecting one of two types of devices: the embedded Ethernet port and PCMCIA Ethernet card.
A selection can also be made to stop the embedded Ethernet function.
The PCMCIA Ethernet card is to be inserted into the memory card slot for temporary communication.

⚠ CAUTION

1 When using the embedded Ethernet function for the first time, set an IP address and other items carefully as instructed by the network administrator, then perform a sufficient communication test.
Note that an incorrect IP address or other setting may cause a communication failure on the entire network.
2 A unit such as a PC situated in the same network can increase the communication processing load on the CNC even if the unit is not communicating with the CNC.
Avoid connecting the CNC to a factory-wide network. Use a router or the like to separate the network including the CNC from the other networks.

NOTE

1 Use the PCMCIA Ethernet card designated by FANUC. General Ethernet cards available on the market cannot be used.
2 The PCMCIA Ethernet card is used for FANUC LADDER-III or SERVO GUIDE.
3 Use the PCMCIA Ethernet card just for temporary communication as described above. Avoid using the card for continuous communication.
4 The PCMCIA Ethernet card is inserted into a memory card slot, with a part of the card left uninserted. When using the PCMCIA Ethernet card, take great care not to damage the card by hitting the protruding part of the card.
When the card becomes unnecessary, remove the card immediately, in order to prevent any damage to the card.

Related NC parameters

	#7	#6	#5	#4	#3	#2	#1	#0
14880								ETH

[Input type] Setting input
[Data type] Bit

 # 0 ETH The embedded Ethernet function (embedded Ethernet port or PCMCIA Ethernet card) is:
0: Used.
1: Not used.

5.2 SETTING UP THE EMBEDDED ETHERNET FUNCTION

This section describes the setting of parameters for the embedded Ethernet function.

5.2.1 Setting of the FOCAS2/Ethernet Function

This subsection describes the settings required to operate the FOCAS2/Ethernet function.

Notes on using the FOCAS2/Ethernet function for the first time

NOTE
1 When running user's original application software created by using the FOCAS2/Ethernet function, use the embedded Ethernet port.
2 The FOCAS2/Ethernet function allows up to five FOCAS2/Ethernet clients to be connected to one CNC.
3 Concurrent access by multiple applications or personal computers may overload the CNC, reducing the communication speed.

5.2.1.1 Operation on the FOCAS2/Ethernet setting screen

On the Ethernet parameter setting screen, set the parameters for operating the FOCAS2/Ethernet function.

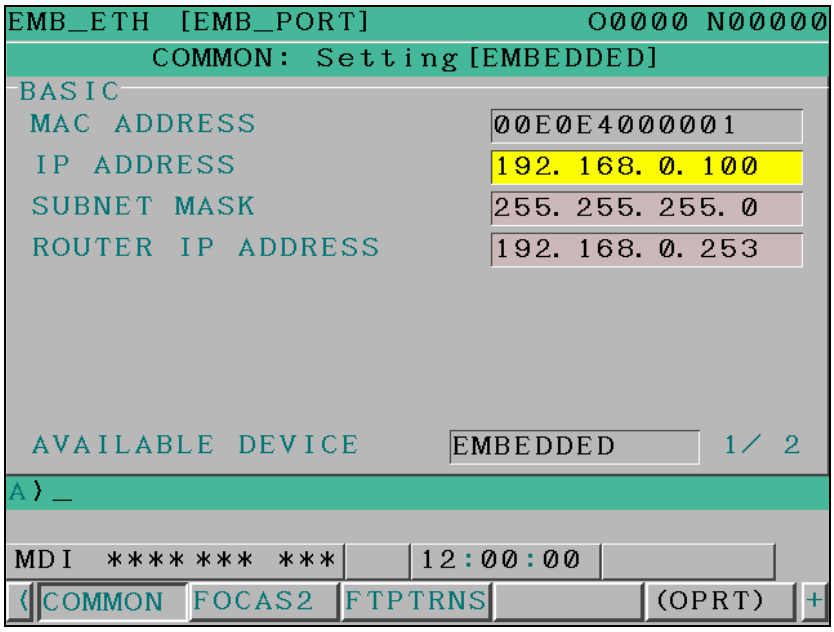
Procedure

1 Press the function key  .
2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)
3 To display the Ethernet Setting screen for the embedded Ethernet port or the PCMCIA Ethernet card, press soft key [EMBED] or [PCMCIA], respectively.
4 Press soft keys [COMMON] and [FOCAS2] and then enter parameters for the items that appear.

NOTE
1 The parameters for the embedded Ethernet port and the parameters for the PCMCIA Ethernet card are independent of each other.
2 The settings of the FOCAS2/Ethernet function for the PCMCIA Ethernet card are made when a connection to SERVO GUIDE and FANUC LADDER-III is established.

COMMON screen (BASIC)

Press soft key [COMMON]. The COMMON screen (BASIC) is displayed.



COMMON screen (BASIC)

Settings items

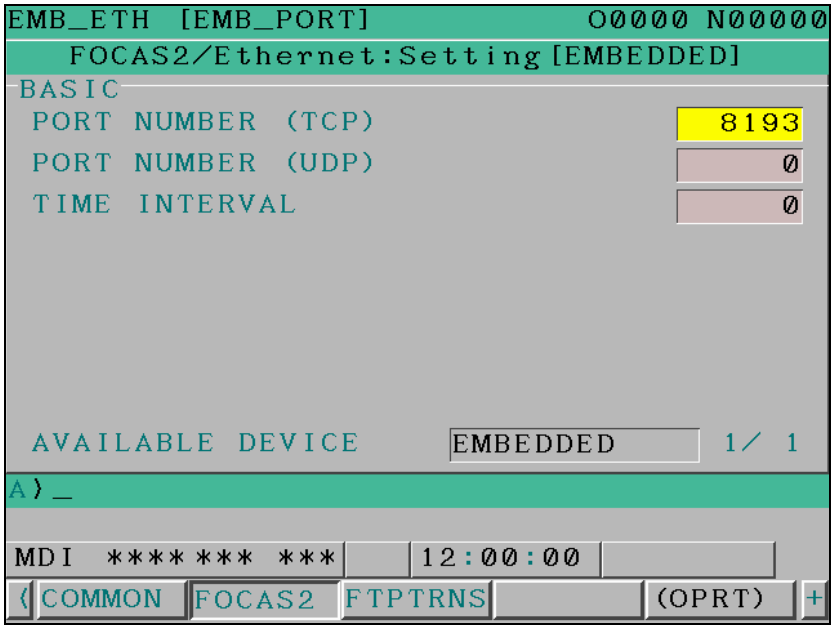
Item	Description
IP ADDRESS	Specify the IP address of the embedded Ethernet. (Example of specification format: "192.168.0.100")
SUBNET MASK	Specify a mask address for the IP addresses of the network. (Example of specification format: "255.255.255.0")
ROUTER IP ADDRESS	Specify the IP address of the router. Specify this item when the network contains a router. (Example of specification format: "192.168.0.253")

Display items

Item	Description
MAC ADDRESS	Embedded Ethernet MAC address
AVAILABLE DEVICE	Enabled device of the embedded Ethernet. Either the embedded Ethernet port or the PCMCIA Ethernet card is displayed.

FOCAS2 screen

Press soft key [FOCAS2]. The FOCAS2 screen is displayed.



FOCAS2 screen

Setting items

Item	Description
PORT NUMBER (TCP)	Specify a port number to be used with the FOCAS2/Ethernet function. The valid input range is 5001 to 65535.
PORT NUMBER (UDP)	Set this item to 0 when it is used as the FOCAS2/Ethernet function.
TIME INTERVAL	Set this item to 0 when it is used as the FOCAS2/Ethernet function.

NOTE

1 When a connection to the CIMPLICITY *i* CELL is established, set the UDP port number and time interval above as described in the FANUC CIMPLICITY *i* CELL Operator's Manual (B-75074).

2 The unit of the time interval is 10 ms. The allowable range is between 10 and 65535. A time interval less than 100ms cannot be set.

3 Decreasing the time interval setting increases the communication load and can affect the network performance.

Example) If the interval is set to 100 (100 x 10 ms = 1 second), broadcast data is sent every 1 second.

Initial setting of the PCMCIA Ethernet card

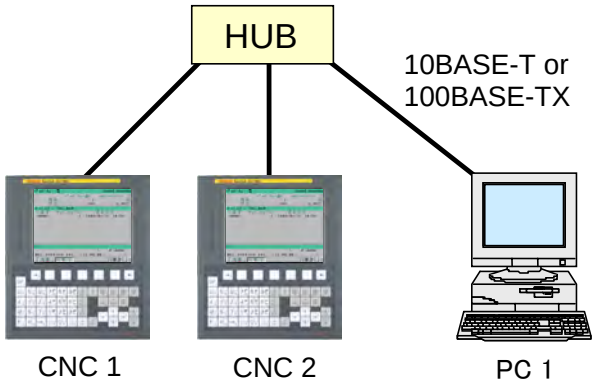
The PCMCIA Ethernet card is factory-set to the following default values, for ease of connection with SERVO GUIDE or FANUC LADDER-III.

IP ADDRESS : 192.168.1.1
SUBNET MASK : 255.255.255.0
ROUTER IP ADDRESS : None
PORT NUMBER (TCP) : 8193
PORT NUMBER (UDP) : 0
TIME INTERVAL : 0

If a specified IP address is changed to a blank (space), the specified setting is reset to the default value.
The embedded Ethernet port does not have a default value.

5.2.1.2 Example of setting the FOCAS2/Ethernet function

The following shows a setting example required for the FOCAS2/Ethernet function to operate.
In this example, one personal computer is connected to two CNCs through FOCAS2/Ethernet.



	CNC 1	CNC 2
IP address	192.168.0.100	192.168.0.101
Subnet mask	255.255.255.0	255.255.255.0
Router IP address	None	None
TCP port number	8193	8193
UDP port number	0	0
Time interval	0	0

The Ethernet parameter screen is used for setting.

		PC 1
IP address		192.168.0.200
Subnet mask		255.255.255.0
Default gateway		None
CNC 1	NC IP address	192.168.0.100
	NC TCP port number	8193
CNC 2	NC IP address	192.168.0.101
	NC TCP port number	8193

"Microsoft TCP/IP property" of the personal computer (Windows 2000/XP/Vista) is used for setting.

The arguments of the data window library function cnc_allclibhndl3 are used for setting.

5.2.2 Setting of the FTP File Transfer Function

This section describes the settings required for the FTP file transfer function to operate using the embedded Ethernet function.

Notes on using the FTP file transfer function for the first time

NOTE
1 When using the FTP file transfer function, use the embedded Ethernet port.
2 The number of FTP communications to which one CNC can be connected using the FTP file transfer function is one.

5.2.2.1 Operation on the FTP file transfer setting screen

On the Ethernet setting screen, set the parameters for operating the FTP file transfer function.

Procedure

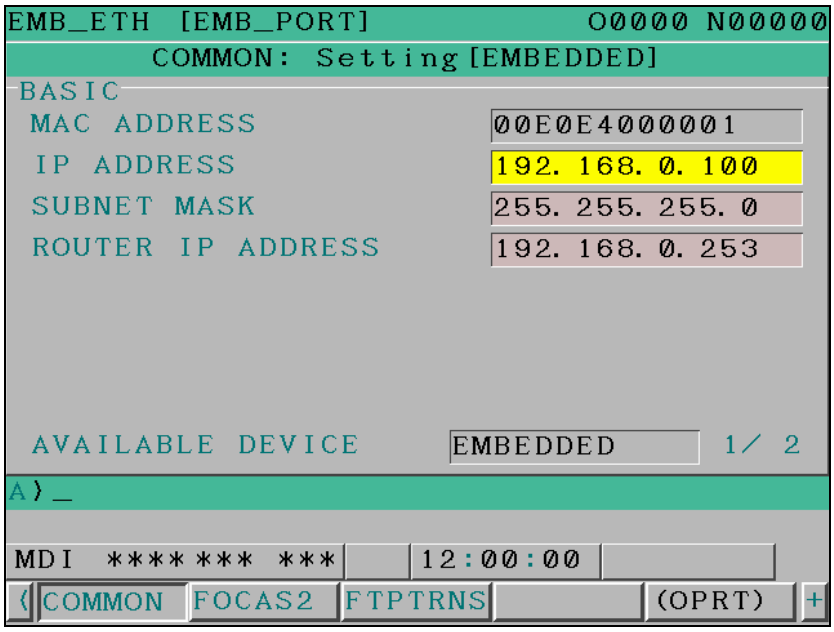
1 Press the function key 

.
2 Soft keys [EMBED] appear.
(When there is no soft keys, press the continue key.)
3 By pressing the [EMBED] soft key, the Ethernet Setting screen for the embedded Ethernet port is displayed.
4 Press soft keys [COMMON] and [FTPTRNS] and then enter parameters for the items that appear.

NOTE
The parameters for the embedded Ethernet port and the parameters for the PCMCIA Ethernet card are independent of each other.
If the [PCMCIA] soft key is pressed, the PCMCIA Ethernet card can be set up. However, the card setup is carried out for maintenance and is not necessary usually.

COMMON screen (BASIC)

Press soft key [COMMON]. The COMMON screen (BASIC) is displayed.



COMMON screen (BASIC)

Setting items

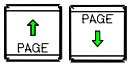
Item	Description
IP ADDRESS	Specify the IP address of the embedded Ethernet. (Example of specification format: "192.168.0.100")
SUBNET MASK	Specify a mask address for the IP addresses of the network. (Example of specification format: "255.255.255.0")
ROUTER IP ADDRESS	Specify the IP address of the router. Specify this item when the network contains a router. (Example of specification format: "192.168.0.253")

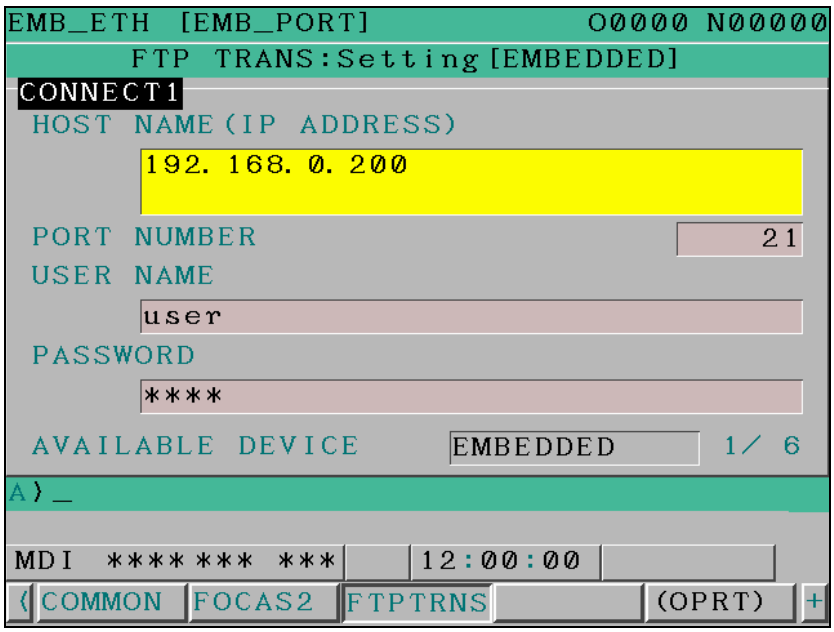
Display items

Item	Description
MAC ADDRESS	Embedded Ethernet MAC address
AVAILABLE DEVICE	Enabled device of the embedded Ethernet. Either the embedded Ethernet port or the PCMCIA Ethernet card is displayed.

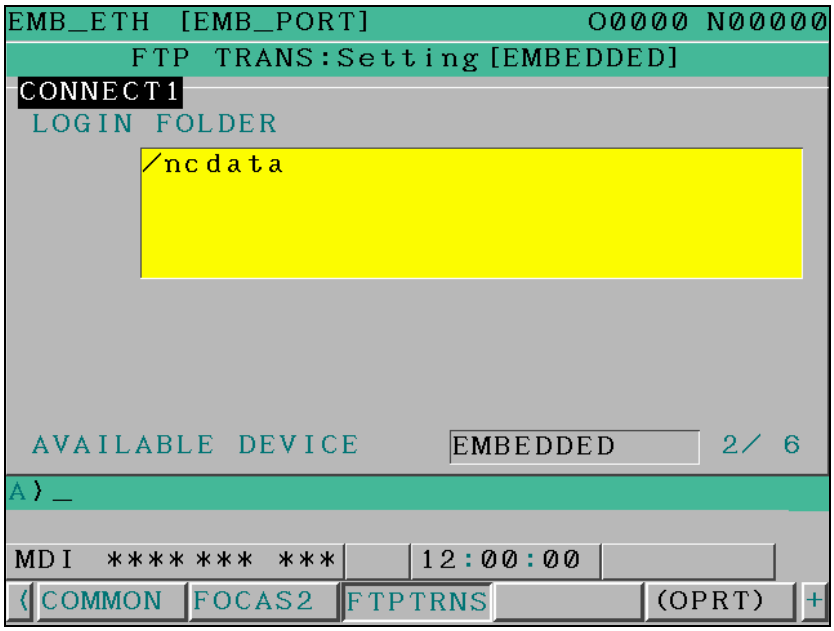
FTP transfer screen (CONNECT1, CONNECT2, CONNECT3)

1 Press soft key [FTPTRNS]. The FTP transfer screen is displayed.

2 Page keys  can be used to make settings for the three host computers for connection destinations 1 to 3.



FTP transfer screen (1st page)



FTP transfer screen (2nd page)

Item	Description
HOST NAME	Specify the IP address of the host computer. (Example of specification format: "192.168.0.200")

Item	Description
PORT NUMBER	Specify a port number to be used with the FTP file transfer function. An FTP session is used, so that "21" is to be specified usually.
USERNAME	Specify a user name to be used for logging in to the host computer with FTP. (Up to 31 characters can be specified.)
PASSWORD	Specify a password for the user name specified above. (Up to 31 characters can be specified.) Be sure to set a password.
LOGIN FOLDER	Specify a work folder to be used when logging in to the host computer. (Up to 127 characters can be specified.) If nothing is specified, the home folder specified in the host computer becomes the log-in folder.

Operation

Select a destination.

1 Pressing the [(OPRT)] soft key causes soft key [HOST] to be displayed. Pressing this soft key causes soft keys [CONECT 1], [CONECT 2], and [CONECT 3] to be displayed.

2 Depending on the host computer to be connected, press soft key [CONECT 1], [CONECT 2], or [CONECT 3]. Destination 1, 2, or 3 is highlighted in the screen title field. The computer corresponding to the highlighted destination is selected as the target computer to be connected.

When destination 1 is selected

5.2.2.2 Related NC parameters

The NC parameters related to the FTP file transfer function are described below.

0020	I/O CHANNEL : Input/output device selection, or interface number for a foreground input device

[Input type] Setting input
[Data type] Byte
[Valid data range] 9 : Select the embedded Ethernet as the input/output device.

	#7	#6	#5	#4	#3	#2	#1	#0
13115			SI2	SI1				

[Input type] Parameter input
[Data type] Bit

 # 4 SI1 Soft key input of the characters shown below is:
0: Disabled.
1: Enabled.
< > ¥ % $! ~ : " '

 # 5 SI2 Soft key input of the characters shown below and switching between the uppercase and lowercase input modes by a soft key are:
0: Disabled.
1: Enabled.
( ) ? * & @ _

For embedded Ethernet port

	#7	#6	#5	#4	#3	#2	#1	#0
14880							PCH	

[Input type] Setting input
[Data type] Bit

 # 1 PCH When communication based on the FTP file transfer function starts, an FTP server presence check based on PING is:
0: Made
1: Not made

NOTE
Generally, set this parameter to 0 so that an FTP server presence check based on PING is performed. Otherwise, if the server is not present in the network, it takes several tens of seconds to detect an error. Some PCs are set not to response to the PING command mainly for security purposes. To communicate with such a PC, set this parameter to 1.

14890	Selects the host computer 1 OS.
14891	Selects the host computer 2 OS.
14892	Selects the host computer 3 OS.

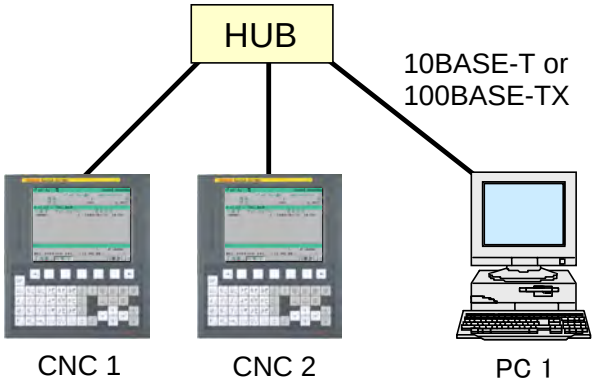
[Input type] Parameter input
[Data type] Word
[Valid data range] 0 to 2
0: Windows2000/XP/Vista.
1: UNIX, VMS.
2: Linux.

NOTE
Some FTP server software products do not depend on the OS. So, even when the above parameters are set, it is sometimes impossible to display a list of files properly.

5.2.2.3 Example of setting the FTP file transfer function

The following shows a setting example required for the FTP file transfer function to operate.
In this example, one personal computer is connected to two CNCs through the FTP file transfer function.

- On Personal Computer 1, the FTP server function operates.
- On CNC 1 and CNC 2, the FTP client operates as the FTP file transfer function.



		CNC 1	CNC 2
IP address		192.168.0.100	192.168.0.101
Subnet mask		255.255.255.0	255.255.255.0
Router IP address		None	None
Connection host 1	Port number	21	21
	IP address	192.168.0.200	192.168.0.200
	User name	user	user
	Password	user	user
	Login DIR	None	None
NC parameter No. 20		9	9

The Ethernet parameter screen is used for setting.

The parameter screen is used for setting.

	PC 1
IP address	192.168.0.200
Subnet mask	255.255.255.0
Default gateway	None
User name	user
Password	user
Login DIR	Default

"Microsoft TCP/IP property" of the personal computer (Windows 2000 / XP / Vista) is used for setting.

"User acount of the personal computer (Windows 2000 / XP / Vista) is used for setting.

"Internet service manager" of the personal computer (Windows 2000 / XP) is used for setting.
"FTP Publishing Service" (Windows Vista) is used for setting.

5.2.3 Setting Up the DNS/DHCP Function

The DHCP/DNS function is set up by using the COMMON screen (DETAIL) and NC parameters.

5.2.3.1 Setting up DNS

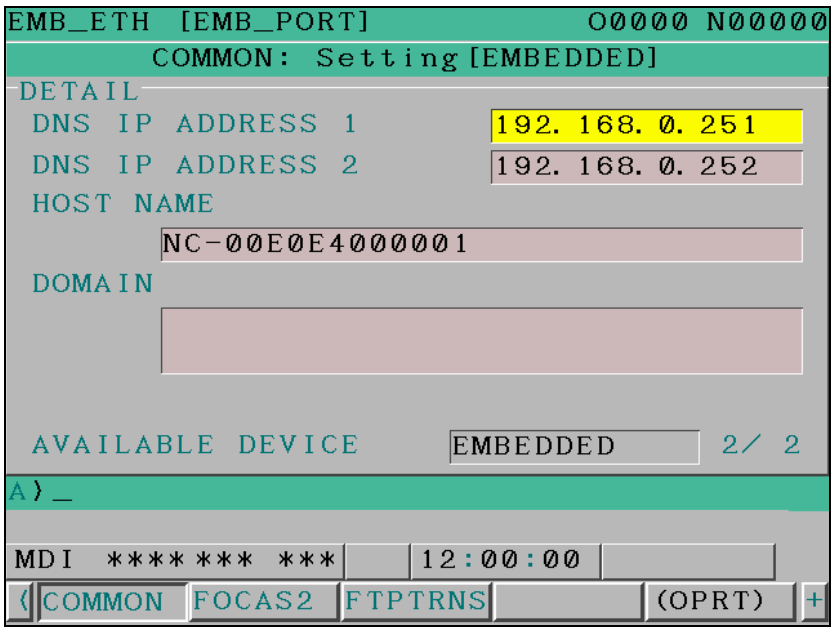
This subsection describes the procedure for setting up a DNS.

Procedure

1 Enable the DNS function, with reference to "Related NC Parameters," which will be seen later.
2 Set up the DNS server of the host computer.
3 Connect the host computer on which the DNS server is working (hereafter referred to as a DNS server), reboot the CNC, then press function key SYSTEM.
4 Press soft keys [EMBED] and [COMMON] in that order. The COMMON screen (DETAIL) appears.
5 Enter the IP address of the DNS server in the corresponding DNS IP address field.

COMMON screen (DETAIL)

After pressing soft key [COMMON], press either page key PAGE PAGE to call a desired COMMON screen (DETAIL). Specify a DNS IP address.



COMMON screen (DETAIL)

Setting items

Item	Description
DNS IP ADDRESS 1, 2	Up to two DNS IP addresses can be specified. The CNC searches for the DNS server using DNS IP addresses 1 and 2 in that order.

5.2.3.2 Setting up DHCP

This subsection describes the procedure for setting up a DHCP.

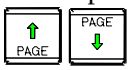
Procedure

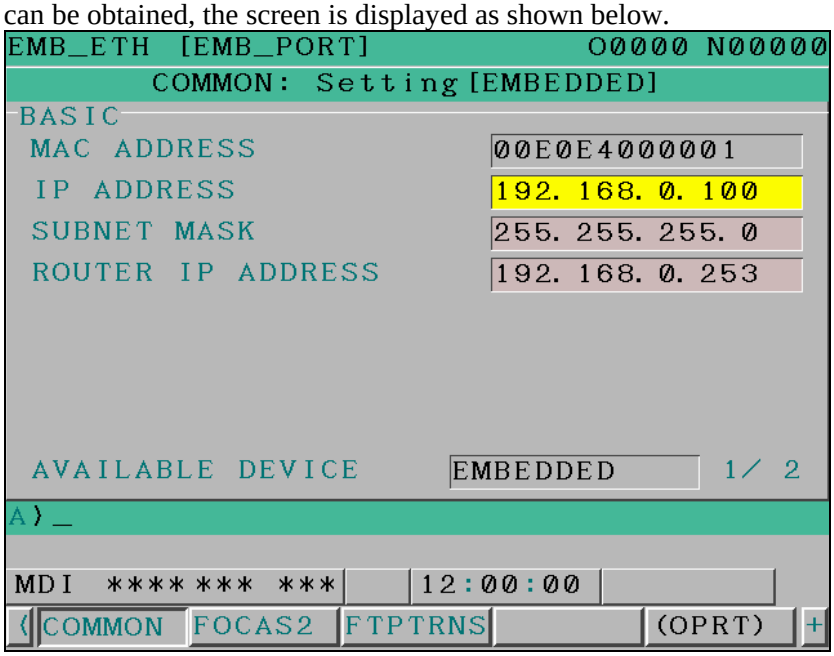
1 Enable the DHCP function, with reference to "Related NC Parameters," which will be seen later.
2 Set up the DHCP server of the host computer.
3 Connect the host computer on which the DHCP server is working (hereafter referred to as a DHCP server), reboot the CNC, then press function key 

.
4 Press soft keys [EMBED] and [COMMON] in that order. The COMMON screen appears.
5 If the DHCP function of the CNC has been enabled and if the DHCP server is connected successfully, the DHCP server automatically specifies the following items.
- IP ADDRESS
- SUBNET MASK
- ROUTER IP ADDRESS
- DNS IP ADDRESS
- DOMAIN

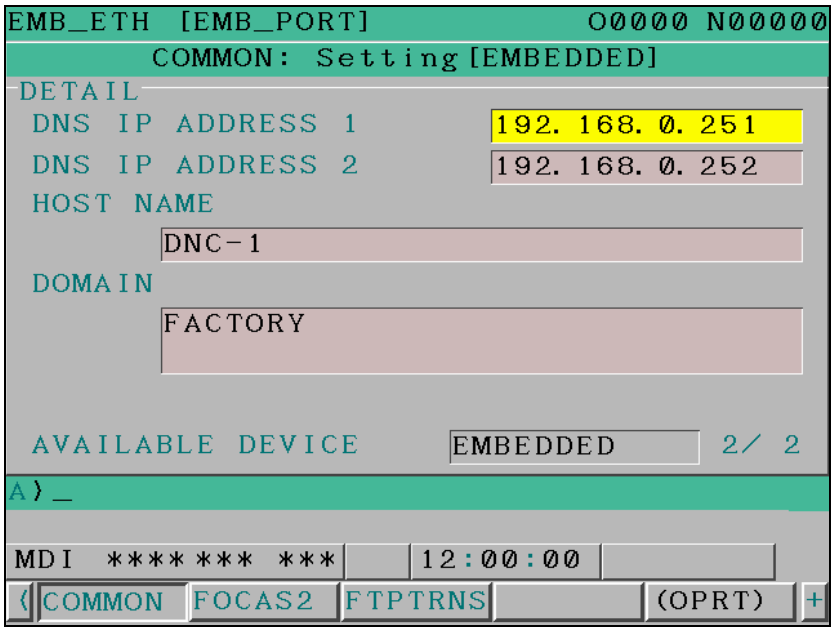
If the DHCP server cannot be connected, "DHCP ERROR" is displayed in each field.
6 If the DNS function has also been enabled and if the DHCP server and the DNS server work together (if the DNS server supports dynamic DNS), enter a host name.

COMMON screen (basic and detail)

After pressing soft key [COMMON], press either page key  to call a desired Ethernet common setting screen (basic, detail).
If the DHCP server is connected successfully and if the setting data can be obtained, the screen is displayed as shown below.



When the DHCP server is connected successfully (1st page)

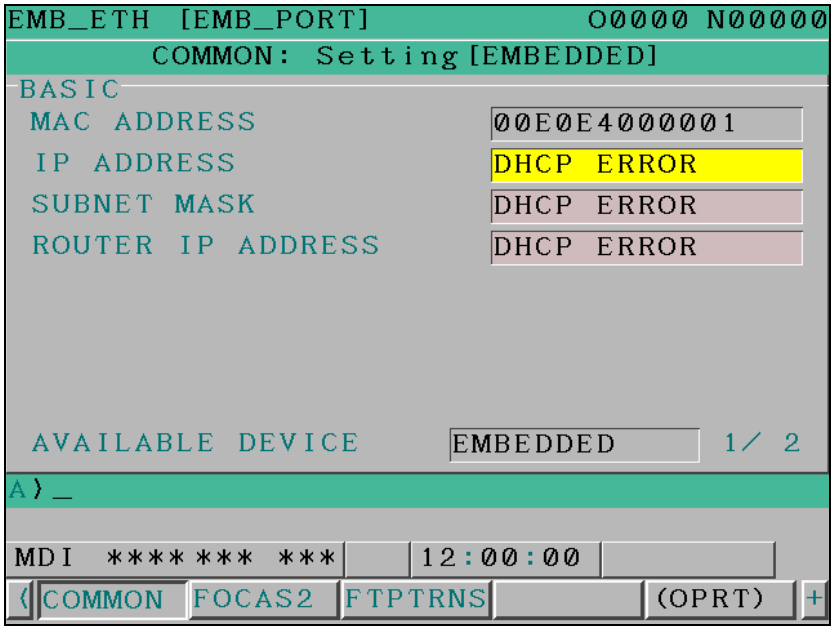


When the DHCP server is connected successfully (2nd page)

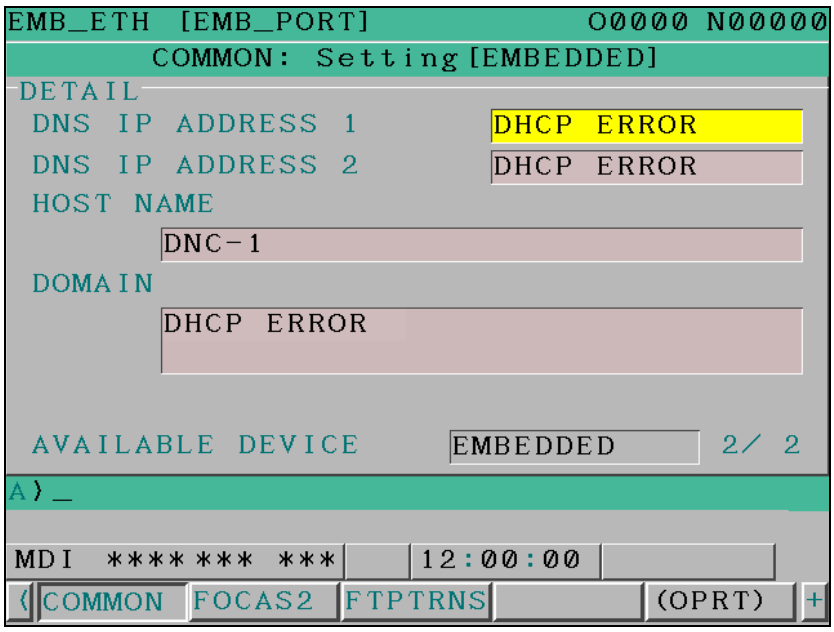
If the host name is not specified, the CNC automatically assigns a host name in the "NC-<MAC-address>" format.

Example of automatically assigned host name

If the DHCP server cannot be connected, the screen is displayed as shown below.



When the DHCP server cannot be connected (1st page)



When the DHCP server cannot be connected (2nd page)

Check items

Item	Description
IP ADDRESS	If the DHCP server is connected successfully, the items obtained from the DHCP server are displayed. If the DHCP server cannot be connected, "DHCP ERROR" is displayed.
SUBNET MASK	
ROUTER IP ADDRESS	
DNS IP ADDRESS 1,2	
DOMAIN	

Setting items

Item	Description
HOST NAME	Enter the host name of the CNC. If a DHCP server and a DNS server work together, the DHCP server notifies the DNS server of this host name. If the host name is left blank, a host name is automatically assigned in the "NC-<MAC-address>" format. Example of automatically assigned host name: NC-00E0E4000001

Display items

Item	Description
MAC ADDRESS	MAC address of embedded Ethernet

5.2.3.3 Related NC parameters

For embedded Ethernet port

	#7	#6	#5	#4	#3	#2	#1	#0
14880		DHC	DNS		D1E			

[Input type] Setting input
[Data type] Bit

 # 3 D1E When the DHCP function is used:
0: The default parameters for the FOCAS2/Ethernet function are specified.
PORT NUMBER (TCP) 8193
PORT NUMBER (UDP) 0
TIME INTERVAL 0
1: The default parameters for CIMPLICITY *i* CELL are specified.
PORT NUMBER (TCP) 8193
PORT NUMBER (UDP) 8192
TIME INTERVAL 50

 # 5 DNS The DNS function is:
0: Used.
1: Not used.

 # 6 DHC The DHCP function is:
0: Used.
1: Not used.

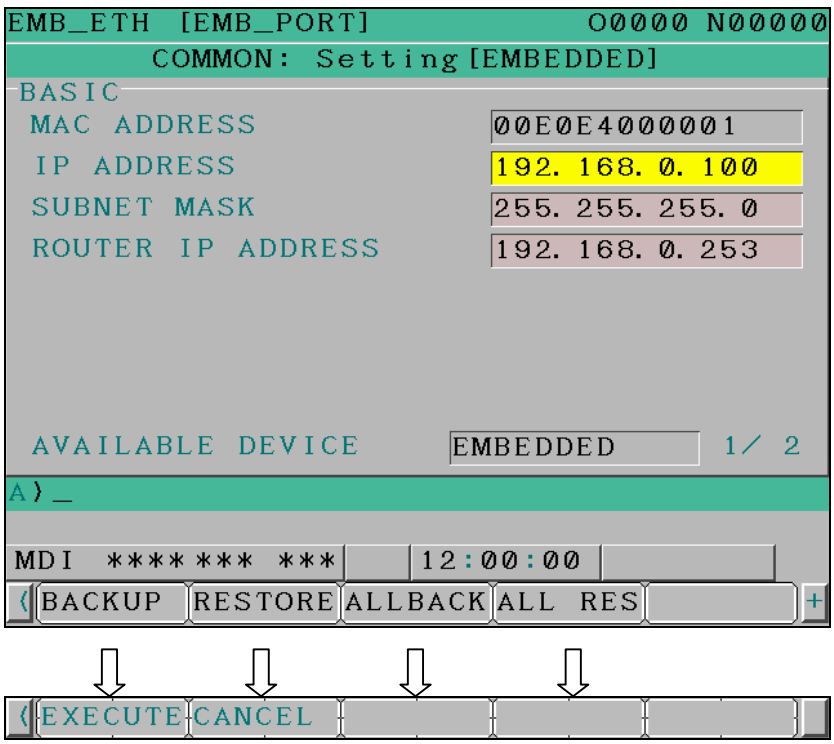
A change in these parameters becomes effective after the power is turned off and on or after the embedded Ethernet function is restarted.

5.2.4 Backing up and Restoring Communication Parameters

This section describes how to back up the embedded Ethernet communication parameters to a memory card and to restore them from the memory card.

1. Press the function key 

.
2. The soft keys [EMBED] and [PCMCIA] appear. (If they do not appear, press the continuous menu key.)
3. When the soft key [EMBED] or [PCMCIA] is pressed, the Ethernet Setting screen, respectively, for the embedded Ethernet port or the PCMCIA Ethernet card appears.
4. Once the soft keys [COMMON] and [(OPRT)] are pressed, pressing the soft key [+] displays the soft keys [BACKUP], [RESTORE], [ALLBACK], and [ALL RES] for backing up or restoring communication parameters as shown below.
5. Pressing the soft key [BACKUP], [RESTORE], [ALLBACK], or [ALL RES] displays the soft keys [EXECUTE] and [CANCEL].
6. Once the name of a file to be backed up or restored is entered into a key-in buffer, pressing the soft key [EXECUTE] starts the respective operation.
   "EXECUTING" blinks while backup or restoration is in progress.



BACKUP

The embedded Ethernet communication parameters are saved from the SRAM of the CNC main unit to the memory card.
If a file name is specified in the key-in buffer, the specified file name is used when the parameters are saved to the memory card. If no file name is specified, the file name “EMBETHER.MEM” is used.

RESTORE

The embedded Ethernet communication parameters are read from the memory card and saved to the SRAM of the CNC main unit.
If a file name is specified in the key-in buffer, the specified file name is used when the parameters are read from the memory card. If no file name is specified, the file name “EMBETHER.MEM” is used.

ALLBACK

All valid embedded Ethernet, Fast Ethernet/Fast Data server, and PROFIBUS-DP master/slave communication parameters are saved from the SRAM of the CNC main unit to the memory card.
If a file name is specified in the key-in buffer, the file name is used when the parameters are saved. If no file name is specified, the file name “NETWORK.MEM” is used.

ALL RES

All valid embedded Ethernet, Fast Ethernet/Fast Data server, and PROFIBUS-DP master/slave communication parameters are read from the memory card and saved to the SRAM of the CNC main unit.
However, if a communication function related to a valid communication parameter is disabled in the CNC, that parameter is not saved to the SRAM.
If a file name is specified in the key-in buffer, the specified file name is used when the parameters are read from the memory card. If no file name is specified, the file name “NETWORK.MEM” is used.

NOTE
1 Communication parameter backup and restoration are usable only in the MDI mode and at an emergency stop.
2 Performing communication parameter restoration leads to an alarm condition that requests to turn off the power.
3 When communication parameters are backed up or restored, the memory card is always used no matter what the external input/output device number (NC parameter No. 20) is.

5.3 SWITCHING BETWEEN THE EMBEDDED ETHERNET DEVICES

There are two types of embedded Ethernet devices: the embedded Ethernet port and PCMCIA Ethernet card.
Screen operation is required to switch between these two types of devices.

Procedure

1 Press the function key 

.

2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)

3 Press soft key [EMBED] or [PCMCIA], press soft key [COMMON], and then press [(OPRT)] to display soft key [EMB/PCM].

4 Pressing soft key [EMB/PCM] switches between enabled devices.
- If you want to execute the switchover, press soft key [EXECUTE].
- If you do not want to execute the switchover, press soft key [CANCEL].

5 The valid devices are switched each time Step 4 is performed.

NOTE
Information on a switched device is stored in nonvolatile memory.
On the next power-on, the device last selected can be used as is.

5.4 EMBEDDED ETHERNET OPERATIONS

5.4.1 FTP File Transfer Function

The operation of the FTP file transfer function is described below.

Host file list display

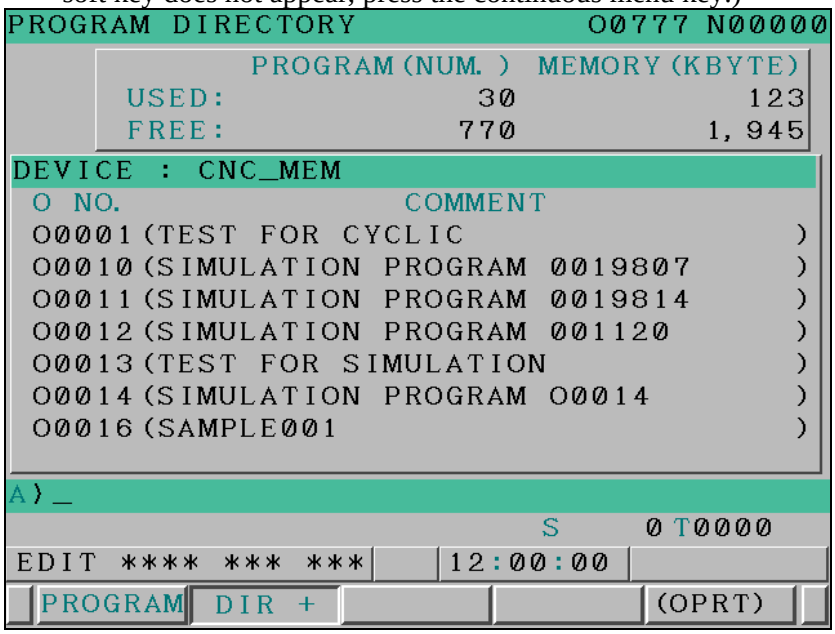
A list of the files held on the host computer is displayed.

Procedure

1 Press the function key 

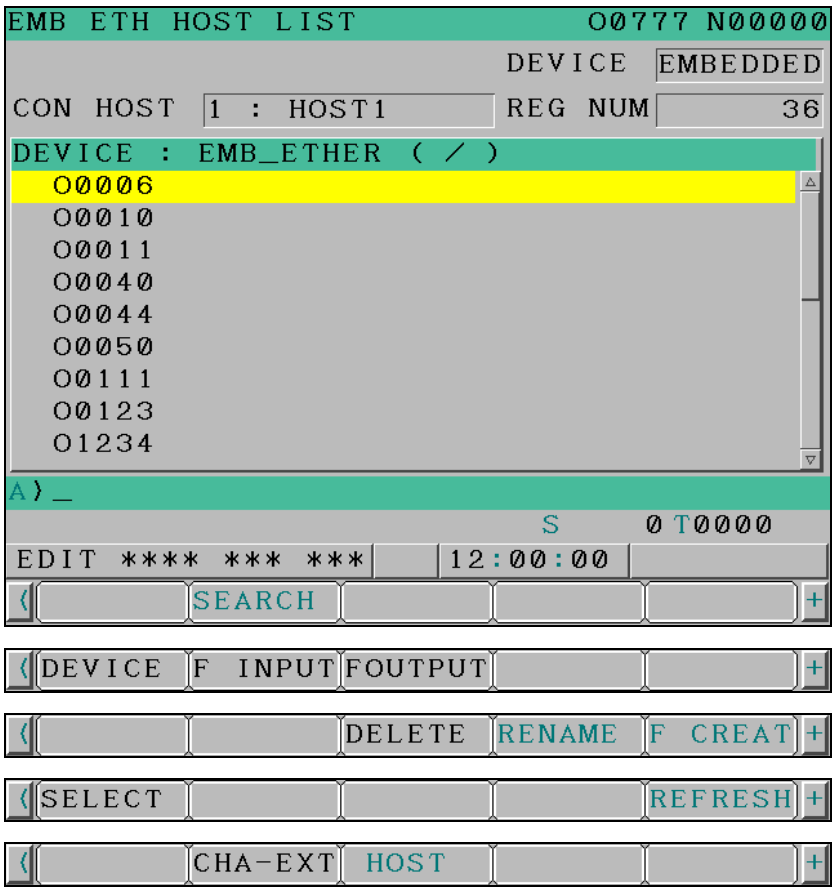
.

2 Press soft key [DIR+]. The program folder screen appears. (If the soft key does not appear, press the continuous menu key.)

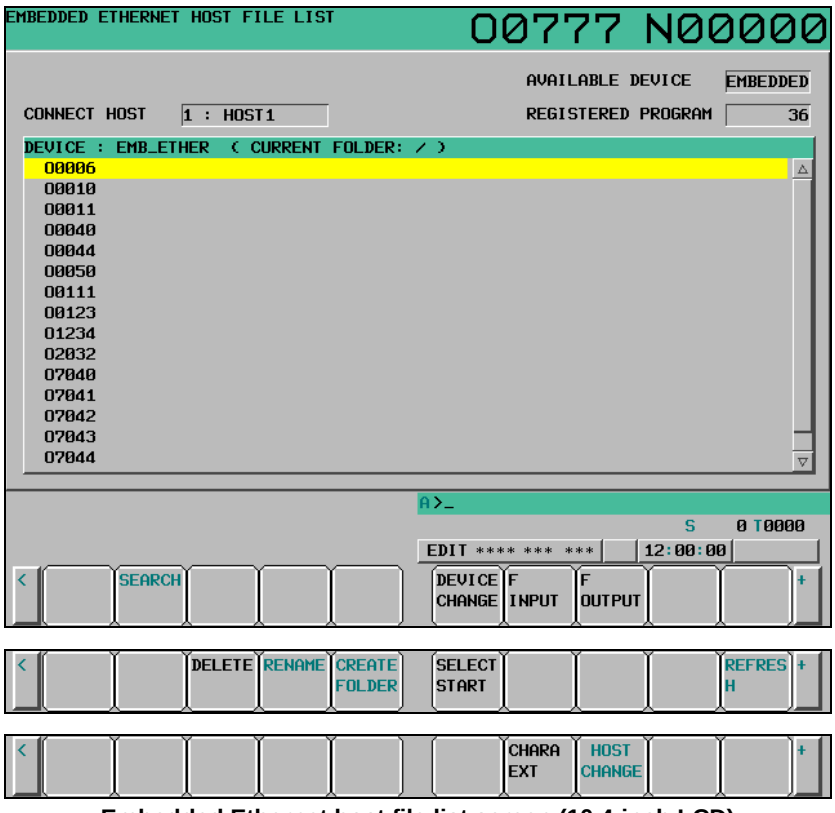


3 Press soft keys [(OPRT)] and [DEVICE] in that order. The soft keys for selectable devices appear.

4 Pressing soft key [EMB ETH] displays the Embedded Ethernet host file list screen, on which a list of files in the host computer connected with the embedded Ethernet port is displayed.



Embedded Ethernet host file list screen (8.4-inch LCD)



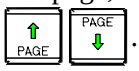
Embedded Ethernet host file list screen (10.4-inch LCD)

NOTE

When using the FTP file transfer function, check that the valid device is the embedded Ethernet port. The two conditions below determine a connection destination on the host file list screen:

(1) Check that the valid device is the embedded Ethernet port. It is selected using soft key [EMB/PCM] on the Ethernet setting screen.

(2) A host computer can be selected from connection destinations 1, 2, and 3. A computer to be connected is selected using the operation procedure described in Subsection 5.2.2.1, "Operation on the FTP file transfer setting screen" or “HOST CHANGE” explained later.

5 When a list of files is larger than one page, the screen display can be switched using the page keys 

.

Display item

DEVICE (AVAILABLE DEVICE)

The currently selected device is displayed.

CON HOST (CONNECT HOST)

Number of the currently connected host of the host computer

REG NUM (REGISTERED PROGRAM)

The number of files in the current folder.

DEVICE

Current device. When the embedded Ethernet host file list is selected, “EMB_ETHER” is displayed.

CURRENT FOLDER

Current work folder in the host computer

FILE LIST

Information of the files and folders in the host computer

Operation list

DEVICE (DEVICE CHANGE)

Enables a device to be selected from the program folder screen. To select the embedded Ethernet host file list, press soft key [EMB ETH].

DIR +

Switches between the outline and detailed file lists.

F CREAT (CREATE FOLDER)

Create a subfolder in the current work folder in the host computer.

DELETE

Deletes a file or folder in the host computer.

RENAME

Renames a file or folder in the host computer.

HOST (HOST CHANGE)

Changes the connected host computer.

SEARCH

Searches for a file through the current folder in the host computer.

REFRESH

Updates the information displayed on the embedded Ethernet host file list screen.

F INPUT

Transfers a program from the host computer to the CNC memory.

F OUTPUT

Transfers a program from the CNC memory to the host computer.

NOTE
The character strings enclosed in parentheses are those displayed when the 10.4-inch LCD unit is used.

5.4.1.1 Displaying and operating the file list

DETAIL ON, DETAIL OFF

Displays can be switched between outline and detailed file lists.
Either the outline or detailed file list display is selected each time soft key [DIR+] is pressed.
The outline file list display contains only file names, while the detailed file list display contains file sizes, creation dates, and other file information as well file names.

NOTE
1 The items displayed in the detailed list depend on the FTP server setting on the host computer.
2 When files in the detailed file list are operated on, information displayed at the right edge of the screen is treated as a file name. Therefore, it is likely that files may not be operated on properly depending on displays or file names. If this is the case, use the outline file list display.

REFRESH

Update the contents of the file list.
Pressing soft key [REFRESH] causes the file list contents to be updated.

Moving a folder

Move a folder.

1 Select a folder you want to move using cursor keys  and  .

2 Press MDI key  .

CREATE FOLDER

Create a new folder.

1 Move to a folder in which you want to create a new folder.
2 Key in a folder name.
3 Press soft key [F CREAT] ([CREATE FOLDER]).

DELETE

Delete a file or folder.

1 Select a file or folder you want to delete using cursor keys  and  .

2 Press soft key [DELETE].
- To execute the deletion, press soft key [EXEC].
- To cancel the deletion, soft key [CANCEL].

DELETE (multiple files)

Delete multiple files at a time.

1 Press soft key [SELECT] ([SELECT START]).

2 Select a file or folder you want to delete using cursor keys  and  .

3 Press soft key [SELECT].
The selected file is highlighted.
Repeat steps 2 and 3 for each file you want to delete.

4 Press soft key [DELETE].
- To execute the deletion, press soft key [EXEC].
- To cancel the deletion, soft key [CANCEL].

NOTE
1 Up to 10 files can be selected at a time.
2 Only files can be specified. If folders are specified, an error is reported when an attempt is made to delete the folders.

RENAME

Rename a file or folder.

1 Select a file or folder you want to rename using cursor keys  and  .

2 Enter a new file or folder name.

3 Press soft key [RENAME].

SEARCH

Search for a file or folder through the current work folder. The file or folder found is displayed at the top of the file list.

1 Key in a file or folder name you want to search for.

2 Press soft key [SEARCH].

HOST CHANGE

Change the connected host computer.

1 Press soft key [HOST] ([HOST CHANGE]).
The connected host number changes from 1 to 2 to 3, then back to 1.

5.4.1.2 Transferring programs

How programs are transferred between the host computer and CNC is explained below.

NOTE
1 Inputting or outputting programs with the embedded Ethernet host requires setting NC parameter No. 20 with 9.
2 If an error occurs, check its cause on the Ethernet log screen.

Inputting programs

The following procedure can be used to transfer programs from the host computer to the CNC memory.

1 Press soft key [F INPUT].
2 Select a program in the host computer.
In the host computer, place the cursor on the file you want to input and press soft key [F GET], or key in the file name.
3 Press soft key [F NAME].
4 If you want to rename a program when inputting it, key in the program number and press soft key [O SET].
5 Press soft key [EXEC].

The following table summarizes what operation occurs when the input file name [F NAME] and input program number [O SET] are omitted.

[F NAME]	[O SET]	Key input buffer	Input file name	Input program	Input program No.
–	–	–	Warning message “NO PROGRAM SELECTED” is displayed, and nothing is input.		
		Other than Oxxxx	Warning message “THE WRONG DATA IS USED” is displayed, and nothing is input.		
		Oxxxx	File name set in the key input buffer (NOTE)	All programs in the input file	Continuous program numbers starting at one (xxxx) set in the key input buffer
	-9999	No relation	Warning message “NO PROGRAM SELECTED” is displayed, and nothing is input.		
	O		Same file name as program No. set by [O SET] (NOTE)	All programs in the input file	Continuous program numbers starting at one set by [O SET]
O	–		File name set by [F NAME]	All programs in a file specified by [F NAME]	Program No. used when the program was saved
	-9999		Warning message “THE WRONG DATA IS USED” is displayed, and nothing is input.		
	O		File name set by [F NAME]	All programs in the file specified by [F NAME]	Continuous program numbers starting at one set by [O SET]

O: Specified
– : Not specified

NOTE

The input file name consists of “O” followed by a 4-digit number.
If program input is executed by specifying program No. 1, for example, a file whose file name is “O0001” is input.
If this operation is performed for path 2, the file name is suffixed with the file extension “P-2” (for this example, “O0001.P-2”).

Outputting programs

The following procedure can be used to transfer programs from the CNC memory to the host computer.

1 Press soft key [FOUTPUT].
2 Select a program in the CNC.
Key in the program No. of the program to be output.
3 Press soft key [O SET].
4 If you want to rename a program when outputting it, key in the file name and press soft key [F NAME].
5 Press soft key [EXEC].

The following table summarizes what operation occurs when the output file name [F NAME] and output program number [O SET] are omitted.

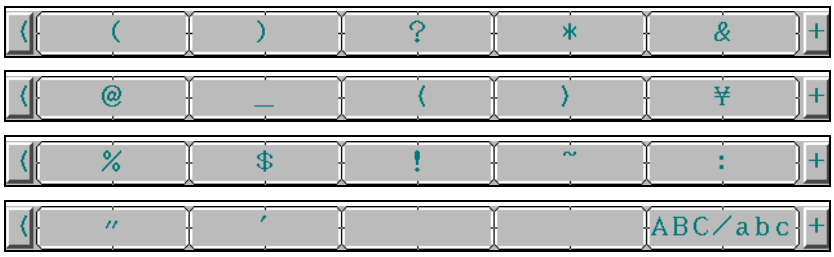
<table>
<tr><th>[F NAME]</th><th>[O SET]</th><th>Key input buffer</th><th>Output file name</th><th>Output program</th></tr>
<tr><td rowspan="6">–</td><td rowspan="3">–</td><td>–</td><td>Currently selected main program name (NOTE 1 and NOTE 2)</td><td>Currently selected main program (NOTE 1)</td></tr>
<tr><td>Other than Oxxxx</td><td colspan="2">Warning message “THE WRONG DATA IS USED” is displayed, and nothing is output.</td></tr>
<tr><td>Oxxxx</td><td>Program name set in the key input buffer (NOTE 2)</td><td>Program in the CNC memory set in the key input butter</td></tr>
<tr><td>O-9999</td><td rowspan="2">ALL-PROG.TXT (NOTE 3)</td><td rowspan="2">All programs in the CNC memory</td></tr>
<tr><td>-9999</td><td rowspan="4">No relation</td></tr>
<tr><td>O</td><td>Same file name as program No. set by [O SET] (NOTE 2)</td><td>Program in the CNC memory set by [O SET]</td></tr>
<tr><td rowspan="3">O</td><td>–</td><td rowspan="3">File name set by [F NAME]</td><td>Currently selected main program (NOTE 1)</td></tr>
<tr><td>-9999</td><td>All programs in the CNC memory</td></tr>
<tr><td>O</td><td>Program in the CNC memory set by [O SET]</td></tr>
</table>

O : Specified
– : Not specified

NOTE
1 If a file is undergoing background editing, it is output.
2 The output file name consists of “O” followed by a 4-digit number.
If a program whose program No. is 1 is output, for example, it is output under the file name “O0001” to the host computer.
If this operation is performed for path 2, the file name is suffixed with the file extension “P-2” (for this example, “O0001.P-2”).
3 If this operation is performed for path 2, the file name “ALL-PROG.P-2” is used.

5.4.1.3 Inputting special characters

Using bits 4 (SI1) and 5 (SI2) of NC parameter No. 13115 enables special characters and lowercase letters, which are not available on the MDI keypad, to be entered.
Setting this NC parameter displays soft key [CHA-EXT]([CHARA EXT]). Pressing this soft key displays the following soft keys:



Pressing soft key [ABC/abc] switches between uppercase and lowercase characters for input. Which case can be currently input is indicated in the key input field.

Uppercase letter input ↔ Lowercase letter input

Related NC parameters

	#7	#6	#5	#4	#3	#2	#1	#0
13115			SI2	SI1				

[Input type] Parameter input
[Data type] Bit

 # 4 SI1 Soft key input of the characters shown below is:
0: Disabled.
1: Enabled.
< > ¥ % $! ~ : " '

 # 5 SI2 Soft key input of the characters shown below and switching between the uppercase and lowercase input modes by a soft key are:
0: Disabled.
1: Enabled.
( ) ? * & @ _

5.5 RESTART OF THE EMBEDDED ETHERNET

Communication using the embedded Ethernet can be restarted.

Procedure

1 Press the function key 

.

2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)

3 Press soft key [EMBED] or [PCMCIA], press soft key [COMMON], and then press [(OPRT)] to display soft key [RESTART].

4 Pressing soft key [RESTART] resets embedded Ethernet communication and then restarts it.

NOTE
1 Pressing soft key [RESTART] forcibly interrupts communication even when it is in progress.
2 This function makes a restart by software. An actual restart may be impossible under some conditions.

5.6 MAINTENANCE SCREEN FOR EMBEDDED ETHERNET FUNCTION

With the embedded Ethernet function, a dedicated maintenance screen is available.
The maintenance screen enables operations to be checked when the embedded Ethernet function operates abnormally.

Displaying and operating the PING screen

Procedure

1 Press the function key 

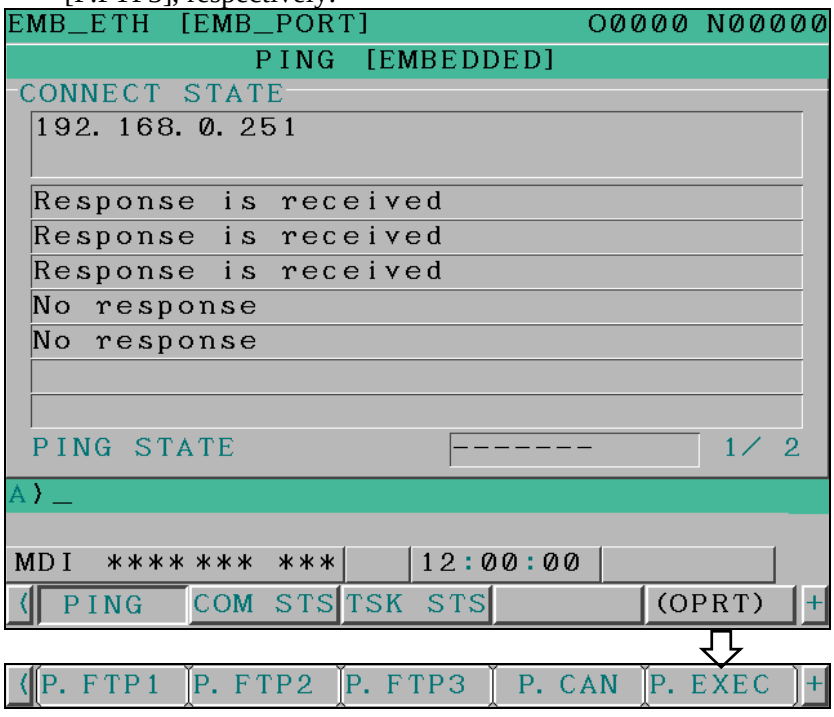
.

2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)

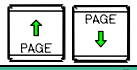
3 By pressing the [EMBED] soft key, the Ethernet Setting screen for the embedded Ethernet is displayed.
By pressing the [PCMCIA] soft key, the Ethernet Setting screen for the PCMCIA Ethernet card can be set.

4 Press soft key [PING] and then press [(OPRT)].

5 To send the PING command to connection destination 1 for FTP file transfer, press soft key [P.FTP1]. Similarly, to send the PING command to connection destination 2 or 3, press [P.FTP2] or [P.FTP3], respectively.



PING connection status screen

6 To send the PING command to the desired destination, enter the address of the destination on the PING setting screen. (Page keys  are used for switching.)

PING connection setting screen

7 After entering the address and the repeat count, press the soft key [P.EXEC]. The specified number of PING commands are sent to the specified destination.

8 To cancel the PING command currently being sent, press soft key [P.CAN].

Displaying Communication status screen

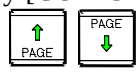
Procedure

1 Press the function key 

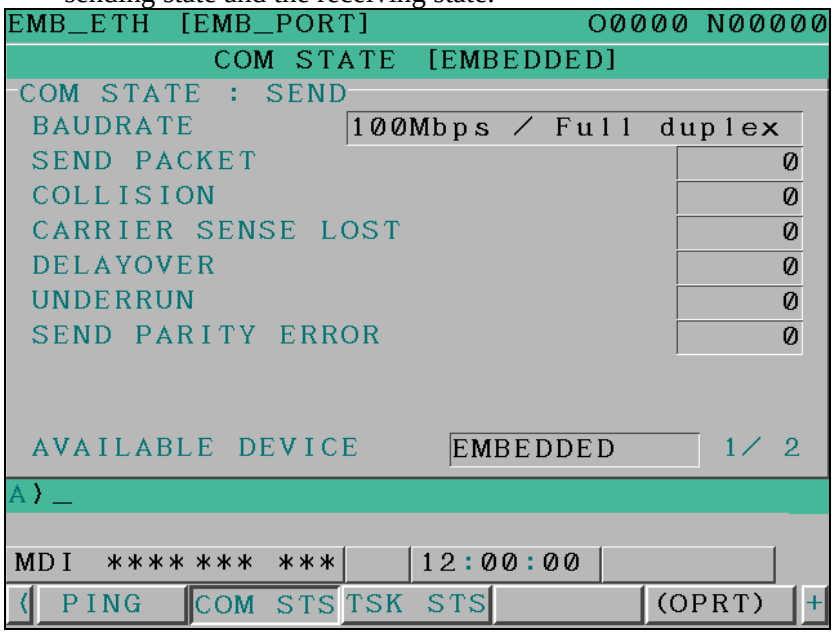
.

2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)

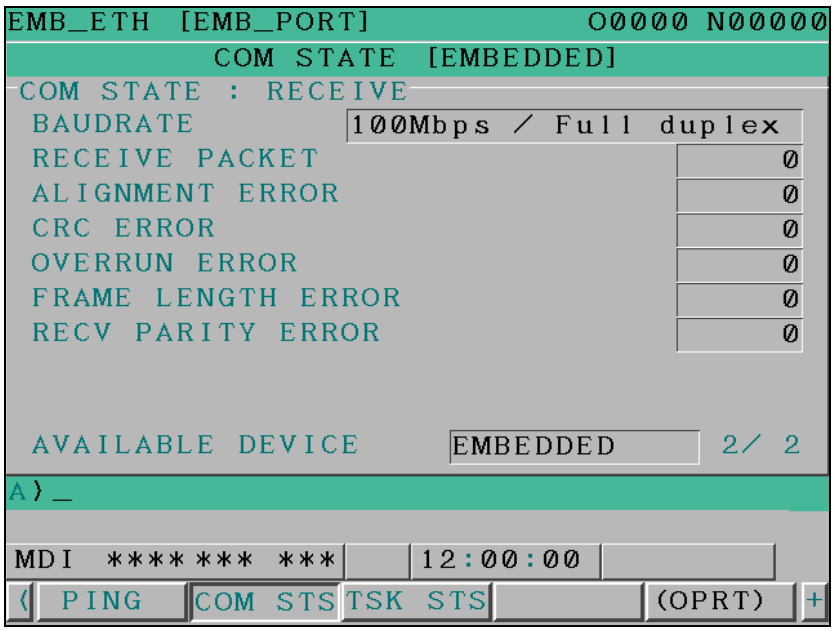
3 By pressing the [EMBED] soft key, the Ethernet Setting screen for the embedded Ethernet is displayed.
By pressing the [PCMCIA] soft key, the Ethernet Setting screen for the PCMCIA Ethernet card can be set.

4 To display the communication status of the embedded Ethernet, press soft key [COM STS].
Page keys 

can be used to switch between the sending state and the receiving state.



Communication status screen (1st page)



Communication status screen (2nd page)

Display items

Display item	Explanation
BAUDRATE	Indicates the communication speed and communication mode. Communication speed: 100 or 10 Mbps Communication mode: Full or half duplex --------: Not connected to HUB
SEND PACKET	Indicates the number of packets sent.
COLLISION CARRIER SENSE LOST DELAYOVER UNDERRUN SEND PARITY ERROR	Indicate the number of errors detected during packet transmission.
RECEIVE PACKET	Indicates the number of packets received.
ALIGNMENT ERROR CRC ERROR OVERRUN ERROR FRAME LENGTH ERROR RECV PARITY ERROR	Indicate the number of errors detected during packet reception.

Displaying Task status screen

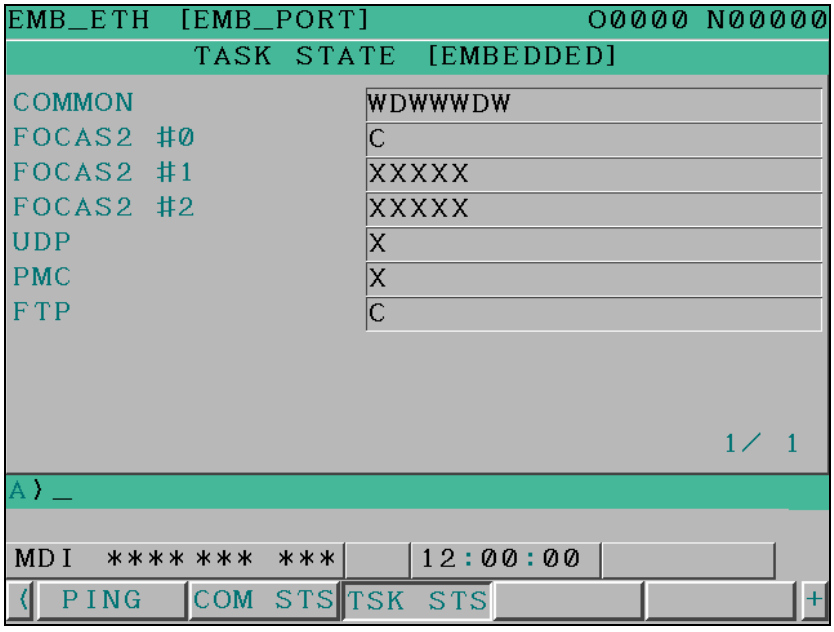
Procedure

1 Press the function key  .

2 Soft keys [EMBED] and [PCMCIA] appear.
(When there is no soft keys, press the continue key.)

3 To display the Ethernet Setting screen for the embedded Ethernet port or the PCMCIA Ethernet card, press soft key [EMBED] or [PCMCIA], respectively.

4 Pressing soft key [TSK STS] causes the task status of the embedded Ethernet function to be displayed.



Task status screen

The following symbols are used.

	Symbol and meaning
FOCAS2 #0 (FOCAS2/Ethernet)	C: Waiting for a connection from the host W: Data processing in progress (1) D: Data processing in progress (2) N: FOCAS2 out of service
FOCAS2 #1,#2 (FOCAS2/Ethernet)	W: Data processing in progress (1) D: Data processing in progress (2) X: Not yet executed
PMC (FANUC LADDER-III)	W: Data processing in progress (1) D: Data processing in progress (2) X: Not yet executed
UDP (CIMPLICITY *i*CELL)	W: Data processing in progress (1) D: Data processing in progress (2) X: Not yet executed
FTP (FTP file transfer function)	C: Execution wait W: Data processing in progress (1) D: Data processing in progress (2) X: Not yet executed

5.7 LOG SCREEN OF THE EMBEDDED ETHERNET FUNCTION

This screen displays the log of the embedded Ethernet function.

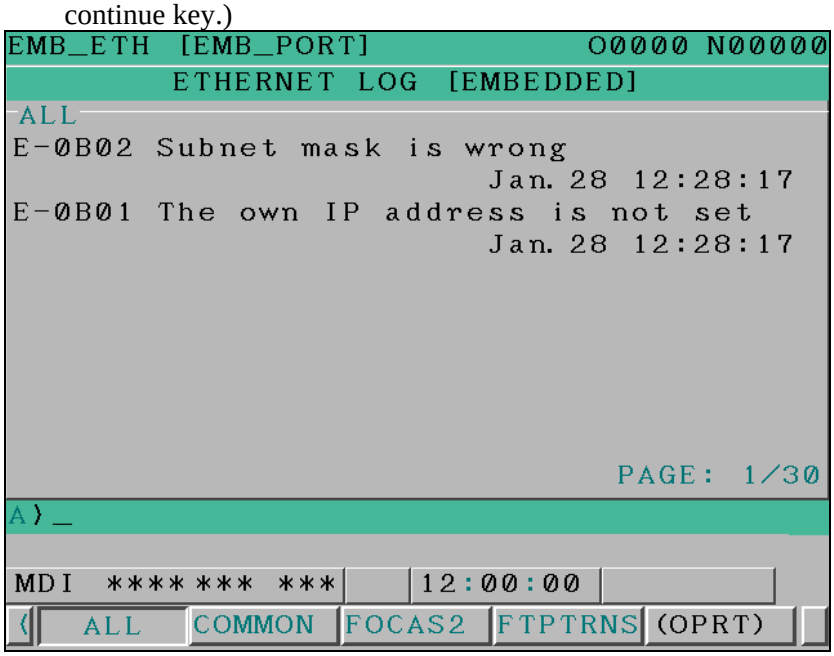
NOTE
If alarm SR2032, “EMBEDDED ETHERNET/DATA SERVER ERROR” is issued during data transfer using the embedded Ethernet function, check the error details on the log screen of the embedded Ethernet function.

Displaying the log screen

Procedure

1 Press the function key  .

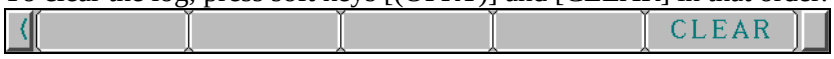
2 To display the log screen for the embedded Ethernet port or PCMCIA Ethernet card, press soft key [EMB LOG] or [PCM LOG], respectively. (When there is no soft keys, press the continue key.)



LOG screen

The newest error log appears at the top of the screen. The date and time when an error occurred are displayed at the right end of the line. The format of date and time data is “MMM.DD hh:mm:ss” where MMM represents a month, DD represents a day, hh represents hours, mm represents minutes, and ss represents seconds.
The date and time of the upper item shown above is January 28, 12:28:17.

To clear the log, press soft keys [(OPRT)] and [CLEAR] in that order.



The log for each function can be displayed by using soft keys on the embedded Ethernet log screen.

(1) Soft key [ALL]
Displays all log related to the embedded Ethernet.

(2) Soft key [COMMON]
Displays the log related to the parameter settings of the embedded Ethernet function and the basic communication function.

(3) Soft key [FOCAS2]
Displays the log related to the FOCAS2/Ethernet function.

(4) Soft key [FTPTRNS]
Displays the log related to FTP file transfer.

Error and message

Error No.	Log message	Description and necessary action
E-0118 E-0119	Error occurred while wait for FOCAS2 pdu	A communication error has occurred because of any of the following: → The network quality has been lowered to such a level that data cannot be received from a PC at the other end. The communication channel has been logically shut down. → Software running on a PC at the other end has logically shut down the communication channel. → The Ethernet cable has been disconnected.
E-011A	All communication paths are busy	All the FOCAS2/Ethernet communication channels are busy.
E-0200	Received message from FTP server	A message sent by the FTP server is directly displayed.
E-0202	Connection failed with FTP server	Software of the FTP server may not be running. Start the software of the FTP server.
E-0207	The router is not found	The specified IP address of the router may be wrong. Alternatively, the router may be turned off. Check whether the IP address of the router has been correctly specified and whether the router is turned on.
E-0208	The FTP server is not found	The specified IP address of the FTP server may be wrong. Alternatively, the FTP server may be turned off. Check whether the IP address of the FTP server has been correctly specified and whether the FTP server is turned on.
E-020B	Cannot login into FTP server	Check whether a correct user name and password are specified when logging into the FTP server.
E-020C	The parameters of FTP server are wrong	Check whether a correct user name and password are specified when logging into the FTP server.
E-020D	Changing a work folder of host failed	Check the work folder logging into the FTP server.

Error No.	Log message	Description and necessary action
E-041A	Frame transmission failed (TCP)	A communication error has occurred because of any of the following: → The network quality has been lowered to such a level that data cannot be received from a PC at the other end. The communication channel has been logically shut down. → Software running on a PC at the other end has logically shut down the communication channel. → The Ethernet cable has been disconnected.
E-0901	Cannot read MAC address	The MAC address is not written in the hardware. Alternatively, the hardware has been damaged.
E-0A06	Network is too busy	An excessive amount of data is flowing over the network. One possible solution is to divide the network.
E-0B00	The own IP address is wrong	Specify a correct IP address in the designated format.
E-0B01	The own IP address is not set	Specify an IP address.
E-0B02	Subnet mask is wrong	Specify a correct subnet mask in the designated format.
E-0B03	Subnet mask is not set	Specify a subnet mask.
E-0B04	Router IP address is wrong	There may be class disagreement between the IP address of the local node and the IP address of the router.
E-0B05	IP address of DNS server is wrong	There may be class disagreement between the IP address of the local node and the IP address of the DNS server.
E-0B06	The own host name is wrong	Check whether a correct host name is specified.
E-0B07	The own domain name is wrong	Check whether a correct domain name is specified.
E-0B08	TCP port number is wrong	A value beyond the permissible setting range may be specified.
E-0B09	UDP port number is wrong	A value beyond the permissible setting range may be specified.
E-0B0B	IP address of remote FTP server is wrong	Specify a correct IP address in the designated format.
E-0B0B	IP address of remote FTP server is wrong	Specify a correct IP address in the designated format.
E-0B0C	Port No of a remote FTP server is wrong	A value beyond the permissible setting range may be specified.
E-0B0D	User name of remote FTP server is wrong	The specified user name may contain a prohibited character.
E-0B0E	Password of remote FTP server is wrong	The specified password may contain a prohibited character.
E-0B0F	Login folder of remote FTP srv is wrong	The specified log-in folder name may contain a prohibited character.
E-0B18	Cannot set because DHCP is available	To allow a set-up, disable the DHCP client function.
E-0B19 E-0B1A	Embedded Ethernet hardware isn't found	The software or hardware of embedded Ethernet function cannot be recognized. Check whether the software has been incorporated. Check whether the hardware is sound.
E-XXXX	(No message)	An internal error has occurred. Make a notification of the error number.