Notice:

Omron products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

Danger: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution: Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage.

Omron Product References

All Omron products are capitalized in this manual. The word Unit is also capitalized when it refers to an Omron product, regardless of whether or not it appears in the proper name of the product.

The abbreviation Ch, which appears in some displays and on some Omron products, often means word, and may be abbreviated Wd in documentation in this sense.

The abbreviation PLC means Programmable Controller.

Visual Aid

The following visual aid appears in the left column of the manual.

Note: Indicates information of particular interest for efficient and convenient operation of the product.

Contents

4 Web Service Settings and Operation

5 Mail Service Settings and Operation

1

Introduction

1-1 Outline

The following three varieties of Open Network Controller Optional Software are available:

- ISaGRAF Target Software
- Web Service
- Mail Service

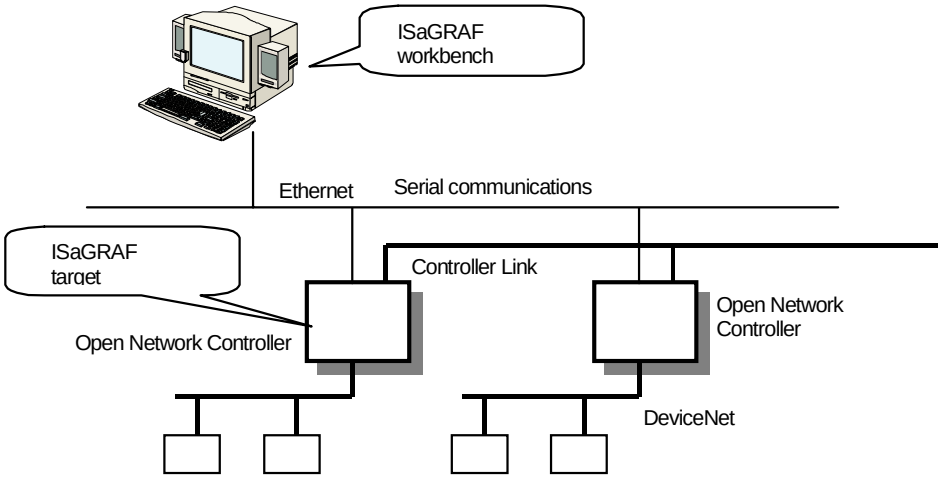
The above Optional Software all run on the Open Network Controller.

The functional outline of the Optional Software is explained below.

ISaGRAF Target Software

By adding an ISaGRAF target to the Open Network Controller, the Open Network Controller can be used as a soft PLC target machine. The ISaGRAF target executed on the Open Network Controller controls the I/O through the EventMemory of FinsGateway.

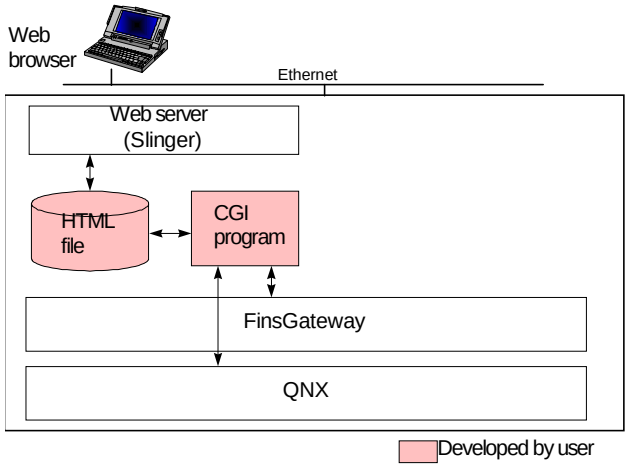
The devices that can be accessed through the EventMemory are DeviceNet, Controller Link, and SYSMAC Board. (Separate drivers are not needed for each device.) The ISaGRAF workbench is connectable through Ethernet or serial communications.



Web Service

Using the Web Service, the Open Network Controller can be accessed through a computer on the network with a web browser. (Microsoft Internet Explore 4.0 or newer is recommended). The Web Service main functions are the following:

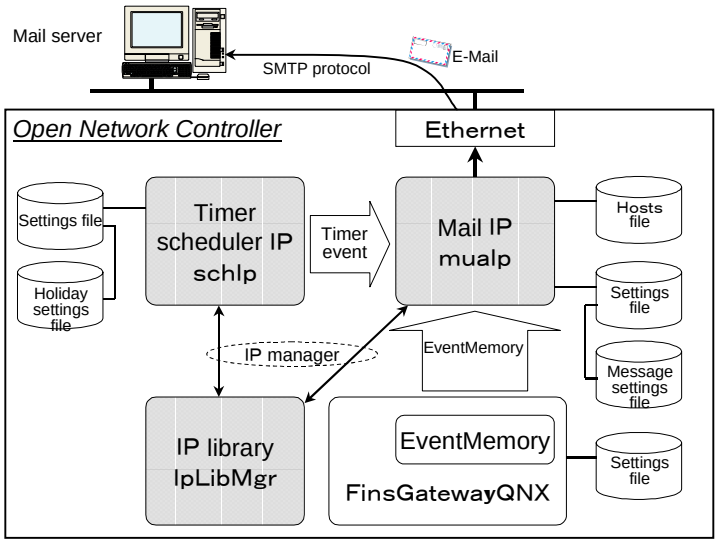
- The Open Network Controller settings can be read/written, the controller can be rebooted, etc. (Open Network Controller maintenance functions) through a web browser.
- By using the web browser to send FINS commands, the network I/O can be accessed. (FinsGateway utilities allow access to the network I/O connected to the Open Network Controller.)



Mail Service

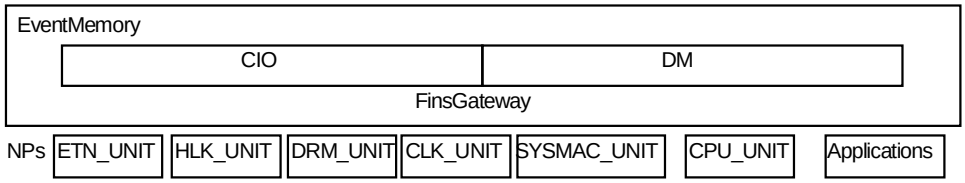
Using the Mail Service and e-mail, the Open Network Controller event data can be sent to a computer on the network. When the specified event occurs in the Open Network Controller, the Mail Service sends an e-mail in the specified format. The following two types of events can be specified. Up to 16 can be set:

- Timer event (interval, 1-shot)
- Memory event (FinsGateway QNX EventMemory event)



Open Network Controller Software Configuration

The Optional Software uses the Open Network Controller FinsGateway and EventMemory as shown below:



CPU_UNIT	CPU_UNIT provides function of a CPU Unit in a PLC. The variables in event memory can be read and written from personal computers and other devices on the networks by sending FINS commands.
EventMemory	The variables in event memory can be allocated to slave I/O on a DeviceNet network, to data links on a Controller Link network, or to I/O memory for the SYSMAC Board.
NP	NP stands for network provider. The network providers function as Communications Units to provide network software services. Data is read or written by sending FINS commands to the NPs or by sending FINS commands to connected devices through the NPs. ETN_UNIT: The Ethernet NP HLK_UNIT: The C-mode and CV-mode Host Link (SYSMAC WAY) and CompoWay/F NP DRM_UNIT: The DeviceNet NP CLK_UNIT: The Controller Link NP SYSMAC_UNIT: The SYSMAC Board connection NP
FinsGateway	FinsGateway performs communications between CPU_UNIT and the NPs, communications between NPs, and FINS routing. It also manages the event memory.

For details regarding the configuration, etc. of each of the above software, refer to the Open Network Controller Operation Manual, Chapter 2.

1-2 Product Configuration

Summary

The Open Network Controller Optional Software is available in the following two packages:

Part number	Product name	Outline
ITNC-TG1Q-F	ISaGRAF Target Software	Inculdes an ISaGRAF target, I/O board, sample program
ITNC-WE1Q-F	Web & Mail Service	Includes the Web Service and Mail Service.

The configuration of each product is shown below. Confirm that each product is complete before proceeding further.

ITNC-TG1Q-EF (ISaGRAF Target Software)

The following is included in the box with the ITNC-TG1Q-F (ISaGRAF Target Software). Confirm all these items before proceeding:

Item	Quantity
IsaGRAF Target Software Installation Disk	1 floppy disk
Operation Manual	1
IsaGRAF runtime license sticker	1
QNX IsaGRAF runtime license sticker	1
Caution sticker	1
Usage Release (IsaGRAF Target Software)	1
Registration postcard	1

ITNC-WE1Q-EF (Web & Mail Service)

The following is included in the box with the ITNC-WE1Q-F (Web & Mail Service). Confirm all these items before proceeding:

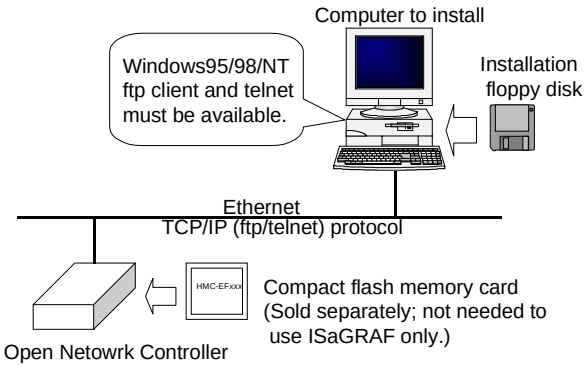
Item	Quantity
Web & Mail Service Installation Disk	1 floppy disk
Operation Manual	1
Caution sticker	1
Usage Release (Web & Mail Service)	1
Registration postcard	1

2

Installation

2-1 Before Installing

The following hardware and software is required to install and operate the ISaGRAF Target Software, Web Service, and Mail Service. Confirm that these are all available before beginning the installation process:



Computer

Item	Specifications
OS	Microsoft Windows95/98/NT
Network	Ethernet
Software	ftp client, or telnet software
Floppy disk drive	1.44Mbyte, 2HD

Open Network Controller

Must have a QNX-format compact flash card. (Not required for using ISaGRAF Target Software only.) For details regarding the formatting and mounting of the compact flash card, refer to the Open Network Controller Operation Manual Chapter 3-9.

Network Environment

The computer and the Open Network Controller must be networked with Ethernet, and ftp or telnet must be available. If they are not networked with Ethernet, refer to the Open Network Controller Operation Manual, Chapter 3 to connect and set them properly.

To use the Web Service, the computer must have a web browser installed. (Microsoft Internet Explore 4.0, or newer is recommended.)

2-2 Installing

Installation Procedure

The same procedure must be followed to install the ISaGRAF Target Software, Web Service, or Mail Service to the Open Network Controller. The example here describes the installation of the Web Service.

To use the Web Service or Mail Service, the Open Network Controller must have a compact flash card (8MB, or more; QNX format). The compact flash card is sold separately. The files related to the Web Service and Mail Service are installed to the compact flash card.

If the compact flash card is not QNX format, refer to the Open Network Controller Operation Manual Chapter 3-9 to format it for QNX.

To use only the ISaGRAF Target Software, the compact flash card is not required.

1. Insert the installation disk into the computer floppy disk drive.

2. Use the ftp (client) software of the computer to log into the Open Network Controller as **root**. The default password is OMRON.

3. Use the ftp software binary mode to transfer the oncweb100.taz file from the installation disk to the Open Network Controller /usr/tmp/ directory.

- To install the ISaGRAF Target Software, transfer the ¥target¥oncisa100.taz file.
- To install the Mail Service, transfer the oncmail100.taz file.

4. Connect to the Open Network Controller from the computer using telnet, and log in as **root**. The default password is OMRON.

5. Move to the directory with the taz file.

#**cd /usr/tmp** ↵

6. Convert the file to a tar format.

#**gunzip oncweb100.taz** ↵

Specify oncisa100.taz for ISaGRAF Target Software.

Specify oncmail100.taz for Mail Service.

The tar file will be generated (for Web Service, oncweb100.tar).

7. Extract the tar file just generated.

#**tar –xvf oncweb100.tar** ↵

Specify oncisa100.tar for ISaGRAF Target Software.

Specify oncmail100.tar for Mail Service.

Each file will be copied into the appropriate directory as the tar file is extracted properly.

This completes the installation process. Delete the tar file (onc*100.tar) after the extraction is completed properly.

Example: #rm oncweb100.tar ↵

Refer to the appropriate chapter for the software installed, to perform all the required settings, as follows:

- ISaGRAF Target Software: Chapter 3
- Web Service: Chapter 4
- Mail Service: Chapter 5

Installation Files/Directories

The files installed, and the directories are shown below for each product:

ISaGRAF Target Software

Compressed filename	Filename	Description	Directory
¥target¥ oncisa100.taz	isaker	Kernel task	/usr/isagraf/bin/
	isatst	Serial communication task	
	isanet	Ethernet communication task	
	omisa	Initial settings file	
	isastart	Priority settings file	
	oncisa	Startup file	

The Open Network Controller I/O boards, and sample program shown below are installed using the ISaGRAF workbench Archive. For I/O boards and sample program installation details, refer to Chapter 3-3.

Directory	Filename	Description	Installation by workbench
¥Japan¥iobrd ¥English¥iobrd	ombi**.bia	Boolean input board	I/O boards are restored as archives.
	ombo**.bia	Boolean output board	
	omwi**.bia	Analog input board	
	omwo**.bia	Analog output board	
¥Japan¥sample ¥English¥sample	omsample.pia	Sample software	Project is restored as an archive.

Web Service

Compressed filename	Filename	Description	Directory
oncweb100.taz	slinger	Web server	/usr/ucb/slinger
	*.html	Html file	/hd/usr/web/*.html
	*.shtml	shtml file	/hd/usr/web/*.shtml
	*.cgi	cgi file	/hd/usr/web/cgi-bin/*.cgi

/hd: directory on compact flash card

Mail Service

Compressed filename	Filename	Description	Directory
oncmail100.taz	SchIp	Timer scheduler IP	/usr/FgwQnx/bin/schIp
	IpLibMgr	IP library	/usr/FgwQnx/bin/ipLibMgr
	FgwQnxSch.ini	Timer scheduler IP settings file	/etc/FgwQnx/FgwQnxSch.ini
	FgwQnxSchHoliday.ini	Timer scheduler IP holiday settings file	/etc/FgwQnx/FgwQnxSchHoliday.ini
	muaIp	Mail IP	/hd/usr/mail/bin/muaIp
	FgwQnxMua.ini	Mail IP settings file	/hd/usr/mail/etc/FgwQnxMua.ini
	FgwQnxMuaMsg.ini	Mail IP message settings file	/hd/usr/mail/etc/FgwQnxMuaMsg.ini

/hd: directory on compact flash card

The Web & Mail Service installation disk contains a Nonsupport folder. This folder includes sample software to use Microsoft Visual Basic, Microsoft Office to monitor the Open Network Controller EventMemory (CIO, DM) through a network.

Details for using the files in the Nonsupport folder are described in the Open Network Controller Technical Support Web Site. Access to the web site is described on page 4-18.

3

ISaGRAF Settings and Operation

3-1 ISaGRAF Outline

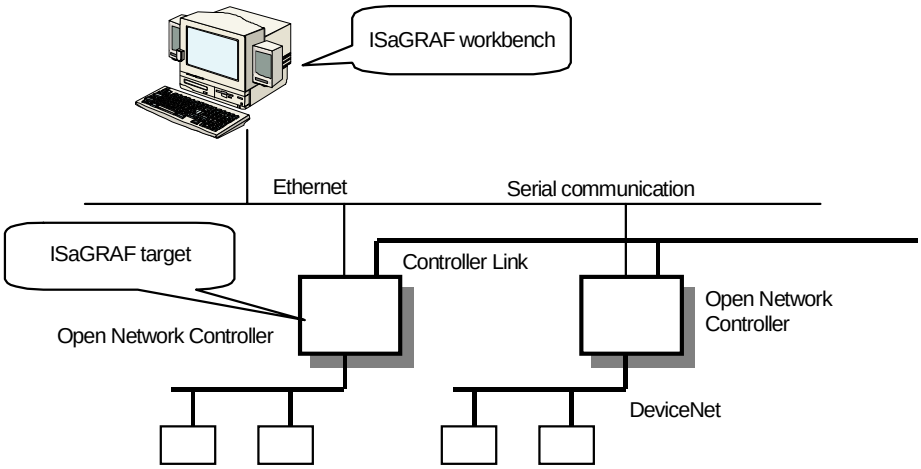
Functional Summary

By adding an ISaGRAF target to the Open Network Controller, the Open Network Controller can be used as a software PLC target machine.

The ISaGRAF targets executed in the Open Network Controller all control the I/O through the FinsGateway shared memory area, EventMemory.

The devices that can be accessed through the EventMemory are DeviceNet, Controller Link, and SYSMAC Board. (Separate drivers are not required for each device.)

Ethernet or serial communication can be used to connect to the ISaGRAF workbench.



Device	EventMemory and I/O data allocation	Mapping settings file, or Setting Utility
DeviceNet	DeviceNet master I/O area and mapping	/etc/FgwQnx/FgwQnxDrm.ini /etc/FgwQnx/scanlist.ini
Controller Link	Data link settings done by mapping	Controller Link support software
SYSMAC Board	Data link settings done by mapping	/etc/FgwQnx/FgwQnxSysmacMapping.ini

ISaGRAF Variables and Allocation Example

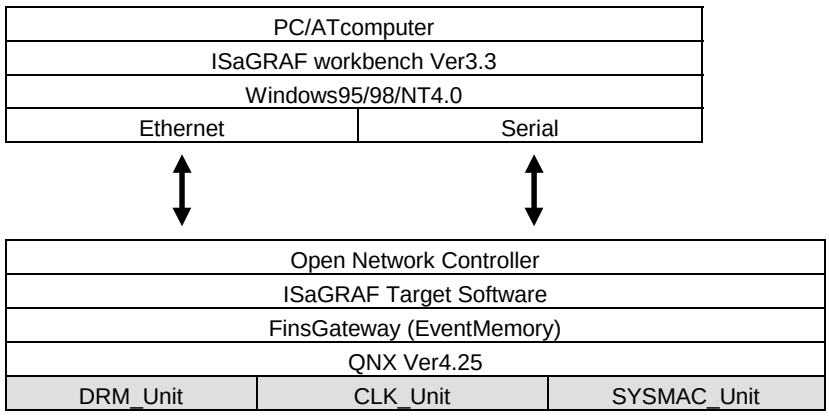
ISaGRAF variable to EventMemory to each type of data link

ISaGRAF variables	Output variable	→	CIO	1900 to	→	OUT	DeviceNet
	Input variable	←		2000 to	←	IN	
	Output variable	→	DM	0000 to	→	OUT	Controller Link
	Input variable	←		1000 to	←	IN	

Each device can be used from the ISaGRAF through the EventMemory I/O board.

Software Configuration

The following shows the relationship between the Open Network Controller ISaGRAF target software configuration, and the computer ISaGRAF workbench.



The shaded area NP can access the I/O through the EventMemory.

EventMemory and actual I/O allocation (mapping) is performed with the Setting Utility. It is done using the ONC_wizard. For details about the ONC_wizard, refer to the Open Network Controller Operation Manual, Chapter 4-3.

Installation Outline

To use the ISaGRAF with the Open Network Controller, the following software must be installed. Install each software while referring to the Chapters indicated:

Item	Description	Location	Chapter
ISaGRAF Target Software*	Software PLC (runtime)	Open Network Controller	2-2, 3-2
ISaGRAF workbench	Programming Utility	Computer	3-3
I/O board	Device driver	Computer	3-3

*The settings file must be edited to use the ISaGRAF Target Software with the Open Network Controller. Refer to the following explanation.

3-2 Editing the Settings Files

To use the ISaGRAF target with the Open Network Controller, the following two settings files must be edited:

- /etc/config/sysinit.1
- /usr/isagraf/bin/omisa

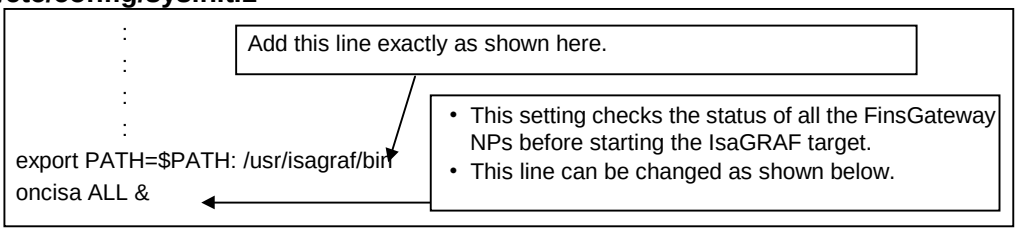
Note: If the ISaGRAF target is not yet installed, refer to Chapter 2 to install it.

To edit the settings file, log into the Open Network Controller using telnet, and use the vi editor.

Editing the Startup File (/etc/config/sysinit.1)

To use the ISaGRAF target with the Open Network Controller, add the following two lines to the /etc/config/sysinit.1 file.

/etc/config/sysinit.1



Meaning and Setting of the oncisa Line

The second line above (oncisa) checks the FinsGateway NP status before starting the ISaGRAF target. If the FinsGateway NP has been started properly, it starts the ISaGRAF target. If the FinsGateway NP has not been started properly, the ISaGRAF target is not started.

Setting oncisa ALL & as shown above, monitors all the NPs registered under Services in the /etc/FgwQnx/FgwQnx.ini file. To specify which services should be monitored, use the settings shown below:

Format

oncisa NP &

Enter the NP as follows:

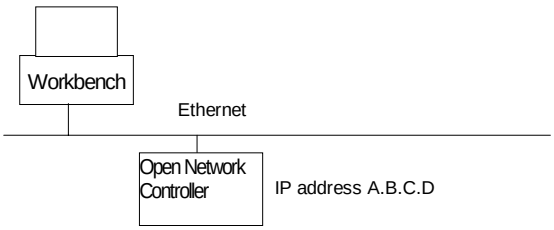
NP	Text
CPU_Unit	FGW-CPU
DRM_Unit	FGW-DRM
CLK_Unit	FGW-CLK
Sysmac_Unit	FGW-SYSMAC
ETN_Unit	FGW-ETN
HLK_Unit	FGW-HLK0, FGW-HLK1

Setting Example

Setting Example	Meaning
oncisa FGW-DRM &	Check only DRM_Unit
oncisa FGW-DRM FGW-CLK &	Check DRM_Unit and CLK_Unit
oncisa FGW-DRM FGW-ETN FGW-SYSMAC &	Check DRM_Unit, ETN_Unit, Sysmac_Unit
oncisa &	No check

Editing the Startup Settings File (/usr/isagraf/bin/omisa)

The startup settings file (/usr/isagraf/bin/omisa) is used to set the kernel task and communication tasks for the ISaGRAF. For the system configuration shown below, the startup settings file does not require editing. It can be used with the default settings.



The ISaGRAF workbench and Open Network Controller are connected 1:1 with Ethernet.

For a serial connection, or to connect multiple ISaGRAF workbenches or multiple Open Network Controllers, edit the /usr/isagraf/bin/omisa file.

/usr/isagraf/bin/omisa

```
cd /usr/isagraf/bin
isastart 24 isaker -s=1 &
isastart 20 isanet -t=1100 -s=1 -c=1 &
#stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1
#isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &
```

Used for serial connections.
Remove the # at the beginning of the line to make it valid.

Meaning of Each Line

cd /usr/isagraf/bin	ISaGRAF path setting (Do not modify.)
isastart 24 isaker -s=1 &	Kernel task (isaker) startup 24: priority 24 -s=1: slave 1
isastart 20 isanet -t=1100 -s=1 -c=1 &	Ethernet communication task (isanet) startup 20: priority 20 -t=1100: Ethernet port number 1100 -s=1: slave 1 -c=1: communication task number 1
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1	COM port 1 settings 19200bps, 8 bits, 1 stop bit, no parity
Isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &	Serial communication task (isatst) startup 20: priority 20 -t=/dev/ser1: COM port number 1 -s=1: slave 1 -c=2: communication task number 2

Settings Range

Item	Setting Range
Task priority	1 to 29
Slave number	1 to 32 (not 13)
Communication task number	1 to 32
Ethernet port number	1100, 1101, …
COM port number	Ser1 (COM1) , ser2 (COM2)

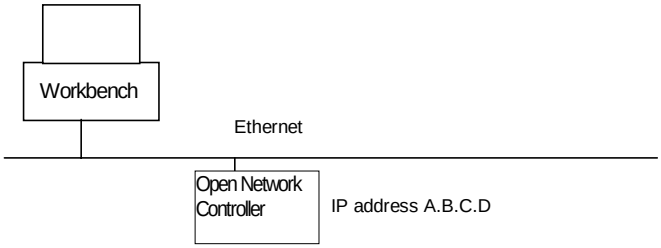
One kernel task, and up to two communIcatIon tasks can be started.

Set the same slave number for all the tasks.

When starting two communication tasks, use different values for the communication task numbers.

Target Startup Settings Example

Example 1: Workbench:Open Network Controller = 1:1 (Ethernet)



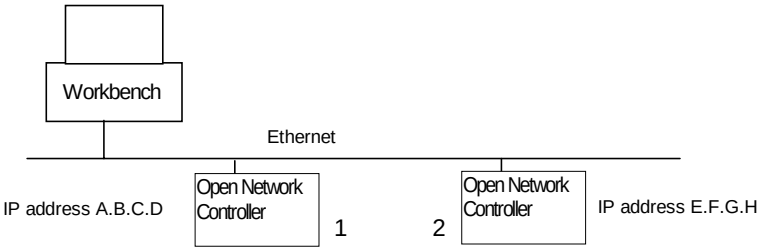
Startup File omisa (default settings)

```
isastart 24 isaker -s=1 &
isastart 20 isanet -t=1100 -s=1 -c=1 &
#stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1
# isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &
```

ISaGRAF Workbench Settings

Target slave number	1
Communication port	Ethernet (IP address A.B.C.D), port number 1100

Example 2: Workbench:Open Network Controller = 1: 2 (Ethernet)



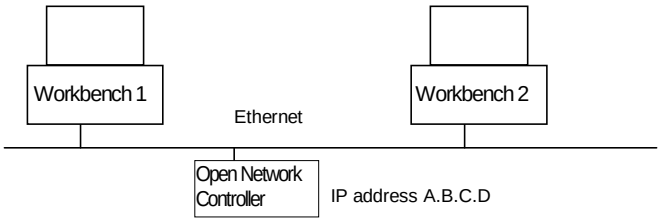
Startup File omisa (Open Network Controller 1 and 2 default settings)

```
isastart 24 isaker -s=1 &
isastart 20 isanet -t=1100 -s=1 -c=1 &
#stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1
# isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &
```

ISaGRAF Workbench Settings

Target Slave	1 (Open Network Controllers 1, 2)
Open Network Controller 1 communication port	Ethernet (IP address A.B.C.D), port number 1100
Open Network Controller 2 communication port	Ethernet (IP address E.F.G.H), port number 1100

Example 3: Workbench:Open Network Controller = 2: 1 (Ethernet)



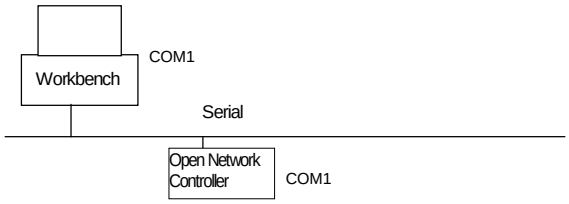
Startup File omisa (starts two communication tasks)

```
isastart 24 isaker -s=1 &
isastart 20 isanet -t=1100 -s=1 -c=1 &
isastart 20 isanet -t=1101 -s=1 -c=2 &   ←add (port number 1101, logical number 2)
#stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1
# isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &
```

ISaGRAF Workbench Settings

Target slave number	1 (ISaGRAF workbenches 1, 2)
Workbench 1 communication port	Ethernet (IP address A.B.C.D) , port number 1100
Workbench 2 communication port	Ethernet (IP address A.B.C.D) , port number 1101

Example 4: Workbench:Open Network Controller = 1: 1 (serial port 1)



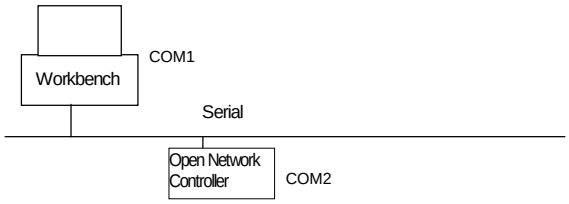
Startup File omisa (serial communication task startup with /dev/ser1)

```
isastart 24 isaker -s=1 &
#isastart 20 isanet -t=1100 -s=1 -c=1 &          ←Add # to the beginning of the line.
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1   ←Delete # from the beginning of the line.
isastart 20 isatst -t=/dev/ser1 -s=1 -c=1 &      ←Delete # from the beginning of the line,
                                                    set logical number to 1
```

ISaGRAF Workbench Settings

Target slave number	1
Communication port	COM1, default settings (19200, None, 8 bits,1 stop, None)

Example 5: Workbench:Open Network Controller = 1:1 (serial port 2)



Startup File omisa (serial communication task startup with /dev/ser2)

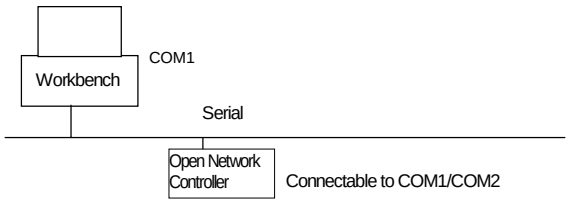
```
isastart 24 isaker -s=1 &
# isastart 20 isanet -t=1100 -s=1 -c=1 &          ←Add # to the beginning of the line.
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser2   ←Delete # from the beginning of the
                                                       line, and change to /dev/ser2
isastart 20 isatst -t=/dev/ser2 -s=1 -c=1 &      ←Delete # from the beginning of the
                                                    line, set logical number to 1,
```

and change to /dev/ser2

ISaGRAF Workbench Settings

Target slave number	1
Communication port	COM1, default settings (19200, None, 8 bits, 1 stop, None)

Example 6: Workbench: Open Network Controller = 1:1 (serial port 1/port 2)



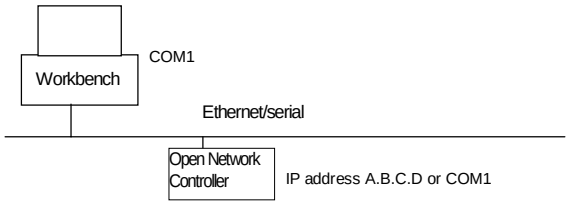
Startup File omisa (starts two serial communication tasks)

```
isastart 24 isaker -s=1 &
# isastart 20 isanet -t=1100 -s=1 -c=1 &      ←Add # to the beginning of the line.
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1      ←Delete # from the
                                                          beginning of the line.
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser2      ←Add line: /dev/ser2
isastart 20 isatst -t=/dev/ser1 -s=1 -c=1 &      ←Delete # from the beginning of the
                                                          line, set logical number to 1,
isastart 20 isatst -t=/dev/ser2 -s=1 -c=2 &      ←Add line:   /dev/ser2, set logical
                                                          number to 2
```

ISaGRAF Workbench Settings

Target slave number	1
Communication port	COM1, default settings (19200, None, 8 bits, 1 stop, None)

Example 7: Workbench: Open Network Controller = 1:1 (Ethernet/serial port 1)



Startup File omisa (starts Ethernet or serial communication task)

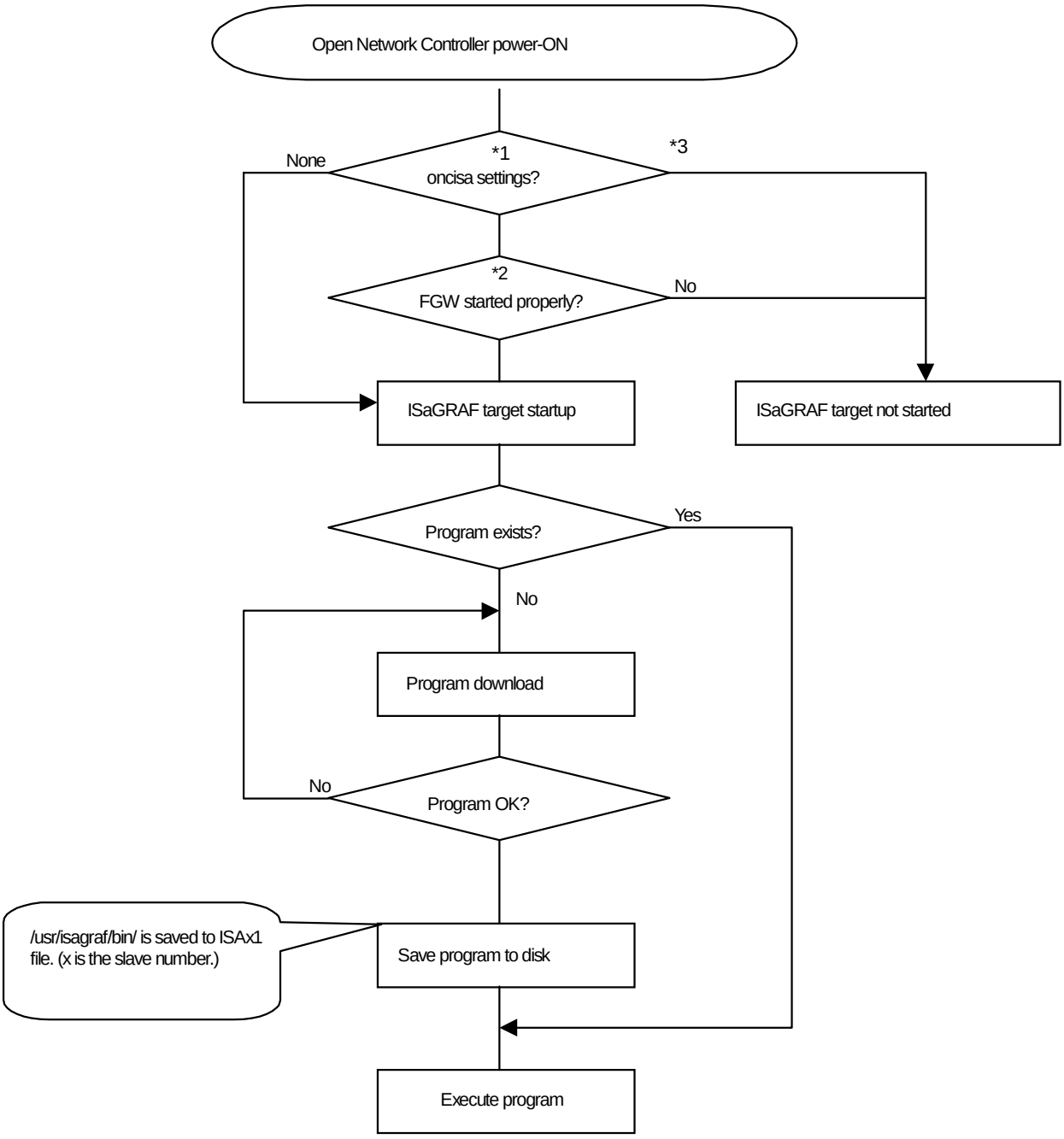
```
isastart 24 isaker -s=1 &
isastart 20 isanet -t=1100 -s=1 -c=1 &
stty baud=19200 bits=8 stopb=1 par=none < /dev/ser1      ←Delete # from the
                                                          beginning of the line.
isastart 20 isatst -t=/dev/ser1 -s=1 -c=2 &              ←Delete # from the
                                                          beginning of the line.
```

ISaGRAF Workbench Settings

Target slave number	1
Serial communication port	COM1, default settings (19200, None, 8 bits, 1 stop, None)
Ethernet communication port	Ethernet (IP address A.B.C.D), port number 1100

ISaGRAF Target Startup Flow

The flow chart from Open Network Controller power-ON to program execution is as follows:



*1: No oncisa settings means that the /etc/config/sysinit.1 file contains the line oncisa & (no NP is checked before starting the ISaGRAF target).

*2: Checks the NPs specified in the /etc/config/sysinit.1 oncisa line.

*3: If the oncisa line is not entered properly.

3-3 Installation to the Computer

Installing the ISaGRAF Workbench

To install the ISaGRAF workbench, refer to the manual included with the ISaGRAF workbench.

Note: To use the ISaGRAF Target Software, the ISaGRAF workbench Ver3.3 (made by CJ International) is required.

Installing the I/O Board

Before installing the I/O board, confirm that the ISaGRAF workbench Ver3.3 installation is completed normally. Install the I/O board as follows:

1. Insert the installation floppy disk into the computer with the ISaGRAF workbench already installed.

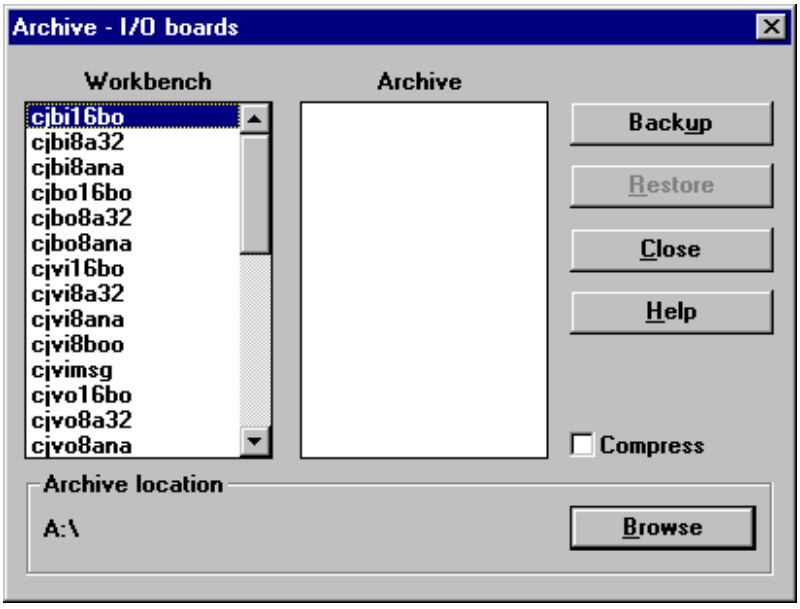
Note: Temporarily release the write-protect on the installation floppy disk.

2. Select Start | Program | ISaGRAF 3.3 | Library to start the ISaGRAF-Library window.

3. In the ISaGRAF-Library window, select File | Other Library | I/O Board.

4. Select Utility | Archive.

The following Archive - I/O boards dialog box will be displayed



5. Click the Browse button and select the A:¥English¥iobrd directory. Then click OK.

The focus will return to the Archive - I/O boards dialog box.

6. Select all the I/O boards on the Archive side, and click the Restore button.

All the I/O boards will be copied to the Workbench.

This completes the I/O board installation.

Installing the Sample Project

The following is the sample project installation procedure. Follow this procedure to use the sample project for reference:

1. Insert the installation floppy disk into the computer with the ISaGRAF workbench already installed.

Note: Temporarily release the write-protect on the installation floppy disk.

2. Select Start | Program | ISaGRAF 3.3 | Project to start the ISaGRAF-Project Management window.

3. In the ISaGRAF-Project Management window, select Utility | Archive | Project.

The Archive-Project dialog box will be displayed.

4. Click the Browse button and select the A:¥English¥sample directory. Then click OK.

The focus will return to the Archive-Project dialog box.

5. Select omsample on the Archive side, and click the Restore button.

The sample project will be copied to the Workbench.

This completes the sample project installation.

For sample project details, refer to Chapter 3-5.

3-4 Using the I/O Boards

The functions of the I/O boards are explained here. The I/O boards are the drivers that provide the connection between the variables and the EventMemory (CIO, DM). The Omron I/O boards must be installed in order to connect the variables set in the ISaGRAF workbench and the EventMemory.

I/O Boards

The followIng I/O boards are provided:

Name	I/O Points	Data Type	I/O
ombi16	16 points	Boolean	Input
ombo16	16 points	Boolean	Output
ombi32	32 points	Boolean	Input
ombo32	32 points	Boolean	Output
ombi64	64 points	Boolean	Input
ombo64	64 points	Boolean	Output
omwi1	1 word	Analog	Input
omwo1	1 word	Analog	Output
omwi10	10 words	Analog	Input
omwo10	10 words	Analog	Output
omwi128	128 words	Analog	Input
omwo128	128 words	Analog	Output

Access Areas

The I/O boards can access the following areas:

EventMemory (CIO/DM)

Type	Address
1: CIO	Words 0 to 8191
2: DM	Words 0 to 32766

Note: Neither the EventMemory CIO, or DM can be backed up in the event of a power-outage.

- The offset (address) range that can be specified is the default range for FinsGateway. This range can be changed in the FinsGateway settings (/etc/FgwQnx/FgwQnx.ini).
- 16 I/O points corresponds to 1 word.
- Input and output I/O boards can be allocated to the same offset (address).
- Analog and Boolean boards can also be allocated to the same offset (address).
- The EventMemory CIO, and DM can both be accessed with Boolean boards.

Note: The ISaGRAF handles analog data (integers) as 32 bits, but the EventMemory access is in 16-bit data units. As a result, the ISaGRAF lower 16 bits are accessed in the EventMemory.

I/O Board Settings Example

Settings Example 1: Use ombi32 to enter data to CIO 0 to 1 (2 words).

Type 1
Address 0
The ombi32 I/O board is a 32-point (2 words) board.

Settings Example 2: Use omwo10 to output DM 10 to 19 (10 words).

Type 2
Address 10

Settings Example 3: Impossible setting

Be sure the offset (address) + number of words does not exceed the EventMemory area.

The following example setting would excced the DM area (0 to 32766), and would not function properly.
Use omwi128
Type 2
Offset (Address) 32641

Offset (Address) + number of words - 1 = 32641 + 128 - 1
= 32768

Creating a User-defined I/O Board

It is possible to use an analog I/O board to make a new I/O board with the desired number of words. (Boolean boards cannot be modified.) The maximum number of words possible is 128. The following I/O boards can be used to create a user-defined I/O board.

Name	I/O Points	Data Type	I/O
omwi1	1 word	Analog	Input
omwo1	1 word	Analog	Output

ModIfy the I/O board as follows:

1. In the ISaGRAF-Library window, select one of the above I/O boards to copy. Modify the settings of the copy. Do not modify the original.

Note: If the settings of the original I/O board are ever modified by mistake, re-install the board using the Archive - I/O board dialog box.

2. Use the I/O Board Parameters dialog box to modify the number of words, and make a new analog I/O board.

Caution: Do not change any parameter other than the number of words. Operation is not guaranteed with any other changes.

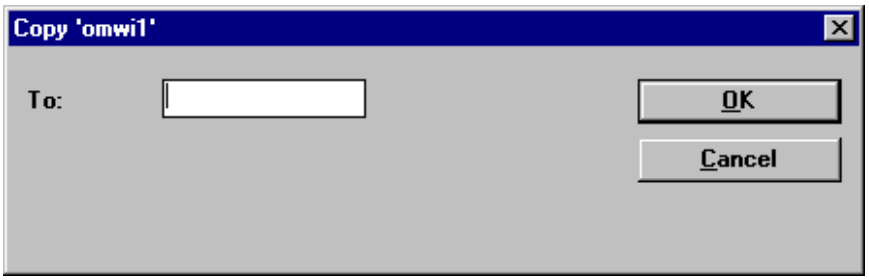
Example

This example shows the procedure for copying omwi1, and making an analog I/O board with 50 input words.

1. In the ISaGRAF-Library window, Select File | Other Library | I/O board.

2. Click on omwi1, then select File | Copy.

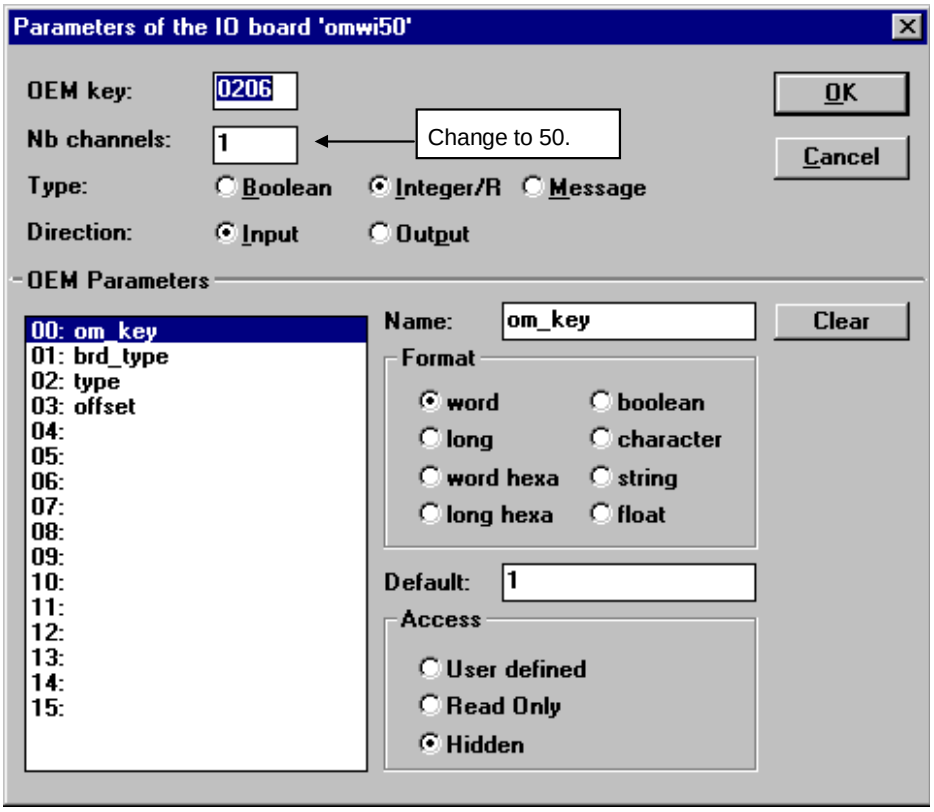
The following dialog box will be displayed.



3. After entering omwi50, Click the OK button.

4. Double-click omwi50 (or select omwi50, then select Edit | Parameters.

The following I/O Board Parameters dialog box will be displayed.

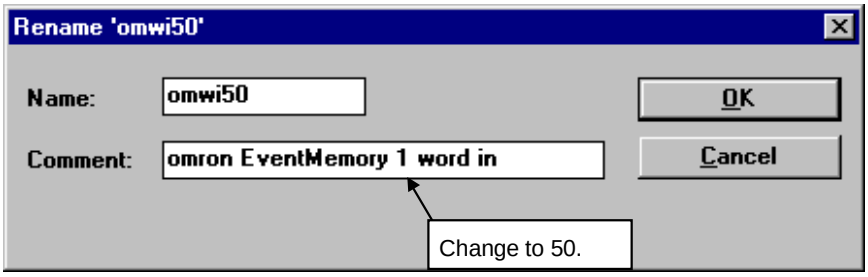


5. Change the number of words setting to 50, then click the OK button.

Caution: Do not change any parameter other than the number of words. Operation is not guaranteed with any other changes.

6. Select File | Rename.

The following Rename dialog box will be displayed.



7. Change the 1 to 50 in the Comment line.

This completes the user-defined I/O board.

I/O Board Allocation Example

Allocation with ISaGRAF Variables

The allocation relationship between the ISaGRAF variables, EventMemory, and the actual I/O is shown below:

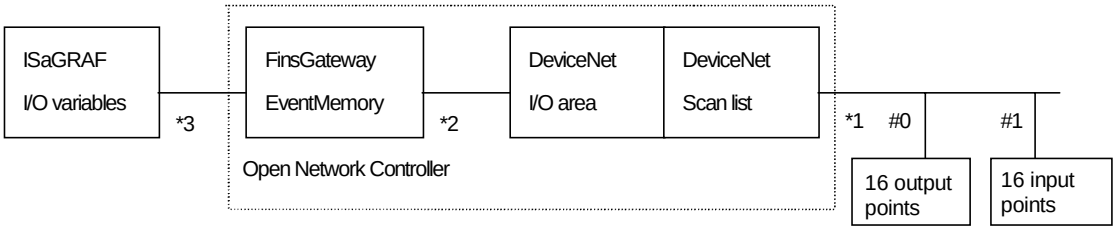
ISaGRAF variable		to	EventMemory		to	Actual I/O	
ISaGRAF variable	Output variable	→	CIO	1900~	→	OUT	DeviceNet
	Input variable	←		2000~	←	IN	
	Output variable	→	DM	0000~	→	OUT	Controller Link
	Input variable	←		1000~	←	IN	

Allocation with DeviceNet

The following example shows the allocation between the ISaGRAF target, EventMemory, and actual I/O for DeviceNet.

The allocation between the DeviceNet remote I/O data and EventMemory would be as follows:

#0 Output slave: 16 points at EventMemory CIO 1900 allocated to ISaGRAF output variable A
#1 Input slave: 16 points at EventMemory CIO 2000 allocated to ISaGRAF input variable B



The following three settings are required:

*1: The I/O area/remote I/O allocation is done with the scanlist.ini settings.

*2: The EventMemory/I/O area allocation is done with the FgwQnxDrm.ini settings.

*3: The ISaGRAF I/O variable/EventMemory allocation is done with the ISaGRAF workbench I/O connection.

Scan List registration (/etc/FgwQnx/scanlist.ini)

```
00,1,00,00,1,00,02 : #0   OutArea 1   offset (address) 0   2 bytes
01,1,00,02,1,00,00 : #1   InArea 1    offset (address) 0   2 bytes
```

Mapping to EventMemory (/etc/FgwQnx/FgwQnxDrm.ini)

```
#InAreaName1(EventMem Name)
InAreaName1=CIO
#InAreaOffset1(0-EventMem Size)
InAreaOffset1=2000
#InAreaSize1(0-128ch)
InAreaSize1=64

#OutAreaName1(EventMem Name)
OutAreaName1=CIO
#OutAreaOffset1(0-EventMem Size)
OutAreaOffset1=1900
#OutAreaSize1(0-128ch)
OutAreaSize1=64
```

ISaGRAF Workbench I/O Connection (Allocation with I/O variables)

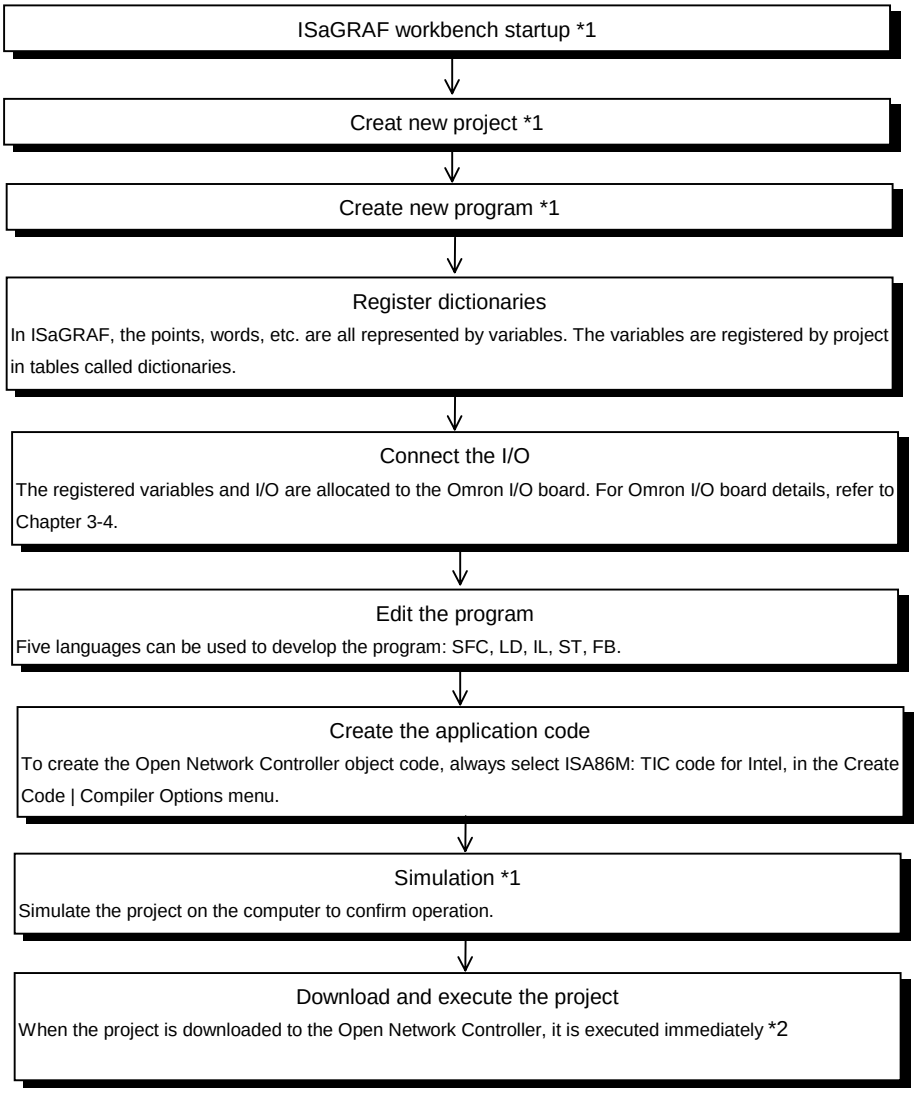
Output variable A: Type1 (CIO), offset (address) 1900
Input variable B: Type1 (CIO), offset (address) 2000
For details about I/O connection settings, refer to Chapter 3-5.

3-5 Creating a Project

This example uses the sample project shown on the following page to explain the basic development of an Open Network Controller project. The ISaGRAF workbench operations are not explained here. For ISaGRAF workbench details, refer to the ISaGRAF workbench manual, or the Online Manual.

Procedure

Create a project by the following procedure, and execute that project in the Open Network Controller:



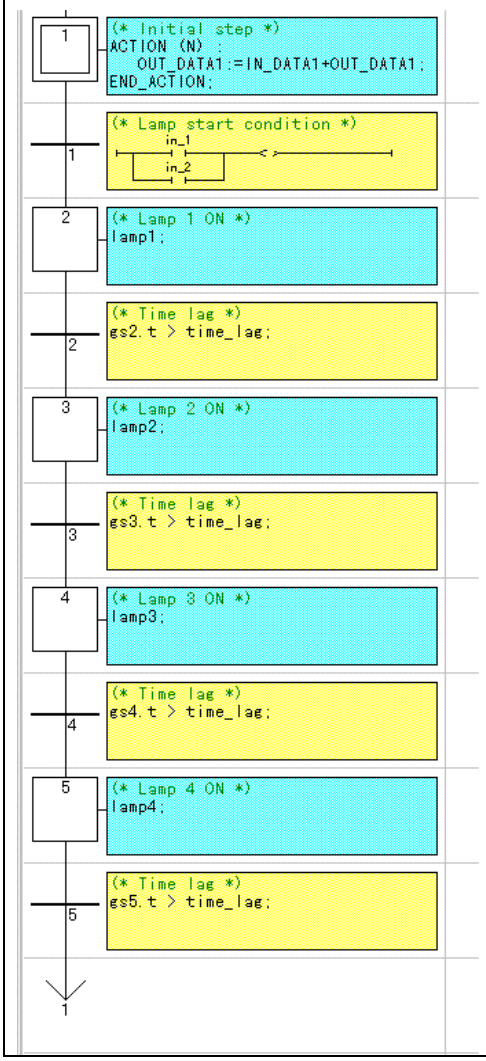
*1: For details about the procedures for these steps, refer to the ISaGRAF workbench manual, or the Online Manual.

*2: The default is that the program is executed immediately upon download, or Open Network Controller power-ON.
To change the setting so that it is not executed immediately upon download or Open Network Controller power-ON, refer to Chapter 3-6.

Project to Create

The program to create is omsample. It is included on the installation floppy disk. This program performs the following two operations:

- Analog input data is obtained, and added to the analog output data.
- When the lamp start condition (in_1 or in_2) is ON, lamp1 to lamp4 start to blink in order.



Step 1

In this step, the analog output data (OUT_DATA1) and the analog input data (IN_DATA1) are added, and the new value is entered into the analog output data (OUT_DATA1).
If transition 1 is not active, addition is always performed in this step.
If transition 1 is active, addition is performed in this step each time execution moves here.

Transition 1

When either the external start SW1 (in_1) or the internal start SW2 (in_2) is turned ON, lamp1 to lamp4 start to blink in order.

Step 2

Lamp1 is turned ON.

Transition 2

At the value set for the timer (default 1s) execution moves to step 2.

Step 3 to transition 5

Lamp2 to lamp4 are repeatedly turned ON.

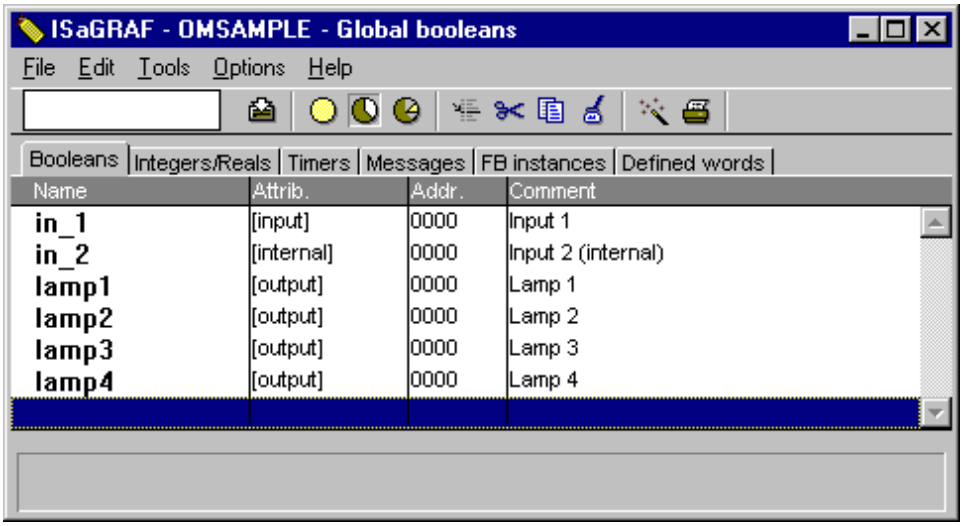
Jump 1

Jump to step 1.

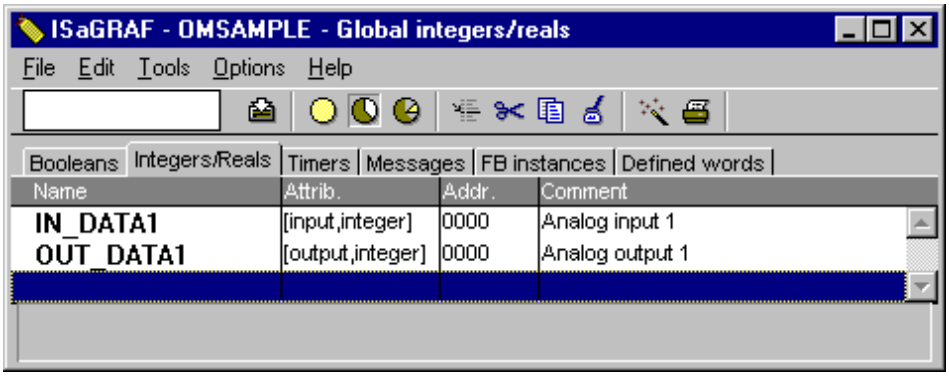
Dictionaries to Register

Register the following three dictionaries

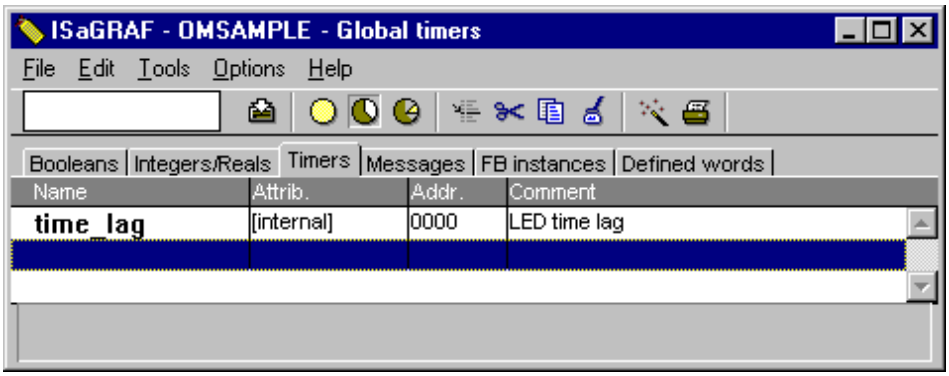
Boolean Variables



Integer/Real Number Variables



Timer Variables

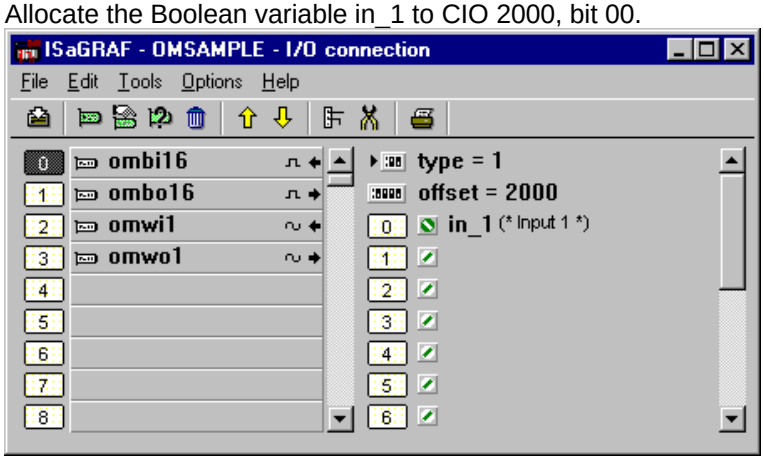


Connecting to I/O

Allocate the registered variables and EventMemory (Omron I/O board). For Omron I/O board details, refer to Chapter 3-4. Connect the following Omron I/O boards and the variables just registered.

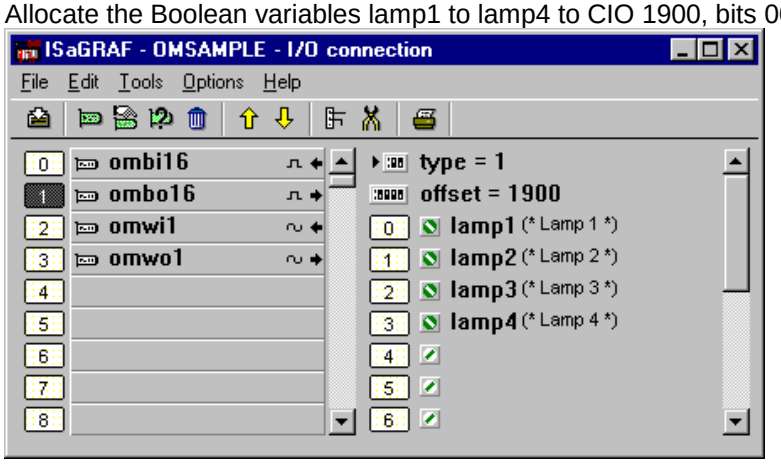
ombi16 (16-point Input Board)

Allocate the Boolean variable in_1 to CIO 2000, bit 00.



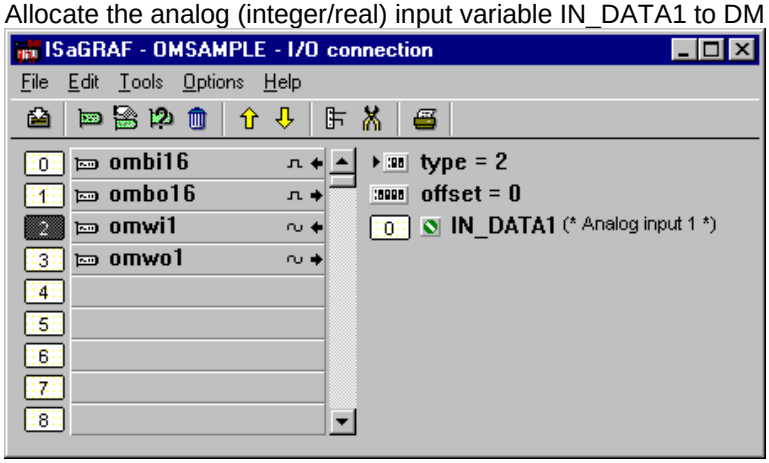
ombo16 (16-point Output Board)

Allocate the Boolean variables lamp1 to lamp4 to CIO 1900, bits 00 to 03.



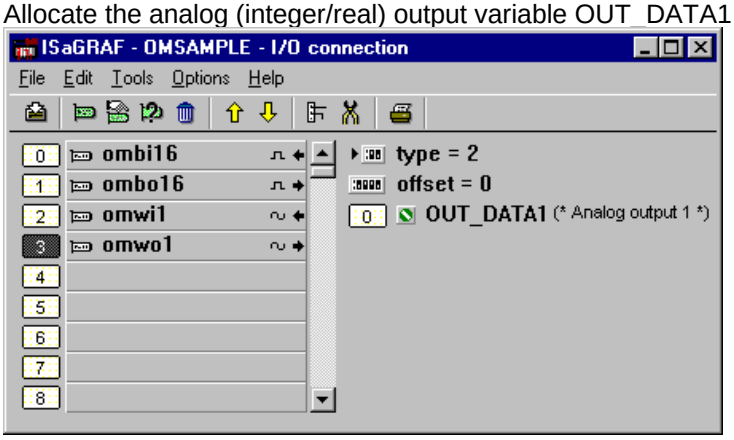
omwi1 (1-word Input Board)

Allocate the analog (integer/real) input variable IN_DATA1 to DM 0.



omwo1 (1-word Output Board)

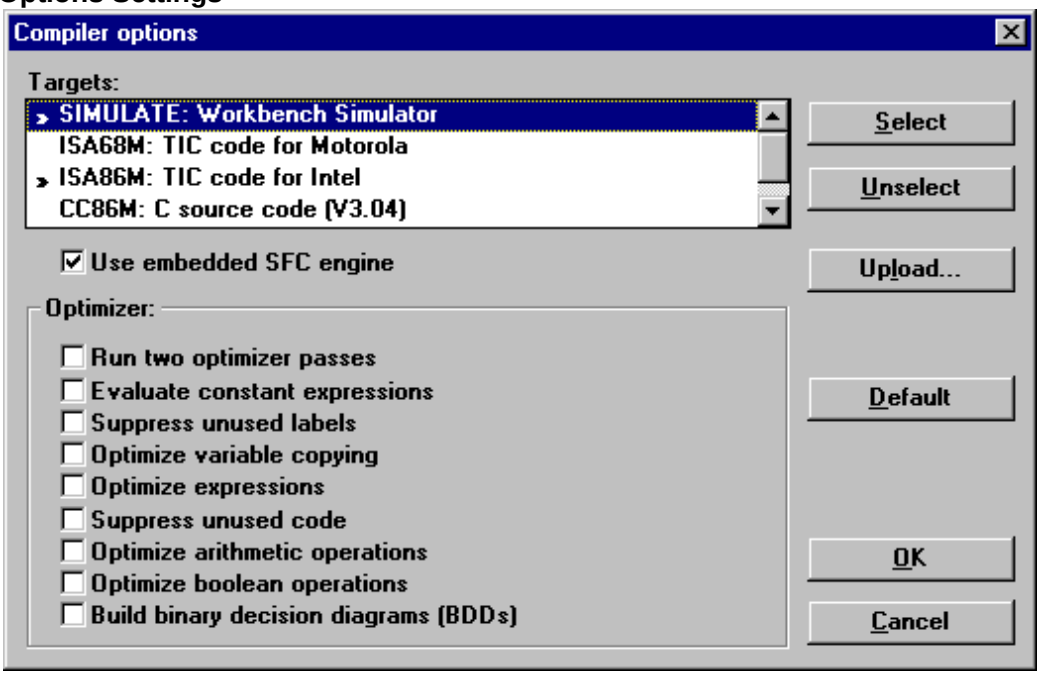
Allocate the analog (integer/real) output variable OUT_DATA1 to DM 0.



Creating the Application Code

To create code that can be executed on the Open Network Controller or workbench, the following two compiler options must be selected:

Compiler Options Settings



SIMULATE: Workbench Simulator	workbench for simulator
ISA86M: TIC code for Intel	for Open Network Controller

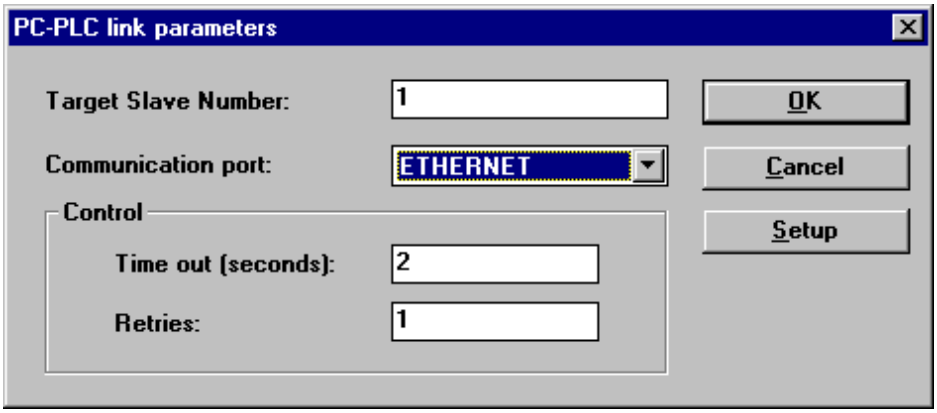
After making the above settings, execute Create Code | Create Application Code.

Download

Ethernet

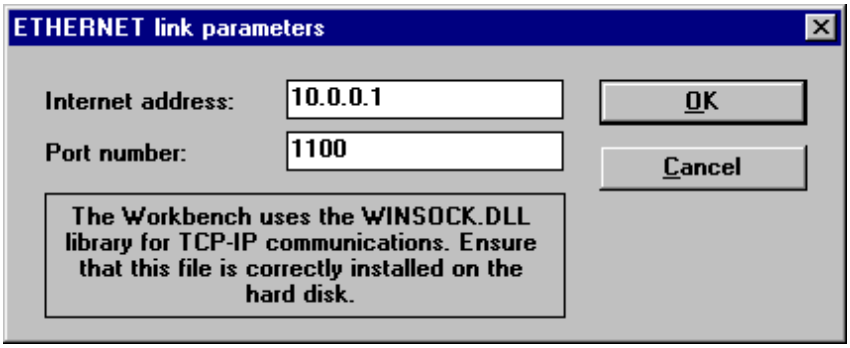
The following explanation assumes that the Open Network Controller ISaGRAF target functions properly, and the workbench application code creation has been done.

1. Select Debug | Link Setup, and set the Communication Port to ETHERNET.



The Open Network Controller default slave number is 1.

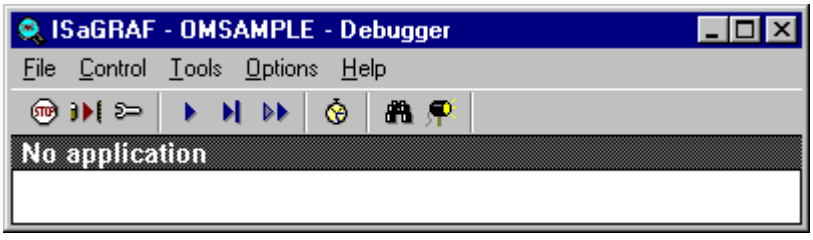
2. Click on Setup, and set the Open Network Controller IP address (example: 10.0.0.1) for the Internet Address.



The Open Network Controller default port number is 1100.

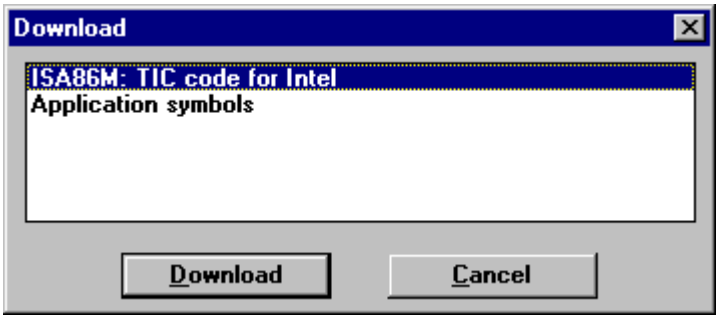
3. Select Debug | Debug.

It connects to the Open Network Controller, and displays the following screen.



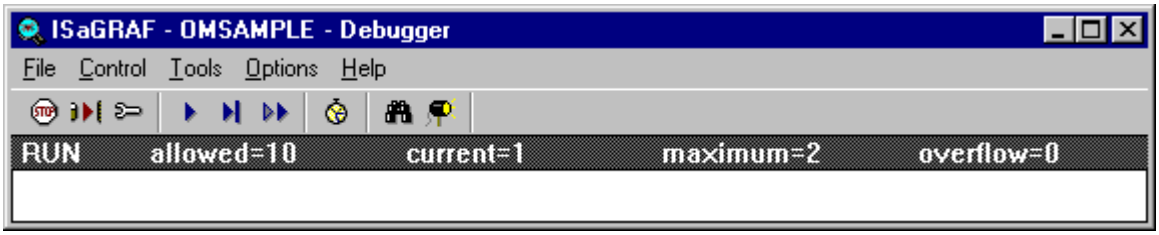
4. Select File | Download.

The following screen will be displayed.



5. Select ISA86M: TIC code for Intel, and click Download.

The following screen will be displayed.



The ISaGRAF default is to execute the program immediately after download, or at Open Network Controller power-ON. Refer to Chapter 3-6 for details about changing this setting.

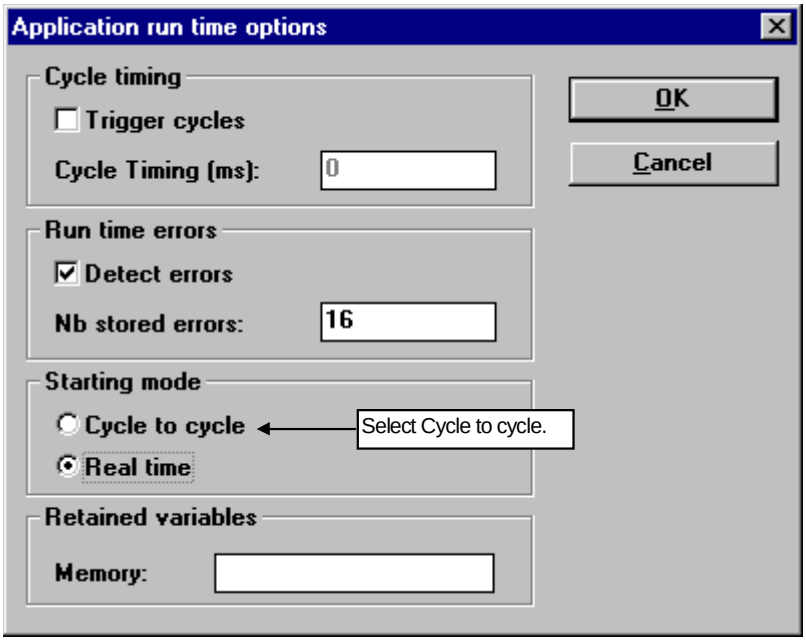
If the program downloaded to the Open Network Controller is slave number 1, it is registered as /usr/isagraf/bin/ISA11. (For slave number 2, it is ISA21.)

3-6 ISaGRAF Target Start Mode Setting

The ISaGRAF default is to execute the program immediately after download, or at Open Network Controller power-ON. To change this setting, use the following procedure in creating the application code.

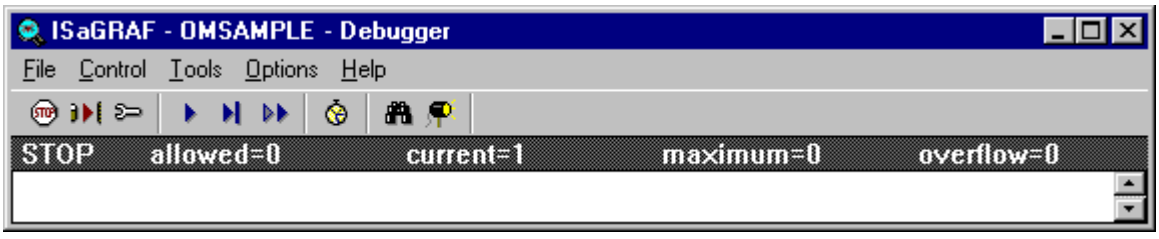
1. Select Create Code | Application Runtime Options.

The following screen will be displayed.



2. Change the Starting mode from Real time to Cycle to cycle, then click the OK button.

3. After performing the above setting, create the application code, and download. The program will be downloaded, but not executed, as shown below.



4. To execute the program, select Control | Real time.

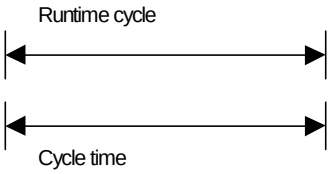
3-7 ISaGRAF Target Execution

The necessary precautions for setting the ISaGRAF target cycle time and priority settings are explained here.

Cycle Time Setting

The ISaGRAF workbench default is Cycle time: 0. In this case the runtime cycle is the same as the cycle time, and other applications (tasks) executed on the Open Network Controller have little or no time for processing.

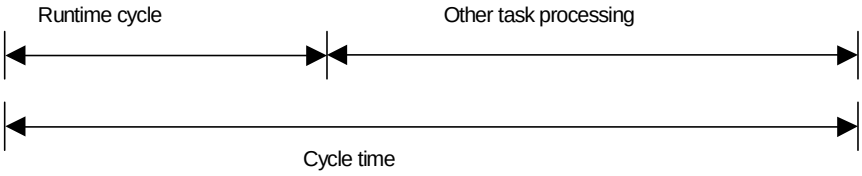
Cycle Time Setting < Runtime Cycle



In this situation, the telnet, ftp, Web Service, (any other services running on the Open Network Controller) may not accept key entry, or the response may be slow, etc. The ISaGRAF workbench communication may also be shut down, an overflow error may occur, etc.

To avoid the above errors, set the cycle time to be greater than the runtime cycle. Create the application code after adjusting this setting. This allows the runtime cycle to be shorter than the cycle time, which provides additional time for the other tasks to be performed.

Cycle Time Setting ＞ Runtime Cycle

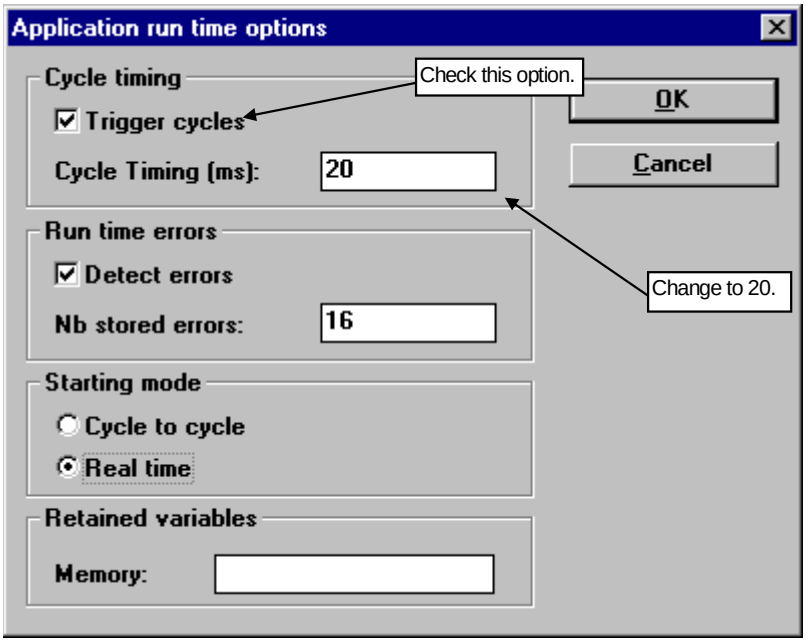


Set the cycle time as follows:

In this example, the cycle time is set to 20ms (the runtime cycle is set to 10ms).

1. Select Create Code | Application Runtime Options.

2. Check the trigger cycles box, and set the Cycle Timing to 20. The click the OK button.



3. After completing the above settings, create the application code, and download it.

Priority Settings

The Open Network Controller default is for the ISaGRAF target priorities (task order of priority) to be as follows:

/usr/isagraf/bin/omisa

isastart 24 isaker	(ISaGRAF kernel task	priority 24)
isastart 20 isanet	(ISaGRAF Ethernet communication task	priority 20)
isastart 20 isatst	(ISaGRAF Serial communication task	priority 20)

- These values can be edited, but the default values are recommended.
- If the default priority settings cause a problem, consider the entire system configuration and exercise extreme caution in modifying these values.
- If modifying, always be sure that kernel task ＞ communication task.
- If there is any question about the meaning of these priority settings, leave them at the default values.

3-8 Troubleshooting

The following describes probable causes for errors, countermeasures, and precautions for using the ISaGRAF.

ISaGRAF Errors

Error	Probable Cause and Countermeasure
The ISaGRAF workbench cannot be used on WindowsNT. (When going to debug, it shuts down.)	Modify the WS001 section of the isa.ini file in the exe directory of the ISAGRAF installation directory, as follows: For details, refer to the ISaGRAF workbench manual. [WS001] NT=1 ＜---Add Isa=C: ¥ISAWIN IsaExe=C: ¥ISAWIN¥EXE IsaApl=C: ¥ISAWIN¥APL IsaTmp=C: ¥ISAWIN¥TMP
When going to debug, it shuts down.	Communication conditions are not set properly. The workbench communication settings must be 19200bps, 8 bits, No parity, 1 stop bit. COM port is not set properly. Confirm the workbench communication settings COM port number. Confirm the cable being used. Confirm that ISA86M: TIC code for Intel was selected in the Compiler Options when creating the application code. FinsGateway does not start. Confirm that DIP switch 2, pin 1 is OFF, and restart the Open Network Controller.
Cannot download.	The total system load is too great. Use the following procedure to delete the downloaded program (/usr/isagraf/bin/ISA*1), then transfer it again. If the slave number is 1, the file name is ISA11; if the slave number is 2, the file name is ISA21. 1. Turn the Open Network Controller OFF, turn the DIP switch 2, pin 1 ON, then turn the Open Network Controller ON again. Login with telnet, and delete /usr/isagraf/bin/ISA*1, as follows: #**cd /usr/isagraf/bin**↵ #**rm ISA*1**↵ 2 Turn the power OFF, turn the DIP switch 2, pin 1 OFF, then turn the power ON. 3. Use the workbench to set the project cycle time to a large value, then download to the Open Network Controller.
Cannot upload.	If the download does not include the upload data, upload will not be possible. Communication conditions may not be set properly: 19200bps, 8 bits, No parity, 1 stop bit, No flow control
The I/O points are not refreshed, or the wrong points are output.	Confirm that the I/O board is connected properly when creating the program. Especially check that it is not set as internal variables.
Cannot simulate.	Confirm that SIMULATE: Workbench Simulator is selected in Create Code | Compiler Options when creating the application code.
Cannot write variables.	The I/O board connection is set as an input unit, or read-only area. Correct the setting.

3-9 Open Network Controller Error Codes

The Open Network Controller ISaGRAF target I/O board error messages are shown below. For explanation of the other ISaGRAF messages, refer to the ISaGRAF workbench Users' Guide.

Open Network Controller I/O Board Error Messages

Message	Code	Description	Countermeasure
Board type recognition error om_key	20600	I/O board library (om_key) value is invalid.	Confirm that the library is set properly.
Board type error brd_type	20601	I/O board library board type (brd_type) is invalid.	Confirm that the library is set properly.
Area type setting error type	20602	I/O board library area type is not DM/CIO (0, or 3, or greater).	Confirm the I/O connection parameters, and the library setting.
Address setting error offset	20603	I/O board library offset (address) + number of words exceeds 65535.	Confirm the I/O connection parameters, and the library setting.

3-10 Precautions

Consider the following points when using the ISaGRAF.

Precautions when Using ISaGRAF

- When using the ISaGRAF, do not change the Open Network Controller /etc/FgwQnx/FgwQnx.ini ticksize (500 μs).
- If the workbench communication gets cut off, or overflow is displayed, set the cycle time to a larger value.
- To allocate less than 16 points, use a 16-point I/O board. Allocating less than 16 points still occupies a full word.
- If a 16-point output board has unallocated points, those points will be written to 0.

Restrictions for Functions and Function Blocks

The following standard ISaGRAF functions and function blocks are not supported. (day_time, and binary file management functions)

FB Name	Description
day_time	Read the date and time.
f_ropen	Open a file in read mode.
f_wopen	Open a file in write mode.
f_close	Close a file.
f_eof	Find the end of the file.
fa_read	Read the integer values from the file.
fa_write	Write integer values to the file.
fm_read	Read text string from the file.
fm_write	Write text string to the file.

Other Restrictions

- The I/O boards are only the Omron boards that are restored during installation.
- MODBUS protocol is not supported.
- There is no backup function for the ISaGRAF variables during a power blackout.
- Timer resolution is 1ms.
- The Omron I/O boards cannot use the operate command.
- The target software must be ISaGRAF version 3.3, or equivalent.
- There is no particular limit to the size of the ISaGRAF user program. The limitations are determined by the Open Network Controller available disk space, and memory capacity. However, during uploads, the project data, etc. is added to the program data. The capacity available for the program data is consequently decreased.

4

Web Service Settings and Operation

4-1 Web Service Outline

Functional Outline

It is possible to access the Open Network Controller from the web browser of a computer on the network (Microsoft Internet Explorer 4.0 newer is recommended), using the Web Service. The Web Service has the following two main functions:

- Open Network Controller maintenance

  The web browser can be used to read/write the Open Network Controller settings, and reboot the Open Network Controller.

- Access to the Open Network Controller network I/O through the FinsGateway Utilities

  The web browser can be used to send FINS commands, and access the network I/O.

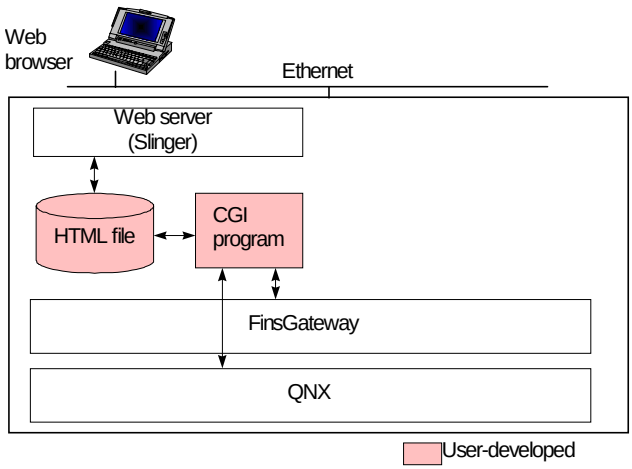
Note: For the web browser, Microsoft Internet Explorer 4.0, or newer is recommended.

Maintenance Functions

These functions are not providing web application functions. Web applications must be developed using HTML files or CGI modules. The Web Service supports maintenance functions by performing the Open Network Controller settings and sending FINS commands from the web browser.

Software Configuration

The Web Service software configuration is as shown below:



4-2 Web Service Confirmation (Accessing the Web Site)

It is necessary to access the Open Network Controller web site to check the operation of the Web Service. Use the following procedure:

For the web browser Microsoft Internet Explorer 4.0 newer is recommended.

Note: The Web Service must already be installed to perform this check.

1.After installing the Web Service, turning the Open Network Controller power ON will start the Open Network Controller.

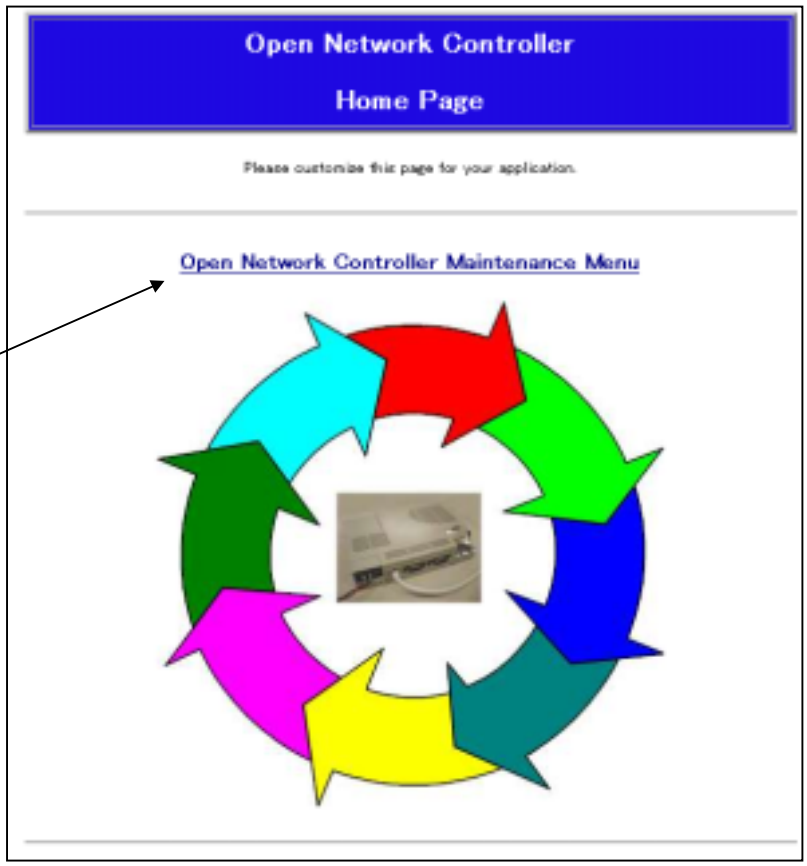
2. Confirm that the Open Network Controller starts (the RUN LED will light), and that the compact flash memory card is mounted (the CARD LED will light).

3. Start the web browser.

4. Specify the Open Network Controller IP address (or host name) + index.html as the URL in the browser, as shown below:

The Open Network Controller default IP address is 10.0.0.1, as shown above. If the IP address has been changed, enter the new IP address.

If the connection to the Open Network Controller is made, and the Web Server is operating properly, the following Open Network Controller home page will be displayed.



Clcik here to go to the Open Network Controller maintenance menu.

4-3 Web Service Operation

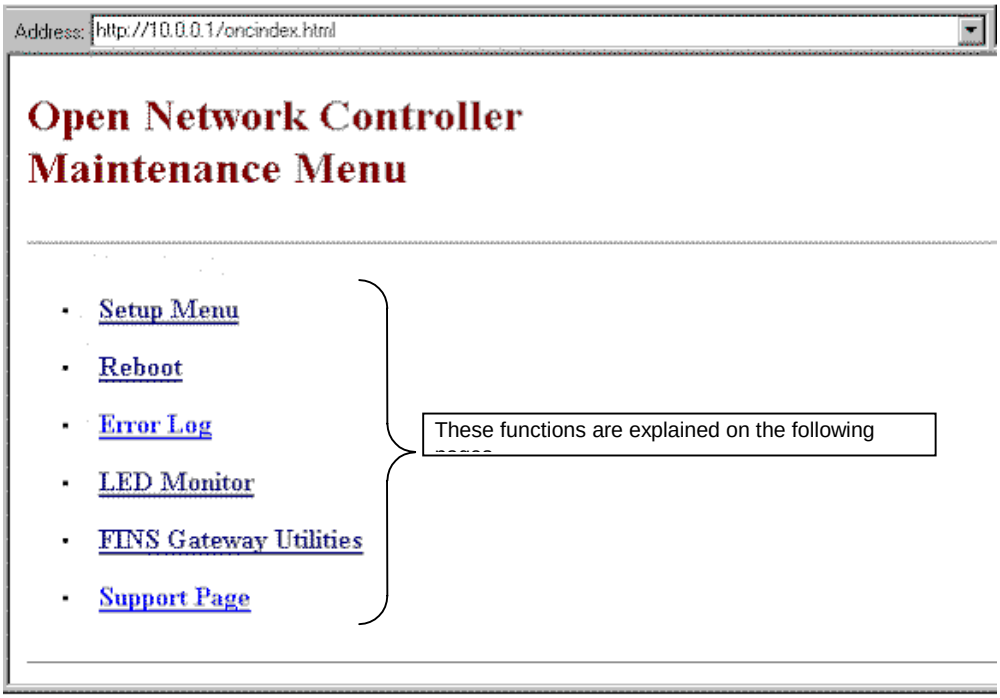
This version of the Web Service allows Open Network Controller maintenance to be performed by only one user at a time. More than one user performing maintenance on the same Open Network Controller at the same time can result in monitoring errors, setting errors, etc. For this reason, it is not allowed by the Web Service.

Maintenance Menu

1. Access the Open Network Controller web site as described above.
2. Click on Open Network Controller Maintenance Menu.

The following Maintenance Menu will be displayed:

Maintenance Menu



Function List

The list of Maintenance Menu functions is as shown below:

Menu	Submenu	Function
Setup Menu	View Setup Files	Displays the Open Network Controller settings files in the web browser.
	Edit Setup Files	Edits the Open Network Controller settings files in the web browser.
Reboot	-	Reboots the Open Network Controller.
Error Log	-	Displays the syslogfile (/tmp/syslog). For details about the syslogfile, refer to the Open Network Controller Operation Manual, Chapter 6-1.
LED Monitor	-	Displays the Open Network Controller LEDerror data, etc. For details about the LED error data, refer to the Open Network Controller Operation Manual Chapter 6-1.
FinsGateway Utilities	Dump Event Memory	Reads the Open Network Controller EventMemory (CIO, DM) data.
	Write Event Memory	Writes the Open Network Controller EventMemory (CIO, DM) data.
	Send FINS Command	Sends FINS commands to the Open Network Controller, or other devices on the network.
	Send FINS Command (repeat)	Repeatedly sends FINS commands to the Open Network Controller, or other devices on the network.
	FinsGateway Online Manual	Displays the FinsGateway Online Manual.

Setup Menu

The Setup Menu contains the following two functions

- View Setup Files
- Edit Setup Files

List of Settings Files

The following settings file can be viewed/edited. Files not shown below can also be viewed/edited by specifying the file name.

Settings File Name	Settings
/hd/usr/web/testfile	Test file to confirm display, editing, and writing. It has no effect on the Open Network Controller operation.
/etc/config/sysinit.1*	QNX startup settings file*
/etc/netstart	Subnet mask
/etc/hosts	IP address
/iproute	IP router
/etc/FgwQnx/FgwQnx.ini	Startup service, local network table, relay network table, COM port services.
/etc/FgwQnx/FgwQnxEtn.ini	ETN_UNIT (Ethernet NP)
/etc/FgwQnx/FgwQnxClk.ini	CLK_UNIT (Controller Link network NP)
/etc/FgwQnx/FgwQnxSysmac.ini	SYSMAC_UNIT (SYSMAC Board NP)
/etc/FgwQnx/FgwQnxSysmacDriver.ini	SYSMAC_UNIT driver
/etc/FgwQnx/FgwQnxSysmacMapping.ini	SYSMAC memory to EventMemory allocation
/etc/FgwQnx/FgwQnxDrm.ini	DRM_UNIT (DeviceNet NP)
/etc/FgwQnx/FgwQnxHlk.ini	HLK_UNIT (SYSWAY C, SYSWAY CV, CompoWay/F NP)
/etc/FgwQnx/scanlist.ini	DeviceNet scan list
/etc/FgwQnx/HlkNetTbl.ini	HLKaddress settings table (SYSWAY C, SYSWAY CV, CompoWay/F NP)
/usr/isagraf/bin/omisa	ISaGRAF initial settings
/etc/FgwQnx/FgwQnxHsv.ini	PT connection service
/etc/FgwQnx/FgwQnxRut.ini	RUT service
/etc/FgwQnx/FgwQnxSch.ini	Timer scheduler
/etc/FgwQnx/FgwQnxSchHoliday.ini	Timer scheduler holiday settings
/hd/usr/mail/etc/FgwQnxMua.ini	Mail settings
/hd/usr/mail/etc/FgwQnxMuaMsg.ini	User message to add to mail.

*If this file is not set properly, the Open Network Controller may not start. Be very certain of all changes before editing this file.

Changing the attribute on a file to make it inaccessible in user mode will prevent it from being displayed in the web browser.

Example

#**chmod 600 sysinit.1**↵

To edit a file that has been set not be displayed in the web browser, log into the Open Network Controller as root, and use the vi editor to edit the file.

Refer to the Open Network Controller Operation Manual, Chapter 4 for details about logging in, etc.

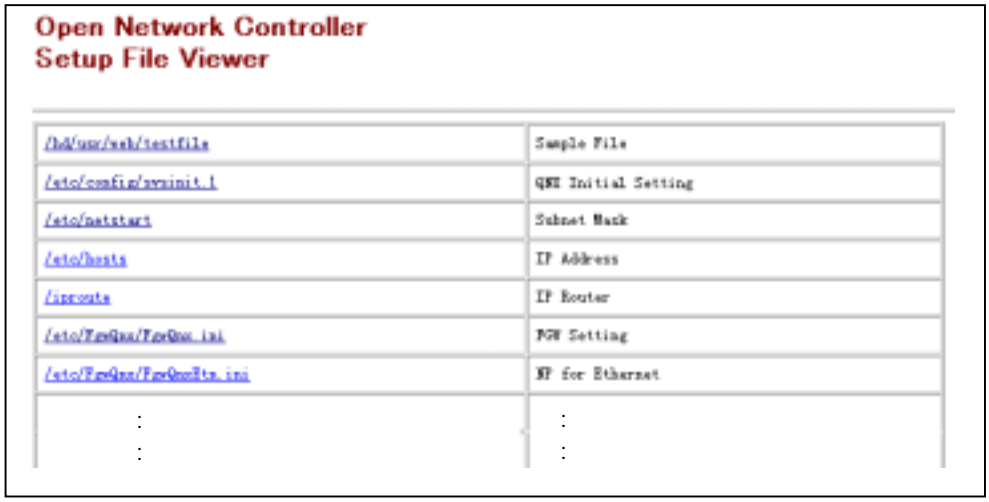
Setup Menu

1. Click on Setup Menu in the Maintenance Menu.

The following Setup Menu will be displayed.

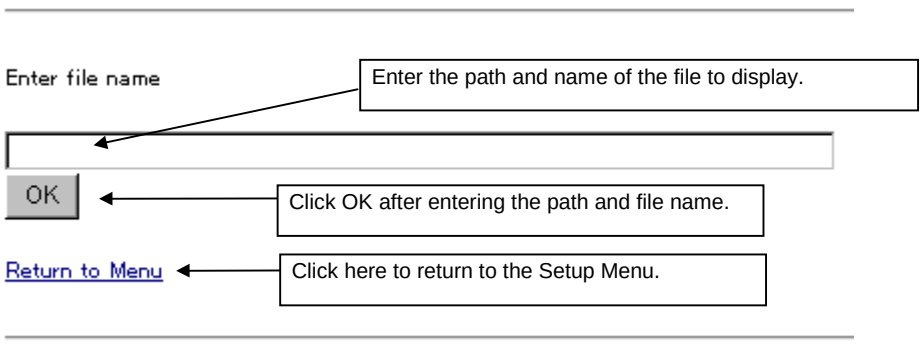
View Setup Files

1. Click View Setup Files in the Setup Menu, and the following settings file list will be displayed.



2. Click the settings file name, and the contents of the settings file will be displayed.

It is also possible to display a file by entering the path and name in the Enter file name box in the lower part of the screen, and clicking the OK button. Other text files can also be displayed in this manner.

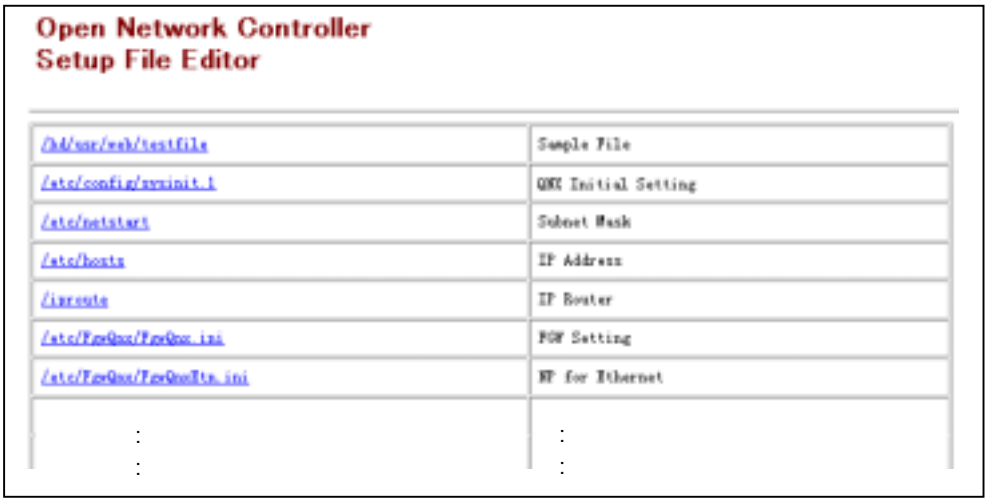


Editing Setup Files

Edit the settings files, and write them to the Open Network Controller as follows.

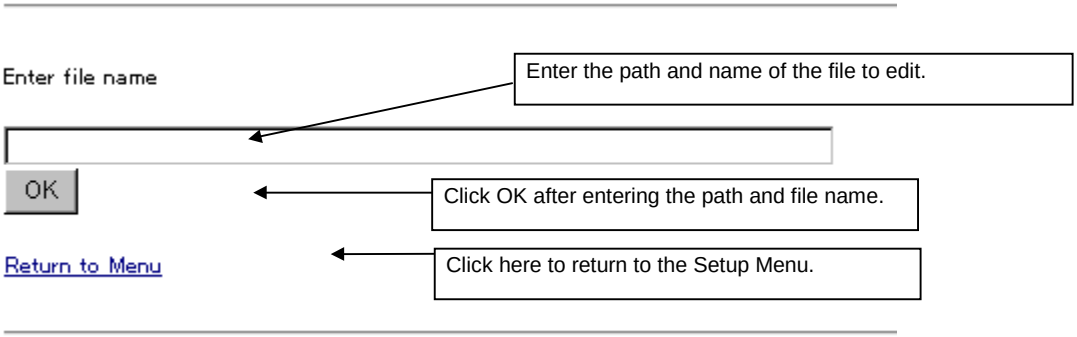
- If the settings files are not set properly, the Open Network Controller may not start. Be very certain of all changes before editing.
- The default for this menu is that here is no password set. For security and safety, set a password.

1. Click Edit Setup Files in the Setup Menu, and the following settings file list will be displayed.



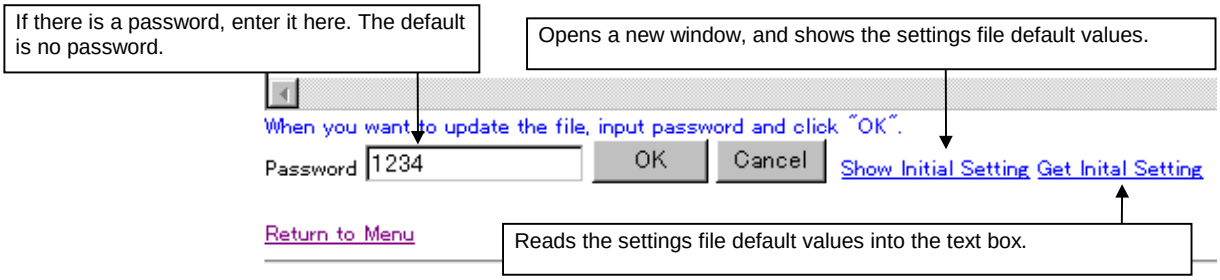
2. Click on the settings file name, and the settings file contents will be displayed in the text box.

It is also possible to edit a file by entering the path and name in the Enter file name box in the lower part of the screen, and clicking the OK button. Other text files can also be edited in this manner.

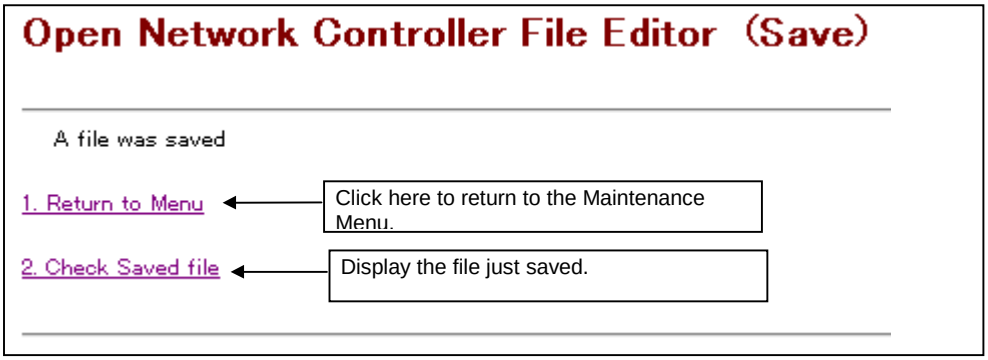


3. After all editing is complete, click the OK button in the lower part of the screen.

Note: If a password has been set, enter the password in the password entry box before clicking OK.



After writing is complete, the following screen will be displayed.



Reboot

Reboot the Open Network Controller.

- When rebooting the Open Network Controller, before there will be no danger for people or equipment before using this function.
- When this function is executed, the Web Service cannot be used until the Open Network Controller restarts.

1. Click Reboot in the Maintenance Menu, and the following screen will be displayed.

2. Enter the password, and click the OK button.

The default password is 1234.

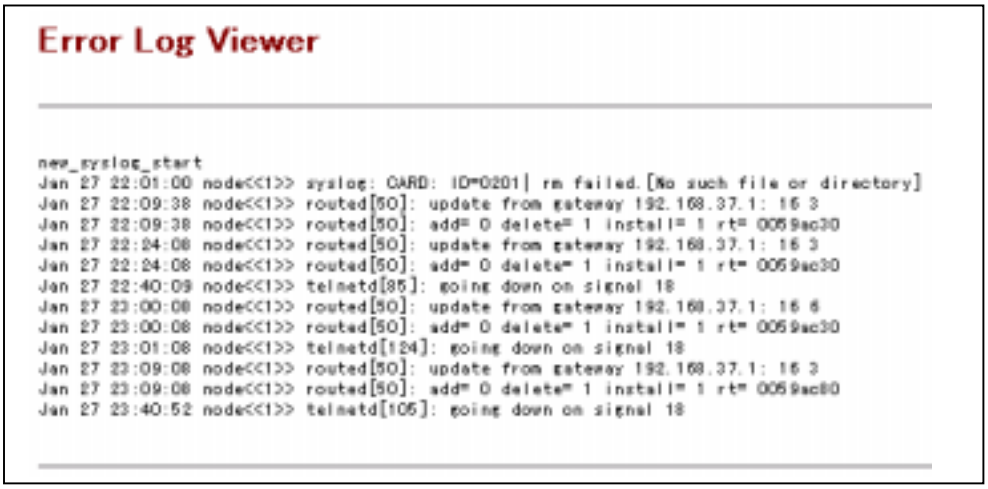
When the Open Network Controller is rebooted, the following screen will be displayed.

It is recommended to change the password for security and safety.

Error Log

This displays the contents of the Open Network Controller syslog file.

1. Click Error Log in the Maintenance Menu, and the syslog file will be displayed. (The file shown below is only an example.)



For details about the meanings of the messages in the syslog file (/tmp/syslog), refer to the Open Network Controller Operation Manual, Chapter 6-1.

LED Monitor

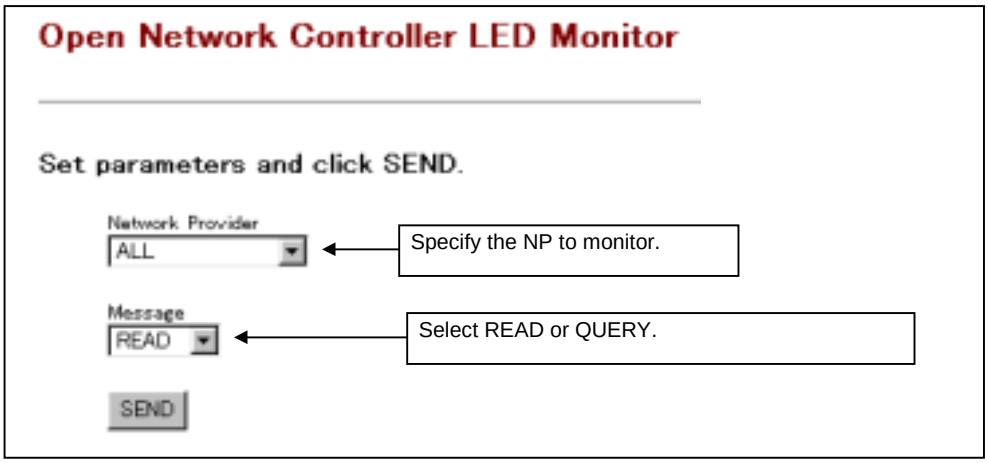
The LED Monitor has the following two functions.

Name	Function
READ	Indicates the Open Network Controller LED error data.
QUERY	Indicates whether the NP is operating properly.

The NP to be monitored can be specified.

For details about the meanings of the error data, refer to the Open Network Controller Operation Manual, Chapter 6-1.

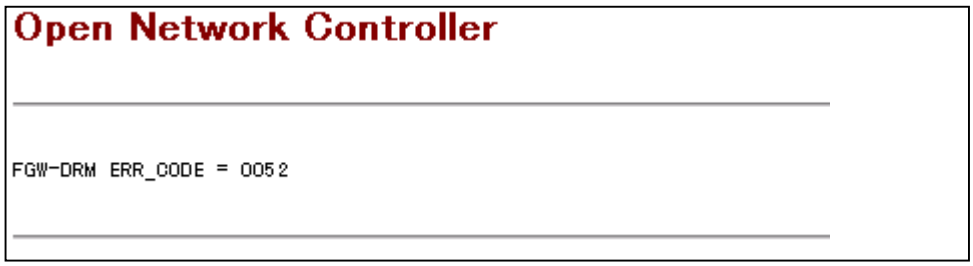
1. Click LED Monitor in the Maintenance Menu, and the following screen will be displayed.



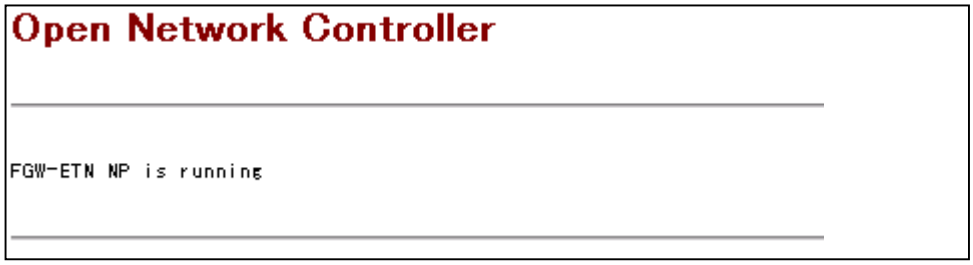
2. After setting the above parameters, click the SEND button.

The following screen will be displayed.

READ



QUERY



FinsGateway Utilities

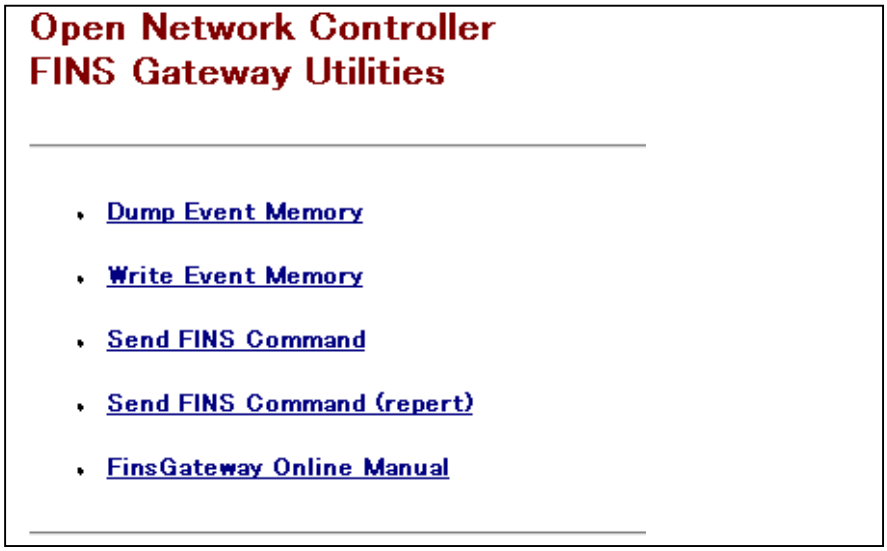
The FinsGateway Utilities have the following functions:

Submenu	Function
Dump Event Memory	Reads the Open Network Controller EventMemory (CIO, DM) data.
Write Event Memory	Writes the Open Network Controller EventMemory (CIO, DM) data.
Send FINS Command	Sends FINS commands to the Open Network Controller, or other devices on the network.
Send FINS Command (repeat)	Repeatedly sends FINS commands to the Open Network Controller, or other devices on the network.
FinsGateway Online Manual	Displays the FinsGateway online manual.

Display the FinsGateway Utilities

1. Click FinsGateway Utilities in the Maintenance Menu.

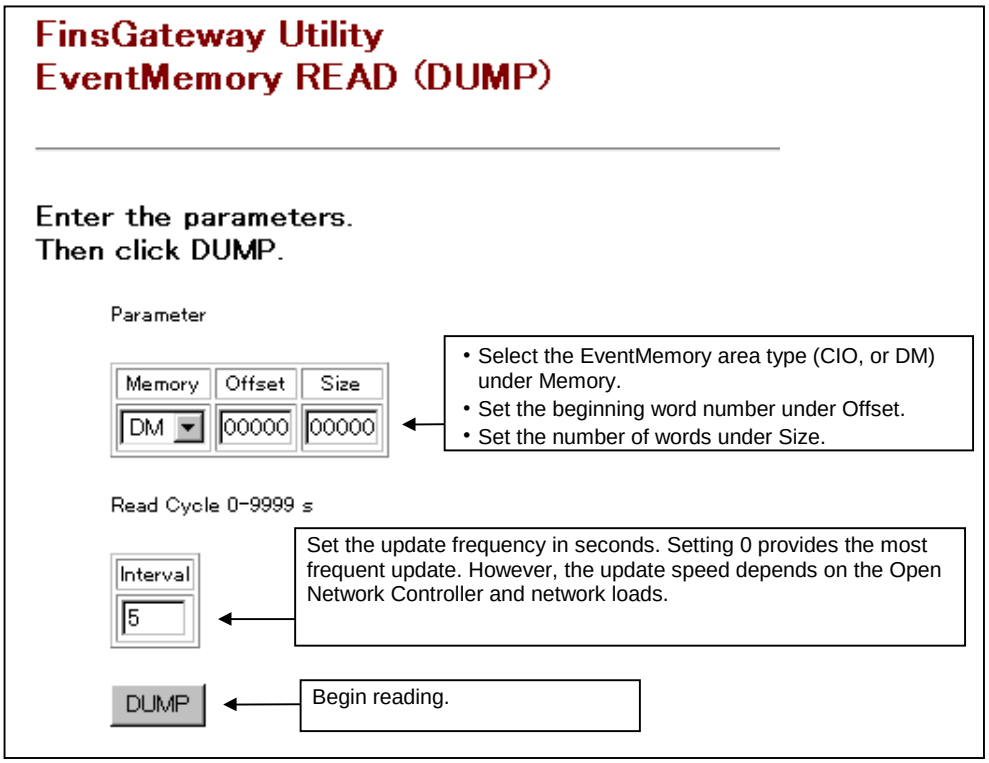
The following FinsGateway Utilities will be displayed.



Dump Event Memory

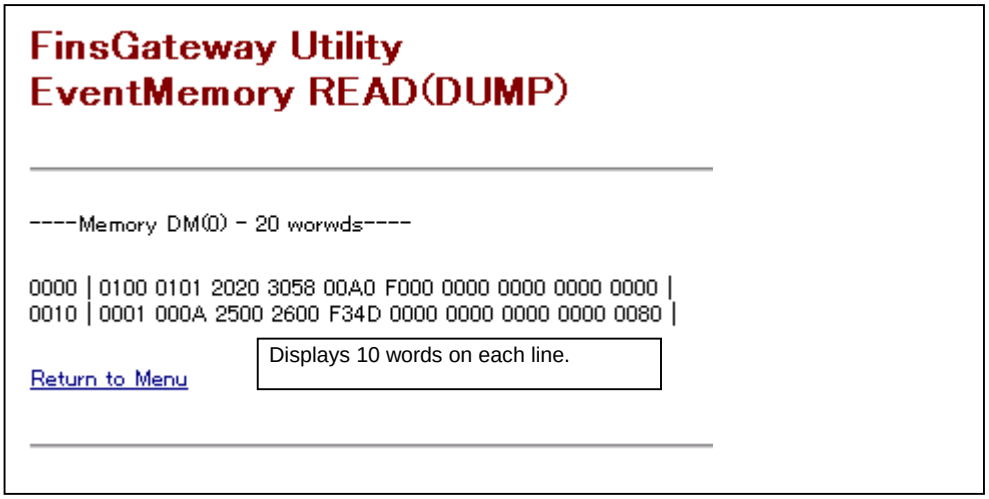
Reads the Open Network Controller EventMemory (CIO, DM) data.

1. Click Dump Event Memory in FinsGateway Utilities, and the following screen will be displayed.



2. After completing the above parameter settings, click the DUMP button.

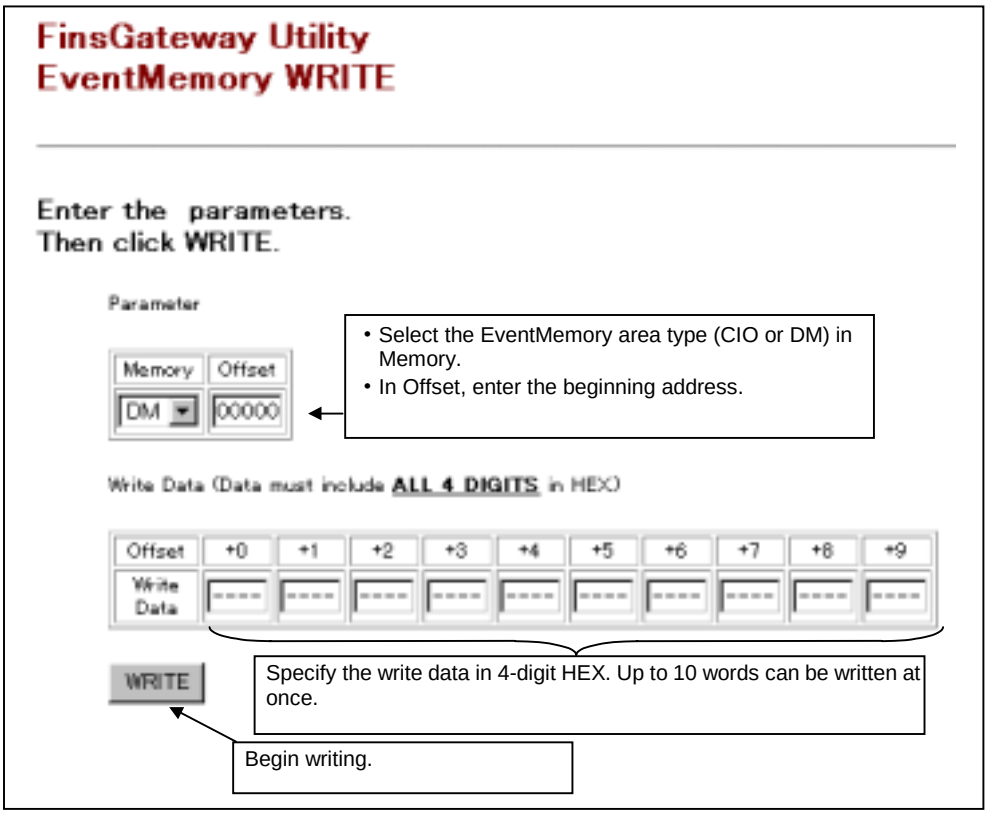
The reading will begin, and the following screen will be displayed.



Write Event Memory

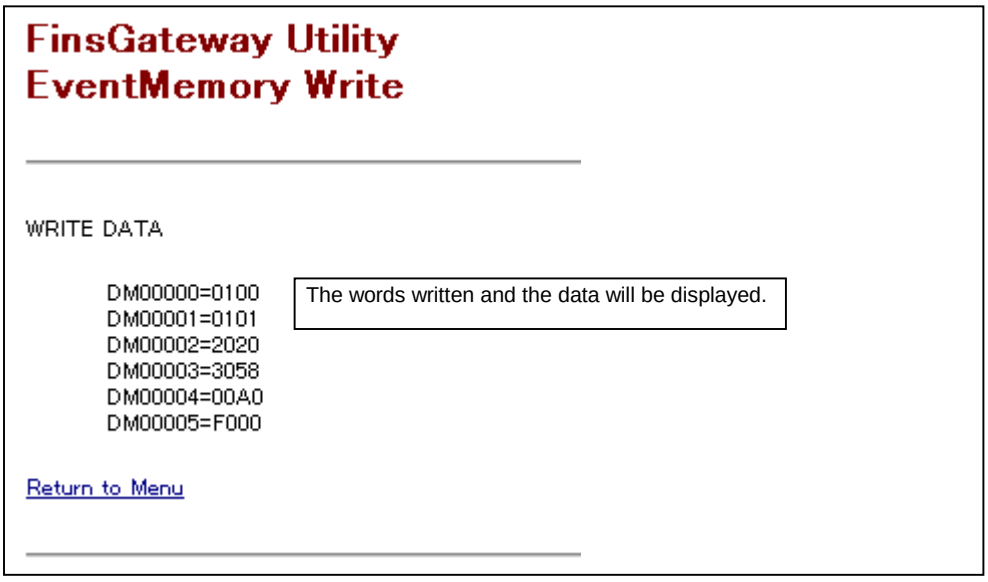
Writed the Open Network Controller EventMemory (CIO, DM) data.

1. Click Write Event Memory in FinsGateway Utilities, and the following screen will be displayed.



2. After completing the above parameter settings, click the WRITE button.

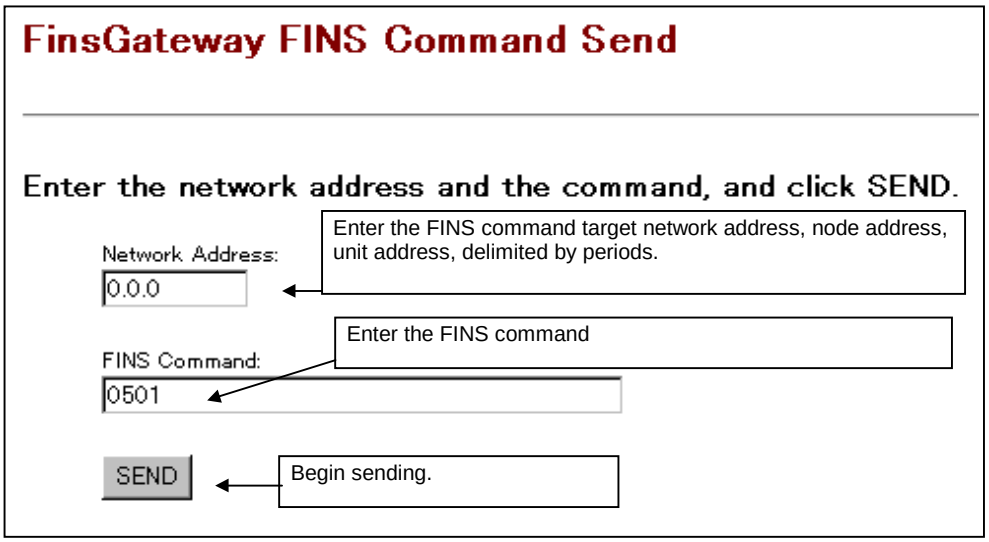
When writing is complete, the following screen will be displayed.



Send FINS Commands

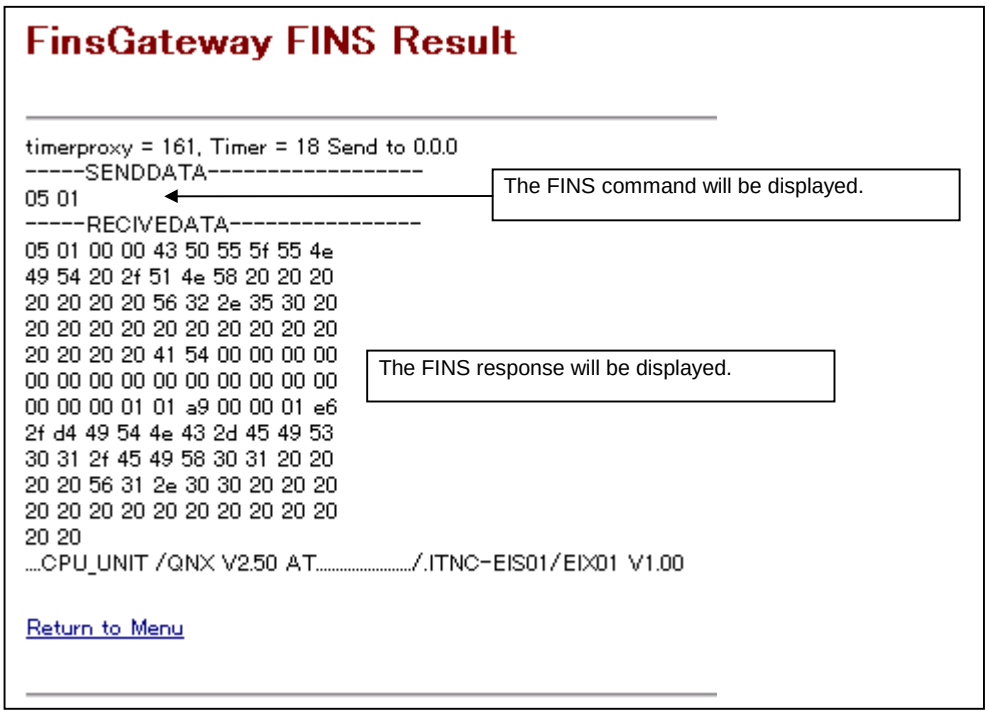
Sends FINS commands to the Open Network Controller, or other devices on the network.

1. Click Send FINS Command in FinsGateway Utilities, and the following screen will be displayed.



2. After completing the above parameter settings, click the SEND button.

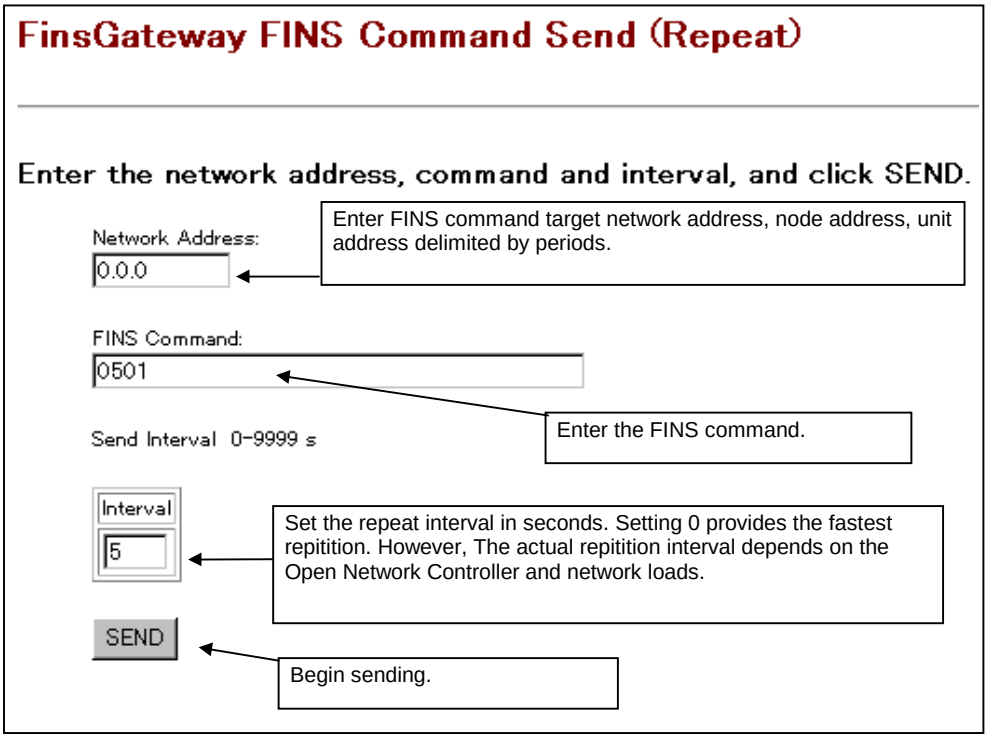
After the send is complete, the following screen will be displayed.



Send FINS Commands (Repeat)

Repeatedly sends FINS commands to the Open Network Controller, or other devices on the network.

1. Click Send FINS Command (repeat) in FinsGateway Utilities, and the following screen will be displayed.

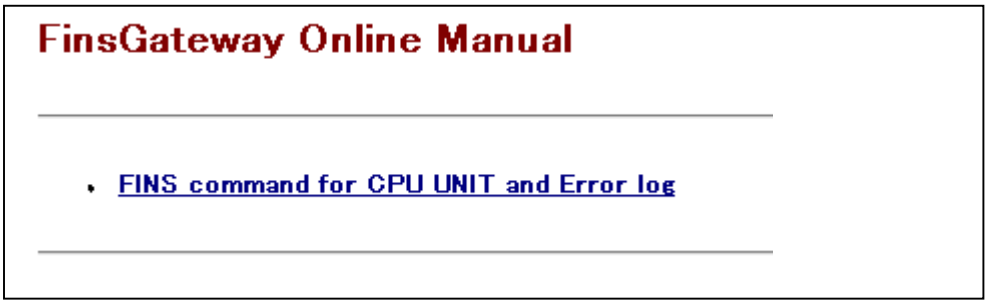


2. After completing the above parameter settings, click the SEND button.

With each send, the response will be displayed as shown in the Send FINS Command explanation.

FinsGateway Online Manual

1. Click FinsGateway Online Manual in FinsGateway Utilities, and the following screen will be displayed.



2. Click the manual to display.

The online manual will be displayed.

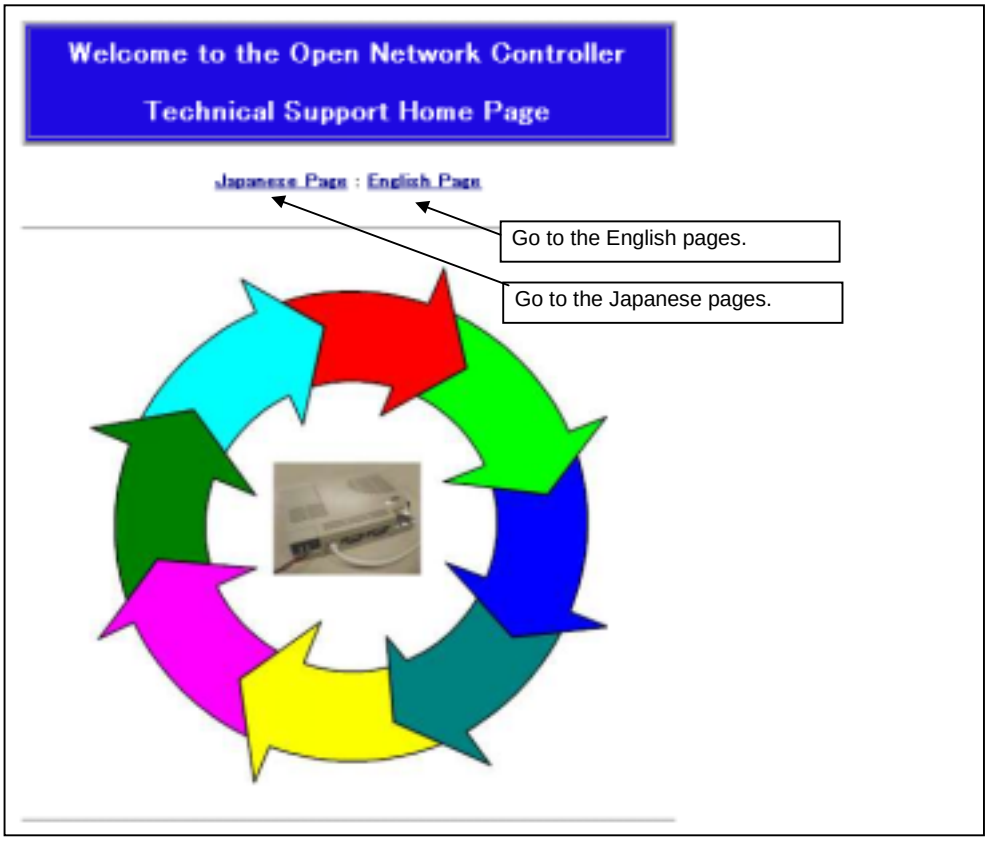
Support Page

Connect to the Open Network Controller technical support web site.

This function is only valid when the computer is connected to the Internet.

1. Click Support Page in the Maintenance Menu.

The following Open Network Controller technical support web site will be displayed.



2. Click English Page, or Japanese Page.

This technical support web site contains information about the files in the Web & Mail Services installation floppy disk Nonsupport folder.

The Nonsupport folder contains sample software for monitoring the Open Network Controller EventMemory (CIO, DM) through Microsoft Visual Basic and Microsoft Office on a network.

Setting a Password

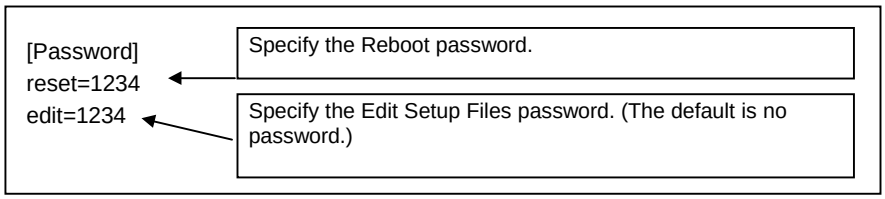
A password can be set for the Edit Setup Files and Reboot functions.

Edit the /etc/FgwQnx/OncStart.ini file to set/change the password.

1. Enter /etc/FgwQnx/OncStart.ini into the Enter file name box in the Edit Setup Files page, and click the OK button.

The /etc/FgwQnx/OncStart.ini file will be displayed.

2. Specify the password in the Password section of the /etc/FgwQnx/OncStart.ini file. The password is 4 characters.



3. Click the OK button to save the changes.

4. Reboot the Open Network Controller. The new password(s) will be effective after the reboot.

For security and safety, change the attributes of the /etc/FgwQnx/OncStart.ini file after changing the password(s).

Example

#chmod 600 OncStart.ini↵

Make the same change to other files not to be seen or edited from the web browser.

This prevents the files set in this manner from being accessed by the web browser. To edit files that have been set in this manner, log into the Open Network Controller as root, and use the vi editor.

For details about logging into the Open Network Controller, refer to the Open Network Controller Operation Manual, Chapter 4.

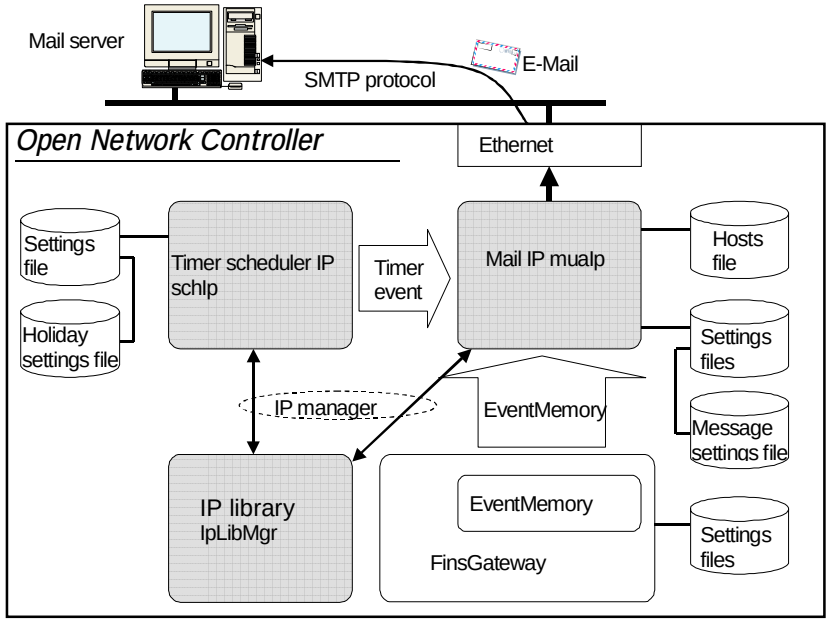
5

Mail Service Settings and Operation

5-1 Mail Service Outline

Software Configuration

The Mail Service software configuration is as shown below:



Functional Outline

By using the Mail Service, e-mail can be sent to a computer on the network to notify the user of the Open Network Controller event data.

When the specified type of event occurs in the Open Network Controller, the Mail Service sends an e-mail in the specified format.

The following two types of event can be specified. Up to 16 events can be specified.

- Timer event (cyclic, 1-shot)
- Memory event (FinsGateway EventMemory event)

5-2 Editing the Settings Files

It is necessary to edit the settings file to use the Mail Service function.

Refer to Chapter 2 to install the Mail Service.

List of Settings Files

The following settings files need to be edited to use the Mail Service function:

File Name	Settings
/etc/hosts	Hosts file Register the mail target server name and IP address.
/etc/FgwQnx/FgwQnx.ini	FinsGateway QNX settings file Add the settings to use the IP library, timer scheduler IP, and mail IP.
/hd/usr/mail/etc/FgwQnxMua.ini	Mail IP settings file Perform the settings for sending e-mail at timer event s. Perform the EventMemory memory event settings and the settings for sending e-mail at memory events.
/hd/usr/mail/etc/FgwQnxMuaMsg.ini	Mail IP message settings file Register a user-defined message for each mail.
/etc/FgwQnx/FgwQnxSch.ini	Timer scheduler IP settings file Perform the settings for the mail frequency, start time, etc. and the timer event. Not necessary to set when not using the timer event.
/etc/FgwQnx/FgwQnxSchHoliday.ini	Timer scheduler IP holiday settings file Specify days not to generate timer events, holidays, etc. Not necessary to set if holiday settings are not needed.

After editing the above settings files, reboot the Open Network Controller. The Mail Service will then be ready to use.

- If the Web Service is installed, the settings files can be edited from the web browser. Refer to Chapter 4 for details on using the Web Service.
- If the Web Service is not installed, log into the Open Network Controller as root, and use the vi editor to edit the settings files. For details about connecting to and logging into the Open Network Controller, refer to the Open Network Controller Operation Manual, Chapter 4.

Editing the Hosts File (/etc/hosts)

Register the mail target server name and IP address in the /etc/hosts file.

/etc/hosts

```
#
# Host Database
# This file should contain the addresses and aliases
# for local hosts that share this file.
# It is used only for "ifconfig" and other operations
# before the nameserver is started.
#
#
127.1                   localhost localhost.my.domain
#
# Imaginary network.
192.168.0.1             onchost
192.168.0.100           MailServer
```

Specify the mail server IP address, and name.

Editing the FinsGateway Settings File (/etc/FgwQnx/FgwQnx.ini)

Add the following three services to the Services section of the /etc/FgwQnx/FgwQnx.ini file: IP library (IpLibMgr), timer scheduler IP (Sch), mail IP (Mua).

/etc/FgwQnx/FgwQnx.ini

```
;=====================================================
; (c) Copyright OMRON Corporation 1999
;       All Rights Reserved
;=====================================================
[FgwLibMgr]
;Priority=23
Qnx_pFlagMask=

;-----------------------------------------------------
; SERVICES under SCM
;-----------------------------------------------------
[Services]
Services= CPU_UNIT, ETN, IpLibMgr, Sch, Mua
          :
          :
          :
```

Add these to the Services section: IpLibMgr, Sch, Mua

Do not include Sch if not using the timer event mail.

Editing the Timer Scheduler IP Settings File (/etc/FgwQnx/FgwQnxSch.ini)

Perform the timer event registration and the timer event conditions settings in the /etc/FgwQnx/FgwQnxSch.ini file. Up to 16 timer events can be registered.

There is no need to edit this file if the timer events are not to be used.

/etc/FgwQnx/FgwQnxSch.ini

```
;============================================
; (c)Copyright OMRON Corporation 1999
;       All Rights Reserved
;============================================
;FgwQnixSch.ini.For SCH profile

;============================================
; Event Define
;============================================
[Common]
SendPortName        = schSendPort
TmEventPortName     = (TimerEventPort, TimerService)
;PreSettingService  =Timer1,Timer2,Timer3,Timer4,Timer5,Timer6,Timer7,Timer8,Timer9,
Timer10,Timer11,Timer12,Timer13,Timer14,Timer15,Timer16
PreSettingService   = Timer1,Timer2

[Holiday]
SubProfile          = /etc/FgwQnx/FgwQnxSchHoliday.ini
HolidayInfo         = Holiday1

;============================================
; Timer Parameter Define
;============================================
[Timer1]
StartTime           = 199907011700
Interval            = 000000000001
EnableWeekDay       = Mon,Tue,Wed,Thu,Fri,Sat,Sun
EnableHolidayFlag   = ON
MonthlyCheckFlag    = ON
SendPortName        = TimEvt1 *
:
:
:
:
:
[Timer16]
StartTime           = 199907011700
Interval            = 000000010000
EnableWeekDay       = Mon,Tue,Wed,Thu,Fri
EnableHolidayFlag   = ON
MonthlyCheckFlag    = ON
SendPortName        = TimEvt16
```

Register the timer events (Timer 1 to 16) to generate.
The timer events specified here ned to be defined in the Timer Parameter Define section below.

Generated every minute, starting at 1999/07/01, 17: 00.
Valid every day.
Holiday settings valid.
The timer event name is TimEvt1*.
Setting details are explained hereafter.

Define the timer event conditions here.

*The timer event names registered here must be set in the mail IP settings file (/hd/usr/mail/etc/FgwQnxMua.ini) IpEventPortName to be explained later. The default timer event name is TimEvt1 to TimEvt16, but they can be changed to names appropriate for the application. When changing the timer event names, the new names must be regostered in the mail IP settings file (/hd/usr/mail/etc/FgwQnxMua.ini) under IpEventPortName.

Setting the Timer Event Conditions

The timer event conditions settings are done in the Timer Parameter Define section. Each of these items is explained as follows:

Item	Setting
StartTime	Set the date and time: year (4 digits), month (2 digits), day (2 digits), time (4 digits), 12 digits total Example: 199901010000 (starting from 1999, January 1. 00: 00)
Interval	Set the generation interval for timer events. Beginning at the lower end, set 2 digits each for minutes, hours, days, months. Set the last 4 digits for years. Example : 000000000659 (generate every 6 hours,59 minutes.) 000000010000 (generate every day)
EnableWeekDay	Set the valid days: Mon, Tue, Wed, Thu, Fri, Sat, Sun
EnableHolidayFlag	Sets the validity of the holiday settings in the /etc/FgwQnx/FgwQnxSchHoliday.ini file: ON/OFF.
MonthlyCheckFlag	Set the validity of the end-of-month check: ON/OFF. Use this if there is a need for an event at the end of every month. This setting is only valid for generating an event at the end of the month, and at the end of each following month, if the StartTime is set for the 31st, and the Interval for 1 month (month units). ON: If the event generation is for a day that does not exist. It will be generated on the closest reasonable day. For example, an event scheduled for September 31 will be generated on September 30. OFF: The check is not performed. For example, an event scheduled for September 31 will not be generated. The next event will be generated on October 31.
SendPortName	The default timer event name is TimEvt1 to TimEvt16. Refer to the note at the bottom of the previous page for details.

Editing the Holiday Settings File (/etc/FgwQnx/FgwQnxSchHoliday.ini)

The /etc/FgwQnx/FgwQnxSchHoliday.ini file is used to specify days that the timer events do not to be generated (holidays). If holiday settings are not required, these settings are not necessary.

/etc/FgwQnx/FgwQnxSchHoliday.ini

```
;============================================
;(c)Copyright OMRON Corporation 1999
;     All Rigths Reserved
;============================================
;FgwQnxSchHoliday.ini.For SCH profile
;
;
;           date            start Year - End Year
; Usage: MM/DD              CCYY-CCYY

[Holiday1]
;date     Start Year - End Year
;

1/1                         1970-2029
1/15                        1970-2029
2/11                        1970-2029
3/20                        1970-2029
4/29                        1970-2029
5/3                         1970-2029
5/4                         1986-2029
5/5                         1970-2029
7/20                        1997-2029
9/15                        1970-2029
9/23                        1970-2029
10/10                       1970-2029
11/23                       1970-2029
12/23                       1989-2029
```

Register the days that timer events are not reuired.
These settings will only be valid if the FgwQnxSch.ini timer event condition EnableHolidayFlag is ON.

Editing the Mail IP Settings File (/hd/usr/mail/etc/FgwQnxMua.ini)

The /hd/usr/mail/etc/FgwQnxMua.ini file is mostly used for the following settings.

- Mail settings for timer event generation

  (For details about the timer event conditions, refer to page 5-5.)

- Settings for memory event conditions, and mail settings for memory event generation

/hd/usr/mail/etc/FgwQnxMua.ini

```
;=============================================
; (c)Copyright OMRON Corporation 1999
;              All Right Reserved
;=============================================
;FgwQnxMua.ini.For MUA profile
;=============================================
; Mail Define
;=============================================
[Common]
Subject          = OMRON ONC Mail Service
From             = onc
domain           = MailServer
SendPortName     = muaSendPort
IpEventPortName  =(TimEvt1, Mail1, 1) *

EmEventPortName  = CIO_01000_01,DM_02000_CH

;=============================================
; Memeoy Event Define
;=============================================
[EventDefine]
CIO_01000_01     = (Mail2,ON)
DM_02000_CH      = (Mail3,FtoT,GE,0x0064,0x0)

;=============================================
;   Mail Parameter Define
;=============================================
[Mail1]
SubProfile       = /hd/usr/mail/etc/FgwQnxMuaMsg.ini
Msg              = UserMsg1
To               = abc@def.ghi.co.jp
ErrorLog         = 1
ErrorLogSize     = 10
Status           = 0
MemoryType       = DM
OffsetAdr        = 0
ChannelLength    = 0
:
:
:
[Mail16]
```

Register the mail subject, account name (From), and mail server (domain).

Register the timer event name (refer to page 5-5), and mail definition name (Mail1 to Mail16*) delimited by commas. Set the mail definition (contents of message) in the Mail Parameter Define section below.
The 1 at the end of the line is required.

Fixed at 1.

Register the memory event name to make valid. It must be set in the Memory Event Define section to be explained hereafter. This is convenient for sharing files among multiple Open Network Controllers.

Memory event name

Register the memory event name, mail definition name, and memory event conditions. Up to 16 memory events can be registered.
Refer to the explanation hereafter for details.

Mail definition name*

Memory event conditions

Mail definition name*

Define the contents of the mail to send.
- Message to send: UserMsg1
- Mail address: abc@def.ghi.co.jp
- Attach syslog file: Yes (1)
- Nuimber of lines of syslog: 10 lines
- EventMemory status: None (0)

The default settings for Mail1 are that EventMemory Status is not included. The remaining settings are therefore not valid.

*The default mail definition name is Mail1 to Mail16, but they can be changed to names appropriate for the application. When changing the mail definition names, the new names must be regostered in the Mail Parameter Define section under mail definition names.

Setting the Memory Event Conditions

Set the FgwQnxMua.ini file EventDefine section memory event conditions in the following format:

- Events based on a bit status

  MemoryEventName = (MailServiceName, ON/OFF)

  Example: CIO_01234_11 = (MailService2, OFF)

- Events based on a value

  MemoryEventName = (MailServiceName, Transit, LogicType, Arg1, Arg2)

  Example: DM_00001_CH = (dmevent,FtoT,GE,0x64,0x0)

MemoryEventName

Set the memory event name.

Use the formats shown below, depending on the event type:

- Events based on bit status change

  MemoryType_MemoryOffset_BitNo

  Example: To specify CIO1000 bit 02 - CIO_01000_02

- Events based on a value

  MemoryType_MemoryOffset_CH

  Example: To specify DM2025 - DM_02025_CH

MailServiceName

Specify the MailServiceName to execute at the event. Select a MailServiceName set in FgwQnxMua.ini

ON/OFF

For events based on a bit status, define the specific status transition that is to generate the event.

- ON: When the bit is ON (=1)
- OFF: When the bit is OFF (=0)

Transition, LogicType, Arg1, Arg2

Transition	Description
F to F	When the LogicType goes from false to false, an event is generated.
T to T	When the LogicType goes from true to true, an event is generated.
F to T	When the LogicType goes from false to true, an event is generated.
T to F	When the LogicType goes from true to false, an event is generated.

LogicType	Arg1	Arg2	Calculation
AND	○	×	Value has at least one bit ON, the same as Arg1.
ANDEQ	○	×	Value has all bits ON the same as Arg1.
TRUE	×	×	Always true.
NOP	×	×	Value ≠ 0
EQ	○	×	Value = Arg1
LT	○	×	Value < Arg1
LE	○	×	Value ≦ Arg1
GT	○	×	Value > Arg1
GE	○	×	Value ≧ Arg1
GELE	○	○	Arg1 ≦ value ≦ Arg2
GTLT	○	○	Arg1 < value < Arg2
GELT	○	○	Arg1 ≦ value < Arg2
GTLE	○	○	Arg1 < value ≦ Arg2
PrevAND	△	×	Value has at least one bit ON, the same as the previous value.
PrevANDEQ	△	×	Value has all bits ON the same as the previous value.
PrevEQ	△	×	Value = the previous value.
PrevLT	△	×	Value < the previous value.
PrevLE	△	×	Value ≦ the previous value.
PrevGT	△	×	Value > the previous value.
PrevGE	△	×	Value ≧ the previous value.

○: Required for condition settings

×: Not required for condition settings

△: Required only for setting the previous calculation result depending on the memory contents at condition setting.

The following are examples of memory event conditions settings:

Bit Transition Event

- Execute MailService1 when DM1000, bit 02 turns ON.

  DM_01000_02 = (MailService1, ON)

- Execute MailService2 when CIO1234, bit 11 turns OFF.

  CIO_01234_11 = (MailService2, OFF)

Value-based Event

- Execute MailService3 when DM2000 becomes greater than 100 (0x64).

  DM_02000_CH = (MailService3, FtoT, GE, 0x64, 0)

- Execute MailService4 when CIO3165 becomes greater than 50 (0x32) but less than 120 (0x78).

  CIO_03165_CH = (MailService4, TtoT, GELT, 0x32, 0x78)

- Execute MailService5 one time only when DM1500 becomes less than 100 (0x64), or greater than 200 (0xC8).

  DM_01500_CH = (MailService5, TtoF, GELE, 0x64, 0xC8)

Mail Definition Settings

Set the items in the Timer Parameter Define section as follows. This is where the contents of the mail to be sent are defined:

Item	Setting
Msg	Set the message name (UserMsg1 to UserMsg16). The message content is set in the mail IP message settings file (/hd/usr/mail/etc/FgwQnxMuaMsg.ini) described hereafter.
To	Set the target mail address.
ErrorLog	Set whether or not to attach the syslog file to the mail. 1: Attach, 0: Not attach
ErrorLogSize	Set the numbe of lines of the syslog file to attach: 0: All 1 to 64: Number of lines to include, beginning with the newest line.
Status	Set whether or not to include the EventMemory (CIO, DM) status in the mail: 1: Attach, 0: Not attach When setting 1: Attach, also set the MemoryType, OffsetAdr, and ChannelLength.
MemoryType	Set the EventMemory data area type (CIO, or DM).
OffsetAdr	Set the word number (address).
ChannelLength	Set the number of words.

Editing the Mail IP Message Settings File (/hd/usr/mail/etc/FgwQnxMuaMsg.ini)

Register a user-defined message for each mail in the /hd/usr/mail/etc/FgwQnxMuaMsg.ini file. Up to 256 characters can be included in one message, with up to 16 messages, maximum.

/hd/usr/mail/etc/FgwQnxMuaMsg.ini

```
;=========================================
;(c)Copyright OMRON Corporation 1999
;              All Right Reserved
;=========================================
;FgwQnxMuaMsg.iniFor MUA profile
;
[UserMsg1]
 This is UserMessage1
[UserMsg2]
 This is UserMessage2
  :
  :
[UserMsg16]
 This is UserMessage16
```

Enter the content of the UserMsg1 message.

Enter the content of the UserMsg2 message.

Example of Receiving Mail

The following is an example of receiving mail sent by the Open Network Controller:

```
X-POP3-Rcpt: kehisa@engine
Return-Path: <onc>
Received: [192.168.0.15] by engine
          (/¥oo/¥ Smail3.1.29.1 #29.3 #3) id m11Buij-000EbSC; Wed, 4 Aug 99 15: 40 JST
Message-Id: <m11Buij-000EbSC@engine>
Date: Wed, 4 Aug 99 15: 40 JST
From: onc@abc.defgh.co.jp (ONC)
To: hisa@abc.defgh.co.jp
CC:
Subject: OMRON ONC Mail Service
Reply-To:

------------------------------------------------------------
//ONC Infomation   <-- Source Open Network Controller data
------------------------------------------------------------
Unit-Type      : ITNC-EIS01/EIX01
Version        : V1.00
IP-Adress      : 192.168.37.46
ServiceName    : Mail1
------------------------------------------------------------
//User Message   <-- Message registered in the /hd/usr/mail/etc/FgwQnxMuaMsg.ini file.
------------------------------------------------------------
 This is ONC Running Test Message


------------------------------------------------------------
//Error Log Information   <-- Contents of /tmp/syslog. Attached only when the /hd/usr/mail/etc/FgwQnxMua.ini ErrorLog is set to 1. For details about the syslog file (/tmp/syslog) contents, refer to the Open Network Controller Operation Manual, Chapter 6-1.
------------------------------------------------------------
MM/DD/YY HH: MM: SS   Error   Detail   Description
Aug   4 12: 51: 43 node<<1>> routed[50]: add= 0 delete= 0 install= 1 rt= 0059ac30
Aug   4 13: 36: 43 node<<1>> routed[50]: update from gateway 192.168.37.1: 16 6
Aug   4 13: 36: 43 node<<1>> routed[50]: add= 0 delete= 1 install= 1 rt= 0059ac30
Aug   4 14: 19: 42 node<<1>> routed[50]: update from gateway 192.168.37.1: 16 6
Aug   4 14: 19: 42 node<<1>> routed[50]: add= 0 delete= 1 install= 1 rt= 0059ac30
Aug   4 14: 20: 12 node<<1>> routed[50]: update from gateway 192.168.37.1: 6 16
Aug   4 14: 20: 12 node<<1>> routed[50]: add= 1 delete= 0 install= 1 rt= 0059ac30
Aug   4 14: 20: 13 node<<1>> routed[50]: after change
Aug   4 14: 22: 42 node<<1>> routed[50]: update from gateway 192.168.37.1: 16 6
Aug   4 14: 22: 42 node<<1>> routed[50]: add= 0 delete= 1 install= 1 rt= 0059ac30

------------------------------------------------------------
//Status Information   <-- EventMemory (DM, in this example) status. Attached only when the /hd/usr/mail/etc/FgwQnxMua.ini Status is set to 1.
------------------------------------------------------------
[EventMemory DUMP]
MemoryName: DM Offset Addr: 01000 Size: 100ch
ADDRES +0   +1    +2    +3   +4    +5    +6   +7   +8    +9
01000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01020 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01030 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01040 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01050 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01060 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01070 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01080 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
01090 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
```

5-3 Mail Service Settings Example

The following is an example of setting the Mail Service:

Settings List

The following shared settings and each mail (mail 1 to mail 3) send condition settings are used as an example to explain the Mail Service settings:

Shared Settings

Item	Value	Setting File
Mail server name	MailSrv (IP address 192.168.0.100)	Hosts FgwQnxMua.ini
Mail address	onc1 (mail address is onc1@MailSrv)	FgwQnxMua.ini
Subject	ONC Mail Service	FgwQnxMua.ini

Mail 1

Item	Value	Setting File
Timing (timer event, or memory event)	Timer event send Send mail starting on 1999 July 1, Mon-Fri at 20:00. Holiday settings used.	FgwQnxSch.ini FgwQnxSchHoliday.ini
Event name	TimEvt1	FgwQnxSch.ini FgwQnxMua.ini
Address	abc@omron.co.jp	FgwQnxMua.ini
Message	ONC Operate Information (UserMsg1)	FgwQnxMuaMsg.ini (FgwQnxMua.ini)
Error log	Attach the newest 10 items of the syslog file.	FgwQnxMua.ini
EventMemory content	None	FgwQnxMua.ini

Mail 2

Item	Value	Setting File
Timing (timer event, or memory event)	Memory event send EventMemory CIO1000, bit 01 turning ON generates mail.	FgwQnxMua.ini
Address	Xyz@omron.co.jp	FgwQnxMua.ini
Message	Machine Trouble Information(#1) (UserMsg2)	FgwQnxMuaMsg.ini (FgwQnxMua.ini)
Error log	Attach the newest 10 items of the syslog file.	FgwQnxMua.ini
EventMemory content	The data for 100 words starting from CIO1000 is included.	FgwQnxMua.ini

Mail 3

Item	Value	Setting File
Timing (timer event, or memory event)	Memory event send EventMemory DM2025 becoming greater than 100 (0x64) generates mail.	FgwQnxMua.ini
Address	Xyz@omron.co.jp	FgwQnxMua.ini
Message	Machine Trouble Information(#2) (UserMsg3)	FgwQnxMuaMsg.ini (FgwQnxMua.ini)
Error log	None	FgwQnxMua.ini
EventMemory content	The data for 50 words starting from DM2000 is included.	FgwQnxMua.ini

Editing /etc/hosts

Register the mail address, mail server name and IP address in the /etc/hosts file.

/etc/hosts

```
#
# Host Database
# This file should contain the addresses and aliases
# for local hosts that share this file.
# It is used only for "ifconfig" and other operations
# before the nameserver is started.
#
#
127.1                   localhost localhost.my.domain
#
# Imaginary network.
192.168.0.1             onchost
192.168.0.100           MailSrv
```

Shared settings
Mail server IP address, and name.

Editing /etc/FgwQnx/FgwQnx.ini

To start the IP library (IpLibMgr), timer scheduler IP (Sch), and mail IP (Mua), add these services to the /etc/FgwQnx/FgwQnx.ini file under the Services section, as follows:

/etc/FgwQnx/FgwQnx.ini

```
;=====================================================
; (c) Copyright OMRON Corporation 1999
;       All Rights Reserved
;=====================================================
[FgwLibMgr]
;Priority=23
Qnx_pFlagMask=

;-----------------------------------------------------
; SERVICES under SCM
;-----------------------------------------------------
[Services]
Services= CPU_UNIT, ETN, IpLibMgr, Sch, Mua
          :
          :
          :
```

Add IpLibMgr, Sch, and Mua to the Services section.

Sch is not required if not sending mail generated by a timer event.

Editing /etc/FgwQnx/FgwQnxSch.ini

Register the timer event and conditions to generate in the /etc/FgwQnx/FgwQnxSch.ini file. Up to 16 timer events can be registered.

/etc/FgwQnx/FgwQnxSch.ini

```
;============================================
; (c)Copyright OMRON Corporation 1999
;       All Rights Reserved
;============================================
;FgwQnixSch.ini.For SCH profile

;============================================
; Event Define
;============================================
[Common]
SendPortName        = schSendPort
TmEventPortName     = (TimerEventPort, TimerService)
;PreSettingService  = Timer1,Timer2,Timer3,Timer4,Timer5,Timer6,Timer7,Timer8,Timer9,Timer10,
Timer11,Timer12,Timer13,Timer14,Timer15,Timer16
PreSettingService   = Timer1
EmEventPortName     =

[Holiday]
SubProfile          = /etc/FgwQnx/FgwQnxSchHoliday.ini
HolidayInfo         = Holiday1

;============================================
; Timer Parameter Define
;============================================

[Timer1]
StartTime           = 199907012000
Interval            = 000000010000
EnableWeekDay       = Mon,Tue,Wed,Thu,Fri
EnableHolidayFlag   = ON
SendPortName        = TimEvt1
MonthlyCheckFlag    = OFF
```

Mail 1 settings
Set the mail 1 timer event conditions to valid.

Mail 1 settings
Set the mail 1 timer event conditions to valid.
Start sending mail on 1999 July 1,
Mon-Fri, at 20: 00.
Holiday settings are valid.
No end of month check.

Editing /etc/FgwQnx/FgwQnxSchHoliday.ini

Set the holiday settings in the /etc/FgwQnx/FgwQnxSchHoliday.ini file.

This file does not need to be edited unless the holiday settings are to be used.

/etc/FgwQnx/FgwQnxSchHoliday.ini

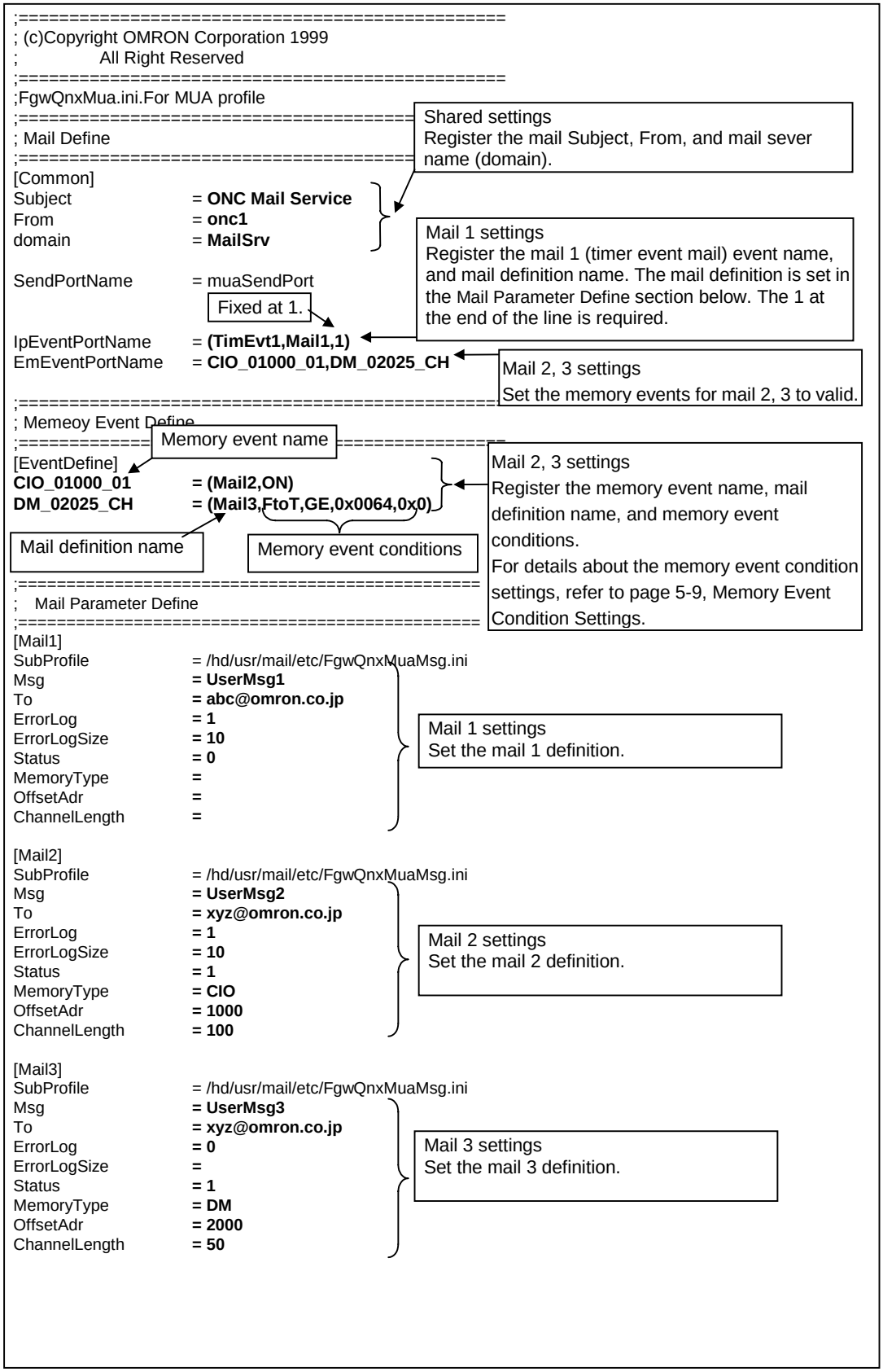
```
;============================================
;(c)Copyright OMRON Corporation 1999
;     All Rigths Reserved
;============================================
;FgwQnxSchHoliday.ini.For SCH profile
;
;
;            date             start Year - End Year
; Usage: MM/DD                CCYY-CCYY

[Holiday1]
;date      Start Year - End Year
;

1/1                     1970-2029
1/15                    1970-2029
2/11                    1970-2029
3/20                    1970-2029
4/29                    1970-2029
5/3                     1970-2029
5/4                     1986-2029
5/5                     1970-2029
7/20                    1997-2029
9/15                    1970-2029
9/23                    1970-2029
10/10                   1970-2029
11/23                   1970-2029
12/23                   1989-2029
```

Mail 1 settings
Register the holiday settings to use for mail 1.
(The default setting is valid.)

Editing /hd/usr/mail/etc/FgwQnxMua.ini

Specify the timer event mail settings, the memory event settings, and the memory event mail settings in the /hd/usr/mail/etc/FgwQnxMua.ini file.

/hd/usr/mail/etc/FgwQnxMua.ini



Editing /hd/usr/mail/etc/FgwQnxMuaMsg.ini

Register the user-defined message for each mail in the /hd/usr/mail/etc/FgwQnxMuaMsg.ini file.

/hd/usr/mail/etc/FgwQnxMuaMsg.ini

```
;=======================================
;(c)Copyright OMRON Corporation 1999
;              All Right Reserved
;=======================================
;FgwQnxMuaMsg.iniFor MUA profile
;
[UserMsg1]
ONC Operate Information

[UserMsg2]
Machine Trouble Information(#1)

[UserMsg3]
Machine Trouble Information(#2)
```

Mail 1 settings
Enter the message for mail 1.

Mail 2 settings
Enter the message for mail 2.

Mail 3 settings
Enter the message for mail 3.

5-4 Troubleshooting

The following is the list of error messages that are registered in the Mail Service syslog file, and the countermeasures for each:

Sch_Unit (FGW-SCH)

ID	Level	syslog Message	Description	Cause	Countermeasure
0005	ERROR	[Sch]StartTime failed	Invalid start time.	StartTime setting is incorrect.	Correct the setting. (FgwQnxSch.ini)
0006	ERROR	[Sch]Interval failed	Invalid interval	Interva l setting is incorrect.	Correct the setting. (FgwQnxSch.ini)
0009	ERROR	[Sch]EnableWeekDay failed	Invalid days	EnableWeekDay setting is incorrect.	Correct the setting. (FgwQnxSch.ini)
0010	ERROR	[Sch]EnableSkipFlag failed	Invalid skip flag	EnableSkipFlag setting is incorrect.	Correct the setting. (FgwQnxSch.ini)
0011	ERROR	[Sch]EnableHolidayFlag failed	Invalid holiday flag	EnableHolidayFlag setting is incorrect.	Correct the setting. (FgwQnxSch.ini)
0012	ERROR	[Sch]Monthly CheckFlag failed	Invalid end of month check flag	MonthlyCheckFlag setting is incorrect.	Correct the setting. (FgwQnxSch.ini)