RENESAS

PG-FP5 V2.17
Flash Memory Programmer

User's Manual

: RL78, 78K, V850, RX100, RX200, RX61x, RX62x, RX63x, R8C, SuperH

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PREFACE

Thank you for purchasing the PG-FP5 flash memory programmer. The PG-FP5 is a flash memory programmer for Renesas Electronics microcontrollers.

The manuals relevant to usage of the PG-FP5 are listed below. The manuals for your product consist of two volumes; a common part and a part for the corresponding MCUs. Be sure to read both volumes before using the PG-FP5. You can download the latest manuals from the Renesas Tools homepage (https://www.renesas.com/pg-fp5).

Related manuals

Document name	Document number
PG-FP5 V2.17 Flash Memory Programmer User's Manual Common	R20UT2922E
PG-FP5 V2.17 Flash Memory Programmer User's Manual RL78, 78K, V850, RX100, RX200, RX61x, RX62x, RX63x, R8C, SuperH	This manual
PG-FP5 V2.17 Flash Memory Programmer User's Manual RH850, RX64x, RX65x, RX66x, RX71x	R20UT2924E

Contents

Term replacement

When the RX100, RX200 is used, some terms in this manual should be replaced as shown in the table below.

Term	Meaning.
Get Flash options	Access window read
Set Security	Access window program

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1. PROGRAMMING GUI USAGE

This chapter explains functional details on windows and dialog boxes of the programming GUI.

1.1. Introduction

Make sure that the programming GUI, USB driver, and the FP5 parameter file (PR5 file) for the target device are installed. For the installation method, refer to Common 3 SOFTWARE INSTALLATION.

1.2. Startup of Programming GUI

(1) System connection

Connect a USB cable (or serial cable) to the USB port (or serial port) on the host PC, and the other side of the cable to the USB connector (or serial connector) on the FP5. Plug in the AC adaptor and then connect to the FP5 power supply connector.
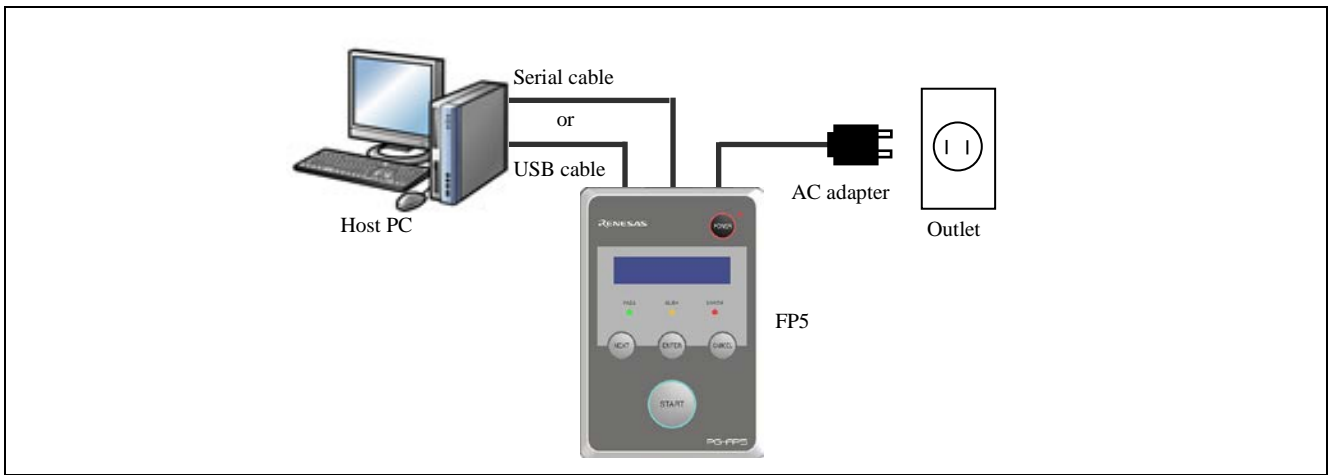
Figure 1.1   System Connection

(2) FP5 startup

After the cables are connected, press the POWER button on the FP5. When the FP5 is correctly started, the POWER LED is turned on and "Commands >" is displayed in the message display. If not, the cause may be a defect in the FP5, so consult a Renesas Electronics sales representative or distributor.

(3) Startup of programming GUI

Click the Start menu, "All Programs", point to "Renesas Electronics Utilities", "Programming Tools", and then select "PG-FP5 Vx.xx" of "PG-FP5 Vx.xx" to start the Programming GUI. The valid communication mode is automatically detected in the order of the USB, and then the serial interface.
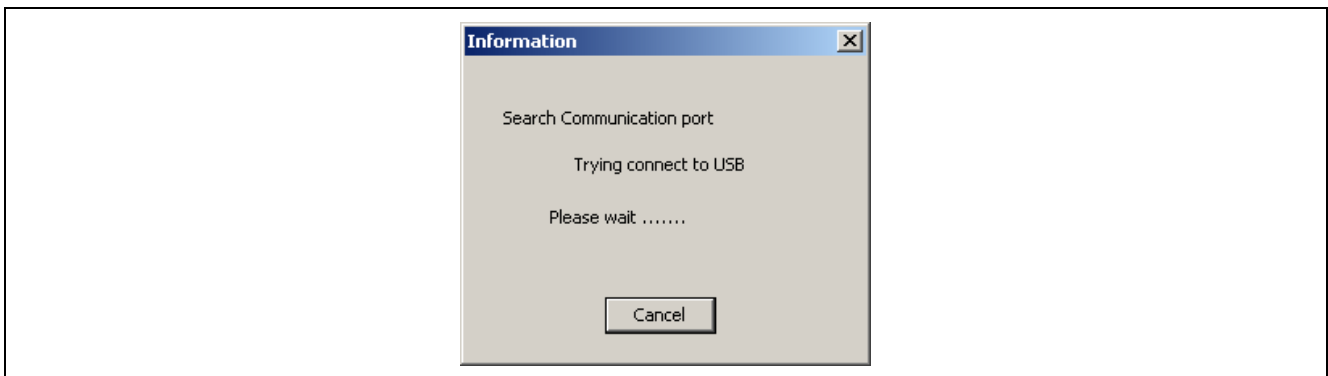

Figure 1.2   Port Scanning at Startup of Programming GUI

The communication mode can also be selected by cancelling this operation by clicking the Cancel button and selecting the [Setup host connection...] command in the [Programmer] menu.

When communication is established and the programming GUI is correctly started, the main window will be opened. Note that when the programming GUI is started for the first time, the valid programming area is cleared or once FP5 unit from a number of units has been connected, the following message will be displayed, so download the following ESF file, PR5 file or program file. This message means that ESF file and program file in the FP5 unit and the information stored in the programming GUI (INI file) do not match.
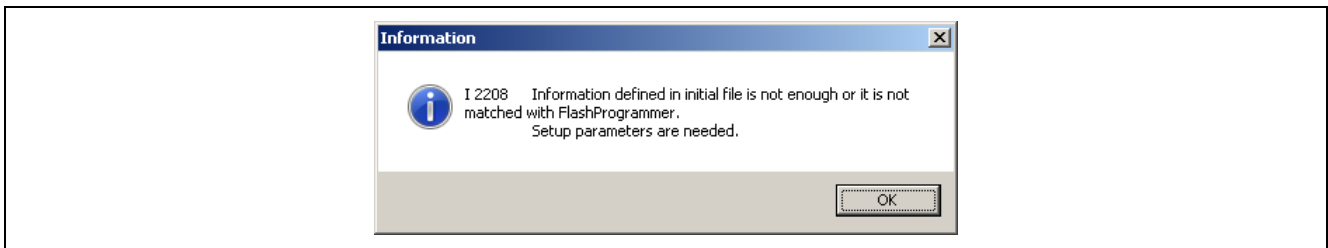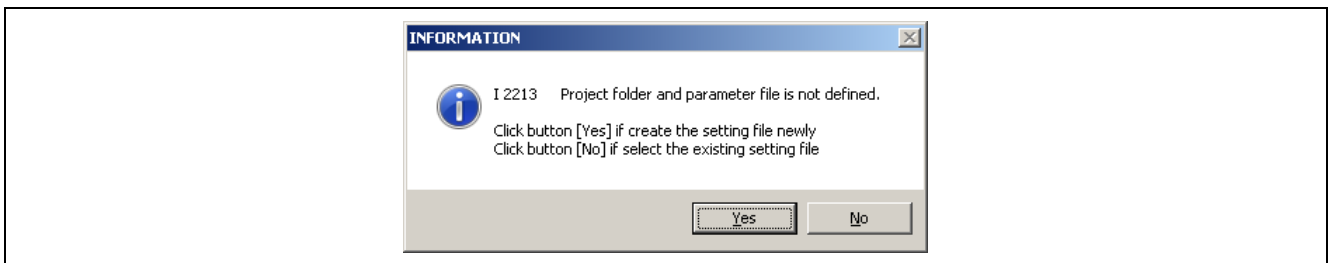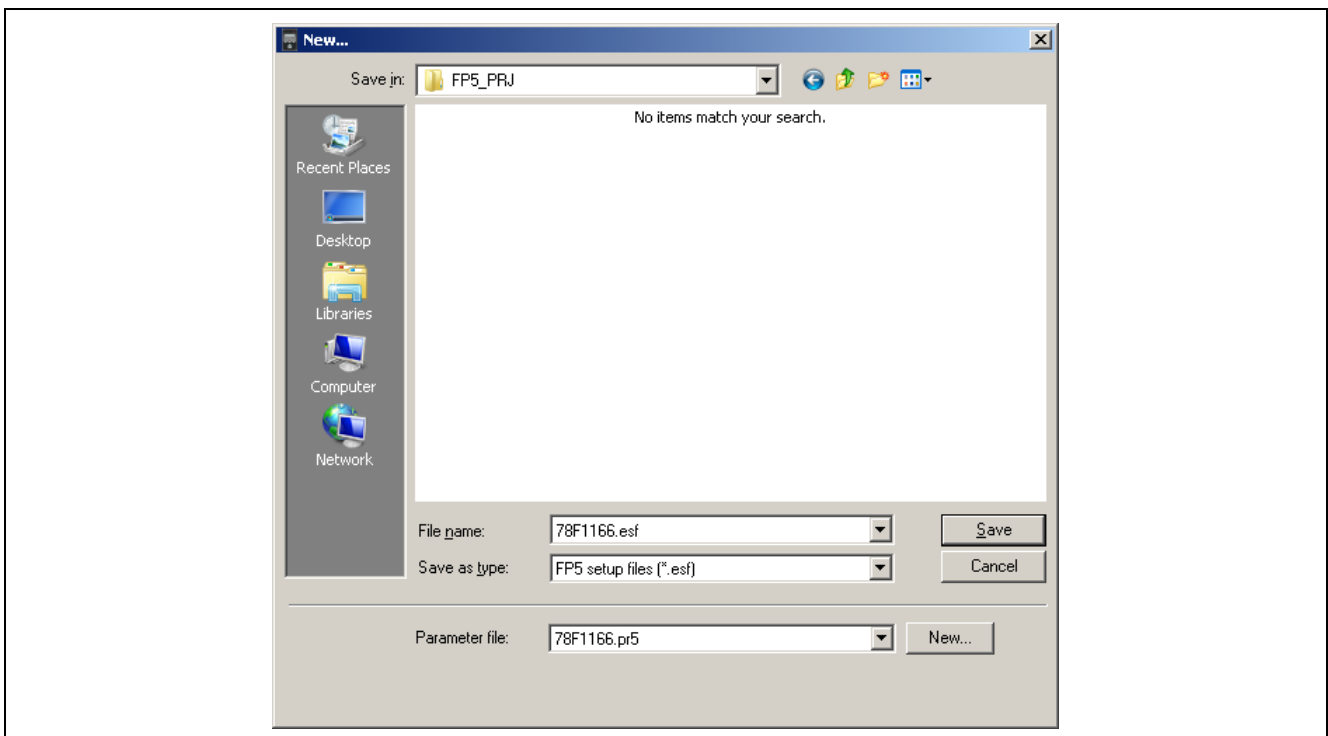

**Figure 1.3   Message Displayed at the First Startup of Programming GUI**

1. Click the OK button in the dialog box.
2. The following dialog box will be displayed. Click Yes or No .

3. Clicking Yes will open a dialog box to make a new ESF file. Refer to 1.3.3 (15) (a) <3> New... button for the steps that follow.

Clicking No will open a dialog box to select a previously created ESF file. Refer to 1.3.3 (15) (a) <3> ... button for the steps that follow.
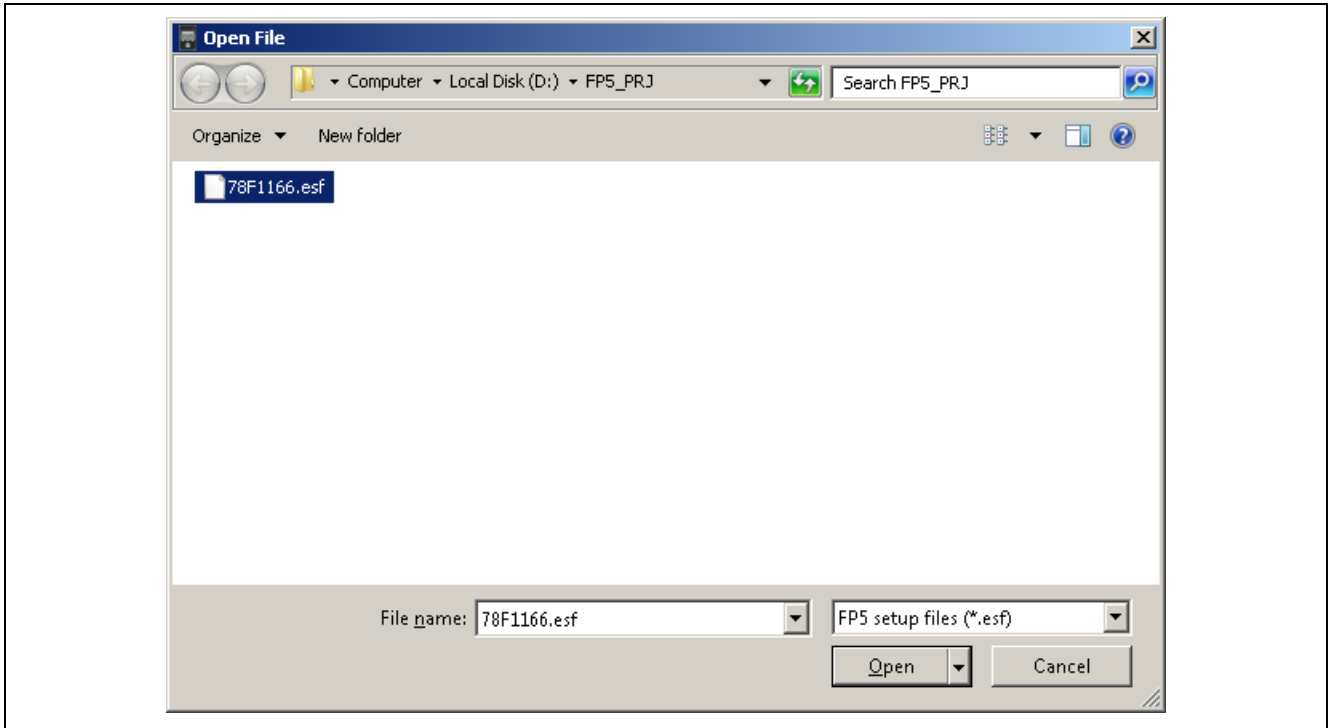
4. Next, the device setup dialog box that is opened when [Device] menu -> [Setup...] command is executed will be opened, so make the settings. Refer to 1.3.3 (15) [Setup] for the steps that follow.
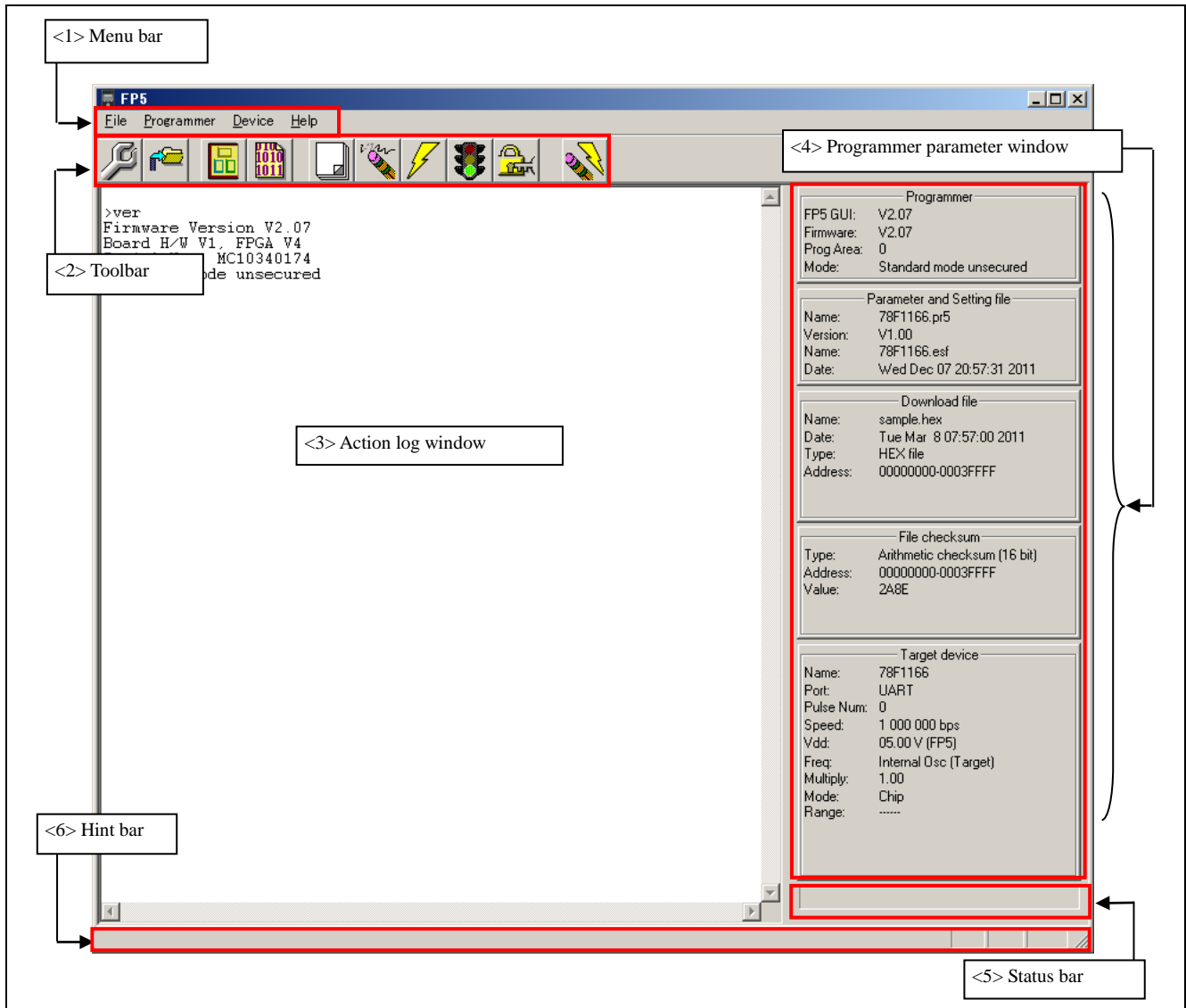

Figure 1.4   Main Window

The main window consists of the following areas.

	Name	Displayed Items	Refer to:
<1>	Menu bar	Menu items executable by the programming GUI	1.3
<2>	Toolbar	Frequently used commands, as buttons	1.4
<3>	Action log window	A programming GUI action log	1.5
<4>	Programming parameter window	Programming parameter settings	1.6
<5>	Status bar	Command progress shown as a color or with a message	1.7
<6>	Hint bar	Hints for commands and toolbar	1.8

1.3. Menu Bar

The menu bar displays the commands that are available for the programming GUI. Some commands may be unavailable when the programming GUI is started for the first time, depending on the parameter file (PR5 file) selected or FP5 Manager setting. Also, if an HCUHEX file is selected, the HCUHEX file is handled as master data, so the [Program], [Read], [Set Security], [Set Option bytes], and [Set ID Code] commands are unavailable.
Note   During command execution, do not execute other commands or terminate the programming GUI.

1.3.1. [File] menu

The following pull-down menu appears by clicking the [File] menu.
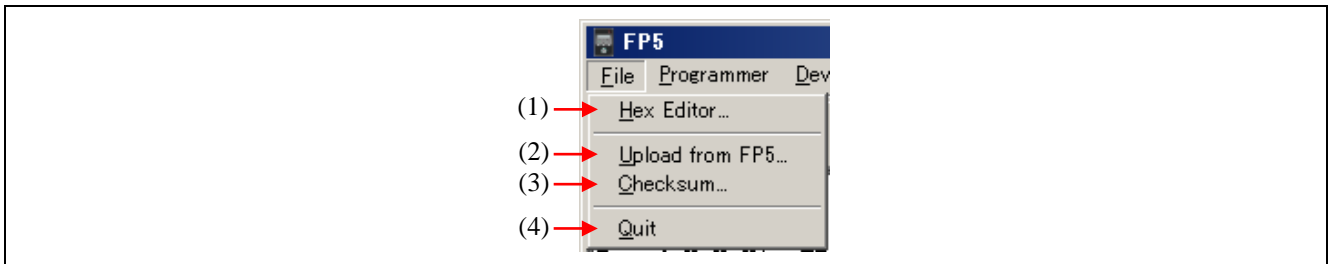This menu includes commands related to program file operation.

Figure 1.5   [File] Menu

(1)   [Hex Editor...] command
The [Hex Editor] menu allows you to edit a program file in Intel HEX format or Motorola HEX format. When this command is executed, a program file select dialog box is opened and the file to be edited can be specified. Note that HCUHEX files, and DDI files cannot be loaded in this dialog box.
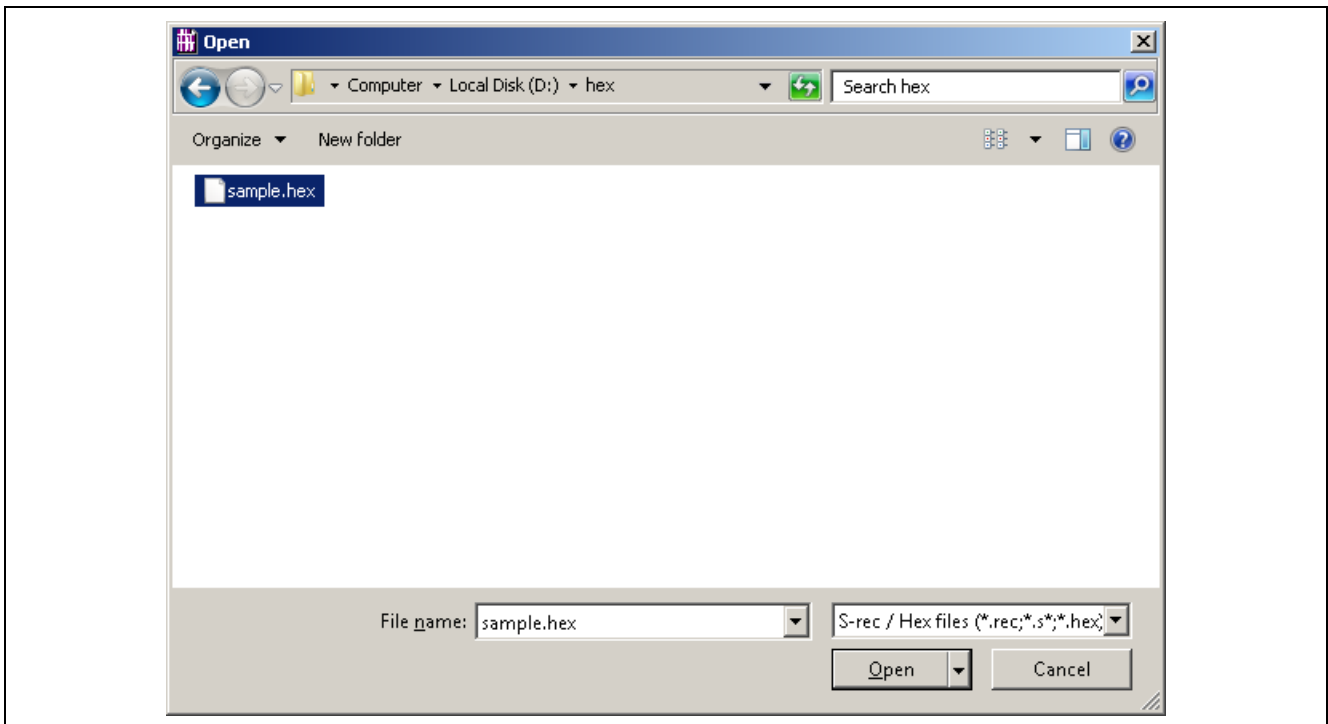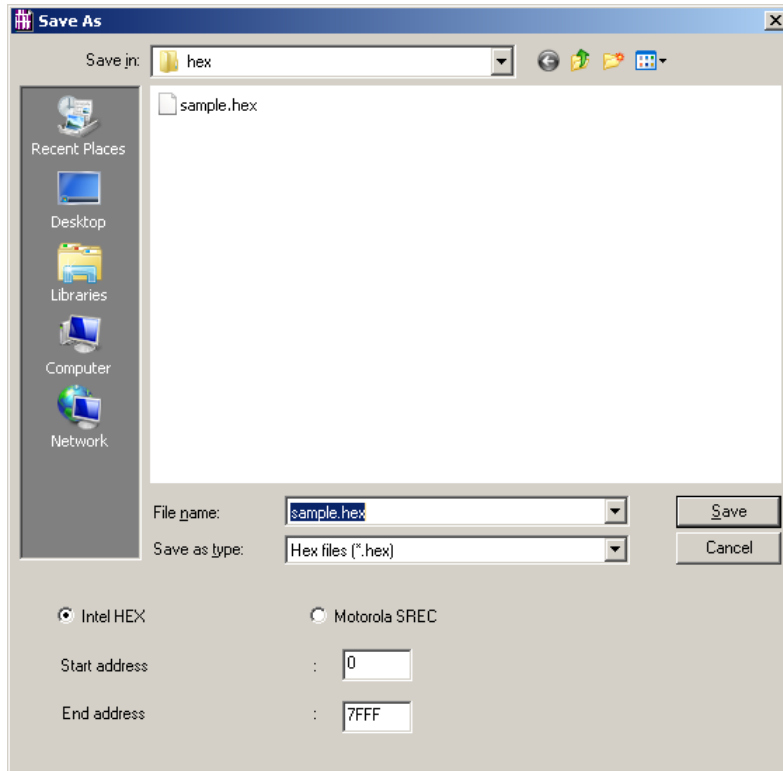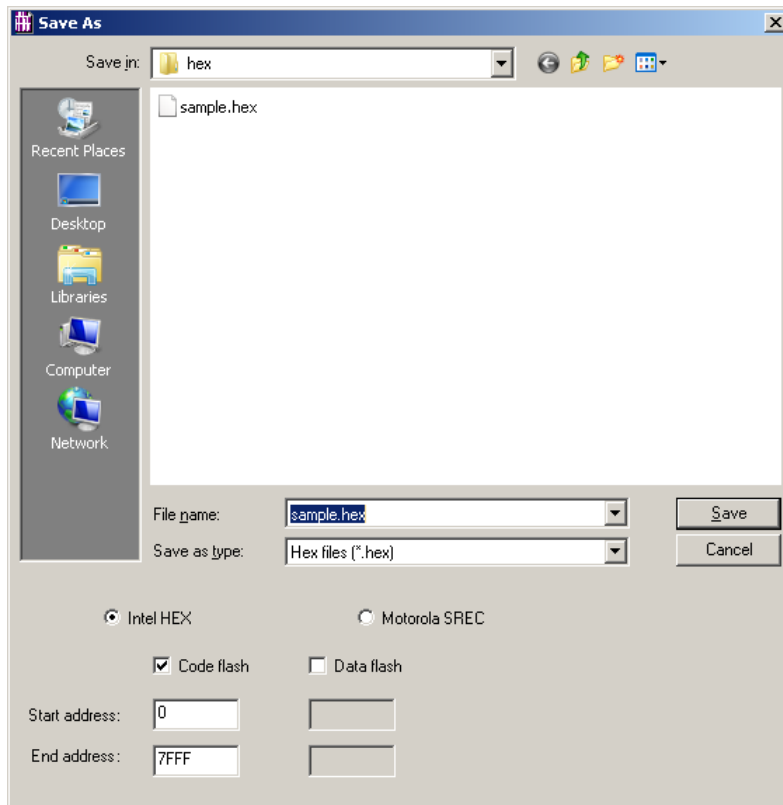

Figure 1.6   Program File Select Dialog Box

S-rec / Hex files (*.rec;*.s*;*.hex) or All files (*.*) may be selected from the Files of types list box.
After selecting a file to be opened, the file selected in the HEX Editor main window is loaded. At this time, whether the file is of the Intel HEX format or Motorola HEX format is automatically recognized. When loading is finished, the HEX Editor main window is opened.

Figure 1.7   HEX Editor Main Window

The displayed file contents can be modified by placing the pointer in the data display area in the HEX Editor main window. Data input via the keyboard is accepted for all shown memory locations.

The ID Tag area is the area used with the target device supporting data flash. Only area indicating 0 or 1 can be edited in this area. Input 0 or 1 for the ID Tag area. If 0 is input, then 00000000h will be set, and if 1 is input, FFFFFFFFh will be used as the ID Tag. For details on data flash and ID tags, refer to the user's manual of the target device.

The HEX Editor only accepts hexadecimal data, i.e., numbers 0 to 9 and letters A to F. All other data will be rejected.

The ASCII representation, if any, is shown in the ASCII display area. This area is for reference only, so no data can be input.

Use the scroll bar to move another address range into the visible area of the HEX Editor.

The following keys can be input using the keyboard.

Table 1.1   Key Functions That Can Be Input in HEX Editor Window

Key	Function
0-9, A-F	Data input (data display area)
⊢→	Move cursor in right direction
⊢←	Move cursor in left direction
⬆	Move cursor in up direction
⬇	Move cursor in down direction
Tab	Tab Move cursor to next input field (address + 1)

If any changes have been made to the file, [Save] and [Save As] in the [File] menu in the HEX Editor main window become available for saving the modified data.

(a) When a 78K product or V850 and RL78 family product without data flash memory is selected

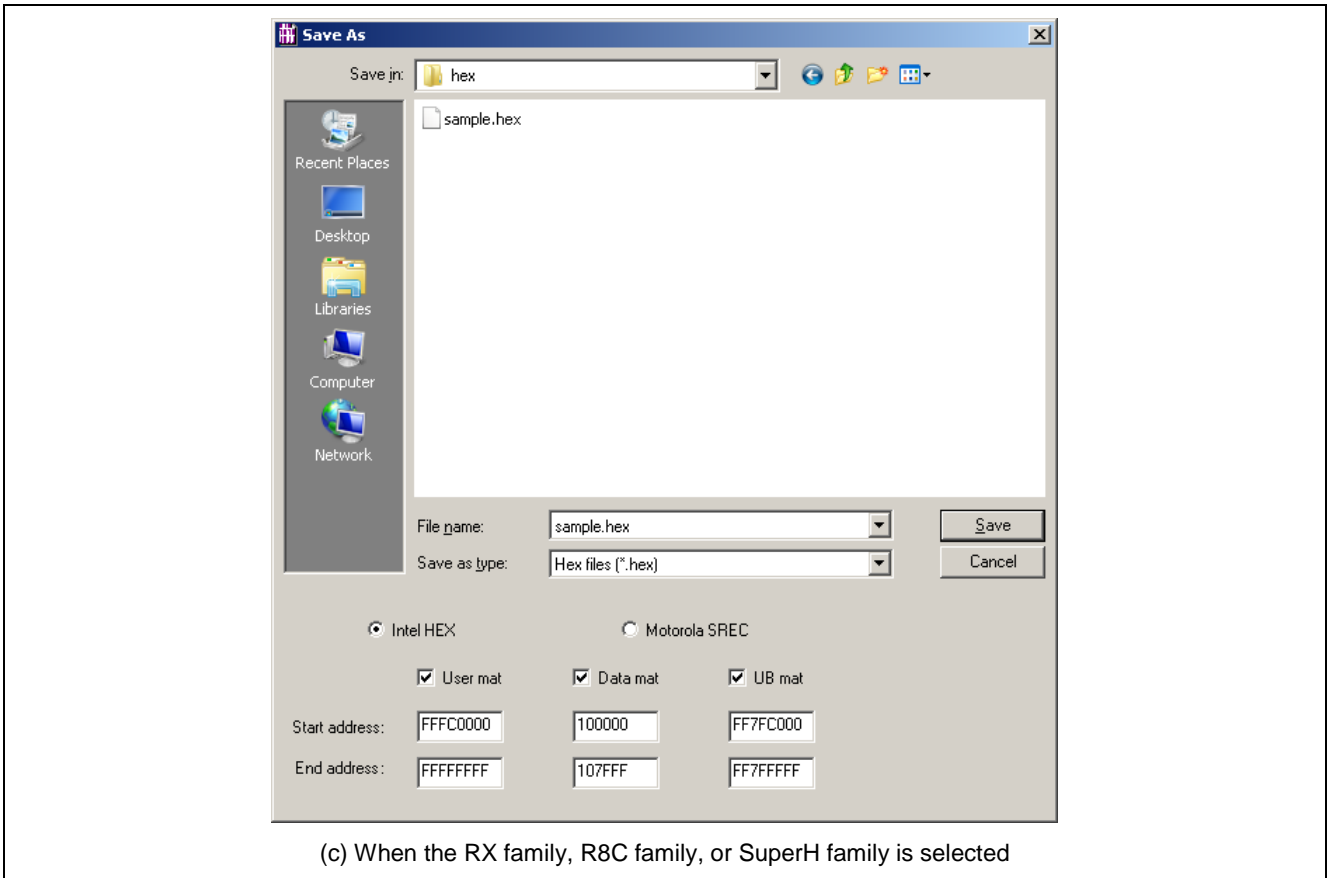(b) When a V850 or RL78 family product with data flash memory is selected

(c) When the RX family, R8C family, or SuperH family is selected

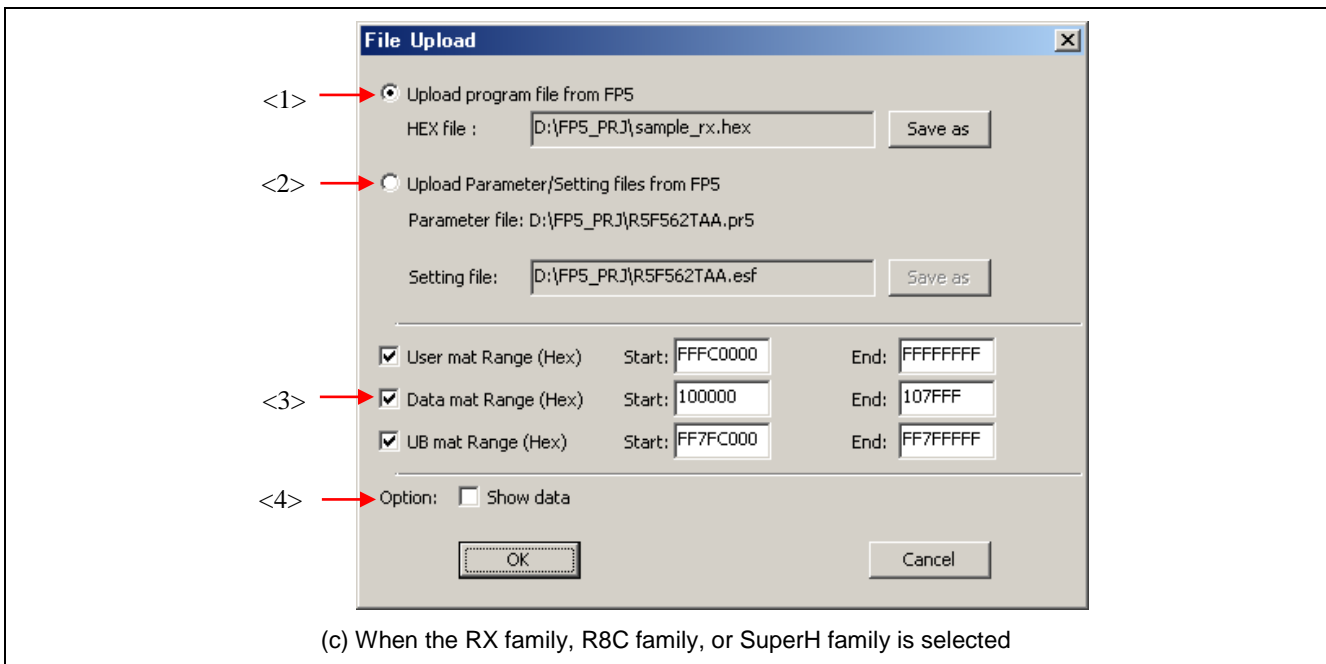**Figure 1.8   [Save As] Dialog Box of HEX Editor**

Besides the file name and folder location, a start address and an end address for the new file can be selected in the [Save As] dialog box. The original start address and end address are displayed by default. Select the file radio button for the format in which to save the data. Select the same format as that of the loaded file. Use of the saved file with other tool products is not supported.

Note   In a microcontroller that supports ID Tags of data flash, for the saved program file contents of the data flash area, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.1 Relationship Between HEX Editor and Saved Program File.

Mapping of the data flash memory may differ between normal operation and flash memory programming mode. Refer to the user's manual of the MCU for more information on mapping when the flash memory programming mode is selected.

(2) [Upload from FP5...] command

The [Upload from FP5...] command is used to upload the program file, PR5 file and ESF file saved in a valid programming area.

Note   The HCUHEX file, or DDI file cannot uploads.
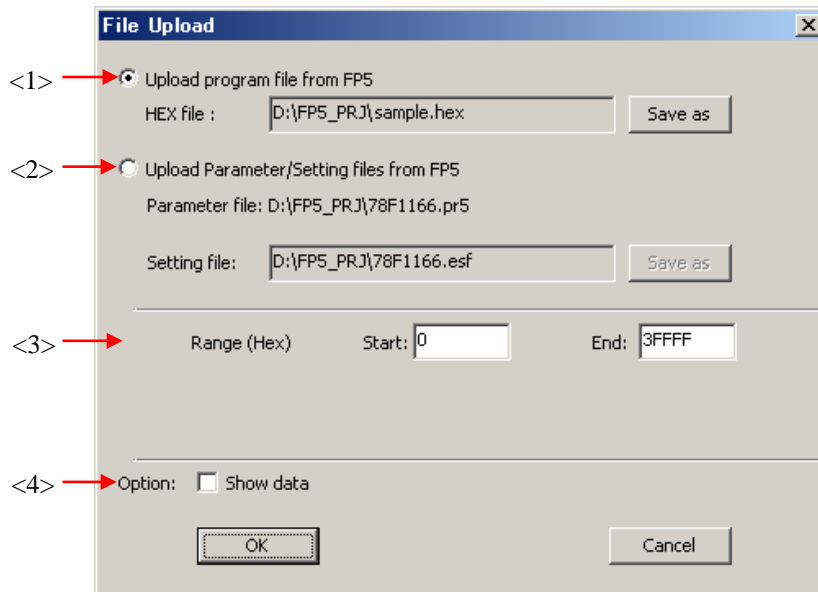
(a) When a 78K product or V850 and RL78 family product without data flash memory is selected

(b) When a V850 or RL78 family product with data flash memory is selected
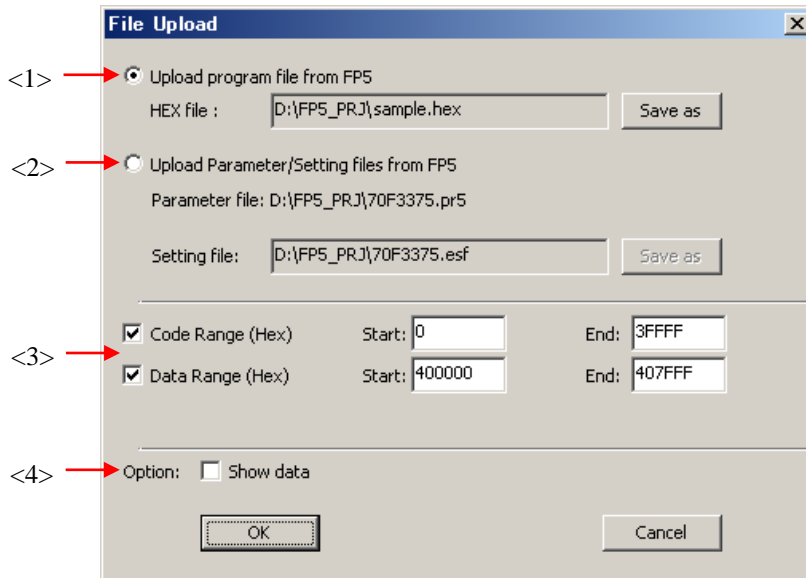
(c) When the RX family, R8C family, or SuperH family is selected

Figure 1.9   [Upload from FP5...] Dialog Box in the HEX Editor

<1> [Upload program file from FP5] button
The storage location and file name of the program file are specified in the HEX file: box. In order to change the file location or name, click the Save as button and make the changes.

<2> [Upload Parameter/Setting files from FP5] button
The Parameter file: box specifies the storage location of the PR5 file. The Setting file: box specifies the ESF file storage location and file name. In order to change the file locations, click the Save as button and make the changes. The parameter file names cannot be changed.

<3> Address range selection area
This area is enabled with the [Upload program file from FP5] button clicked. Specify the address range of the program file that is to be saved. When a V850 and RL78 family product with data flash memory is selected, [Code flash:] and [Data flash:] are displayed. For the RX family, R8C family, and SuperH family, [User mat], [Data mat], and [User boot] are displayed.

<4> Option area
When the [Show data] check box is checked, the action log window will be displayed when the upload is executed. Pressing the OK button will start the upload with the selected settings.
Pressing the Cancel button will close the dialog box without executing the upload.

(3) [Checksum] command

The [Checksum] command calculates the checksum of the selected program file downloaded to FP5 and displays the result. When this command is executed, the Checksum dialog box appears. Select the optional calculation method and the target address range, and click the $\boxed{\text{OK}}$ button. The result will then be displayed in the [File Checksum] area in the action log window and programmer parameter window. This command can be executed after the [Setup] command is executed. If the [Setup] command is executed again after the [Checksum] command is executed, the result displayed in the [File Checksum] area in the programmer parameter window will be cleared.

Note   The HCUHEX file, or DDI file cannot checksum.

(a) When a 78K product or V850 and RL78 family product without data flash memory is selected

(b) When a V850 or RL78 family product with data flash memory is selected

(c) When the RX family, R8C family, or SuperH family is selected
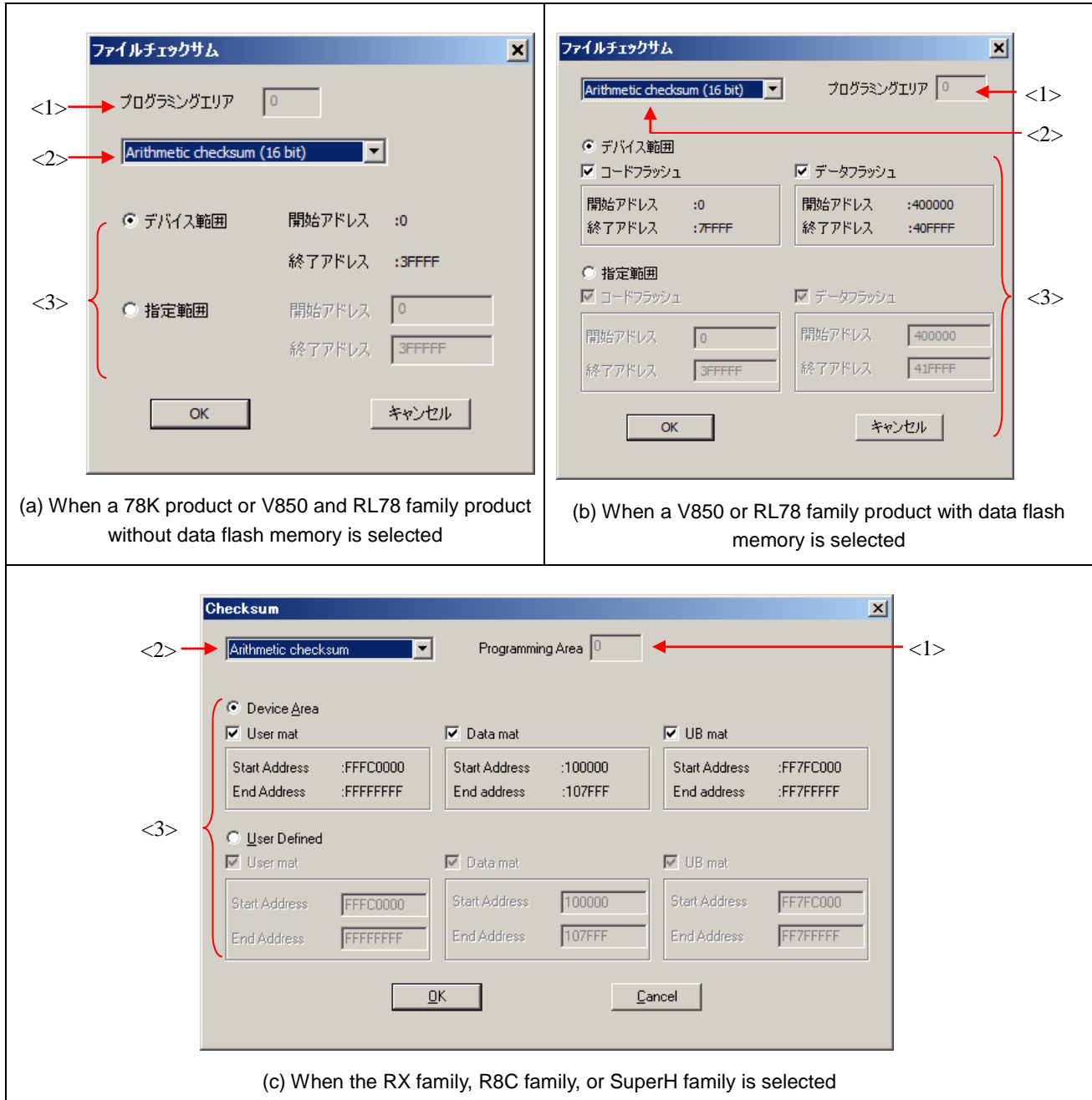
Figure 1.10 Checksum Dialog Box

<1> Programming area
The valid programming area is displayed.

<2> Checksum calculation mode selection
Select the mode for calculating checksum of the selected program file. Selected calculation modes differ with the MCU.

Table 1.2   Checksum calculation

Checksum calculation		Correspondence microcontroller
Arithmetic checksum (16bit)	16-bit arithmetic (subtraction)	78K and V850 products, and RL78 family products that support the Checksum command
Arithmetic checksum	32-bit arithmetic (addition)	RX, R8C, and SuperH families
CRC sum (16bit)	16-bit CRC	RL78 family products that support the CRC check command
CRC sum (32bit)	32-bit CRC	78K and V850 products, RL78 family products that support the Checksum command, RX, R8C, and SuperH families

Note   With the 16-bit arithmetic (subtraction) mode, the lower 4 digits of the result from which a value is subtracted from 00h in 1-byte units are displayed.

With the 32-bit arithmetic (addition) mode, the lower 8 digits of the result to which a value is added from 00h in 1-byte units are displayed.

With 16-bit mode, the 4-digit result of CRC16 function calculation is displayed. For details on arithmetic specifications, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.5 16-bit CRC Calculation Specifications.

With 32-bit mode, the 8-digit result of CRC32 function calculation is displayed. For details on arithmetic specifications, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.2 32-bit CRC Calculation Specifications.

<3> Address range selection

Select the range for calculating checksum of the selected program file. If there is no program file data in the specified range, the specified range is filled with FFh for calculation. When a V850 or RL78 family product with data flash memory is selected, [Code flash:] and [Data flash:] are displayed. When the RX family, R8C family, or SuperH family is selected, [User mat], [Data mat], and [User boot] are displayed.

Device Area: From the start to end addresses of the device, which are contained in the selected PR5 file

User Defined: Any range can be specified by inputting the addresses to the [Start Address] and [End Address] text boxes.

Clicking the OK button displays the calculation result in the [File Checksum] area in the action log window and programmer parameter window.

Clicking the Cancel button closes the dialog box without saving the settings made in the Checksum dialog box.

Note   When the valid programming area is changed or a program file is downloaded, the checksum result will be cleared.
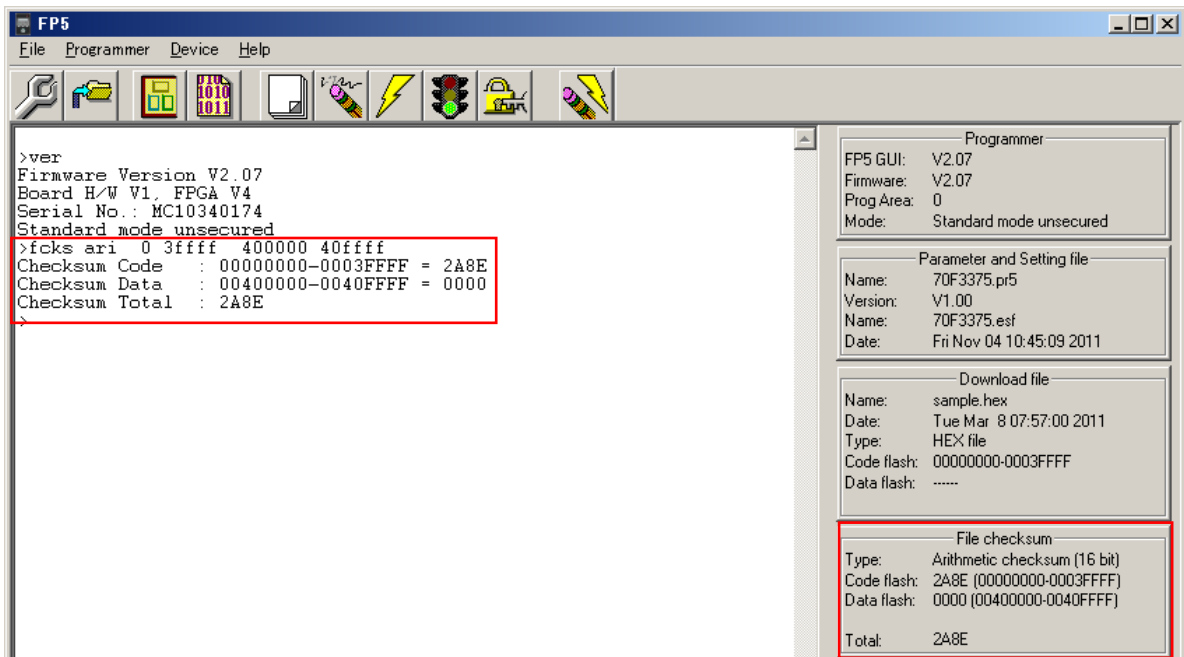
Note   When the RX family, or SuperH family is selected, when ROM size is less than $8Kx2^n$ byte, a space area is complemented with FFh to an $8Kx2^n$ byte, and the range of an $8Kx2^n$ byte is calculated.

Ex.1) When ROM size is 384 K bytes, a space area is complemented with FFh to a 512K byte, and the range of a 512K byte is calculated.
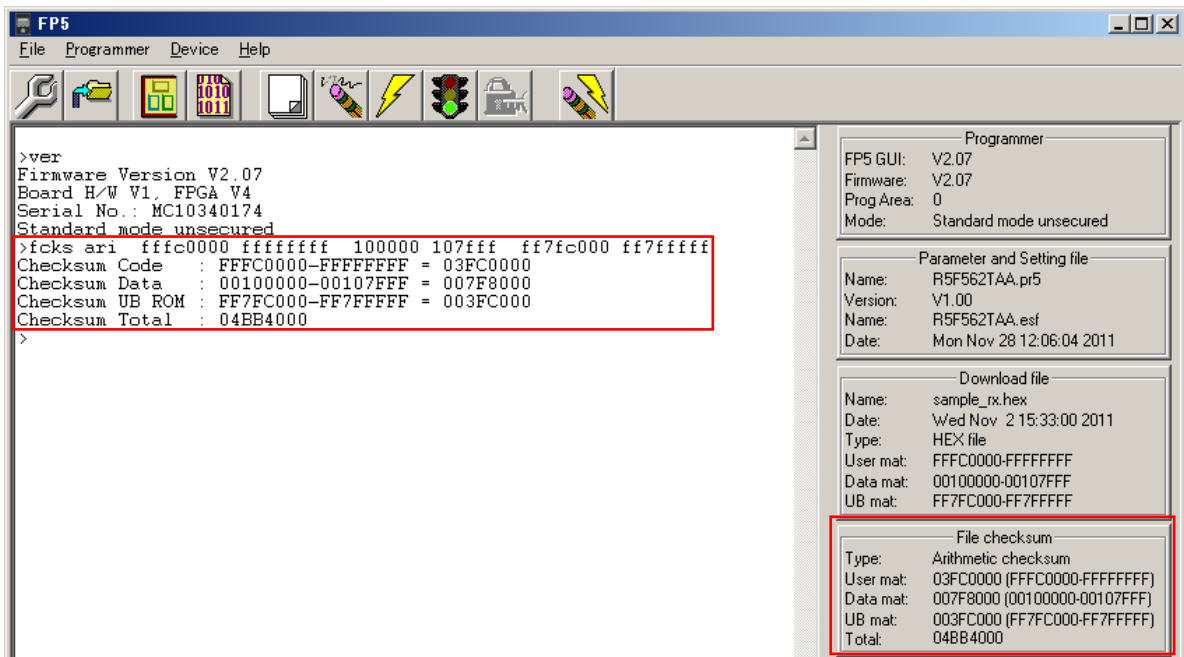
Ex.2) When ROM size is 256 K bytes, a space area is complemented with FFh to 256 K bytes, and 256 K bytes of range is calculated.
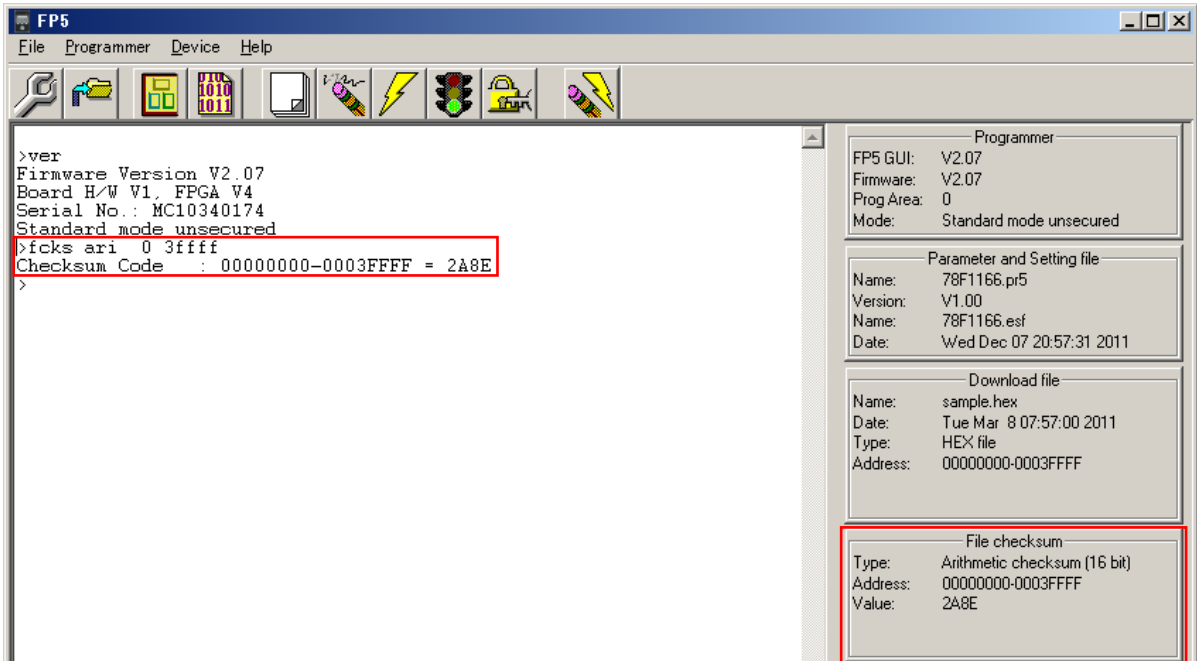
(a) When a 78K product or V850 and RL78 family product without data flash memory is selected

(b) When a V850 or RL78 family product with data flash memory is selected

(c) When RX Family, R8C Family or SuperH Family Is Selected

Figure 1.11 Checksum Result

(4)   [Quit] command
The [Quit] command terminates the programming GUI. The programming GUI can also be terminated by clicking the
⊠ button on the right end of the title bar in the main window. When the programming GUI is terminated, various
settings are saved in the INI file (FP5.ini), and these settings are loaded when the programming GUI is started the next
time.

1.3.2. [Programmer] menu

Clicking the [Programmer] menu displays the following pull-down menu.
This menu includes commands related to FP5 settings.
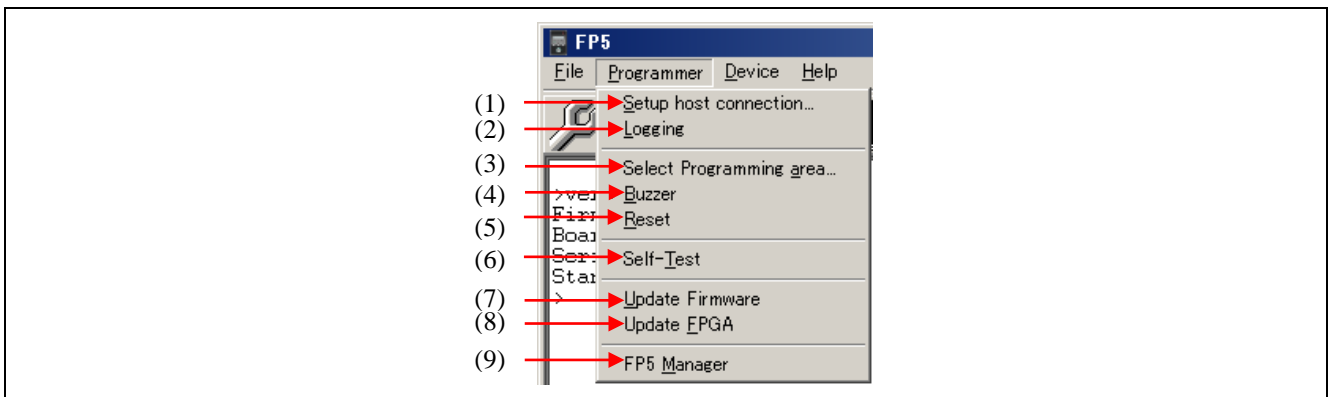
Figure 1.12 [Programmer] Menu

(1)   [Setup host connection] command
Running the [Setup host connection] command opens the [Host Connection] dialog box. The channel for
communication between the FP5 and the host PC can be selected and configured in this dialog box.
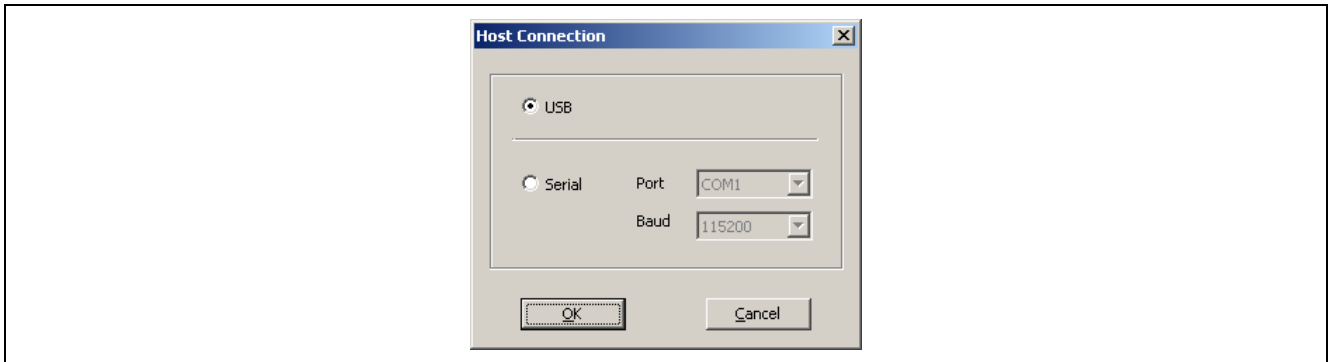
Figure 1.13 [Host Connection] Dialog Box

"USB" can be selected as the communication channel if the USB interface is supported in the PC used.
When selecting "Serial", select the COM port and baud rate from the drop-down list boxes. COM ports that are
recognized by the host PC are displayed in the Port list. Up to 256 ports can be recognized.

When the OK button is clicked, software tries to establish a connection between the FP5 and the host PC using the
selected communication channels.
Clicking the Cancel button closes the window without making any changes.

(2)   [Logging] command
The [Logging] command saves information displayed in the action log window in the log file. When this command is
executed, the log file save dialog box appears. Move to an arbitrary folder, select the log file in the [File name] drop-
down list, and click the Save button; the log file will then be saved. The [Logging] command on the menu bar will be
checked. The check mark will be cleared by clicking the [Logging] command again and saving of the log file will be
stopped. Enabling/disabling the [Logging] command is added to the time stamp. For a log file example, refer to
Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.3 Log File Example.
Note   The log file that was saved the last time is displayed in the log file save dialog box.
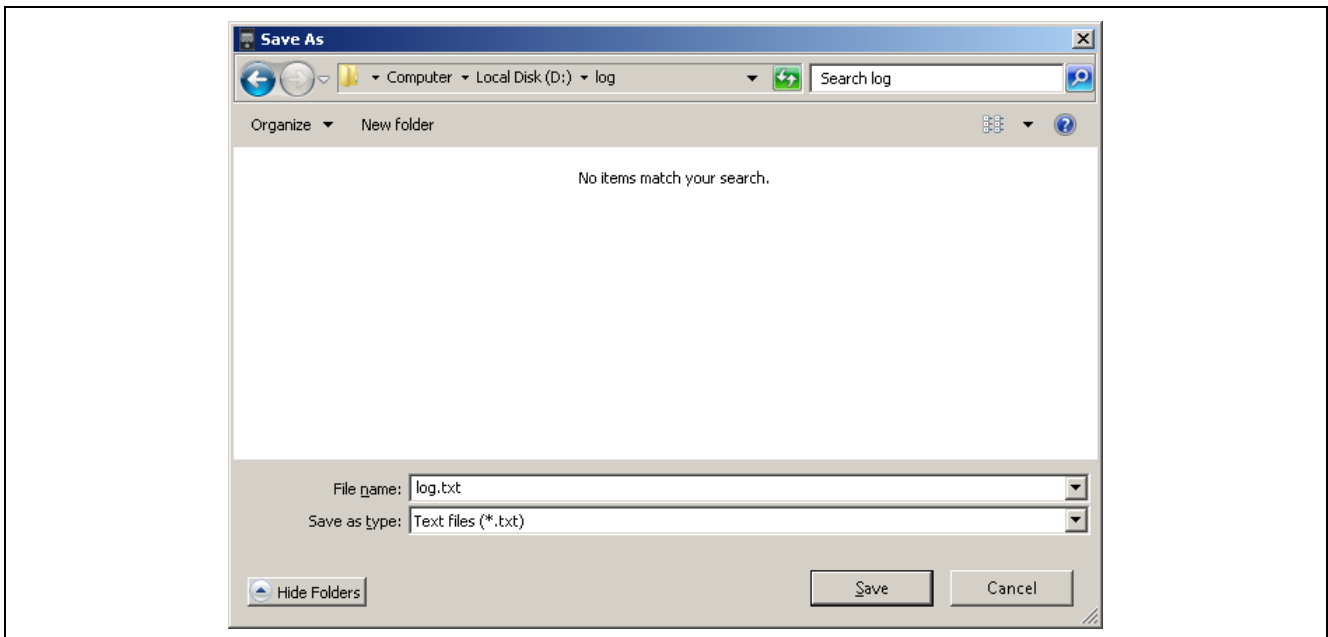

Figure 1.14 Log File Save Dialog Box

Clicking the Save button saves the specified log file.
Clicking the Cancel button closes the dialog box without saving the log file.

(3) [Select Programming area] command

The FP5 has a 16 MB flash memory area for saving program files. This memory area can be used as one independent 16 MB programming areas (Area 0) or two programming areas of 10 MB and 6 MB (Area 0 to Area 1), four independent 4 MB programming areas (Area 0 to Area 3) or eight independent 2 MB programming areas (Area 0 to Area 7). Program files can be downloaded to each programming area, and which file, PR5 or ESF, is to be saved is selectable in programming area units. That is, files can be individually downloaded in each programming area, and the area used can also be selected individually.

This command is used to select a valid programming area from the FP5's programming areas x. When this command is executed, the programming area select dialog box is opened, and the desired programming area can be selected. The number of programming areas that can be selected with this command is the value defined in the [Programming Area Setting] area on the [Target] tab of the Device Setup dialog box, which is opened by the [Setup...] command in the [Device] menu.
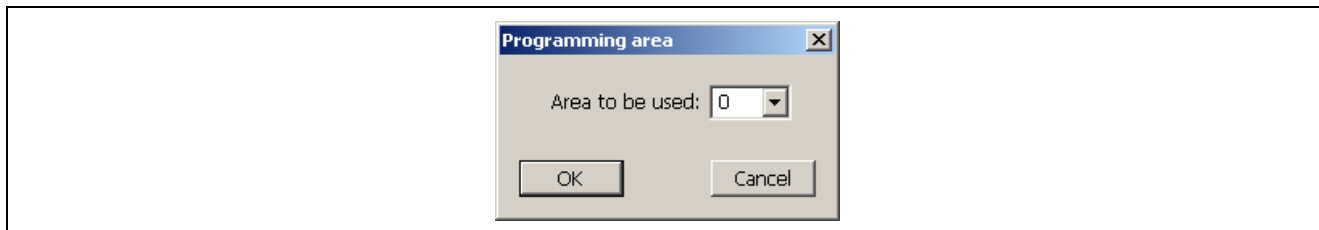
Figure 1.15 Programming Area Select Dialog Box

The currently selected programming area is displayed in the programming area selection dialog box. To change the area, select the relevant number from the list box and click the OK button. To check the contents set to each area or to change the division factor, see the [Target] tab of the Device Setup dialog box.

Clicking the OK button selects the programming area selected in the programming area select dialog box.
Clicking the Cancel button closes the dialog box without changing the programming area.

(4) [Buzzer] command

The [Buzzer] command is used to enable or disable the setting to output the buzzer sound from the FP5 main unit. When this command is executed, the [Buzzer] command on the menu bar is checked and becomes valid. When this command is executed again, the check mark is cleared and the command becomes invalid. The FP5 makes a double-beep sound when the Autoprocedure(E.P.) command is completed normally, or makes a buzzer sound when the command is completed abnormally.

(5) [Reset] command

When the [Reset] command is executed, a software reset can be applied to the FP5. After reset, the current versions of the firmware, FPGA, the FP5 serial number, and mode will be displayed in the action log window.

(6) [Self-Test] command

The [Self-Test] command executes the FP5 self-testing program. The following three items are subject to self-testing. The self-testing program does not affect the PR5 files, ESF files and program files saved in the FP5.
<1> FPGA test
<2> Power generation block test
<3> Target / remote interface I/O test

Since execution of the [Self-Test] command involves I/O testing, a message that prompts the user to disconnect hardware connected the target connector or remote connector is displayed. Remove hardware (including target system and program adaptor), connected to the target connector or remote connector, if any. Make sure that no hardware is connected and click the OK button; self-testing will then be executed.
If the Cancel button is clicked, self-testing will not be executed.
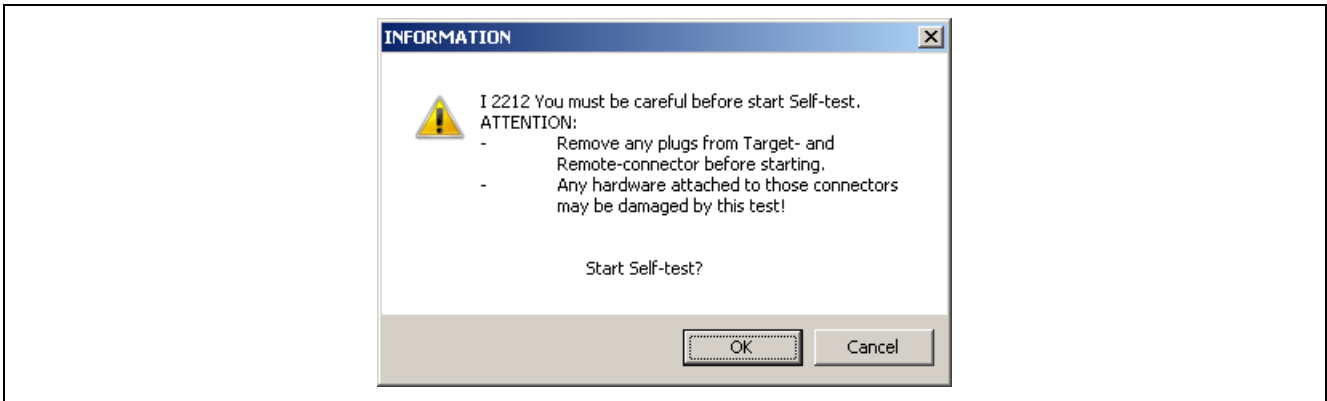
Figure 1.16 Confirmation Before Starting Self-Testing

Self-testing takes about three seconds, and the result will be displayed in the action log window and a result dialog box. If the message "Selftest FAILED." is displayed, the cause may be a defect in the FP5, so consult a Renesas Electronics sales representative or distributor.
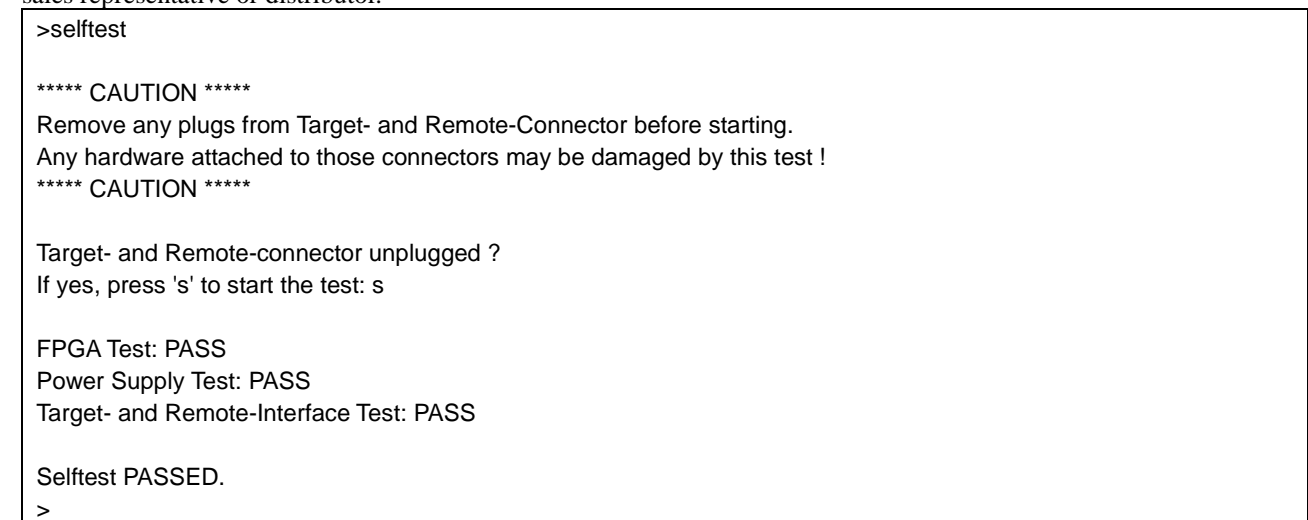
```
>selftest

***** CAUTION *****
Remove any plugs from Target- and Remote-Connector before starting.
Any hardware attached to those connectors may be damaged by this test !
***** CAUTION *****

Target- and Remote-connector unplugged ?
If yes, press 's' to start the test: s

FPGA Test: PASS
Power Supply Test: PASS
Target- and Remote-Interface Test: PASS

Selftest PASSED.
>
```

Figure 1.17 Result When Self-Testing Program Has Been Completed Normally <Action Log Window>
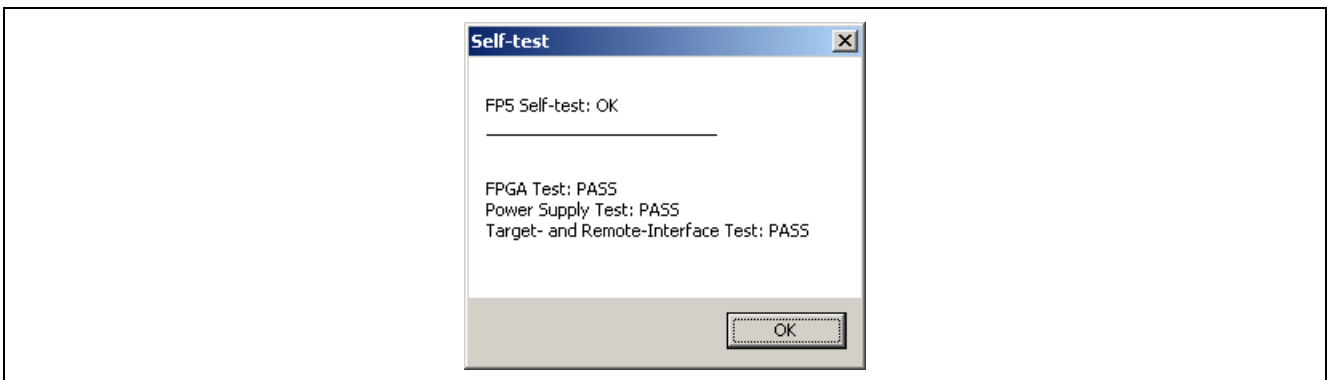
Figure 1.18 Result When Self-Testing Program Has Been Completed Normally <Result Dialog Box>

```
>selftest

***** CAUTION *****
Remove any plugs from Target- and Remote-Connector before starting.
Any hardware attached to those connectors may be damaged by this test !
***** CAUTION *****

Target- and Remote-connector unplugged ?
If yes, press 's' to start the test: s

FPGA Test: PASS
Power Supply Test: PASS
Target- and Remote-Interface Test: FAIL

Selftest FAILED.
>
```

Figure 1.19 Example of Result When Self-Testing Program Has Been Completed Abnormally <Action Log Window>
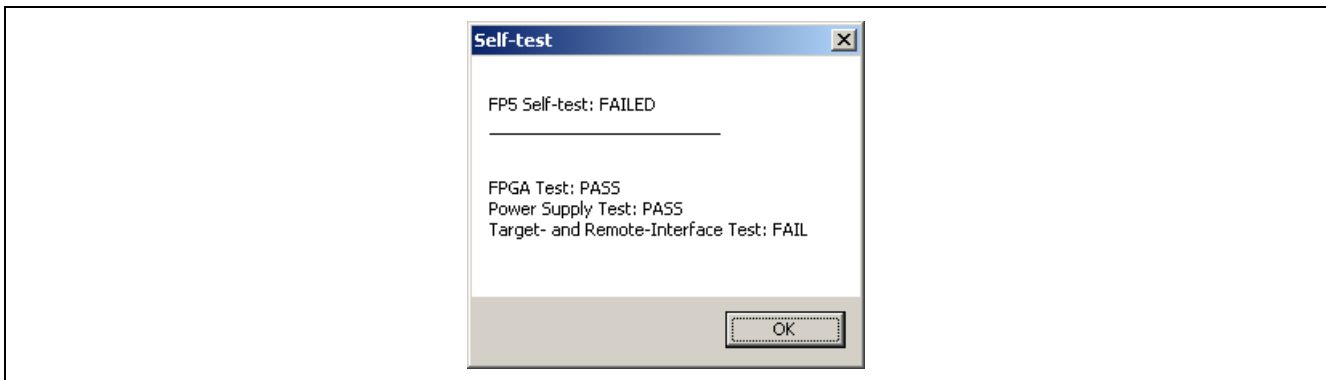
Figure 1.20 Example of Result When Self-Testing Program Has Been Completed Abnormally <Result Dialog Box>

(7) [Update Firmware] command
The [Update Firmware] command updates the firmware. Refer to Common 3.4 Updating Programming GUI, Firmware and FPGA and download the relevant update file before starting update.
Executing of this command displays the following dialog box.
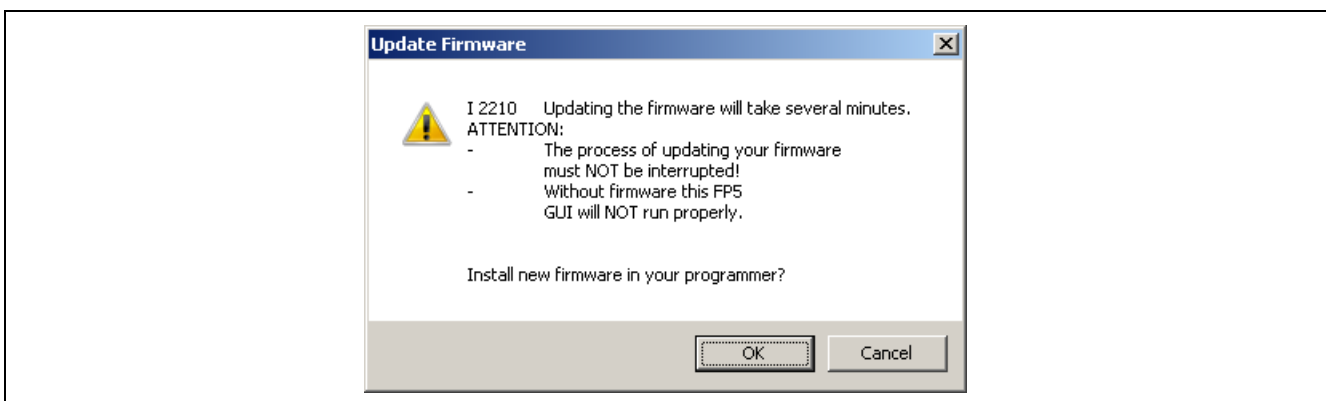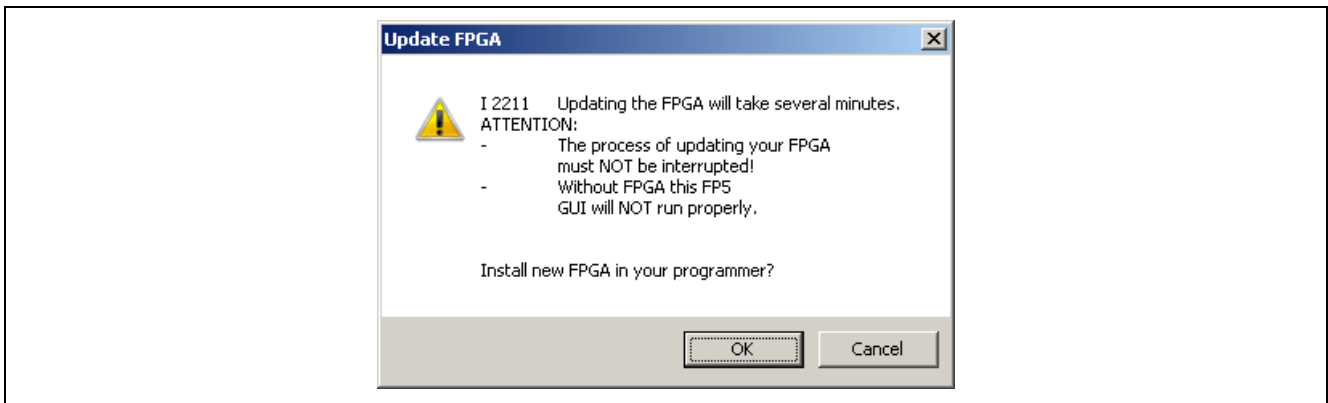

Figure 1.21 [Update Firmware] Dialog Box

To continue the firmware update, click the OK button.
Clicking the Cancel button cancels the firmware update.
Clicking the OK button opens the [Open firmware file] dialog box.
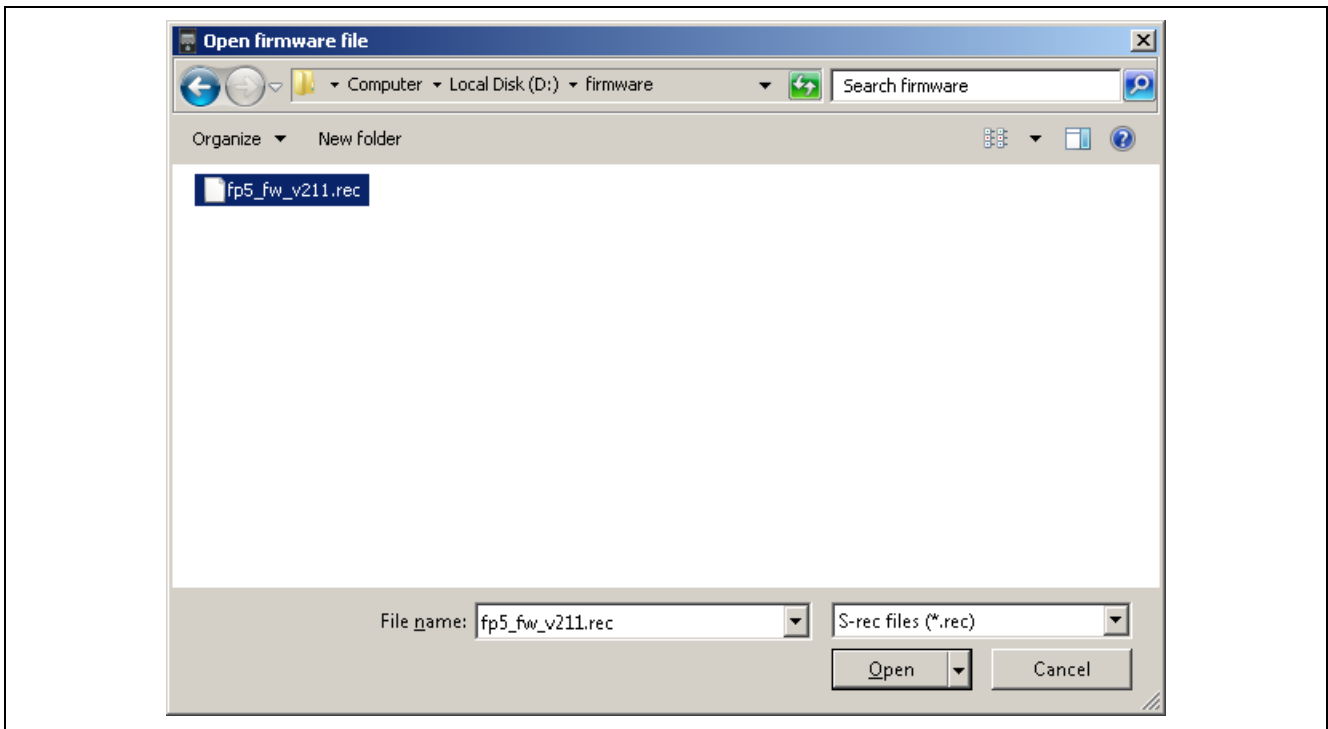
Figure 1.22 [Open firmware file] Dialog Box

Select the firmware file "fp5_fw_vxxx.rec" and then click the Open button.

Note   1. Do not use FP5 firmware other than the one posted on the website; otherwise, a defect may occur.
        2. When a firmware of FP5 updates from V2.00 to V1.xx, a serial number of FP5 is erased.
            And, FP5 can't operate in USB1.1. In addition, the other functions don't have any problem.
            When FP5 revives, consult a Renesas Electronics sales representative or distributor.

Some commands are sent to the FP5 and the update progress status is displayed in the action log window. The message "Firmware Update succeeds", which indicates normal completion of firmware update, and "Restarting FP5...", which is equivalent to [RESET] command processing, is automatically performed. The new version can then be checked as "Firmware Version Vx.xx". The update takes about 10 seconds.
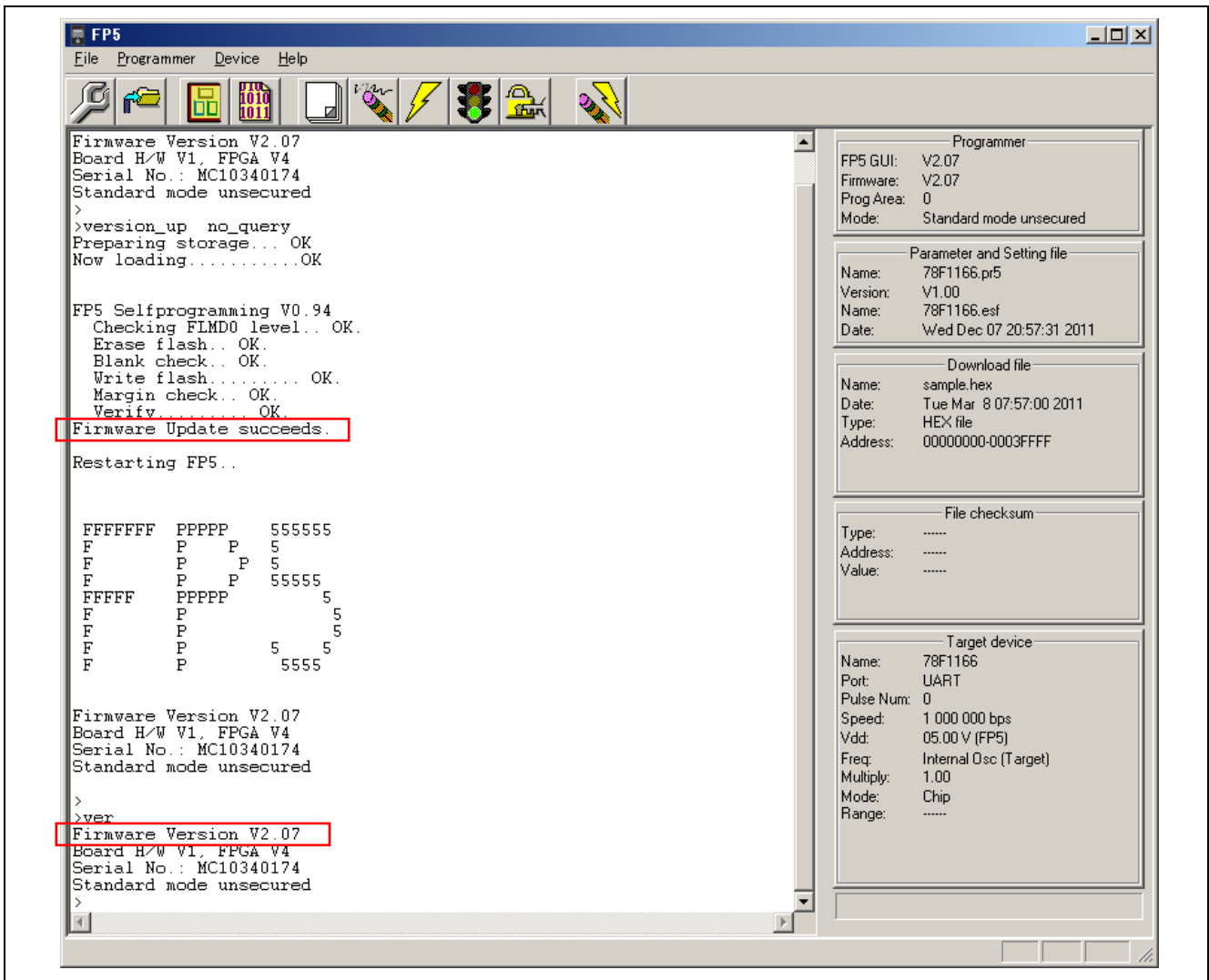
Figure 1.23 Action Log Window When Firmware Update Is Finished

Note   Depending on the changes made, the following dialog box will be displayed. In this case, the information stored
in the FP5 (PR5 file, ESF file, program file) will have been deleted, so please download those files again. (Refer
to 1.2 Startup of Programming GUI.)
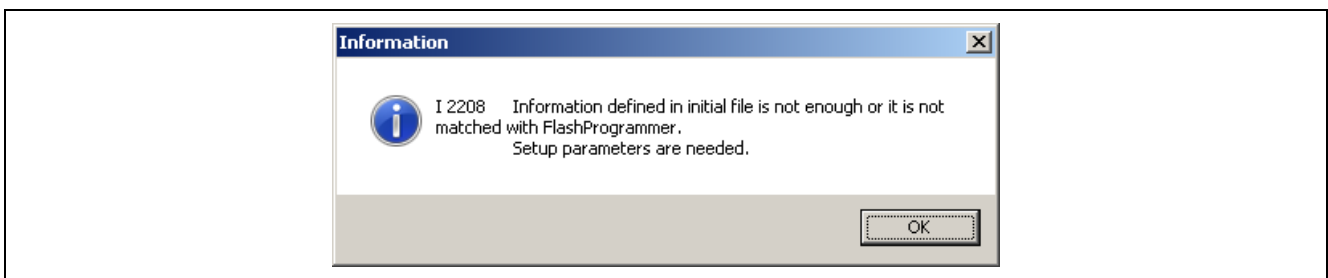
(8)   [Update FPGA] command
The [Update FPGA] command updates the FPGA. Refer to Common 3.4 Updating Programming GUI, Firmware and
FPGA and download the relevant update file before starting update.
Executing of this command displays the following dialog box.

Figure 1.24 [Update FPGA] Dialog Box

To continue the FPGA update, click the OK button.
Clicking the Cancel button cancels the FPGA update.
Clicking the OK button opens the [Open FPGA file] dialog box.
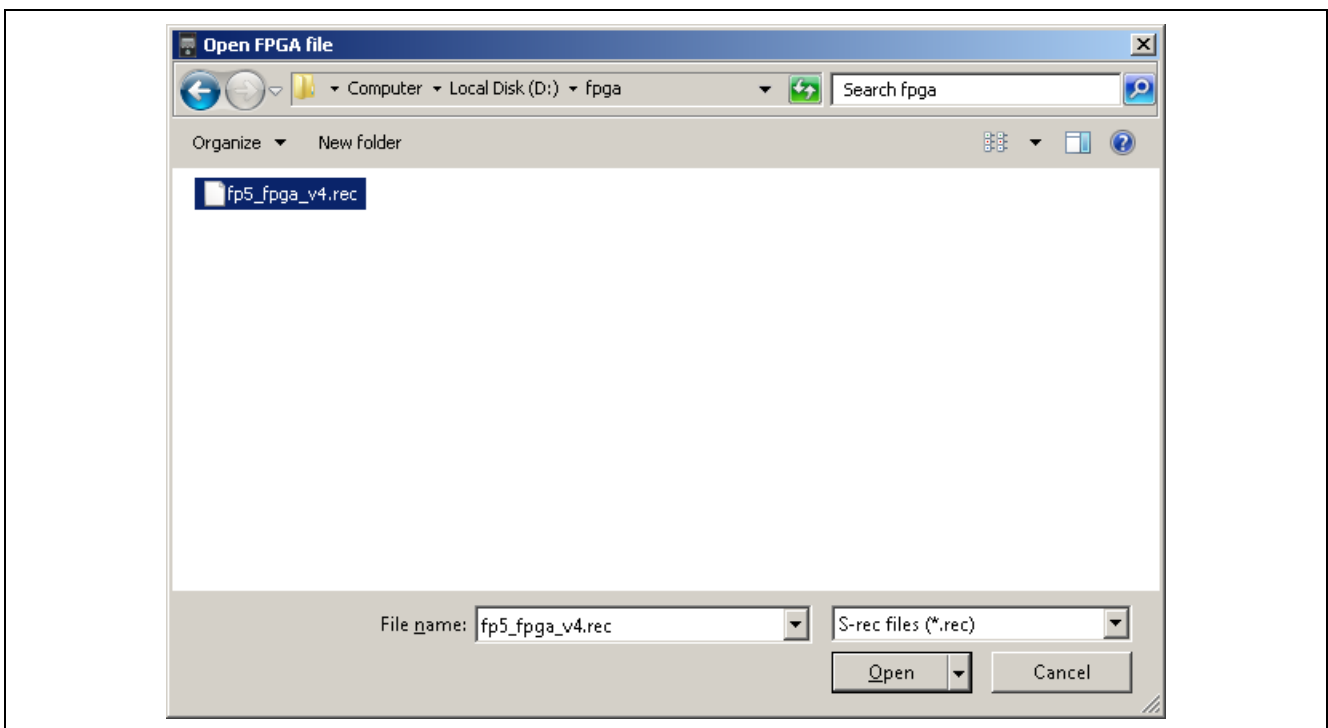
Figure 1.25 [Open FPGA file] Dialog Box

Select the FPGA file "fp5_fpga_vx.rec" and then click the Open button.

Note   Do not use FP5 FPGA other than the one posted on the website; otherwise, a defect may occur.

Some commands are sent to the FP5 and the update progress status is displayed in the action log window. The message "FPBGA Upload succeeded.", which indicates normal completion of firmware update, and "FP5 Power will be switched OFF now.....", which is equivalent to processing when the POWER button is turned off, is automatically executed. The update takes about 30 seconds.
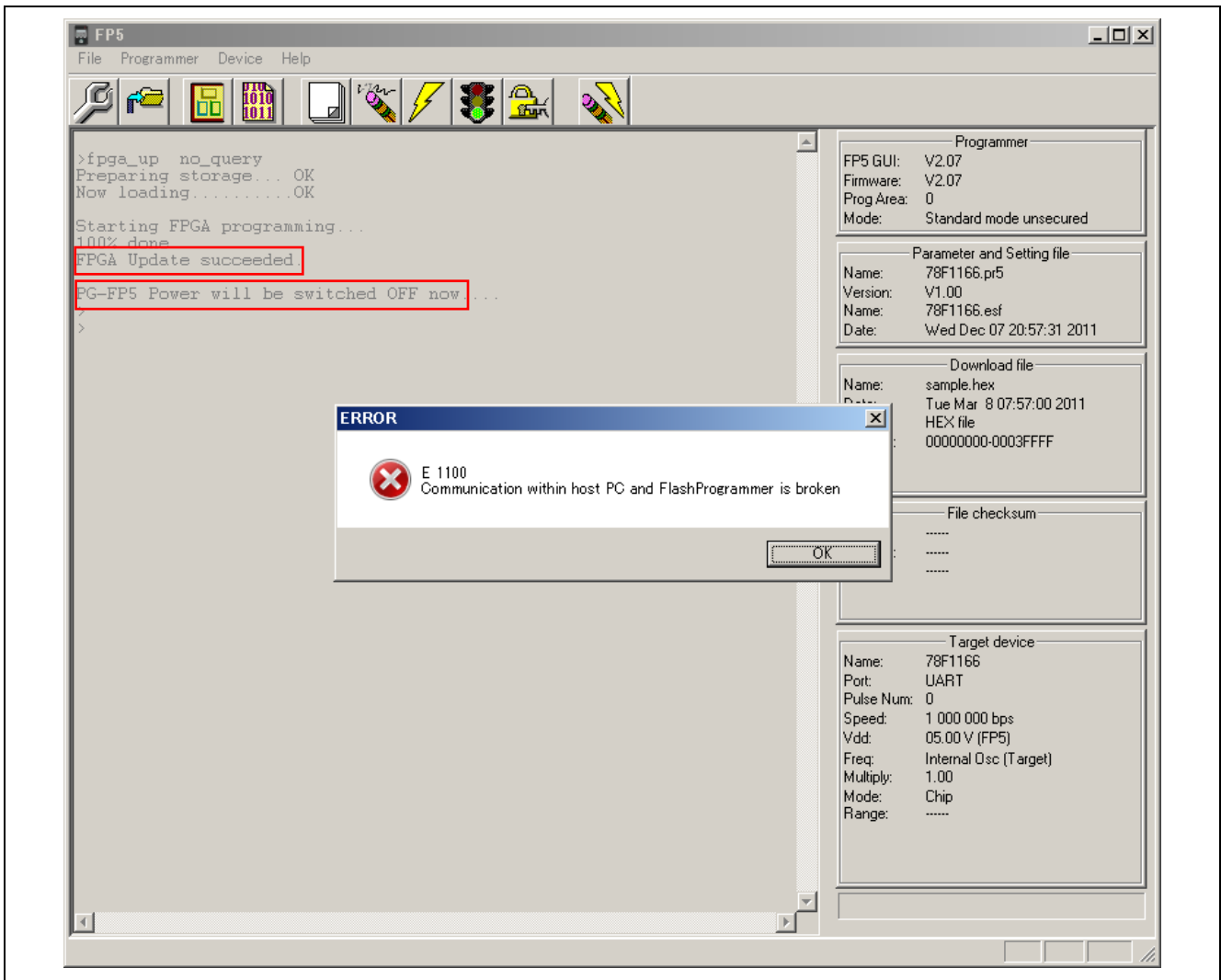
Figure 1.26 Action Log Window When FPGA Update Is Finished

Click the OK button in the error message dialog box and then press the POWER button on the FP5 to turn on power.

Execution of the [Setup host connection...] command opens the [Host Connection] dialog box. Select the communication mode used and then click the OK button.
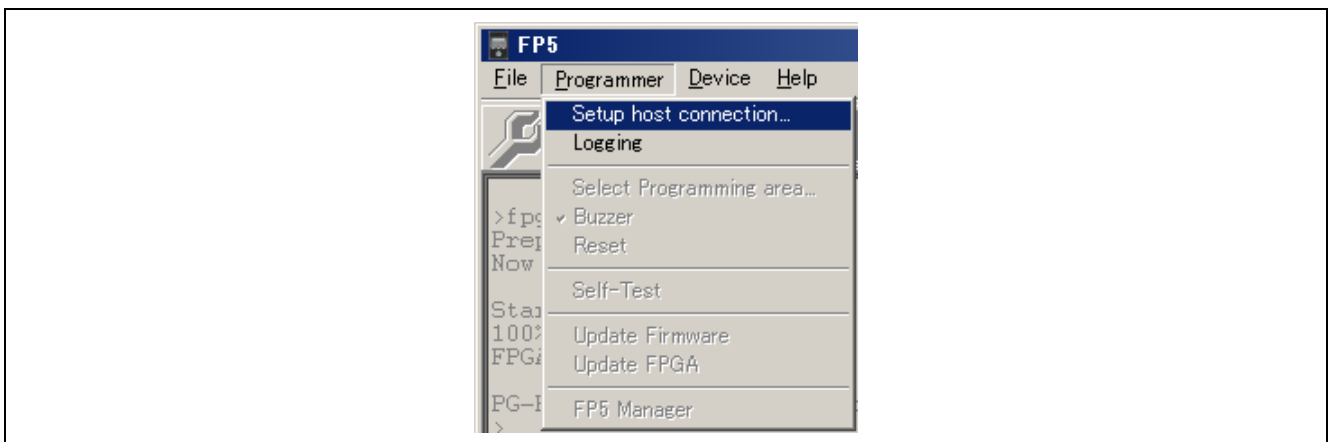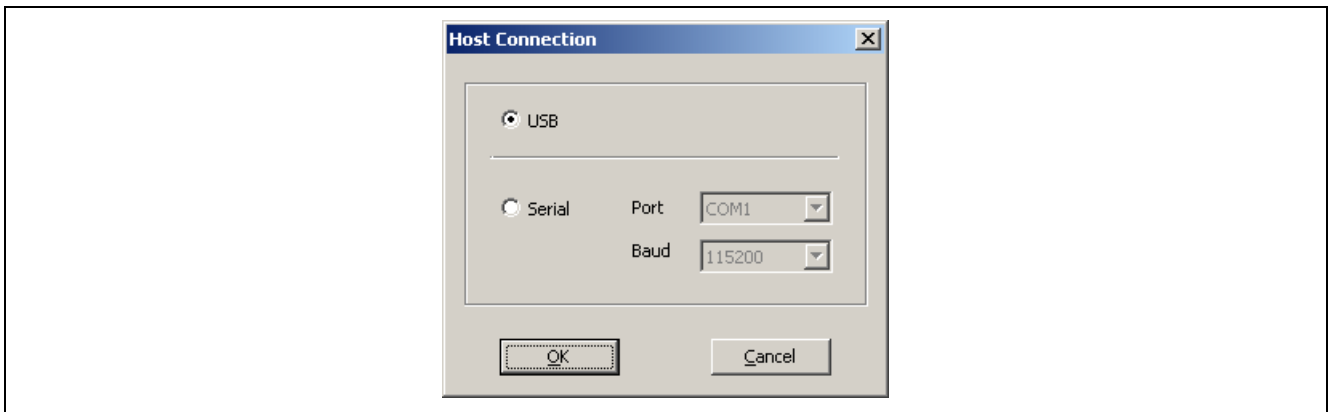

Figure 1.27 [Setup host connection] Command

Figure 1.28 [Host Connection] Dialog Box

The main window is opened. "Board H/W V1, FPGA Vx" is displayed in the action log window; thus, the version can be checked.
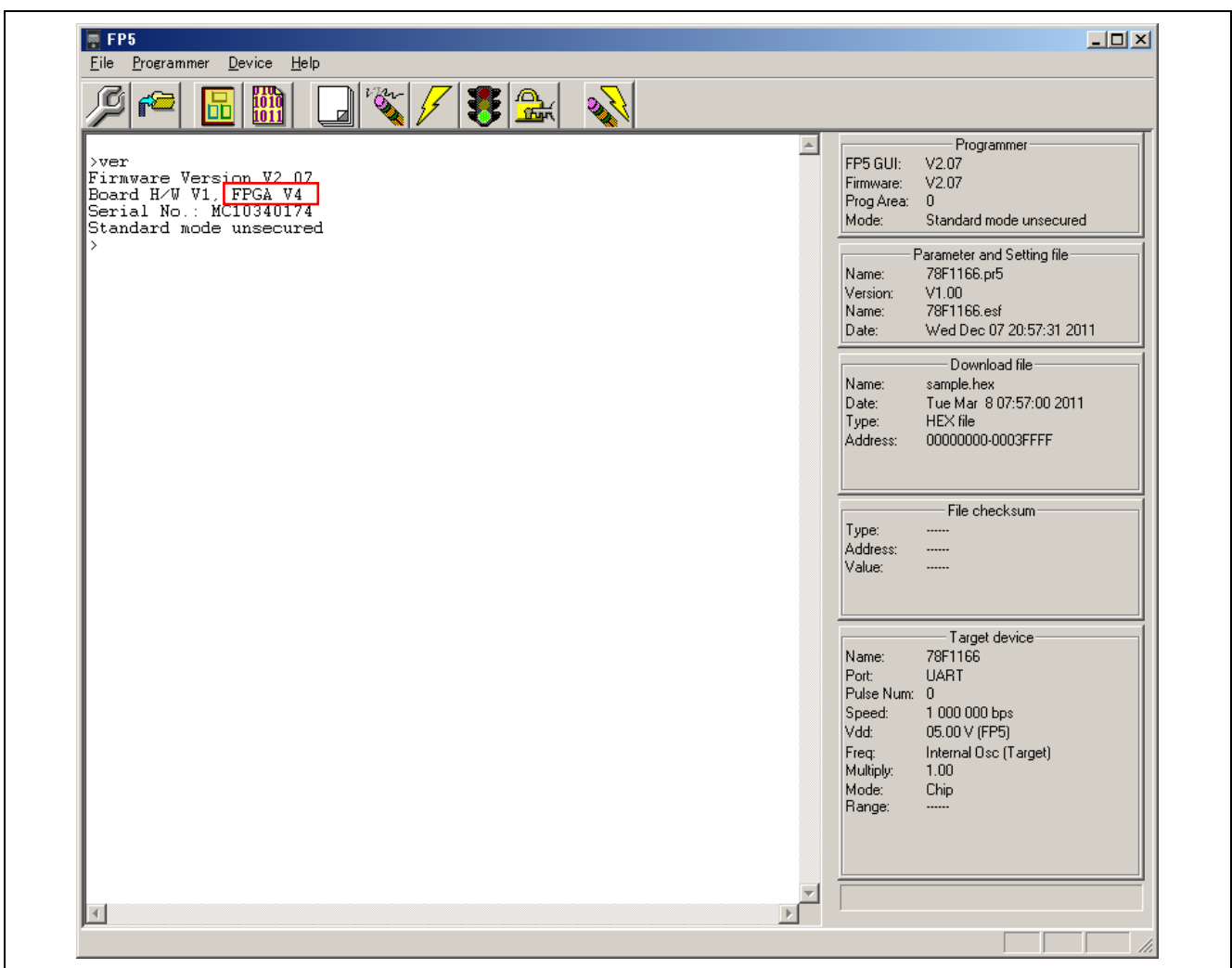
Figure 1.29 Version Confirmation After FPGA Update Is Finished

(9) [FP5 Manager] command
The [FP5 Manager] command sets the FP5 management functions. These functions include the following: The password function, the upload prohibit function, the device setup prohibit function, the bank mode enable function, the simple mode enable function, the checksum comparison function, the program file size monitoring function, unique code embedding function, and the reset terminal property switching function.
When the [FP5 Manager] command is executed, the following dialog will be opened.

If a password is not registered, the dialog box in Fig. 1.30 will open.
If a password is registered, the dialog box in Fig. 1.32 will open.

Figure 1.30 Welcome to FP5 Manager Dialog Box

Clicking Yes will open the following dialog box.
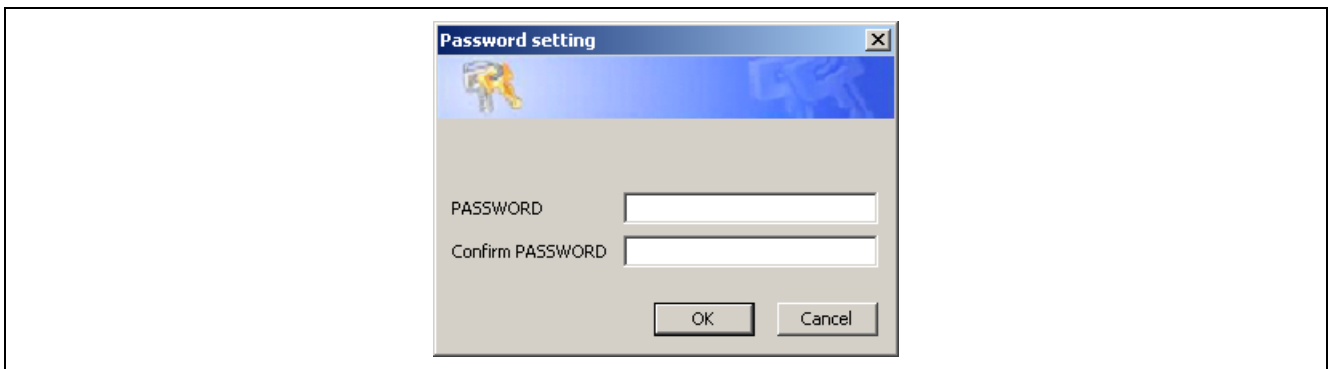Clicking No will close the dialog box.

Figure 1.31 Password setting Dialog Box

In order to register a password, input a password into the [PASSWORD] box and [Confirm PASSWORD] box, and then click OK .
The password must be made up of up to eight alphanumeric characters. (Differences in upper and lower case are not recognized.)
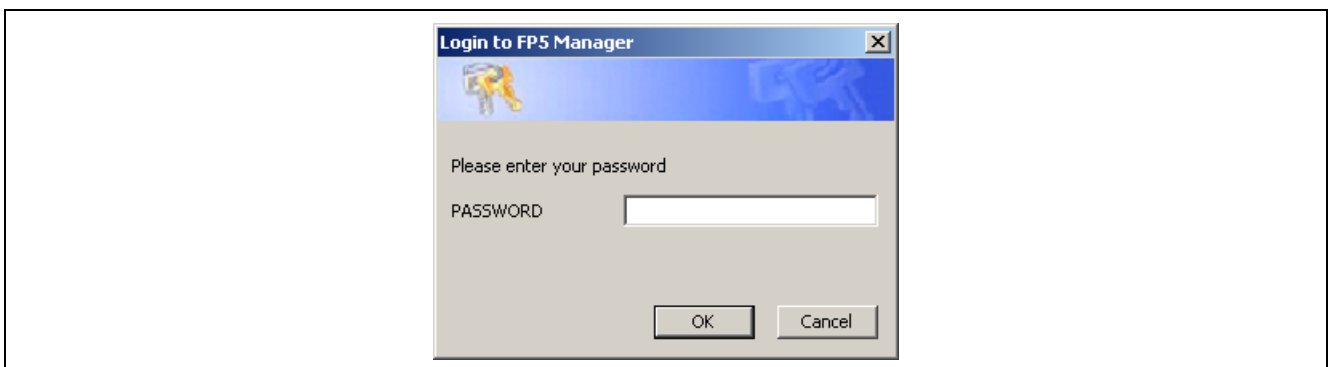Clicking Cancel will close the dialog box.

Figure 1.32 Login to FP5 Manager Dialog Box

Input the password into the [PASSWORD] box, and then click OK .
If the password is correct the dialog box in Figure 1.34 will open. If the password is wrong, then the dialog box in Figure 1-33 will open.
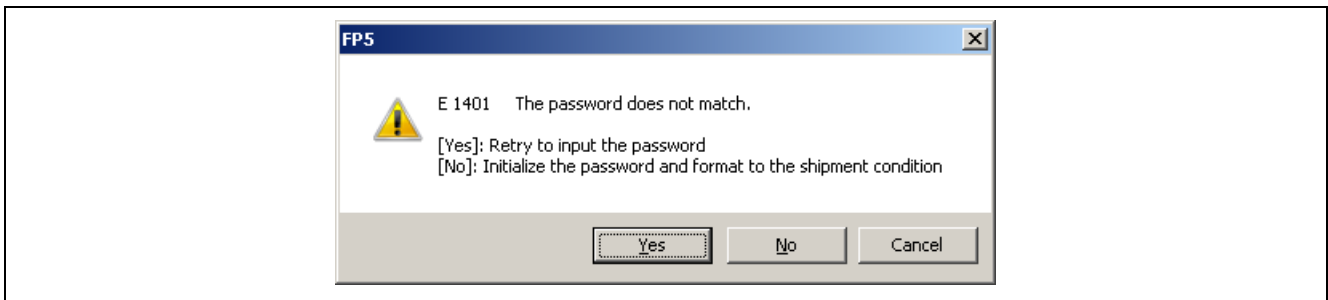Clicking Cancel will close the dialog box.

Figure 1.33 FP5 Dialog Box

Clicking Yes will open the dialog box to input the password again (Figure 1.32).
Clicking No will initialize the FP5 to its default settings. When initialized, the following stored information will be deleted or reset to their defaults:
- Password
- FP5 Manager setting
- PR5 file
- ESF file
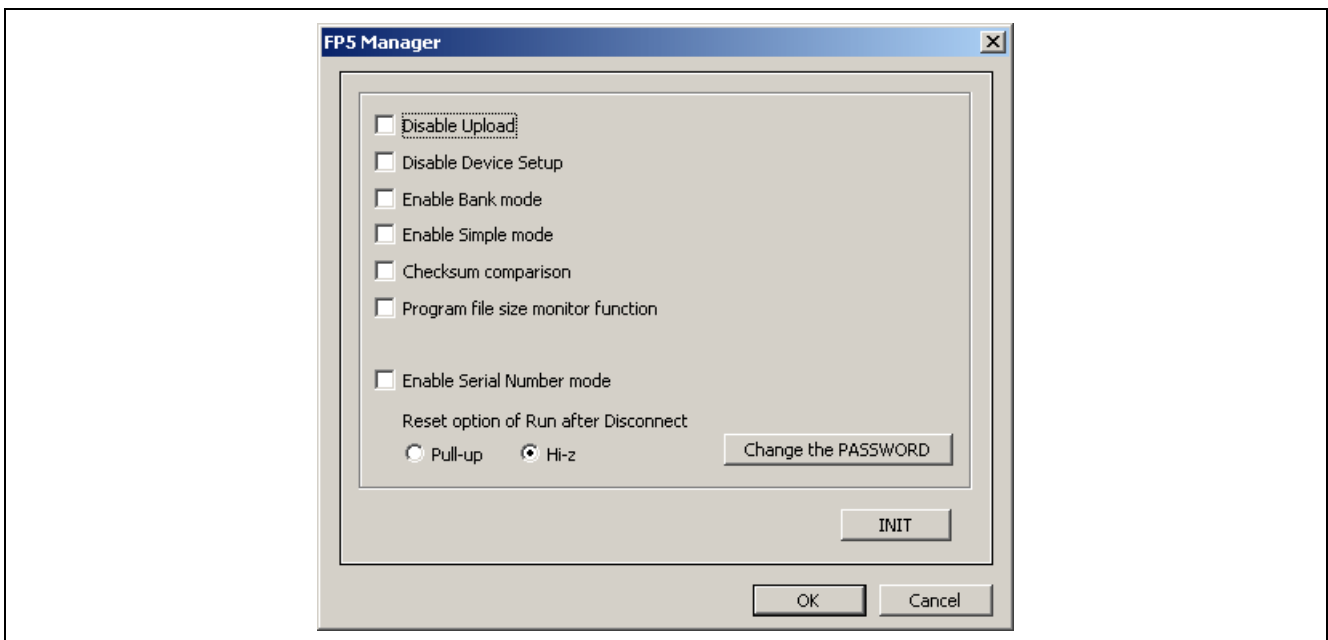- Program file

Clicking Cancel will close the dialog box.

Figure 1.34 FP5 Manager Dialog Box

After making any changes to the settings and clicking OK, the dialog box will close and the settings will be enabled.
Clicking Cancel will close the dialog box and discard the changes. The FP5 Manager settings are described below.

- Displaying Mode Contents

The mode contents that indicate the FP5 state is displayed in the [Programmer] area of the programming parameter window.
  - Standard mode unsecured
    The FP5 Manager has not been set.
  - Standard mode secured
    The FP5 Manager has been set. However, the bank mode or the simple mode have not been set.
  - Bank mode secured
    The FP5 Manager and bank mode have been set.

- Simple mode secured

  The FP5 Manager and simple mode have been set.

- FP5 Manager Dialog Settings (Refer to Figure 1.34)

[Disable Upload] check box

This sets enabling or disabling of the upload function used to upload data (program file, PR5 file, ESF file) from the valid programming area of FP5 to the host PC. Checking the box will disable and unchecking it will enable the function. When this function is disabled, the [File] menu -> [Upload from FP5...] command, and the hex, srec, and upset of the communications command are disabled. The default is not to have this box checked.

[Disable Device Setup] check box

Enables or disables the [Setup] command in the [Device] menu. It is disabled when checked, and enabled when not checked. When it is disabled, the [Setup] command in the [Device] menu, as well as the downprm, downset, and lod communication commands become invalid.

[Enable Bank mode] check box

Sets the normal mode or bank mode for the mode of the remote connector. Checking this box will set the bank mode, and not checking it will set the normal mode. If checked, [Enable Simple mode] cannot be checked. When in the bank mode, the programming area can be selected through the remote connector. With respect to detailed functions, refer to Common 5 USAGE THE REMOTE CONNECTOR. The default is not to have this box checked.

[Enable Simple mode] check box

Sets the normal mode or the simple mode. Checking this box will set the simple mode, and not checking it will set the normal mode. If checked, [Enable Bank mode] cannot be checked. When in the simple mode, the functions of the FP5 control buttons and message display will change. When the NEXT button is clicked, the programming area will be switched. Clicking the ENTER button or START button will execute the Autoprocedure(E.P.) command. The message display will display (1) the programming area number, (2) the program file name, and (3) the checksum and (4) command name. Immediately after the program file is downloaded, the checksum will show H:xxxxxxxx. At this time, the program file will be checked using 32-bit CRC calculations from the start to the end address. After this, executing [File] menu -> [Checksum] command will display F:xxxxxxxx. The default is not to have this box checked.
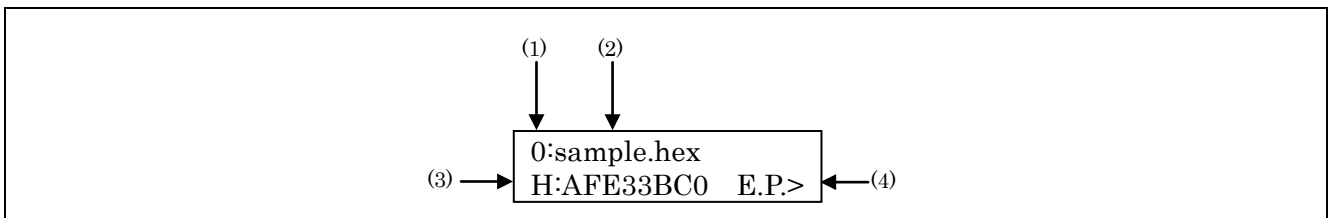

Figure 1.35 Example of Message Display

[Checksum comparison] check box

When [Device] menu -> [Checksum] command is executed and the checksum of the target device is displayed, the checksum of the program file stored in FP5 will be referenced and the results displayed. Checking this box will cross-reference the checksum, and not checking it will not. The default is not to have this box checked.
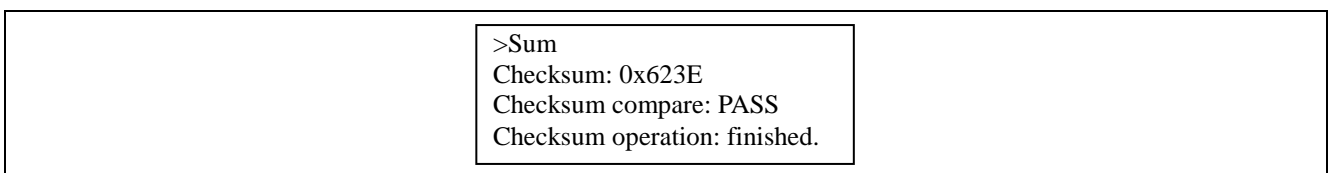

Figure 1.36 Example of Action Log Window

[Program file size monitor function] check box

Halts execution of programming commands if the program file size exceeds the programmable range. If this check box is checked and the address range of the downloaded program file exceeds the address range specified in the [Operation

Mode] area on the [Standard] tab of the Device Setup dialog box, executing a [Program], [Verify], or [Autoprocedure(E.P.)] command will cause the error message "ERROR (E302): Hex file exceeds target device flash range." to appear in the Action Log window and execution of the command will halt. If this check box is not checked, the warning message "WARNING: HEX file exceeds target device flash range." will appear in the Action Log window, but execution of the command will continue. The default is not to have this box checked.

Note   RX is not supported. Warning or error is not displayed.

[Enable Serial Number mode] check box
Serial Number mode (Unique code embedding function) is for embedding a unique code in the specified area of a program file that has been read. The code is embedded by issuing the serno command with the code and area specified. Placing a check mark in this box enables the unique code embedding function. For more information on the serno command, refer to Common 6.4.18 serno command.

[Reset option of Run after Disconnect]
When the [Run after Disconnect] function in the [Command options] area of the Device setup dialog [Advanced] tab is enabled, the properties of the $\overline{\text{RESET}}$ signal after the write command is completed can be set to Pull-up or Hi-Z. The default is Hi-Z.

[Change the PASSWORD] button
Clicking the [Change the PASSWORD] button will open the following dialog box.
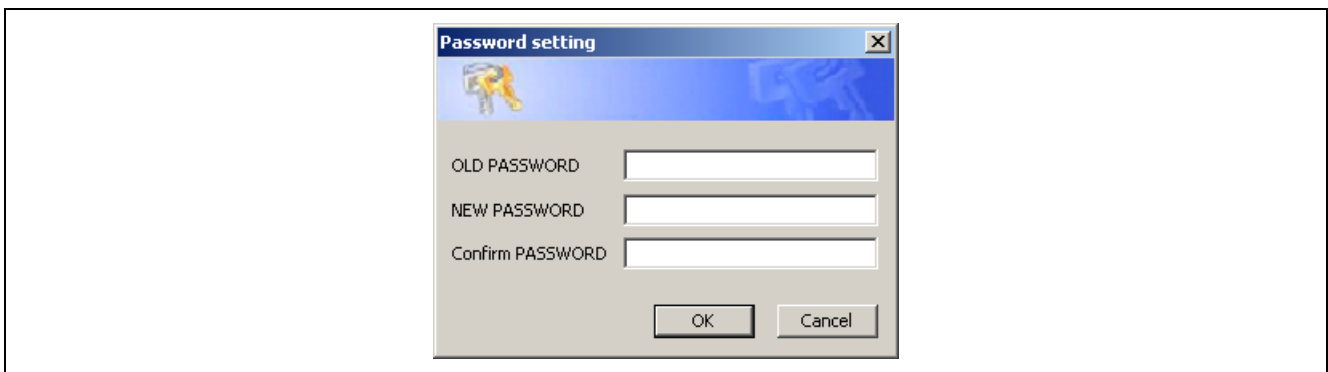

Figure 1.37 Password setting Dialog Box

This dialog box allows the user to change the registered password.
Input the current password into the [OLD PASSWORD] box, input the new password into the [NEW PASSWORD] box and [Confirm PASSWORD] box, and then click OK. When Cancel is clicked, the dialog box will be closed and the password will not be changed.

[INIT] button
Resets the FP5 to its default settings. Initializing the FP5 will reset or delete the following stored information.
- Password
- FP5 Manager setting
- PR5 file
- ESF file
- Program file

1.3.3. [Device] menu

The following pull-down menu appears by clicking the [Device] menu.
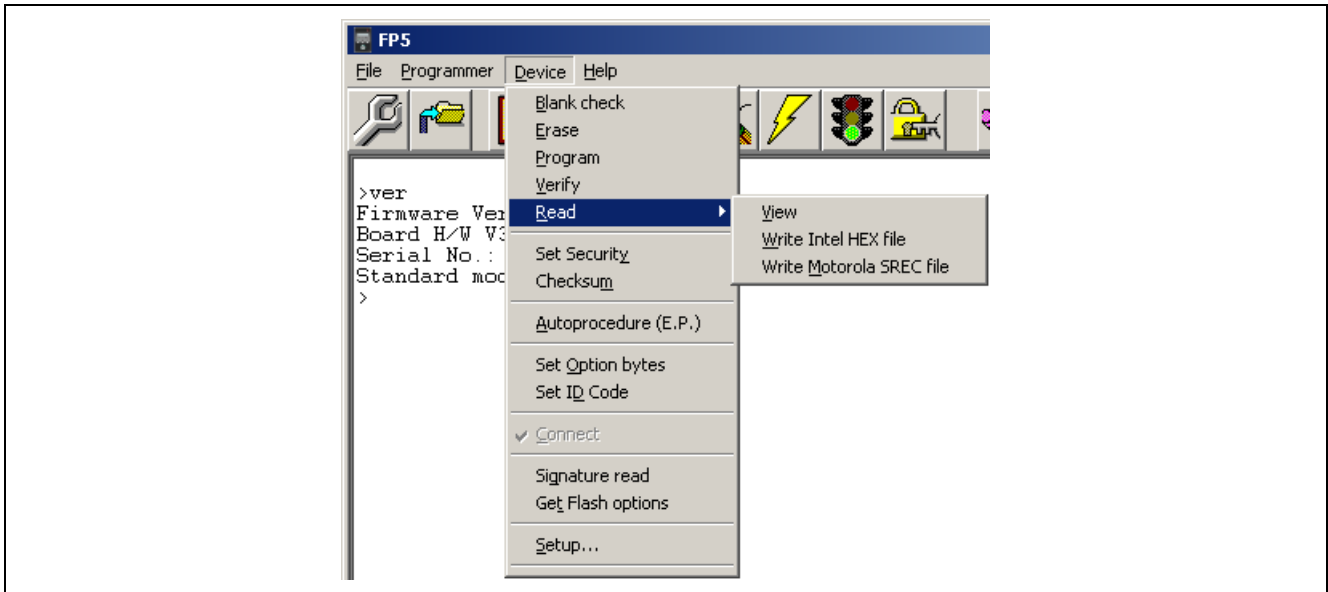This menu includes commands mainly related to programming to the target device, such as erase, write and verify.

Figure 1.38 [Device] Menu

(1)   [Blank check] command
The [Blank Check] command performs blank check for the flash memory in the target device. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. If the flash memory has not yet been written, "PASS" is displayed. If the flash memory has already been written, "ERROR(E051):Not Blank" is displayed. If this error is displayed, erase the entire flash memory before starting programming.

(2)   [Erase] command
The [Erase] command erases the flash memory in the target device. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. If this command is executed with [Chip] selected, security command options are initialized at the same time. While erasing the flash memory is in progress, the progress status is displayed in the action log window. When execution of this command is completed, the result of command execution in the target device is displayed. Whether to perform the [Blank Check] command before executing this command depends on the [Blank check before Erase] check box setting in the [Command options] area on the [Advanced] tab in the Device Setup dialog box. If this command is executed for the target device that has already been erased with the [Blank check before Erase] check box selected, "OK, Erase skipped." is displayed and erasure is not performed.

(3)   [Program] command
The [Program] command transmits the memory contents (program files) in the FP5 valid programming area to the target device and writes the programs to the flash memory. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. The progress status of this command is displayed as a percentage in the action log window. When execution of this command is completed, the programming GUI displays the result of command execution in the target device. Command options after execution of this command depend on the settings of the [Verify after Program], [Security after Program] and [Checksum after Program] check boxes in the [Command options] area on the [Advanced] tab in the Device Setup dialog box. For details on these check boxes, refer to 1.3.3 (15) (c) <2>   [Command options] area.

(4) [Verify] command

For the 78K, V850, and RL78 family, the [Verify] command transmits the memory contents (program files) in the FP5 valid programming area to the target device, verifies the data written to the flash memory in the target device, and receives the result. For the RX family, R8C family, and SuperH family, it reads data from the microcontroller, and compares it with the memory content (program file) in the effective programming area of the FP5. The target area can be set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. The progress status of this command is displayed as a percentage in the action log window. When execution of this command is completed, the programming GUI displays the result of command execution in the target device.

(5) [Read] command

The [Read] command loads data on the flash memory in the target device and saves it as a file. The target range of the flash memory is specified in the [Operation Mode] area on the [Standard] tab of the Device Setup dialog box. When the [View] command is executed following this command, 4 KB read data is displayed in the log window each time the ENTER key is pressed. When the [Write Intel HEX file] or [Write Motorola SREC file] command is executed following this command, the read data can be saved in the Intel HEX format or Motorola HEX format. Use of the saved file with other tool products is not supported.

Note   The folder in which program data was saved the last time is displayed in the program data save dialog box.
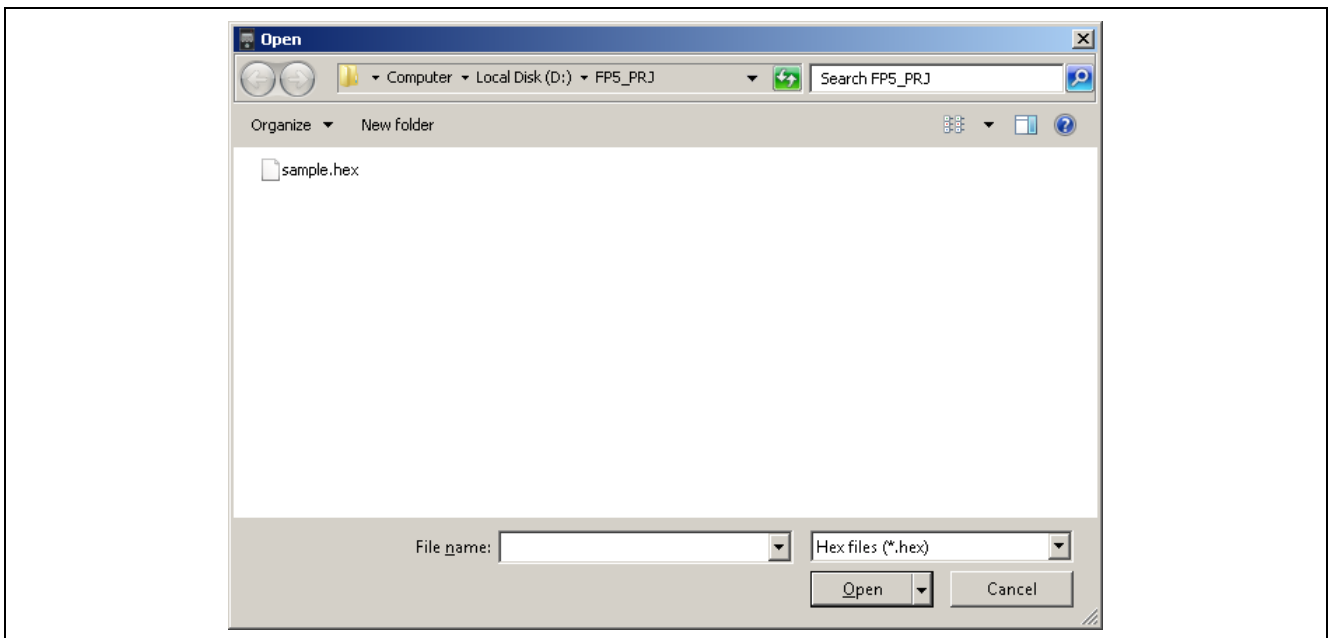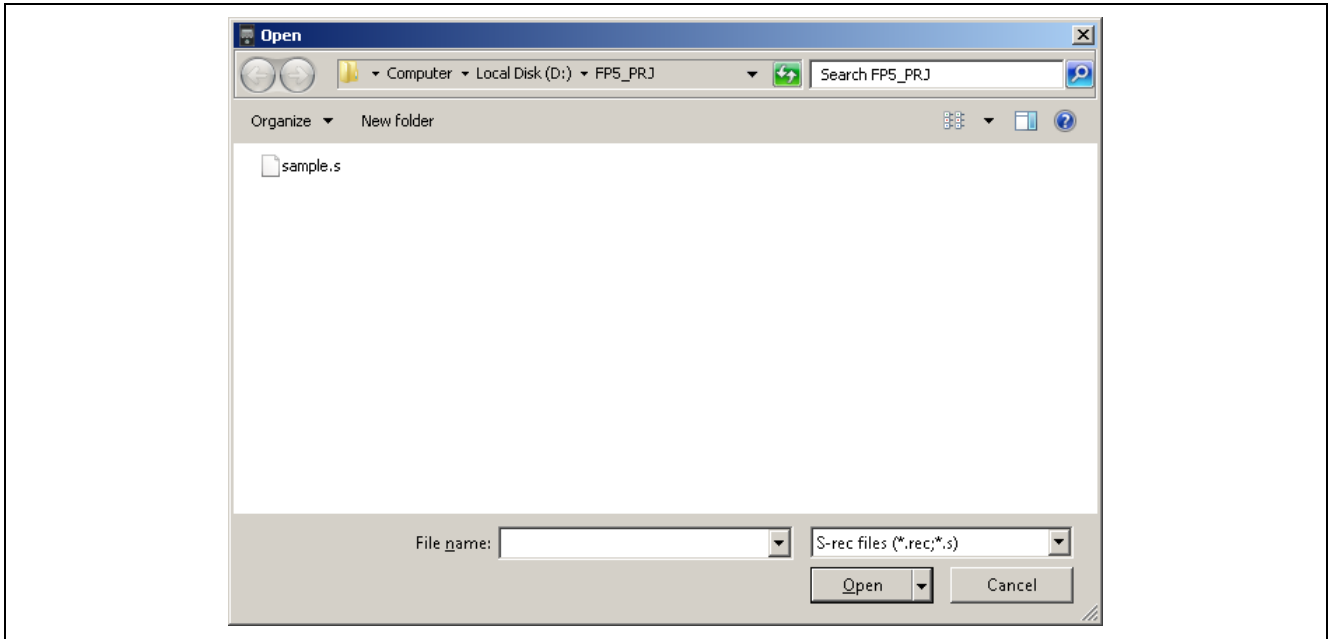

Figure 1.39 Program Data Saved Dialog Box <When Write Intel HEX file Command Is Executed>

Figure 1.40 Program Data Save Dialog Box <When Write Motorola SREC file Command Is Executed>

Clicking the Open button saves the program data into a file and closes the dialog box.
Clicking the Cancel button closes the program data save dialog box without saving the program data into a file.

(6)   [Set Security] command
The [Set Security] command sets the security functions for the target device. When this command is executed, the settings made in the [Set Security command options] area on the [Advanced] tab in the Device Setup dialog box will be reflected in the target device. For details on the security functions, refer to 1.3.3 (15) (c) <4> [Set Security command options] area.

(7)   [Checksum] command
For the 78K, V850, RL78 family, RX family, and SuperH family, the [Checksum] command reads the checksum calculated in the target device and displays it in the action log window. When using a 78K0S/Kx1+ microcontroller or the μPD78F9334, this command also displays the checksum of the program file and compares both. For the R8C family, it reads the content of the flash memory of the target device, and displays the checksum calculated in the FP5 on the action log window.

Note   The checksum read by this command differs from the one displayed in the [File checksum] area in the programmer parameter window. For details on the [File checksum] area, refer to 1.3.1 (3) [Checksum] command.

The checksum is calculated as follows. Note that this is the result when the [Enable Checksum Compare Function] check box of the FP5 manager dialog box is not selected.

<When using 78K (other than 78K0S/Kx1+, UPD78F9334), V850E1, V850ES, RL78 family>

Method: Subtraction (16-bit arithmetic)

Range: Area set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box

```
>sum
Code flash: 0x8FCD
Data flash: 0x1000
Total:        0x9FCD
PASS
Checksum operation finished.
>
```

Figure 1.41 Action Log Window After [Checksum] Command Execution <When using 78K (Other than 78K0S/Kx1+, UPD78F9334), V850E1, V850ES, RL78 family>

Note   With the 16-bit arithmetic (subtraction) mode, the lower 4 digits of the result from which a value is subtracted from 00h in 1-byte units are displayed.

<When using a 78K0S/Kx1+ microcontroller or UPD78F9334>

Method: Division (original)

Range: Area set in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box

```
>sum
Device Checksum: 0x1842
FP5 Checksum:      0x1842
Checksum compare: PASS
Checksum operation finished.
>
```

Figure 1.42 Action Log Window After [Checksum] Command Execution (When using 78K0S/Kx1+ microcontroller or UPD78F9334)

Note   For details on the arithmetic specifications, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.4 Division (Original) Calculation Specifications.

<V850E2>

Method: 32-bit CRC

Range: Area specified in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box

```
>sum
Code flash: 0x370A7BE5
Data flash: 0xBFD1B03F
Total: 0xF6DC2C24
PASS
Checksum operation finished.
>
```

Figure 1.43 Action Log Window After [Checksum] Command Execution (V850E2)

Note   32-bit CRC displays the 8-digit result of CRC32 function operation. For the calculation specifications, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.2 32-bit CRC Calculation Specifications.

<RX family, R8C family, SuperH family>
Method: 32-bit arithmetic (addition) mode
Range: Result of calculating all the areas (user mat, data mat, user boot) selected in the [Operation Mode] area on the
[Standard] tab of the Device Setup dialog box

```
>sum
User mat:         0x03FC0000
Data mat:         0x00444588
User Boot mat: 0x003FC000
Total:            0x04800588
PASS
Checksum operation finished.
>
```

**Figure 1.44 Action Log Window After [Checksum] Command Execution (RX Family, R8C Family, SuperH
Family)**

Note   With the 32-bit arithmetic (addition) mode, the lower 8 digits of the result to which a value is added from 00h in 1-
byte units are displayed.

(8)   [Autoprocedure(E.P.)] command
The [Autoprocedure(E.P.)] command executes the [Erase] and [Program] commands in succession. For more
information, refer to the sections on the [Erase] command and [Program] command.

```
>ep
Blank check Chip:
PASS, Erase skipped.
Program Chip:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
Erase, Program operation finished.
>
```

Figure 1.45 Action Log Window After [Autoprocedure(E.P.)] Command Execution

(9)   [Set Option bytes] command
The [Set Option bytes] command specifies the settings for the target device's option byte. When this command is
executed, the settings specified in the [Option byte setting] area on the [Advanced] tab of the Device Setup dialog box
are applied to the target device. For details of the option byte settings, see 1.3.3 (15) (c) <9>   [Option bytes setting]
area.

(10) [Set ID Code] command
The [Set ID Code] command specifies the settings for the target device's option byte. When this command is executed,
the settings specified in the [OCD ID setting] area on the [Advanced] tab of the Device Setup dialog box are applied to
the target device. For details of the OCD security ID settings, see 1.3.3 (15) (c) <8> [OCD security ID setting] area.

(11) [Set Lock bits] command
The [Set Lock bits] command specifies the lock bits of the target device. When this command is executed, the settings
specified in the [Set Lock bits] area on the [Advanced] tab in the Device Setup dialog box are reflected to the target
device. For detais about lock bit settings, refer to 1.3.3 (15) (c) <11> [Lock bit setting] area.

(12) [Connect] command

Executes the con command or dcon command. When the con command is executed a check will be added and when the dcon command is executed the check will be removed. When "autocon off" or "autocon on" is executed with the autocon command, the [connect] command is enabled or disabled. Refer to Common 6 USAGE COMMUNICATION COMMANDSfor details about the functions.

(13) [Signature read] command

The [Signature read] command reads target device product information.

The read result is displayed in the action log window.

(14) [Get Flash options] command

The [Get Flash options] command reads the settings for the flash options for the target device and displays the result in the [Flash options] area on the [Advanced] tab in the Device Setup dialog box. When execution of this command is enabled, execute this command before the [Set Security] command, [Set Option bytes] command, or [Set ID Code] command. The flash option settings can thus be checked. For details on the flash option settings, refer to 1.3.3 (15) (c) <3> [Flash options] area.

Note   When loading an HCUHEX file, the HCUHEX file is handled as master data, so even though the flash option settings specified for the device can be checked by executing the [Get Flash Options] command, these settings cannot be applied to the device. The OK button in the Device Setup dialog box is therefore unavailable. In this case, click the Cancel button and close the Device Setup dialog box. Note that the OK button becomes available if the HCUHEX file is changed to a HEX file in the [Object HEX file] area. After changing the file, the HCUHEX file information remains unchanged in the [Command Options] and [Flash options] areas.
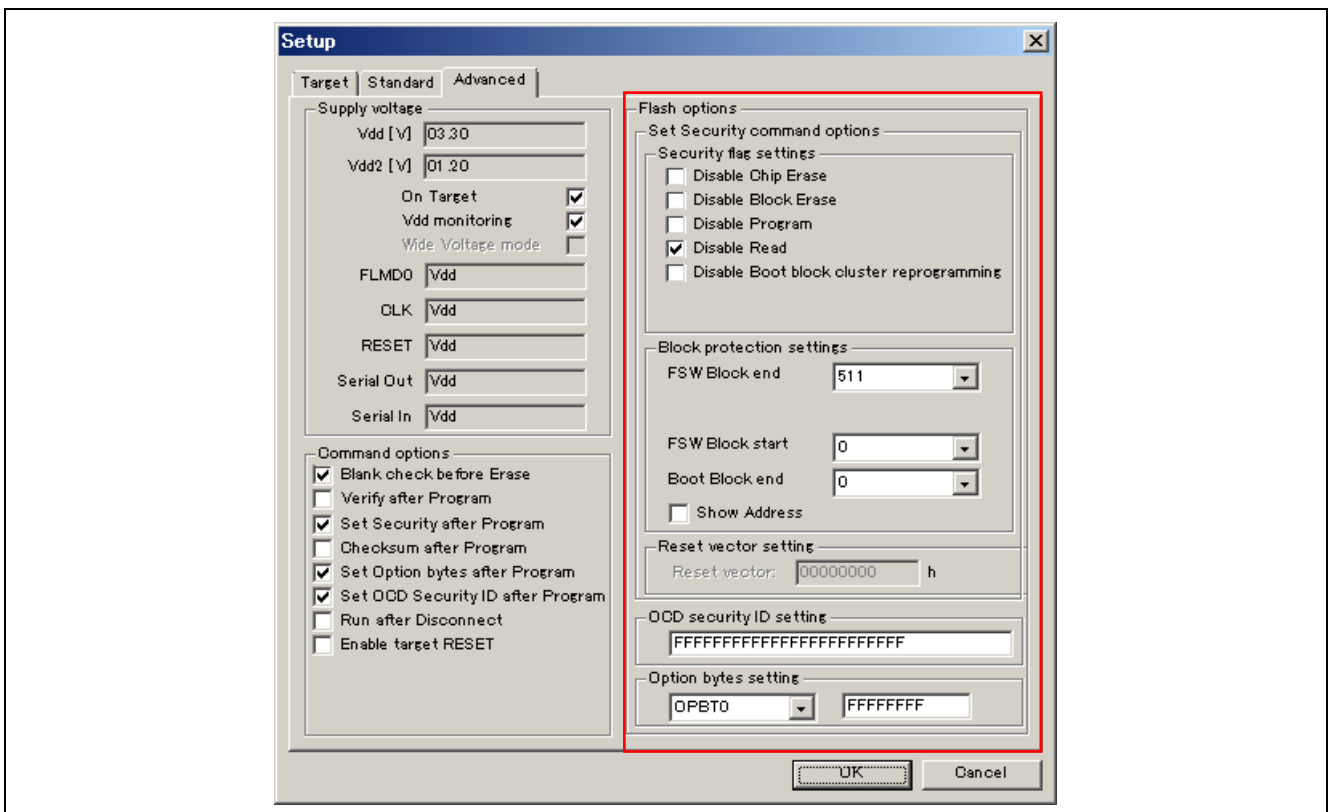
Figure 1.46 [Get Flash options] Command

(15) [Setup]

When the [Setup...] is executed, the Device Setup dialog box is opened. In this dialog box, select a program file, perform settings in accordance with the user environment for flash memory programming, set command option and option data etc.. Each time the programming GUI is started, the programming GUI loads the PR5 file, ESF file and program file that were used last and displays the settings. Settings for the items not dimmed can be changed in accordance with the user environment. Switch the [Target], [Standard] and [Advanced] tabs for setting.
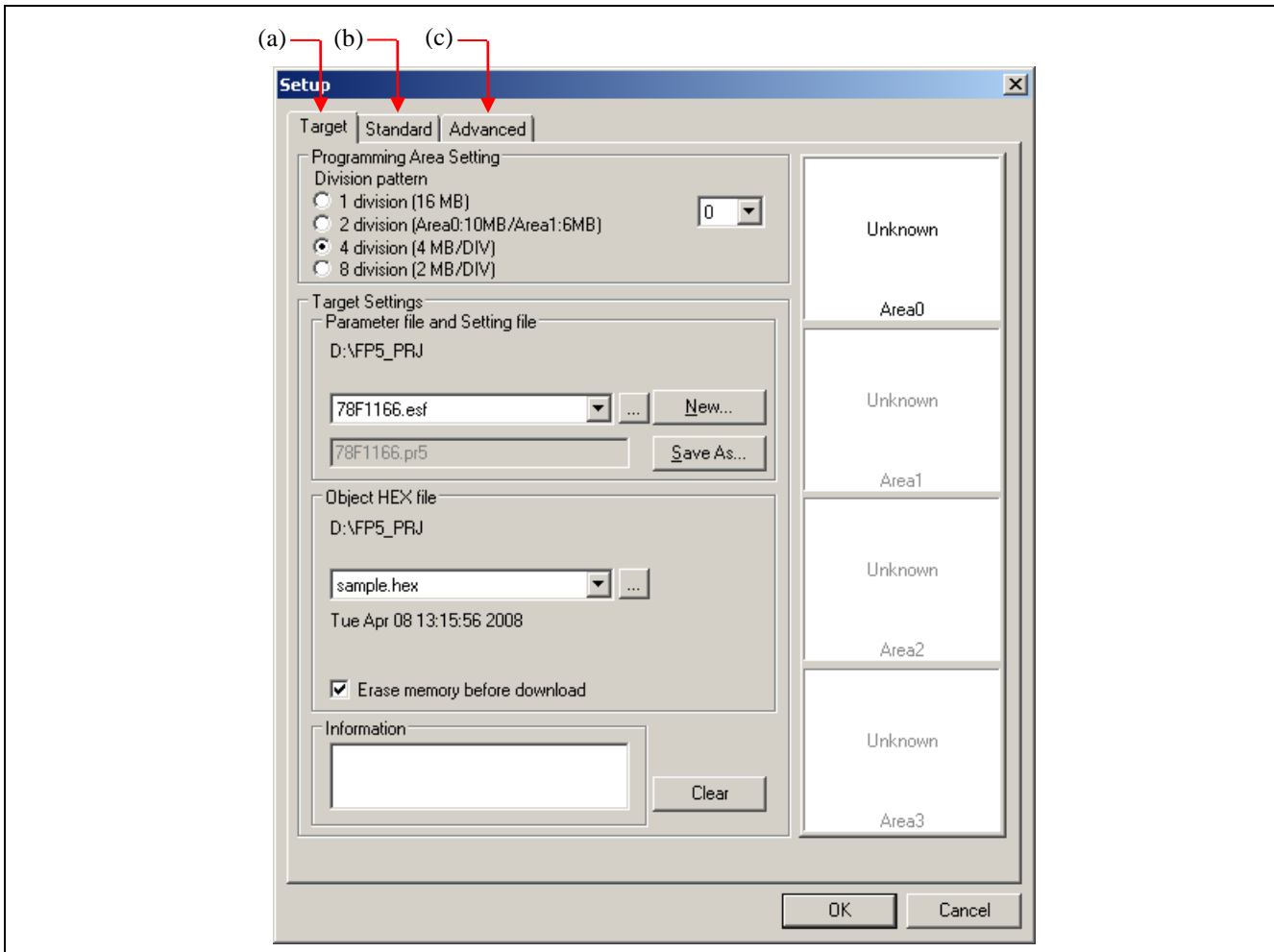
Figure 1.47 Device Setup Dialog Box

When the OK button (button common to [Target], [Standard] and [Advanced] tabs) is clicked, program areas are cleared and PR5 files, ESF files and program files are downloaded for the FP5. After that, the settings made on the [Target], [Standard] and [Advanced] tabs are saved into an ESF file. These settings are reflected to the programming parameter window. If there are settings which have not been updated, the files related to the settings are not downloaded. When a program file is downloaded, the date and checksum (An empty area will be supplemented by FFh when it is downloaded to FP5.) of that file are displayed in the action log window. The checksum is calculated as shown below. For details of the arithmetic specifications, refer to Common APPENDIX B SUPPLEMENTARY INFORMATION Figure B.2 32-bit CRC Calculation Specifications.

Method: 32-bit CRC
Range: From the start to end addresses in the program file

When the Cancel button (button common to [Target], [Standard] and [Advanced] tabs) is clicked, the dialog box is closed without saving changed settings on the [Target], [Standard] and [Advanced] tabs into an ESF file.
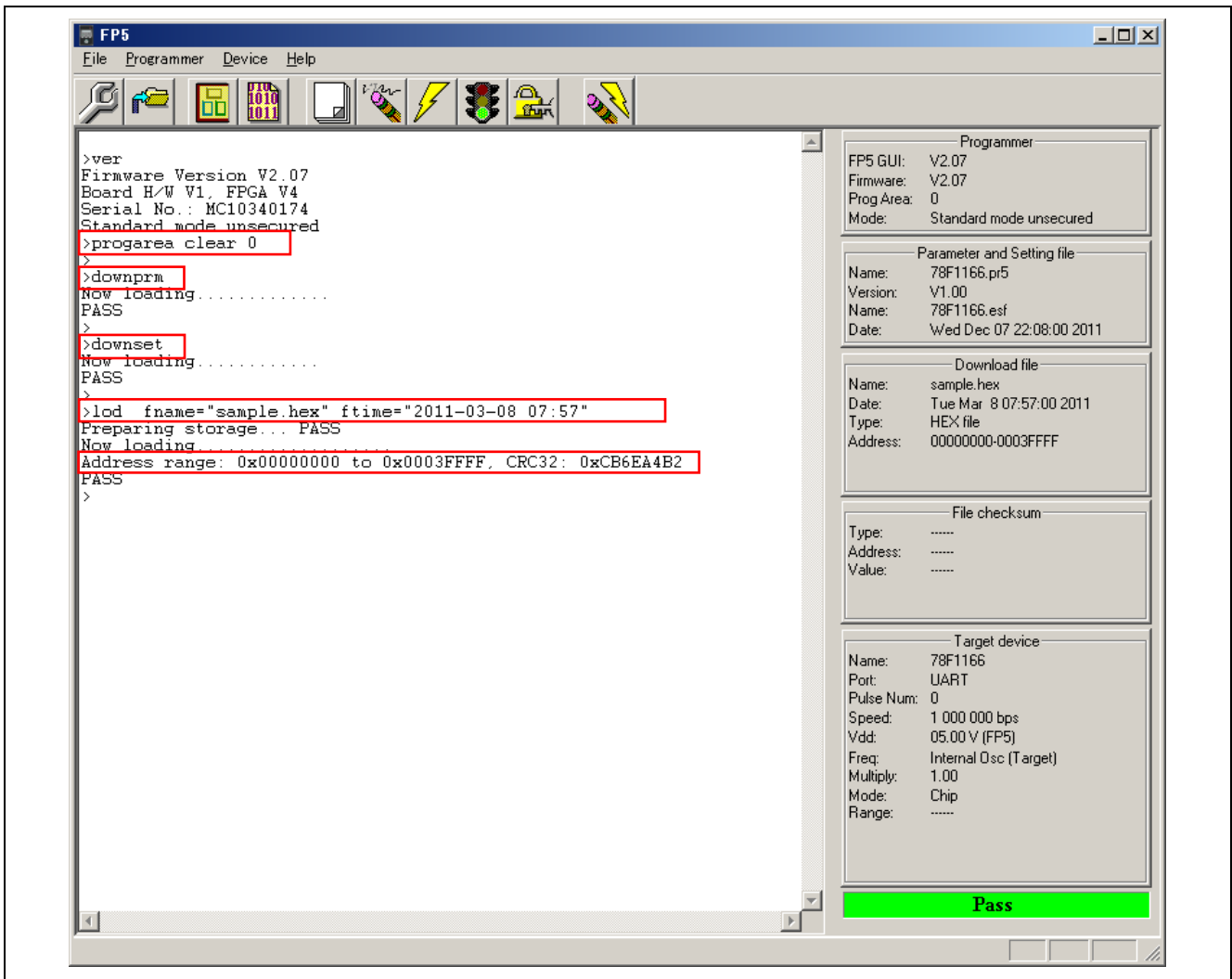
Figure 1.48 Clearing of Programming Area, PR5 Files and ESF Files, and Download of Program File

(a)   [Target] tab in Device Setup dialog box

Settings related to programming areas, PR5 files, ESF files and program files can be performed on the [Target] tab in the Device Setup dialog box. This tab consists of the following items.

<1> [Programming Area Setting] area

<2> [Target Setting] area

<3> [Parameter and Setting file] area

<4> [Object HEX file] area

<5> [Information] area and Clear button

<6> Programming area map area
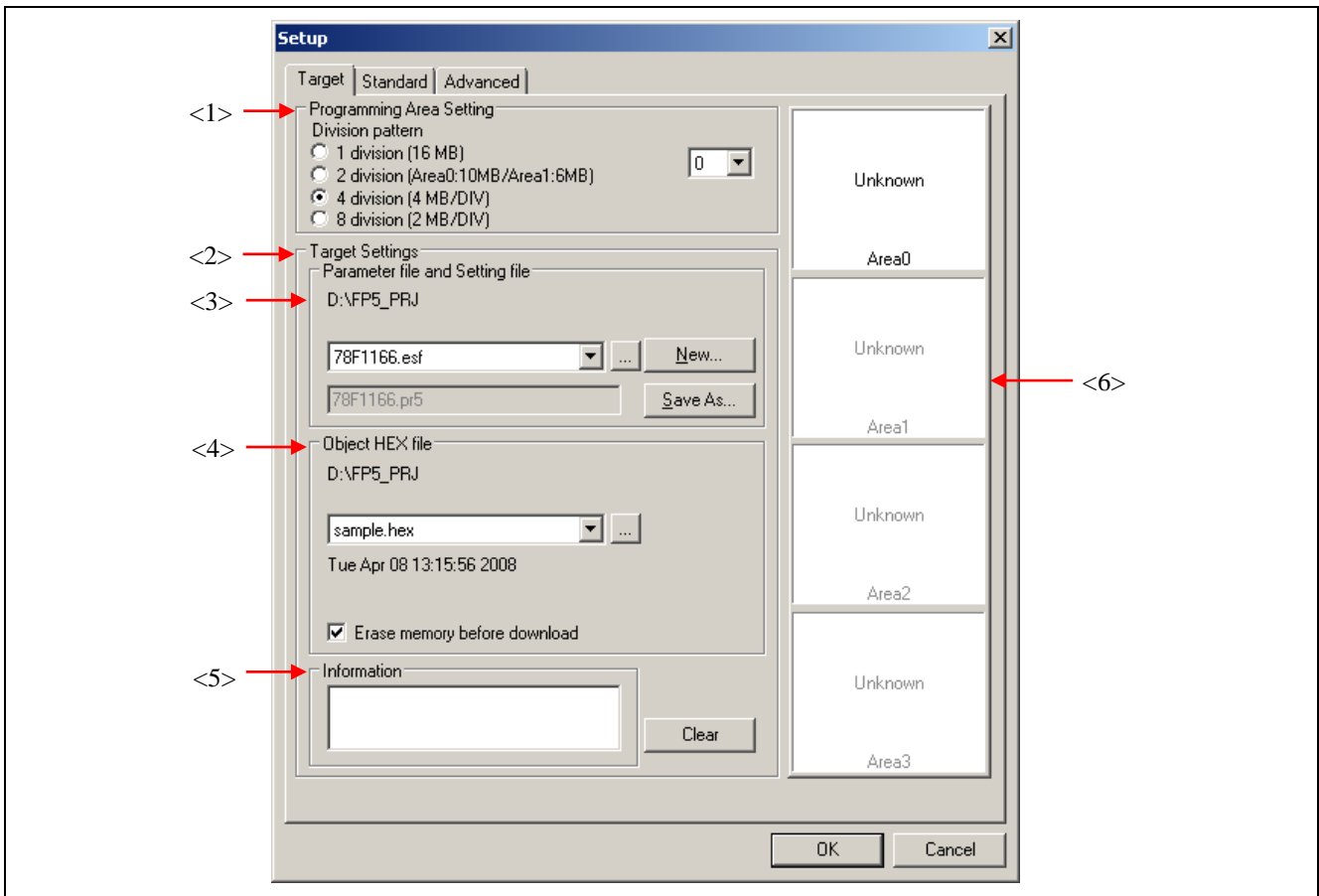
Figure 1.49 Device Setup Dialog Box - [Target] Tab

<1> [Programming Area Setting] area

The FP5 has a 16 MB flash memory area for saving program files. This memory area can be used as one independent 16 MB programming areas (Area 0) or two programming areas of 10 MB and 6 MB (Area 0 to Area 1), four independent 4 MB programming areas (Area 0 to Area 3) or eight independent 2 MB programming areas (Area 0 to Area 7). Program files can be downloaded to each programming area, and which file, PR5 or ESF, is to be saved is selectable in programming area units. That is, files can be individually downloaded in each programming area, and the area used can also be selected individually.

In this area, the factor for dividing the programming area can be selected. If the division factor is changed, data on the programming area map is cleared. In addition, the valid programming area can be selected. If the valid programming area is changed, the focused area in the [Programming area map] area is also changed. By default, the division factor is set to 2 and programming area 0 is selected.
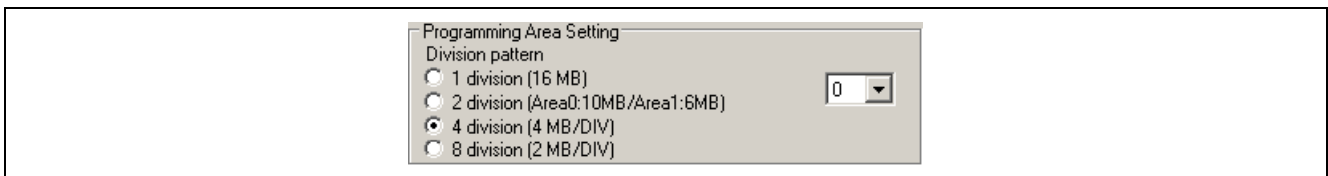
Figure 1.50 [Programming Area Setting] Area

[Division pattern] radio buttons

1 division (16MB): The division factor is set to 1 (16 MB).

2 division (Area0:10MB/Area1:6MB): The division factor is set to 2 (10 MB area and 6 MB).

4 division (4 MB/DIV): The division factor is set to 4 (4 MB per area).

8 division (2 MB/DIV): The division factor is set to 8 (2 MB per area).

[Programming Area Setting] list
If "1 division (16MB)" is selected, the valid programming area is selected from areas 0.
If "2 division (Area0:10MB/Area1:6MB)" is selected, the valid programming area is selected from areas 0 to 1.
If "4 division (4 MB/DIV)" is selected, the valid programming area is selected from areas 0 to 3.
If "8 division (2 MB/DIV)" is selected, the valid programming area is selected from areas 0 to 7.

<2> [Target Setting] area
In this area, ESF files can be created and selected, and PR5 files and program files can be selected. A warning message
will be displayed in the [Information] area if there is a mismatch between PR5 files, ESF files and program files saved
in the FP5 and information held in the programming GUI. Information of PR5 files, ESF files and program files, which
is set to the current valid programming area, can be deleted.
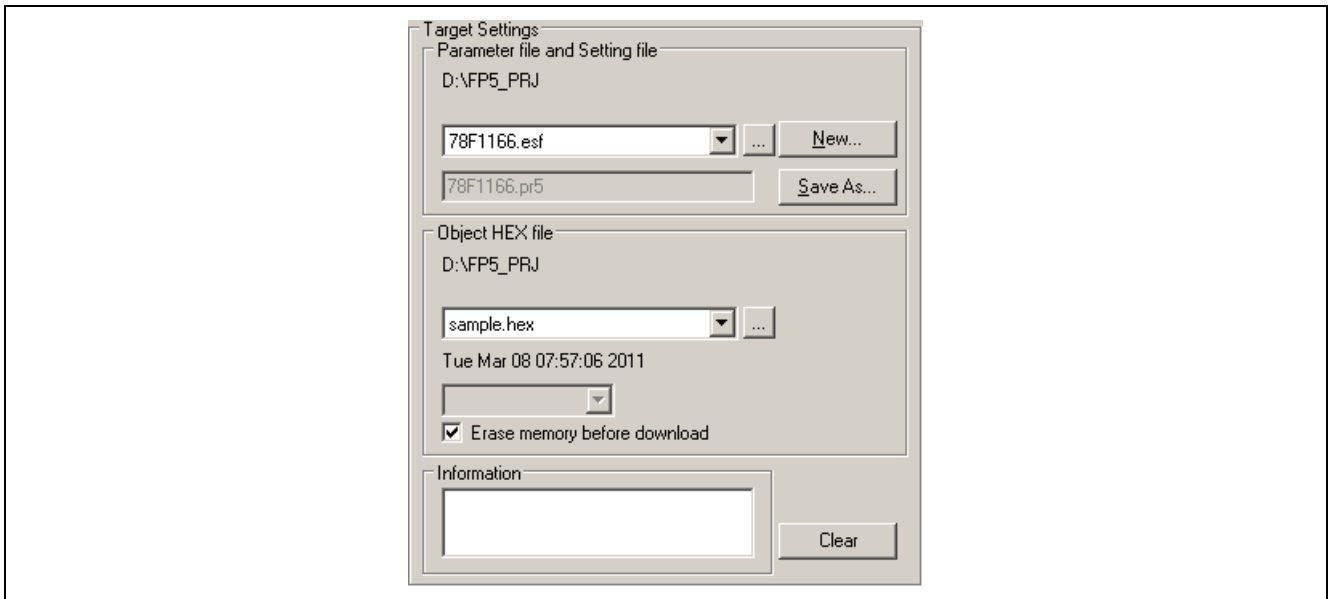
Figure 1.51 [Target Setting] Area

<3> [Parameter and Setting file] area
In this area, ESF files can be created and selected, and PR5 files can be selected.
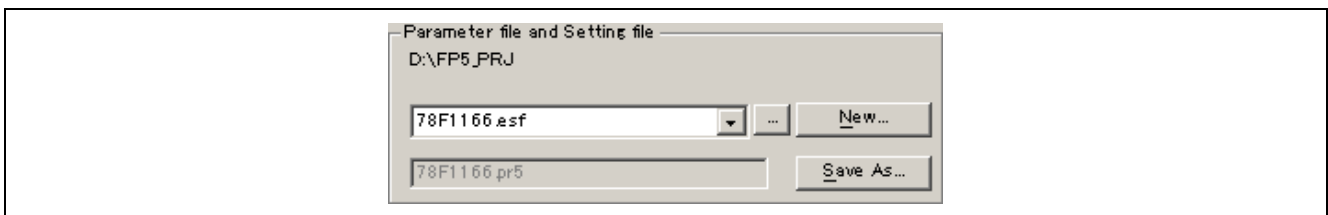
Figure 1.52 [Parameter and Setting file] Area

ESF file selection list box
Select the ESF file to be used. If no ESF files are registered in the valid programming area, ESF files stored in the
FP5_PRJ folder in the programming GUI installation folder are displayed. If the reference folder is changed by using
the ..., New... or Save As... button, ESF files stored in the changed folder are displayed.

... button
Click this button when specifying an ESF file stored in a folder other than the FP5_PRJ folder in the programming GUI
installation folder. A dialog box for specifying the ESF file will be displayed. Specify the relevant file, and then click
the Open button. Note that the PR5 file specified by the ESF file must be in the specified folder.
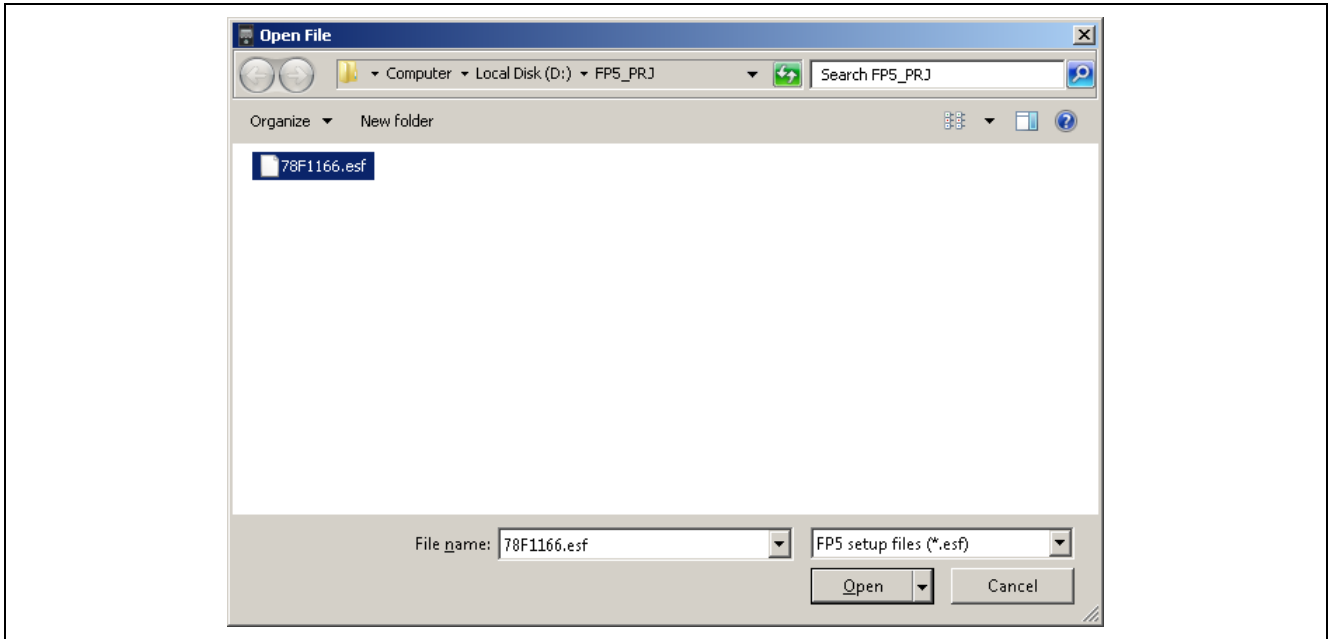
Figure 1.53 ESF File Select Dialog Box

New... button
Click this button to create a new ESF file. The following dialog box will be displayed.
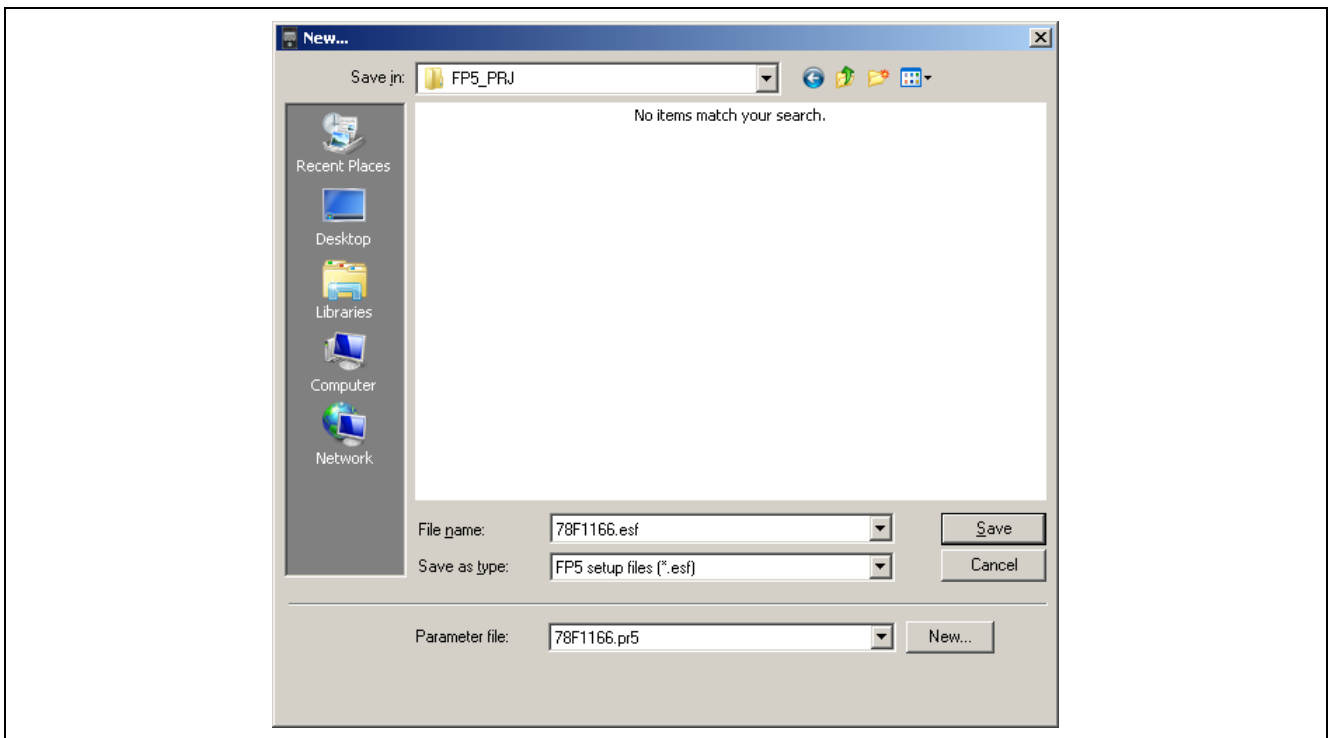

Figure 1.54 New ESF File Creation Dialog Box

The PR5 file stored in the FP5_PRJ folder in the programming GUI installation folder is displayed in the [Parameter file:] list. Select the PR5 file for the target device used.
Clicking the New... button will open the following dialog box. The PR5 file can be copied to the specified folder of the ESF file with this dialog box.
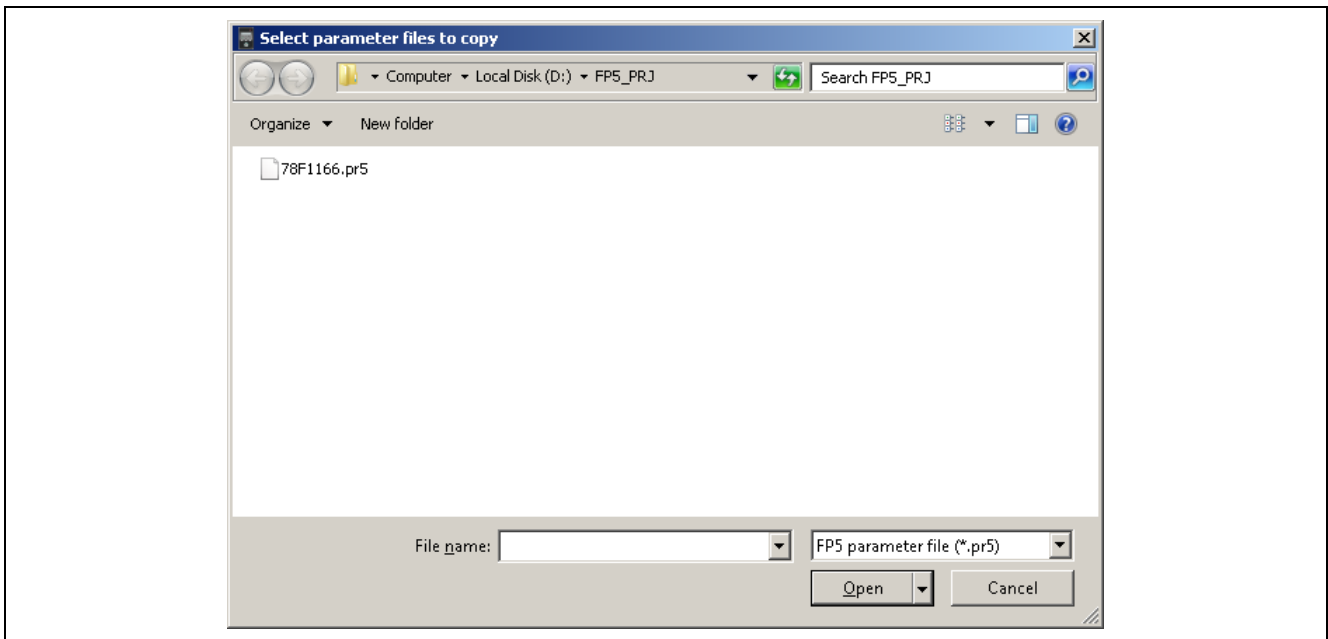
Figure 1.55 [Select parameter files to copy] Dialog Box

After selecting the PR5 file, input the new ESF file name and then click the Save button.

Save As... button
Clicking this button opens the dialog box for overwriting the current settings made in the Device Setup dialog box to the existing ESF file, or saving as another file.
Specify the file and then click the Open button. Note that the PR5 file is also copied to the destination folder.
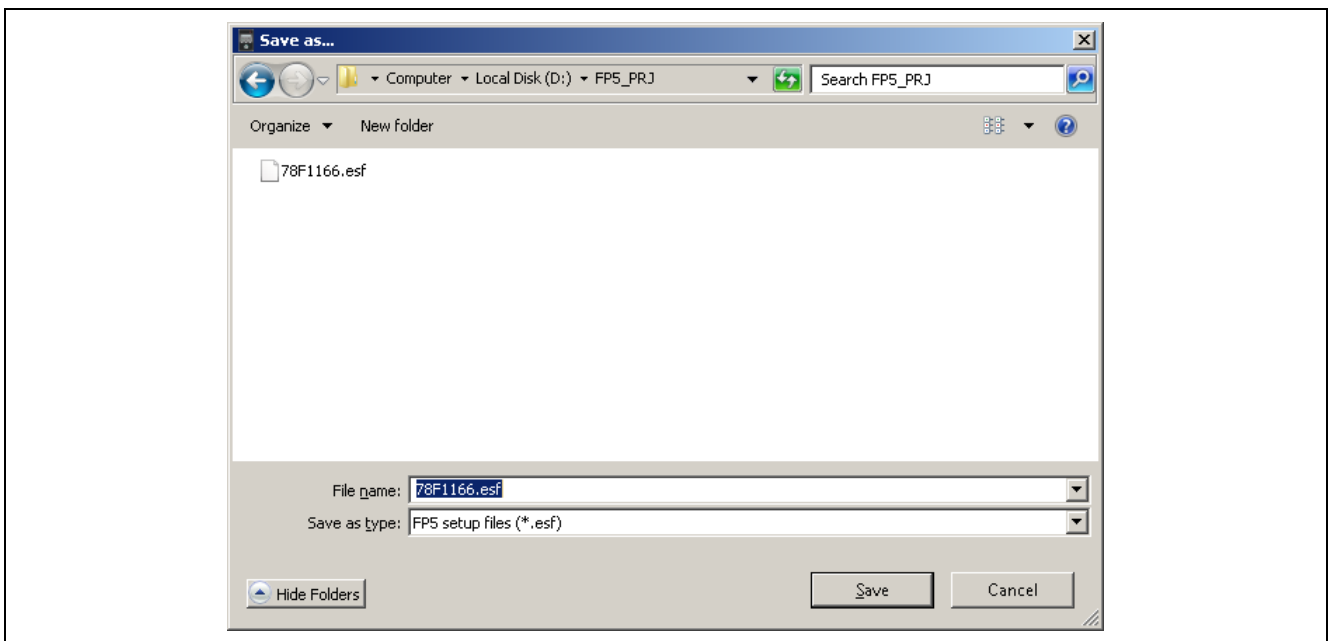
Figure 1.56 [Save as...] Dialog Box

<4> [Object HEX file] area
Select the program file in this area. If an HCUHEX file is selected, "HCUHEX file" is displayed in this area.
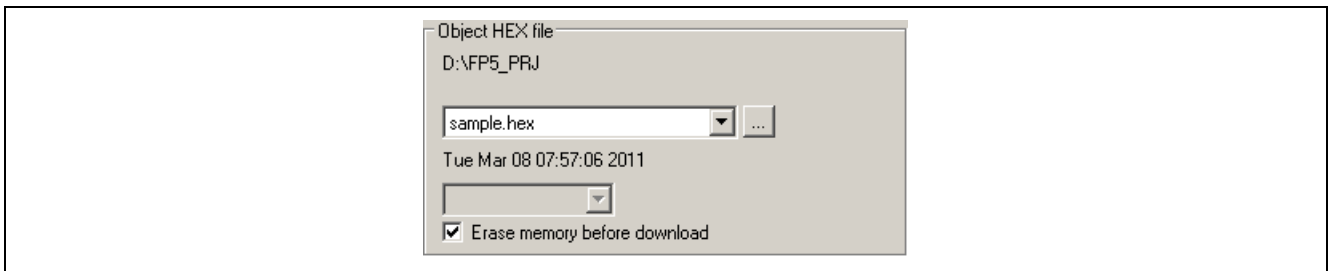
Figure 1.57 [Object HEX file] Area

Program file selection list
Select the program file to be used. If no program files are registered in the valid programming area, program files stored in the *bin* folder in the programming GUI installation folder are displayed. If the reference folder is changed by using the ... button, program files stored in the changed folder are displayed.

[Erase memory before download] check box
The [Erase memory before download] check box allows the user to select whether to delete the internal memory of the FP5 before downloading a new program file. Under normal conditions, check this box.

Note   Clear this check box when downloading and writing two program files. When a file is downloaded with this check box cleared, the PG-FP5 downloads data 512 bytes at a time without erasing its internal flash memory. Note, however, that the download error "ERROR: NAND flash – Illegal Write (Bit 0->1)" occurs if there is data other than FFh in the data being downloaded.

... button
Click this button when specifying a program file stored in a folder other than the folder in the programming GUI installation folder. The [Download file] dialog box will be displayed. Specify the relevant file, and then click the Open button. From the [File type (T)] list box, a program file (*.rec;*.s*;*.s2;*.mot;*.a20;*.a37;*.hex;*.ddi) or all files (*.*) can be selected.
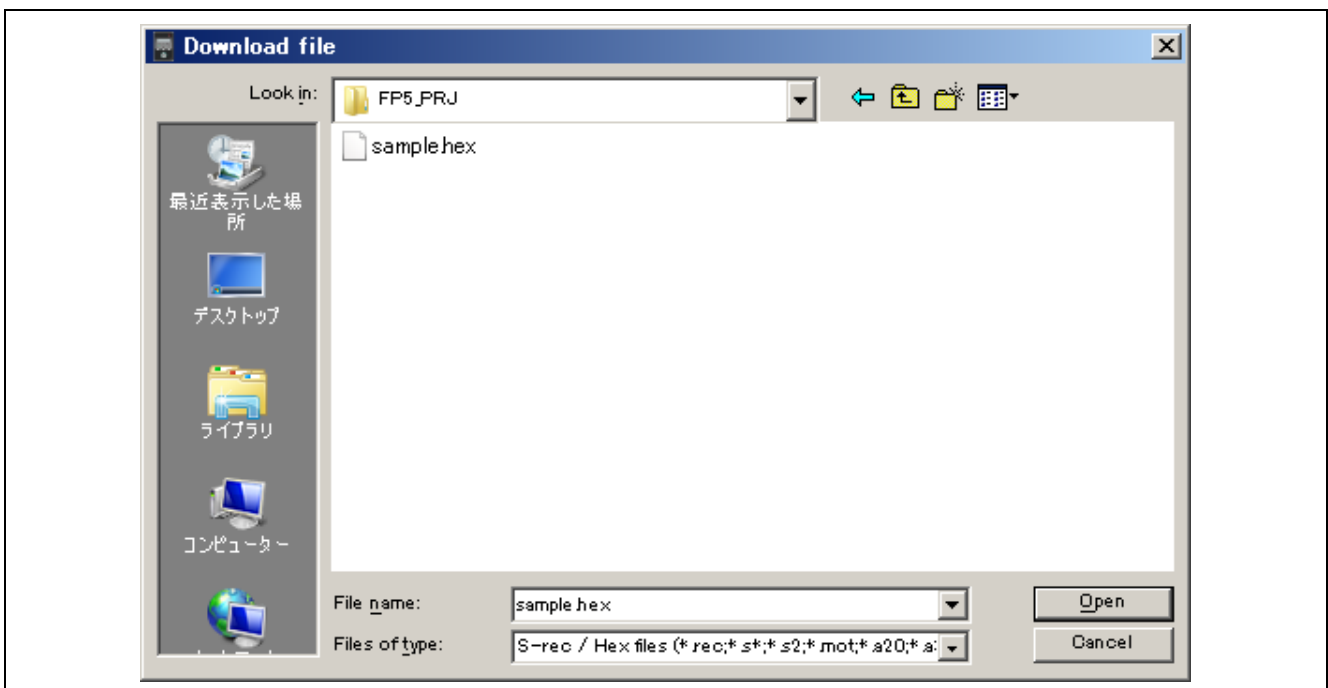

Figure 1.58 [Download file] Dialog Box

<5> [Information] area and Clear button
This area displays a warning message or is used to clear information on PR5 files, ESF files and program files.

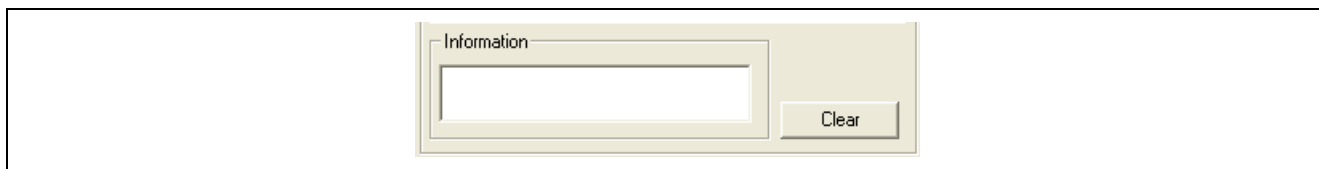**Figure 1.59 [Information] Area and Clear Button**

[Information] area
A warning message will be displayed in this area if there is a mismatch between PR5 files, ESF files and program files saved in the FP5 and information held in the programming GUI.

Clear button
Information of PR5 files, ESF files and program files, which is set to the current valid programming area, can be deleted .
Information of a programming area that is no longer required to be used can be deleted. When the clear button is clicked, deletion of the set information selected in the programming area settings will be specified.
When the OK button is clicked, programming areas that are currently valid will be downloaded and the internal memory information of the programming area, for which deletion has been specified by using the clear button, will be deleted. Deleting the information of all programming areas cannot be performed.
Initialize the FP5 management setting to initialize all programming areas. See the [FP5 Management setting (M) …] command in 1.3.2 (9)[FP5 Manager] command for details.

Note   The settings are not reflected to the FP5 internal memory unless the OK button is clicked in the Device Setup dialog box.

<6> Programming area map area
The programming area status can be checked in this area. The FP5 programming areas whose information matches information held in the programming GUI are displayed in light green. In the valid programming area, the names of ESF files, PR5 files and program files, and programming area numbers are displayed in black. These items appear dimmed in invalid programming areas. If no area information is held in the programming GUI, "Unknown" is displayed. The FP5 programming areas whose information does not match information held in the programming GUI are displayed in pink. The information held in the programming GUI is displayed in such areas.
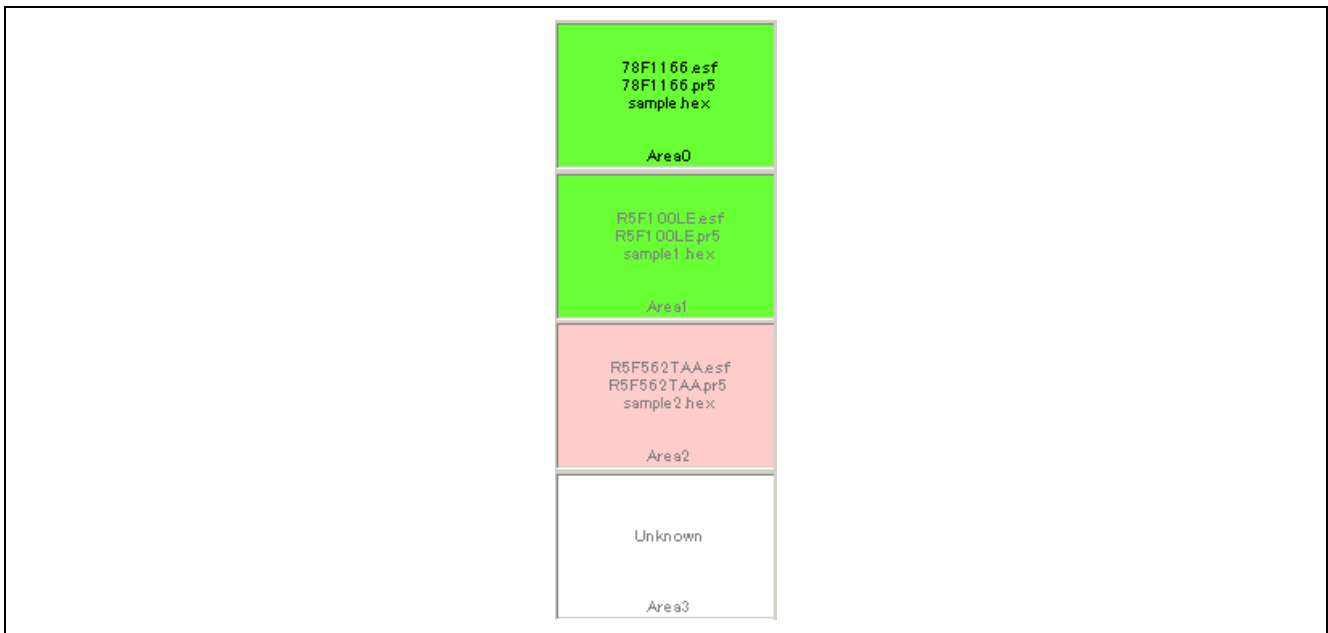
78F1166.esf
78F1166.pr5
sample.hex

Area0

R5F100LE.esf
R5F100LE.pr5
sample1.hex

Area1

R5F562TAA.esf
R5F562TAApr5
sample2.hex

Area2

Unknown

Area3

Figure 1.60 Programming Area Map Area

(b) [Standard] tab in Device Setup dialog box

On the [Standard] tab, set the programming environment of the flash memory in the target device. All basic settings to configure the user environment and the target device can be performed. Communication channels, speeds and the operation clock supplied to the target device vary depending on the device, so refer to the user's manual of the target device for setting these items.

This tab consists of the following items.

<1> [Communication interface to device] area

<2> [Supply oscillator] area

<3> [Operation Mode] area

<4> Defaults button
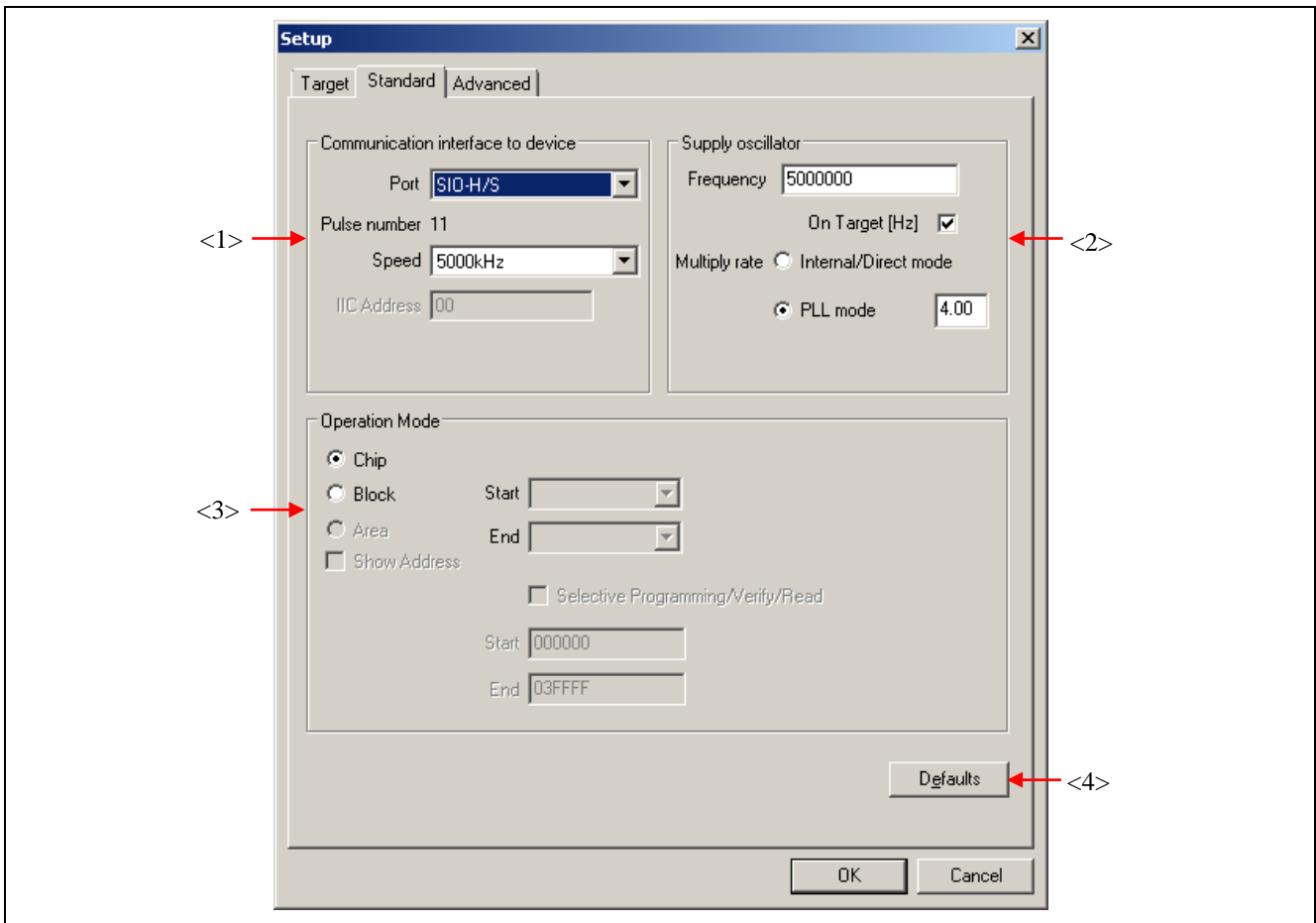
Figure 1.61 Device Setup Dialog Box - [Standard] Tab

<1> [Communication interface to device] area
In this area, select the channel and speed for communication between the FP5 and target device.
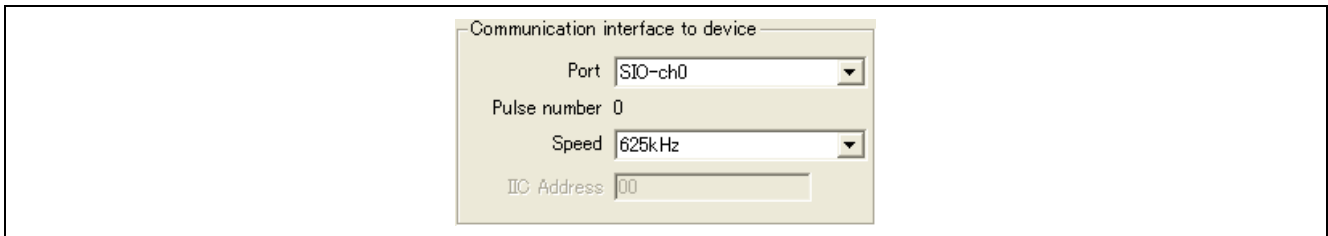
Figure 1.62 [Communication interface to device] Area

[Port] list
Select the mode of communication between the FP5 and target device. The communication mode is determined by the number of V_{PP} output from the FP5 or the FLMD0**Note** pulse count. The selectable communication mode differs depending on the target device. Refer to the user's manual of the target device used and select a mode. With some devices, the channel number may start from 1. In this case, the corresponding number is shifted, for example, ch0 shown in the screen corresponds to ch1 of the device, and the displayed channel number must be shifted accordingly.

Note   FLMD0 in a single-power-supply flash memory microcontroller, or FLMD1 in a two-power-supply flash memory microcontroller.
Note   For the available communication channel, refer to the user's manual of the target device, based on the pulse count displayed for "Pulse number".

Table 1.3   Channels for Communication Between FP5 and Target Device

Item on Screen	Description
SIO-ch0	SIO (3-wire clocked communication port) channel 0[Note]
SIO-ch1	SIO (3-wire clocked communication port) channel 1
SIO-ch2	SIO (3-wire clocked communication port) channel 2
SIO-H/S	SIO (3-wire clocked communication port, with handshake pin)
IIC-ch0	I^2C channel 0
IIC-ch1	I^2C channel 1
IIC-ch2	I^2C channel 2
IIC-ch3	I^2C channel 3
UART-ch0	UART (asynchronous communication port) channel 0
UART-ch1	UART (asynchronous communication port) channel 1
UART-ch2	UART (asynchronous communication port) channel 2
UART-ch3	UART (asynchronous communication port) channel 3
Port-ch0	Port (pseudo 3-wire) A
Port-ch1	Port (pseudo 3-wire) B
Port-ch2	Port (pseudo 3-wire) C
CSI-Internal-OSC	SIO (3-wire clocked communication port) (using internal oscillator) * In the case of 78K0 (All Flash)
UART-EXCLK	UART (asynchronous communication port) (using external clock/FP5 clock) *In the case of 78K0 (All Flash)
UART-X1-OSC	UART (asynchronous communication port) (using external oscillator) * In the case of 78K0 (All Flash)
UART-Internal-OSC	UART (asynchronous communication port) (using internal oscillator) * In the case of 78K0 (All Flash)
UART	UART (asynchronous communication port) * In the case of RX family or SuperH family
1 wire UART	Single-wire UART (asynchronous communication port) * In the case of RL78 family, 78K0 or 78K0R (All Flash)
UART I/O mode3	UART (asynchronous communication port) * Standard serial I/O mode 3 of the R8C family
Fine-D	FINE (RX100, RX200 series)

Note   This might be "3-wire clocked communication port, with handshake" depending on the target device.

[Pulse number]
V_{PP} or the FLMD0 count corresponding to the selected communication mode is displayed. This item cannot be changed.
It is not displayed for the RX family, R8C family, and SuperH family.

[Speed] List box
Select the communication rate of the selected communication channel.

Note   For the available communication speed, refer to the user's manual of the target device. For the RX family, R8C family, and SuperH family, communication speeds that can be selected in the [Frequency] box and [PLL mode (CKP)] box are displayed in the list box.

<When UART-ch0, UART-ch1, UART-ch2, UART-ch3, UART-EXCLK, UART-X1-OSC, UART-Internal-OSC, UART, 1 wire UART, UART I/O mode3, or Fine-D is selected>
- 9600Baud
- 19200Baud
- 31250Baud
- 38400Baud
- 57600Baud
- 76800Baud

- 115200Baud
- 125000Baud
- 128000Baud
- 153600Baud
- 250000Baud
- 500000Baud
- 1MBaud
- 2MBaud

<When SIO-ch0, SIO-ch1, SIO-ch2, SIO-H/S or CSI-Internal-OSC is selected>
- 9.8kHz
- 39kHz
- 156kHz
- 625kHz
- 2500kHz
- 5000kHz

<When IIC-ch0, IIC-ch1, IIC-ch2 or IIC-ch3 is selected>
- 10kBaud
- 20kBaud
- 50kBaud
- 100kBaud

<When Port-ch0, Port-ch1 or Port-ch2 is selected>
- 100Hz
- 200Hz
- 300Hz
- 400Hz
- 500Hz
- 600Hz
- 800Hz
- 1000Hz
- 1200Hz
- 1500Hz
- 2000Hz

[IIC Address] area
If I^{2}C is selected as the communication channel, input a hexadecimal number as a slave address of the target device. The valid input range is 8 to 77h. Do not input a unit. The slave address can be any value in the above range but must not be the same as the slave address of another target device on the I^{2}C. This field is not available if the I^{2}C port is not selected.

<2> [Supply oscillator] area
Set the clock to be supplied to the target device.

(a) When 78K, V850, RL78 Family or R8C Family Is Selected

(b) When RX Family or SuperH Family Is Selected
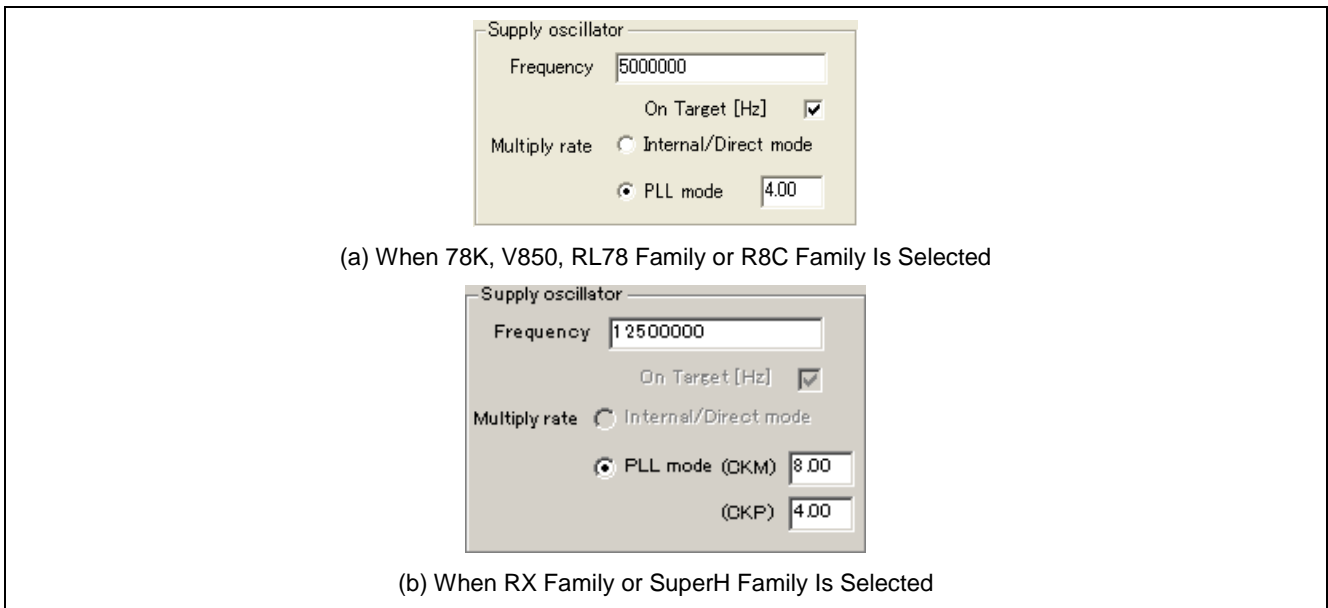
Figure 1.63 [Supply oscillator] Area

[Frequency] text box
Set the oscillation frequency of the clock supplied to the target device. When using the clock mounted on the target system ([On Target] check box selected), input its oscillation frequency. When using the clock on the FP5 side ([On Target] check box cleared), input one of the following.

- 1MHz
- 2MHz
- 4MHz
- 5MHz
- 6MHz
- 8MHz
- 9MHz
- 10MHz
- 12MHz
- 16MHz
- 20MHz

Note   For the selectable frequency, refer to the user's manual for the device used.

[On Target] check box
Specify which clock is supplied to the target device: a clock mounted on the target system, or a clock on the FP5 side. If this check box is selected, the clock mounted on the target system will be used. If this check box is cleared, the clock on the FP5 side will be used.

[Multiply rate] text box
Set the multiplication ratio of the clock supplied to the target device. If the target device includes the PLL circuit, input the multiplication ratio in accordance with the environment used. If the target device does not include the PLL circuit, select "Internal/Direct mode". On the initial screen, the default settings that have been loaded from the PR5 file is displayed. For the RX family and SuperH family, the [CKM] box and [CKP] box are displayed in PLL mode. Enter the multiplication ratio of the main clock in the [CKM] box, and the multiplication ratio of the peripheral clock in the [CKP] box.

Note   For the selectable multiply rate, refer to the user's manual for the device used.

<3> [Operation Mode] area
Switch the operation mode to execute commands, such as flash memory programming, for the entire flash memory area, in area units or in block units. The settings made here are valid for the [Blank Check], [Erase], [Program], [Verify], [Read], [Checksum], and [Autoprocedure(E.P.)] commands.
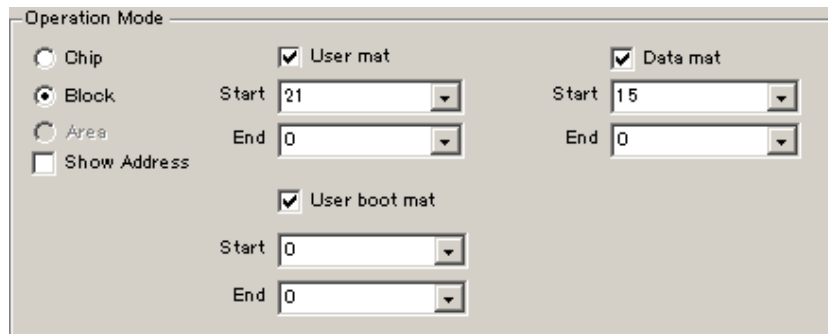
Note   When loading an HCUHEX file, the HCUHEX file is handled as master data, so the [Chip] are selected. The setting of this check box therefore cannot be changed.
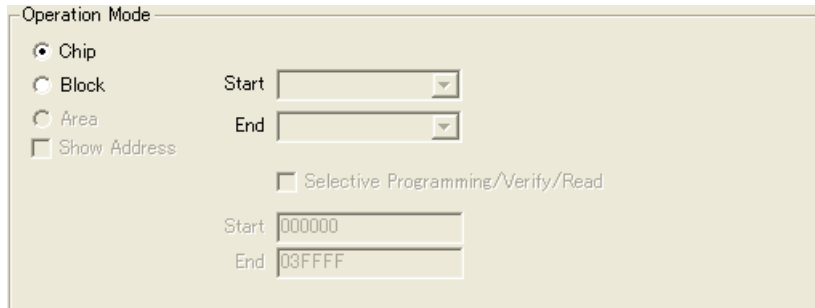
(a) When a product without data flash is selected from the 78K, V850, RL78 family
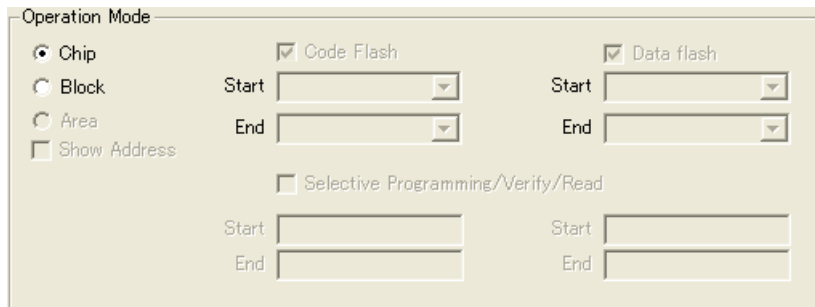
(b) When a product with data flash is selected from the 78K, V850, RL78 family

(c) When the RX family, R8C family, or SuperH family is selected

Figure 1.64 [Operation Mode] Area

If [Chip] is selected:
The entire flash memory area of the target device is subject to command processing, such as programming.

If [Block] is selected:
Specify the block range subject to command processing, using the [Start] and [End] drop-down lists. These lists show the block numbers where flash memory in the target device is configured.

Note   1. For the R8C family, a block cannot be specified with the [Start/End] list box.
        2. For the SuperH family, there are cautions on selection of User mat, Data mat, and User boot depending on the format of the program file.
           Other than DDI files: If the addresses of User mat, Data mat, and User boot overlap, multiple items cannot be selected.
           DDI files: The restriction above does not exist.

If [Area] is selected:
Specify the Area number range subject to rewrite processing by using the [Start] and [End] lists.
The [Start/End] lists display the Area number where the target device is configured.

[Show Address] check box
Specifies whether numbers or addresses are displayed in the Start/End lists. If this check box is checked, addresses are
displayed. If it is not checked, numbers are displayed.

[Selective programming/Verify/Read] check box
This item is not available.

<4> Defaults button
The default settings stored in the PR5 file are restored.

(c) [Advanced] tab in Device Setup dialog box
On the [Advanced] tab, the programming voltage, options added to programming commands, and security settings can
be configured.
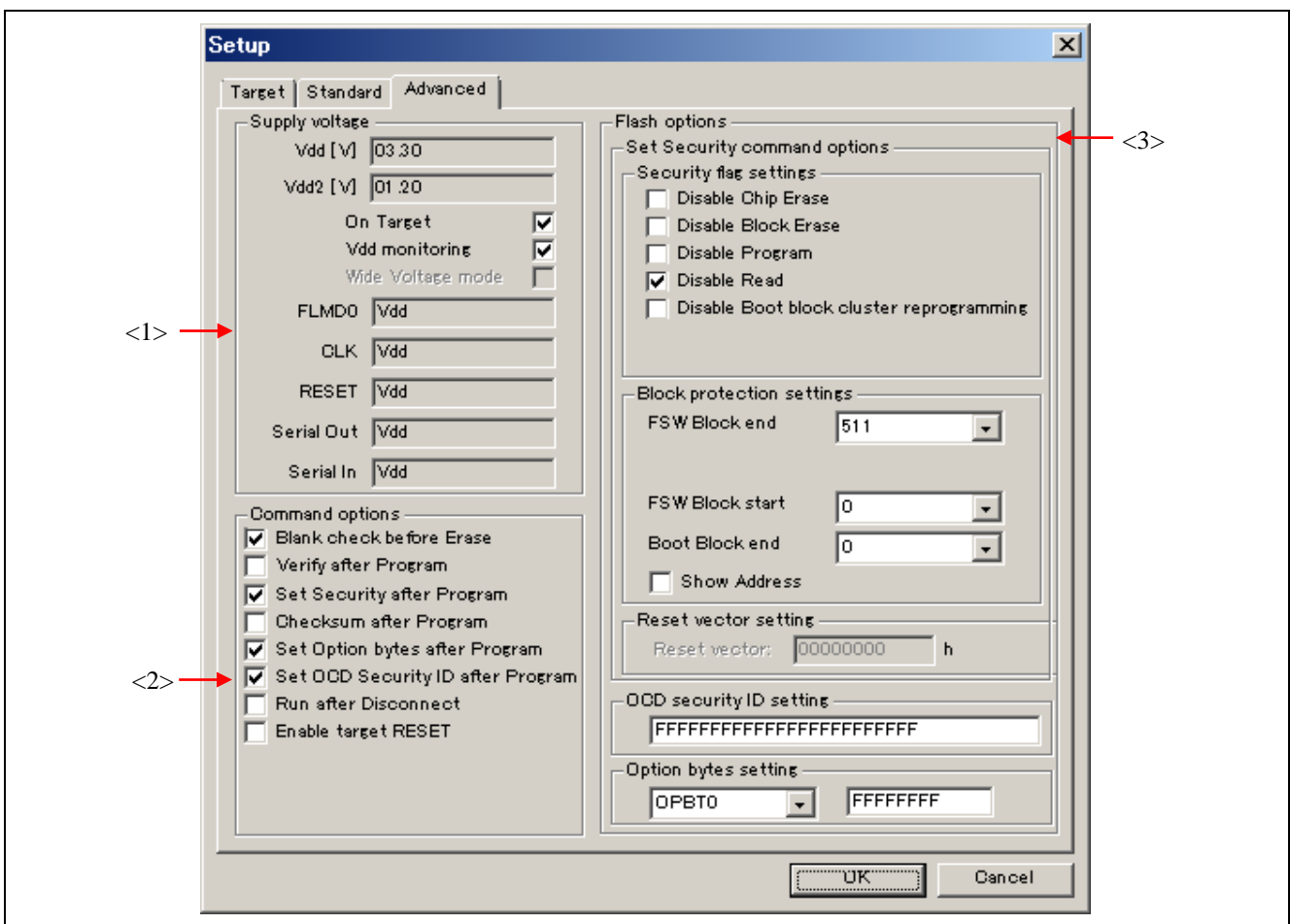
Figure 1.65 [Operation Mode] Area

This tab consists of the following items.
<1> [Supply voltage] area
<2> [Command options] area
<3> [Flash options] area

<1> [Supply voltage] area
In this area, specify one (V_{DD}) or two (V_{DD} and V_{DD2}) voltage levels for target device programming, in accordance with
the target device type. Basically, V_{DD}/V_{DD2} voltages for target device programming should be supplied from the target
system. Supplying from the FP5 is possible, but the current flow is not large enough to operate the whole target system

(Refer to Common APPENDIX C ELECTRICAL SPECIFICATIONS OF TARGET INTERFACE). Therefore, supply voltage via the FP5 only when a dedicated writing adaptor such as an FA adaptor is used.
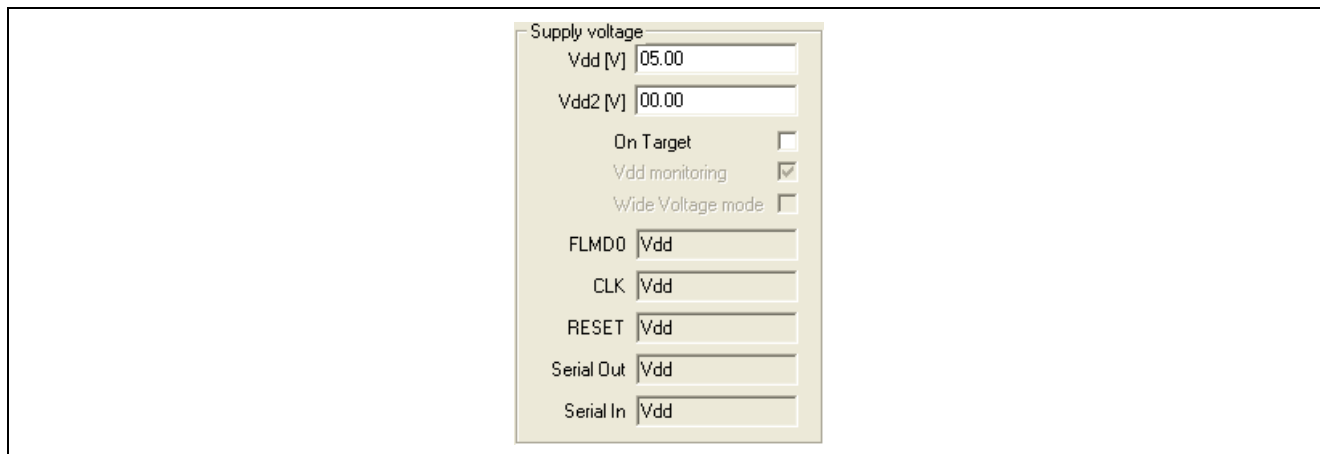
Figure 1.66 [Supply voltage] Area

[Vdd[V]] box
The default V_{DD} level set in the PR5 file is displayed in volts (V). This level can be changed by input.

[Vdd2[V]] box
The default V_{DD2} level set in the PR5 file is displayed in volts (V). If the target device specifications require two types of V_{DD} for writing to flash memory, specify a lower voltage for V_{DD2} (e.g. V_{DD}=5.0V, V_{DD2}=3.3V). This level can also be changed by input.

[On Target] check box
Select this check box when supplying the V_{DD}/V_{DD2} voltages from the target system.

Note   The target system may be damaged if proper values are not set.

The V_{DD} pin power supply detection function varies depending on the setting of the [On Target] check box.

- When V_{DD} is set to be supplied from FP5 ([On Target] check box: not selected)

If the target system V_{DD} exceeds 0.2V before V_{DD} is supplied, the message "Target power detected! Check Setup" will be displayed in the action log window.
- When V_{DD} is set to be supplied from the target system ([On Target] check box: selected)

If V_{DD} is outside the range of ±5% of the V_{DD} set value immediately before communication starts, the message "No VDD applied or Voltage is out of range" will be displayed in the action log window.

[Vdd monitoring] check box
When supplying V_{DD} from the target system ([On Target] check box: selected), whether to enable the V_{DD} pin power supply detection function can be selected with this check box. Select to enable, or clear to disable the function.

Note   When the V_{DD} pin power supply detection function is disabled, the product can be used even if the V_{DD} pins in the FP5 and the target system are not connected. In such a case, make sure that V_{DD} power generated in the target system always matches the output signal power supply generated in the FP5.

[Wide Voltage mode] check box
This check box can be used to select whether to use wide-voltage mode or full-speed mode. If this check box is checked, commands are executed in wide-voltage mode. If this check box is not checked, commands are executed in full-speed mode. This check box becomes available when a device that supports this function is selected. For details about wide-voltage mode and full-speed mode, see the user's manual of the target device.

Note   When loading an HCUHEX file, the HCUHEX file is handled as master data, so the HCUHEX file settings are
        applied to the target device. The setting of this check box therefore cannot be changed.

[FLMD0] (or Vpp[V]), [CLK], [RESET], [Serial Out] and [Serial In] boxes
Through the PR5 file, this box displays the various default terminal levels. FLMD0 (or Vpp[V]) uses volt (V) units,
CLK uses Vdd or Vdd2, RESET uses Vdd or VDD Reset TrigIn, and Serial Out and Serial In use Vdd. Note that VDD
Reset TrigIn is displayed when the [Enable target RESET] check box of the [Command options] area is enabled.

<2> [Command options] area
In this area, set options to be added to the [Erase], [Program] and [Autoprocedure(E.P.)] commands. Some commands
may be unavailable when depending on the parameter file (PR5 file) selected or FP5 Manager setting.

Note   When loading an HCUHEX file, the HCUHEX file is handled as master data. The settings of [Blank check before
        Erase], [Set Security after Program] becomes enabled and they cannot be changed. Also, [Set Option bytes
        after Program], and [Set OCD Security ID after Program] cannot be changed.

Command options ☐ Blank check before Erase ☐ Verify after Program ☑ Set Security after Program ☐ Checksum after Program ☑ Set Option bytes after Program ☑ Set OCD Security ID after Program ☐ Run after Disconnect ☐ Enable target RESET ☐ Enable minimum unit programming	Command options ☐ Blank check before Erase ☐ Verify after Program ☐ Set Security after Program ☐ Checksum after Program ☐ Set Option bytes after Program ☐ Set OCD Security ID after Program ☐ Run after Disconnect ☐ Enable target RESET ☐ Enable minimum unit programming ☐ Lock bit set after Program
(a) When the 78K, V850, or RL78 family is selected	(b) When the RX family, R8C family, or SuperH family is selected

Figure 1.67 [Command options] Area

[Blank check before Erase] check box
If this check box is selected, the [Blank Check] command is automatically executed before the [Erase] and [Autoprocedure(E.P.)] commands are executed.

[Verify after Program] check box
If this check box is selected, the [Verify] command is automatically executed after the [Program] and [Autoprocedure(E.P.)] commands are executed.

[Set Security after Program] check box
If this check box is selected, the [Set Security] command is automatically executed after the [Program] and [Autoprocedure(E.P.)] commands are executed.

[Checksum after Program] check box
If this check box is selected, the [Checksum] command is automatically executed after the [Program] and [Autoprocedure(E.P.)] commands are executed.

[Set Option bytes after Program] check box
If this check box is selected, the [Set Option bytes] command is automatically executed after the [Program] and [Autoprocedure(E.P.)] commands are executed.

[Set OCD security ID after Program] check box
If this check box is selected, the [Set ID Code] command is automatically executed after the [Program] and [Autoprocedure(E.P.)] commands are executed.

[Run after Disconnect] check box
If this check box is selected, the $\overline{\text{RESET}}$ signal level changes from low level to Hi-Z after each command. Note that when the "Reset option of Run after Disconnect" is set to Pull-up with the [FP5 Manager] dialog box, the signal will go from low level to Pull-up. If this check box is not selected, the $\overline{\text{RESET}}$ signal changes to low level after each command is finished. This check box becomes available if the [On Target] check box in the [Supply voltage] area is selected. If selected, the written program can be automatically executed after each command is finished.

[Enable target Reset] check box
When this box is checked, the $\overline{\text{RESET}}$ terminal will change to the input mode (Hi-Z). Immediately after execution of the various commands, FP5 will detect the leading edge of the signal entering the $\overline{\text{RESET}}$ terminal. Until a signal is detected, "Waiting for RESET..." will be displayed in the action log window, and the transition to the flash memory programming mode will be put on hold. When the signal is detected, the transition will be resumed. And right before each commands are completed, FP5 will detect the leading edge of the signal entering the $\overline{\text{RESET}}$ terminal. Until a signal is detected, "Waiting for RESET" will be displayed in the action log window, and the termination of the flash memory programming mode will be put on hold. When the signal is detected, the flash programming mode is ended.
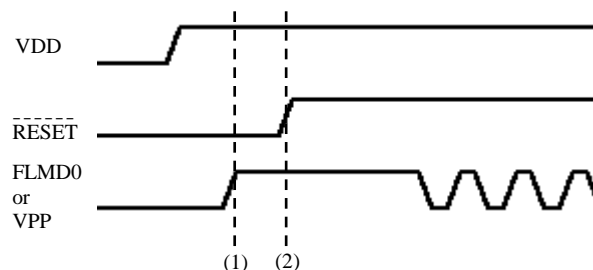
(a) Transition to the flash memory programming mode

(1): Put the transition to the flash memory programming mode on hold.
(2): Detect the rising edge of the signal entering the $\overline{\text{RESET}}$ pin.

(b) Ending the flash memory programming mode
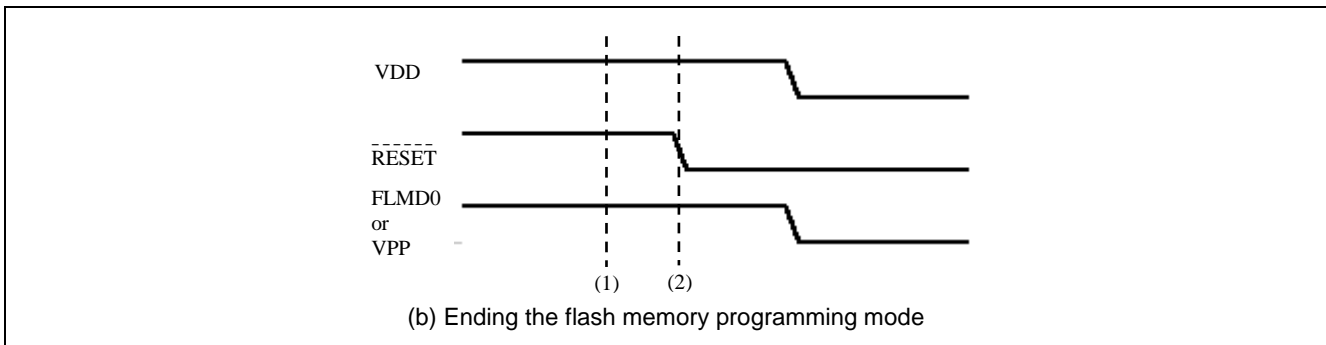
(1): Put the ending of the flash memory programming mode on hold.

(2): Detect the falling edge of the signal entering the $\overline{\text{RESET}}$ pin.

Figure 1.68 Detection Timing of Target Reset

[Enable minimum unit programming] check box

This is a function for programming of the data flash memory in the minimum unit. Placing a check mark in this box enables the function. Once enabled, writing to, verifying, and reading from the data area in the data flash memory in the minimum unit of the MCU's flash memory control are possible. This function can be used when the V850E2/Fx4-L, V850E2/FF4-G, V850E2/FG4-G, V850E2/Px4-L, V850E2/PG4-S, or RX is selected.

Note   Do not use the results of checksums while this function is active, since they will not be as intended.

[Lock bit disable after connect] check box

If this check box is selected, the command is executed, and the lock bit is disabled after connection with the microcontroller.

[Lock bit enable before disconnect] check box

If this check box is selected, the command is executed, and the lock bit is enabled after disconnection from the microcontroller.

[Lock bit set after Program] check box

If this check box is selected, the [Set Lock bit] command is executed when the [Program] command is finished.

Note   For details of lock bits, refer to the user's manual of the target device.

<3> [Flash options] area

For the 78K, V850, and RL78 family, setting of the Set Security command options (security flag settings, block protection settings, reset vector handling function setting, on-chip debug security ID setting, and option byte setting) can performed in this area. For the RX family, R8C family, and SuperH family, I/O signal setting, lock bit setting, I/O signal setting, access window setting, and ID code can be set. When the [Get Flash options] command is enabled, settings in this area can be confirmed by running the [Get Flash options] command before running the [Set Security] command, [Set ID Code] command, or [Set Option bytes] command.

Note   1. For setting of the flash options (security flag settings, block protection settings, reset vector handling function setting, on-chip debug security ID setting, and option byte setting), lock bit, access window setting, and ID code, refer to the user's manual of the target device.
         2. When loading an HCUHEX file, the HCUHEX file is handled as master data, so the HCUHEX file settings are applied to the target device. The setting of this check box therefore cannot be changed.
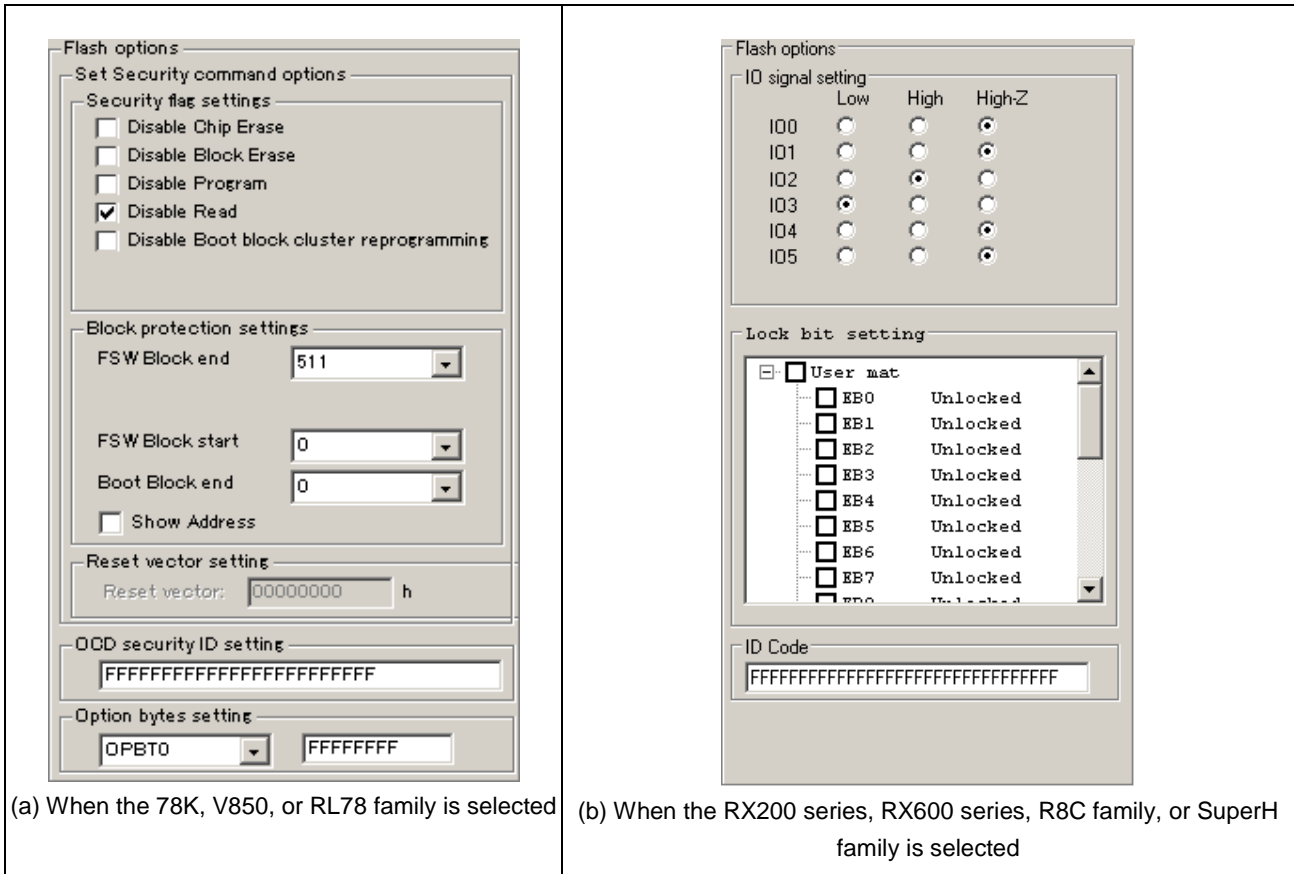
(a) When the 78K, V850, or RL78 family is selected

(b) When the RX200 series, RX600 series, R8C family, or SuperH family is selected
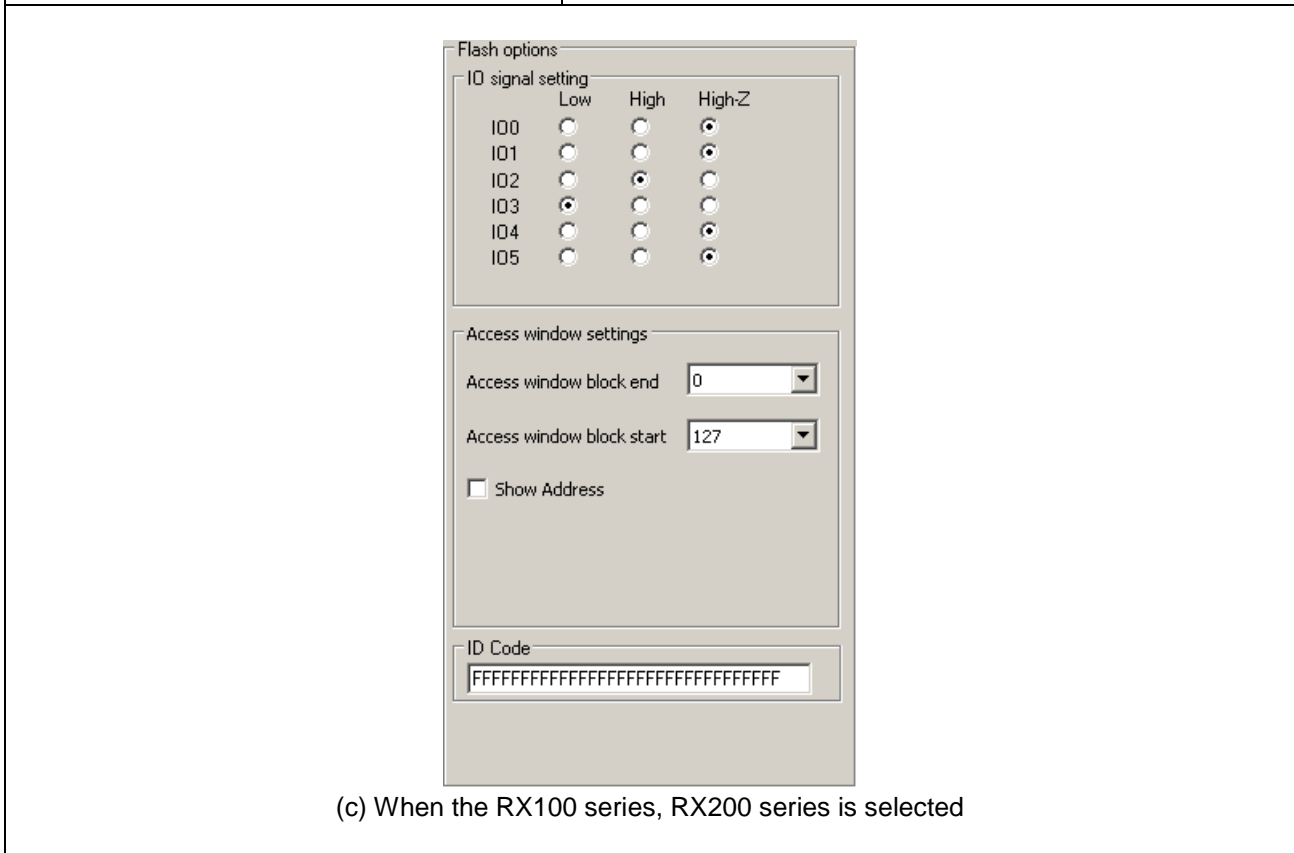
(c) When the RX100 series, RX200 series is selected

Figure 1.69 [Flash options] Area

<4> [Set Security command options] area

The security flag settings block protection settings, and reset vector handling function setting can be set in this area.
When the [Set Security] command is executed, the settings in this area will be reflected in the target device.
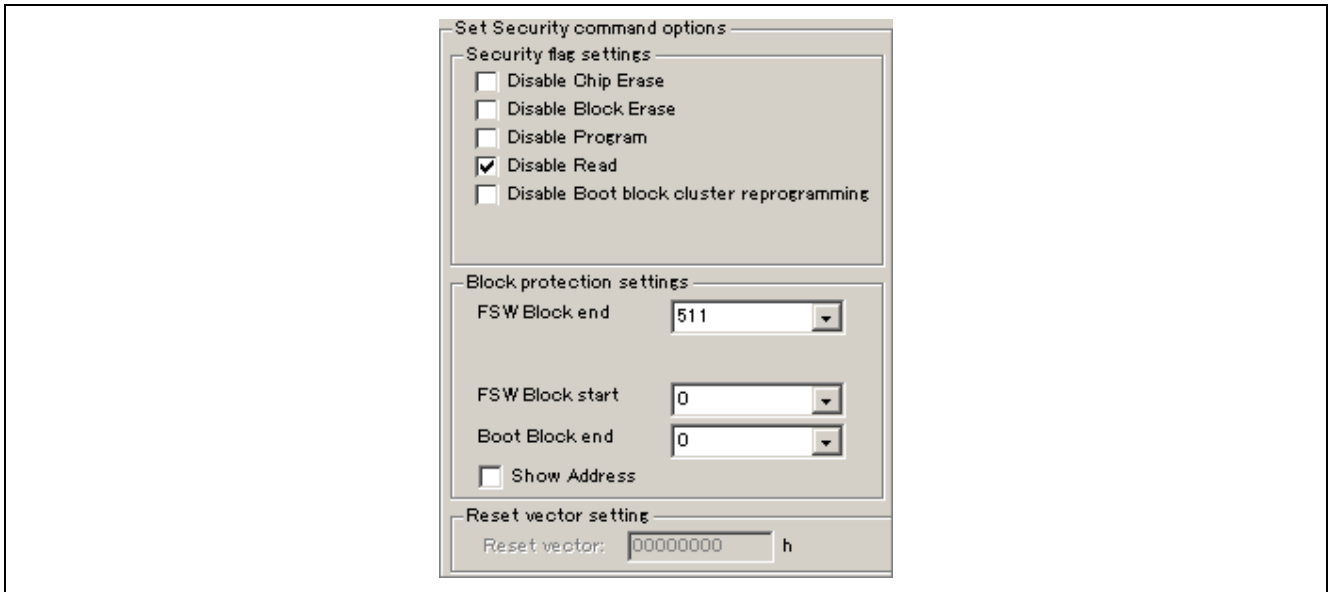
Figure 1.70 [Security flag settings] Area

<5> [Security flag settings] area

The security flag settings can be selected in this area.
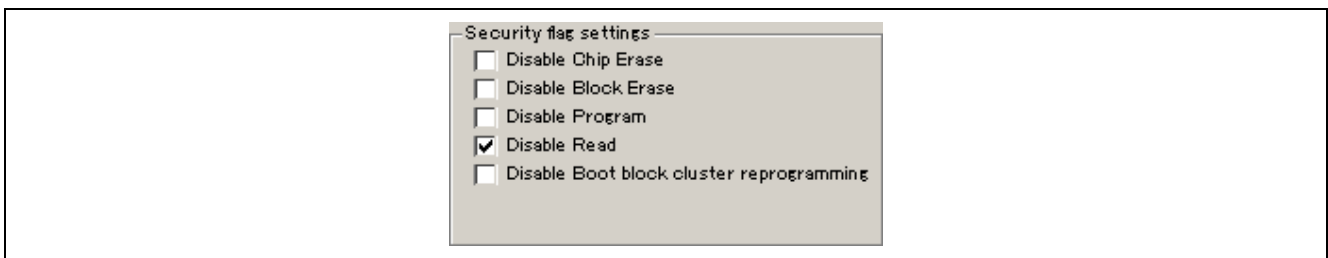
Figure 1.71 [Security flag settings] Area

[Disable Chip Erase] check box

If the [Set Security] command is executed with this check box selected, the [Erase] command will be disabled for the entire area of the flash memory in the target device. When this check box is selected, the following dialog box appears.
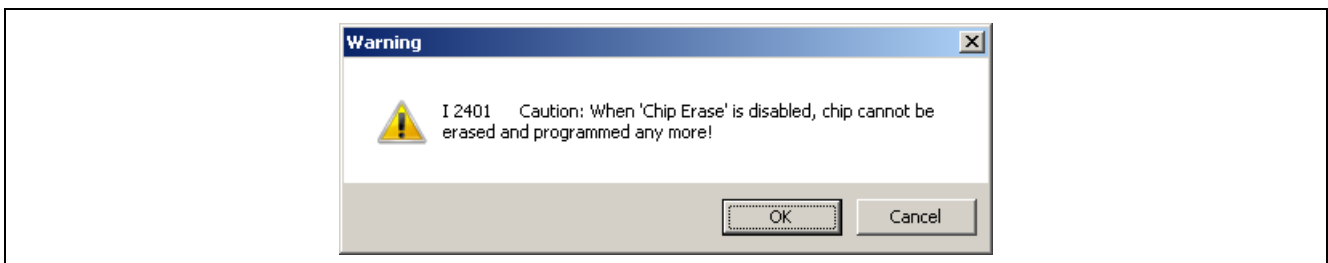
Figure 1.72 [Disable Chip Erase] Warning Dialog Box

Clicking the OK button determines the selection of the [Disable Chip Erase] check box.
Clicking the Cancel button cancels the selection of the [Disable Chip Erase] check box.

Note   If the [Disable Chip Erase] function is enabled, erasure for the device will no longer be possible, and the [Disable Chip Erase] function will no longer be able to be disabled.

[Disable Block Erase] check box

If the [Set Security] command is executed with this check box selected, the [Erase] command is disabled for all the selected blocks in the flash memory selected with "Block" in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area. If this is selected when the RL78 family, V850E2/Fx4-L, V850E2/FF4-G, V850E2/FG4-G, V850E2/Px4-L, or V850E2/PG4-S is selected, the following dialog box is displayed.

Figure 1.73 [Block Erasure Prohibition] Warning Dialog Box

[Disable Program] check box

If the [Set Security] command is executed with this check box selected, the [Erase] command for all the selected blocks in the flash memory selected with "Block" in the [Operation Mode] area on the [Standard] tab in the Device Setup dialog box and the [Program] command is disabled. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area.

[Disable Read] check box

If the [Set Security] command is executed with this check box selected, the [Read] command is disabled. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area.

[Disable Boot block cluster reprogramming] check box

If the [Set Security] command is executed with this check box selected, the boot block set in the [Boot Block end] drop-down list is regarded as the last block in the [Block protection settings] area and then the boot area is set, and rewriting to the area is prohibited. If this check box is selected, the following dialog box appears.
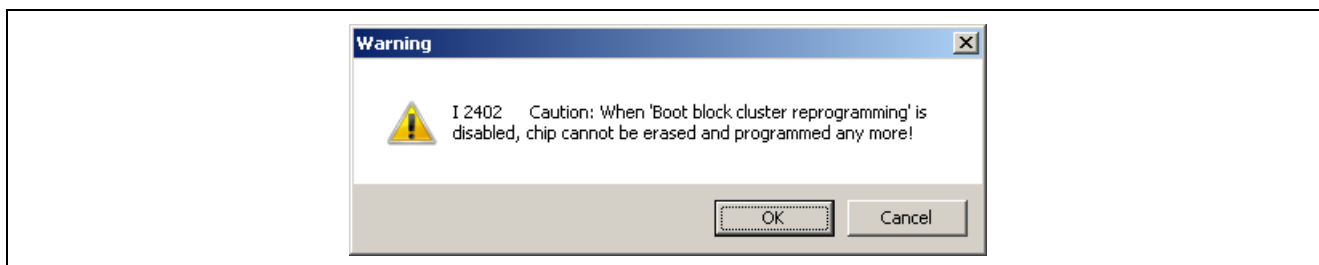
Figure 1.74 [Disable Boot block cluster reprogramming] Warning Dialog Box

Clicking the OK button determines the selection of the [Disable Boot block cluster reprogramming] check box.
Clicking the Cancel button cancels the selection of the [Disable Boot block cluster reprogramming] check box.

Note   If the [Disable Boot block cluster reprogramming] function is enabled, rewriting of the boot area and execution of the [Erase] command with "Chip" selected in the [Operation Mode] area will no longer be possible for the device, and the [Disable Boot block cluster reprogramming] function will no longer be able to be disabled.

<6> [Block protection settings] area
In this area, block settings when the [Disable Boot block cluster reprogramming] check box is selected and block settings for the flash shield window function can be performed.
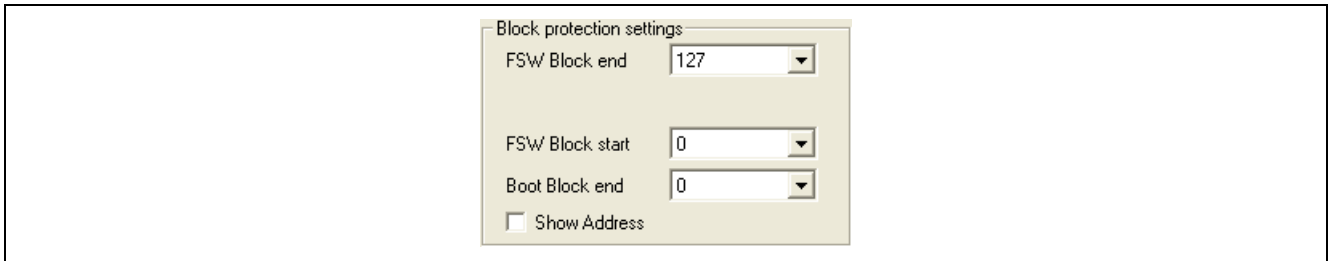
Figure 1.75 [Block protection settings] Area

[Boot Block end] drop-down list
Select a block number from this list if the [Disable Boot block cluster reprogramming] check box is selected. This list shows the block numbers where the flash memory in the target device is configured. Refer to the user's manual of each target device for the setting method.

[FSW Block start] and [FSW Block end] drop-down lists
Select the block subject to the flash shield window function, using these lists. These lists show the block numbers where the flash memory in the target device is configured. Refer to the user's manual of each target device for the setting method.

[Show Address] check box
Specify the display format in the [Boot Block end], [FSW Block start] and [FSW Block end] drop-down lists. If this check box is selected, the block address is displayed. If this check box is cleared, the block number is displayed.

<7> [Reset vector setting] area
The reset vector handling function can be set in this area.
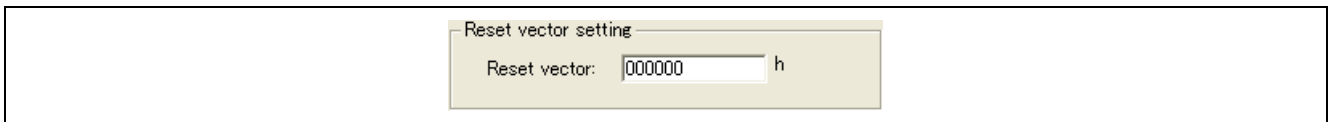
Figure 1.76 [Reset vector setting] Area

[Reset vector] text box
If the [Set Security] command is executed with an arbitrary address value input, the reset vector is changed to the specified address. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area.

<8> [OCD security ID setting] area
The OCD security ID can be set in this area. When the [Set ID Code] command is executed, the settings in this area will be reflected in the target device.
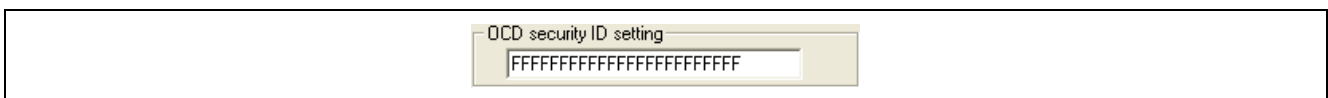
Figure 1.77 [OCD security ID setting] Area

[OCD security ID setting] text box
If the [Set ID Code] command is executed after entering an on-chip debug security ID in this box, the on-chip debug security ID is set. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area.

<9> [Option bytes setting] area
The option bytes can be set in this area. When the [Set Option bytes] command is executed, the settings made in this area in the Device Setup dialog box will be reflected in the target device.
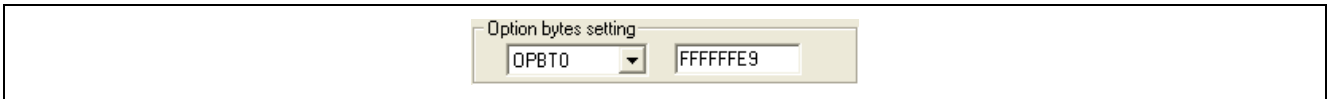
Figure 1.78 [Option bytes setting] Area

[Option byte setting] text box
If the [Set Option bytes] command is executed after entering a setting value of option byte (OPBTx (x=0 to 8)) in 4-byte unit, the option bytes are set. This setting is cleared if the [Erase] command is executed with "Chip" selected in the [Operation Mode] area.

<10>   [IO signal setting] area
A pin to control the operating mode (Mode-Setting Pin) of the RX family and SuperH family can be selected from the IO0 to IO5 pins. Note that the area is grayed out when the Fine-D communications port is selected; the IO0, IO1, IO2, IO4, and IO5 pins are fixed as high-impedance while the IO3 pin is used for communications with the FINE pins.
 For details, refer to Common 8 NOTES ON TARGET SYSTEM DESIGN.

Note   Processing the IO pins is done to set the operating mode of the RX to the boot mode. For the RX62T, control must be applied to set the MD0 pin to the high level and the MD1 pin to the low level. This can be done by connecting any of pins from IO0 to IO5 of the FP5 and making the required settings in the [IO signal setting] area.
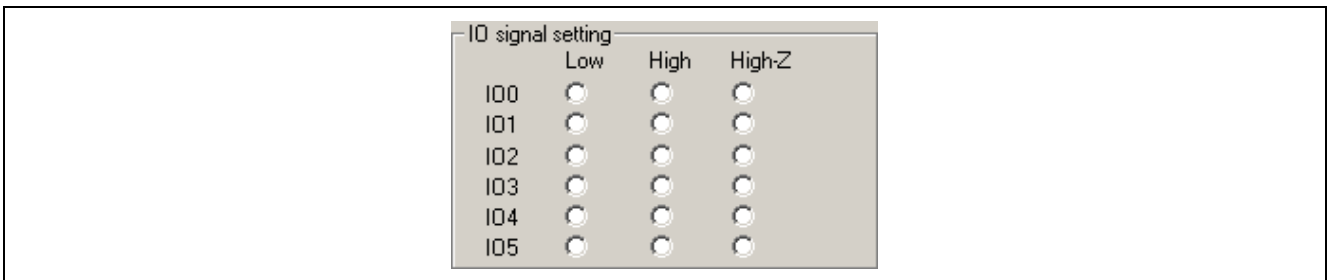
Figure 1.79 [IO signal setting] area

<11>   [Lock bit setting] area
Whether to set lock bits in units of blocks can be selected for User mat. It is locked when this check box is selected, or unlocked when it is cleared. For details on lock bits, refer to the user's manual of the target device.
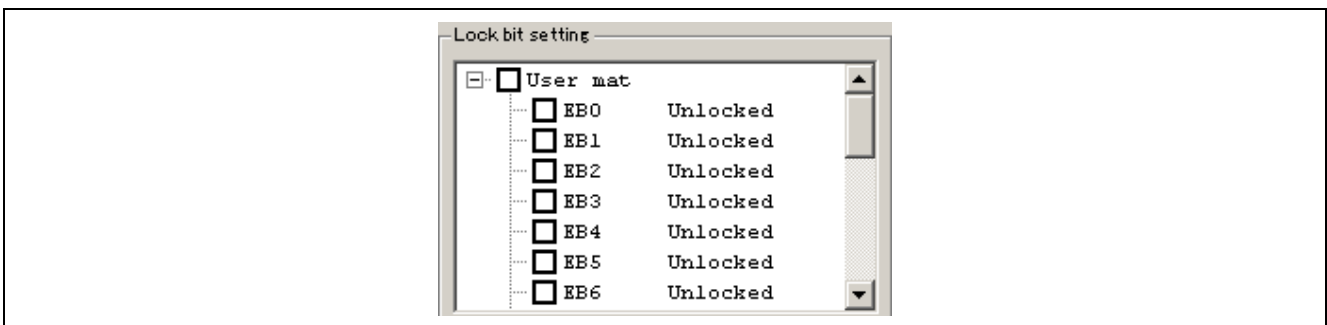
Figure 1.80 [Lock bit setting] area

<12>   [Access window settings] area

In this area, block settings for the area protection function can be performed.
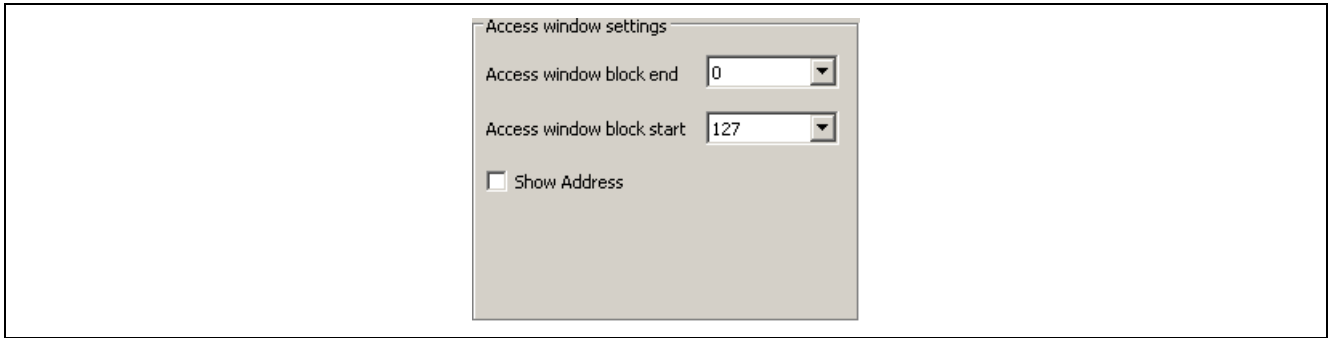
Figure 1.81 [Access window settings] Area

[Access window block start] and [Access window block end] drop-down lists
Select the block subject to the area protection function, using these lists. These lists show the block numbers where the flash memory in the target device is configured. Refer to the user's manual of each target device for the setting method.

[Show Address] check box
Specify the display format in the [Access window block start] and [Access window block end] drop-down lists. If this check box is selected, the block address is displayed. If this check box is cleared, the block number is displayed.

<13>   [ID code] area

For the RX family, R8C family, and SuperH family, ID code authentication is performed before each command is executed. Enter an ID code in the [ID code] area. For the RX family and SuperH family, the FP5 automatically repeats it three times (the flash memory in the microcontroller is erased depending on the setting). For the R8C family, it is performed only once. For details on ID code, refer to the user's manual of the target device.

Note   For a device with control code, enter the value at the first byte of the effective data bytes.
        Example : When Effective data bytes = 16, Control code = H'45, ID code = H'010203, H'04050607, H'08090A0B,
                  H'0C0D0E0F -> 'ID Code' 45010203040506070 8090A0B0C0D0E0F
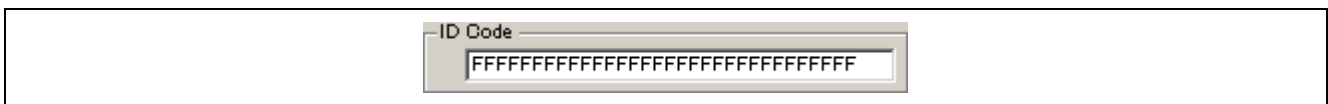
Figure 1.82 [ID code] area

1.3.4. [Help] menu

Clicking the [Help] menu displays the following pull-down menu.

Figure 1.83 [Help] Menu

(1)   [Help Topics] command
The [Help Topics] command opens the FP5 help file.

(2)   [About FP5] command
This command opens the following dialog box and shows the versions of the programming GUI.
Clicking the OK button closes this dialog box.
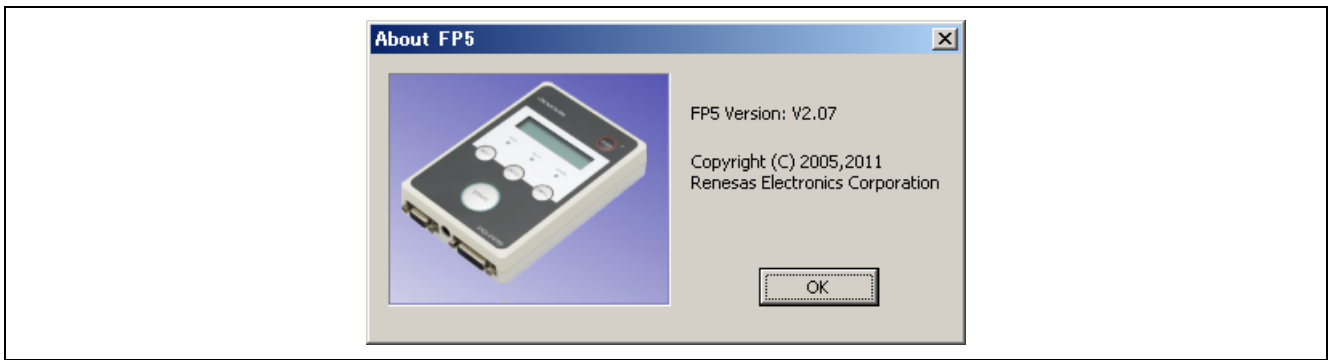
Figure 1.84 [About FP5] Dialog Box

1.4. Toolbar

The commands frequently used with the programming GUI are displayed as buttons on the toolbar. A command can be executed just by clicking the relevant button. Some commands may be unavailable depending on the PR5 file selected, or when the programming GUI is started for the first time. Also, if an HCUHEX file is selected, the HCUHEX file is handled as master data, so the [Program], [Read], and [Set Security] commands are unavailable. By pointing to a button with the pointer, the hint for the button is displayed on the hint bar.

Table 1.4   Toolbar Buttons

	Opens the Device Setup dialog box. This performs the same action as selecting the [Setup] command in the [Device] menu.
	Opens the File Upload dialog box. This performs the same action as selecting the [Upload from FP5…] command in the [File] menu
	Opens the programming area select dialog box. This performs the same action as selecting the [Select Programming area...] command in the [Programmer] menu.
	Opens the HEX Editor select dialog box. This performs the same action as selecting the [HEX Editor...] command in the [File] menu.
	Executes the con command or dcon command. This performs the same action as selecting the [Connect] command in the [Device] menu.
	Executes the [Blank Check] command. This performs the same action as selecting the [Blank Check] command in the [Device] menu.
	Executes the [Erase] command. This performs the same action as selecting the [Erase] command in the [Device] menu.
	Executes the [Program] command. This performs the same action as selecting the [Program] command in the [Device] menu.
	Executes the [Verify] command. This performs the same action as selecting the [Verify] command in the [Device] menu.
	Executes the [Set Security] command. This performs the same action as selecting the [Set Security] command in the [Device] menu.
	Executes the [Autoprocedure(E.P.)] command. This performs the same action as selecting the [Autoprocedure(E.P.)] command in the [Device] menu.

1.5. Action Log Window

This window displays the log of programming GUI actions.

```
>ep
Blank check Chip:
ERROR(E051): Not blank, Erase needed.
Erase Chip:
PASS
Program Chip:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
Erase,Program operation finished.
>
```

Figure 1.85 [About FP5] Dialog Box

1.6. Programming Parameter Window

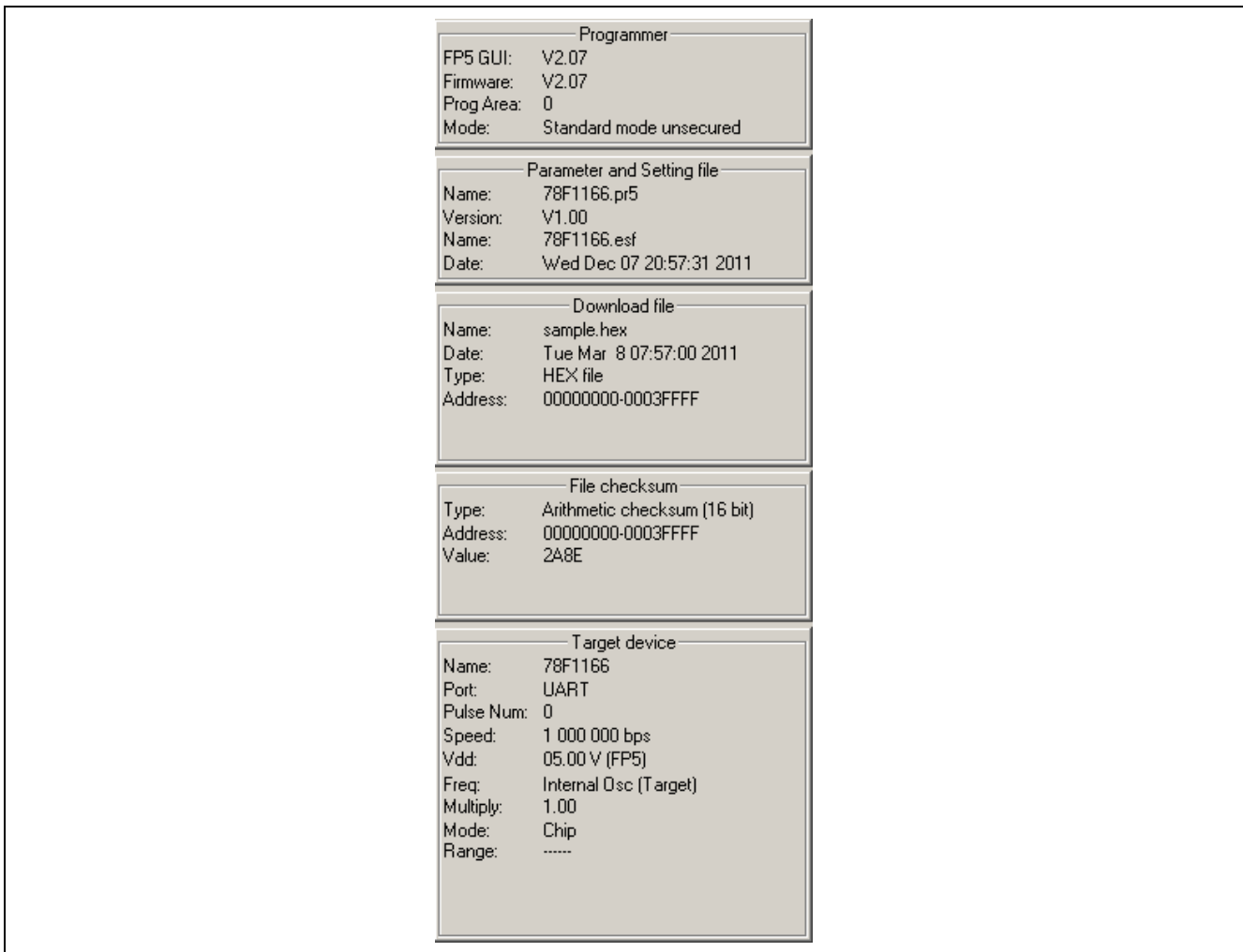This window displays the programming parameter settings.

```
                          ┌─ Programmer ──────────────────────┐
                          │ FP5 GUI:    V2.07                  │
                          │ Firmware:   V2.07                  │
                          │ Prog Area:  0                      │
                          │ Mode:       Standard mode unsecured│
                          └───────────────────────────────────┘
                          ┌─ Parameter and Setting file ──────┐
                          │ Name:       78F1166.pr5            │
                          │ Version:    V1.00                  │
                          │ Name:       78F1166.esf            │
                          │ Date:       Wed Dec 07 20:57:31 2011│
                          └───────────────────────────────────┘
                          ┌─ Download file ───────────────────┐
                          │ Name:       sample.hex             │
                          │ Date:       Tue Mar  8 07:57:00 2011│
                          │ Type:       HEX file               │
                          │ Address:    00000000-0003FFFF      │
                          └───────────────────────────────────┘
                          ┌─ File checksum ───────────────────┐
                          │ Type:       Arithmetic checksum (16 bit)│
                          │ Address:    00000000-0003FFFF      │
                          │ Value:      2A8E                   │
                          └───────────────────────────────────┘
                          ┌─ Target device ───────────────────┐
                          │ Name:       78F1166                │
                          │ Port:       UART                   │
                          │ Pulse Num:  0                      │
                          │ Speed:      1 000 000 bps          │
                          │ Vdd:        05.00 V (FP5)          │
                          │ Freq:       Internal Osc (Target)  │
                          │ Multiply:   1.00                   │
                          │ Mode:       Chip                   │
                          │ Range:      ------                 │
                          └───────────────────────────────────┘
```

Figure 1.86 Programming Parameter Window

[Programmer] area
Displays information such as the programming GUI version, FP5 firmware version, valid programming area number, and FP5 mode.

[Parameter and Setting file] area
Displays information such as the PR5 file name and its version, and the ESF file name and date set in the valid setting programming area.

[Download file] area
Displays information such as the file name, date, type, and start and end addresses of the program file set in the valid setting programming area. If an HCUHEX file is selected, "HCUHEX file" is displayed in "Type". If an HEX file without option data is selected, "HEX file" is displayed in "Type".

[File checksum] area
Displays the checksum result for execution of the [Checksum...] command in the [File] menu.

[Target device] area
Displays information of the settings on the [Standard] tab in the Device Setup dialog box. This area is updated after the
OK button in the Device Setup dialog box is clicked and files are downloaded.

1.7. Status Bar

The status bar shows the progress as a color or with a message when a PR5 file, ESF file or program file is selected, or when a command is executed for the target device.
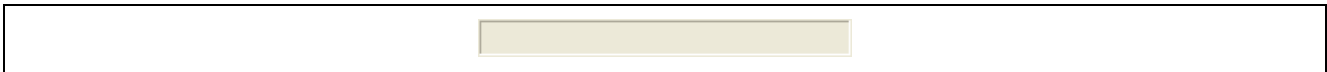
Figure 1.87 Status Bar

Table 1.5   Status Bar Displays

	Immediately after the programming GUI is started
Running . . .	A command execution is in progress, or a PR5 file, ESF file or program file is being downloaded
Pass	A command execution or downloading of a PR5 file, ESF file or program file is completed normally
Error	A command execution or downloading of a PR5 file, ESF file or program file is terminated abnormal

1.8. Hint Bar

By pointing to a command on the menu bar or a button with the pointer, the hint for the command or button is displayed on the hint bar.
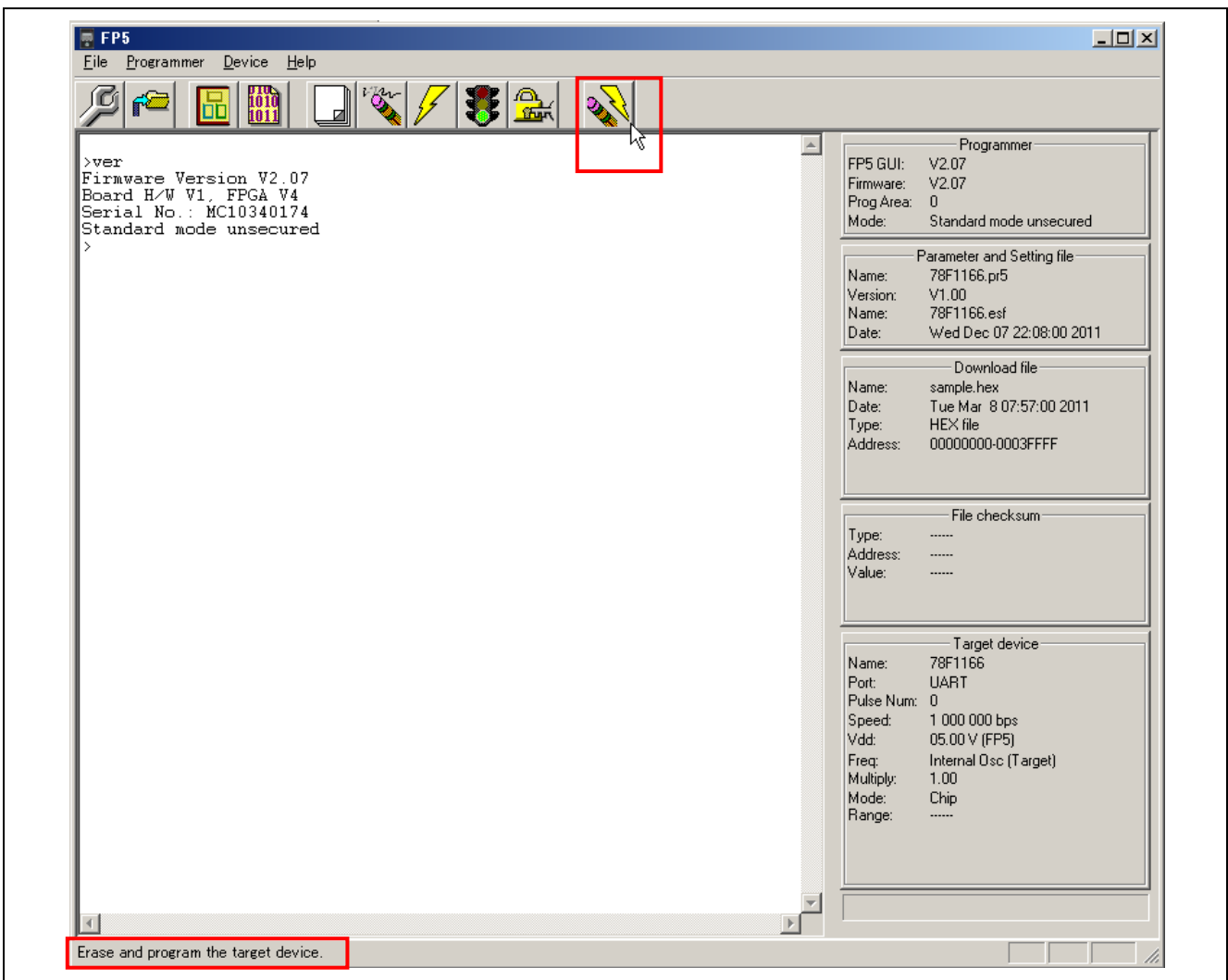
Figure 1.88 Hint Bar

2. EXAMPLE OF OPERATION USING PROGRAMMING GUI

This chapter explains a series of basic FP5 operations using the programming GUI, taking a case where the 78K0R/Kx3 is used as the target device as an example. This chapter covers how to start the system, execute the [Autoprocedure(E.P.)] command and program the target device.

- Series of operations described in this chapter:

The operation conditions for this chapter are as follows.

Host PC interface: USB
Programming area: Divided by 4, Area 0
Target device: UPD78F1166 (78K0R/Kx3) (with program adaptor)
Communication channel: 1 wire UART @ 1MBaud
Clock setting: None (Internal OSC) Internal/Direct mode
Operation mode: Chip
Supply voltage: Supplied from Target system (5 V)
Command option: [Blank check before Erase] enabled
Flash option: Not used

The operation steps described in this chapter are as follows
(1) Installation of programming GUI and USB driver
(2) Installation of PR5 file
(3) System connection
(4) Connection of target system
(5) Startup of programming GUI
(6) Setting of programming environment
(7) Execution of [Autoprocedure(E.P.)] command
(8) System shutdown

(1) Installation of programming GUI and USB driver
Refer to Common 3 SOFTWARE INSTALLATION and install the programming GUI and USB driver in the host PC.

(2) Installation of PR5 file
Refer to Common 3 SOFTWARE INSTALLATION , download the PR5 file for the UPD78F1166 and copy it to the FP5_PRJ folder in the programming GUI installation folder.

(3) System connection
<1> Connect the USB connector of the FP5 to the USB port on the host PC using a USB cable.
<2> Plug the FP5 power supply connector into the AC outlet (100 to 240 V) using the AC adaptor.
<3> Press the POWER button on the FP5 to turn on power. Do not connect the program adaptor (target device) before turning on power. Confirm that the POWER LED on the FP5 is off and that 'Commands >' is displayed in the message display, indicating that the FP5 is ready for operation. If not, the cause may be a defect in the FP5, so consult a Renesas Electronics sales representative or distributor.

(4) Connection of target system
Be sure to turn on the FP5 power before connecting the target system.

<1> Connect the FP5 GND connector to the target system using a GND cable.

Note   The FP5 and target system may be damaged if the voltage between the FP5 GND and the target system GND is different. Use the GND cable to match the voltage before connecting the target cable.

<2> Connect the FP5 target connector to the target system using the target cable.

Note   Connect the target system before supplying V_{DD}/V_{DD2} power from the target system.

(5)   Startup of programming GUI

<1> Click the Start menu, "All Programs", point to "Renesas Electronics Utilities", "Programming Tools", and then select "PG-FP5 Vx.xx" of "PG-FP5 Vx.xx" to start the Programming GUI. The valid communication modes are automatically detected in the order of the USB, and then the serial interface.
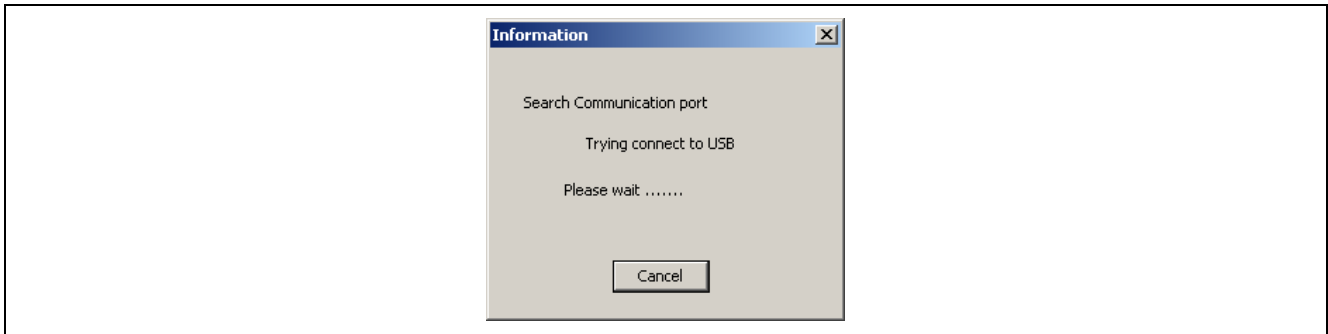
Figure 2.1   Connection Between Programming GUI and FP5

<2> The communication mode can also be selected by cancelling this operation with the Cancel button and selecting the [Setup host connection] command in the [Programmer] menu.
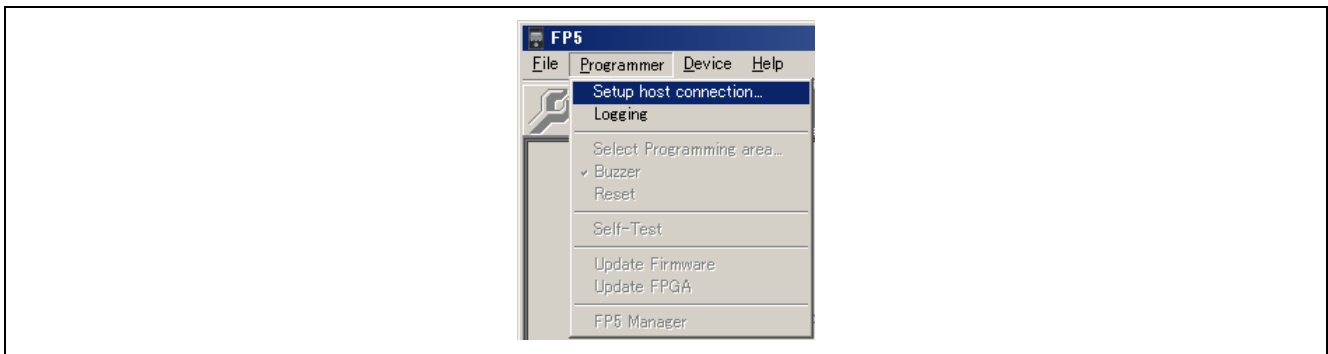
Figure 2.2   [Setup host connection] Command

<3> Perform settings according to the communication port connected to the FP5.
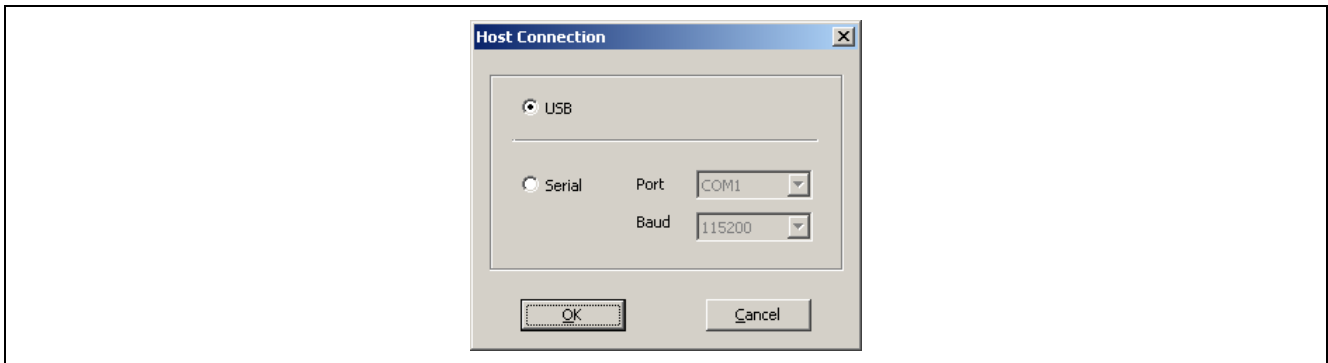
Figure 2.3   Communication Parameter Setup

<4> Click the OK button to enable the new port settings.

<5> When the programming GUI is correctly started, the main window will be opened. The following message will be displayed if the programming GUI is started for the first time or valid programming areas have been cleared, so click the OK button. The Device Setup dialog box will be opened.
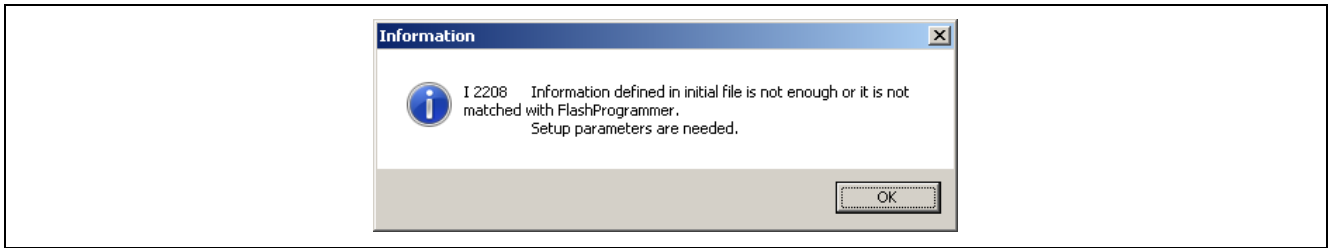
Figure 2.4   Message Displayed at the First Startup of Programming GUI

The following dialog box will be displayed. Click Yes or No.
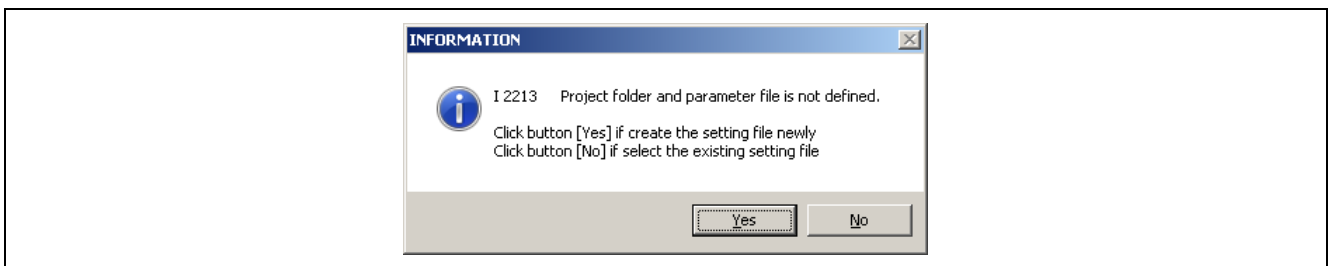
Clicking Yes will open a dialog box to make a new ESF file. Refer to 1.3.3 (15) (a) <3> New... button for the steps that follow.
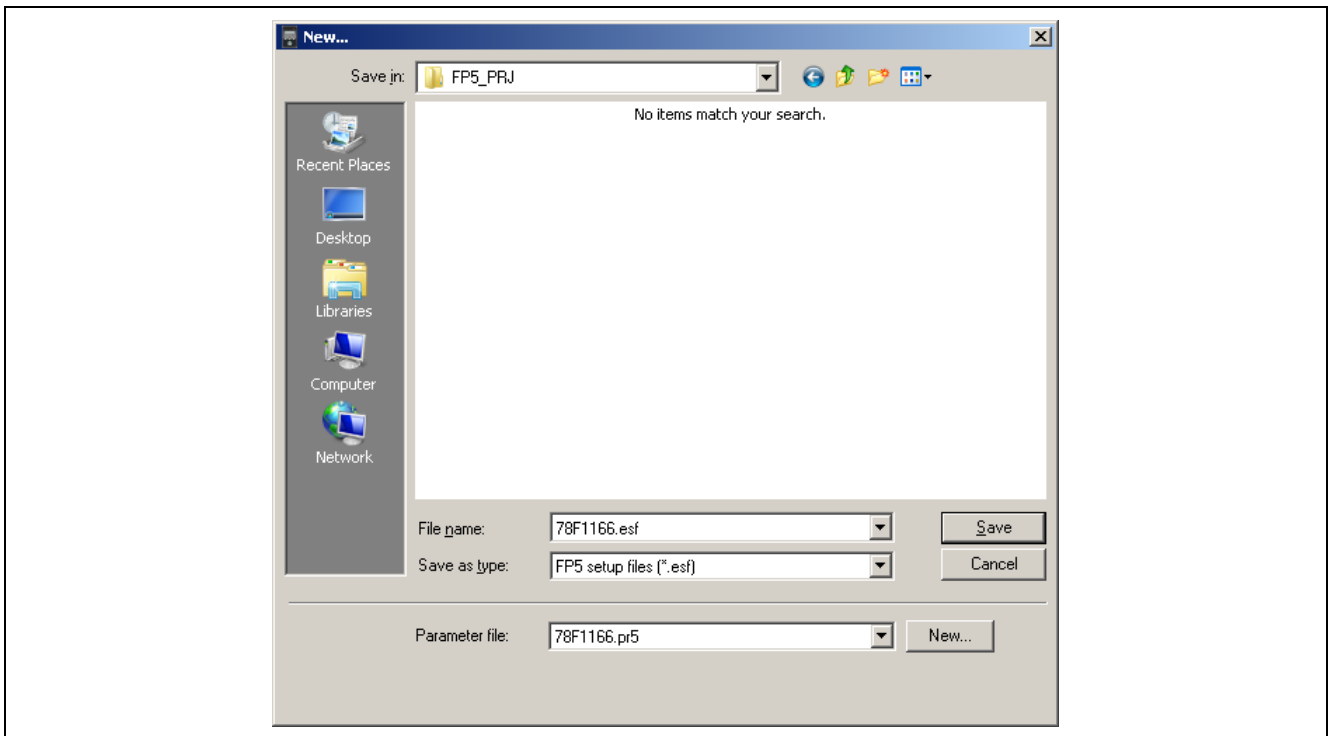
Clicking 'No' will open a dialog box to select a previously created ESF file. Refer to 1.3.3 (15) (a) <3> ... button for the steps that follow.
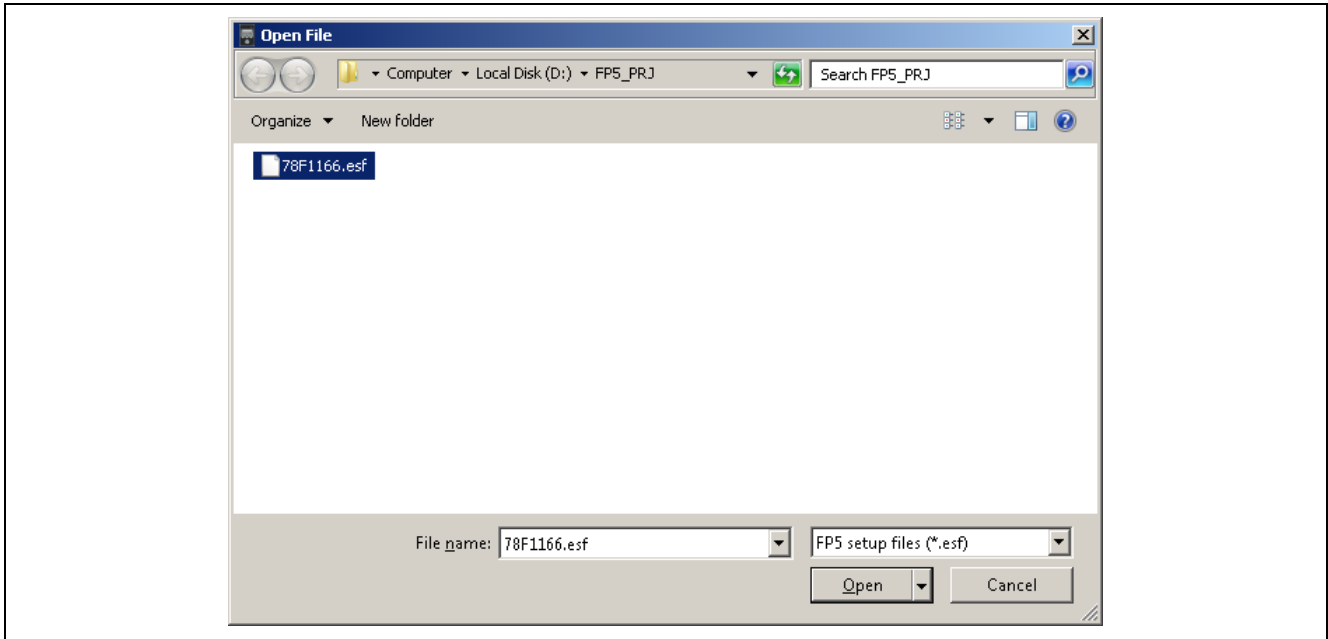
Next, the device setup dialog box that is opened when [Device] menu -> [Setup...] command is executed will be opened, so make the settings.
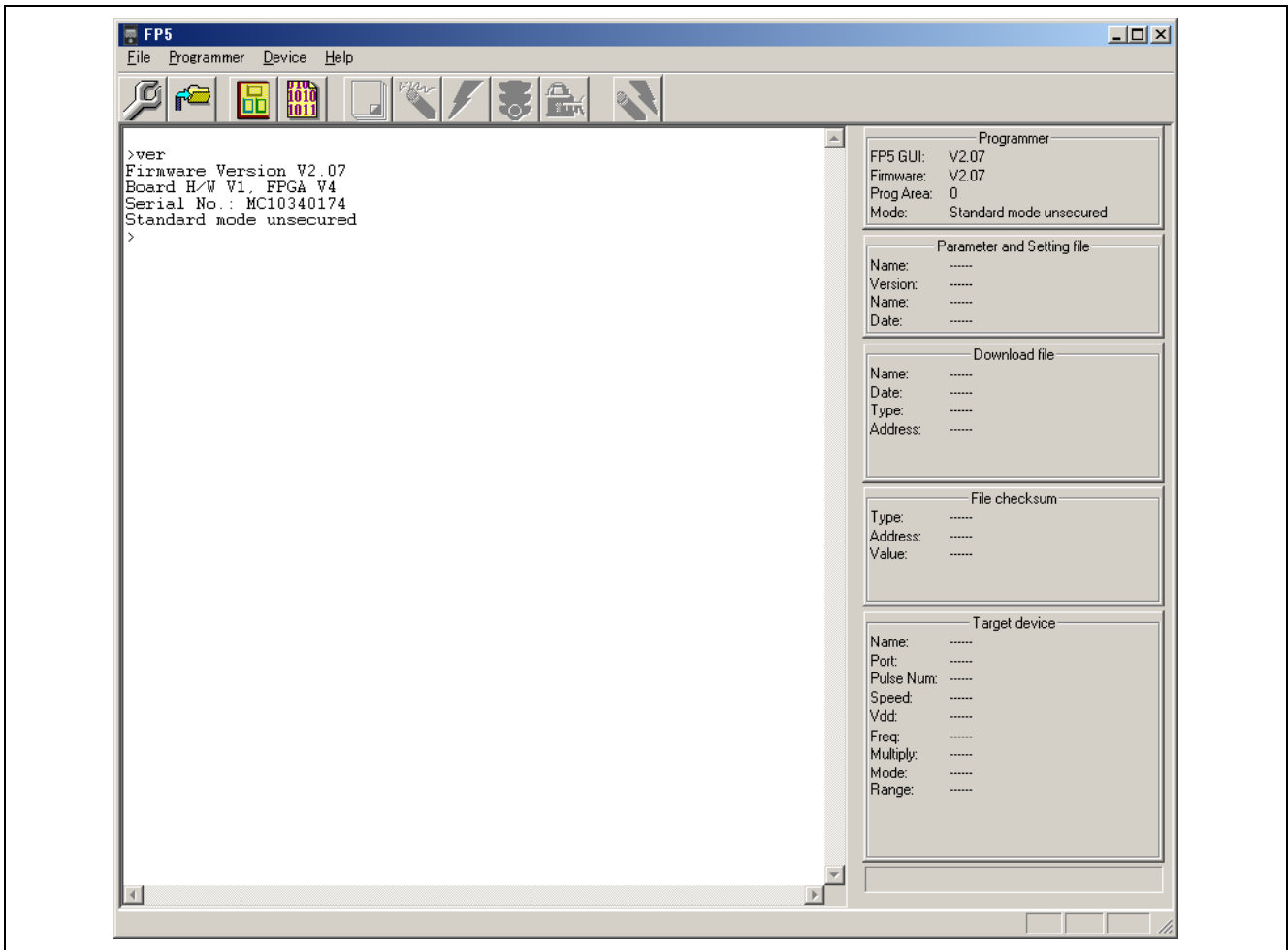
Figure 2.5   Main Window

(6)   Setting of programming environment

<1> Execute the [Setup...] command in the [Device] menu in the main window.
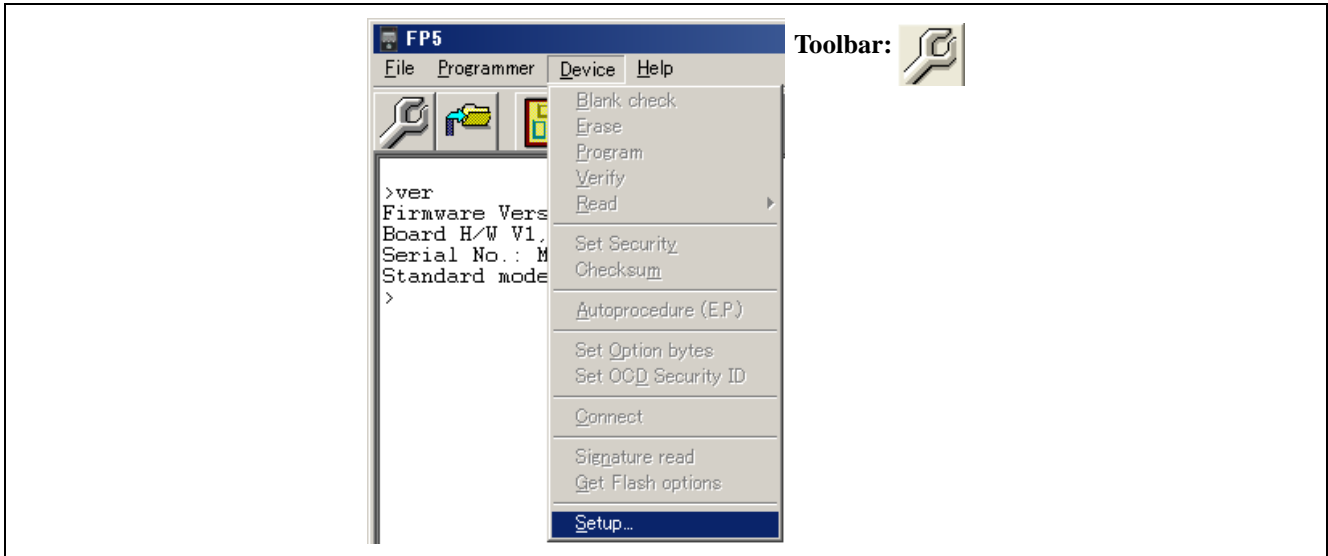
Figure 2.6   [Setup] Command

<2> The Device Setup dialog box ([Target] tab) is opened.
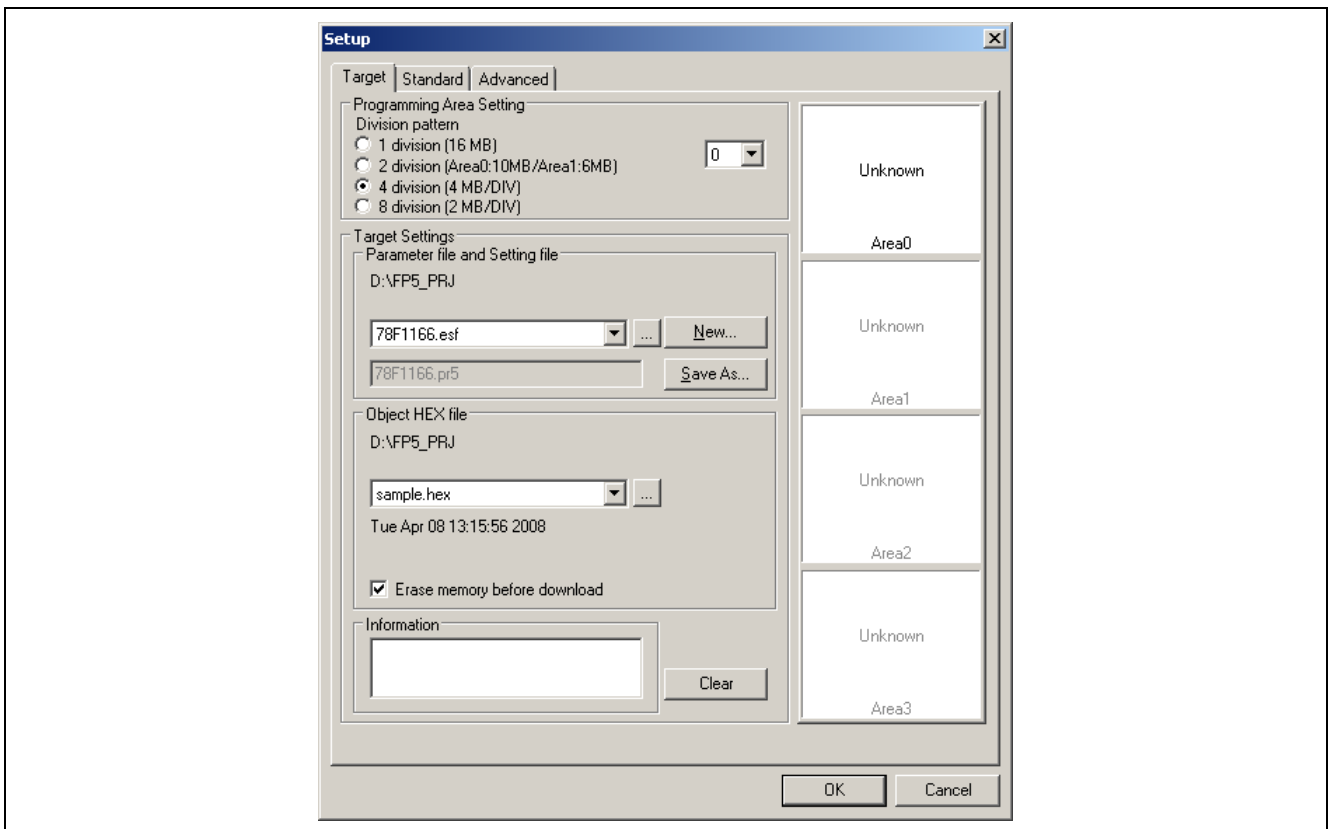
Figure 2.7   Device Setup Dialog Box - [Target] Tab

<3> Set the [Programming Area Setting] area. In this example, 4-divided Area 0 is selected.
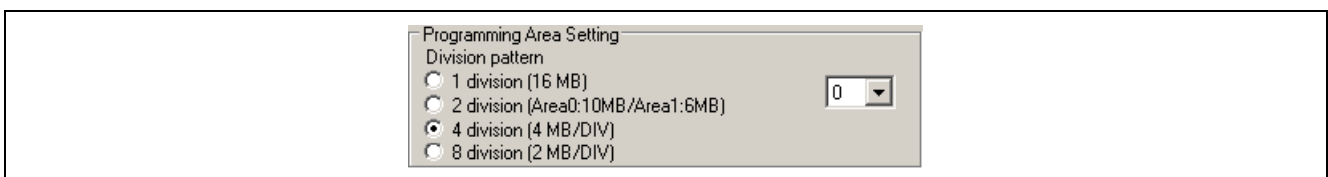
Figure 2.8   Setting of [Programming Area Setting] Area

<4> Click the New... button to create a new ESF file for the UPD78F1166.
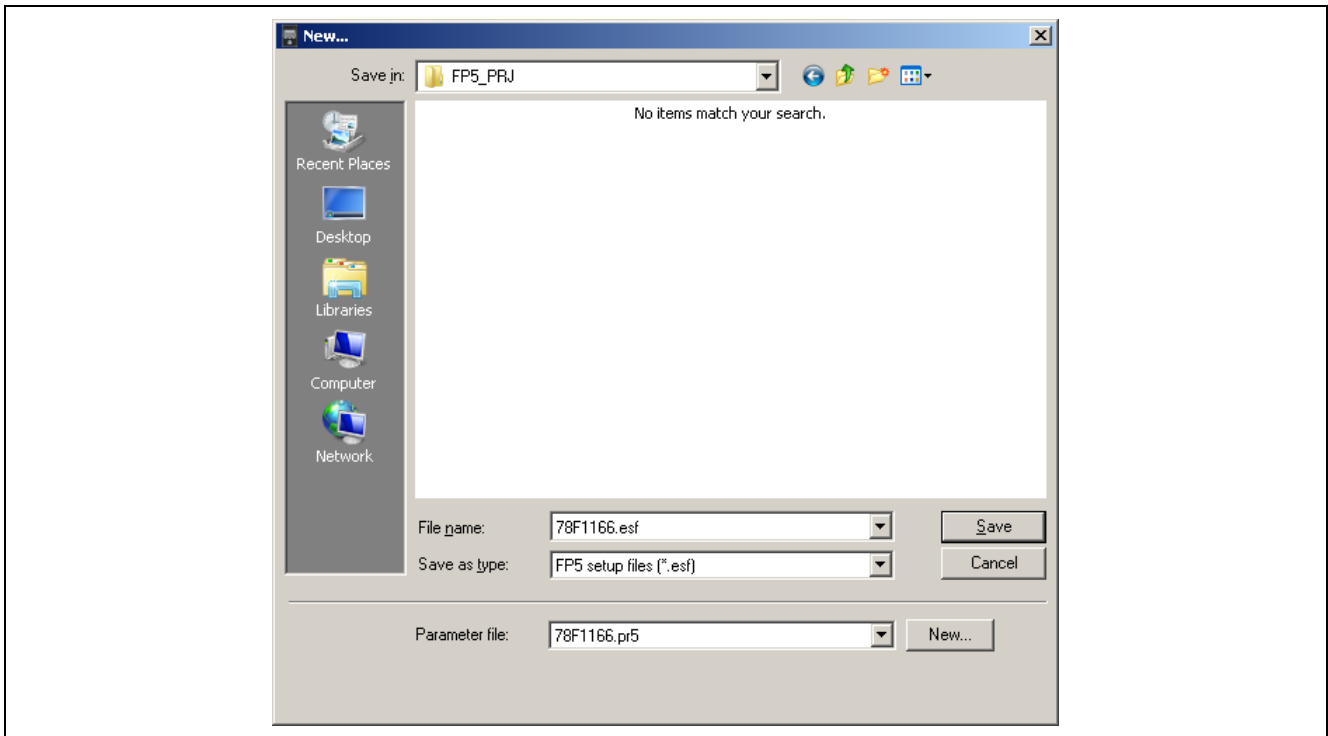
Figure 2.9   Creation of New ESF File

<5> Select 78F1166.pr5 from the [Parameter file] list. If this file is unlisted, use New... button.
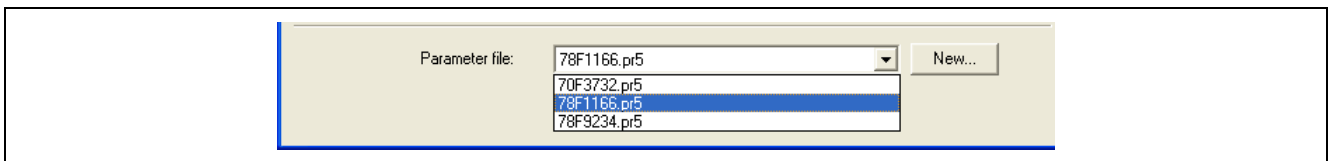
Figure 2.10 Selecting PR5 File

<6> Type the name of the newly created ESF file and click the Save button.
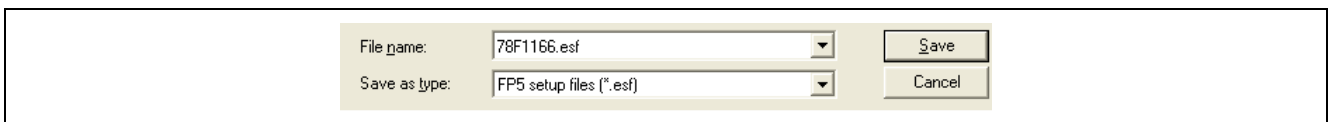
Figure 2.11 Saving ESF File

<7> Select the program file. Click the ... button in the [Object HEX file] area.
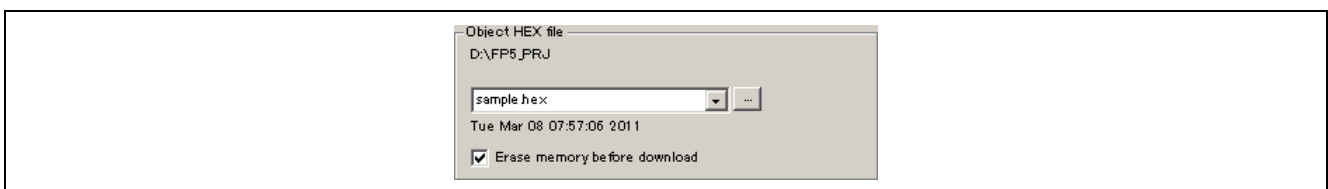
Figure 2.12 [Object HEX file] Area

<8> Select the program file and click the |Open| button. In this example, "sample.hex" is selected.
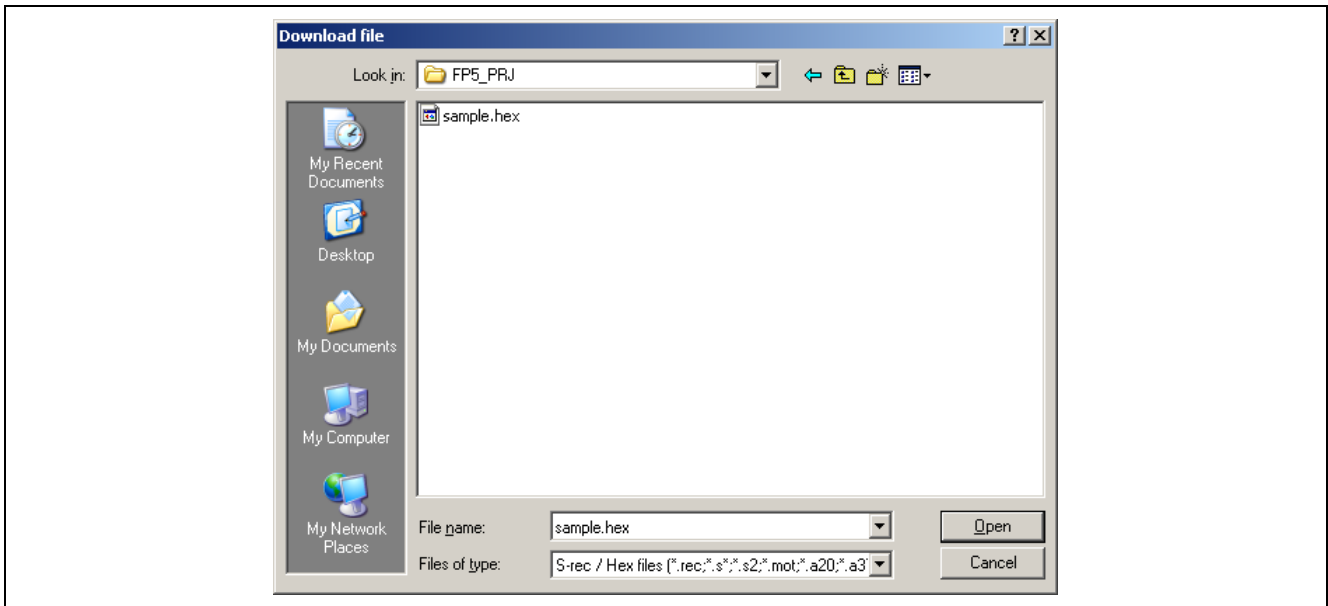
Figure 2.13 Selection of Program File

<9> Click the [Standard] tab.
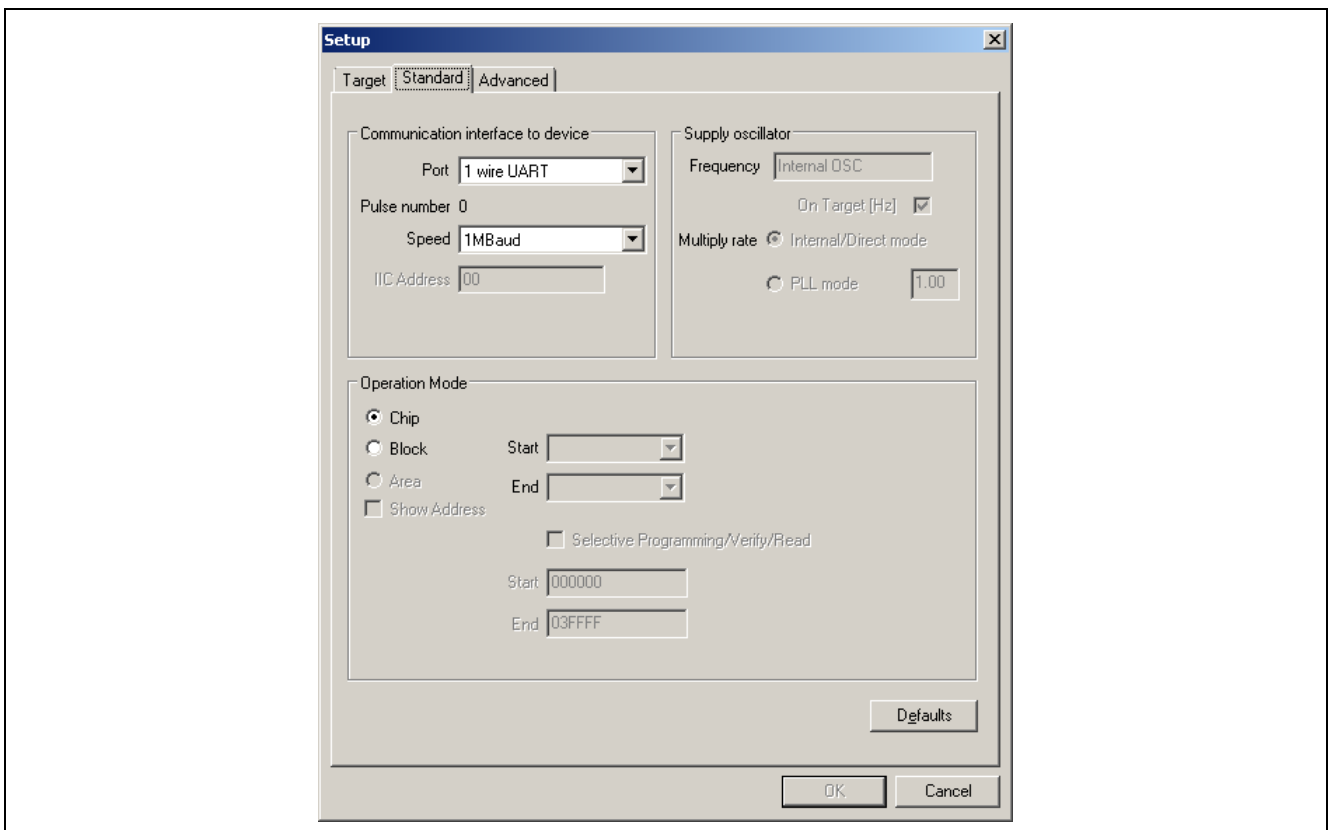
Figure 2.14 Device Setup Dialog Box - [Standard] Tab

<10>   Set the items in accordance with the programming environment used. In particular, set the [Communication interface to device] area and [Supply oscillator] area in accordance with the specifications of the device selected.
Specify a flash memory range to be manipulated in the [Operation Mode] area (the flash memory range that can be set is defined by the PR5 file according to the specifications of the device).
In this example, it is assumed that the following settings are made.

[Communication Interface to device] area
Port: 1 wire UART
Speed: 1M Baud
[Supply oscillator] area
On Target: Unavailable (using internal oscillator)
Frequency: Unavailable (Internal OSC)
Multiply rate: Unavailable (Internal/Direct mode)
[Operation Mode] area
Chip

<11>   Click the [Advanced] tab.
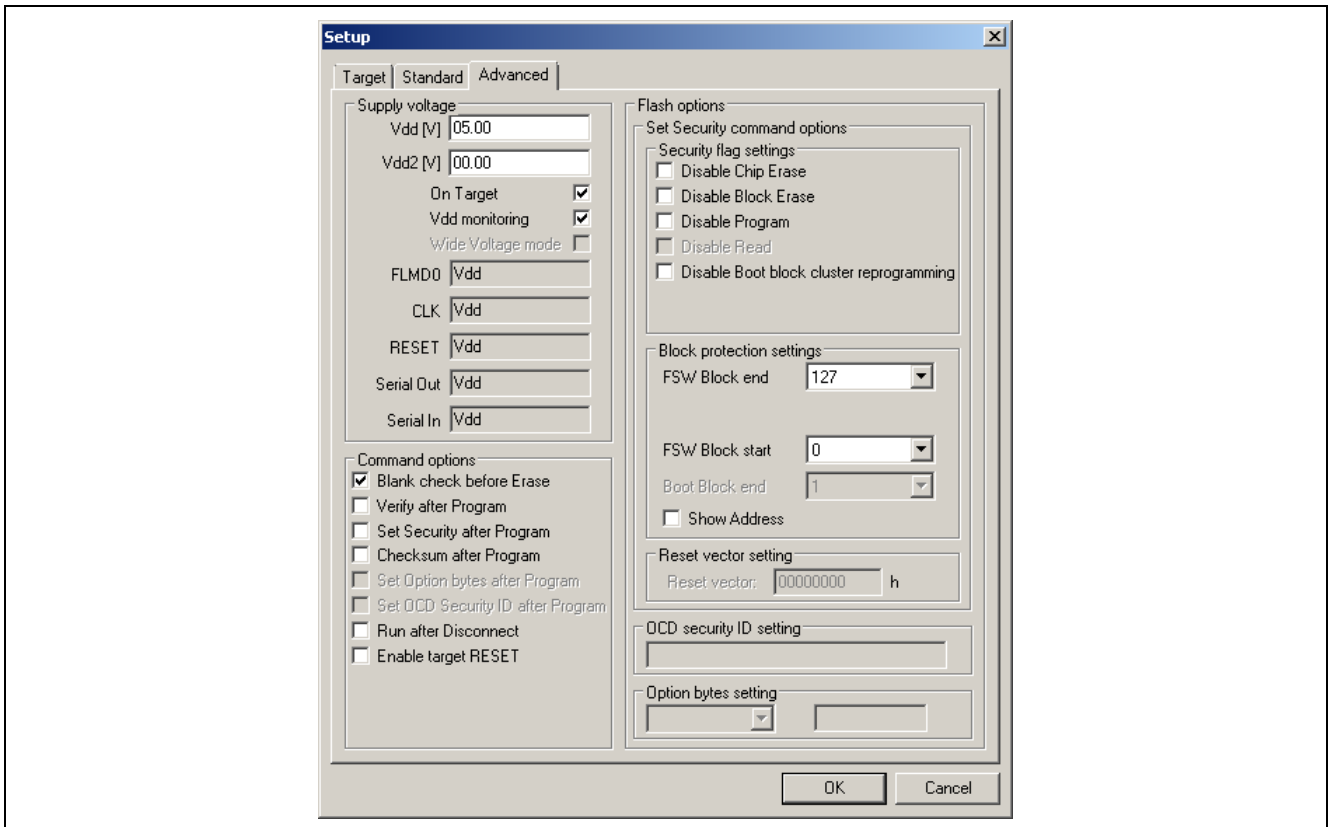
Figure 2.15 Device Setup Dialog Box - [Advanced] Tab

<12>   Check the information in the [Supply voltage] area to make sure that they are set in accordance with the programming environment used.
In this example, it is assumed that the following settings are made.
[Supply voltage] area
Vdd[V]: 5.00 V (Follows the value set in the PR5 file.)
Vdd2[V]: 0.00 V (Not used; follows the value set in the PR5 file.)
[On Target] check box
Checked
[Command options] area
Blank check before Erase: Selected
[Flash options] area
Not used

<13>   Click the OK button in the Device Setup dialog box.
<14>   The programming GUI loads the PR5 file, ESF file and program file to the FP5. When setting is completed, the following window will be displayed. Setting of the programming environment is then finished.
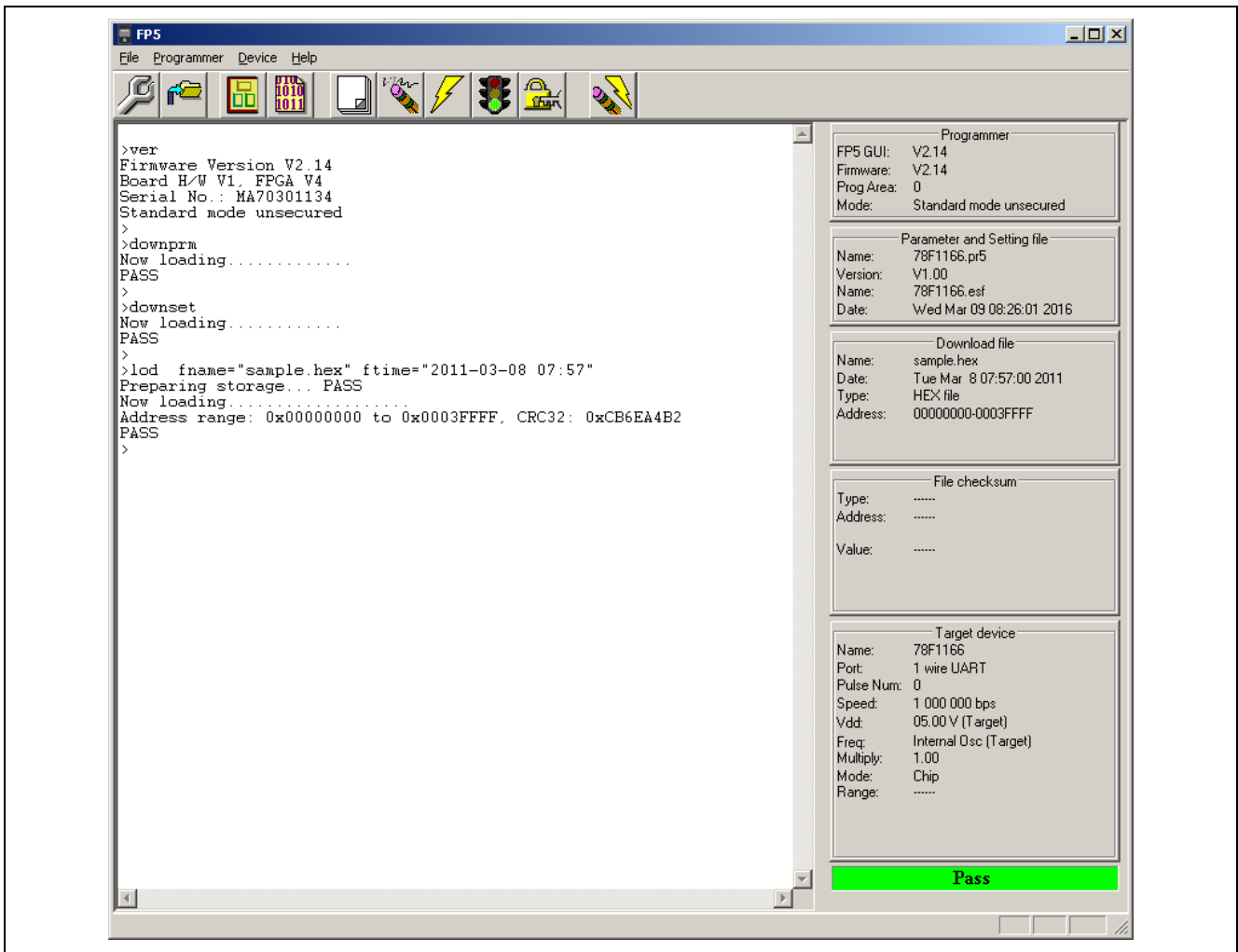
Figure 2.16 Downloading of PR5 File, ESF File and Program File

(7)   Execution of [Autoprocedure(E.P.)] command
Execute the [Autoprocedure(E.P.)] command in the [Device] menu.
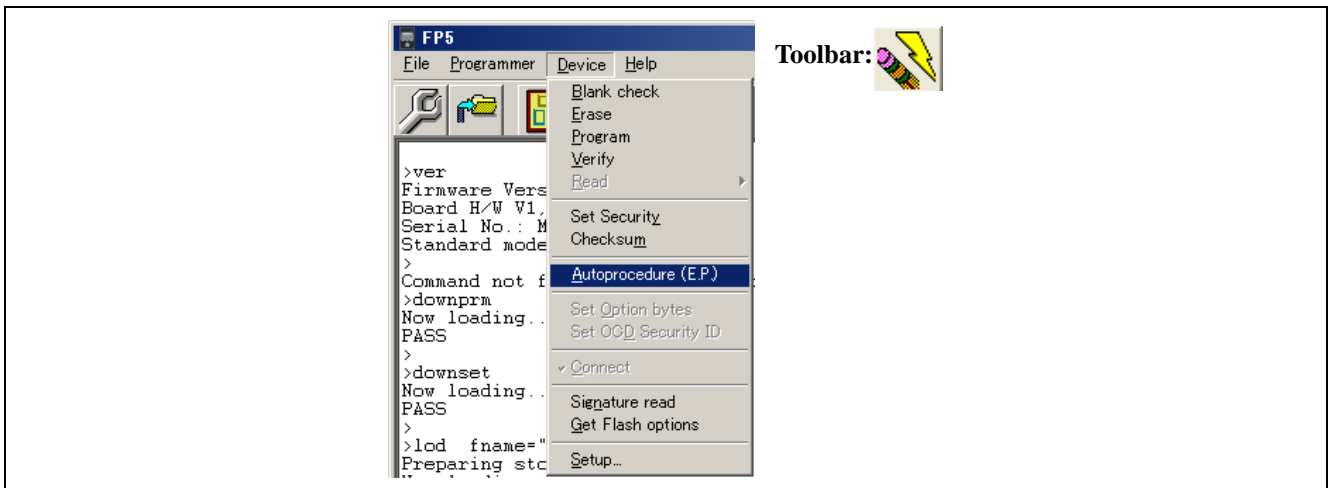
Figure 2.17 [Autoprocedure(E.P.)] Command

When the [Autoprocedure(E.P.)] command is executed, the [Blank check], [Erase] (if the target area is not blank) and [Program] commands are executed in that order for the UPD78F1166.

Note   Turn off power, connect the target system to be newly written to, and execute the [Autoprocedure(E.P.)] command after power is supplied, before writing to another target system.

If execution of the [Autoprocedure(E.P.)] command is normally completed, "Erase, Program operation finished" is displayed in the action log window.
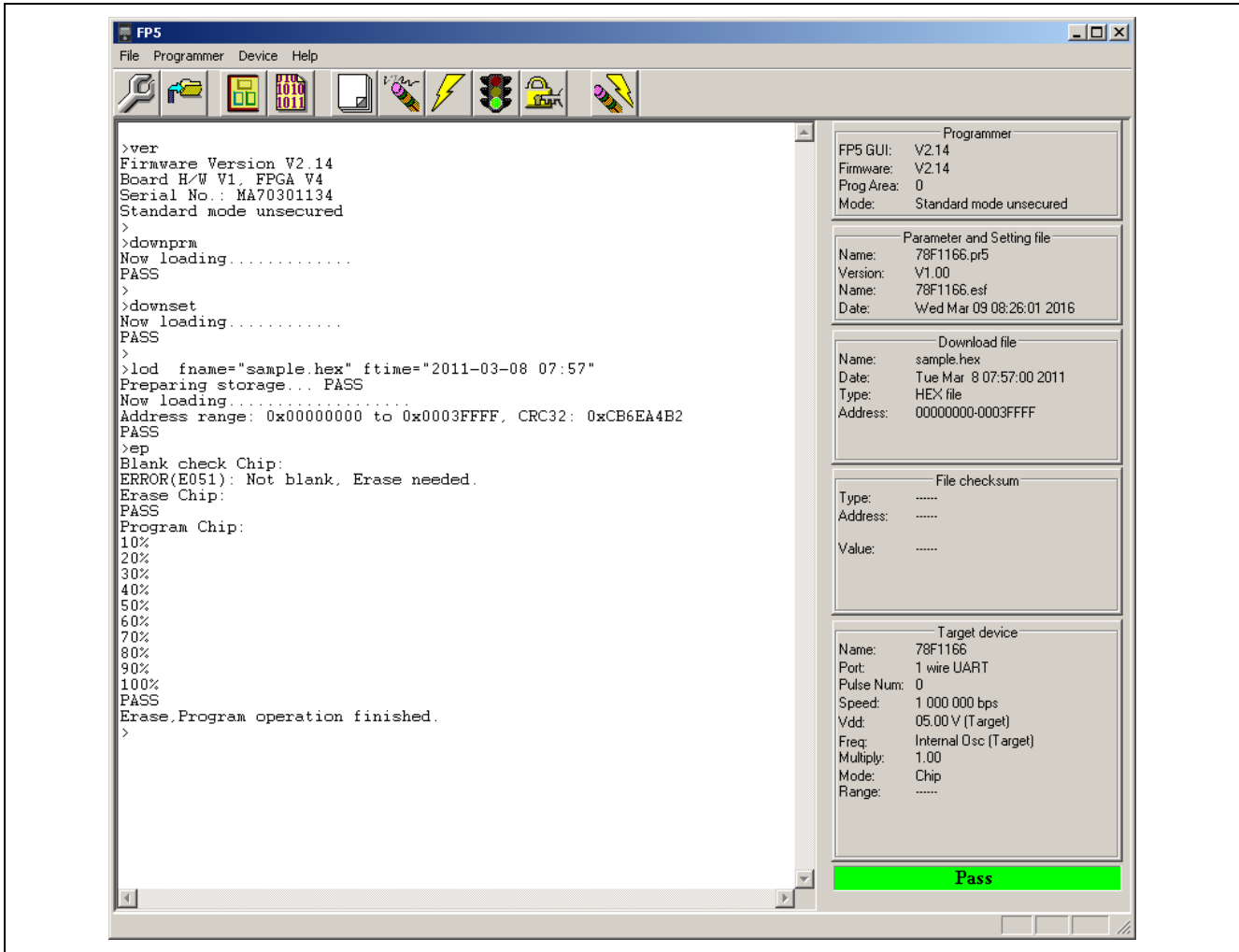
Figure 2.18 [Autoprocedure(E.P.)] Command Execution Result

(8)   System shutdown

<1> Remove the target system from the target cable.

Note   Turn off power and remove the target system before supplying V$_{DD}$/V$_{DD2}$ from the target system.

<2> If no more target devices are to be written to, execute the [Quit] command in the [File] menu to terminate the programming GUI. All the settings made so far are saved, so they can be restored when the programming GUI is restarted. (The PR5 files, ESF files and program files are saved to the FP5 internal flash memory.)

<3> Press and hold the [POWER] button on the FP5 for about 1 second to turn off the POWER LED.

<4> Remove the AC adaptor and USB cable from the FP5.

Note   If an error occurred during the above steps, refer to Common 10 TROUBLESHOOTING and APPENDIX A MESSAGES. In addition, refer to 1.3.2 (6) [Self-Test] command and perform selftesting.

If this does not resolve the problem, see the FAQ (<https://www.renesas.com/pg-fp5> -> Design Support -> FAQ) or access (https://www.renesas.com/contact) for inquiry.

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PG-FP5 V2.17

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