User's Manual

Renesas Flash Programmer V2.05

Flash memory programming software

User's Manual: RH850, RX700 (Include RX64M)

Renesas Electronics
www.renesas.com

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How to Use This Manual

Target Readers This manual is intended for users who are using the flash programmer in designing and developing a system that employs a Renesas Electronics microcontroller equipped with on-chip flash memory.

Purpose This manual is intended to give users an understanding of the basic specifications and correct use of the Renesas flash programmer.

Organization This manual includes the following sections.

- Basic operation (Basic mode)
- Function details (Basic mode)
- Function details (Full mode)
- Script execution function

How to Read This Manual It is assumed that the readers of this manual have general knowledge of electricity, logic circuits, and microcontrollers.

Conventions

Note: Footnote for item marked with **Note** in the text.
Caution: Information requiring particular attention
Remark: Supplementary information
Numeral representation: Binary ... xxxx or xxxxB
Decimal ... xxxx
Hexadecimal ... 0XXXXX or xxxxH
“ ”: Any character or item on the screen that can be selected or input
[ ]: Name of button
[ ]: Name of commands, dialog boxes, options, or areas on the screen

Related documents When using this manual, also refer to the following documents.
The related documents indicated in this publication may include preliminary versions.
However, preliminary versions are not marked as such.

Documents related to development tools

Document name	Document number
Renesas Flash Programmer V2.05 Common	R20UT2906E
Renesas Flash Programmer V2.05 RL78, 78K, V850	R20UT2907E
Renesas Flash Programmer V2.05 RX100, RX200, RX600 (Except RX64M)	R20UT2908E
Renesas Flash Programmer V2.05 RH850, RX700 (Include RX64M)	This manual
E1 Emulator R0E000010KCE00 E20 Emulator R0E000200KCT00	R20UT0398E

Caution The related documents listed above are subject to change without notice.
Be sure to use the latest version of each document for designing, etc.

CONTENTS

CHAPTER 1 BASIC OPERATION (BASIC MODE)

This chapter describes the operation method by using the RX64M as the target microcontroller as an example to help you understand a series of basic operations with the basic mode of RFP. This chapter covers how to start the system, execute the [Program] command, and write the target microcontroller.

• Series of operations described in this chapter:

The operating conditions are as follows:

Target microcontroller:	R5F564ML (RX64M)
Target system:	Evaluation board
Tool used:	E1
Interface:	2 wire UART (Generic Boot Device)
Power supply:	User power supply (3.3 V)
Frequency:	Input clock (high-speed oscillator): 16.0 MHz
Communication speed setting:	2000000 bps
Endian	Little Endian
Object to be programmed:	Program file area (minimum unit programming mode)
Other settings:	Initial value

The steps described in this chapter are as follows:

(1) Installation
(2) System connection
(3) Connection of target system
(4) Creation of workspace
(5) Selection of program file
(6) Execution of [Program] command
(7) System shutdown

(1) Installation

See **Common CHAPTER 2 INSTALLATION** and install in the host PC.

(2) System connection

Connect the USB connector of RFP to the USB port on the host machine using a USB cable.

(3) Connection of target system

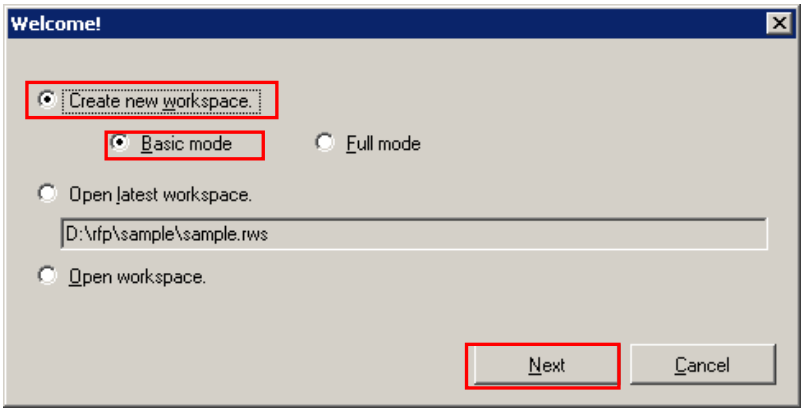
Connect the target cable of the tool used to the target system.

Remark Connect the target system before supplying V_{DD} power from the target system.

(4) Creation of workspace

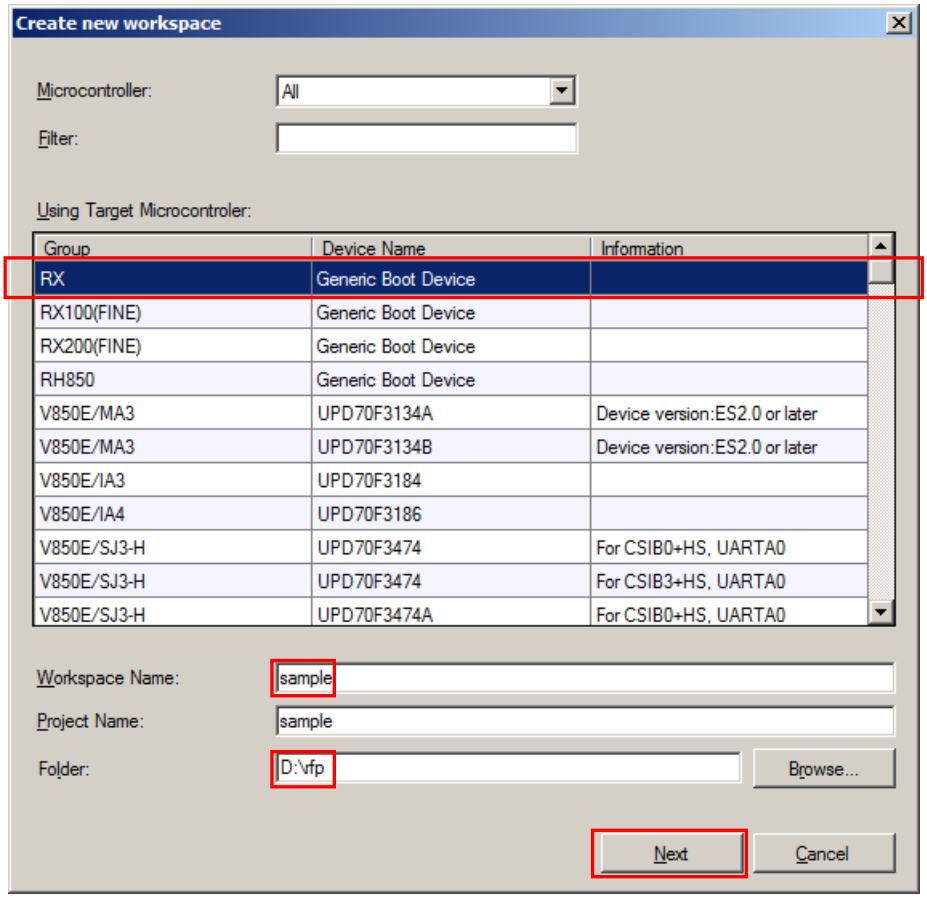
<1> On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer V*x.xx*], and then click [Renesas Flash Programmer V*x.xx*]. The [Welcome!] dialog box will open. Select [Create new workspace.], select [Basic mode], and then click the Next button to open the [Create new workspace] dialog box.

Figure 1-1. [Welcome!] Dialog Box



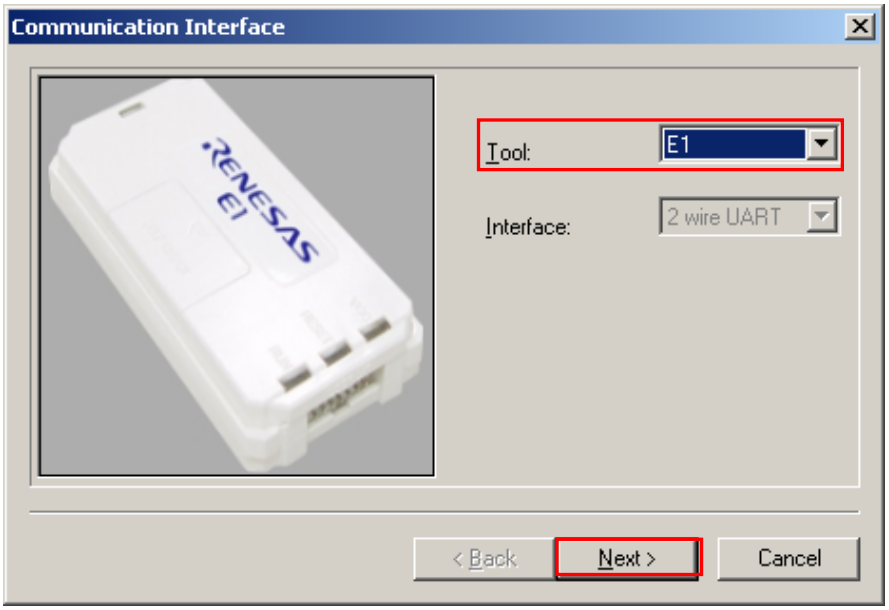
<2> In the [Using Target Microcontroller:] list box, select Group: “RX” Device Name: “Generic Boot Device”. Enter any text string (such as “sample” in this case) in the [Workspace Name:] box, and specify any folder in the [Folder:] box.
Clicking the Next button displays the [Communication Interface] dialog box.

Figure 1-2. [Create new workspace] Dialog Box



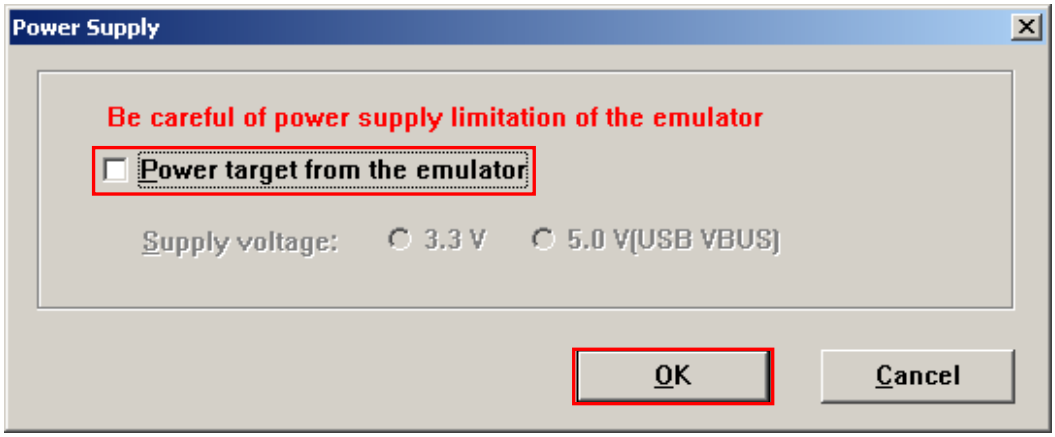
<3> Select “E1” in the [Tool:] list box. For R5F564ML, the selection in the [Interface] list box is fixed to “2 wire UART”.
Clicking the [Next >] button displays the [Power Supply] dialog box.

Figure 1-3. [Communication Interface] Dialog Box



<4> Do not select the [Power target from the emulator] check box.
Clicking the [OK] button displays the [Mode Pins at Connection] dialog box. In the case of RH850, [Mode Pins at Connection] Dialog Box does not open.

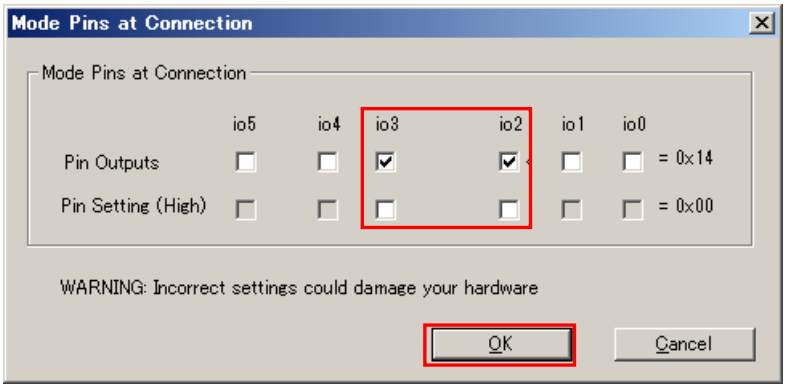
Figure 1-4. [Power Supply] Dialog Box



<5> Pins to control the Mode-Setting Pins of the target microcontroller can be selected from among pins io0 to io5 of the E1 and E2. For the evaluation board, the [Pin Outputs] box is checked and the [Pin Setting (High)] box is not checked for the io2 and io3 pin so that the pin is at the low level. The io3 pin is connected to the MD pin and the io2 pin is connected to UB pin.
Clicking the OK button displays the [Confirmation] dialog box.

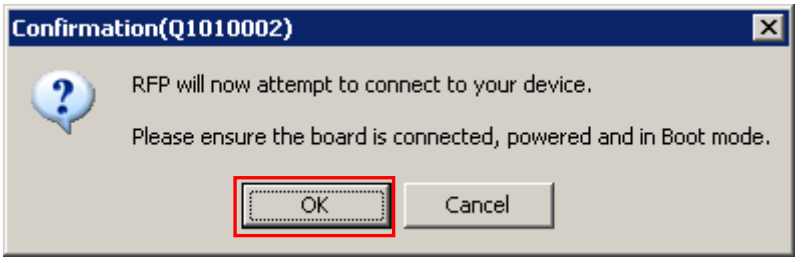
Remark For more information on pins from io0 to io5 of the E1 and E20, refer to **Common Appendix B Figure B-1 E1 and E20 pins - RX -**.

Figure 1-5. [Mode Pins at Connection] Dialog Box



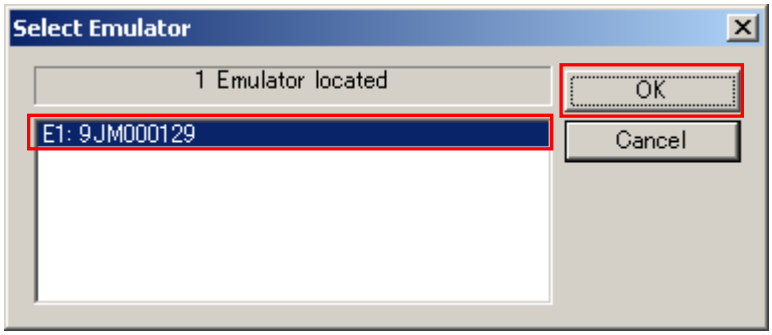
<6> Check that the board is connected, powered, and in Boot mode. Clicking the OK button displays the [Select Emulator] dialog box.

Figure 1-6. [Confirmation] Dialog Box



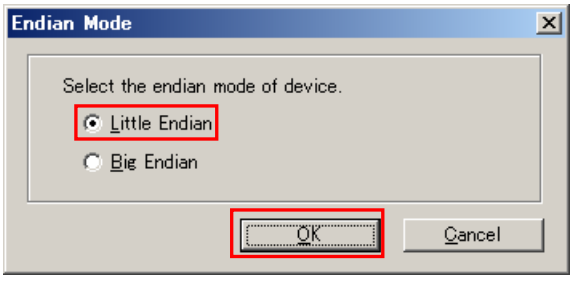
<7> The name and serial number of the detected emulator are displayed. Select it. The serial number is printed on the chassis. Clicking the OK button establishes connection and query with the device and displays the [Endian Mode] dialog box. In the case of RH850, [Endian Mode] Dialog Box does not open.

Figure 1-7. [Select Emulator] Dialog Box



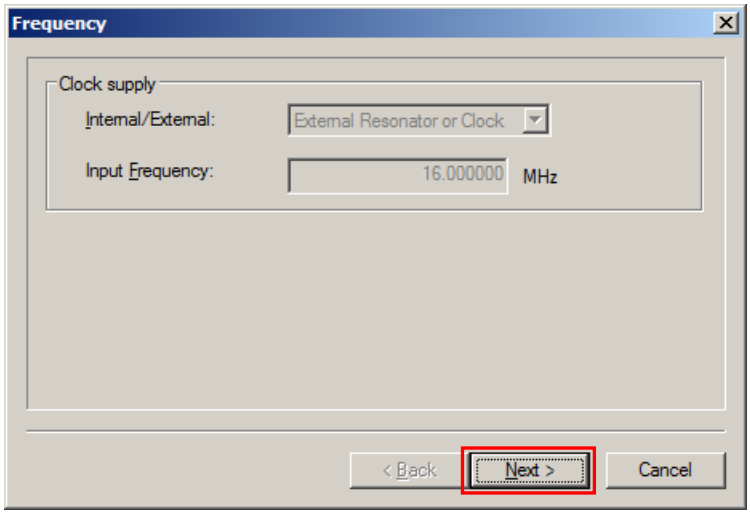
<8> Select the [Little Endian] optional button.
Clicking the OK button displays the [Frequency] dialog box.

Figure 1-8. [Endian Mode] Dialog Box



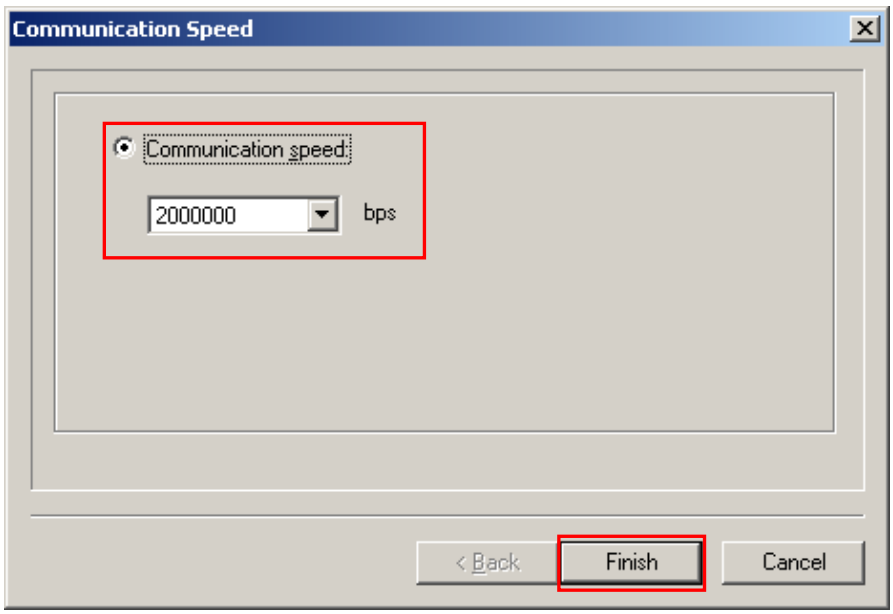
<9> The response to the inquiry in the [Clock supply] area is “External Resonator or Clock” in the [Internal/External:] list box and “16.000000” in the [Input Frequency:] box, indicating the 16-MHz (fixed) high-frequency on-chip oscillator.
Clicking the Next > button displays the [Communication Speed] dialog box.

Figure 1-9. [Frequency] Dialog Box



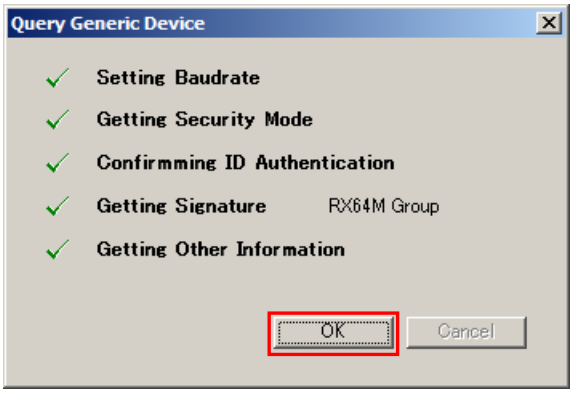
<10>Select “2000000” from the [Communication Speed:] list box.
Clicking the Finish button displays the [Query Generic Device] dialog box.

Figure 1-10. [Communication Speed] Dialog Box



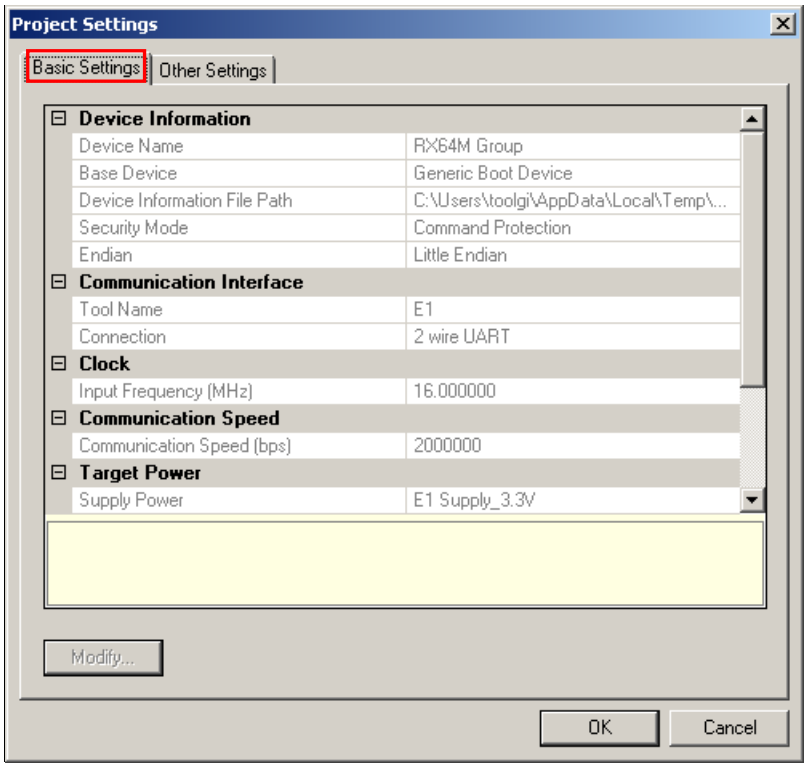
<11>Query the target microcontroller.
Clicking the OK button displays the [Project Settings] dialog box.

Figure 1-11. [Query Generic Device] Dialog Box



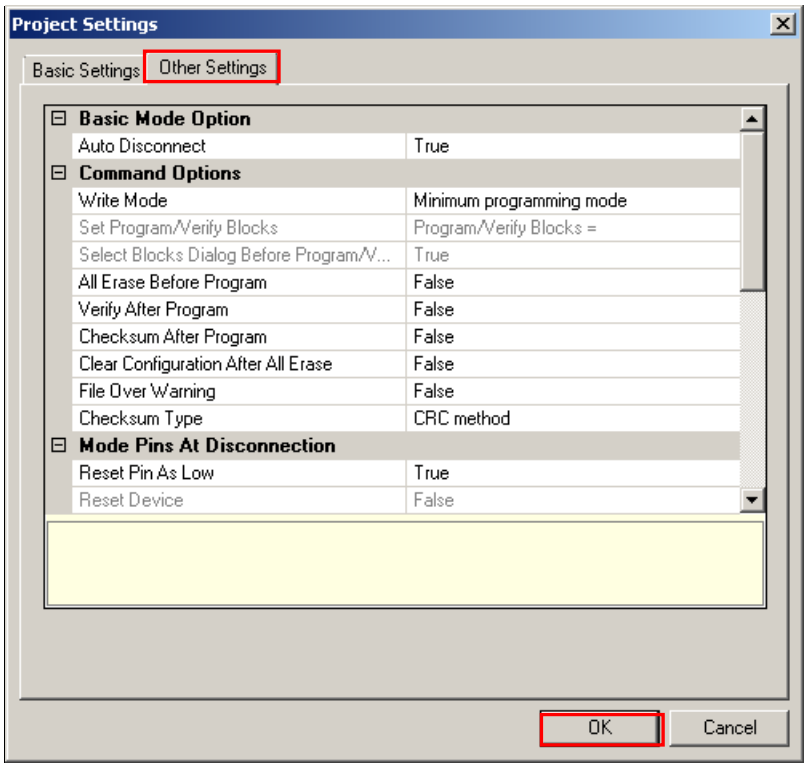
<12>The [Basic Settings] tab in the [Project Settings] dialog box allows you to check basic information about programming. Clicking the [Other Settings] tab of the [Project Settings] dialog box displays the [Other Settings] tab in the [Project Settings] dialog box.

Figure 1-12. [Project Settings] Dialog Box [Basic Settings] Tab



<13>The [Other Settings] tab in the [Project Settings] dialog box allows you to specify and check advanced information about programming.
The values displayed here are the initial values of each item.
Clicking the OK button saves the project file and displays the main window.

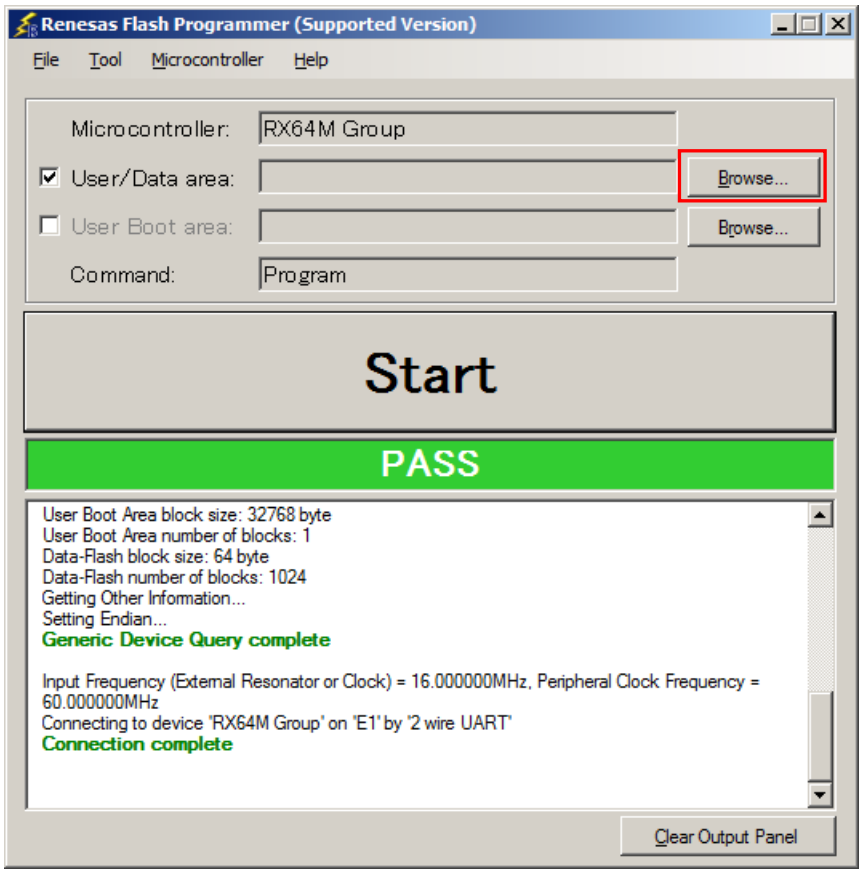
Figure 1-13. [Project Settings] Dialog Box [Other Settings] Tab



(5) Selection of program file

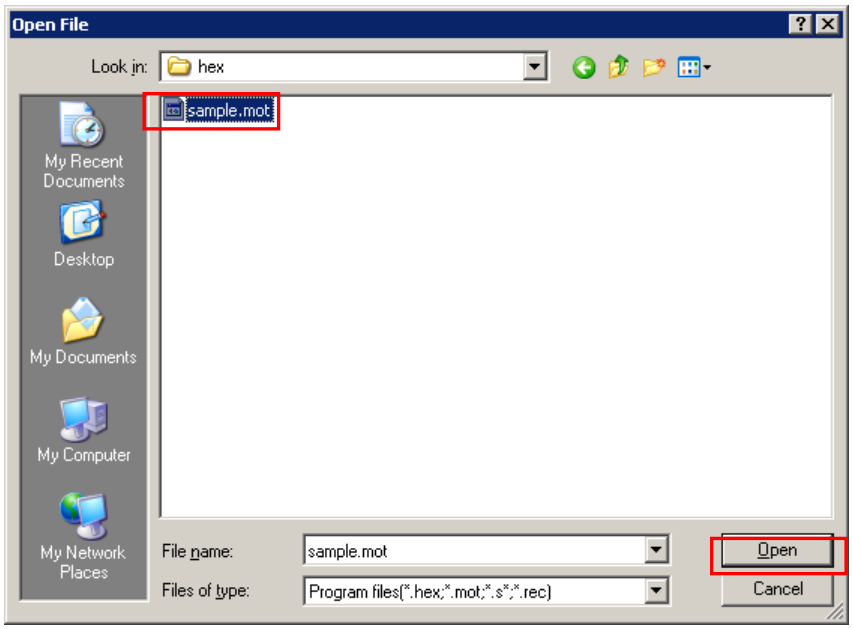
<1> Clicking the Browse… button in the User/Data area: of the program file area displays the [Open File] dialog box.

Figure 1-14. Main Window



<2> Select “sample.mot” in the [Open File] dialog box, and then click the Open button to open the main window.

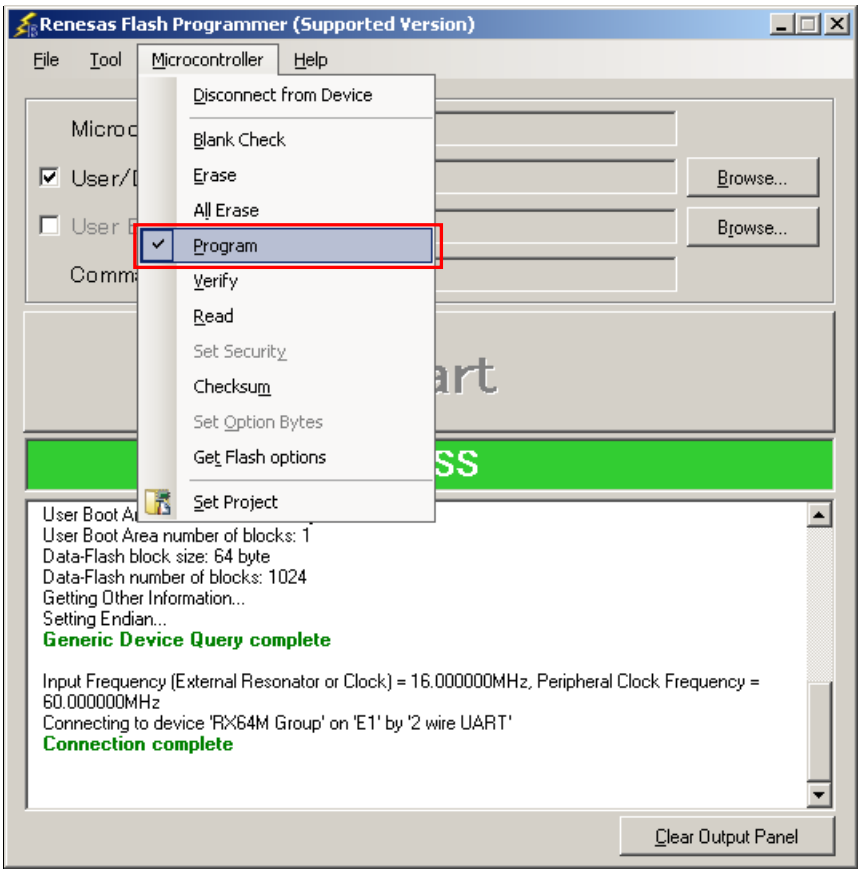
Figure 1-15. [Open File] Dialog Box



(6) Execute the [Program] command

<1> Click the [Microcontroller] menu and select the [Program] command. A check mark is then placed on the left of the command, and the command is assigned to the Start button.

Figure 1-16. Main Window



<2> After clicking the Start button, execute the [Program] command.

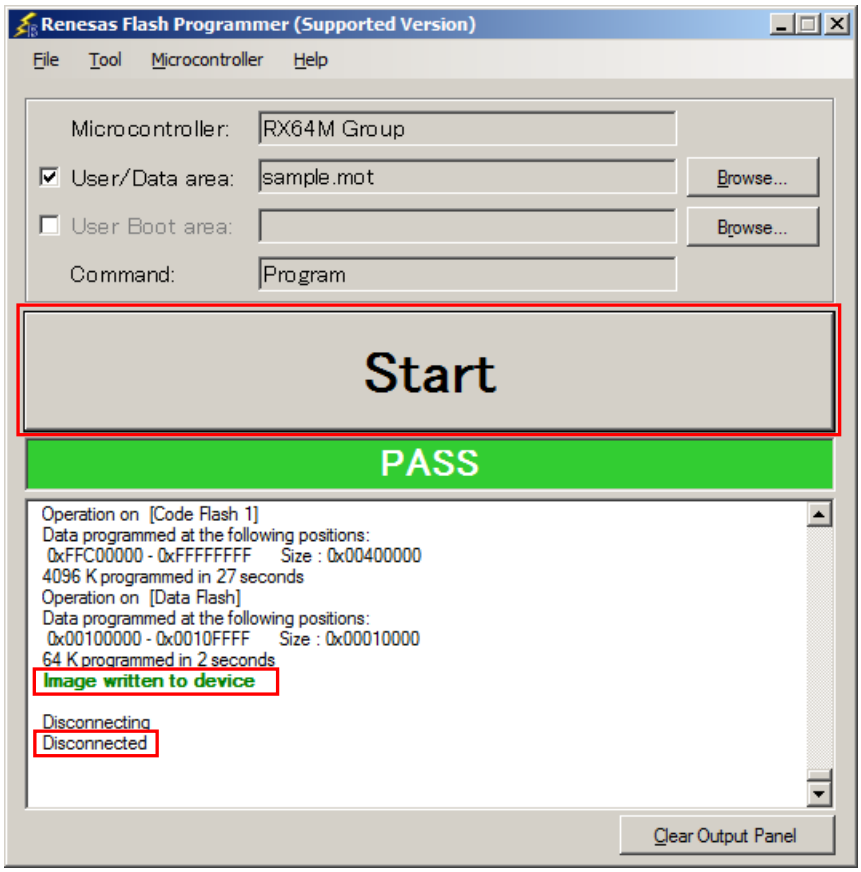
Remark When the [Program] command is executed, programming is performed after the block to be programmed is erased. To erase all blocks, set [All Erase Before Program] in the [Command Options] category in the [Other Settings] tab of the [Project Settings] dialog box to “True.”

<3> When execution of the [Program] command ends normally, “Image written to device” and “Disconnected” are displayed on the output panel.

Remarks 1. When necessary, connect the tool to be used to the target system, and then execute the [Program] command.

2. When supplying V_{DD} power to the target system, first turn off the power, connect the target system (for programming), and then turn on the power and execute the [Program] command.

Figure 1-17. [Program] Command Execution Results



(7) System shutdown

<1> Unless there are other target microcontrollers to be programmed, click the [File] menu and select the [Exit] command to close RFP. All settings made so far will be saved to a project file.

<2> Remove the USB cable from the tool used.

<3> Disconnect the target cable from the target system.

Remark When supplying V_{DD} power to the target system, turn off the power before removing the target cable. Furthermore, if [Auto Disconnect] in the [Basic Mode Option] category in the [Other Settings] tab of the [Project Settings] dialog box is set to “False,” remove the target system after executing [Disconnect To Device].

Caution If an error occurs during the above procedure, see Common CHAPTER 4 TROUBLESHOOTING and APPENDIX A MESSAGES.
Also see the user’s manual of the tool used and execute diagnostic tests.
If the above still does not resolve the problem, see the FAQ (at http://www.renesas.com/support/), or contact Renesas via the Renesas website:
http://www.renesas.com/contact/.

CHAPTER 2 FUNCTION DETAILS (BASIC MODE)

This chapter describes function details of the commands, windows, and dialog boxes of the basic mode of RFP.

2.1 Introduction

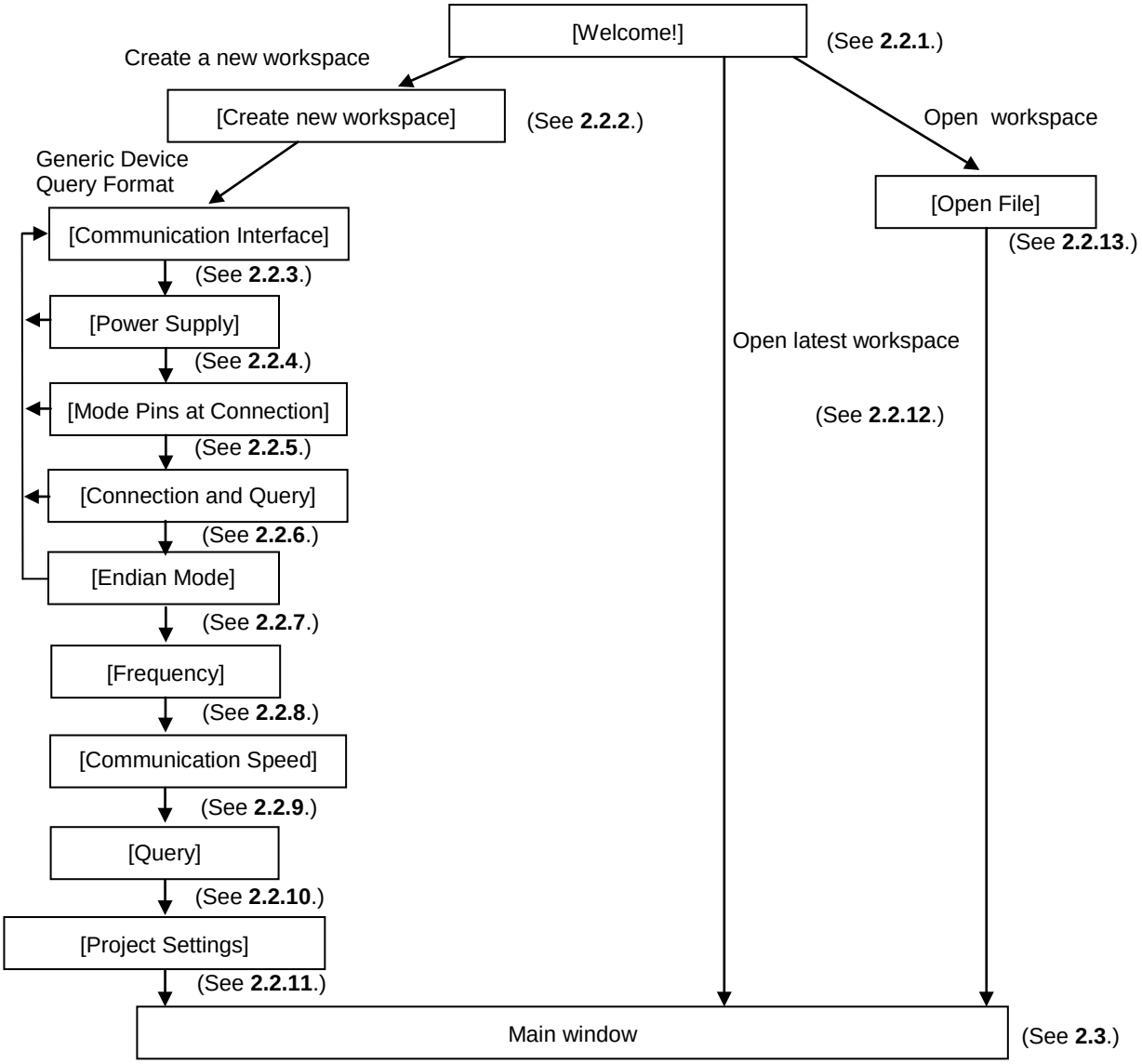
Make sure that the RFP package is installed. For how to install the RFP package, see **Common CHAPTER 2 RFP INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

2.2 Starting up

On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer V*x.xx*], and then click [Renesas Flash Programmer V*x.xx*]. The [Welcome!] dialog box will open.

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The project can be set up by the generic device query format. By this format, the device information file is created through a query to the microcontroller.

Figure 2-1. Dialog Boxes Displayed in the Startup Wizard



Or a main window is opened by the following method. In the case of (1), the main window of the version installed recently opens.

(1) Double clicking a workspace file.

(2) Dragging and dropping a workspace file onto RFP.exe.

(3) Typing RFP.exe followed by the name of a workspace file at the command prompt and so on; then executing it.

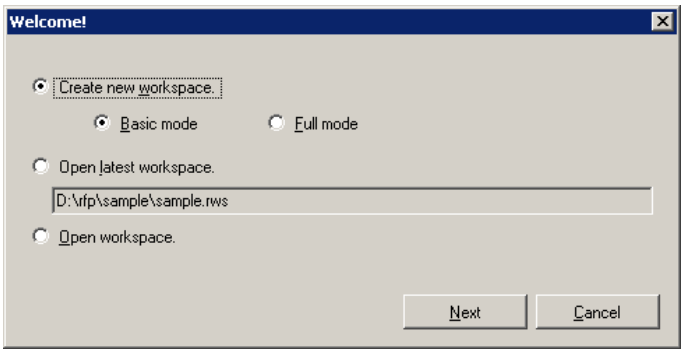
Remarks

1. The following buttons common to all the dialog boxes operate as follows:
   Clicking the OK, Next >, or Complete button opens the next dialog box. Clicking the < Back button opens the previous dialog box.
   Clicking the Cancel or the X button closes the dialog box.
2. The [Power Supply], [Mode Pin at Connection], [Endian Mode], [Frequency], and [Communication Speed] dialog boxes are skipped depending on the selected connection method.

2.2.1 [Welcome!] dialog box

This dialog box is used to make a selection about a workspace.

Figure 2-2. [Welcome!] Dialog Box

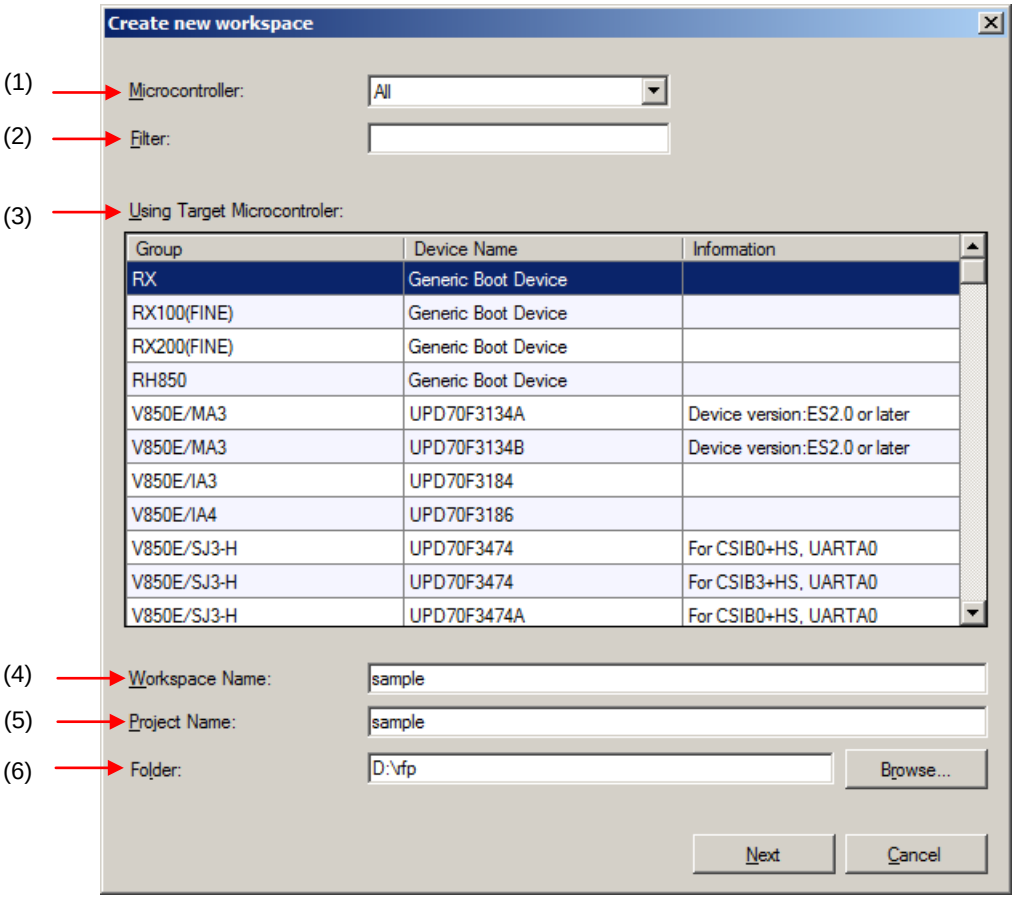


To create a new workspace, select [Create new workspace.], and then select [Basic mode] or [Full mode].
To open the workspace used last time, select [Open latest workspace.].
To open a created workspace, select [Open workspace.].

2.2.2 [Create new workspace] dialog box

This dialog box is used to create a new workspace.

Figure 2-3. [Create new workspace] Dialog Box



(1) [Microcontroller:] list box

Select “All” or “Generic Boot Device”, “V850”, “RL78”, “78K” to narrow down the microcontrollers that can be selected in the [Using Target Microcontroller:] list box.

(2) [Filter:] box

Enter a character string that matches the character strings displayed in the [Using Target Microcontroller:] list box to narrow down the microcontrollers that can be selected in the [Using Target Microcontroller:] list box.

(3) [Using Target Microcontroller:] list box

Select the target microcontroller to be used. Selecting “Generic Boot Device” sets up the project in the generic device query format.

(4) [Workspace Name:] box

Enter the workspace name in this box.

(5) [Project Name:] box

Enter the project name.

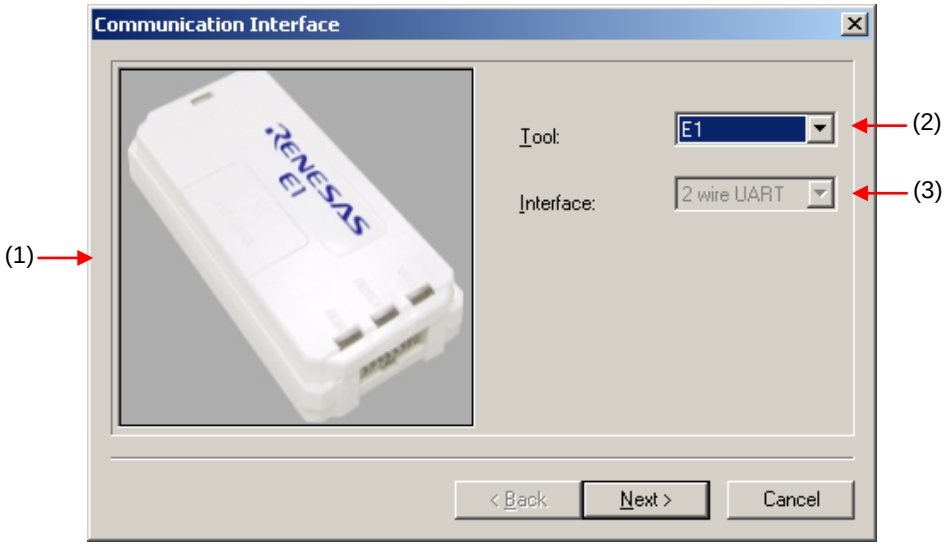
(6) [Folder:] box

Specify a folder in which to create the workspace file. Enter the path in the [Folder:] box, or click the Browse... button to display the [Select Folder] dialog box, and then specify the folder.

2.2.3 [Communication Interface] dialog box

This dialog box is used to select the tool used and the connection method between the selected tool and the target microcontroller.

Figure 2-4. [Communication Interface] Dialog Box



(1) Tool image panel

An image of the tool selected in the [Tool:] list box is displayed.

Figure 2-5. Tool Image Panel

(2) [Tool:] list box

Select the tool to be used.

- E1
- E20
- USB Direct
- COMx

(3) [Interface:] list box

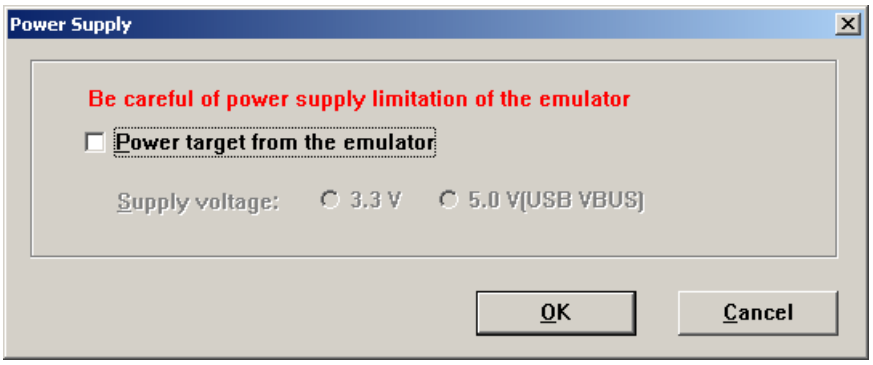
Displays the connection method between the selected tool and the target microcontroller.

- 1 wire UART < when using RH850>
- 2 wire UART
- USB < when using USB Direct of RX>

2.2.4 [Power Supply] dialog box

This dialog box is used to specify the power supply to the target system.

Figure 2-6. [Power Supply] Dialog Box



[Power target from the emulator] check box

Select this check box if supplying power from the emulator. Clear this check box if supplying power from the target system.

[Supply voltage:] option button

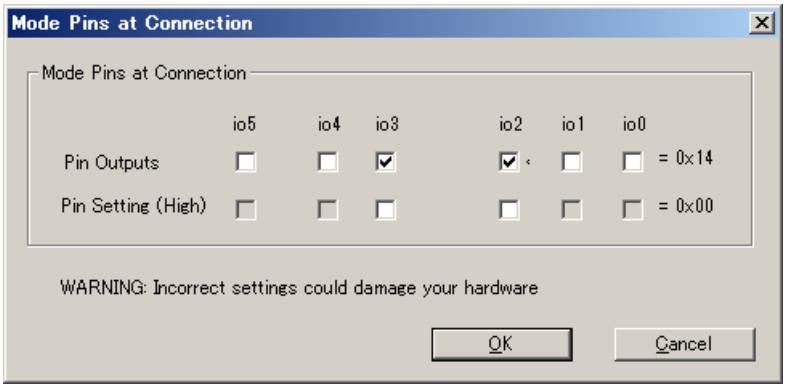
When supplying power from the tool used, select a voltage of 3.3 V or 5.0 V (USB VBUS).

Caution E1 supports the power supply function. In the mass-production process, do not use the power supply function of E1. Instead, supply the power suitable for the microcontroller specifications from the target system. The supply voltage from E1 is dependent on the USB power performance of the host PC, so the accuracy cannot be guaranteed.

2.2.5 [Mode Pins at Connection] dialog box

This dialog box is used to select and control the pins that control the mode pins of the target microcontroller from among pins io0 to io5 of the E1 or E20.

Figure 2-7. [Mode Pins at Connection] Dialog Box



[Pin Outputs] check box

Select the pin or pins from among io0 to io5 to control the mode pins of the target microcontroller.

Placing a checkmark in the box sets the pin as an output and removing a checkmark sets the pin as an input.

[Pin Setting (High)] check box

This box is used to set the level of the pin selected from among io0 to io5 to high or low. Placing a checkmark sets the level to high while removing the checkmark sets the level to low. This setting is effective only when the I/O direction of the pin is output.

Remark For more information on pins from io0 to io5 of the E1 and E20, refer to **Common Appendix B Figure B-1. E1 and E20 pins – RX -**.

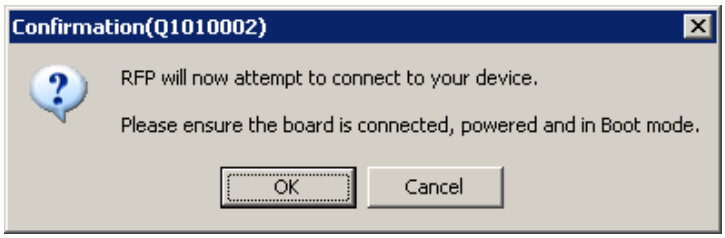
2.2.6 [Connection and query] dialog box

This dialog box is used to perform connection and a query of the target microcontroller and create a device information file.

Caution The connection is maintained after querying the device until the disconnection processing is executed.

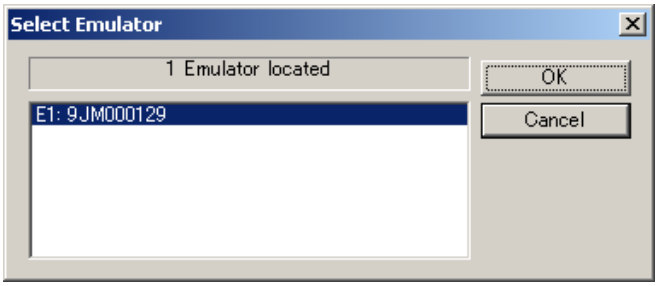
(1) Confirm before connecting to the target microcontroller.

Figure 2-8. [Confirmation] Dialog Box



(2) When E1 or E20 is selected, the [Select Emulator] dialog box is displayed. The name and serial number of the detected USB device are displayed. Select it.

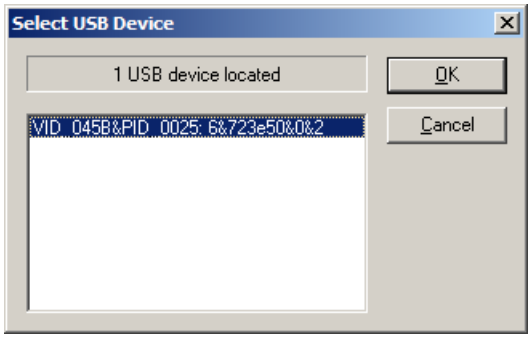
Figure 2-9. [Select Emulator] Dialog Box



Remark This dialog box is displayed only when RFP starts up for the first time. It won't be displayed for the second time and on. After a restart of RFP, it is displayed only for the first time and not for the second time and on.

(3) When USB Direct is selected, the [Select USB Device] dialog box is displayed. The detected USB port number is displayed. Select it.

Figure 2-10. [Select USB Device] Dialog Box

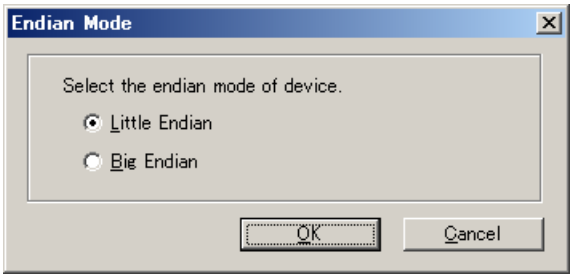


Remark This dialog box is displayed only when RFP starts up for the first time. It won't be displayed for the second time and on. After a restart of RFP, it is displayed only for the first time and not for the second time and on.

2.2.7 [Endian Mode] dialog box

Select the endian mode for the project. Select "Little Endian" or "Big Endian".

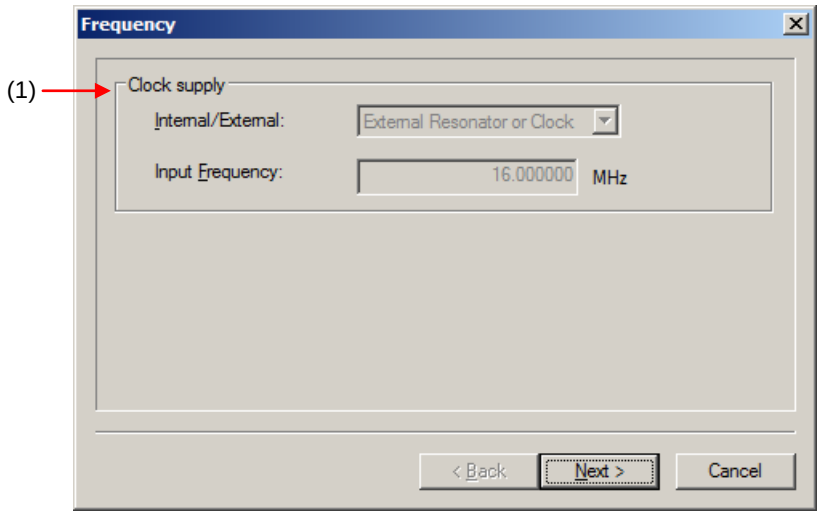
Figure 2-11. [Endian Mode] Dialog Box



2.2.8 [Frequency] dialog box

This dialog box is used to set the input frequency and the CPU frequency.

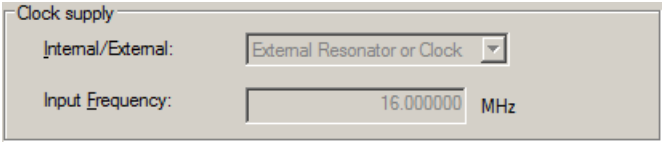
Figure 2-12. [Frequency] Dialog Box



(1) [Clock supply] area

This area is used to display the clock type and set the input frequency.

Figure 2-13. [Clock supply] Area



[Internal/External:] list box

Displays the type of clock supplied to the target microcontroller.

External Resonator or Clock	Clock or clock resonator for a microcontroller that does not support the clock switching function
External Clock	Clock for a microcontroller that supports the clock switching function
External Resonator	Clock resonator for a microcontroller that supports the clock switching function
Internal Clock	On-chip oscillator for a microcontroller that supports the clock switching function

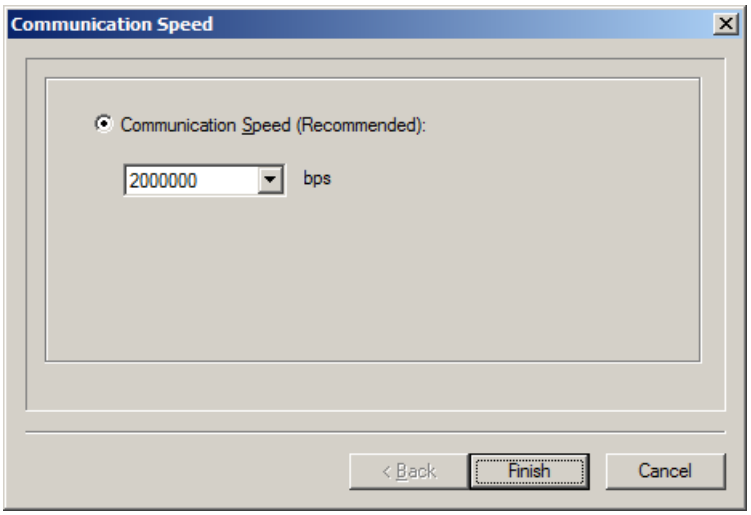
[Input Frequency:] list box

Enter the frequency of the clock supplied to the target microcontroller.

2.2.9 [Communication Speed] dialog box

This dialog box is used to set communication speed.

Figure 2-14. [Communication Speed] Dialog Box



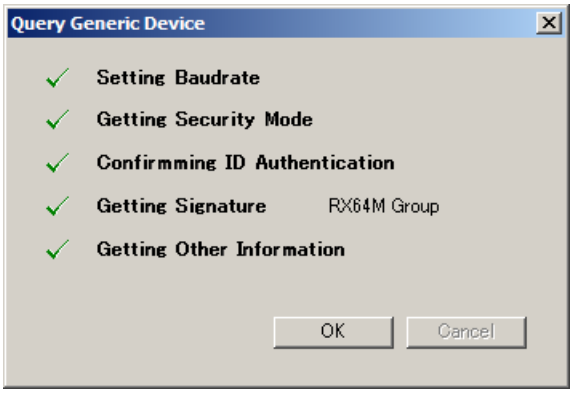
(1) [Communication speed:] list box

Select the communication speed.

2.2.10 [Query] dialog box

Execute a query to the target microcontroller.

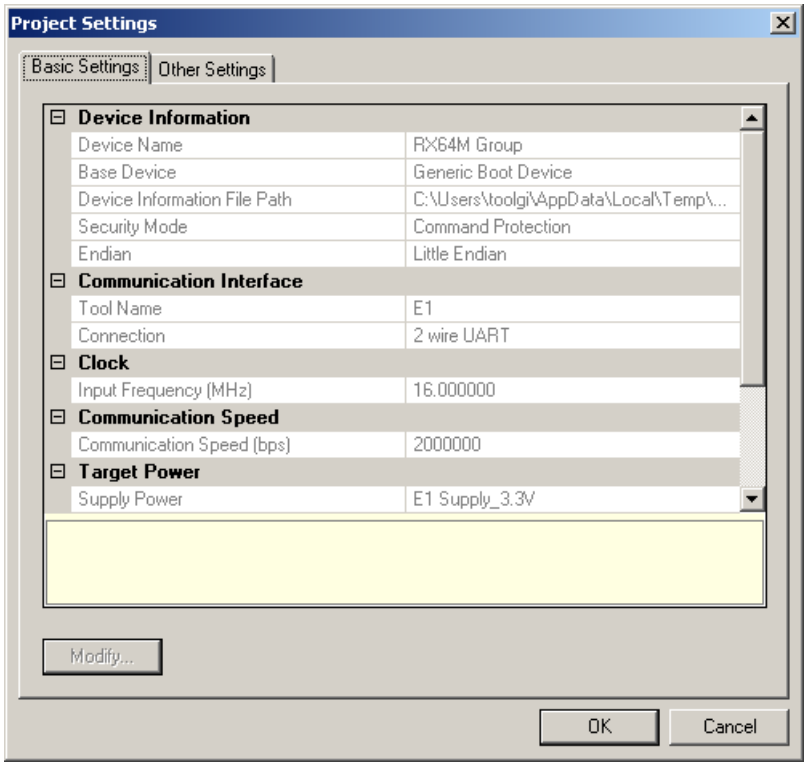
Figure 2-15. [Query Generic Device] Dialog Box



2.2.11 [Project Settings] dialog box

This dialog box is used to check and change the project settings. It has the [Basic Settings] tab and [Other Settings] tabs. Selecting a tab changes the categories in which settings are displayed.

Figure 2-16. [Project Settings] Dialog Box



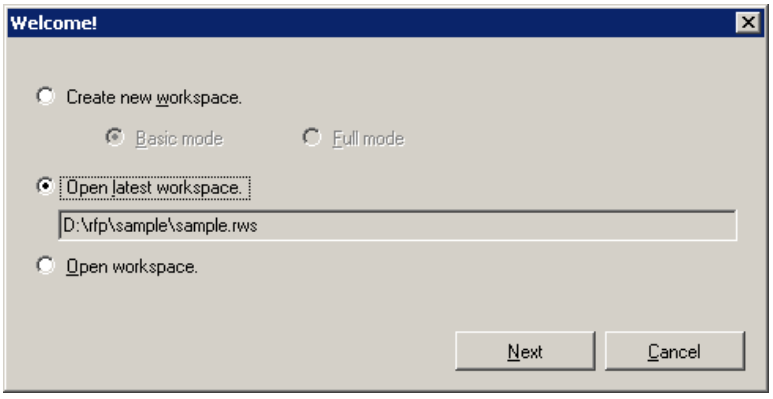
For details about each item, see **2.4.3 (11) (f) [Project Settings] dialog box**.
Clicking the Modify... button opens the [Communication Interface] dialog box.
Clicking the OK button saves the project file and opens the main window.

Remark The Modify… button is disabled while it is connected with the target controller. To enable it, select the [Microcontroller] menu and select [Disconnect from Device], then select [Set Project] from the [Microcontroller] menu to display the [Project Settings] dialog box.

2.2.12 Open latest workspace

If you select [Open latest workspace.] in the [Welcome!] dialog box, the main window is displayed with the settings for the workspace used last time.

Figure 2-17. [Open latest workspace.]



2.2.13 Open workspace

If you select [Open workspace.] in the [Welcome!] dialog box, the [Open File] dialog box is displayed.

Figure 2-18. [Open workspace.]

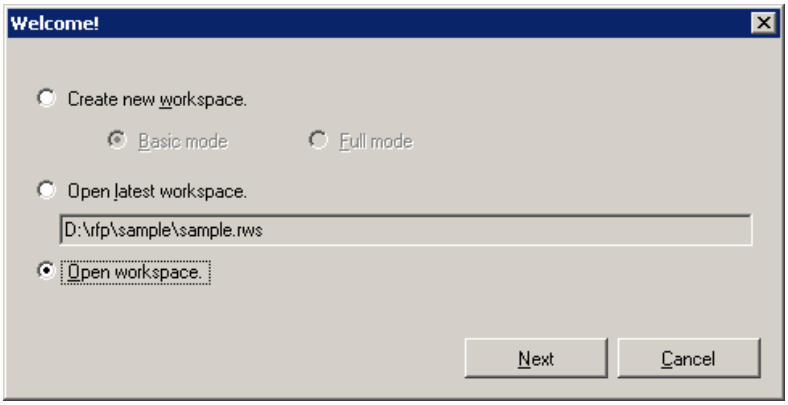
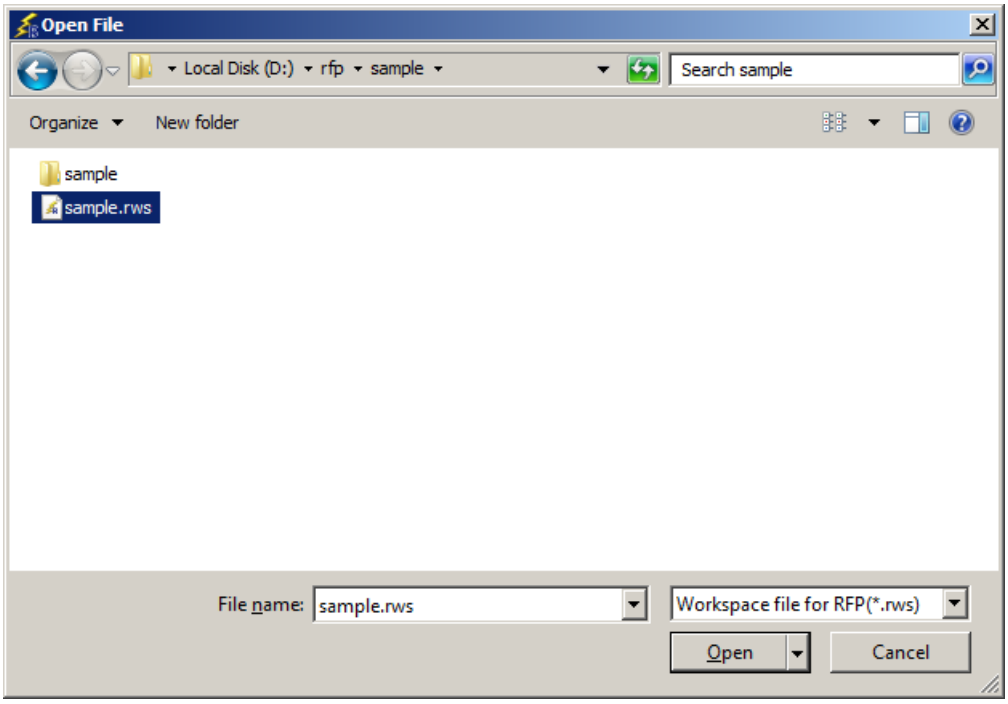


Figure 2-19. [Open File] Dialog Box

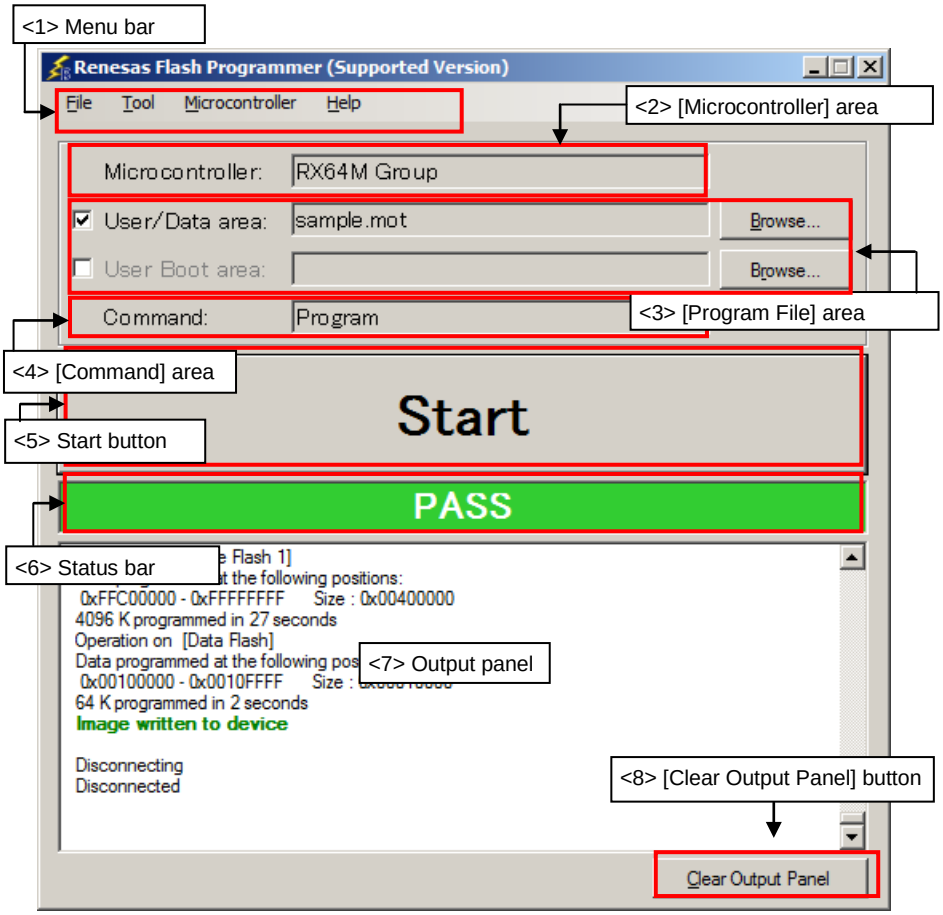


Select a workspace file, and then click the Open button. The main window is displayed with the settings for the specified workspace.
Clicking the Cancel or the X button closes the [Open File] dialog box and returns you to the [Welcome!] dialog box.

2.3 Main Window

The main window consists of the following items:

Figure 2-20. Main Window



Name		Description	See
<1>	Menu bar	Displays the selectable menus	2.4
<2>	[Microcontroller] area	Displays the selected target microcontroller	2.5
<3>	[Program File] area	Displays the selected program file	2.6
<4>	[Command] area	Displays the selected command	2.7
<5>	Start button	Executes the selected command	2.8
<6>	Status bar	Displays the command execution status in colors and text	2.9
<7>	Output panel	Displays in detail what is executed by the command	2.10
<8>	[Clear Output Panel] button	Clears the output panel display	2.11

2.4 Menu Bar

The menu bar consists of [File], [Tool], [Microcontroller], and [Help]. When a menu is selected, the pull-down menu is displayed where the items can be selected. Some items may be disabled depending on the settings.

2.4.1 [File] menu

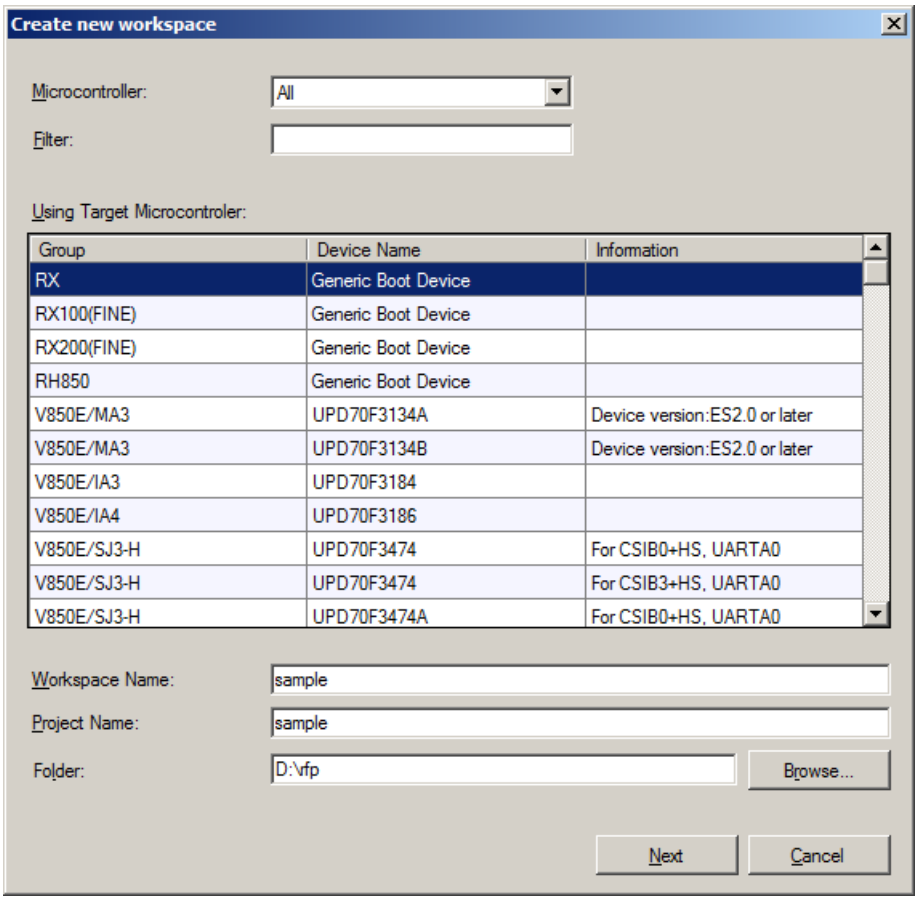
The following pull-down menu appears by selecting the [File] menu.

Figure 2-21. [File] Menu

(1) [Create a new workspace]

The [Create new workspace] dialog box is displayed. Create a new workspace. Save the project file that has been created. For the items in the dialog box, refer to **2.2.2**.

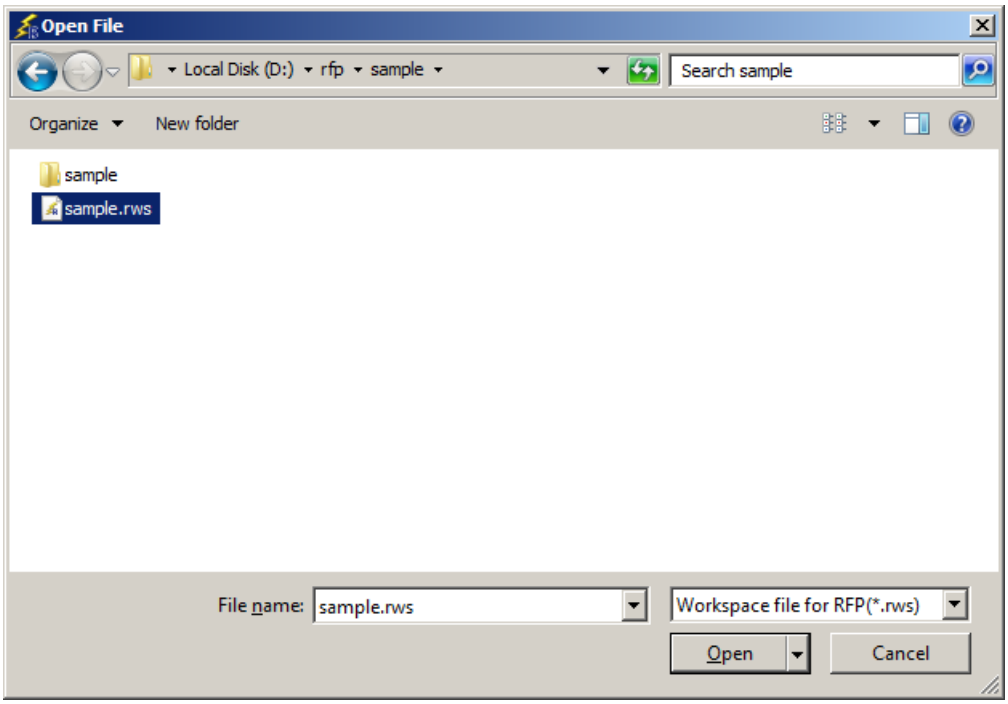
Figure 2-22. [Create new workspace] Dialog Box



(2) [Open a workspace]

Selecting this option opens the [Open File] dialog box in which you can open a workspace created before. Save the project file that has been created. For the items in the dialog box, see **2.2.12**.

Figure 2-23. [Open File] Dialog Box



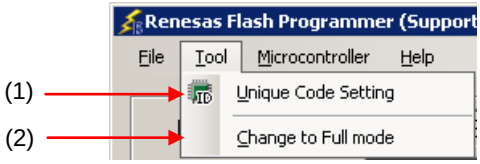
(3) [Exit]

[Exit] terminates RFP. RFP can also be terminated by clicking the X button on the right end of the title bar in the main window. When RFP is terminated, various settings are saved in the `rfp.ini` file. Save the project file that has been created.

2.4.2 [Tool] menu

Selecting the [**Tool**] menu displays the pull-down menu as shown in the figure below.

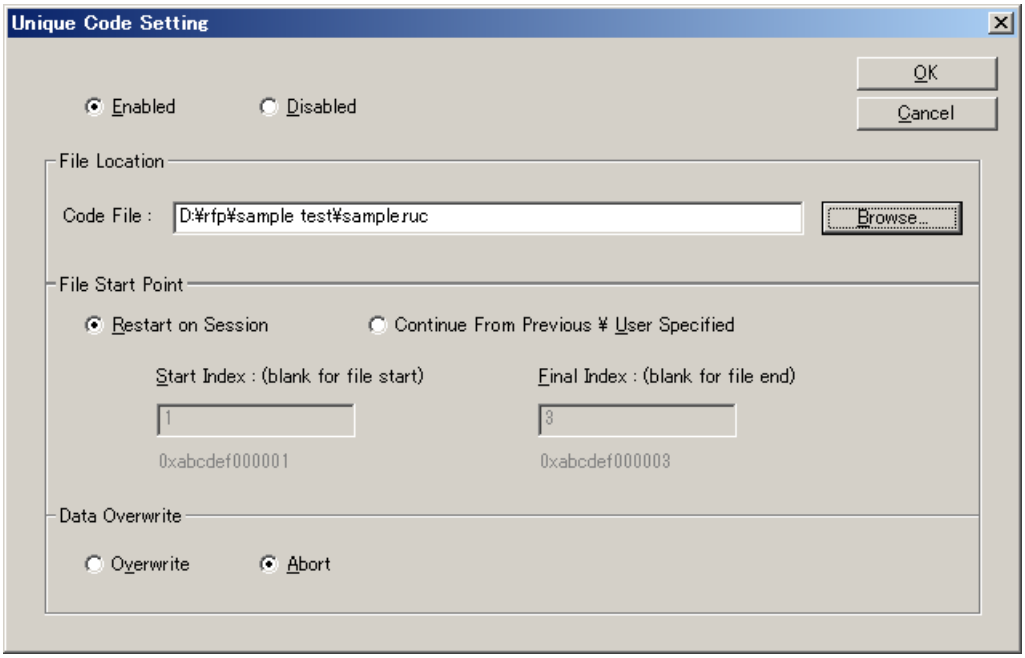
Figure 2-24. [Tool] Menu



(1) [Unique Code Setting]

Selecting this option displays the [Unique Code Setting] dialog box, in which you make settings for imbedding unique codes. For the items in the dialog box, refer to **Common CHAPTER 3**.

Figure 2-25. [Unique Code Setting] Dialog Box



(2) [Change to Full mode]

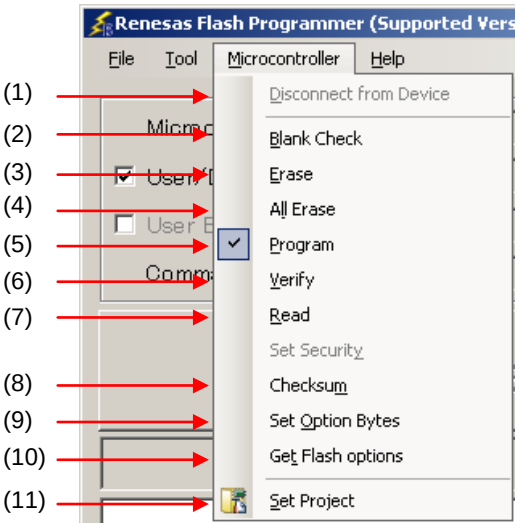
Selecting this option switches the mode from basic to full. Save the project file that has been created. For the full mode features, refer to **CHAPTER 3**.

Caution This menu is grayed out when a device is connected. To enable this menu, execute [Disconnect from Device].

2.4.3 [Microcontroller] menu

The following pull-down menu appears by selecting the [Microcontroller] menu. This menu is used for selection and setting of commands such as disconnection from a device, all erase, and program. If you select a command, the check mark is displayed at the left of the command, and the command is assigned to the Start button. Note that [Disconnect from Device] and [Set Project] commands are not assigned to the Start button.

Figure 2-26. [Microcontroller] Menu



(1) [Disconnect from Device]

This command is used to disconnect from the device, and shut off the power supply if the [Power target from the emulator] check box is selected in the [Power Supply] dialog box.

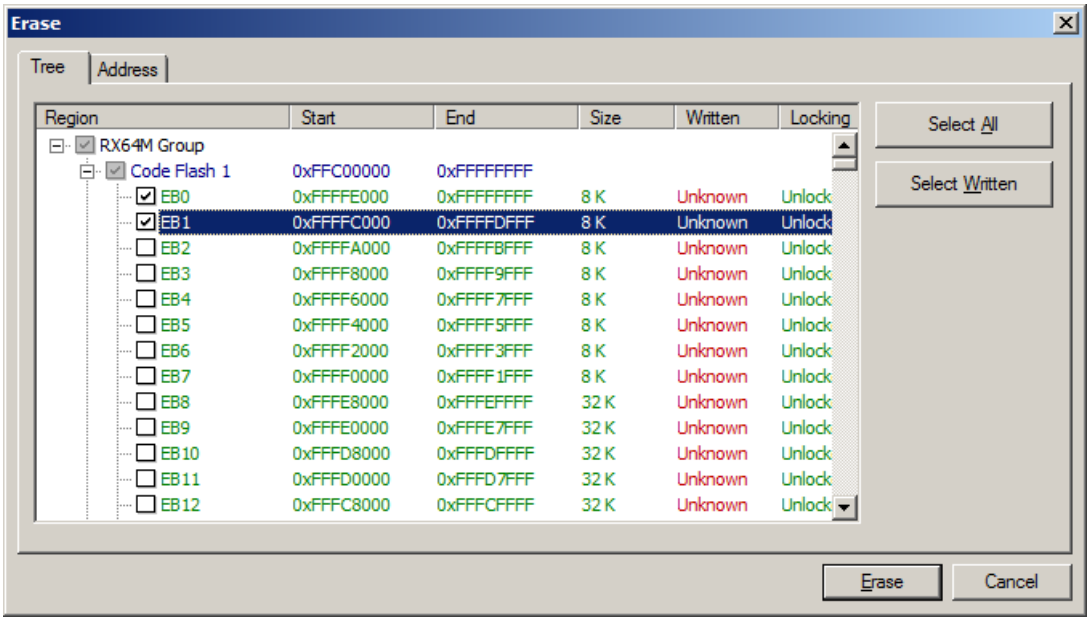
(2) [Blank Check] command

This command executes blank check on all areas of the flash memory. The result is displayed per area when the command completes.

(3) [Erase] command

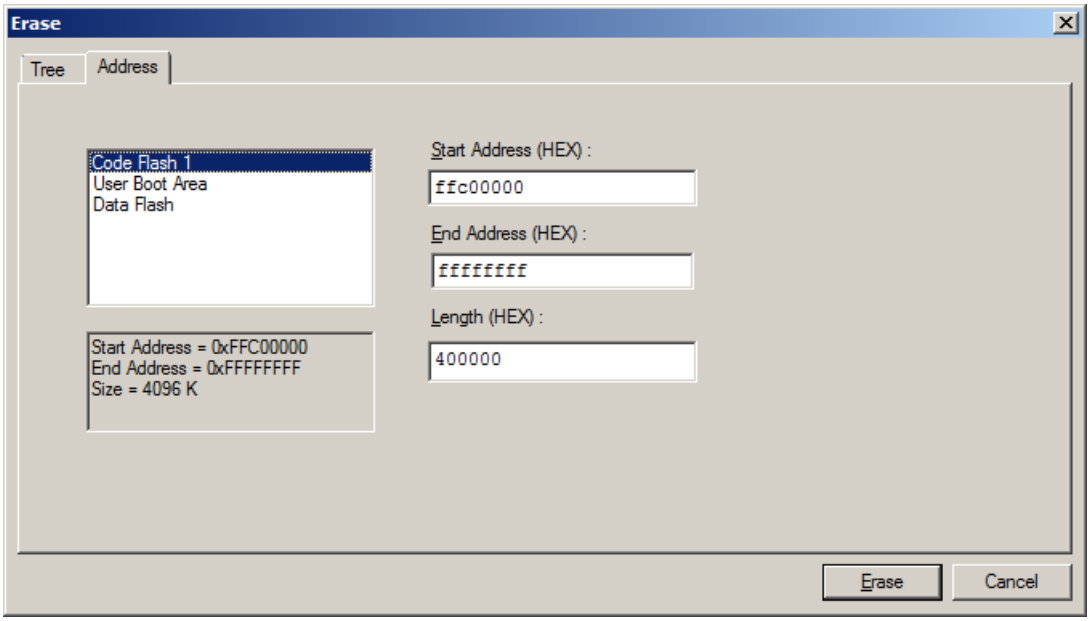
This command is used to erase the specified block of the flash memory. Executing the [Erase] command opens the [Erase] dialog box. The blocks whose checkboxes are selected will be erased.

Figure 2-27. [Tree] Tab of [Erase] Dialog Box



Clicking the Select All button selects all blocks for erasure.
Clicking the Select Written button selects all blocks that have been programmed for erasure.
Clicking the Erase button selects the specified block for erasure.
Clicking the Cancel or the X button returns you to the main window without erasing a block.

Figure 2-28. [Address] Tab of [Erase] Dialog Box



Specify the erasing target area by entering the start address and the end address, or by entering the start address and the data length.

Clicking the Erase button leads to erasing of the data from the specified address range.
Clicking the Cancel or the X button closes the dialog box without performing erasing.

(4) [All Erase] command

This command is used to erase all blocks of the flash memory. The result is displayed when the command finishes.

(5) [Program] command

This command is used to write the program file selected in the program file area to the flash memory. The operation options related to the [Program] command are according to the settings of [Command Options] category of the [Other Settings] tab in the [Project Settings] dialog box. For details, see **2.4.3 (11) (f) <8> [Command Options] category**.

Remark When the [Program] command is executed, programming is performed after the block with data is erased. To erase all blocks, set [All Erase Before Program] in the [Command Options] category in the [Other Settings] tab of the [Project Settings] dialog box to "True."

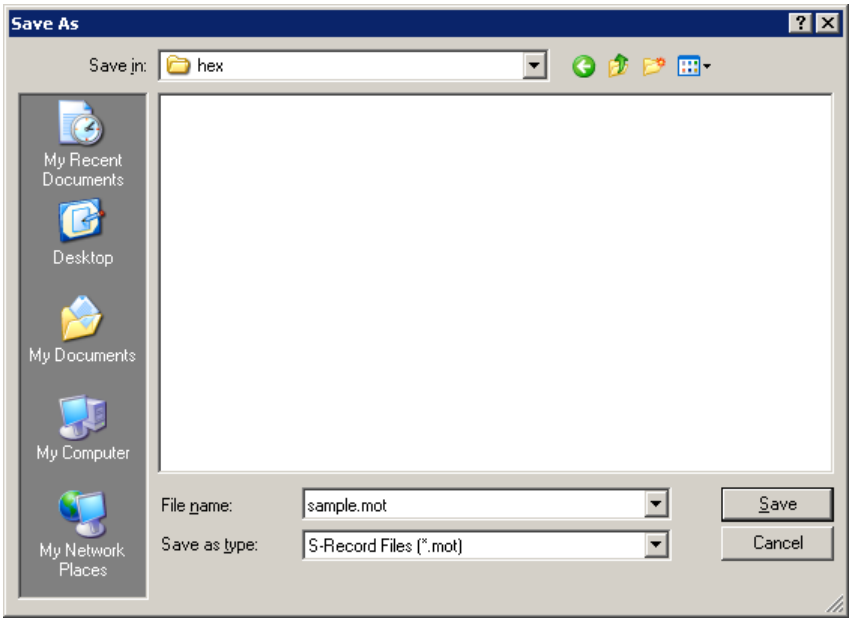
(6) [Verify] command

This command is used to verify that the data written to the flash memory is the same as the data in the program file selected in the program file area. The verification method depends on whether a prohibition setting for readout from a microcontroller is enabled or disabled. The operation options related to the [Verify] command are according to the settings of [Command Options] category of the [Other Settings] tab in the [Project Settings] dialog box. For details, see **2.4.3 (11) (f) <8> [Command Options] category**.

(7) [Read] command

This command is used to read the specified block of the flash memory. Executing the [Read] command opens the [Save As] dialog box. Note that no data is saved when the FFH is read.

Figure 2-29. [Save As] Dialog Box

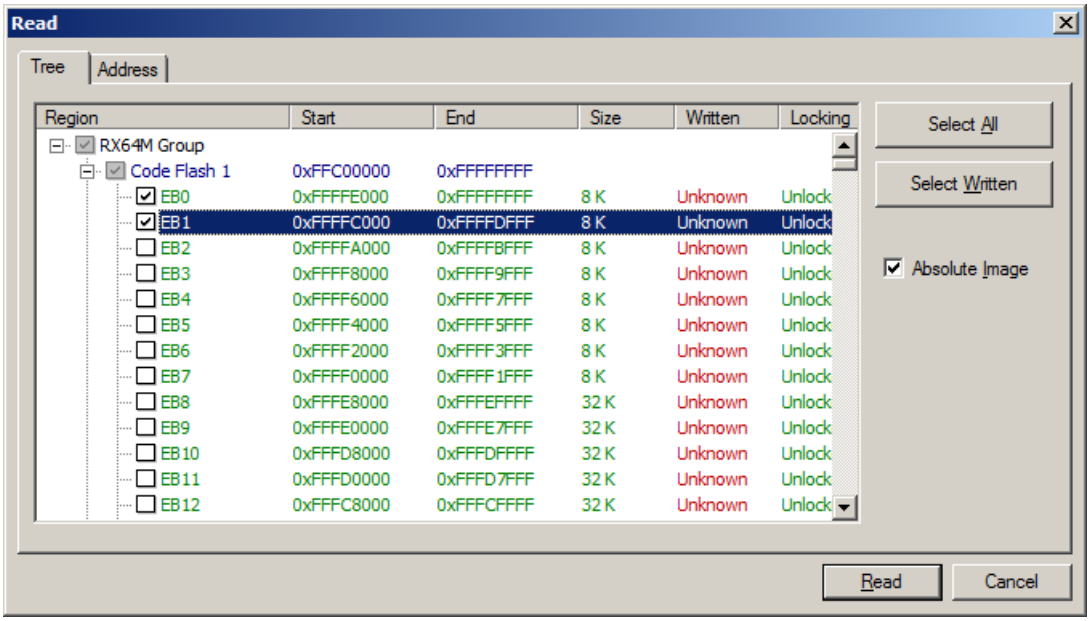


Enter a filename in the [File name:] box. A saving format "S-Record File (*.mot)" is specified in the [Save as type:] list box.

Clicking [Save] button specifies the file name, closes the dialog box, and opens the [Read] dialog box. The dialog box has the [Tree] tab and the [Address] tabs. Selecting either of them determines how you specify the item to be read.

Clicking the [Cancel] or the [X] button closes the dialog box without specifying the file name.

Figure 2-30. [Tree] Tab of [Read] Dialog Box



The blocks with boxes under the Region column checked are read.

[Absolute Image] check box

Checked: When the read data are saved to a file, the data are saved at the address in flash memory from which the data were read out.

Not checked: When the read data are saved to a file, the data are saved in the address range starting from address 00h.

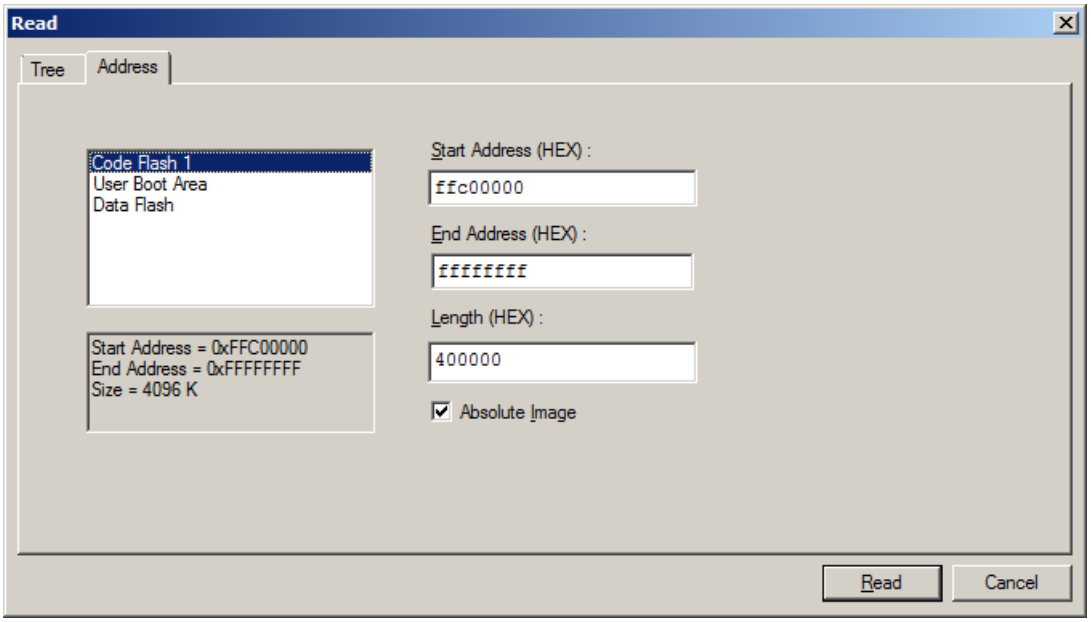
Clicking the Select All button selects all blocks for reading.

Clicking the Select Written button selects all blocks that have been programmed for reading.

Clicking the Read button leads to reading of the selected blocks and saving of the contents in a file when the process ends normally.

Clicking the Cancel or the X button closes the dialog box without performing reading.

Figure 2-31. [Address] Tab of [Read] Dialog Box



Specify the reading target area by entering the start address and the end address, or by entering the start address and the data length.

[Absolute Image] check box

Checked: When the read data are saved to a file, the data are saved at the address in flash memory from which the data were read out.

Not checked: When the read data are saved to a file, the data are saved in the address range starting from address 00h.

Clicking the [Read] button leads to reading of the data from the specified address range and saving of the contents in a file when the process ends normally.

Clicking the [Cancel] or the [X] button closes the dialog box without performing reading.

(8) [Checksum] command

This command executes the checksum of the flash memory and program file on all the areas in the flash memory and displays the results on the output panel after execution. Checksum can be calculated either by the 32-bit addition or 32-bit CRC method selected. For details, refer to 2.4.3, (11), (f), <8>.

Remark: This command cannot be executed without selecting the program file.

Checksums are calculated as follows:

Calculation method: 32-bit addition method

Calculation scope: All the areas (user area, the user boot area, and the data area)

Figure 2-32. Output Panel after Execution of [Checksum] Command

```
Calculating device checksum
Flash Checksum:   0x3FBCE2BF   Code Flash 1
Flash Checksum:   0x007F8000   User Boot Area
Flash Checksum:   0x007FBBA5   Data Flash
```

Remark 32-bit addition displays the eight lower digits of the result of adding the value of all bytes in the flash memory.

Checksums are calculated as follows:

Calculation method: 32-bit CRC method

Calculation scope: All the areas (user area, the user boot area, and the data area)

Figure 2-33. Output Panel after Execution of [Checksum] Command

```
Calculating device checksum
Flash Checksum:   0x371B4DD7   Code Flash 1
Flash Checksum:   0x42A83D27   User Boot Area
Flash Checksum:   0xE24C5217   Data Flash
```

Remark 32-bit CRC method displays the eight digits of the result of CRC32 function calculation.
For details of calculation, refer to “Figure B-2, 32-bit CRC Calculation Specifications” in Appendix B, Supplementary Document.

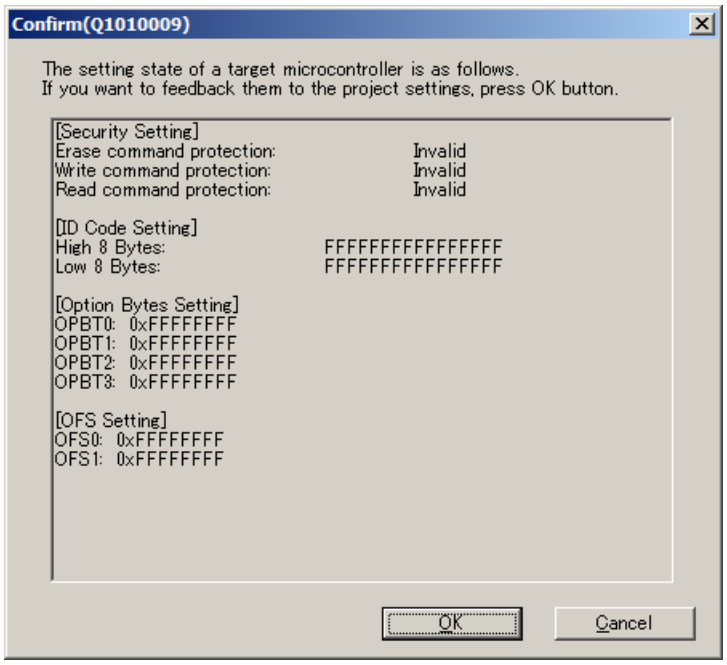
(9) [Set Option Bytes] command

This command is used to set the option bytes of the target microcontroller. When the [Set Option Bytes] command is executed, the contents that are set for [OPBT*n*] in the [Option Bytes] category in the [Other Settings] tab of the [Project Settings] dialog box are reflected to the target microcontroller. For details, see **2.4.3 (11) (f) <13> [Option Bytes] category.**

(10) [Get Flash options] command

This command is used to read and display the contents of the flash option settings of the target microcontroller. When the OK button is clicked, the read results are reflected to the [Set ID Code], [Command Protection Security], [Option Bytes] and [OFS] categories in the [Other Settings] tab of the [Project Settings] dialog box and displayed. When this command is executable, the flash option settings can be verified by executing this command before executing the [Set Security At Disconnection], [Set Option Bytes] or [Set ID Code At Disconnection] command. For details, see **2.4.3 (11) (f) <14> [Option Bytes] category, <16> [Set Device Security] category, and <17> [Set ID Code] category.**

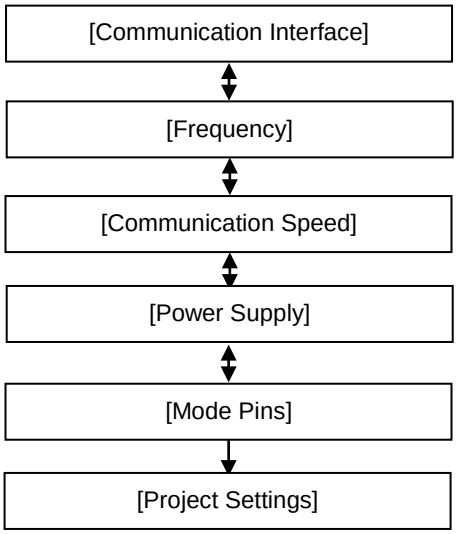
Figure 2-34. [Get Flash options] Command



(11) [Set Project]

When [Set Project] is selected, the [Project Settings] dialog box is displayed, and you can check and change project settings. You can select [Basic Settings] tab or [Other Settings] tab, each of which presenting its specific category of settings. When the [Modify…] button in the [Basic Settings] is clicked, the [Communication Interface] dialog box is displayed, and you can change the settings in the wizard format (refer to **Figure 2-35**). The [Communication Speed] dialog box is not displayed when USB Direct is selected. The [Power Supply] dialog box is displayed when E1 is selected. The [Mode Pins] dialog box is displayed when RX and E1 or E20 and 2 wire UART is selected.

Figure 2-35. Flow of Setting Change with the [Modify...] Button



Remark The following buttons common to all the dialog boxes operate as follows:
Clicking the [OK], [Next >], or [Complete] button opens the next dialog box.
Clicking the [< Back] button opens the previous dialog box.
Clicking the [Cancel] or the [X] button closes the dialog box.

(a) [Communication Interface] dialog box

This dialog box is used to select the tool used and the port used for communication between the selected tool and the target microcontroller.

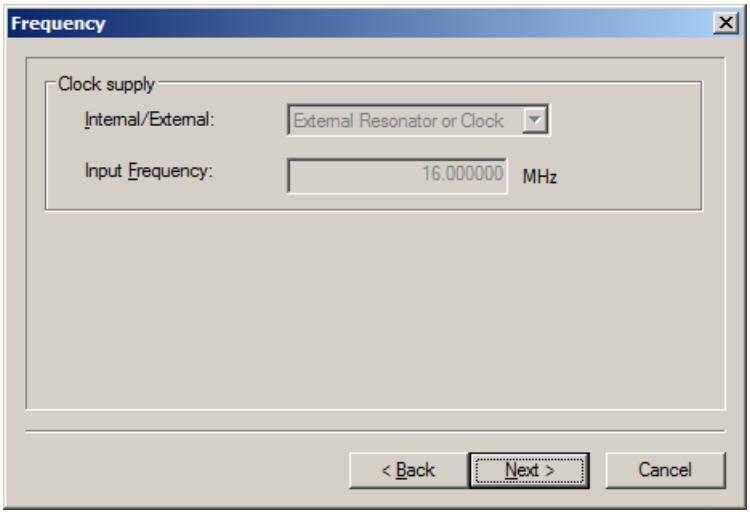
Figure 2-36. [Communication Interface] Dialog Box

For details about each item, see **2.2.3**.

(b) [Frequency] dialog box

This dialog box is used to set the input frequency and the CPU frequency.

Figure 2-37. [Frequency] Dialog Box

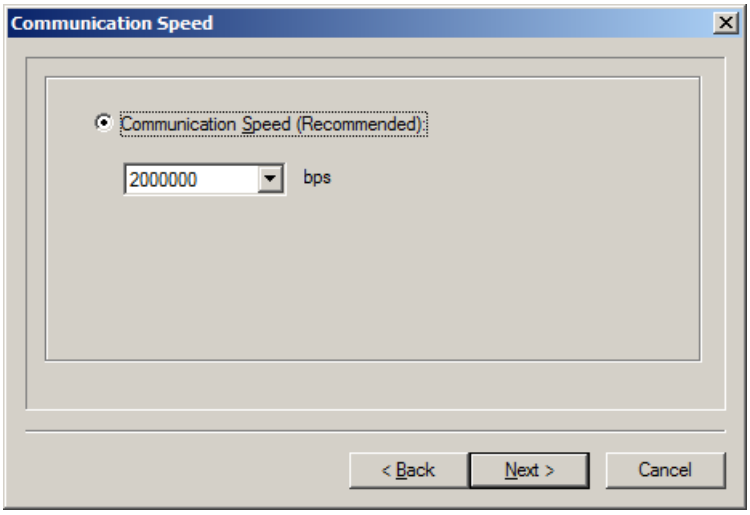


For details about each item, see **2.2.8**.

(c) [Communication Speed] dialog box

This dialog box is used to set the communication speed.

Figure 2-38. [Communication Speed] Dialog Box

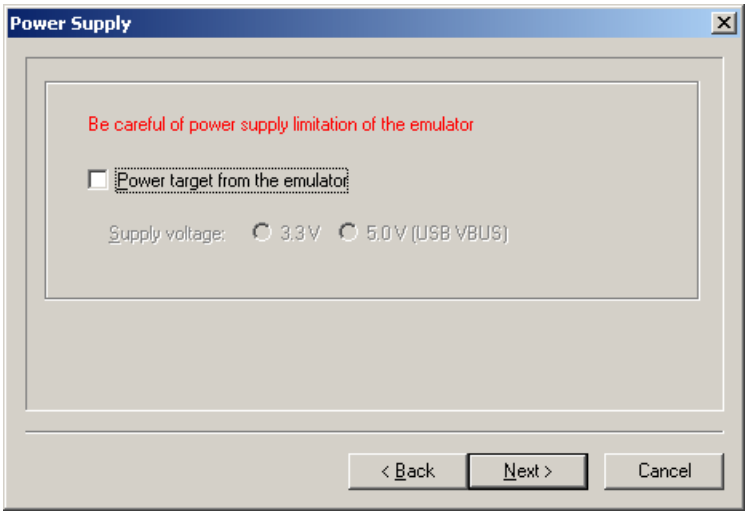


For details about each item, see **2.2.9**.

(d) [Power Supply] dialog box

This dialog box is used to set power supply for the target system.

Figure 2-39. [Power Supply] Dialog Box

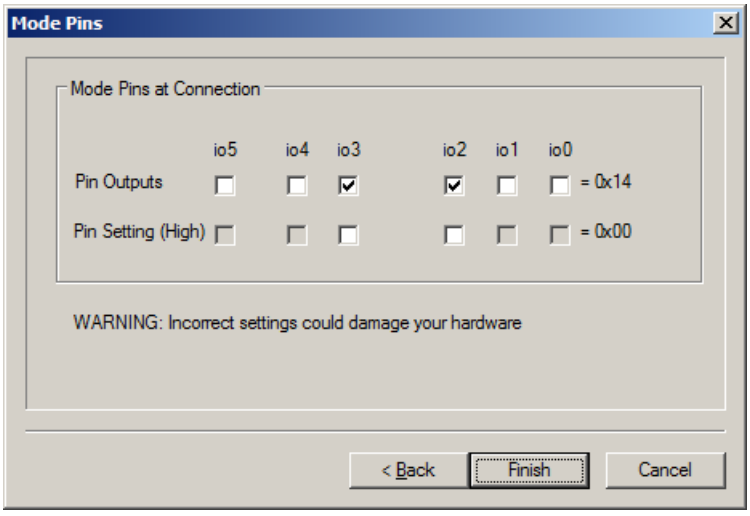


For details about each item, see **2.2.4**.

(e) [Mode Pins] dialog box

This dialog box is used to select and control the pins that control the mode pins of the target microcontroller from among pins io0 to io5 of the emulator.

Figure 2-40. [Mode Pins] Dialog Box



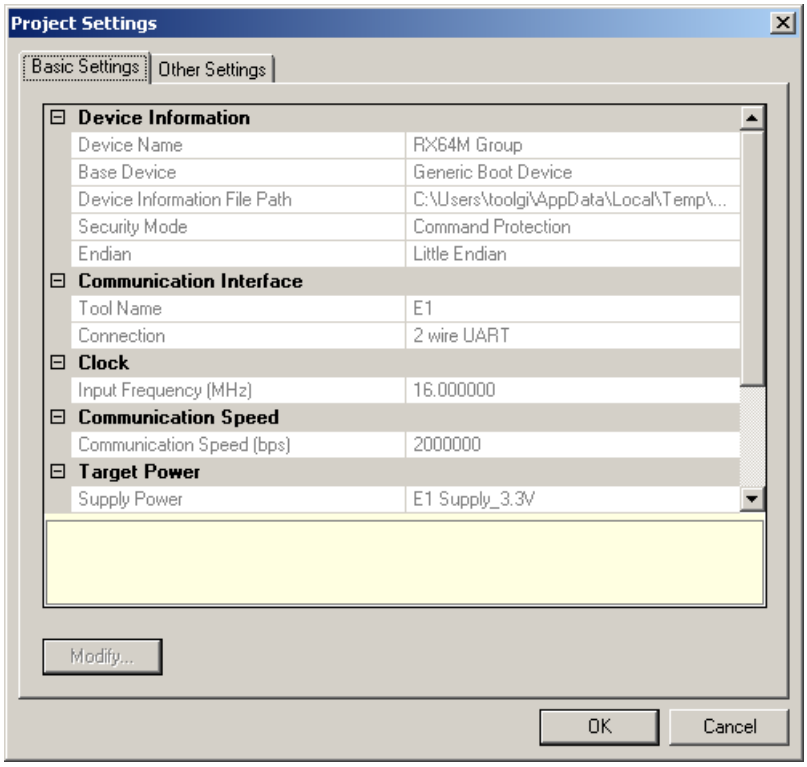
Refer to **2.2.5** for more information on each item in the dialog box.

Clicking the Finish button saves the project file and returns you to the [Project Settings] dialog box.

(f) [Project Settings] dialog box

This dialog box is used to check and change the project settings. It has the [Basic Settings] tab and [Other Settings] tab. Selecting a tab changes the categories in which settings are displayed. Some items may be disabled depending on the settings.

Figure 2-41. [Project Settings] Dialog Box



[Basic Settings] tab

<1> [Device Information] category
<2> [Communication Interface] category
<3> [Clock] category
<4> [Communication Speed] category
<5> [Target Power Supply] category
<6> [Mode Pins At Connection] category

[Other Settings] tab

<7> [Basic Mode Option] category
<8> [Command Options] category
<9> [Mode Pins At Disconnection] category
<10> [ID Code Authentication] category
<11> [Timeout Option] category
<12> [Lock Bit] category
<13> [OTP] category
<14> [Option Bytes] category
<15> [ICU] category
<16> [Set Device Security] category
<17> [Set ID Code] category
<18> [Command Protection Security] category

Clicking the Modify... button displays the [Communication Interface] dialog box.
Clicking the OK button saves the project file and returns you to the main window.

Remark The Modify… button is disabled while it is connected with the target controller. To enable it, select the [Microcontroller] menu and select [Disconnect from Device], then select [Set Project] from the [Microcontroller] menu to display the [Project Settings] dialog box.

<1> [Device Information] category

This category displays information about the microcontroller such as Device Name, Base Device, and Device Information File Path.

Device Name	Displays the device name.
Base Device	Displays the base device of the device.
Device Information File Path	Displays the parameter file path of the device.
Security Mode	Display the security mode of device. The entry is blank when a device is not connected.
Endian	Display the endian mode of project.
TM Identification Data	Displays the TM Identification Data of the device. This item is left blank if a device is not connected or Trusted Memory is disabled.

<2> [Communication Interface] category

This category displays Tool and Connection.

Tool Name	Displays the communication tool between the target board and host PC.
Connection	Displays the connection method between the target board and host PC.

<3> [Clock] category

This category displays clock-related settings.

Input Frequency (MHz)	Displays the input clock of the device.

<4> [Communication Speed] category

This category displays communication speed-related settings.

Communication Speed (bps)	Displays the communication speed with the device.

<5> [Target Power Supply] category

This category displays Power Supply of the target device.

Supply Power	Displays the power supply for the target device.

<6> [Mode Pins at Connection] category

This category displays the state of the mode pin to start the device in the boot mode when it is connected.

Mode Pin Information	Displays the state of the mode pin to start the device in the Boot mode at connection.

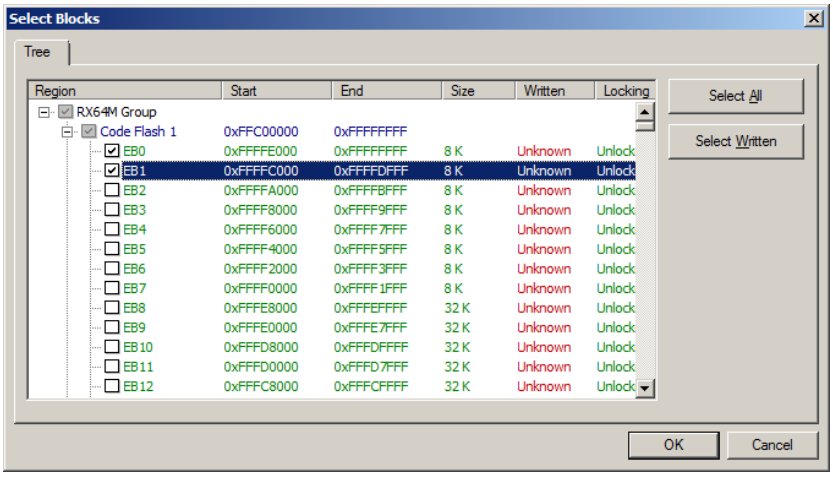
<7> [Basic Mode Option] category

This category is used to set the basic mode option.

Auto Disconnect	Selects whether to disconnect automatically after execution.	
	True	Enabled
	False	Disabled

<8> [Command Options] category

This category is used to set the operation options.

Write Mode	Selects the unit of data for programming or verification.	
	Block Programming Mode	Executes programming or verification in block units. If there is available space in a block, the space is filled with FFH.
	Minimum Programming Mode	Executes programming or verification in the minimum units. This setting applies only to the area containing the program file data. If no data is contained in the minimum processing unit of a program file, this setting is not applied to the file. If data (including FFH) is contained in the minimum processing unit of a program file, this setting applies to the file. The minimum processing unit is defined for each area of the microcomputer. If there is available space in the minimum processing unit, the space is filled with FFH.
Set Program/ Verify Blocks	Specifies a block to be programmed or verified in the [Select Blocks] dialog box when Block Programming Mode is selected. 	
Select Blocks Dialog Before Program/Verify	Selects whether to display the [Select Blocks] dialog box before programming or verification when Block Programming Mode is selected.	
	True	Enabled
	False	Disabled
All Erase Before Program	Selects whether to erase all blocks before programming.	
	True	Enabled
	False	Disabled

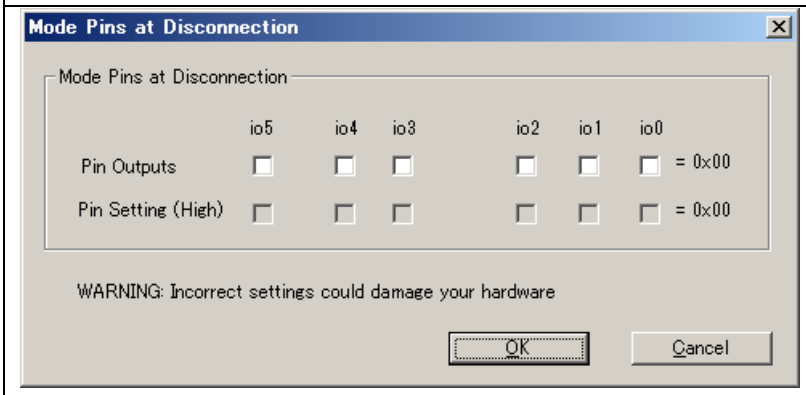
Verify After Program	Selects whether to execute verification after programming.	
	True	Enabled
	False	Disabled
Checksum After Program	Selects whether to execute checksum after programming.	
	True	Enabled
	False	Disabled
Set Option Bytes After Program	Selects whether to set option bytes after programming.	
	True	Enabled
	False	Disabled
Set OFS After Program	Selects whether to set OFS after programming	
	True	True
	False	False
Clear Configuration After All Erase	Selects whether to clear configuration after erasing all data by using [All Erase] or other means. Caution: If this function and [All Erase Before Program] are enabled, executing [Program] command does not clear configuration between erasure and programming.	
	True	Enabled
	False	Disabled
File Over Warning	Selects whether to display the warning dialog when the program file exceeds the ROM size of the flash.	
	True	Enabled
	False	Disabled
Checksum Type	Selects the calculation method for checksum.	
	CRC method	Calculates the checksum using the 32-bit CRC method.
	Addition method	Calculates the checksum using the 32-bit addition method.

Remark The 32-bit addition method displays the eight lower-order digits of the result of adding the values of all bytes starting from address 00h. The 32-bit CRC method displays the eight digits of the result of CRC32 function calculation. For details of calculation, refer to **Common Appendix B Figure B-2, 32-bit CRC Method Calculation Specifications**.

<9> [Mode Pins At Disconnection] category

This category is used to make mode pin-related settings.

Reset Pin As Low	Selects whether to set the reset pin at Low level when disconnecting from the device.	
	True	The reset pin is set to low level.
	False	The reset pin is set to high impedance.
Reset Device	Selects whether to reset the device when disconnecting from the device.	
	True	Enabled
	False	Disabled
Mode Pins Information	Specifies the mode pin state when resetting the device.	



[Pin Outputs] check box

Selects the pin to control the mode pin of the target microcontroller from io0 to io5 pins. A selected check box is output, and a cleared check box is input.

[Pin Setting (High)] check box

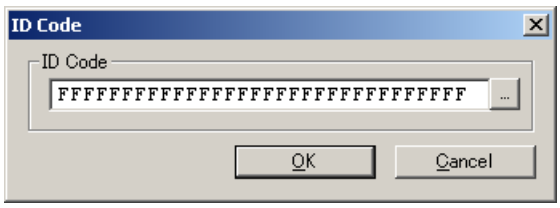
Sets the level of the selected io0 to io5 pins to High or Low. A selected check box is High, and a cleared check box is Low. This setting is effective only when the I/O direction is Output.

Remark For the io0 to io5 pins of E1 and E20, refer to **Common APPENDIX B Figure B-1. E1 and E20 Pins - RX -**.

<10> [ID Code Authentication] category

This category is used to specify ID code.

<table>
<tr><td>ID Code
(Authentication)</td><td colspan="2">Changes the ID code for authentication.

• <Changing the ID code>
 

[ID Code] box
Enter the ID code.
[Import (...)] button
The [Open] dialog box is opened; when an ID code file for authentication in the RFP ID Code File (*.rid)” format is selected, the ID code read from the file will be input to the [ID Code] dialog box.

Notes 1. If the value of each input field is less than effective data bytes, RFP automatically input 0xFF from the beginning of the field.
2. For RX devices, input the value in this order: ID1, ID2, …, ID16.
Example : When Effective data bytes = 16, ID code = ID1=01h, ID2=02h, ID3=03h, ID4=04h, ID5=05h, ID6=06h, ID7=07h, ID8=08h, ID9=09h, ID10=0Ah, ID11=0Bh, ID12=0Ch, ID13=0Dh, ID14=0Eh, ID15=0Fh, ID16=10h
-> ‘ID Code’ 0102030405060708090A0B0C0D0E0F10
• <Output to file…>
The [Save As] dialog box is opened and the name of an ID code file for authentication in the “RFP ID Code Files (*.rid)” format to be created is specified.</td></tr>
<tr><td rowspan="3">Automatic authentication</td><td colspan="2">This option selects whether or not to send the ID code automatically on ID code authentication.</td></tr>
<tr><td>True</td><td>Enables automatic verification of the ID code.</td></tr>
<tr><td>False</td><td>The [ID Code] dialog box is opened on connection to a device to which an ID code has been written.</td></tr>
<tr><td rowspan="3">Save to the project file</td><td colspan="2">This option selects whether or not to save the ID code for authentication in the project file.</td></tr>
<tr><td>True</td><td>Enables the option.</td></tr>
<tr><td>False</td><td>Disables the option.</td></tr>
</table>

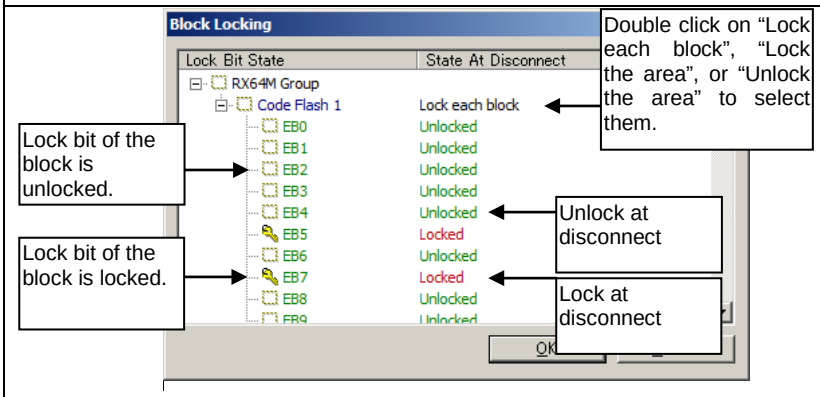
<11> [Timeout Option] category

This category is used to specify Timeout for Erase, Timeout for Blank Check, Timeout for Program, and Timeout for Read.

Timeout At Erase (sec)	Specifies the timeout for erasing the device.
Timeout At Blank Check (sec)	Specifies the timeout for checking if the device is blank.
Timeout At Program (sec)	Specifies the timeout for writing data to the device.
Timeout At Read (sec)	Specifies the timeout for reading data from the device.

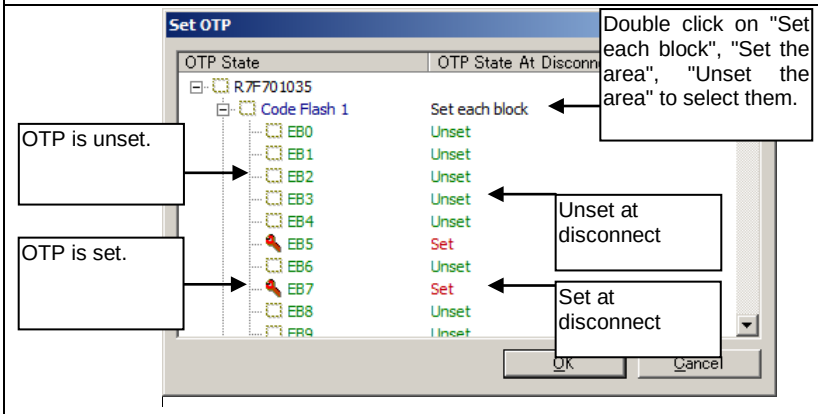
<12> [Lock Bit] category

This category is used to specify lock-bit-related settings.

Disconnect Option	Selects whether to set the lock bit in block units when disconnecting from the device.
	• Set
	• Displays the setting dialog
	• Do Nothing
Lock Blocks At Disconnect	Changes the lock state of the block when disconnecting from the device.
	 The lock bit setting at disconnection is changed to “Locked” or “Unlocked.”

<13> [OTP] category

This category is used to make OTP-related settings.

Disconnect Option	Selects whether to set the OTP when disconnecting from the device.
	• Set
	• Displays the setting dialog
	• Do Nothing
Set OTP At Disconnection	Changes the OTP settings when disconnecting from the device.
	 The OTP setting at disconnection is changed to “Set” or “Unset.”

<14> [Option Bytes] category

This category is used to set option bytes.

Enable Extended Option Byte	Selects whether to Extended Option Byte.	
	True	The values of [OPBT*n*] (*n* = 0 to 12) can be entered.
	False	The values of [OPBT*n*] (*n* = 0 to 7) can be entered.
OPBT*n*	Enters option bytes.	
	FFFFFFFF	Enters any value.

<15> [ICU] category

This category is used to set the ICU.

Disconnect Option	Selects whether to set the ICU when disconnecting from the device.	
	Do nothing	Does nothing
	Set	Sets the ICU.

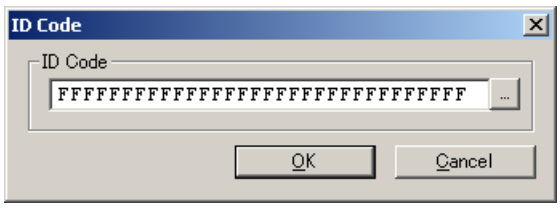
<16> [Set Device Security] category

This category is used to set device security.

Set Security At Disconnection	Selects whether to set the device security when disconnecting from the device.
	• Command Protection Mode
	• ID Authentication Mode
	• Disable Serial Programming
	• Do Nothing

<17> [Set ID Code] category

This category is used to specify ID code for setting.

ID Code (Setting)	Enters the ID code for setting.
	• <Changing the ID code>  [ID Code] box Box for entry of the ID code [Import] button The [Open] dialog box is opened; when an ID code file for setting in the RFP ID Code File (*.rid)" format is selected, the ID code read from the file will be input to the [ID Code] dialog box. **Notes** If the input has fewer bytes than the number of effective data bytes, the RFP automatically pads the value with 0xFF from the beginning of the field. • <Output to file…> The [Save As] dialog box is opened and the name of an ID code file for setting in the "RFP ID Code Files (*.rid)" format to be created is specified.
Disconnection Option	Selects whether to set the ID Code for setting when disconnecting from the device.
	• Set ID Code
	• Do Nothing

<18> [Command Protection Security] category

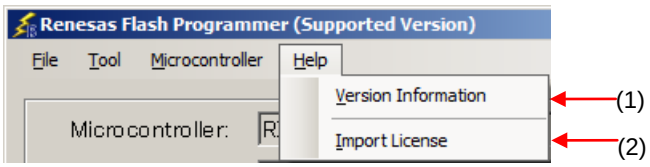
This category is used to set command protection.

Disable Erase	Selects whether to enable the [Erase] command.	
	True	Enabled
	False	Disabled
Disable Program	Selects whether to enable the [Program] command.	
	True	Enabled
	False	Disabled
Disable Read	Selects whether to enable the [Read] command.	
	True	Enabled
	False	Disabled

2.4.4 [Help] menu

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

Figure 2-42. [Help] Menu



(1) [Version Information]

This is used to open the Version Information dialog box below and display the RFP version.
Clicking the OK button closes this dialog box.

Figure 2-43. [Version Information] Dialog Box

(2) [Import License]

For details of this menu item, see the manual accompanying this product.

2.5 [Microcontroller] Area

This area displays the selected target microcontroller.

Figure 2-44. [Microcontroller] Area

2.6 [Program File] Area

This area displays the selected program file. Clicking the Browse... button in the User/Data area or the Browse... button in the User Boot area opens the [Open File] dialog box. Move to a desired folder and select a program file (*.hex;*.mot;*.s*;*.rec). Each item can be enabled by selecting the left check box, or disabled by clearing it.

Remark If you want to write both areas by using a program file that contains the user / data area and user boot area, check the [User/Data area:] and [User Boot area:], and select the same program file on Browse... and Browse... button.

Figure 2-45. [Program File] Area

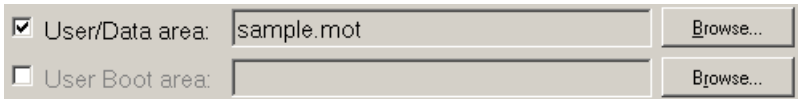
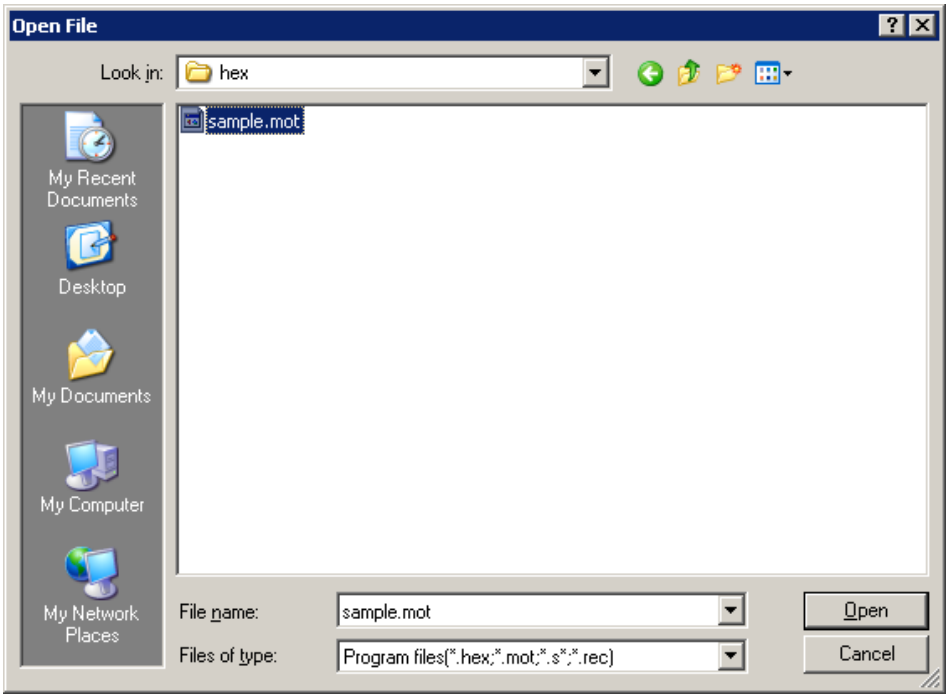


Figure 2-46. [Open File] Dialog Box



2.7 [Command] Area

The command area displays the command selected on the [Microcontroller] menu.

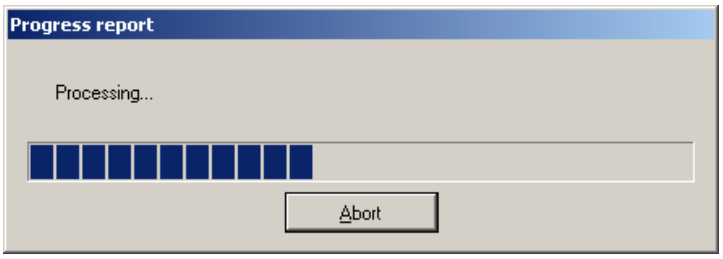
Figure 2-47. Command Area

2.8 Start Button

This button executes the command selected on the [Microcontroller] menu. The execution progress is displayed on the output panel or in the [Progress report] dialog box.

Figure 2-48. Start Button

Figure 2-49. [Progress report] Dialog Box



If Abort button is clicked during the Abort button is effective, the command being executed is aborted.

2.9 Status Bar

The status bar shows the progress as a color and with a message when a command selected on the [Microcontroller] menu is executed.

Figure 2-50. Status Bar

Table 2-1 List of Status Bar Display

	Immediately after start of the command, or when the clear button of the output panel is clicked
BUSY	During the command execution
PASS	When the command has terminated normally
ERROR	When the command has terminated abnormally

2.10 Output Panel

The output panel displays the execution status of the command selected on the [Microcontroller] menu in text. Up to 2000 lines can be displayed. If the text exceeds 2000 lines, lines will be deleted, starting from the first line.

Figure 2-51. Output Panel

(a) Output Panel Context Menu

Right-clicking the output panel displays a context menu.

Table 2-2 Output Panel Context Menu

Copy	Copies the text selected on the output panel to the clip board.
Select All	Selects the entire text on the output panel.
Clear	Clears the entire text and the status bar display of the output panel.
Save	Saves the entire text on the output panel to a file. The [Open File] dialog box opens, where you can specify any filename for the file saved.

2.11 Clear Output Panel Button

Clicking the Clear Output Panel button will delete all the text displayed on the output panel. The status bar is also cleared.

Figure 2-52. Clear Output Panel Button

CHAPTER 3 FUNCTION DETAILS (FULL MODE)

This chapter describes function details of the commands, windows, and dialog boxes of the full mode of RFP.

3.1 Introduction

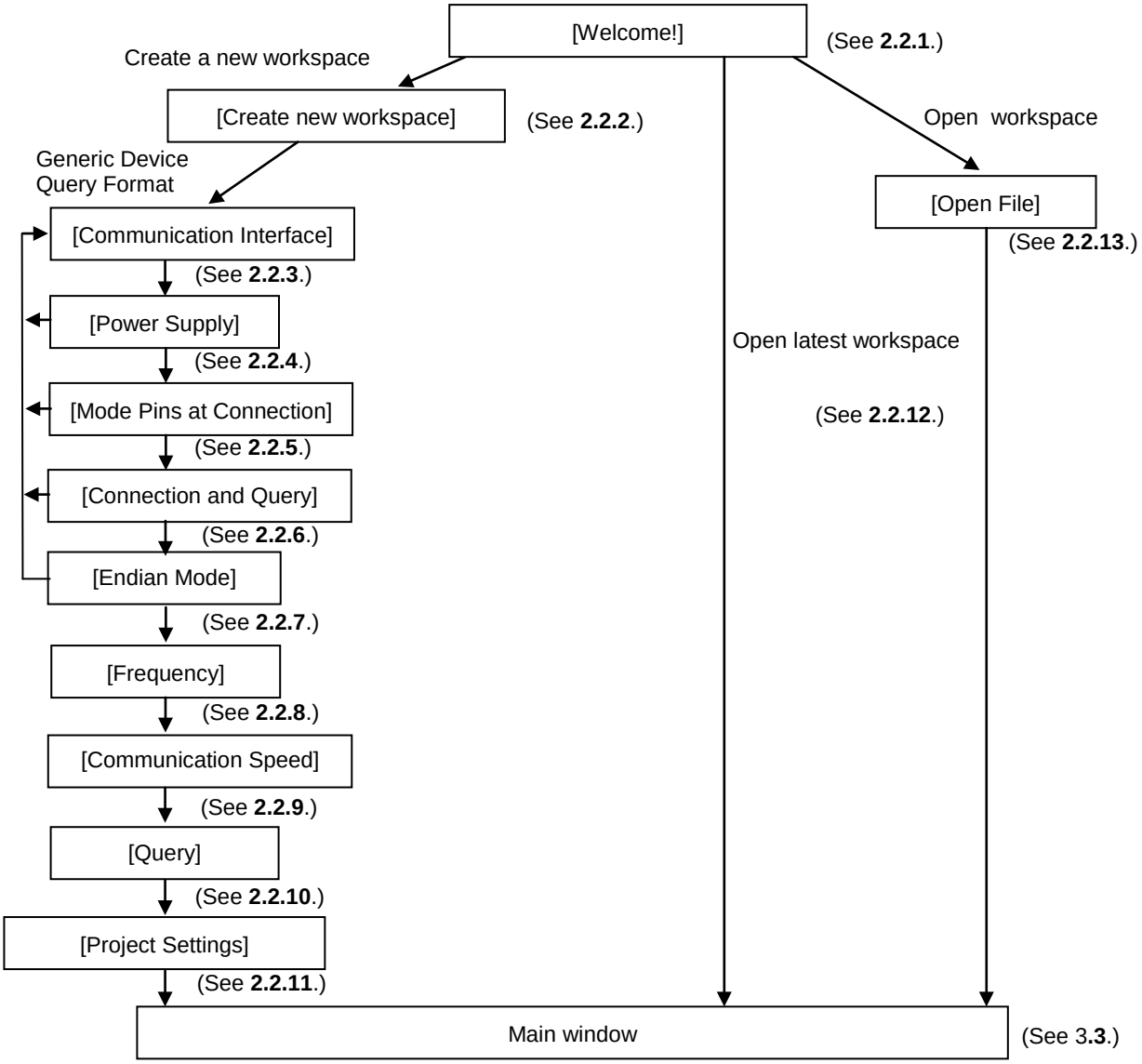
Make sure that the RFP package is installed. For how to install the RFP package, see **Common CHAPTER 2 RFP INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

3.2 Starting up

On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer V*x.xx*], and then click [Renesas Flash Programmer V*x.xx*]. The [Welcome!] dialog box will open.

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The project can be set up by the generic device query format. The device information file is created through a query to the microcontroller.

Figure 3-1. Flow of Dialog Boxes Until the Program is Activated



Or a main window is opened by the following method. In the case of (1), the main window of the version installed recently opens.

(1) Double clicking a workspace file.

(2) Dragging and dropping a workspace file onto RFP.exe.

(3) Typing RFP.exe followed by the name of a workspace file at the command prompt and so on; then executing it.

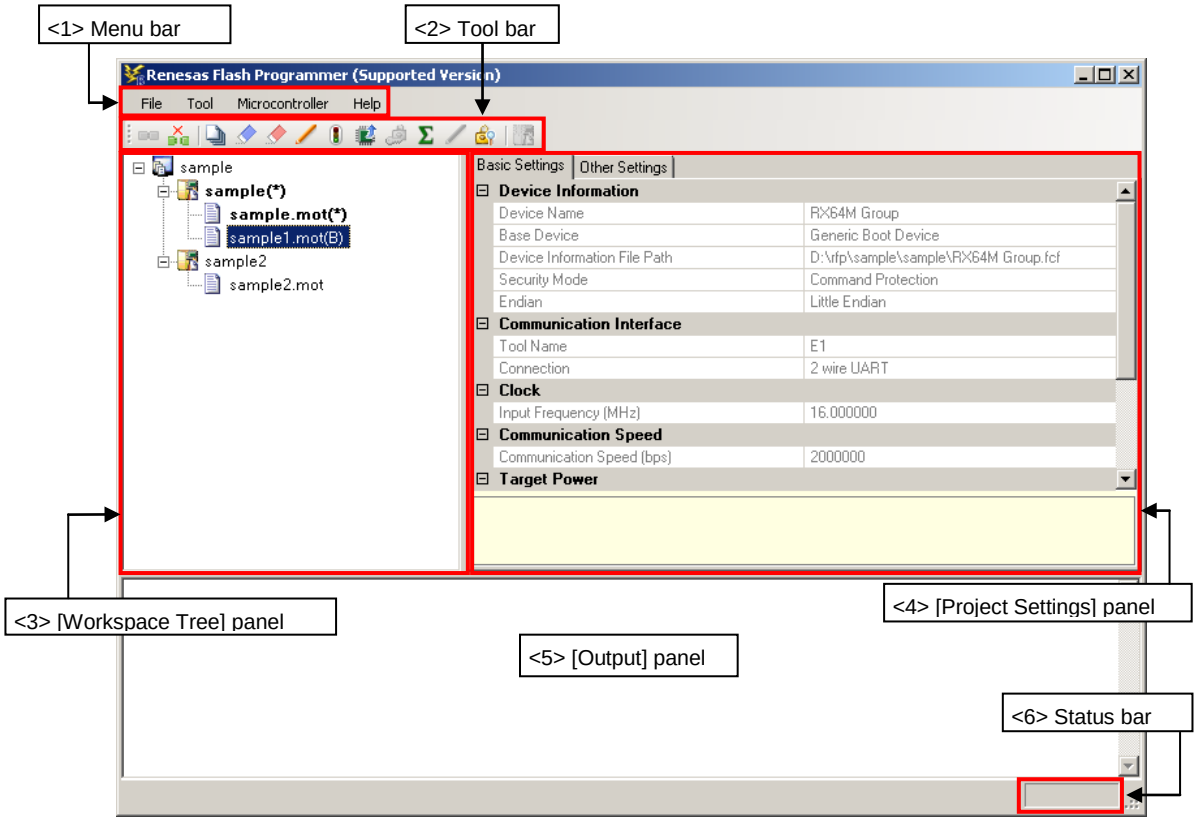
Remarks

1. The following buttons common to all the dialog boxes operate as follows:
   Clicking the [OK], [Next >], or [Complete] button opens the next dialog box. Clicking the [< Back] button opens the previous dialog box.
   Clicking the [Cancel] or the [X] button closes the dialog box.
2. The [Power Supply], [Mode Pin at Connection], [Endian Mode], [Frequency], and [Communication Speed] dialog boxes are skipped depending on the selected connection method.

3.3 Main Window

The main window consists of the following items:

Figure 3-2. Main Window



The main window consists of the following items:

Name		Description	See
<1>	Menu bar	Displays the selectable menus.	3.4
<2>	Tool bar	Displays buttons for frequently used commands.	3.5
<3>	[Workspace Tree] panel	Displays the workspace in a tree form.	3.6
<4>	[Project Settings] panel	Displays the project settings.	3.7
<5>	[Output] panel	Displays the command execution output.	3.8
<6>	Status bar	Displays the command execution status in colors and text	3.9

3.4 Menu Bar

The menu bar consists of [File], [Tool], [Microcontroller], and [Help]. When a menu is selected, the pull-down menu is displayed where the items can be selected. Some items may be disabled depending on the settings.

3.4.1 [File] menu

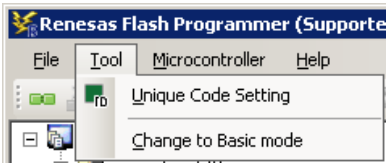
The following pull-down menu appears by selecting the [File] menu. Refer to **2.4.1** for details of each menu.

Figure 3-3. [File] Menu

3.4.2 [Tool] menu

Selecting the [**Tool**] menu displays the pull-down menu as shown in the figure below. Refer to **2.4.2** for details of each menu.

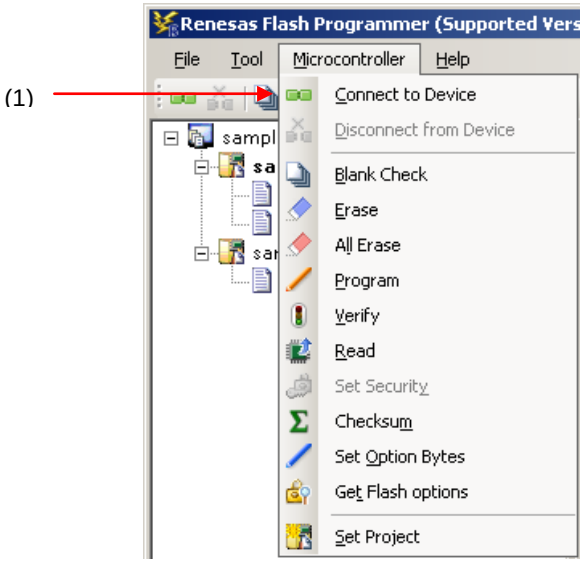
Figure 3-4. [Tool] Menu



3.4.3 [Microcontroller] menu

The following pull-down menu appears by selecting the [Microcontroller] menu. You can select a command such as [Disconnect To Device], [All Erase], and [Program], or make settings. Selecting any command executes that command. Selecting [Project Settings] opens a wizard-type dialog box for changing the project basic settings. For details of the commands other than [Connect to Device], refer to **2.4.3**.

Figure 3-5. [Microcontroller] Menu



(1) [Connect To Device]

This menu item connects to the device. If the [Power target from the emulator] checkbox of the [Power Supply] dialog is selected, the power supply starts.

3.4.4 [Help] menu

Clicking the [Help] menu displays the following pull-down menu. Refer to **2.4.4** for details of each menu.

Figure 3-6. [Help] Menu

3.5 Tool Bar

The tool bar lists the buttons for the commands of the [Microcontroller] menu. Clicking any of the buttons executes the corresponding command. Some buttons become enabled or disabled depending on the settings. Placing the mouse cursor over a tool bar button displays a tooltip. Refer to 8.4.3 for details of each command.

Figure 3-7. Tool Bar

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12)

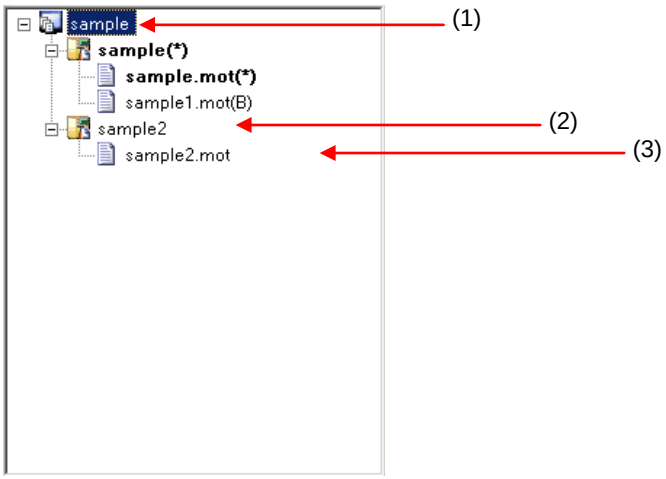
Table 3-1. Tool Bar

(1)	Executes the [Connect To Device].
(2)	Executes the [Disconnect from Device].
(3)	Executes the [Blank Check] command.
(4)	Executes the [Erase] command.
(5)	Executes the [All Erase] command
(6)	Executes the [Program] command.
(7)	Executes the [Verify] command.
(8)	Executes the [Read] command.
(9)	Executes the [Checksum] command.
(10)	Executes the [Set Option Bytes] command
(11)	Executes the [Get Flash Options] command
(12)	Opens a wizard-type dialog box for changing the project basic settings. Remark: This button is invalid when the device is connected to a target microcontroller. Select [Disconnect from Device] to enable the button.

3.6 [Workspace Tree] Panel

This panel displays the tree-format representation of the workspace elements (workspace nodes, project nodes, and program file nodes), allowing you to make project operations (such as adding and deleting) and program file operations (such as adding, deleting, and programming).

Figure 3-8. [Workspace Tree] Panel



(1) Workspace node

This node represents the workspace currently opened. You cannot open multiple workspaces. The workspace tree has only one workspace node as its root node.

(a) Context menu of the workspace node

Right-clicking the workspace node displays its context menu.

Table 3-2. Context Menu of the Workspace Node

Add Project	This menu item opens the [Create a new workspace] dialog for adding a project in the workspace. The newly added project becomes available for manipulation and edition. The project that has been created is saved.

(2) Project nodes

A project node represents a project within the workspace. You can manipulate and edit one of the multiple projects (maximum of 64) at a time. The project that can be manipulated and edited is marked by "(*)". Double-clicking one of other project nodes makes it available for manipulation and edition.

(a) Context menu of project nodes

Right-clicking a project node displays its context menu.

Table 3-3. Context Menu of Project Nodes

Set Project Active	Makes the selected project available for manipulation and edition. The project that has been manipulated and edited is saved.
Delete Project	Deletes the selected project from the list. The project file itself is not deleted. This menu item is enabled when the project is not being manipulated or edited.
Add Program File	Adds a program file to the selected project. The [Open File] dialog box opens for adding a program file.
Merge Program File	Merges data in all program files added to the selected project and outputs the result as a single program file. The program file is in Motorola S-format HEX format (data record: S3, end record: S7). Note that data in ranges beyond the memory area of the MCU will not be output.

(3) Program file nodes

A program file node represents a program file of a project. A project allows multiple program files (maximum of 64) to be registered, one of which is available for programming and verification. The program file node available for programming and verification is marked by "(*)". Double-clicking one of other nodes makes it available for programming and verification. Selecting [User Boot Area] from the context menu of a program file node marks the project node with "(B)".

(a) Context menu of program file nodes

Right-clicking a program file node displays its context menu.

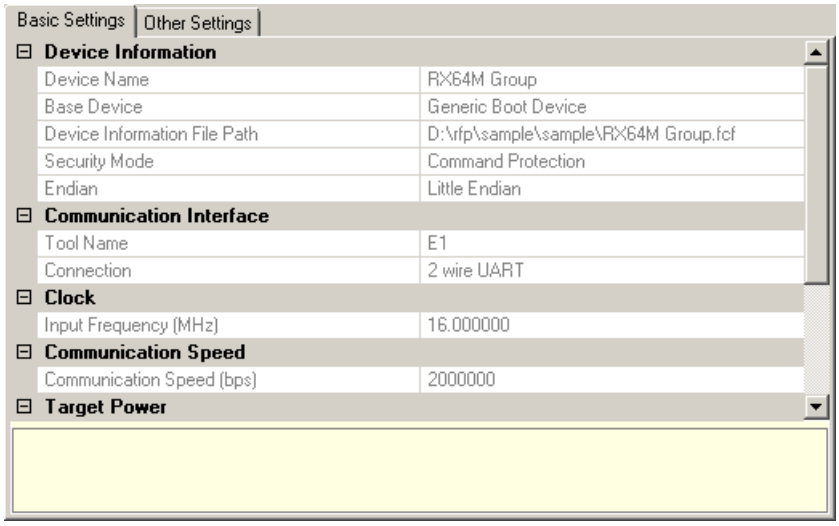
Table 3-4. Context Menu of Program File Nodes

Set Program File Active		Makes the selected program file available for programming and verification.
Delete Program File		Deletes the selected program file from the list. The program file itself is not deleted. This menu item is enabled when the program file is not set as the active program file.
Area		Selects an area from the selected program file.
	User/Data Area	Specifies the area for programming and verification as the User/Data Area.
	User Boot Area	Specifies the area for programming and verification as the User boot Area.
Program		Executes the [Program] command with the selected program file and area. This menu item is enabled only for the active program file.
Autoprocedure(E.P.)		Not used.

3.7 [Project Settings] Panel

This panel allows you to check and change the project settings. The [Basic Setting] tab and [Other Setting] tab are included in this panel, each of which displays its specific category of settings when selected. Information displayed on this panel is for the project selected for manipulation and edition. Refer to 2.4.3 (11) (f), [Project Settings] dialog for details on the commands other than [Erase Before Program].

Figure 3-9. [Project Settings] Panel



<1> [Command Options] category

Operation options can be set.

Erase Before Program	Selects whether to erase the blocks automatically before programming the blocks that have already been programmed.	
	Automatic	Automatically erases the blocks.
	Interactive	Displays the confirmation dialog box before erasure.
	None	Does not erase the blocks before programming.

3.8 Output Panel

The output panel displays the execution status of the command selected on the [Microcontroller] menu or the tool bar in text. Up to 2000 lines can be displayed. If the text exceeds 2000 lines, lines will be deleted, starting from the first line. Refer to 2.10 for details.

Figure 3-10. Output Panel

3.9 Status Bar

The status bar shows the progress as a color and with a message when a command selected on the [Microcontroller] menu or the tool bar is executed.

Figure 3-11. Status Bar

Table 3-5. Status Bar Displays

	Immediately after startup, or when [Clear] is selected in the context menu of the output panel
BUSY	During the command execution
PASS	When the command has terminated normally
ERROR	When the command has terminated abnormally

CHAPTER 4 SCRIPT EXECUTION FUNCTION

This chapter explains the script execution function.

4.1 Overview

The script execution function executes the script commands in a script file sequentially without displaying the main window or dialog boxes[note]. The RFP can be started up and the write command can be executed from the command prompt or user applications.

Note Processing automatically proceeds in response to clicking on OK button in the [Confirmation] dialog box. Note, however, depending on the settings, a dialog box might be shown while the program is running (see section 4.6).

4.2 Start and exit

The script execution starts by the following method. In the case of (1), the main window of the version installed recently starts.

(1) Double clicking a script file.

(2) Dragging and dropping a script file onto RFP.exe.

(3) Typing RFP.exe followed by the name of a script file at the command prompt and so on; then executing it.

After the script execution starts, the script commands in the script file are executed from the first line to the last sequentially. When execution of all commands in the script down to the last line is completed, the result code “”0” is returned on exit from the RFP. If there is an error in a command or an error is generated while a command is being executed, the result code “1” is returned immediately and execution of the RFP is terminated. As a note, If there is no script file (*.rsc) or a file that is not a script file (not an *.rsc file) is specified, the script execution function ends and the [Welcome!] dialog box is opened. If an error occurs due to an incorrect command in the script or while a command is being executed, the [Welcome!] dialog box will not open.

RFP.exe xxxx

xxxx: the full path of a script file. If the full path contains spaces, use double quotation marks to enclose the full path (" ").

Example) A batch file (sample.bat) example

```
:START
d:\rfp\ws\RFP.exe "d:\rfp\sample\sample.rsc"
ECHO OFF
ECHO Rusult Code : %ErrorLevel%
PAUSE
```

4.3 Script file

This section describes a script file (file extension, file format, file and example).

(1) File extension

*.rsc

(2) File format

File format: text format

Newline: CR + LF

The only supported character code is ASCII (one byte). Unicode (two bytes) is not supported.

(3) Format

The first line :log command (optional)
The second line :workspace command
The third line and after :arbitrary script command
The lines starting with // are comment lines and will be skipped.

(4) Example

```
//Sample script file
log "d:\rfp\sample\sample.log"
workspace "d:\rfp\sample\sample\sample.rws"
programfile d:\hex\sample.mot userdata
serial e1 9jm000129
connect
verify
disconnect
```

4.4 Script commands

This section describes script commands in a script file. The command interpreter is case-insensitive.

The symbols used to describe the script commands are defined below.

Symbol	Description
Characters within angle brackets < >	Information that must be provided
Characters within square brackets [ ]	Optional information
Slash /	Options where only one option must be selected

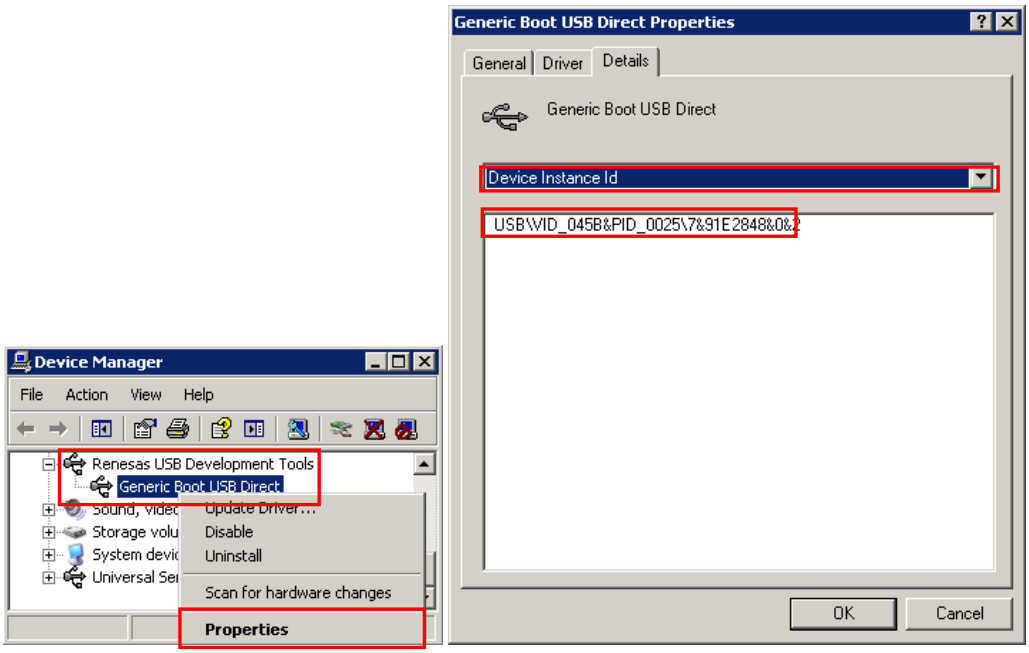
Table 4-1 Script Commands

Function	Script command Description
Specify a log file	log <filename>
	Specifies a log file. For more details, see **4.5**. <filename>: the full path of the log file. If the full path contains spaces, use double quotation marks to enclose the full path (" ").
Specify a workspace	workspace <filename>
	Specifies a workspace file. The script execution function uses an active project and an active program file. <filename>: the full path of the workspace file. If the path contains spaces, use double quotation marks to enclose the path (" ").
Specify a program file	programfile <filename> <area>
	Specifies a program file. When multiple files are specified, the last file is active. <filename>: the full path of the program file. If the path contains spaces, use double quotation marks to enclose the path (" "). <area>: specifies the area (userdata / userboot) userdata: specifies the user and data area. userboot: specifies the user boot area.

Specify an ID code file	idcodefile <filename>
	Specifies an ID code file for authentication. When multiple files are specified, the command is only effective for the last file to be specified. Note that the command leads to the ID code settings in a project file being ignored. <filename>: Use double quotation marks (“ ”) in cases where the full pathname of the program file is specified or the filename includes a space.
Specify the serial number	serial <connection> <serial_id>
	Specifies the serial number of the tool used. <connection>: specifies the connection method. (e1/ e20/ usb) e1: specifies “E1.” e20: specifies “E20.” usb: specifies “USB Direct.” <serial_id>: When "E1" or "E20" is selected, the serial number marked on the chassis: Example) 9jm000129 When "USB Direct" is selected, the USB port number* : Example) VID_045B&PID_0025\6&3234B9D9&0&3
Wait	wait <time>
	Waits for the specified time. <time>: specifies the wait time (unit: msec, range: 1-2147483647)
Connect to the device	connect
	Executes the connect to the device command.
Disconnect from the device	disconnect
	Executes the disconnect from the device command.
Blank check	blankcheck <area> [<option>]
	Executes the blankcheck command. <area>: specifies the area (user / data/ userboot/ all) user: specifies the user area. data: specifies the data area. userboot: specifies the user boot area. all: specifies all the area. If data or userboot is specified for a microcontroller that does not have a data area or user boot area, the result code “1” is returned. <option>: specifies the action (stoponwritten / stoponblank) stoponwritten: if the area specified with <area> is not blank, terminate the script execution function. stoponblank: if the area specified with <area> is blank, terminate the script execution function.
Erase	erase <block>
	Executes the erase command. <block>: specifies using either one of the following options. Using block numbers: Example) 0|1|4|7 Using block names: Example) EB0|EB1|EBA|EBB written: all written blocks will be erased. device: all blocks will be erased.
Program	program
	Executes the program command.

Verify	verify
	Executes the verify command.
Checksum	checksum
	Executes the checksum command.

*) The USB port number is information shown in the device manager when the Generic USB Boot device is connected to the host PC with a USB cable. In the following case, it is "VID_045B&PID_0025\6&3234B9D9&0&3".



4.5 Log file

Execute the specify a log file script command (log <filename>) by the script command to create a specified log file and to save the script commands and the characters in the output panel to the log file in the text format. If a log file with the same name already exists when a new log file is tried to be created, the existing log file is opened and new log entries are appended after the last line.

(1) Log file format

[DD-Mon-YY HH:MM:SS.mmm] ------ Start Script ------
Version
Script
Workspace
[DD-Mon-YY HH:MM:SS.mmm] <script command>
Characters in the output panel
[DD-Mon-YY HH:MM:SS.mmm] ------ End Script ------

DD: day (two digits)
Mon: month (three characters)
YY: year (two digits)
HH: hour (two digits)
MM: minute (two digits)
SS: second (two digits)
mmm: millisecond (three digits)

4.6 How to Handle Dialog Boxes that Open while the Program is Running

According to the settings, dialog boxes might be displayed while the program is running. How to deal with the various dialog boxes is covered below.

(1) [ID code] dialog box
<Condition>
When the ID code set in a project and that written in the microcomputer do not match, the [ID Code] dialog box is displayed on connection of the microcomputer.
<Action by the user>
Enter the ID code written in the microcomputer to the [ID Code] dialog box in the [ID Code Authentication] category under the [Other Settings] tab in the [Project Settings]. After that, set [Auto Authentication] to “True”.

(2) [Block Locking] dialog box
<Condition>
The [Block Locking] dialog box is displayed on disconnection of a microcomputer that supports lock bits.
<Action by user>
Select either [Set Locks/Unlocks] or [Do Nothing] for [Disconnect Option] in the [Lock Bit] category below the [Other Settings] tab in the [Project Settings] dialog box.

(3) [Set OTP] dialog box
<Condition>
The [Set OTP] dialog box is displayed on disconnection of a microcomputer that supports OTP.
<Action by user>
Select either [Set OTP] or [Do Nothing] for [Disconnect Option] in the [OTP] category below the [Other Settings] tab in the [Project Settings] dialog box.

(4) [Confirmation] dialog box
<Condition>
The [Confirmation] dialog box is displayed when the program file exceeds the capacity of the flash ROM at the time of writing.
<Action by user>
Change the setting of [File Over Warning] to “False” in the [Flash Program Options] category under the [Other Settings] tab in the [Project Settings] dialog box.

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