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(2012.4)
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

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

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.

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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 Vdd power from the target system.
Creation of workspace

1. On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer Vx.xx], and then click [Renesas Flash Programmer Vx.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.

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.
<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 E2, refer to Common Appendix B Figure B-1 E1 and E20 pins - RX -.

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

Figure 1-5. [Mode Pins at Connection] 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**

![Select Emulator Dialog Box](image1)

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

**Figure 1-8. [Endian Mode] Dialog Box**

![Endian Mode Dialog Box](image2)

<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**

![Frequency Dialog Box](image3)
<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

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

<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 VDD 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.
(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 VDD 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 Vx.xx], and then click [Renesas Flash Programmer Vx.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:
(2) Mode:
(3) Using Target Microcontroller:
(4) Workspace Name:
(5) Project Name:
(6) Folder:
(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.

![Communication Interface Dialog Box](image)

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

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.

![Mode Pins at Connection Dialog Box](image)

- **[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.

![Confirmation Dialog Box](image)
(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](image)

**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](image)

**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](image)
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](image)

(1) [Clock supply] area

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

![Figure 2-13. [Clock supply] Area](image)

[Internal/External:] list box

Displays the type of clock supplied to the target microcontroller.

<table>
<thead>
<tr>
<th>External Resonator or Clock</th>
<th>Clock or clock resonator for a microcontroller that does not support the clock switching function</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Clock</td>
<td>Clock for a microcontroller that supports the clock switching function</td>
</tr>
<tr>
<td>External Resonator</td>
<td>Clock resonator for a microcontroller that supports the clock switching function</td>
</tr>
<tr>
<td>Internal Clock</td>
<td>On-chip oscillator for a microcontroller that supports the clock switching function</td>
</tr>
</tbody>
</table>

[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](image)

(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](image)
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.

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.]](image)

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.]](image)
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:

![Main Window Diagram]

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

Figure 2-20. Main Window
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](image)

(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](image)

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

![Figure 2-25. [Unique Code Setting] Dialog Box](image)

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

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 \textbf{Erase} button leads to erasing of the data from the specified address range.
Clicking the \textbf{Cancel} or the \textbf{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 (1) (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 (1) (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.
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.
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

<table>
<thead>
<tr>
<th>Calculating device checksum</th>
<th>Flash Checksum: 0x3FBCE2BF Code Flash 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flash Checksum: 0x007F8000 User Boot Area</td>
</tr>
<tr>
<td></td>
<td>Flash Checksum: 0x007F8BA5 Data Flash</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Calculating device checksum</th>
<th>Flash Checksum: 0x371B4DD7 Code Flash 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flash Checksum: 0x42A83D27 User Boot Area</td>
</tr>
<tr>
<td></td>
<td>Flash Checksum: 0xE24CS217 Data Flash</td>
</tr>
</tbody>
</table>

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 [OPBTn] 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) [Option Bytes] category, <16> [Set Device Security] category, and <17> [Set ID Code] category.
(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](image)

**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](image)

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](image)

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](image)

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](image)

**[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.

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

### <2> **[Communication Interface] category**

This category displays Tool and Connection.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Name</td>
<td>Displays the communication tool between the target board and host PC.</td>
</tr>
<tr>
<td>Connection</td>
<td>Displays the connection method between the target board and host PC.</td>
</tr>
</tbody>
</table>

### <3> **[Clock] category**

This category displays clock-related settings.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Frequency (MHz)</td>
<td>Displays the input clock of the device.</td>
</tr>
</tbody>
</table>

### <4> **[Communication Speed] category**

This category displays communication speed-related settings.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Speed (bps)</td>
<td>Displays the communication speed with the device.</td>
</tr>
</tbody>
</table>

### <5> **[Target Power Supply] category**

This category displays Power Supply of the target device.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Power</td>
<td>Displays the power supply for the target device.</td>
</tr>
</tbody>
</table>
<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.

<table>
<thead>
<tr>
<th>Auto Disconnect</th>
<th>Selects whether to disconnect automatically after execution.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<8> [Command Options] category

This category is used to set the operation options.

<table>
<thead>
<tr>
<th>Write Mode</th>
<th>Selects the unit of data for programming or verification.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Programming Mode</td>
<td>Executes programming or verification in block units. If there is available space in a block, the space is filled with FFH.</td>
</tr>
<tr>
<td>Minimum Programming Mode</td>
<td>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.</td>
</tr>
</tbody>
</table>

| Set Program/ Verify Blocks | Specifies a block to be programmed or verified in the [Select Blocks] dialog box when Block Programming Mode is selected. |

<table>
<thead>
<tr>
<th>Select Blocks Dialog Before Program/Verify</th>
<th>Selects whether to display the [Select Blocks] dialog box before programming or verification when Block Programming Mode is selected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All Erase Before Program</th>
<th>Selects whether to erase all blocks before programming.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Verify After Program</td>
<td>Selects whether to execute verification after programming.</td>
</tr>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>Checksum After Program</td>
<td>Selects whether to execute checksum after programming.</td>
</tr>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>Set Option Bytes After Program</td>
<td>Selects whether to set option bytes after programming.</td>
</tr>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>Set OFS After Program</td>
<td>Selects whether to set OFS after programming.</td>
</tr>
<tr>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>False</td>
<td>False</td>
</tr>
<tr>
<td>Clear Configuration After All Erase</td>
<td>Selects whether to clear configuration after erasing all data by using [All Erase] or other means.</td>
</tr>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>File Over Warning</td>
<td>Selects whether to display the warning dialog when the program file exceeds the ROM size of the flash.</td>
</tr>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
<tr>
<td>Checksum Type</td>
<td>Selects the calculation method for checksum.</td>
</tr>
<tr>
<td>CRC method</td>
<td>Calculates the checksum using the 32-bit CRC method.</td>
</tr>
<tr>
<td>Addition method</td>
<td>Calculates the checksum using the 32-bit addition method.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Reset Pin As Low</th>
<th>Selects whether to set the reset pin at Low level when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>The reset pin is set to low level.</td>
</tr>
<tr>
<td>False</td>
<td>The reset pin is set to high impedance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reset Device</th>
<th>Selects whether to reset the device when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode Pins Information</th>
<th>Specifies the mode pin state when resetting the device.</th>
</tr>
</thead>
</table>

![Mode Pins at Disconnection]

[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>
<thead>
<tr>
<th>ID Code (Authentication)</th>
<th>Changes the ID code for authentication.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• &lt;Changing the ID code&gt;</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="ID Code dialog box" /></td>
</tr>
</tbody>
</table>

[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.

<table>
<thead>
<tr>
<th>Automatic authentication</th>
<th>This option selects whether or not to send the ID code automatically on ID code authentication.</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Save to the project file</th>
<th>This option selects whether or not to save the ID code for authentication in the project file.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enables the option.</td>
</tr>
<tr>
<td>False</td>
<td>Disables the option.</td>
</tr>
</tbody>
</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.

<table>
<thead>
<tr>
<th>Timeout At Erase (sec)</th>
<th>Specifies the timeout for erasing the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeout At Blank Check (sec)</td>
<td>Specifies the timeout for checking if the device is blank.</td>
</tr>
<tr>
<td>Timeout At Program (sec)</td>
<td>Specifies the timeout for writing data to the device.</td>
</tr>
<tr>
<td>Timeout At Read (sec)</td>
<td>Specifies the timeout for reading data from the device.</td>
</tr>
</tbody>
</table>

<12> [Lock Bit] category

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

<table>
<thead>
<tr>
<th>Disconnect Option</th>
<th>Selects whether to set the lock bit in block units when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Set</td>
<td>- Displays the setting dialog</td>
</tr>
<tr>
<td>• Do Nothing</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lock Blocks At Disconnect</th>
<th>Changes the lock state of the block when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double click on “Lock each block”, “Lock the area”, or “Unlock the area” to select them.</td>
<td></td>
</tr>
</tbody>
</table>

The lock bit setting at disconnection is changed to “Locked” or “Unlocked.”
### <13> [OTP] category

This category is used to make OTP-related settings.

<table>
<thead>
<tr>
<th>Disconnect Option</th>
<th>Selects whether to set the OTP when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Nothing</td>
<td>Displays the setting dialog</td>
</tr>
<tr>
<td>Set</td>
<td>Displays the setting dialog</td>
</tr>
</tbody>
</table>

Set OTP At Disconnection

Changes the OTP settings when disconnecting from the device.

<table>
<thead>
<tr>
<th></th>
<th>Double click on &quot;Set each block&quot;, &quot;Set the area&quot;, &quot;Unset the area&quot; to select them.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTP is unset.</td>
<td>Unset at disconnect</td>
</tr>
<tr>
<td>OTP is set.</td>
<td>Set at disconnect</td>
</tr>
</tbody>
</table>

The OTP setting at disconnection is changed to “Set” or “Unset.”

### <14> [Option Bytes] category

This category is used to set option bytes.

<table>
<thead>
<tr>
<th>Enable Extended Option Byte</th>
<th>Selects whether to Extended Option Byte.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>The values of [OPBTn] (n = 0 to 12) can be entered.</td>
</tr>
<tr>
<td>False</td>
<td>The values of [OPBTn] (n = 0 to 7) can be entered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPBTn</th>
<th>Enters option bytes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFFFFFF</td>
<td>Enters any value.</td>
</tr>
</tbody>
</table>

### <15> [ICU] category

This category is used to set the ICU.

<table>
<thead>
<tr>
<th>Disconnect Option</th>
<th>Selects whether to set the ICU when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do nothing</td>
<td>Does nothing</td>
</tr>
<tr>
<td>Set</td>
<td>Sets the ICU.</td>
</tr>
</tbody>
</table>

### <16> [Set Device Security] category

This category is used to set device security.

<table>
<thead>
<tr>
<th>Set Security At Disconnection</th>
<th>Selects whether to set the device security when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command Protection Mode</td>
<td></td>
</tr>
<tr>
<td>ID Authentication Mode</td>
<td></td>
</tr>
<tr>
<td>Disable Serial Programming</td>
<td></td>
</tr>
<tr>
<td>Do Nothing</td>
<td></td>
</tr>
</tbody>
</table>
<17> [Set ID Code] category

This category is used to specify ID code for setting.

<table>
<thead>
<tr>
<th>ID Code (Setting)</th>
<th>Enter the ID code for setting.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="ID Code dialog box" /></td>
</tr>
</tbody>
</table>

[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.

<table>
<thead>
<tr>
<th>Disconnection Option</th>
<th>Selects whether to set the ID Code for setting when disconnecting from the device.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Disconnection Option" /></td>
</tr>
<tr>
<td>Set ID Code</td>
<td></td>
</tr>
<tr>
<td>Do Nothing</td>
<td></td>
</tr>
</tbody>
</table>

<18> [Command Protection Security] category

This category is used to set command protection.

<table>
<thead>
<tr>
<th>Disable Erase</th>
<th>Selects whether to enable the [Erase] command.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disable Program</th>
<th>Selects whether to enable the [Program] command.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disable Read</th>
<th>Selects whether to enable the [Read] command.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td>Enabled</td>
</tr>
<tr>
<td>False</td>
<td>Disabled</td>
</tr>
</tbody>
</table>
2.4.4 [Help] menu

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

![Figure 2-42. [Help] Menu](image)

(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](image)

(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](image)
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

![Program File Area]

Figure 2-46. [Open File] Dialog Box

![Open File Dialog Box]

2.7 [Command] Area

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

Figure 2-47. Command Area

![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.

![Start Button](image)

Figure 2-49. [Progress report] Dialog Box

Table 2-1 List of Status Bar Display

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSY</td>
<td>During the command execution</td>
</tr>
<tr>
<td>PASS</td>
<td>When the command has terminated normally</td>
</tr>
<tr>
<td>ERROR</td>
<td>When the command has terminated abnormally</td>
</tr>
</tbody>
</table>

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.

![Status Bar](image)
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.

![Output Panel](image)

(a) Output Panel Context Menu

Right-clicking the output panel displays a context menu.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Copies the text selected on the output panel to the clip board.</td>
</tr>
<tr>
<td>Select All</td>
<td>Selects the entire text on the output panel.</td>
</tr>
<tr>
<td>Clear</td>
<td>Clears the entire text and the status bar display of the output panel.</td>
</tr>
<tr>
<td>Save</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.

![Clear Output Panel Button](image)
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 Vx.xx], and then click [Renesas Flash Programmer Vx.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

Create a new workspace

[Create new workspace] (See 2.2.2.)

[Welcome!] (See 2.2.1.)

[Open workspace]

Open latest workspace (See 2.2.12.)

[Open File] (See 2.2.13.)

[Communication Interface] (See 2.2.3.)

[Power Supply] (See 2.2.4.)

[Mode Pins at Connection] (See 2.2.5.)

[Connection and Query] (See 2.2.6.)

[Endian Mode] (See 2.2.7.)

[Frequency] (See 2.2.8.)

[Communication Speed] (See 2.2.9.)

[Query] (See 2.2.10.)

[Project Settings] (See 2.2.11.)

Main window (See 3.3.)

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**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1&gt; Menu bar</td>
<td>Displays the selectable menus.</td>
<td>3.4</td>
</tr>
<tr>
<td>&lt;2&gt; Tool bar</td>
<td>Displays buttons for frequently used commands.</td>
<td>3.5</td>
</tr>
<tr>
<td>&lt;3&gt; [Workspace Tree] panel</td>
<td>Displays the workspace in a tree form.</td>
<td>3.6</td>
</tr>
<tr>
<td>&lt;4&gt; [Project Settings] panel</td>
<td>Displays the project settings.</td>
<td>3.7</td>
</tr>
<tr>
<td>&lt;5&gt; [Output] panel</td>
<td>Displays the command execution output.</td>
<td>3.8</td>
</tr>
<tr>
<td>&lt;6&gt; Status bar</td>
<td>Displays the command execution status in colors and text</td>
<td>3.9</td>
</tr>
</tbody>
</table>
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](image)

(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](image)
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**

![Tool Bar Image]

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
<tr>
<td>(8)</td>
<td>(9)</td>
<td>(10)</td>
<td>(11)</td>
<td>(12)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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).

![Diagram of 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. |

Figure 3-8. [Workspace Tree] Panel

(1) Workspace node
(2) Context menu of workspace node
(3) Sample example nodes
(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>
<thead>
<tr>
<th>Table 3-3. Context Menu of Project Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Project Active</td>
</tr>
<tr>
<td>Delete Project</td>
</tr>
<tr>
<td>Add Program File</td>
</tr>
<tr>
<td>Merge Program File</td>
</tr>
</tbody>
</table>

(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>
<thead>
<tr>
<th>Table 3-4. Context Menu of Program File Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Program File Active</td>
</tr>
<tr>
<td>Delete Program File</td>
</tr>
<tr>
<td>Area</td>
</tr>
<tr>
<td>User/Data Area</td>
</tr>
<tr>
<td>User Boot Area</td>
</tr>
<tr>
<td>Program</td>
</tr>
<tr>
<td>Autoprocure(E.P.)</td>
</tr>
</tbody>
</table>
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](image)

<1> [Command Options] category

Operation options can be set.

<table>
<thead>
<tr>
<th>Erase Before Program</th>
<th>Selects whether to erase the blocks automatically before programming the blocks that have already been programmed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic</td>
<td>Automatically erases the blocks.</td>
</tr>
<tr>
<td>Interactive</td>
<td>Displays the confirmation dialog box before erasure.</td>
</tr>
<tr>
<td>None</td>
<td>Does not erase the blocks before programming.</td>
</tr>
</tbody>
</table>

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](image)
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.

![Status Bar](image)

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSY</td>
<td>During the command execution</td>
</tr>
<tr>
<td>PASS</td>
<td>When the command has terminated normally</td>
</tr>
<tr>
<td>ERROR</td>
<td>When the command has terminated abnormally</td>
</tr>
</tbody>
</table>

Immediately after startup, or when [Clear] is selected in the context menu of the output panel.
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. 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 Result 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.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characters within angle brackets &lt; &gt;</td>
<td>Information that must be provided</td>
</tr>
<tr>
<td>Characters within square brackets [ ]</td>
<td>Optional information</td>
</tr>
<tr>
<td>Slash /</td>
<td>Options where only one option must be selected</td>
</tr>
</tbody>
</table>

Table 4-1 Script Commands

<table>
<thead>
<tr>
<th>Function</th>
<th>Script command</th>
<th>Description</th>
</tr>
</thead>
</table>
| 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. |
### CHAPTER 4  SCRIPT EXECUTION FUNCTION

<table>
<thead>
<tr>
<th>Specify an ID code file</th>
<th><code>idcodefile &lt;filename&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>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. <code>&lt;filename&gt;</code>: Use double quotation marks (&quot; &quot;) in cases where the full pathname of the program file is specified or the filename includes a space.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specify the serial number</th>
<th><code>serial &lt;connection&gt; &lt;serial_id&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the serial number of the tool used. <code>&lt;connection&gt;</code>: specifies the connection method. (e1/ e20/ usb) <code>e1</code>: specifies &quot;E1.&quot; <code>e20</code>: specifies &quot;E20.&quot; <code>usb</code>: specifies &quot;USB Direct.&quot; <code>&lt;serial_id&gt;</code>: When &quot;E1&quot; or &quot;E20&quot; is selected, the serial number marked on the chassis: Example) 9jm000129 When &quot;USB Direct&quot; is selected, the USB port number*: Example) VID_045B&amp;PID_0025&amp;PID_0025&amp;6&amp;3234B9D9&amp;0&amp;3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wait</th>
<th><code>wait &lt;time&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Waits for the specified time. <code>&lt;time&gt;</code>: specifies the wait time (unit: msec, range: 1-2147483647)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connect to the device</th>
<th><code>connect</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executes the connect to the device command.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disconnect from the device</th>
<th><code>disconnect</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executes the disconnect from the device command.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blank check</th>
<th><code>blankcheck &lt;area&gt; [option]</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executes the blankcheck command. <code>&lt;area&gt;</code>: specifies the area (user / data/ userboot/ all) <code>user</code>: specifies the user area. <code>data</code>: specifies the data area. <code>userboot</code>: specifies the user boot area. <code>all</code>: 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. <code>&lt;option&gt;</code>: specifies the action (stoponwritten / stoponblank) <code>stoponwritten</code>: if the area specified with <code>&lt;area&gt;</code> is not blank, terminate the script execution function. <code>stoponblank</code>: if the area specified with <code>&lt;area&gt;</code> is blank, terminate the script execution function.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Erase</th>
<th><code>erase &lt;block&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executes the erase command. <code>&lt;block&gt;</code>: specifies using either one of the following options. Using block numbers: Example) 0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program</th>
<th><code>program</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Executes the program command.</td>
<td></td>
</tr>
</tbody>
</table>
Verify

<table>
<thead>
<tr>
<th>Verify</th>
<th>verify</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Executes the verify command.</td>
</tr>
</tbody>
</table>

Checksum

<table>
<thead>
<tr>
<th>Checksum</th>
<th>checksum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Executes the checksum command.</td>
</tr>
</tbody>
</table>

*) 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&3234B69D0&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

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

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 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>

(3) [Set OTP] dialog box
   <Condition>
   The [Set OTP] dialog box is displayed on disconnection of a microcomputer that supports OTP.
   <Action by user>

(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>
Renesas Flash Programmer V.2.05