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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
Numerical 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>This manual</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>R20UT2909E</td>
</tr>
<tr>
<td>E1 Emulator R0E00010KCE00 E20 Emulator R0E000200KCT00</td>
<td>R20UT0398E</td>
</tr>
<tr>
<td>QB-MINI2 On-Chip Debug Emulator with Programming Function</td>
<td>R20UT0449E</td>
</tr>
<tr>
<td>MINICUBE2 Diagnosis Tool</td>
<td>U18588E</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 RL78 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 [Autoprocedure (E.P)] command, and write the target microcontroller.

• Series of operations described in this chapter:

The operating conditions are as follows:

- Target microcontroller: R5F100LE (RL78/G13)
- Target system: Program adapter
- Tool used: E1
- Interface: UART-ch0 (Single-wire UART)
- Interface speed: 1,000,000 bps
- Frequency: None (internal oscillation clock used)
- Power supply: E1 (5.0 V (USB VBUS))
- Operating mode: Chip
- Flash option: Not used
- Operation option: [Blank Check before Erase] enabled

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 [Autoprocedure (E.P)] 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 PC 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.
(4) 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 a new workspace] dialog box.

![Figure 1-1. [Welcome!] Dialog Box](image1)

<2> In the [Using Target Microcontroller:] list box, select “R5F100LE”. 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](image2)
Select “E1” in the [Communication Interface] dialog box. For R5F100LE, the selection in the [Interface] list box is fixed to “UART-ch0” (Single-wire UART). Clicking the Next button displays the [Frequency] dialog box.

Select “1,000,000bps” from the [Interface Speed:] list box. For R5F100LE, the [Supply Oscillator] area is fixed to “Internal-OSC”. Clicking the Next button displays the [Power Supply] dialog box in the case of E1.
Select the [Power target from the emulator] check box, and then select “5.0V (USB VBUS)” for [Supply voltage]. Clicking the [Next] button displays the [Project Settings] dialog box.

The [Other Settings] tab of the [Project Settings] dialog box allows you to view and set advanced details of writing data. “Chip” is the default value for [Operation mode] under the [Target] category, and the default value for “Blank Check before Erase” in the [Command Options] category is “Valid”.

Clicking the [Complete] button saves the project file and displays the main window.

Figure 1-7. [Other Settings] Tab of the [Project Settings] Dialog Box
(5) Selection of program file

<1> Click the [Browse...] button in “User/Data area.” of the program file area to open the [Open File] dialog box.

Figure 1-8. Main Window

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

Figure 1-9. [Open File] Dialog Box
(6) Execute the [Autoprocedure (E.P)] command

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

![Figure 1-10. Main Window](image)

<2> After clicking the [Start] button, execute the following commands in the following order for R5F100LE: [Blank Check] command, [Erase] command (if there are no blanks), and [Program] command.

<3> When execution of the [Autoprocedure (E.P)] command ends normally, "-------- End(Autoprocedure(E.P)) --------" is displayed on the output panel.

Remarks 1. When necessary, insert the target microcontroller (microcontroller to be programmed) into the program adapter, then execute the [Autoprocedure (E.P)] 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 [Autoprocedure (E.P)] command.
Figure 1-11. [Autoprocedure (E.P)] Command Execution Results

(7) System shutdown

<1> 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.

<2> Unless there are other target microcontrollers to be programmed, click the [File] menu and select the [Exit] command to close RFP. Because all settings made so far will be saved to a project file, they can be reused after RFP is restarted.

<3> Remove the USB cable from the tool used.

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 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 [Frequency] and the [Power Supply] dialog boxes are skipped if it is not necessary to change the setting.

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.

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 also 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.].

Clicking the Next button displays the next dialog box.
Clicking the Cancel or the X button terminates RFP.
2.2.2  [Create new workspace] dialog box
This dialog box is used to create a new workspace.

![Create new workspace] Dialog Box

1. **[Microcontroller:]** list box
   Select "All", "Generic Boot Device", "V850", "RL78", or "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.

4. **[Workspace Name:]** box
   Enter the workspace name in this box.

5. **[Project Name:]** box
   Enter the project name in this box.
(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.

Clicking the [Next] button displays the next dialog box.
Clicking the [Cancel] or the [X] button terminates RFP.

2.2.3 [Communication Interface] dialog box
This dialog box is used to select the tool used and the connection method used for communication 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
- MINICUBE2
- COMx

(3) [Interface:] list box
Select the method used for communication between the selected tool and the target microcontroller. For the selectable methods, see the user’s manual of the target microcontroller.
- UART-ch0 (when using the UART feature of RL78 (Single-wire UART), 78K, or V850)
- SIO-ch0 (when using V850E2)
- SIO-H/S (when using the SIO-H/S feature of V850ES or V850E1)
- UART-X1-OSC (when using the X1 clock of 78K0)
- UART-EXCLK (when using the EXCLK input clock of 78K0)
- UART-Int-OSC (when using the internal oscillation clock of 78K0)

Clicking the Next button displays the next dialog box.
Clicking the Cancel or the X button terminates RFP.

2.2.4 [Frequency] dialog box
This dialog box is used to specify the communication speed and the clock.

Figure 2-6. [Frequency] Dialog Box

(1) Target Device Connection
- Interface: UART-ch0
- Interface Speed: 1,000,000 bps

(2) Supply Oscillator
- In Use
- Frequency: Internal OSC
- Multiplier: 1.00
(1) **[Target Device Connection] area**

This area is used to select the communication speed of the connection method.

**Figure 2-7. [Target Device Connection] Area**

![Figure 2-7. [Target Device Connection] Area](image)

**[Interface:] box**

The connection method between the tool used and the target microcontroller is displayed.

**[Interface Speed:] list box**

Select the communication speed for the connection method. For the selectable communication speeds, see the user's manual of the target microcontroller.

- When UART-ch0, UART-X1-OSC, UART-EXCLK, or UART-Int-OSC is selected:
  - 9,600 bps
  - 19,200 bps
  - 31,250 bps
  - 38,400 bps
  - 57,600 bps
  - 76,800 bps
  - 115,200 bps
  - 125,000 bps
  - 128,000 bps
  - 153,600 bps
  - 250,000 bps
  - 500,000 bps
  - 1,000,000 bps

- When SIO-ch0 or SIO-H/S is selected:
  - 0.25 MHz
  - 0.5 MHz
  - 1 MHz
  - 2 MHz
(2) [Supply Oscillator] area

This area is used to specify the clock to be supplied to the target device.

**Figure 2-8. [Supply Oscillator] Area**

<table>
<thead>
<tr>
<th>Supply Oscillator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On Target</strong></td>
</tr>
<tr>
<td>Frequency: 8.00 MHz</td>
</tr>
<tr>
<td>Multiply rate: 10.00</td>
</tr>
</tbody>
</table>

**[On Target] check box**

Specify whether to supply a clock to the target microcontroller by using the clock generated in the target system or the clock generated by the tool used. Select the check box to specify the clock generated in the target system. Clear the check box to specify the clock generated by the tool used.

**[Frequency:] text box**

Select the oscillation frequency of the clock supplied to the target microcontroller. When using the clock generated in the target system, input its oscillation frequency. When using the clock generated by the tool used, input one of the frequencies below. For the selectable frequency, see the user's manual for the target microcontroller.

- 4.00
- 8.00
- 16.00

**[Multiply rate:] text box**

Specify the multiplication ratio of the clock supplied to the target microcontroller. If the target microcontroller includes the PLL circuit, input the multiplication ratio in accordance with the environment used. If the target microcontroller does not include the PLL circuit, enter "1.0". For the selectable multiplication ratio, see the user's manual for the target microcontroller.

Clicking the [Back] button displays the previous dialog box.
Clicking the [Next] button displays the next dialog box.
Clicking the [Cancel] or the [X] button terminates RFP.
4.2.5 [Power Supply] dialog box

This dialog box is used to specify the power supply and other options used for writing to the target microcontroller.

Figure 2-9. [Power Supply] Dialog Box

(1) [Power supply from the emulator] area
This area is used to specify the power supply used for writing to the target microcontroller and the VDD value.

[Power target from the emulator] check box
Select this check box if supplying power from E1. 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 and MINICUBE2 support the power supply function. In the mass-production process, do not use the power supply function of E1 or MINICUBE2. Instead, supply the power suitable for the microcontroller specifications from the target system. The supply voltage from E1 and MINICUBE2 is dependent on the USB power performance of the host PC, so the accuracy cannot be guaranteed.
(2) [Additional Settings] area

This area is used to set power supply options.

[Wide Voltage Mode] check box

Select whether to use wide-voltage mode or full-speed mode. If this check box is selected, commands are executed in wide-voltage mode. If this check box is cleared, commands are executed in full-speed mode. This check box becomes available when a microcontroller that supports this feature is selected. For details about wide-voltage mode and full-speed mode, see the user's manual of the target microcontroller.

Caution When an HCUHEX file is read, the HCUHEX file is handled as master data. As a result, the settings specified in the HCUHEX file are applied and this check box is unavailable.

[Input Voltage:] box

Input the voltage supplied to the target microcontroller.

[User Specified] box

Select the method of input for the value of the voltage to be supplied to the target microcontroller. If this checkbox is selected, the voltage value is input directly in the [Input Voltage] box. If this checkbox is not selected, the voltage value that is detected by using the voltage detection function of the E1/E20 is used. Normally, do not select this checkbox.

Note that there are cases where an error message (E1002004: “Communication failure or timeout”) which indicates an abnormal voltage value for the MCU might occur due to a voltage out of the range of operation being detected due to an error in voltage detection by the E1/E20. In such cases, select the box and enter the actual value for voltage to the target system in the [Input Voltage] box.

Clicking the [Back] button displays the previous dialog box.
Clicking the [Next] button displays the next dialog box.
Clicking the [Cancel] or the [X] button terminates RFP
2.2.6 [Project Settings] dialog box

This dialog box is used to check and change the project settings. The [Basic Settings] tab and [Other Settings] tab are provided, each of which allowing you to set a different type of setting categories.

For details about each item of the dialog box, see 2.4.3 (13) (d), [Project Settings] dialog box. Clicking the Modify… button displays the [Communication Interface] dialog box. Clicking the Complete button saves the project file and displays the main window. Clicking the Cancel or the X button terminates RFP.

2.2.7 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.
2.2.8 Open workspace

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

![Figure 2-12. [Open workspace.]

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 opens the [Welcome!] dialog box.
2.3 Main Window

The main window consists of the following items:

**Figure 2-14. Main Window**

<table>
<thead>
<tr>
<th>&lt;1&gt; Menu bar</th>
<th>Displays the selectable menus</th>
<th>2.4</th>
</tr>
</thead>
<tbody>
<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>
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. When an HCUHEX file has been selected, the HCUHEX file is handled as master data. As a result, the [Program], [Read], [Set Security], [Set Option Bytes], and [Set ID Code] commands become unavailable.

2.4.1 [File] menu

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

Figure 2-15. [File] Menu

(1) [Create a new workspace]

The [Create a 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 2-16. [Create a new workspace] Dialog Box

- Microcontroller: 
- Files: 
- Using Target Microcontroller: 
- Workspace Name: 
- Project Name: 
- Folder:
(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, refer to 2.2.8.

![Figure 2-17. [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 2-18. [Tool] Menu](image)

(1) [Unique Code Setting]
Selecting this option displays the [Unique Code Setting] dialog box, in which you make settings for imbedding unique codes. Save the project file that has been created. For the items in the dialog box, refer to Common Chapter 3.

![Figure 2-19. [Unique Code Setting] Dialog Box](image)

(2) [Change to Full mode]
Selecting this option switches the mode from basic to full in the main window. Save the project file that has been created. For the full mode features, refer to Chapter 5.
2.4.3 [Microcontroller] menu

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

This menu includes commands mainly related to writing to the flash memory, such as setting up, erasing, and writing to the flash memory, and verifying the written 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. The flash memory area subject to manipulation by each command is specified by using the [Operation mode] parameter under [Target] in the [Other settings] tag of the [Project Settings] dialog box.

**Figure 2-20. [Microcontroller] Menu**

Caution When an HCUHEX file has been selected, the HCUHEX file is handled as master data. As a result, the [Program], [Read], [Set Security], [Set Option Bytes], and [Set ID Code] commands become unavailable.

1. **[Blank Check] command**
   This command is used to check whether the flash memory is blank. If the flash memory has already been erased, PASS is displayed. If the flash memory has not yet been erased, Error (E1002008) : Not Blank. is displayed. If this error is displayed, erase the entire area of the flash memory in the target microcontroller before starting programming.

2. **[Erase] command**
   This command is used to erase the flash memory. Whether to perform the [Blank Check] command before executing this command depends on the setting of the [Blank Check before Erase] parameter under [Command Options] in the [Other settings] tab of the [Project Settings] dialog box. If this command is executed for the flash memory that has already been erased with [Blank Check before Erase] enabled, PASS. Erase skipped. is displayed and erasure is not performed.
(3) [Program] command
This command is used to write the program file selected in the program file area to the flash memory. The command options after the [Program] command has finished executing depend on the settings of the [Verify after Program], [Security after Program], and [Checksum after Program] parameters under [Command Options] in the [Other Settings] tab of the [Project Settings] dialog box. For details, see 2.4.3 (13) (d) [Command Options] category.

(4) [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.

(5) [Read] command
This command is used to read data on the flash memory and save it as a file. When this command is executed, the [Save As] dialog box is displayed. Enter any file name in the [File name:] box, select the folder in which to store the file, and then save the program data that has been read. Select the file format from “Intel Hex files (*.hex)” or “Motorola S record files (*.rec; *.s)” in the [Save as type:] list box.

![Figure 2-21. [Save As] Dialog Box](image)

Clicking the [Save] button saves the program data as a file and closes the dialog box. Clicking the [Cancel] or the [X] button closes the dialog box without saving the program data as a file.

(6) [Set Security] command
This command is used to specify the security settings for the target microcontroller. When this command is executed, the settings specified in the [Flash Options] category in the [Other Settings] tab of the [Project Settings] dialog box will be applied to the target microcontroller. For details about the security settings, see 2.4.3 (13) (d) [Flash Options] category.
(7) [Checksum] command

This command is used to read the checksum calculated in the target microcontroller and displays it in the output panel.

Remark The checksum read by this command differs from the one displayed in the [Program File] category in the [Other Settings] tab of the [Project Settings] dialog box. For details about the [Program File] category, see 2.4.3 (13) (d) <5> [Program File] category.

The checksum is calculated as follows:

- When using RL78, 78K, V850E1, or V850ES that has a checksum command:
  Method: Subtraction (16-bit arithmetic)
  Range: Area specified in the [Command Options] category in the [Other Settings] tab of the [Project Settings] dialog box

Figure 2-22. Output Panel After [Checksum] Command Execution (When Using RL78, 78K, V850E1, or V850ES)

Checksum Code flash: 0x2A8E
Checksum PASS

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

- When using V850E2 that has a CRC check command:
  Method: 32-bit CRC

Figure 2-23. Output Panel After [Checksum] Command Execution (When Using V850E2)

Checksum Code flash: 0xD1CA2956
Checksum PASS

Remark With the 32-bit CRC mode, the 8-digit result of CRC32 function calculation is displayed. For details about the arithmetic specifications, see Common Appendix B Figure B-2. 32-bit CRC Calculation Specifications.

- When using RL78 that has a CRC check command:
  Method: 16-bit CRC
  Range: Area specified by the [Operation mode] parameter under the [Target] category in the [Other Settings] tab of the [Project Settings] dialog box

Figure 2-24. Output Panel After [Checksum] Command Execution (When Using RL78 that has a CRC check command)

Chip CRC: 0x242E
Checksum PASS

Remark With the 16-bit CRC mode, the 4-digit result of CRC16 function calculation is displayed. For details about the arithmetic specifications, see Common Appendix B Figure B-3. 16-bit CRC Calculation Specifications.
(8) **[Autoprocedure (E.P)] command**

This command is used to erase and write to the flash memory. The command options after the [Autoprocedure (E.P)] command has finished executing depend on the settings of the [Blank Check before Erase], [Verify after Program], [Security after Program], and [Checksum after Program] parameters under [Command Options] in the [Other Settings] tab of the [Project Settings] dialog box. For details about these check boxes, see 2.4.3 (13) (d) <9> [Command Options] category.

![Figure 2-25. Output Panel After [Autoprocedure (E.P)] Command Execution](image)

(9) **[Set Option bytes] command**

This command is used to specify the settings for the target microcontroller's option byte. When this command is executed, the settings specified by the [OPBTrn] parameter in the [Flash Options] category in the [Other Settings] tab of the [Project Settings] dialog box are applied to the target microcontroller. For details about the option byte settings, see 2.4.3 (13) (d) <7> [Flash Options] category.

(10) **[Set ID Code] command**

This command is used to specify the settings for the target microcontroller's on-chip debug security ID. When this command is executed, the settings specified by the [OCD Security ID] parameter in the [Flash Options] category in the [Other Settings] tab of the [Project Settings] dialog box are applied to the target microcontroller. For details about the on-chip debug security ID settings, see 2.4.3 (13) (d) <7> [Flash Options] category.

(11) **[Signature Read] command**

This command is used to read the target microcontroller's product information, such as the microcontroller name and flash memory information. The read result is displayed in the output panel.
(12) [Get Flash options] command

This command is used to read the settings for the flash options for the target microcontroller and displays the result under the [Flash Options] category in the [Other Settings] tab of the [Project Settings] dialog box. When this command is enabled, execute this command before the [Set Security] command, [Set Option bytes] command, or [Set ID Code] command; the settings for the flash option settings can thus be checked. For details about the flash option settings, see 2.4.3 (13) (d) <7> [Flash Options] category.

Caution When an HCUHEX file is read, the HCUHEX file is handled as master data. As a result, the flash options specified in the microcontroller can be checked by executing the [Get Flash options] command but the settings cannot be applied. Click the OK button to close the dialog box.

Figure 2-26. Items Read by the [Get Flash options] Command
(13) **[Set Project]**

Selecting **[Set Project]** displays the **[Project Settings]** dialog box, where you can check and change the project settings. The dialog box has two tabs: **[Basic Settings]** and **[Other Settings]**. Different categories of settings are displayed depending on the tab you select. Clicking the **[Modify…]** button of the **[Basic Settings]** tab opens the wizard-type dialog box **[Communication Interface]** (see Figure 2-27), which guides you through the process of changing the settings. The **[Frequency]** and the **[Power Supply]** dialog boxes are skipped if the settings do not need to be changed.

**Figure 2-27. Flow of Setting Modification with the **[Modify…]** Button**

![Diagram of setting modification flow](image)

(a) **[Communication Interface] dialog box**

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

**Figure 2-28. [Communication Interface] Dialog Box**

![Communication Interface dialog box](image)

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

Clicking the **Next** button displays the next dialog box.

Clicking the **Cancel** or the **X** button returns you to the main window.
(b) [Frequency] dialog box
This dialog box is used to specify the communication speed and the clock.

Figure 2-29. [Frequency] Dialog Box

For details about each item, see 2.2.4.
Clicking the [Back] button displays the previous dialog box.
Clicking the [Next] button displays the next dialog box.
Clicking the [Cancel] or the [X] button returns you to the main window.

(c) [Power Supply] dialog box
This dialog box is used to specify the power supply and other options used for writing to the target microcontroller.

Figure 2-30. [Power Supply] Dialog Box

For details about each item, see 2.2.5.
Clicking the [Back] button displays the previous dialog box.
Clicking the [Next] button displays the next dialog box.
Clicking the [Cancel] or the [X] button returns you to the main window.
(d) [Project Settings] dialog box

This dialog box is used to check and change the project settings. The dialog box has two tabs: [Basic Settings] and [Other Settings]. Different categories of settings are displayed depending on the tab you select.

**Figure 2-31. [Project Settings] Dialog Box**

![Diagram of [Project Settings] dialog box](image)

- **[Basic Settings] tab**
  - <1> [Device Information File] category
  - <2> [Target] category
  - <3> [Using Tool] category
  - <4> [Power Supply Options] category

- **[Other Settings] tab**
  - <5> [Program File] category
  - <6> [Target] category
  - <7> [Flash Options] category
  - <8> [Target Microcontroller] category
  - <9> [Command Options] category

Clicking the [Modify...] button displays the [Communication Interface] dialog box.

Clicking the [Complete] button saves the project file and returns you to the main window.

Clicking the [Cancel] button or the [X] button returns you to the main window.
<1> [Device Information File] category

This category displays information about device information files such as the file name and file version.

<table>
<thead>
<tr>
<th>File name</th>
<th>Displays the device information file name.</th>
</tr>
</thead>
<tbody>
<tr>
<td>File version</td>
<td>Displays the version of the device information file.</td>
</tr>
</tbody>
</table>

<2> [Target] category

This category displays or allows you to select specifics, such as the connection method, communication transfer rate, and supplied clock, about the interface between the tool and the microcontroller.

<table>
<thead>
<tr>
<th>Interface</th>
<th>Displays the connection method.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication transfer rate</td>
<td>Displays the communication speed.</td>
</tr>
<tr>
<td>Supplied oscillator</td>
<td>Displays the type of clock source supplied to the microcontroller.</td>
</tr>
<tr>
<td>Target</td>
<td>The clock is supplied from the target system.</td>
</tr>
<tr>
<td>Programmer</td>
<td>The clock is supplied from the tool used.</td>
</tr>
<tr>
<td>Frequency [MHz]</td>
<td>Displays the frequency of the clock supplied to the microcontroller.</td>
</tr>
<tr>
<td>Multiply rate</td>
<td>Displays the multiply rate of the clock supplied to the microcontroller.</td>
</tr>
<tr>
<td>Supply power</td>
<td>Displays the voltage supplied to the microcontroller.</td>
</tr>
<tr>
<td>Target</td>
<td>The voltage is supplied from the target system.</td>
</tr>
<tr>
<td>3.3 V</td>
<td>A voltage of 3.3 V is supplied from the tool used.</td>
</tr>
<tr>
<td>5.0 V</td>
<td>A voltage of 5.0 V is supplied from the tool used.</td>
</tr>
<tr>
<td>x.xx V</td>
<td>The voltage is supplied from the target system.</td>
</tr>
</tbody>
</table>

Remark: [Power Supply] is displayed when a power-related setting is made.

<3> [Using Tool] category

This category displays information about the tool used such as the name and firmware version.

<table>
<thead>
<tr>
<th>Tool name</th>
<th>Displays the name of the tool used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware version</td>
<td>Displays the version of the MINICUBE2 firmware.</td>
</tr>
</tbody>
</table>

Remark: The [Firmware version] view is updated whenever a command on the target microcontroller finishes executing.

<4> [Power Supply Options] category

This category displays the power supply options, such as wide voltage mode, of the command executed on the flash memory.

<table>
<thead>
<tr>
<th>Wide voltage mode</th>
<th>Select whether to write in wide voltage mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Data is written in wide voltage mode.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Data is not written in wide voltage mode.</td>
</tr>
</tbody>
</table>

Remark: Some items in this category might not be displayed depending on the type of microcontrollers.

<5> [Program File] category

This category displays or is used to select information about the specified program file such as the file name, date updated, and checksum calculation method.
<table>
<thead>
<tr>
<th><strong>File name</strong></th>
<th>Displays the selected program file name.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Updated date</strong></td>
<td>Displays the date that the program file selected by [File name] was last modified.</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Displays the type of the program file selected in [File name]. HCUHEX is displayed when an HCUHEX file is read. HEX is displayed when a HEX file without option data is read.</td>
</tr>
<tr>
<td><strong>Check sum type</strong></td>
<td>Select the checksum calculation method for the program file selected by [File name].</td>
</tr>
<tr>
<td>Arithmetic check sum (16-bit)</td>
<td>The checksum calculated using 16-bit subtraction.</td>
</tr>
<tr>
<td>CRC sum (32-bit)</td>
<td>Calculated using 32-bit CRC.</td>
</tr>
<tr>
<td>CRC sum (16-bit)</td>
<td>Calculated using 16-bit CRC.</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Select the area from which to calculate the checksum.</td>
</tr>
<tr>
<td>Remark: Use [Operation mode] under the [Target] category to specify the range of memory for the [Checksum] command.</td>
<td></td>
</tr>
<tr>
<td>Range of the Program file</td>
<td>The area to which the program file selected by [File name] is assigned is subject to checksum calculation.</td>
</tr>
<tr>
<td>Range of target microcontroller</td>
<td>All flash memory area built into the microcontroller specified by the project is subject to checksum calculation.</td>
</tr>
<tr>
<td>User optional range (Code Flash)</td>
<td>An area from [Start address of Code Flash] to [End address of Code Flash] is subject to checksum calculation.</td>
</tr>
<tr>
<td>User optional range (Data Flash)</td>
<td>An area from [Start address of Data Flash] to [End address of Data Flash] is subject to checksum calculation.</td>
</tr>
<tr>
<td>User optional range (Code Flash + Data Flash)</td>
<td>The area specified by [Start address of Code Flash] and [End address of Code Flash], and the area specified by [Start address of Data Flash] and [End address of Data Flash] are subject to checksum calculation.</td>
</tr>
<tr>
<td><strong>Start address of Code Flash</strong></td>
<td>Enter the start address of the code flash memory for which to calculate the checksum.</td>
</tr>
<tr>
<td><strong>End address of Code Flash</strong></td>
<td>Enter the end address of the code flash memory for which to calculate the checksum.</td>
</tr>
<tr>
<td><strong>Check sum of Code Flash</strong></td>
<td>Displays the results of checksum calculation using the method selected by [Check sum type].</td>
</tr>
<tr>
<td><strong>Start address of Data Flash</strong></td>
<td>Enter the start address of the data flash memory for which to calculate the checksum.</td>
</tr>
<tr>
<td><strong>End address of Data Flash</strong></td>
<td>Enter the end address of the data flash memory for which to calculate the checksum.</td>
</tr>
<tr>
<td><strong>Check sum of Data Flash</strong></td>
<td>Displays the results of checksum calculation using the method selected by [Check sum type].</td>
</tr>
</tbody>
</table>

**Remarks**

1. The [Updated date] view is refreshed whenever a file name is specified for [File name].
2. The [Check sum of Code Flash] and [Check sum of Data Flash] views are refreshed whenever a checksum calculation mode is specified for [Check sum type].
3. If “Range of the Program file” is selected for [Range], the corresponding addresses are specified for [Start address of Code Flash] and [End address of Code Flash] and [Start address of Data Flash] and [End address of Data Flash], and further input is disabled.
4. When the checksum is calculated, areas to which data is not written are filled in with 0xff.
5. Some items in this category might not be displayed for some microcontrollers.
6. When the 16-bit arithmetic (subtraction) mode, the lower 4 digits of the result from which a value is subtracted from 00h in 1-byte units are displayed. With the 32-bit CRC mode, the 8-digit result of CRC32 function calculation is displayed. For details about the arithmetic specifications, see Common Appendix B Figure B-2. 32-bit CRC Calculation.
**Specifications.** With the 16-bit CRC mode, the 4-digit result of CRC16 function calculation is displayed. For details about the arithmetic specifications, see Common Appendix B Figure B-3. 16-bit CRC Calculation Specifications.

<6> **[Target] category**
This category is used to select the operation mode and other details about the interface between the tool and the microcontroller.

<table>
<thead>
<tr>
<th>Operation mode</th>
<th>Select the unit in which the flash memory is accessed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip</td>
<td>The flash memory is accessed in chip units.</td>
</tr>
<tr>
<td>Block (Code Flash)</td>
<td>The code flash memory is accessed in block units.</td>
</tr>
<tr>
<td>Block (Data Flash)</td>
<td>The data flash memory is accessed in block units.</td>
</tr>
<tr>
<td>Block (Code Flash + Data Flash)</td>
<td>The flash memory is accessed in block units.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start block number of Code Flash</th>
<th>Select the starting block when accessing code flash memory in block units.</th>
</tr>
</thead>
<tbody>
<tr>
<td>End block number of Code Flash</td>
<td>Select the ending block when accessing code flash memory in block units.</td>
</tr>
<tr>
<td>Start block number of Data Flash</td>
<td>Select the starting block when accessing data flash memory in block units.</td>
</tr>
<tr>
<td>End block number of Data Flash</td>
<td>Select the ending block when accessing data flash memory in block units.</td>
</tr>
<tr>
<td>Supplied Power</td>
<td>Displays the voltage supplied to the target microcontroller.</td>
</tr>
</tbody>
</table>

**Note** When an HCUHEX file is read, the HCUHEX file is handled as master data. As a result, [Chip] is selected and this setting cannot be changed. When the device is an RL78 that has a CRC check command, [Chip] is selected and this setting cannot be changed.

**Remarks 1.** [Start block number of Code Flash] and [End block number of Code Flash] are displayed only if “Block (Code Flash)” or “Block (Code Flash + Data Flash)” is selected under [Operation mode].

**Remarks 2.** [Start block number of Data Flash] and [End block number of Data Flash] are displayed only if “Block (Data Flash)” or “Block (Code Flash + Data Flash)” is selected under [Operation mode].
<7> [Flash Options] category
This category is used to disable execution of commands on the flash memory (by selecting settings such as Disable Chip Erase, Disable Block Erase, or Disable Program) and display microcontroller information such as the end of boot block number, reset vector address, and start of flash shield block number.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disable Chip Erase</td>
<td>Used to disable execution of the chip erase command on the flash memory.</td>
</tr>
<tr>
<td>Valid</td>
<td>Execution of the chip erase command is disabled.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Execution of the chip erase command is enabled.</td>
</tr>
<tr>
<td>Disable Block Erase</td>
<td>Used to disable execution of the block erase command on the flash memory.</td>
</tr>
<tr>
<td>Valid</td>
<td>Execution of the block erase command is disabled.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Execution of the block erase command is enabled.</td>
</tr>
<tr>
<td>Disable Program</td>
<td>Used to disable execution of the write command on the flash memory.</td>
</tr>
<tr>
<td>Valid</td>
<td>Execution of the write command is disabled.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Execution of the write command is enabled.</td>
</tr>
<tr>
<td>Disable Read</td>
<td>Used to disable execution of the read command on the flash memory.</td>
</tr>
<tr>
<td>Valid</td>
<td>Execution of the read command is disabled.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Execution of the read command is enabled.</td>
</tr>
<tr>
<td>Disable boot block cluster reprogramming</td>
<td>Used to disable writing to the boot area.</td>
</tr>
<tr>
<td>Valid</td>
<td>Writing to the boot area is disabled.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Writing to the boot area is enabled.</td>
</tr>
<tr>
<td>End of boot block number</td>
<td>Displays the end of the boot area.</td>
</tr>
<tr>
<td>Reset vector address</td>
<td>Displays the reset vector address of the microcontroller.</td>
</tr>
<tr>
<td>Start of flash shield block number</td>
<td>Select the starting block of the flash shield window.</td>
</tr>
<tr>
<td>End of flash shield block number</td>
<td>Select the ending block of the flash shield window.</td>
</tr>
<tr>
<td>OPBTn</td>
<td>Select the option byte.</td>
</tr>
<tr>
<td>OCD Security ID</td>
<td>Enter the on-chip debug security ID.</td>
</tr>
</tbody>
</table>

**Note** When an HCUHEX file is read, the HCUHEX file is handled as master data. As a result, the settings specified in the HCUHEX file are applied and the settings in this category cannot be changed.

**Remark** Some items in this category might not be displayed for some microcontrollers.

<8> [Target Microcontroller] category
This category displays information about the microcontroller such as the target microcontroller name and firmware version.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target microcontroller name</td>
<td>Displays the microcontroller name.</td>
</tr>
<tr>
<td>Firmware version</td>
<td>Displays the version of the microcontroller firmware.</td>
</tr>
</tbody>
</table>

**Remark** The [Target microcontroller name] and [Firmware version] views are refreshed whenever a command finishes executing on the target microcontroller.
### [Command Options] category

This category is used to specify options for commands executed on the flash memory such as Blank Check before Erase, Verify after Program, and Security after Program.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blank Check before Erase</strong>&lt;sup&gt;Note&lt;/sup&gt;</td>
<td>Select whether or not to check the status of the flash memory (whether or not data has been written) before erasing data written to the flash memory.</td>
</tr>
<tr>
<td>Valid</td>
<td>Data is erased after checking the status of the flash memory.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Data is erased without checking the status of the flash memory.</td>
</tr>
<tr>
<td><strong>Verify after Program</strong></td>
<td>Select whether or not to verify that the data written to the flash memory matches the data in the file specified by the [File name] parameter under [Program File] after writing to the flash memory is complete.</td>
</tr>
<tr>
<td>Valid</td>
<td>Data match is verified after writing is complete.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Data match is not verified after writing is complete.</td>
</tr>
<tr>
<td><strong>Security after Program</strong>&lt;sup&gt;Note&lt;/sup&gt;</td>
<td>Select whether or not to apply the security settings specified in the [Flash Options] category such as Blank Check before Erase, Verify after Program, and Security after Program, after the writing to the flash memory is complete.</td>
</tr>
<tr>
<td>Valid</td>
<td>The security settings are applied after writing is complete.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The security settings are not applied after writing is complete.</td>
</tr>
<tr>
<td><strong>Check Sum after Program</strong></td>
<td>Select whether or not to read the checksum of the data written to the flash memory after writing is complete.</td>
</tr>
<tr>
<td>Valid</td>
<td>The checksum is read after writing is complete.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The checksum is not read after writing is complete.</td>
</tr>
<tr>
<td><strong>Set Option Bytes after Program</strong>&lt;sup&gt;Note&lt;/sup&gt;</td>
<td>Select whether or not to apply the option byte settings specified in the [Flash Options] category after writing to the flash memory is complete.</td>
</tr>
<tr>
<td>Valid</td>
<td>The option byte settings are applied after writing is complete.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The option byte settings are not applied after writing is complete.</td>
</tr>
<tr>
<td><strong>Set OCD Security ID after Program</strong>&lt;sup&gt;Note&lt;/sup&gt;</td>
<td>Select whether or not to apply the on-chip debug security ID specified in the [Flash Options] category after writing to the flash memory is complete.</td>
</tr>
<tr>
<td>Valid</td>
<td>The on-chip debug security ID is applied after writing is complete.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The on-chip debug security ID is not applied after writing is complete.</td>
</tr>
<tr>
<td><strong>Program to the reset mask products</strong></td>
<td>Select the method of controlling a reset. Enable this option to use the COMx connection and the reset pin of the RL 78 for a function other than reset.</td>
</tr>
<tr>
<td>Valid</td>
<td>Enable this option to use a function other than reset.</td>
</tr>
<tr>
<td></td>
<td>Executing individual commands displays a confirmation dialog box (Q1001026) for reentering the target power supply.</td>
</tr>
<tr>
<td>Invalid</td>
<td>Disable this option if the reset function is to be used.</td>
</tr>
</tbody>
</table>
Reset Pin as Low | Select whether or not to set the reset pin to the low level when disconnecting the device.
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>The reset pin is set to low level.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The reset pin is set to high impedance.</td>
</tr>
</tbody>
</table>

Program file size monitor function | Halts execution of programming command if the program file size exceeds the programmable range.
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>If the address range of the downloaded program file exceeds the range specified for [Operation mode] in the [Target] category and the [Program], [Verify], or [Autoprocedure(E.P)] command is executed, the error message &quot;Error (E1002018): HEX file exceeds target device flash range.&quot; is displayed on the output panel and command execution is halted.</td>
</tr>
<tr>
<td>Invalid</td>
<td>The message &quot;Truncate the HEX File.&quot; is displayed on the output panel and command execution continues.</td>
</tr>
</tbody>
</table>

**Note** When an HCUHEX file is read, the HCUHEX file is handled as master data. As a result, the settings of [Blank Check before Erase], [Security after Program], [Set Option Bytes after Program], and [Set OCD Security ID after Program] cannot be changed.

**Remarks** 1. The results of executing the command in accordance with the specified options are shown in the output panel.

2. Some items in this category might not be displayed depending on the type of microcontrollers.
2.4.4 [Help] menu

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

![Figure 2-32. [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 2-33. 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 2-34. [Microcontroller] Area](image)
2.6 [Program File] Area

This area displays the selected program file. Clicking the **Browse...** button opens the [Open File] dialog box. Move to a desired folder and select a program file (*.hex;*.mot;*.s;*.rec).

![Figure 2-35. [Program File] Area](image)

![Figure 2-36. [Open File] Dialog Box](image)

2.7 [Command] Area

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

![Figure 2-37. Command Area](image)
2.8 Start Button

Clicking the Start 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 2-38. Start Button](image)

![Figure 2-39. [Progress report] Dialog Box](image)

2.9 Status Bar

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

![Figure 2-40. Status Bar](image)

### Table 2-1. Status Bar Displays

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSY</td>
<td>A command is being executed.</td>
</tr>
<tr>
<td>PASS</td>
<td>The command finished executing normally.</td>
</tr>
<tr>
<td>ERROR</td>
<td>The command terminated abnormally.</td>
</tr>
<tr>
<td><strong>START</strong></td>
<td>After startup or when the [Clear Output Panel] button is clicked</td>
</tr>
</tbody>
</table>
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>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>Copies the text selected on the output panel to the clipboard.</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 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 [Frequency] and the [Power Supply] dialog boxes are skipped if it is not necessary to change the setting.

Figure 3-1. Dialog Boxes Displayed in the Startup Wizard

![Diagram of dialog boxes]

- Create a new workspace
- Open a created workspace
- Open latest workspace
- Main window
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.

### 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. When an HCUHEX file has been selected, the HCUHEX file is handled as master data. As a result, the [Program], [Read], [Set Security], [Set Option Bytes], and [Set OCD Security ID] commands become unavailable.

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](image)

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](image)
3.4.3 [Microcontroller] menu

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

This menu includes commands mainly related to writing to the flash memory, such as setting up, erasing, and writing to the flash memory, and verifying the written program. Selecting any command executes that command. The flash memory area subject to manipulation by each command is specified by using the [Operation mode] parameter under [Target] in the [Other Settings] tab of the [Project Settings] dialog box. Selecting [Set Project] opens a wizard-type dialog box for changing the project basic settings. Refer to 2.4.3 for details of each command.

Figure 3-5. [Microcontroller] Menu
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. When an HCUHEX file is selected, it is used as the master data, disabling the [Program], [Read], and [Set Security] commands. Placing the mouse cursor over a tool bar button displays a tooltip. Refer to 2.4.3 for details of each command.

![Figure 3-7. Tool Bar](image)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Executes the [Blank Check] command.</td>
</tr>
<tr>
<td>(2)</td>
<td>Executes the [Erase] command.</td>
</tr>
<tr>
<td>(3)</td>
<td>Executes the [Program] command.</td>
</tr>
<tr>
<td>(4)</td>
<td>Executes the [Verify] command.</td>
</tr>
<tr>
<td>(5)</td>
<td>Executes the [Read] command.</td>
</tr>
<tr>
<td>(6)</td>
<td>Executes the [Set Security] command.</td>
</tr>
<tr>
<td>(7)</td>
<td>Executes the [Checksum] command.</td>
</tr>
<tr>
<td>(8)</td>
<td>Executes the [Autoprocedure (E.P)] command.</td>
</tr>
<tr>
<td>(9)</td>
<td>Executes the [Set Option Bytes] command.</td>
</tr>
<tr>
<td>(10)</td>
<td>Executes the [Set ID Code] command.</td>
</tr>
<tr>
<td>(11)</td>
<td>Executes the [Signature Read] command.</td>
</tr>
<tr>
<td>(12)</td>
<td>Executes the [Get Flash options] command.</td>
</tr>
<tr>
<td>(13)</td>
<td>Opens a wizard-type dialog for changing the project basic settings.</td>
</tr>
</tbody>
</table>
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).

![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.

| 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 displayed bold and 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

<table>
<thead>
<tr>
<th>Context Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Project Active</td>
<td>Makes the selected project available for manipulation and edition. The project that has been manipulated and edited is saved.</td>
</tr>
<tr>
<td>Delete Project</td>
<td>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.</td>
</tr>
<tr>
<td>Add Program File</td>
<td>Adds a program file to the selected project. The [Open File] dialog box opens for adding a program file.</td>
</tr>
</tbody>
</table>

(3) Program file nodes

A program file node represents a program file of a project. A project can have multiple program files (maximum of 64), one of which is available for programming and verification. The program file node available for programming and verification is displayed in bold type and marked by "(*)". Double-clicking on one of other nodes makes it available for programming and verification. When the User Boot Area is selected as the area for program file nodes, “B” is displayed in bold type.

(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

<table>
<thead>
<tr>
<th>Context Menu Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Program File Active</td>
<td>Makes the selected program file available for programming and verification.</td>
</tr>
<tr>
<td>Delete Program File</td>
<td>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 selected for programming and verification.</td>
</tr>
<tr>
<td>Area</td>
<td>Not used.</td>
</tr>
<tr>
<td>Program</td>
<td>Executes the [Program] command with the selected program file. This menu item is enabled when the project is selected for manipulation and edition, and the program file is selected for programming and verification.</td>
</tr>
<tr>
<td>Autoprocedure(E.P.)</td>
<td>Executes the [Autoprocedure(E.P.)] command with the selected program file. This menu item is enabled when the project is selected for manipulation and edition, and the program file is selected for programming and verification.</td>
</tr>
</tbody>
</table>
3.7 [Project Settings] Panel

This panel allows you to view 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 and the program file selected for programming and verification. Refer to 2.4.3 (13) (d), [Project Settings] dialog for details.

![Figure 3-9. [Project Settings] Panel](image)

**Basic Settings**
- Device Information File
  - File name: RST010LE.prj
  - File version: V1.11
- Target
  - Interface: UART:3:0
  - Communication transfer rate: 1,000,000bps
  - Supply voltage: 3.3V
  - Frequency (MHz): Internal OSC
  - Multiply ratio: 1.00
  - Supply power: 5.0V

**Other Settings**
- Tool name: E1

- **File name**
  - Show a device information file which corresponds to a target microcontroller.

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.

Figure 3-11. Status Bar

Table 3-5. Status Bar Displays

<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 start of the command, or when [Clear] is selected in the context menu of the output panel.
CHAPTER 4  SCRIPT EXECUTION FUNCTION

This chapter explains about 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 the OK button in the [Confirmation] dialog box. Note, however, that when the firmware of the emulator needs updating, this is indicated in the [Confirmation] dialog box.

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
RFP.exe "d:\rfp\sample test\sample.rsc"
ECHO OFF
ECHO Ruscult Code : %ErrorLevel%
PAUSE
```
4.3 Script file

This section describes a script file (file extension, file format, format, 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 test\sample.log"
workspace "d:\rfp\sample test\sample\sample.rws"
programfile d:\hex\sample.hex
verify

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>
</tbody>
</table>

Table 4-1. Script Commands

<table>
<thead>
<tr>
<th>Function</th>
<th>Script command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify a log file</td>
<td>log &lt;filename&gt;</td>
<td>Specifies a log file. For more details, see 4.5. &lt;filename&gt;: the full path of the log file. If the full path contains spaces, use double quotation marks to enclose the full path (&quot; &quot;).</td>
</tr>
<tr>
<td>Specify a workspace</td>
<td>workspace &lt;filename&gt;</td>
<td>Specifies a workspace file. The script execution function uses an active project and an active program file. &lt;filename&gt;: the full path of the workspace file. If the path contains spaces, use double quotation marks to enclose the path (&quot; &quot;).</td>
</tr>
<tr>
<td>Specify a program file</td>
<td>programfile &lt;filename&gt;</td>
<td>Specifies a program file. When multiple files are specified, the last file is active. &lt;filename&gt;: the full path of the program file. If the path contains spaces, use double quotation marks to enclose the path (&quot; &quot;).</td>
</tr>
</tbody>
</table>
### 4.5 Log file

Execute the specify a log file script command (log <filename>) by the script commands 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)
Renesas Flash Programmer V.2.05