User's Manual

Renesas Flash Programmer V2.03

Flash memory programming software

User's Manual

Renesas Electronics
www.renesas.com

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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.

- Overview
- Installation
- Basic operation (Basic mode)- RL78, 78K, V850 -
- Basic operation (Basic mode)- RX -
- Function details (Basic mode)- RL78, 78K, V850 -
- Function details (Basic mode)- RX –
- Function details (Full mode)- RL78, 78K, V850 –
- Function details (Full mode)- RX –
- Script execution function - RL78, 78K, V850 –
- Script execution function - RX –
- Unique code embedding function
- Troubleshooting
- Cautions
- Messages
- Supplementary information

How to Read This Manual

It is assumed that the readers of this manual have general knowledge of electricity, logic circuits, and microcontrollers. In the explanations of the operation of the applications, it is also assumed that the readers have sufficient knowledge of Windows™. For the usage and terminology of Windows, see each Windows manual.

To understand the overall operation of the Renesas flash programmer
→ Read this manual according to the **CONTENTS**.

To know the basic specifications, usages, and usage examples of the hardware
→ See the **E1/E20 User's Manual** or **QB-MINI2 User's Manual**.

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

Terminology The meanings of the terms used in this manual are as follows:

(1/2)

Term	Meaning
RFP	Abbreviation of the flash memory programming software, Renesas Flash Programmer
E1/E20	Abbreviation of the E1 emulator / E20 emulator
MINICUBE2	Nickname used for the main unit of QB-MINI2, the on-chip debug emulator with programming function
Tool used	General term for the tool used by the customer, which is E1, E20, or MINICUBE2.
Utility	Software used for self-diagnosis of the tool used and to update the MINICUBE2 firmware.
Target microcontroller	The Renesas Electronics on-chip flash memory microcontroller used by the user
Target system	User-designed board on which the target microcontroller is mounted
Program adapter[Note 1]	Conversion adapter used to write programs to the target microcontroller
Device information file	Device information files contain parameter information required for writing programs to the flash memory in the target microcontroller. These files have the extension *.prm, *.pr5, or *.fcf. Do not change the data in the device information files. If the data is changed, RFP might not operate properly.
Workspace file	The workspace is where projects are stored. There is always at least one project in the workspace. Some workspaces allow multiple projects to be registered. In RFP, workspace files have the extension *.rws.
Project file	Project files store the data required to write programs. In RFP, a project file stores the settings related to the programming environment, such as target microcontroller settings and command option specifications. In RFP, project files have the extension *.rpj.
OCD security ID[Note 3]	A security feature related to on-chip debugging of a microcontroller.
Signature	Information about the microcontroller.
Flash options[Note 3]	General term for MCU operations such as security settings.
Option data[Note 3]	General term for flash options, wide-voltage mode, and full-speed mode[Note 2]
ID code[Note 3]	ID codes are used for ID code protection, a security function of the MCU. An ID code input by the RFP is compared for verification with an ID code in the internal flash memory. Reading, programming, and erasing cannot proceed unless a correct ID code is input.
Lock bit[Note 3]	Lock bits are used to prevent erroneous programming or erasing of data. Each block has a lock bit to prohibit programming or erasing of data (lock the block) and settings can be made per block.
HEX file	Program file without option data
HCUHEX file	A program file that integrates option data and that is generated by using the HEX Consolidation Utility (HCU), which is used to generate ROM code for flash memory products whose flash memories are pre-written by Renesas Electronics.

Term	Meaning
Program file	The program file refers to the file that contains the program to be written to the microcontroller. The following program file formats are supported by RFP when writing to an RL78, 78K, or V850 microcontroller: a. HEX files in Intel HEX format b. HCUHEX files in Intel HEX format c. HEX files in Motorola S format d. HCUHEX files in Motorola S format The following program file formats are supported by RFP when writing to an RX microcontroller: a. HEX files in Intel HEX format b. HEX files in Motorola S format **Caution An empty area will be supplemented with FFH.** **Notes 1. Blank areas are complemented by FFH when reading is performed.** **2. For details on the format, refer to the information on how to order ROM codes (C10302J).** **3. The only supported character code is ASCII (one byte). Unicode (two bytes) is not supported.**
rfp.ini	This file is where the RFP settings are saved. The settings are saved when RFP is terminated.
COMx	COMx is a serial interface port incorporated in the host PC. When writing data to the target system by using the serial interface incorporated in the host PC, select COMx as the tool used. Any value from 1 to 256 can be specified for *x*.
USB Direct	USB Direct is a method to write in the microcontroller in the USB boot mode by using the USB interface port of the host PC. When writing data by using the USB interface of the host PC, select USB Direct as the tool used.
FINE	FINE is a single or dual line communications interface operating through the FINE pin of microcomputers. Select RX100 and RX200 as the microcomputer to be used and E1 or E20 as the tool to be used.
User/data area	Target area of the flash memory to which the program file is written. For the RL78, 78K, and V850: Code flash and data flash For the RX: User area and data area
User boot area	Target area of the flash memory to which the program file is written. For the RL78, 78K, V850, and RX100: None For the RX200 and RX600: User boot area
Basic mode	This mode is mainly for writing in mass production, and the focus is on basic rewriting processing.
Full mode	The full mode is mainly for the use of microcontrollers in development, and facilitates the control of multiple projects and the checking of setting information.

Notes 1. The program adapter is a product of Naito Densei Machida Mfg. Co., Ltd.
If you have any questions about the FA adapter board, contact Naito Densei Machida Mfg. Co., Ltd. (Tel: +81-42-750-4172).

2. The functions that can be used differ depending on the target microcontroller.

3. Refer to the user's manual of the target device for more information.

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

Documents related to development tools

Document name	Document number
Renesas Flash Programmer V2.01 Flash Memory Programming Software	This manual
E1 Emulator R0E000010KCE00 E20 Emulator R0E000200KCT00	R20UT0398E
QB-MINI2 On-Chip Debug Emulator with Programming Function	R20UT0449E
MINICUBE2 Diagnosis Tool	U18588E

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.

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

Term	To be replaced with
Flash shield window	Area protection
USB Direct	USB interface mode
Get Flash options	Access window read
Set Security	Access window program

CONTENTS

CHAPTER 1 OVERVIEW

Renesas Flash Programmer (hereafter referred to as RFP) is software that erases, writes, and verifies programs on the target system on which a Renesas Electronics single-chip microcontroller with on-chip flash memory is mounted by using an E1 emulator (hereafter referred to as E1), E20 emulator (hereafter referred to as E20), or the on-chip debug emulator with programming function, QB-MINI2 (hereafter referred to as MINICUBE2), or a serial interface.

1.1 Features

- Writing controlled by the host PC
- Writing settings can be saved in a workspace file
- Microcontroller-specific information required for writing is included in the product package as a device information file. Such information of the generic device should be obtained by the query.
- Two types of writing operation windows (Basic mode and Full mode)
- Execution of scripts
- Embedding of unique codes

1.2 Writing Quality

Thoroughly confirm, verify and evaluate the following points before using RFP, in order to improve the writing quality.

- Design circuits as described in the user's manual for the target microcontroller, E1, E20, and MINICUBE2.
- Use the microcontroller and RFP as described in the user's manual of the target microcontroller, RFP, E1, E20, and MINICUBE2.
- Make sure that the power supplied to the target microcontroller is stable.

1.3 Supported Microcontrollers

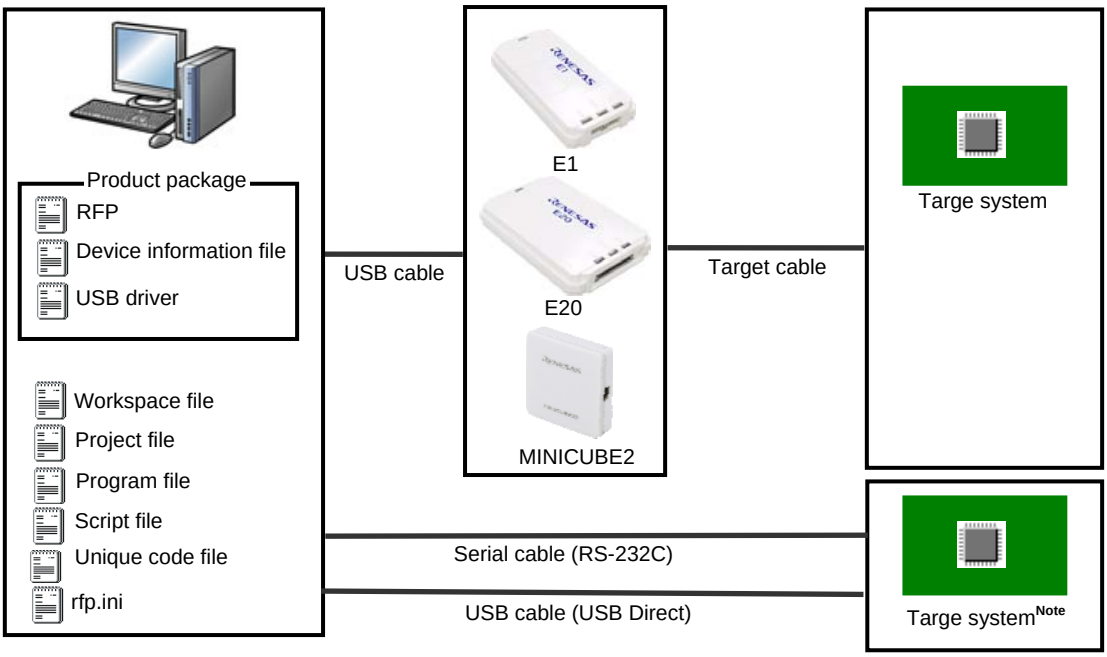
Microcontrollers supported by RFP are listed on the following websites:

http://www.renesas.com/rfp

1.4 System Overview

An overview of the RFP system is illustrated in the following diagram.

Figure 1-1. RFP Connection Image



Note To write data to the target system by using the serial interface incorporated in the host PC, a writing circuit is required in the target system. See the sample circuit shown on the following websites:

http://www.renesas.com/rfp

Remark Do not modify or delete the folder and file configuration of the RFP.

RFP operation overview

The following operations can be performed by using RFP. The settings on the host machine are saved in an `rfp.ini` file.

- Creating, saving, and reading workspace files
- Reading program files and device information files
- Target command execution
- Checksum calculation for program files
- Creating and saving multiple project files in workspace files (only full mode)
- Executing script commands
- Embedding unique codes

1.5 Operating Environment

This section explains the following items with respect to the operating environment:

- Hardware environment
- Software environment

1.5.1 Hardware environment

(1) Host PC

- PC/AT™ compatible
- Processor: 1 GHz or higher
- Main memory: 1 GB or more (2 GB or more when using 64-bit Windows); 2 GB or more recommended
- Display: Resolution of 1,024 x 768 or higher and 65,536 or more colors
- Interface: USB 2.0 (when using E1, E20, MINICUBE2, USB Direct)
  Serial interface (RS-232C) (when using COMx)

(2) Tools used

- E1
- E20
- MINICUBE2

1.5.2 Software environment

- Windows XP® (32-bit only)
- Windows Vista® (32-bit and 64-bit)
- Windows 7® (32-bit and 64-bit)
- Windows 8® (32-bit and 64-bit)
- Microsoft .NET Framework 4
- Microsoft Visual C++ 2010 Redistributable Package (x86)

1.6 Handling of HCUHEX Files

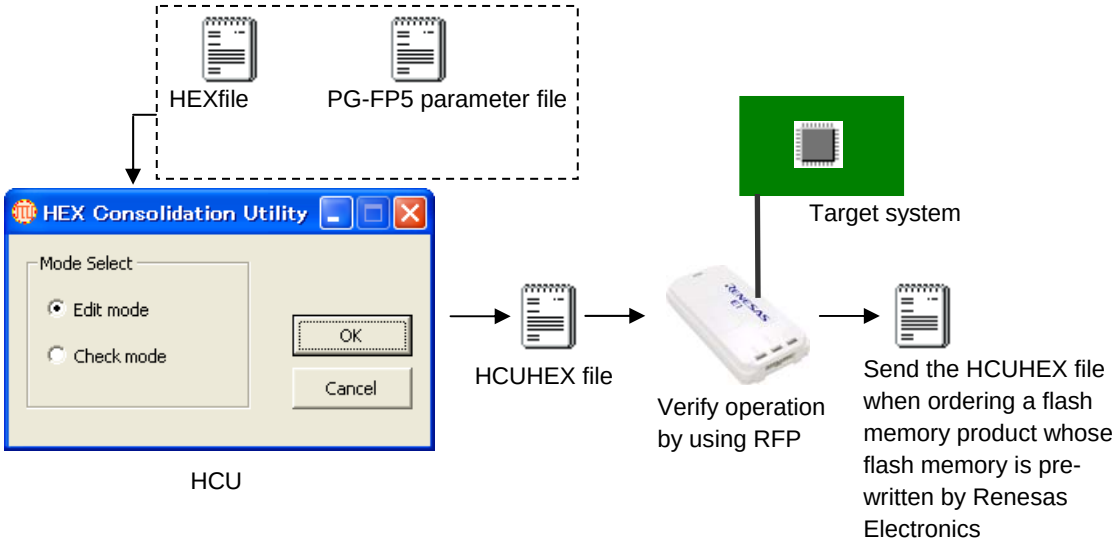
An HCUHEX file is required for ordering flash memory products whose flash memories are pre-written by Renesas Electronics. After being generated by the HEX Consolidation Utility (HCU), operation based on the HCUHEX file must be verified by using the flash memory programmer. Because RFP handles the HCUHEX file as master data, the user can check the settings specified for writing and option data.

Some RL78, 78K, and V850 microcontrollers support HCUHEX files. If a microcontroller supports HCUHEX files, it is written in the user's manual of the microcontroller. (SH, RX, and R8C microcontrollers do not support HCUHEX files.)

For details, see the description on each feature in this manual. For details about the HCU, see the user's manual of the HCU or the target microcontroller. The HCU user's manual is available on the following website:

http://www.renesas.com/support/downloads/download_results/ods/other/hcu_gui.jsp

Figure 1-2. Example of Using RFP and HCUs



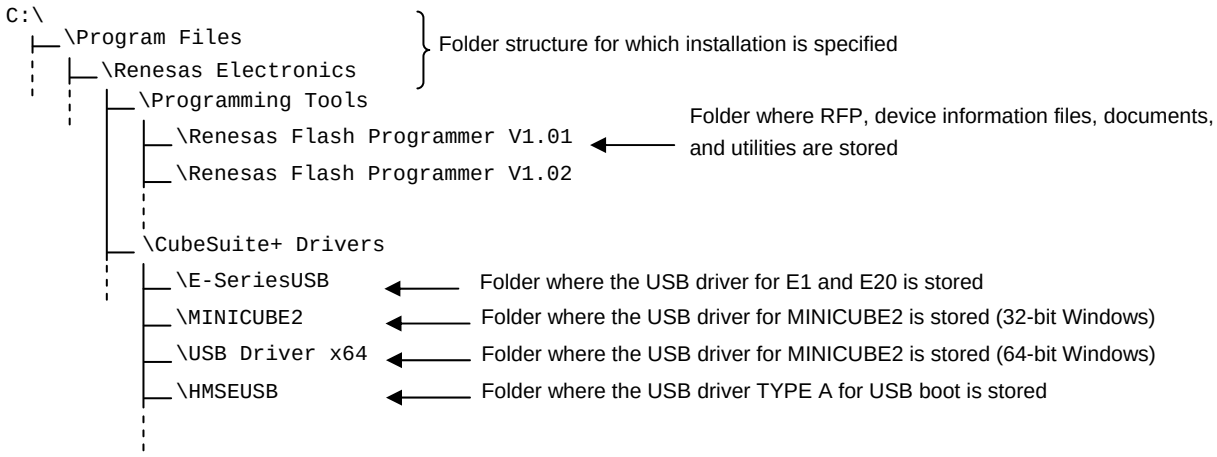
CHAPTER 2 INSTALLATION

This chapter describes installation.

2.1 Installation

To install the product package (RFP, USB driver, and device information file), insert the CD into the host PC to start the installer. Install as instructed by the installer program.

After the product package is installed, the folders are organized as follows:



2.1.1 Notes on installation

(1) Multiple versions of RFP can be installed on a single host PC. Although we recommend using the latest version of any development tool, leaving a previous version on your host PC and then installing the latest version lets you easily switch the development environment. Note that the Vx.yy part of the version notation (Vx.yy.zz) reflects the ability to install multiple versions (installation of multiple versions with different Vx.yy parts is supported). When more than one version having the same Vx.yy is installed, the last version to be installed overwrites the previous version.

(2) You might be asked to reboot your computer after installing the RFP. Be sure to close all other applications before rebooting your computer.

(3) You must have administrator privileges to install the RFP.

(4) The RFP can only be installed in a folder that is named using ASCII characters. (Note that the 11 characters / * : < > ? | " \ ; , and character strings that begin and end with a space cannot be used.) The RFP might not operate correctly if installed in a folder that is named using other characters.

(5) The RFP cannot be installed from a network drive or on a network drive.

(6) The installer does not specify environment variable paths. If these paths are required, add them after installation.

(7) Using the RFP requires the Microsoft .NET Framework, language packs, and Microsoft Visual C++ Runtime Library provided by Microsoft Corporation. Processing by the CD that accompanies an RFP product the user has purchased or by an RFP the user has downloaded from the website includes processing to install the above tools. Note that the host PC must be connected to the network to install the free evaluation versions in a Windows XP or Vista environment if the above tools are not installed. To proceed with setting up on a PC that is not connected to the network, start by setting up the programming GUI after installing Microsoft .NET Framework 4 with reference to the Microsoft download center website.

(8) The following folders created after installation (including the files under the folders) contain files required for the tools to operate. Do not delete them.
(Windows is the 32-bit edition and the system drive is C:)
C:\Program Files\Common Files\Renesas Electronics CubeSuite+\
(Windows is the 64-bit edition and the system drive is C:)
C:\Program Files (x86)\Common Files\Renesas Electronics CubeSuite+\

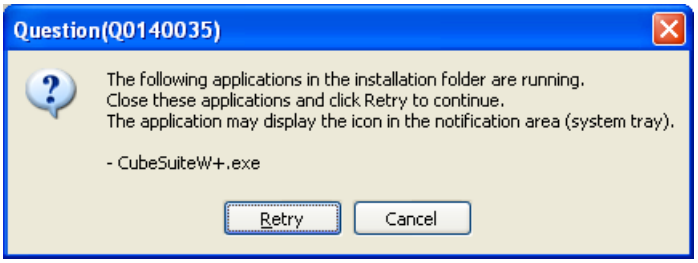
(9) To change the folder of the installed tools, uninstall all the CubeSuite+ related software and the programming GUI for RFP, and install them again.

(10) In the environment where the CubeSuite+, RFP, E1, E20, MINICUBE2 and USB driver for USB Boot are installed, the RFP, E1, E20, MINICUBE2 and USB driver for USB Boot are included in the target software of the CubeSuite+ integrated uninstaller. If you don't want to delete them, remove them from the uninstallation targets.

(11) If the installer is started on a non-Japanese version of Windows, then if the path contains multi-byte characters it will cause an error, and the installer will not start.

(12) If a CubeSuite+ instance launched via Rapid Start is in the notification area (system tray) during installation, the following error will appear. Exit the application, and run the installer again.

Figure 2-1 [Question (Q0140035)] Dialog Box



2.2 Uninstallation

To uninstall the RFP package (RFP, USB driver, and device information file), use “Add or Remove Programs” (or “Programs and Features”) on the Control Panel. The CubeSuite+ integrated uninstaller can also be used to uninstall the RFP package.

2.3 Updating RFP and Firmware

The firmware is a program embedded in the microcontroller for controlling E1, E20, or MINICUBE2. Updating RFP and the firmware enables the following:

- Addition of newly supported functions or microcontrollers
- Correction of restrictions

For RFP and the firmware, use of the latest version is recommended to ensure correct operation of E1, E20, and MINICUBE2.

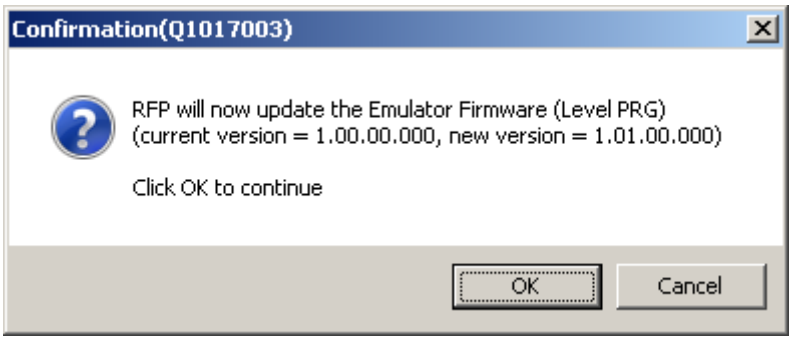
The latest version of the firmware for RFP and MINICUBE2, and MINICUBE2 Diagnostic Tools can be checked and obtained at the following websites:

http://www.renesas.com/rfp

How to check the firmware version and configure and update your system are described below.

For E1 and E20, check that RFP has the correct E1 and E20 firmware versions. If the firmware does not match, the [Renesas Flash Programmer] dialog box will open. Click the Yes button to update.

Figure 2-2. Updating Firmware



For MINICUBE2, see **MINICUBE2 Diagnostic Tools User’s Manual (U18588E)** for how to check the firmware version, and configure and update your system.

CHAPTER 3 BASIC OPERATION (BASIC MODE) - RL78, 78K, V850 -

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 for the RL78, 78K, and V850. 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
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 **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

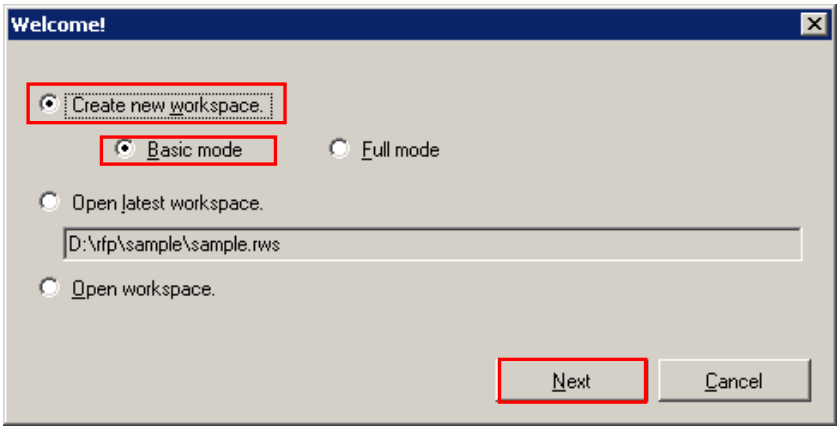
Connect the target cable of the tool used to the target system.

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

(4) Creation of workspace

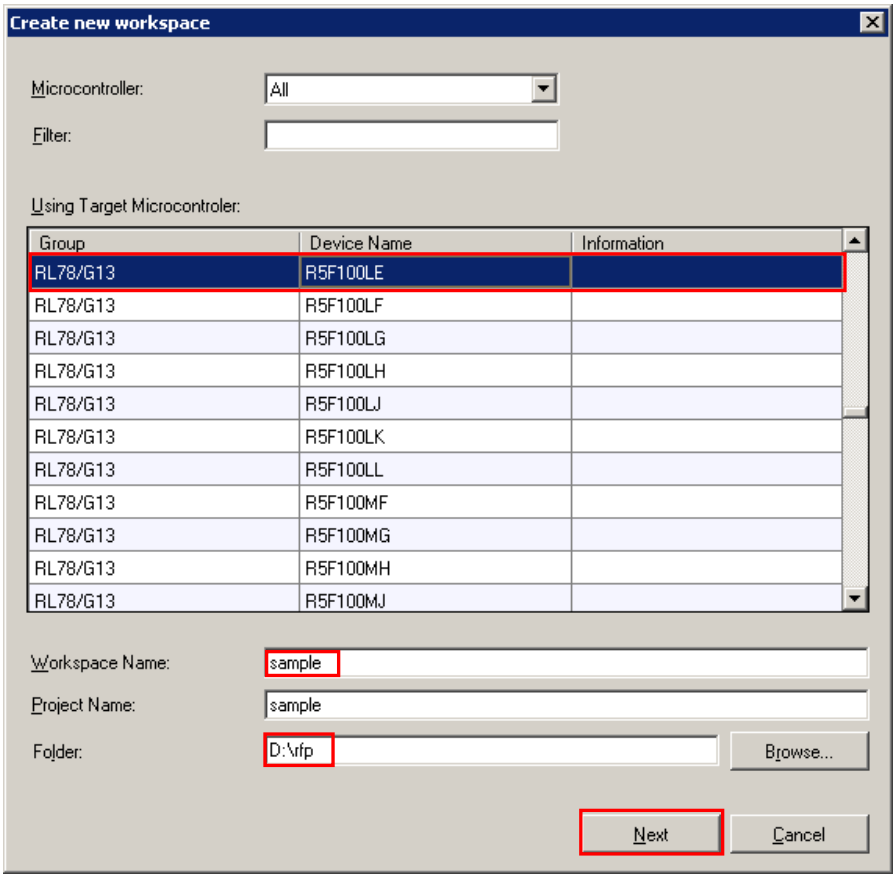
<1> On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer V*x.xx*], and then click [Renesas Flash Programmer V*x.xx*]. The [Welcome!] dialog box will open. Select [Create new workspace.], select [Basic mode], and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

Figure 3-1. [Welcome!] Dialog Box



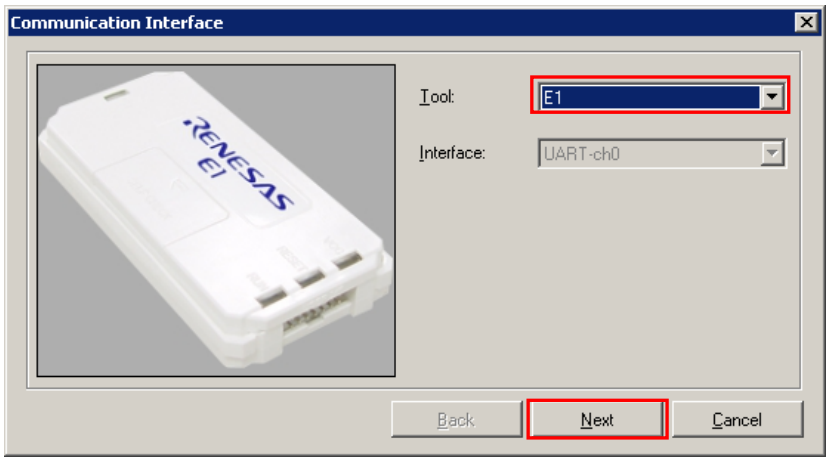
<2> In the [Using Target Microcontroller:] list box, select “R5F100LE”. Enter any text string (such as “sample” in this case) in the [Workspace Name:] box, and specify any folder in the [Folder:] box.
Clicking the Next button displays the [Communication Interface] dialog box.

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



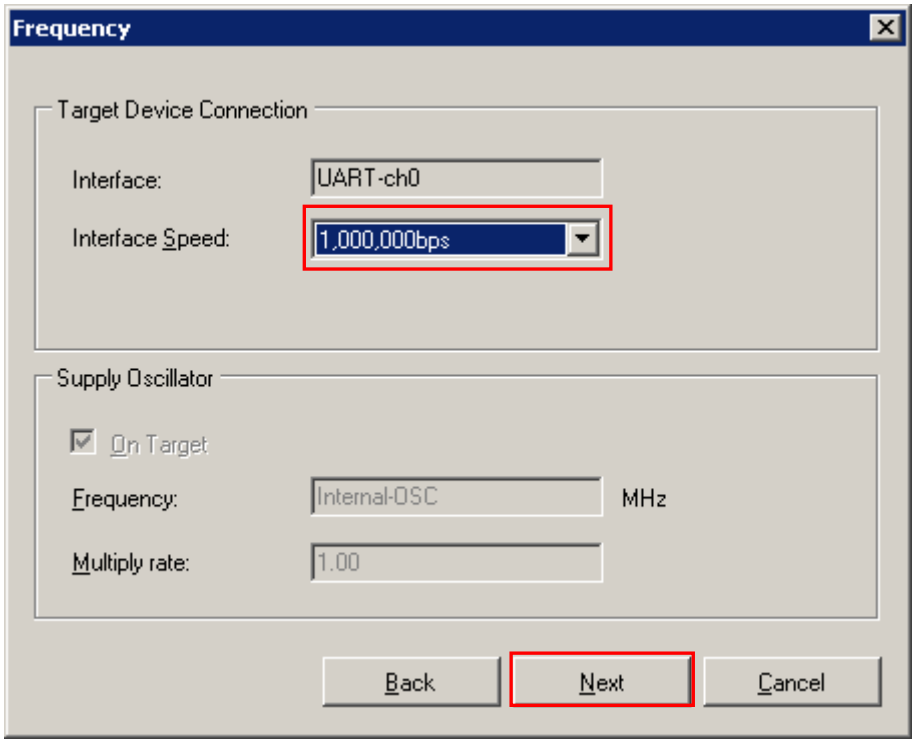
<3> Select “E1” in the [Communication Interface] dialog box. For R5F100LE, the selection in the [Interface] list box is fixed to “UART-ch0”.
Clicking the Next button displays the [Frequency] dialog box.

Figure 3-3. [Communication Interface] Dialog Box



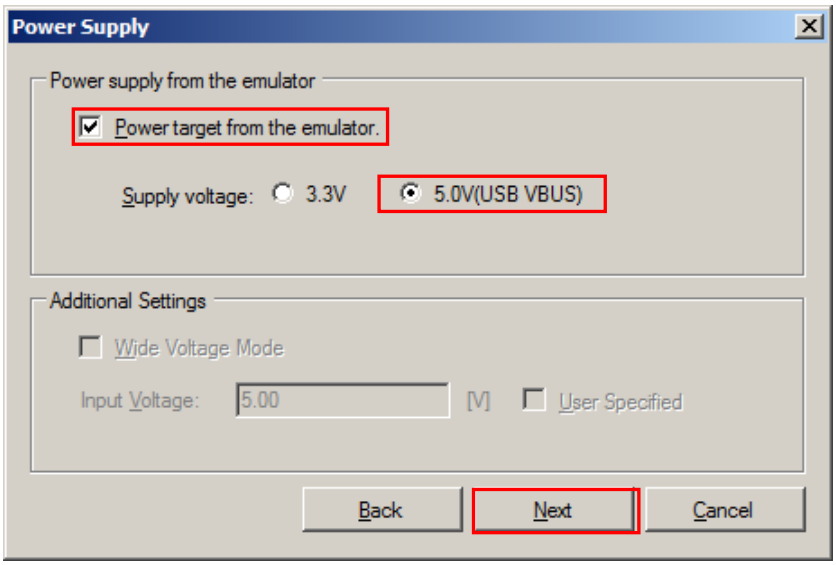
<4> Select “1,000,000bps” from the [Interface Speed:] list box. For R5F100LE, the [Supply Oscillator] area is fixed to “Internal-OSC”.
Clicking the Next button displays the [Power Supply] dialog box in the case of E1.

Figure 3-4. [Frequency] Dialog Box



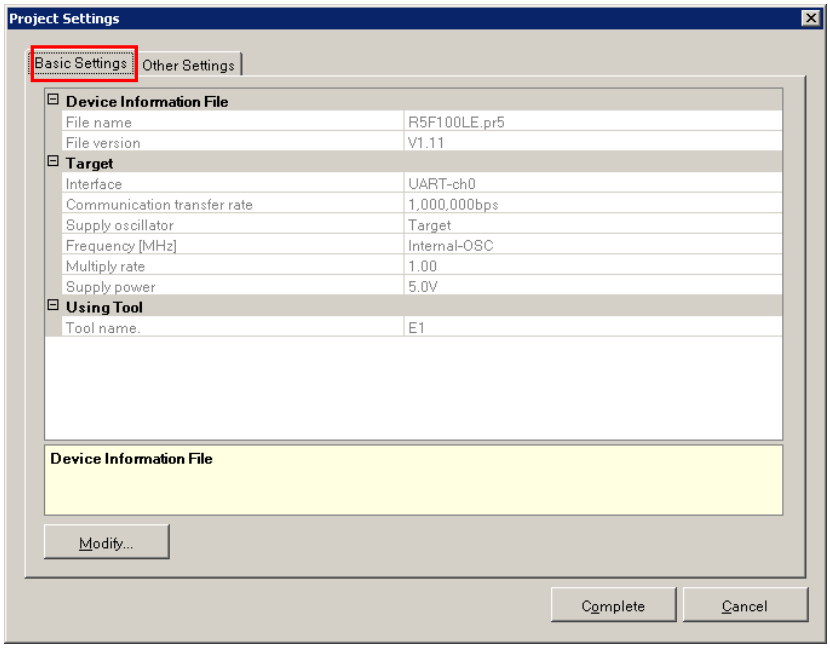
<5> Select the [Power target from the emulator] check box, and then select “5.0V (USB VBUS)” for [Supply voltage].
Clicking the [Next] button displays the [Project Settings] dialog box.

Figure 3-5. [Power Supply] Dialog Box



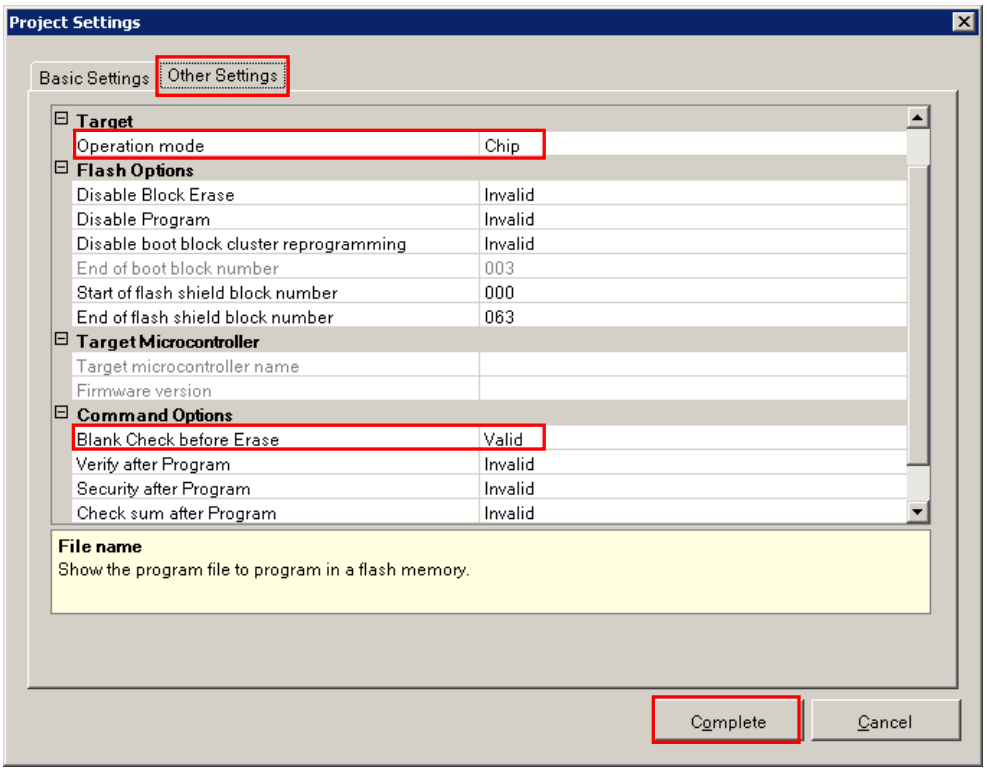
<6> The [Basic Settings] tab of the [Project Settings] dialog box shows the basic information about writing data. Clicking the [Other Settings] tab of the [Project Settings] dialog box displays the [Other Settings] tab screen of the [Project Settings] dialog box.

Figure 3-6. [Basic Settings] Tab of the [Project Settings] Dialog Box



<7> 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.

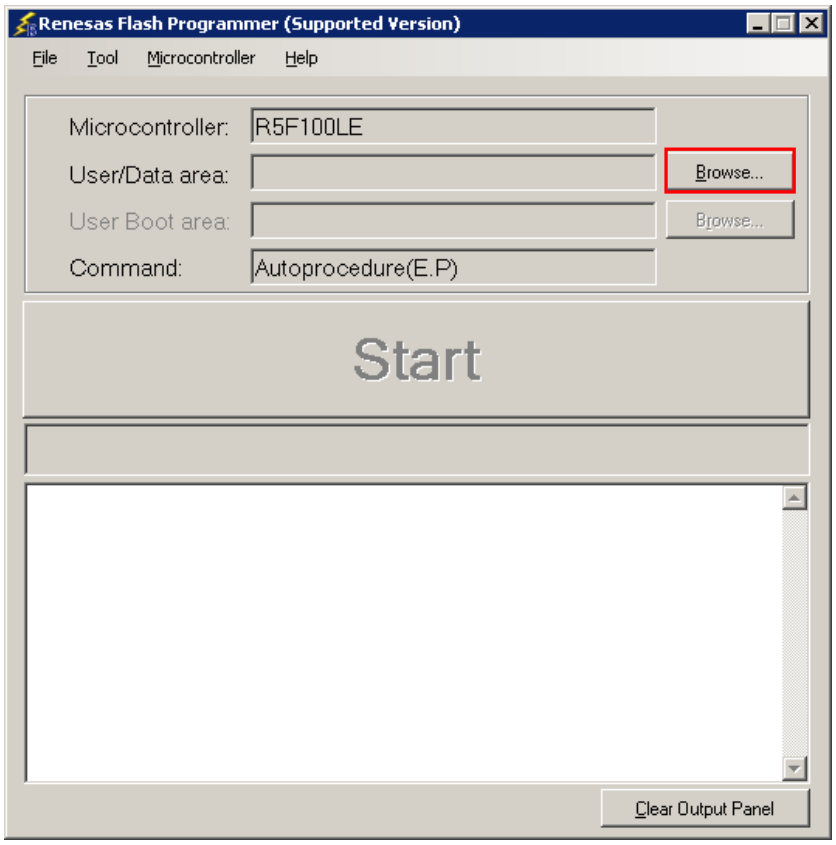
Figure 3-7. [Other Settings] Tab of the [Project Settings] Dialog Box



(5) Selection of program file

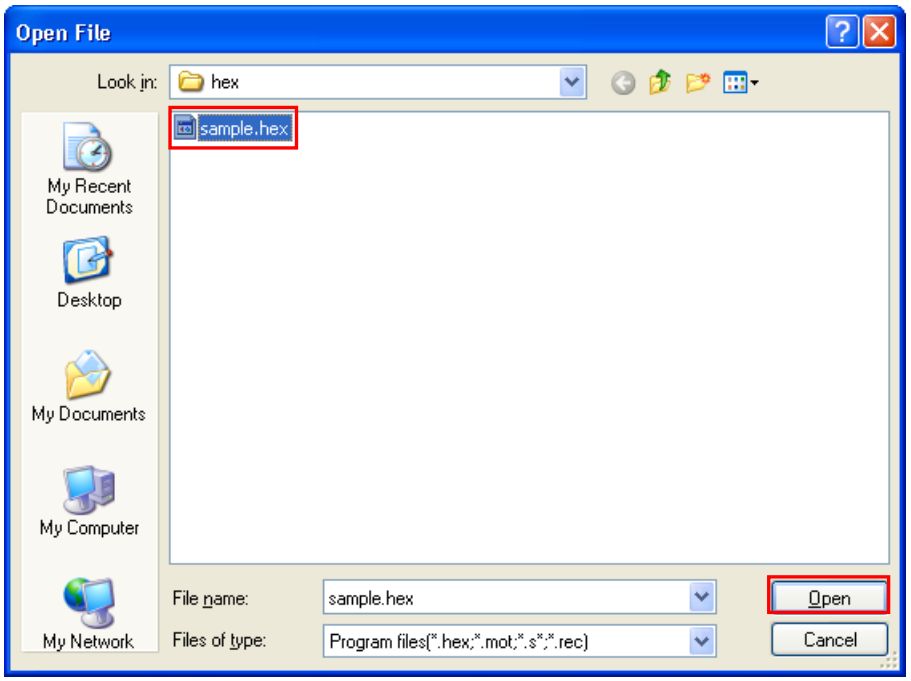
<1> Click the Browse… button in “User/Data area:” of the program file area to open the [Open File] dialog box.

Figure 3-8. Main Window



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

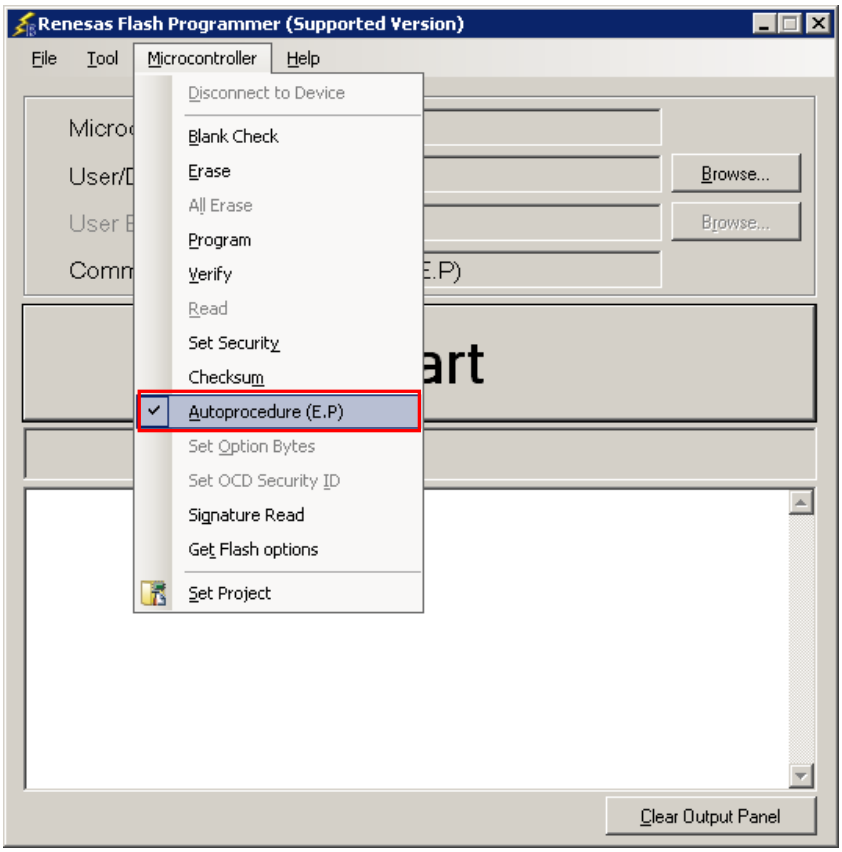
Figure 3-9. [Open File] Dialog Box



(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 3-10. Main Window



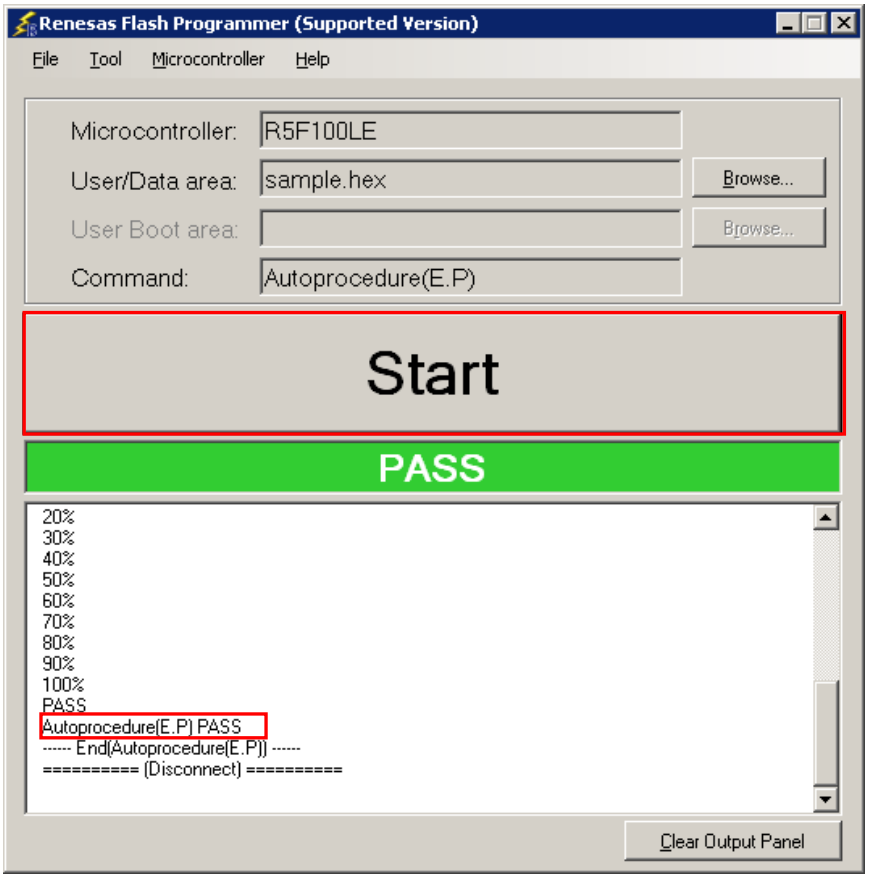
<2> After clicking the Start button, execute the following commands in the following order for R5F100LE: [Blank Check] command, [Erase] command (if there are no blanks), and [Program] command.

<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 V_{DD} power to the target system, first turn off the power, connect the target system (for programming), and then turn on the power and execute the [Autoprocedure (E.P)] command.

Figure 3-11. [Autoprocedure (E.P)] Command Execution Results



(7) System shutdown

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

Remark When supplying V_{DD} power to the target system, turn off the power before removing the target cable.

<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 CHAPTER 12 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 4 BASIC OPERATION (BASIC MODE) - RX -

This chapter describes the operation method by using the RX as the target microcontroller as an example to help you understand a series of basic operations with the basic mode of RFP for the RX. 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:	R5F562TAA (RX62T)
Target system:	Renesas Starter Kit for RX62T
Tool used:	E1
Interface:	2 wire UART
Communication speed setting:	1,562,500 bps
Frequency:	12.50 MHz (main clock × 8 multiplication, peripheral clock × 4 multiplication)
Power supply:	E1 (5.0 V (USB VBUS))
Lock bit:	None
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 **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

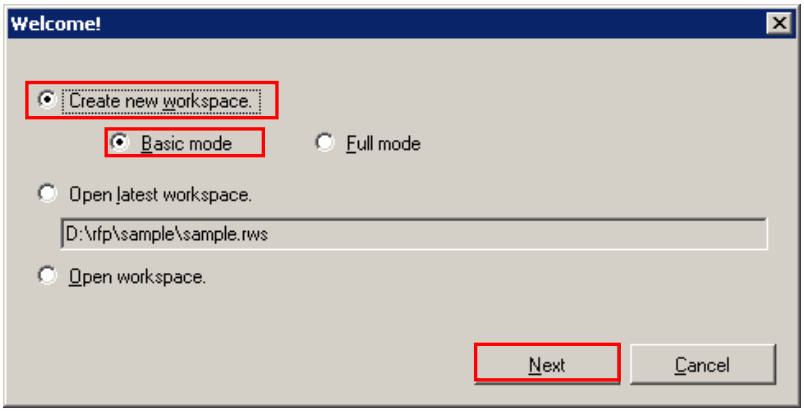
Connect the target cable of the tool used to the target system.

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

(4) Creation of workspace

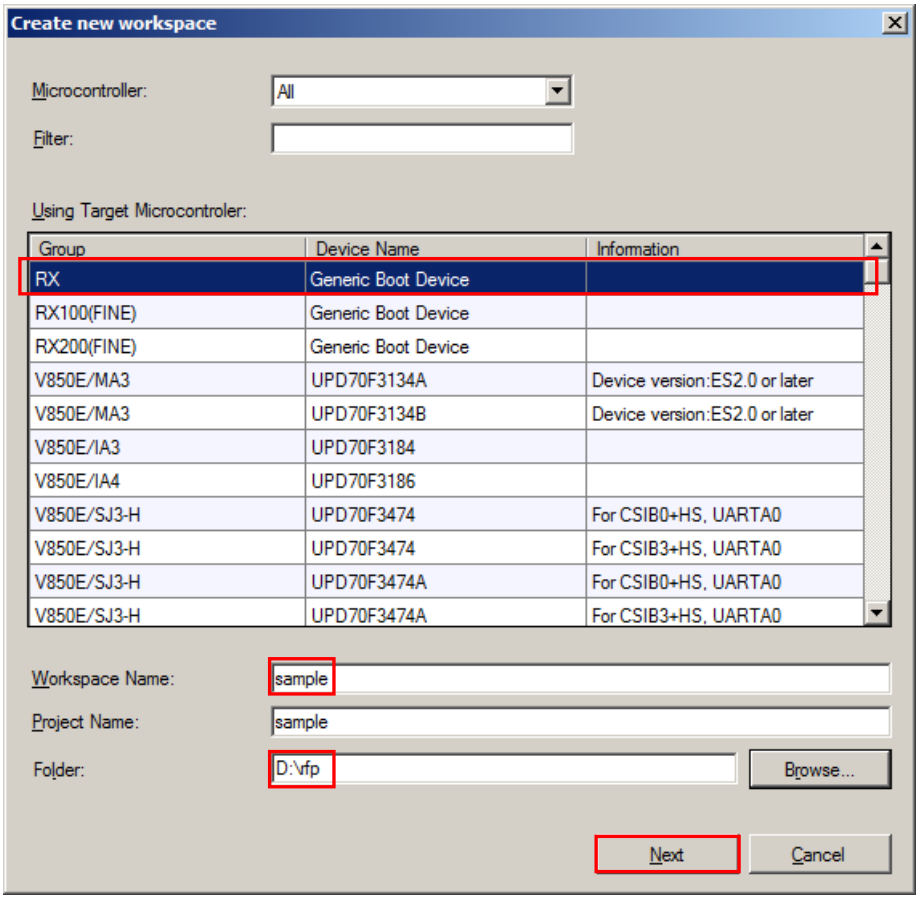
<1> On the taskbar, click the Start button, point to [All Programs], [Renesas Electronics Utilities], [Programming Tools], [Renesas Flash Programmer V*x.xx*], and then click [Renesas Flash Programmer V*x.xx*]. The [Welcome!] dialog box will open. Select [Create new workspace.], select [Basic mode], and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

Figure 4-1. [Welcome!] Dialog Box



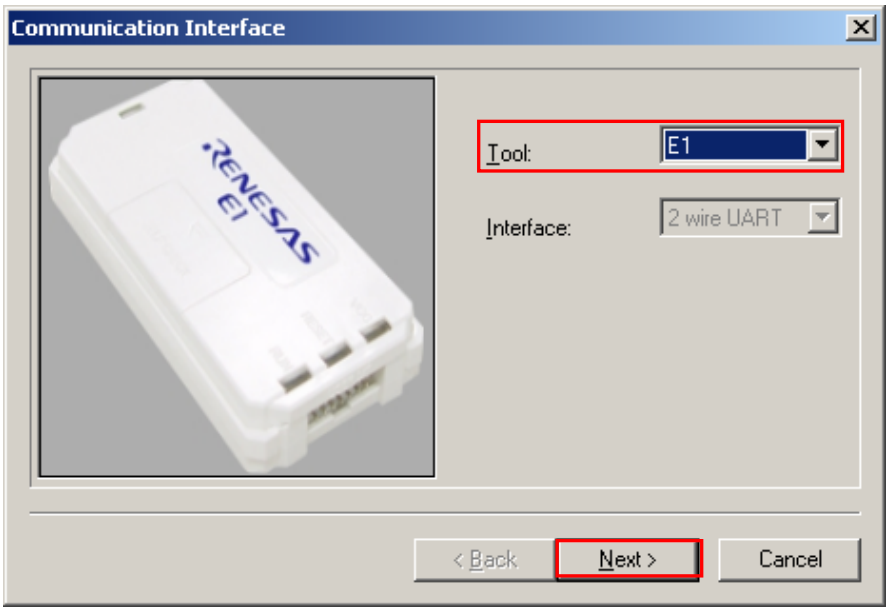
<2> In the [Using Target Microcontroller:] list box, select “Generic Boot Device”. Enter any text string (such as “sample” in this case) in the [Workspace Name:] box, and specify any folder in the [Folder:] box.
Clicking the Next button displays the [Communication Interface] dialog box.

Figure 4-2. [Create new workspace] Dialog Box



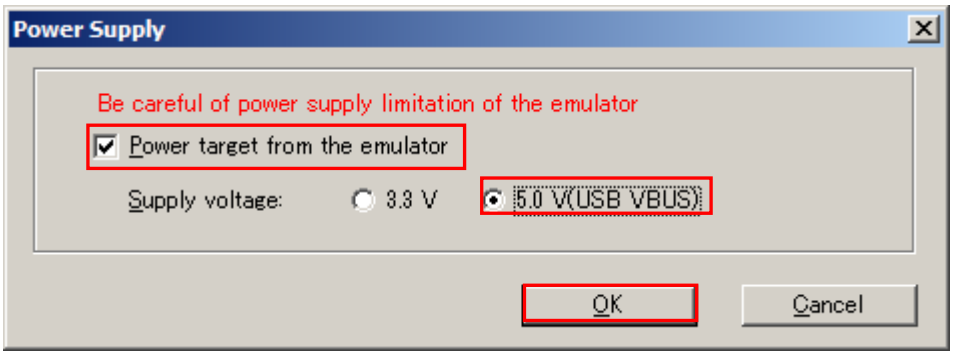
<3> Select “E1” in the [Tool:] list box. For R5F562TAA, the selection in the [Interface] list box is fixed to “2 wire UART”.
Clicking the [Next >] button displays the [Power Supply] dialog box.

Figure 4-3. [Communication Interface] Dialog Box



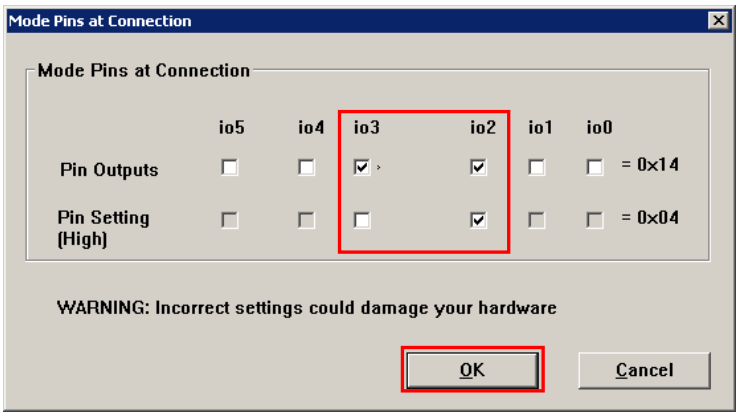
<4> Select the [Power target from the emulator] check box, and then select “5.0 V (USB VBUS)” for [Supply voltage].
Clicking the [OK] button displays the [Mode Pin at Connection] dialog box.

Figure 4-4. [Power Supply] Dialog Box



<5> Set the [Pin Outputs] check boxes and [Pin Setting (High)] check boxes. For R5F562TAA, set io2 of E1 to High for the MD0 pin, and set io3 of E1 to Low for the MD1 pin.
Clicking the OK button displays the [Confirmation] dialog box.

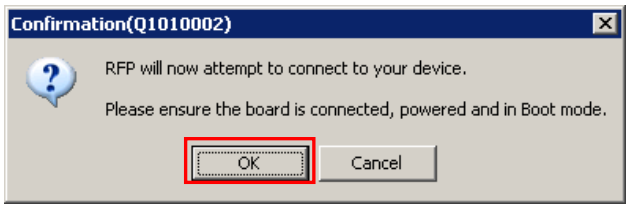
Figure 4-5. [Mode Pin at Connection] Dialog Box



Remark: Processing the io pins is done to set the operating mode of the RX to the boot mode. For the RX62T, control must be applied to set the MD0 pin to the high level and the MD1 pin to the low level. This can be done by connecting any of pins from io0 to io5 of the E1/E20 and making the required settings in the [Mode Pins at Connection] dialog box. For the io0 to io5 pins of E1, refer to **Figure B-1. E1 and E20 Pins - RX -** in **APPENDIX B**.

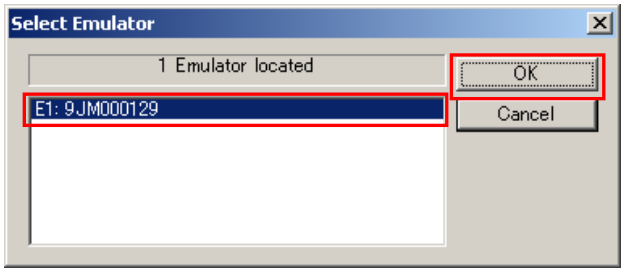
<6> Check that the board is connected, powered, and in Boot mode. Clicking the OK button displays the [Select Emulator] dialog box.

Figure 4-6. [Confirmation] Dialog Box



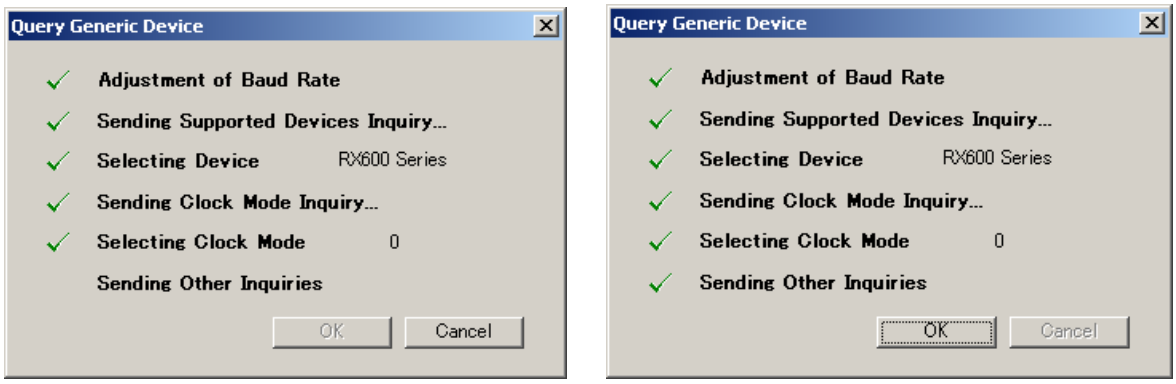
<7> The name and serial number of the detected Emulator are displayed. Select it. The serial number is printed on the chassis.
Clicking the OK button establish connection with the device and displays the [Query Generic Device] dialog box.

Figure 4-7. [Select Emulator] Dialog Box



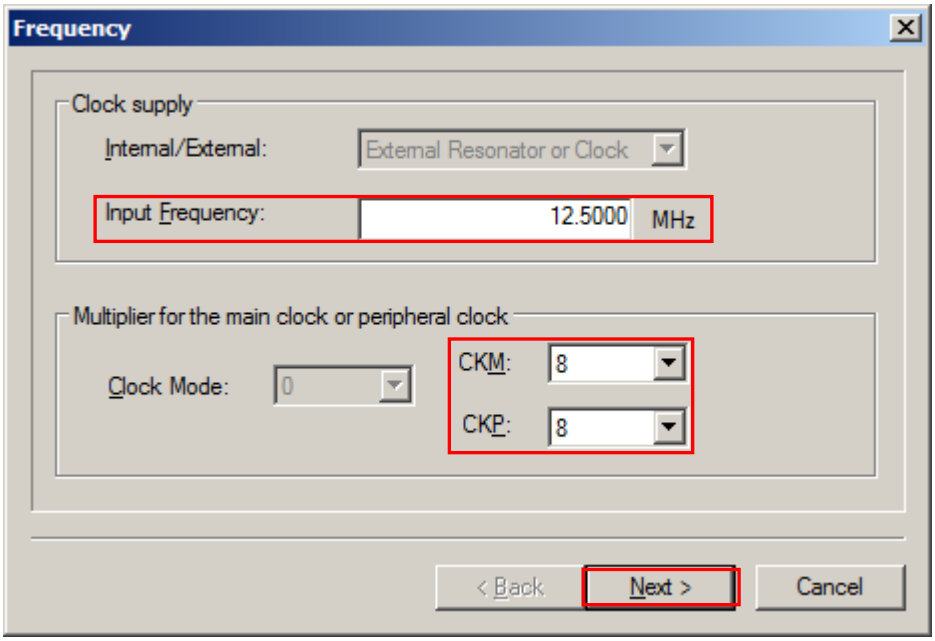
<8> A query for the target microcontroller is performed.
Clicking the OK button displays the [Frequency] dialog box.

Figure 4-8. [Query Generic Device] Dialog Box



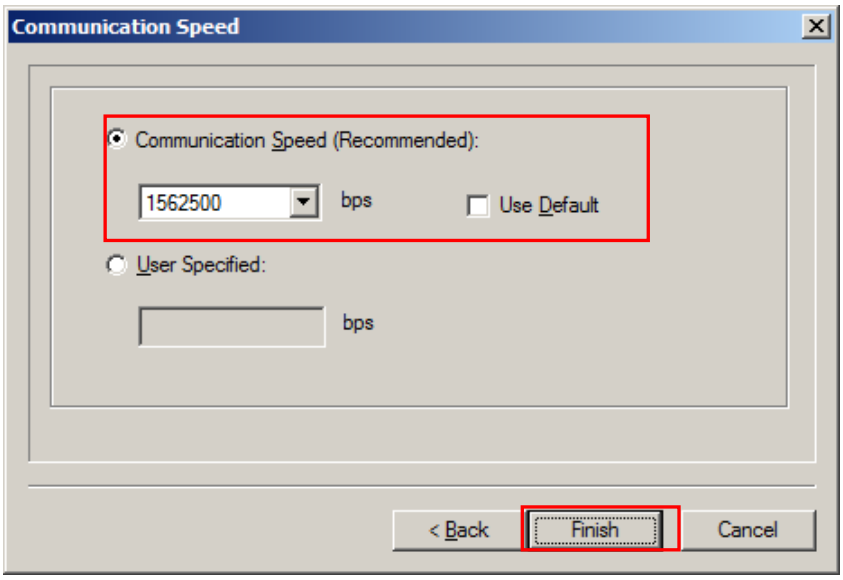
<9> Enter “12.50” in the [Frequency:] box in the [Clock supply] area. The [Internal/External:] list box displays the result of the query “External Resonator or Clock”. Select “8” from the [CKM:] list box in the [Multiplier for the main clock or peripheral clock] area. Select “4” from the [CKP:] list box. The [Clock Mode:] list box displays the result of the query “0”.
Clicking the Next > button displays the [Communication Speed] dialog box.

Figure 4-9. [Frequency] Dialog Box



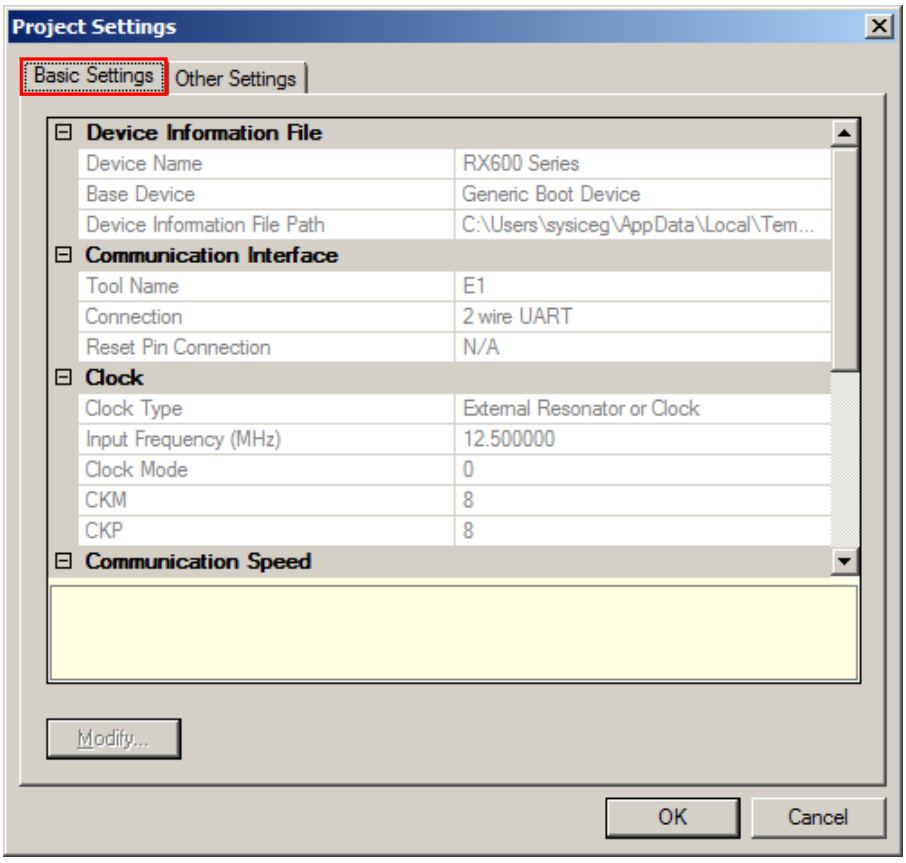
<10> Clear the [Use Default] check box, and select “1562500” from the [Communication Speed (Recommended):] list box.
Clicking the Finish button displays the [Project Settings] dialog box.

Figure 4-10. [Communication Speed] Dialog Box



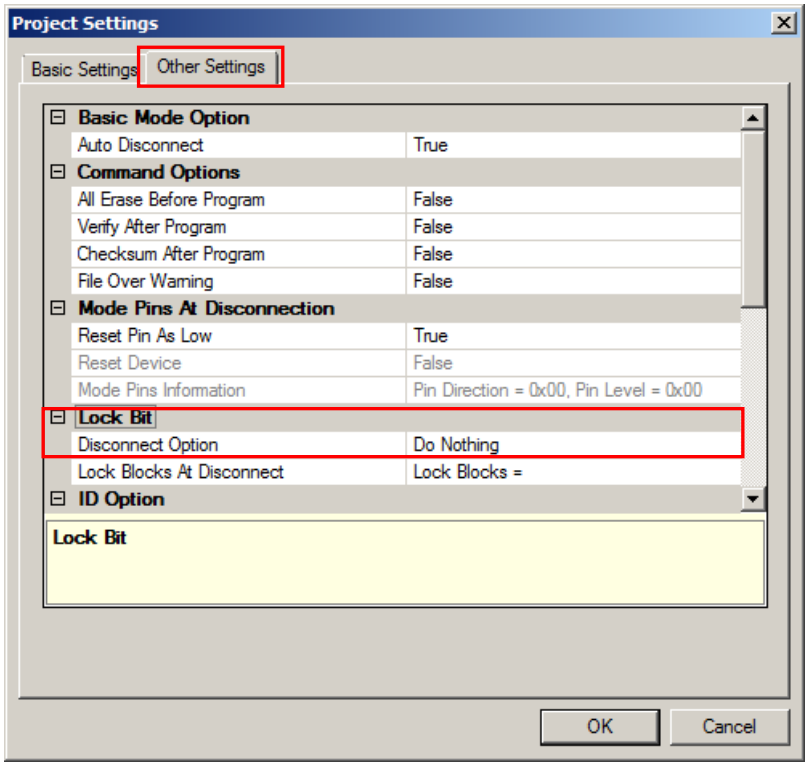
<11> The [Basic Settings] tab in the [Project Settings] dialog box allows you to check basic information about programming. Clicking the [Other Settings] tab of the [Project Settings] dialog box displays the [Other Settings] tab in the [Project Settings] dialog box.

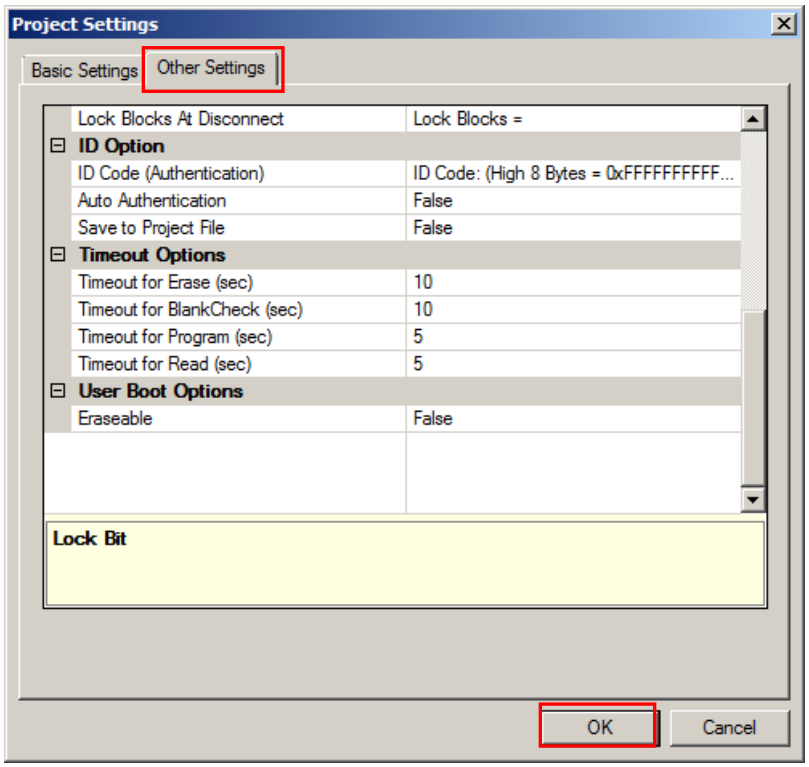
Figure 4-11. [Project Settings] Dialog Box [Basic Settings] Tab



<12> The [Other Settings] tab in the [Project Settings] dialog box allows you to specify and check advanced information about programming.
For [Disconnect Option] in the [Lock Bit] category, select “Do Nothing.” Leave the initial values for other settings.
Clicking the OK button saves the project file and displays the main window.

Figure 4-12. [Project Settings] Dialog Box [Other Settings] Tab

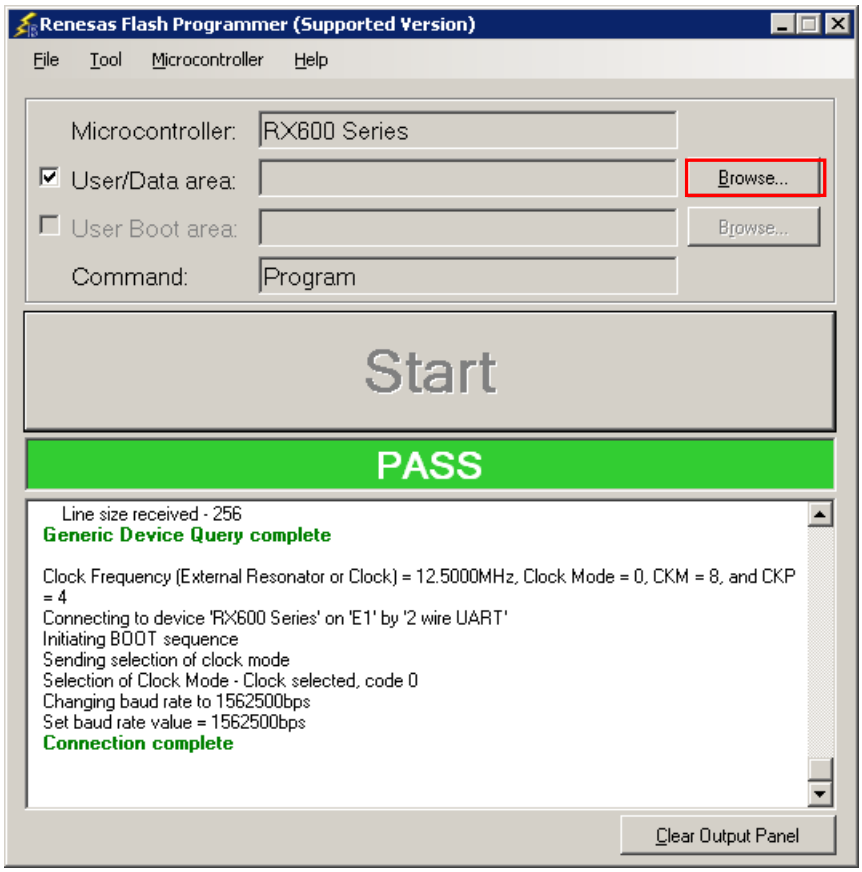




(5) Selection of program file

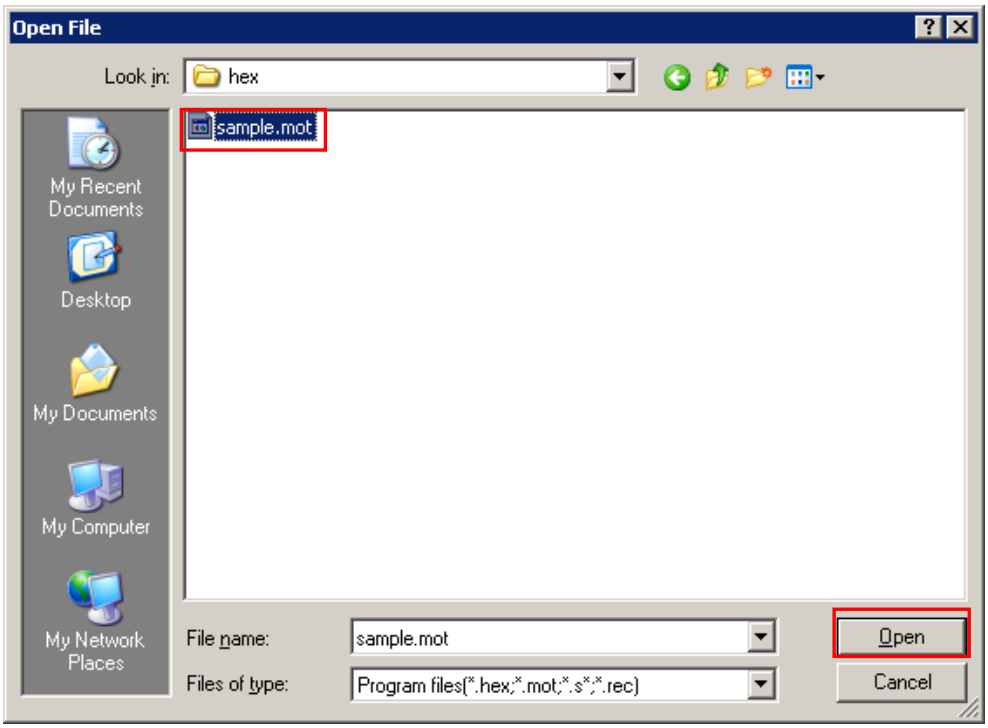
<1> Clicking the Browse… button in the User/Data area: of the program file area displays the [Open File] dialog box.

Figure 4-13. Main Window



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

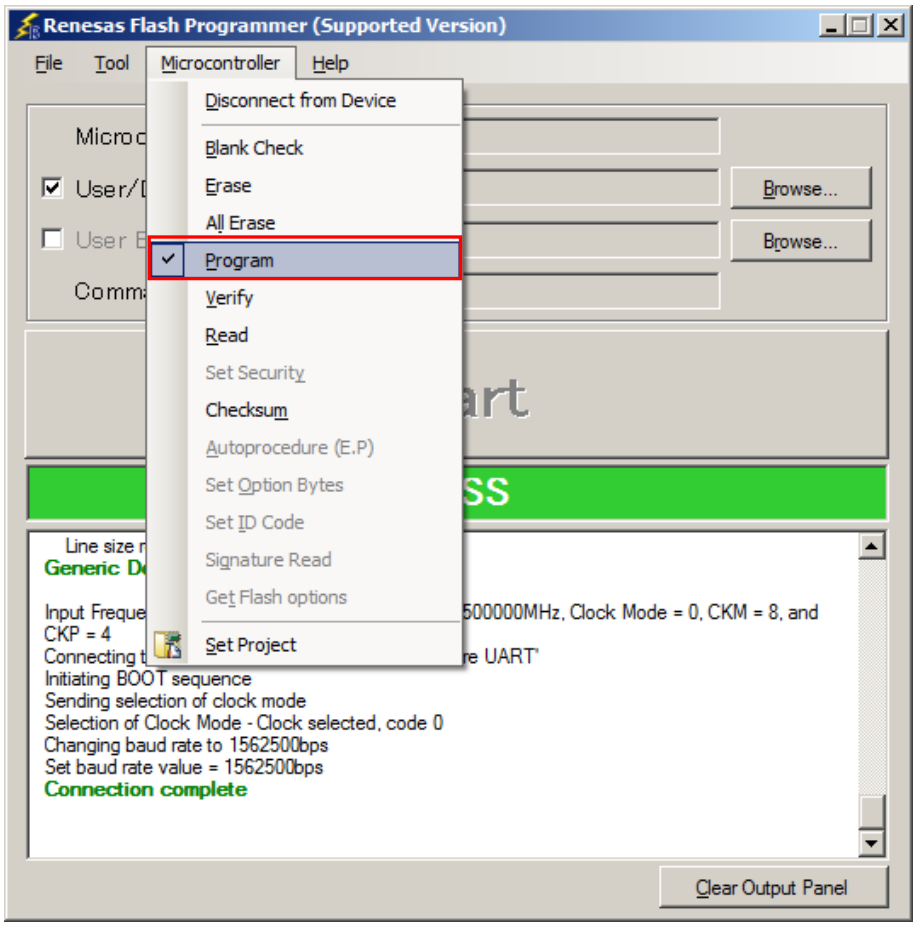
Figure 4-14. [Open File] Dialog Box



(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 4-15. Main Window



<2> After clicking the Start button, execute the [Program] command for R5F562TAA.

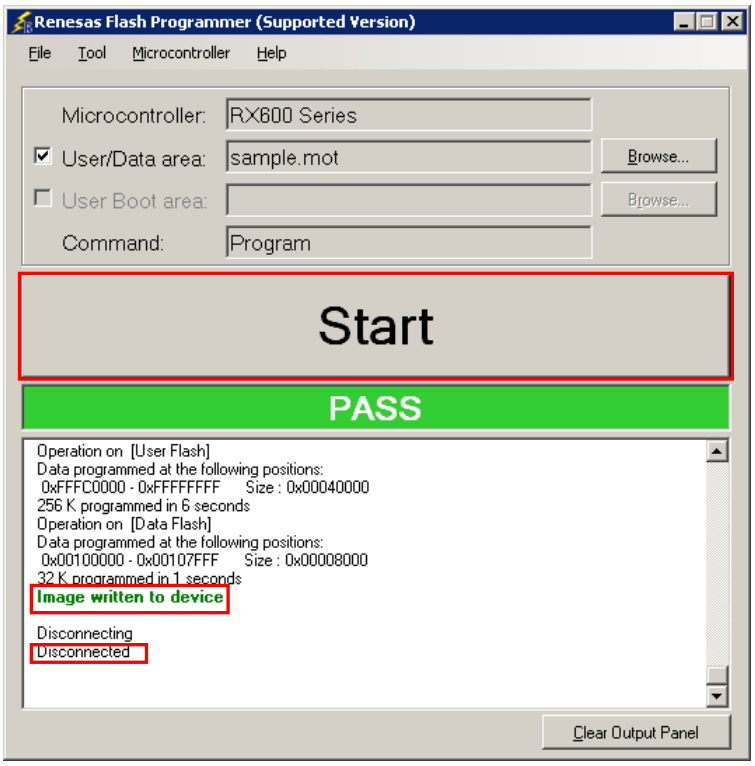
Remark When the [Program] command is executed, programming is performed after the block with data is erased. To erase all blocks, set [All Erase Before Program] in the [Command Options] category in the [Other Settings] tab of the [Project Settings] dialog box to “True.”

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

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

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

Figure 4-16. [Program] Command Execution Results



(7) System shutdown

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

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

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

Remark When supplying V_{DD} power to the target system, turn off the power before removing the target cable. Furthermore, if [Auto Disconnect] in the [Basic Mode Options] 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 CHAPTER 12 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 5 FUNCTION DETAILS (BASIC MODE) - RL78, 78K, 850 -

This chapter describes function details of the commands, windows, and dialog boxes of the basic mode of RFP for the RL78, 78K, and V850.

5.1 Introduction

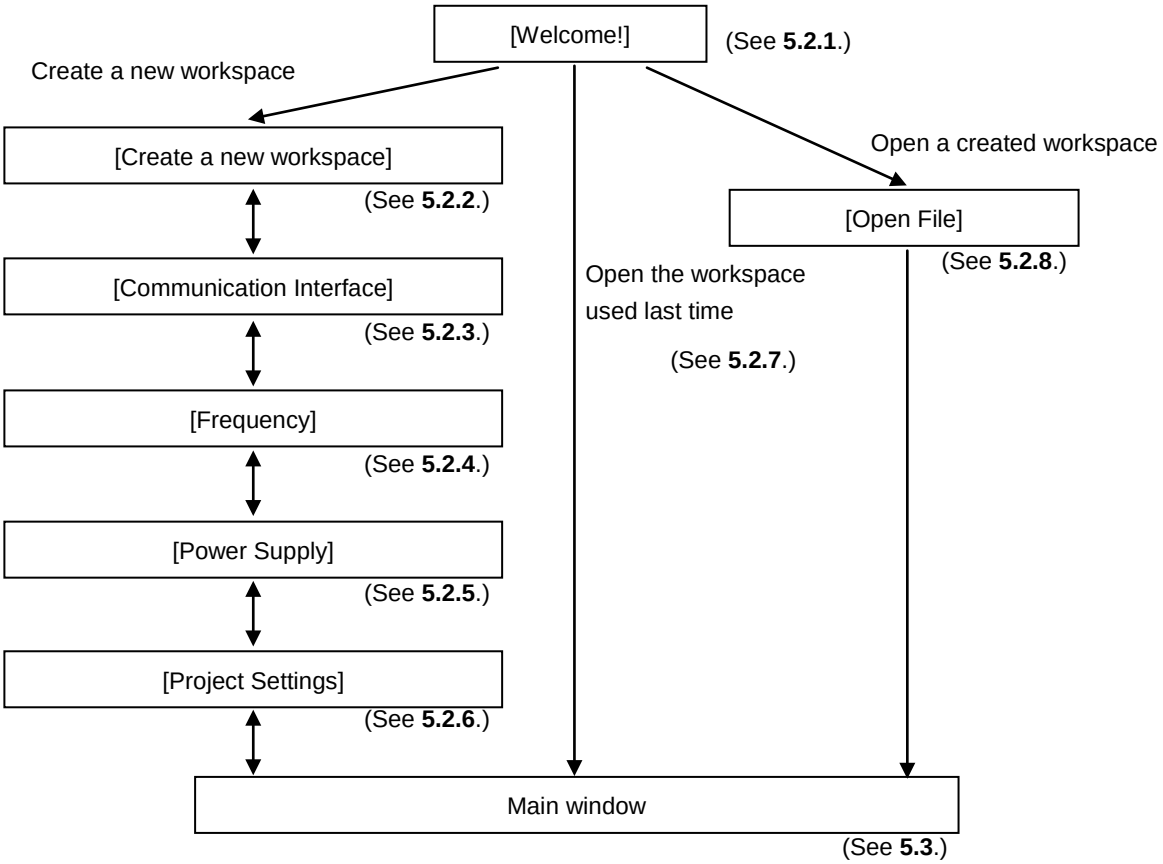
Make sure that the RFP package is installed. For how to install the RFP package, see **CHAPTER 2 INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

5.2 Starting up

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

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The [Frequency] and the [Power Supply] dialog boxes are skipped if it is not necessary to change the setting.

Figure 5-1. 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.

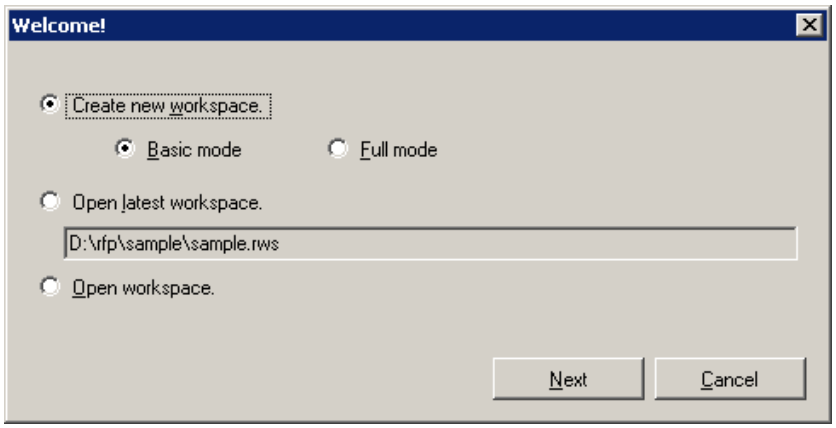
(2) Dragging and dropping a workspace file onto RFP.exe.

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

5.2.1 [Welcome!] dialog box

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

Figure 5-2. [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.].

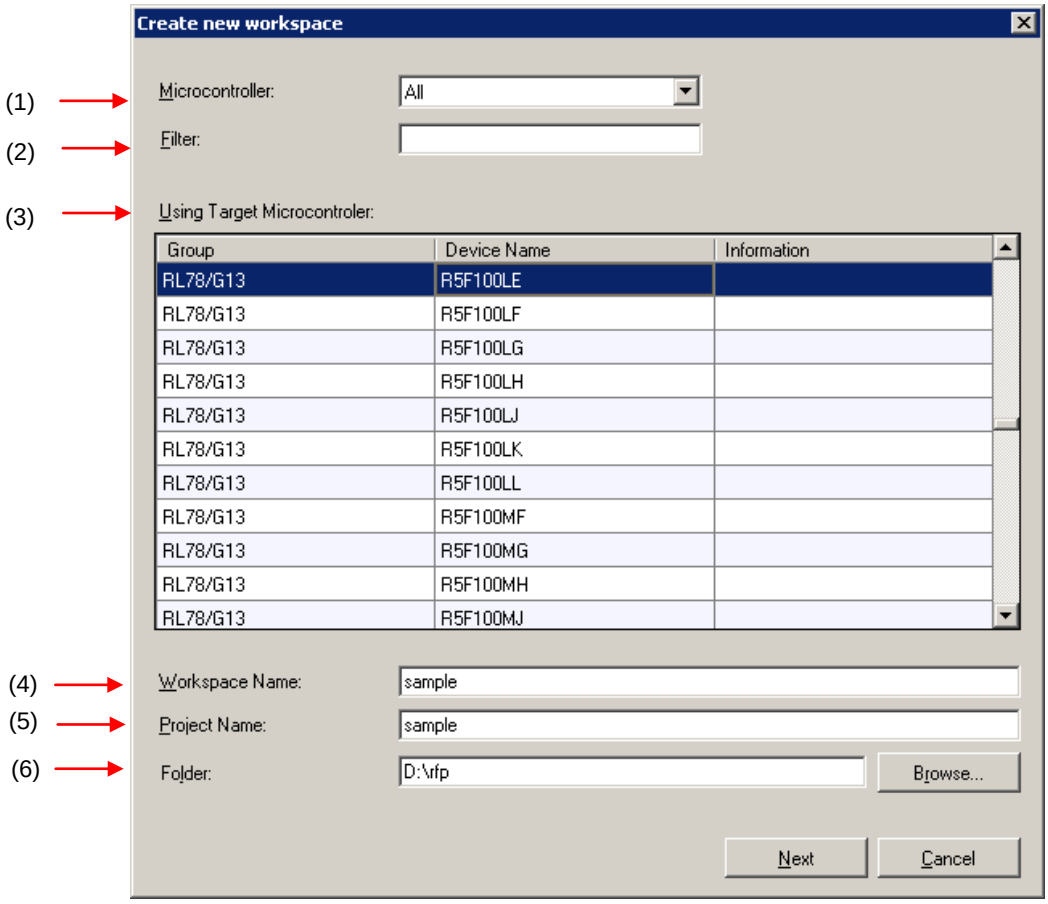
Clicking the Next button displays the next dialog box.

Clicking the Cancel or the X button terminates RFP.

5.2.2 [Create new workspace] dialog box

This dialog box is used to create a new workspace.

Figure 5-3. [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

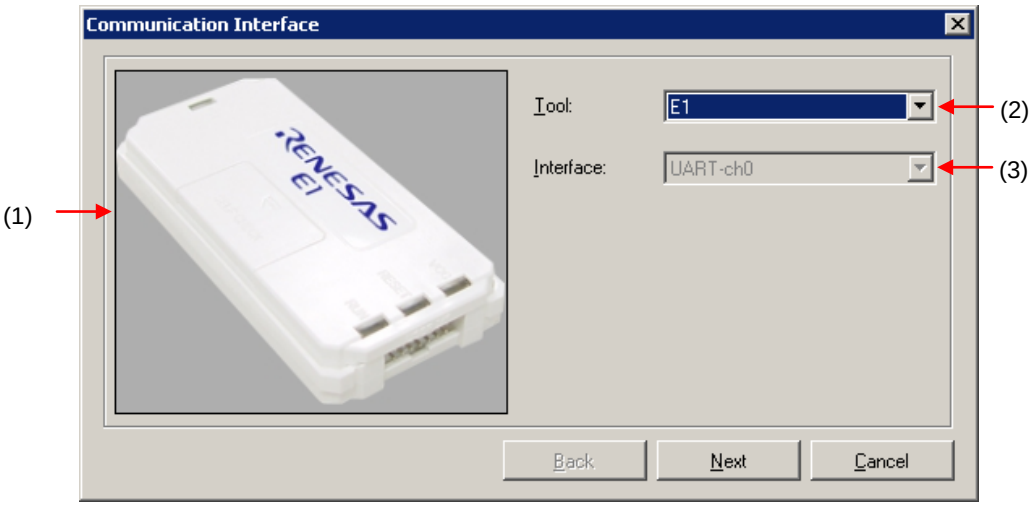
Specify a folder in which to create the workspace file. Enter the path in the [Folder:] box, or click the [Browse...] button to display the [Select Folder] dialog box, and then specify the folder.

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

5.2.3 [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 5-4. [Communication Interface] Dialog Box



(1) Tool image panel

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

Figure 5-5. 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.

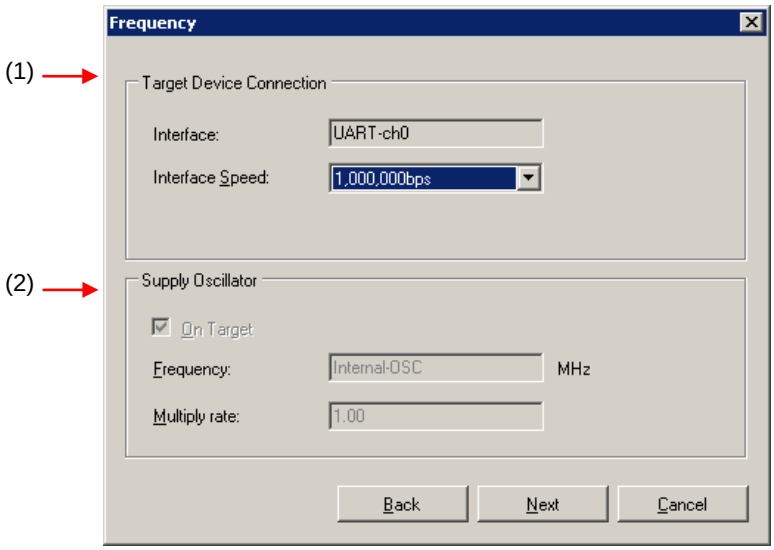
- UART-ch0 (when using the UART feature of RL78, 78K, or V850)
- SIO-ch0 (when using V850E2)
- SIO-H/S (when using the SIO-H/S feature of V850ES or V850E1)
- UART-X1-OSC (when using the X1 clock of 78K0)
- UART-EXCLK (when using the EXCLK input clock of 78K0)
- UART-Int-OSC (when using the internal oscillation clock of 78K0)

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

5.2.4 [Frequency] dialog box

This dialog box is used to specify the communication speed and the clock.

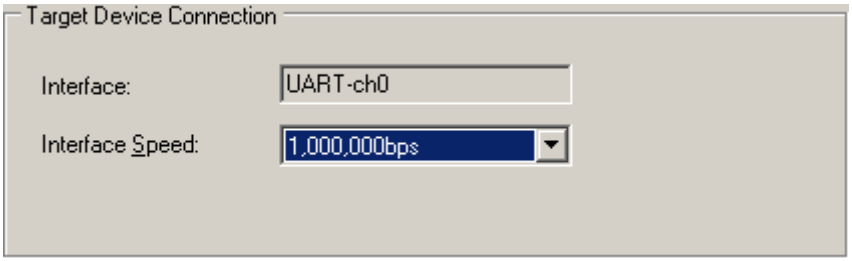
Figure 5-6. [Frequency] Dialog Box



(1) [Target Device Connection] area

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

Figure 5-7. [Target Device Connection] Area



[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.

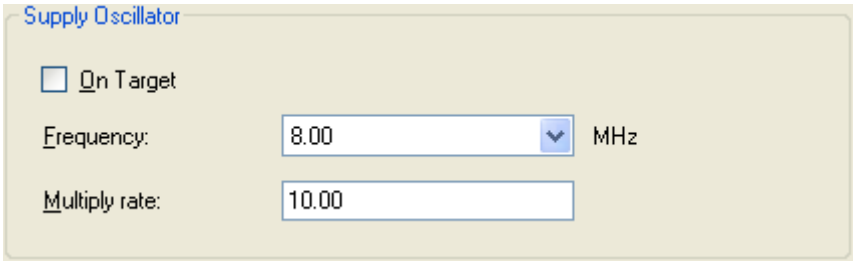
- When UART-ch0, UART-X1-OSC, UART-EXCLK, or UART-Int-OSC is selected:
  - 9,600 bps
  - 19,200 bps
  - 31,250 bps
  - 38,400 bps
  - 57,600 bps
  - 76,800 bps
  - 115,200 bps
  - 125,000 bps
  - 128,000 bps
  - 153,600 bps
  - 250,000 bps
  - 500,000 bps
  - 1,000,000 bps

- 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 5-8. [Supply Oscillator] Area



[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

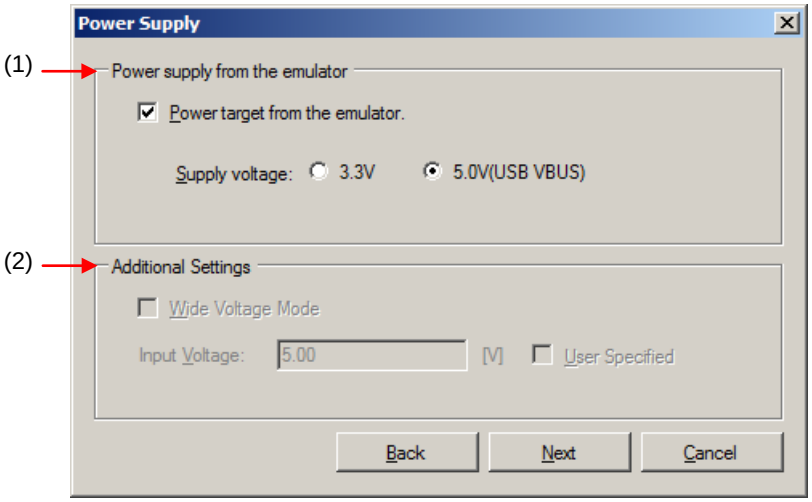
Specify the multiplication ratio of the clock supplied to the target microcontroller. If the target microcontroller includes the PLL circuit, input the multiplication ratio in accordance with the environment used. If the target microcontroller does not include the PLL circuit, enter “1.0”. For the selectable 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.

5.2.5 [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 5-9. [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 machine, 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.

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.

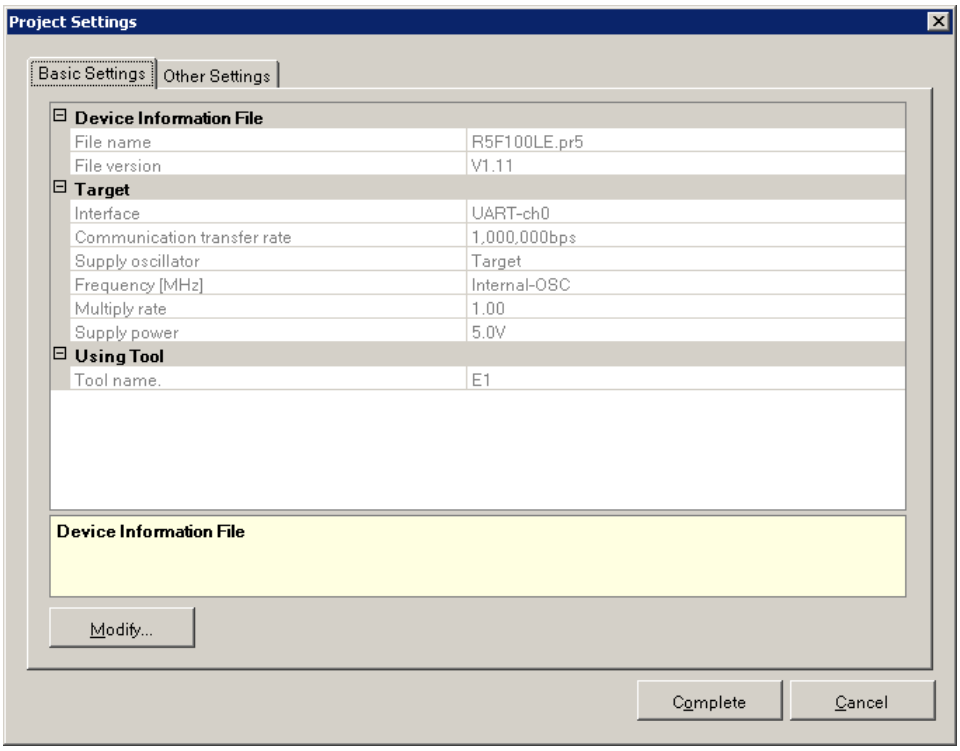
[User Specified] box

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.

5.2.6 [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.

Figure 5-10. [Project Settings] Dialog Box

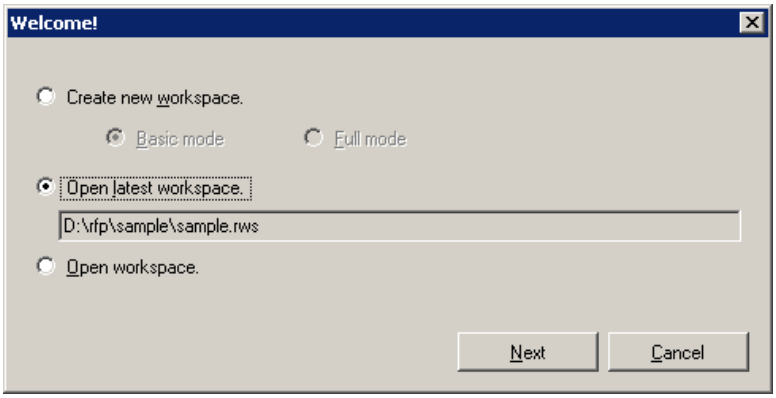


For details about each item of the dialog box, see **5.4.3 (13) (d), [Project Settings] dialog box**.
Clicking the Modify... button displays the [Communication Interface] dialog box.
Clicking the Complete button saves the project file and displays the main window.
Clicking the Cancel or the X button terminates RFP.

5.2.7 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.

Figure 5-11. [Open latest workspace.]



5.2.8 Open workspace

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

Figure 5-12. [Open workspace.]

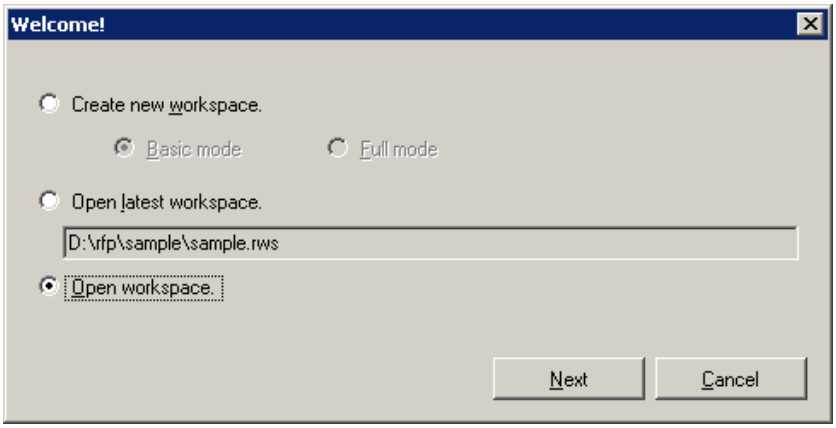
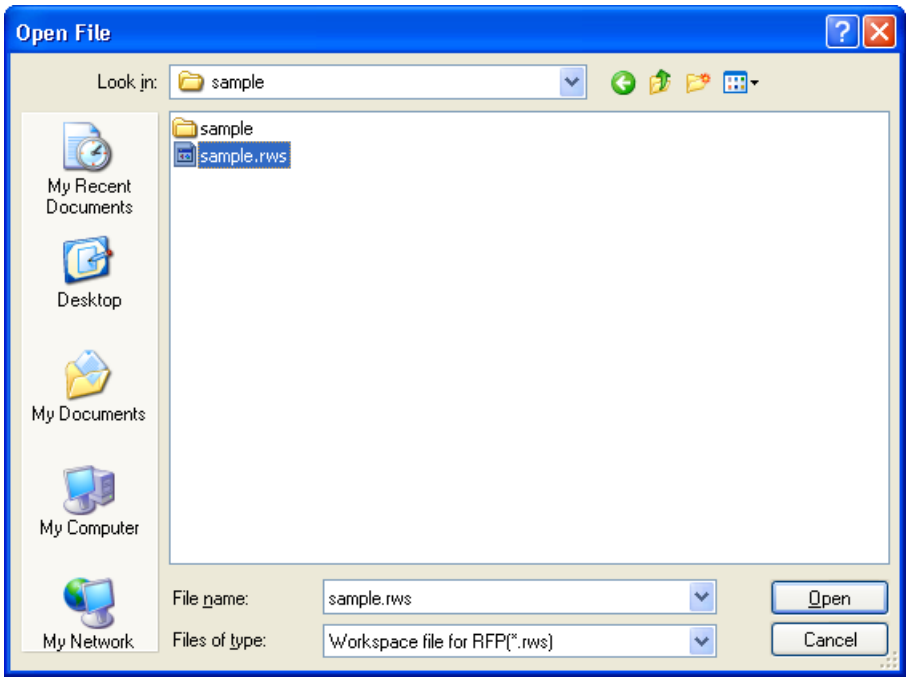


Figure 5-13. [Open File] Dialog Box



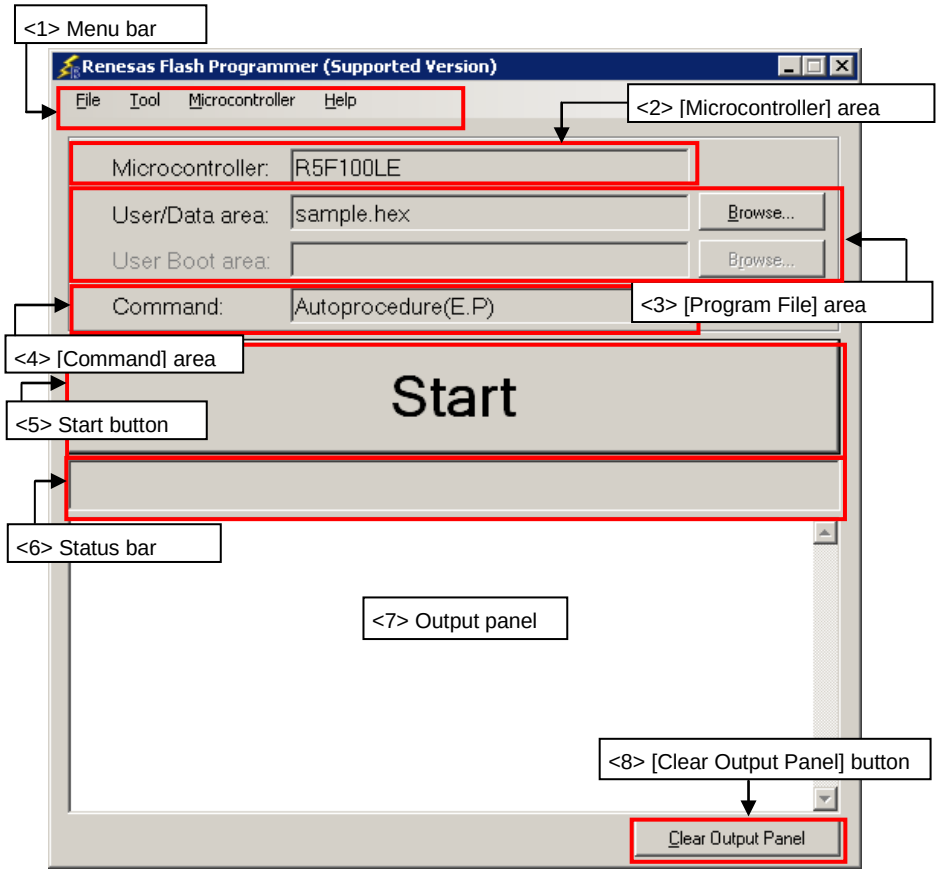
Select a workspace file, and then click the Open button. The main window is displayed with the settings for the specified workspace.

Clicking the Cancel or the X button closes the [Open File] dialog box and opens the [Welcome!] dialog box.

5.3 Main Window

The main window consists of the following items:

Figure 5-14. Main Window



Name		Description	See
<1>	Menu bar	Displays the selectable menus	5.4
<2>	[Microcontroller] area	Displays the selected target microcontroller	5.5
<3>	[Program File] area	Displays the selected program file	5.6
<4>	[Command] area	Displays the selected command	5.7
<5>	Start button	Executes the selected command	5.8
<6>	Status bar	Displays the command execution status in colors and text	5.9
<7>	Output panel	Displays in detail what is executed by the command	5.10
<8>	[Clear Output Panel] button	Clears the output panel display	5.11

5.4 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.

5.4.1 [File] menu

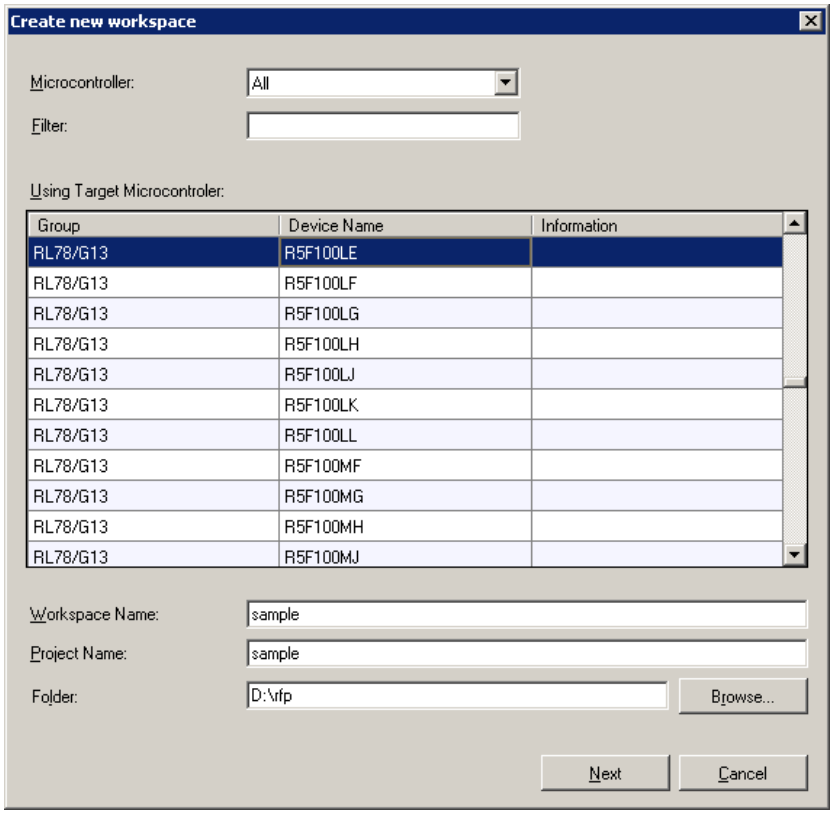
The following pull-down menu appears by selecting the [File] menu.

Figure 5-15. [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 **5.2.2**.

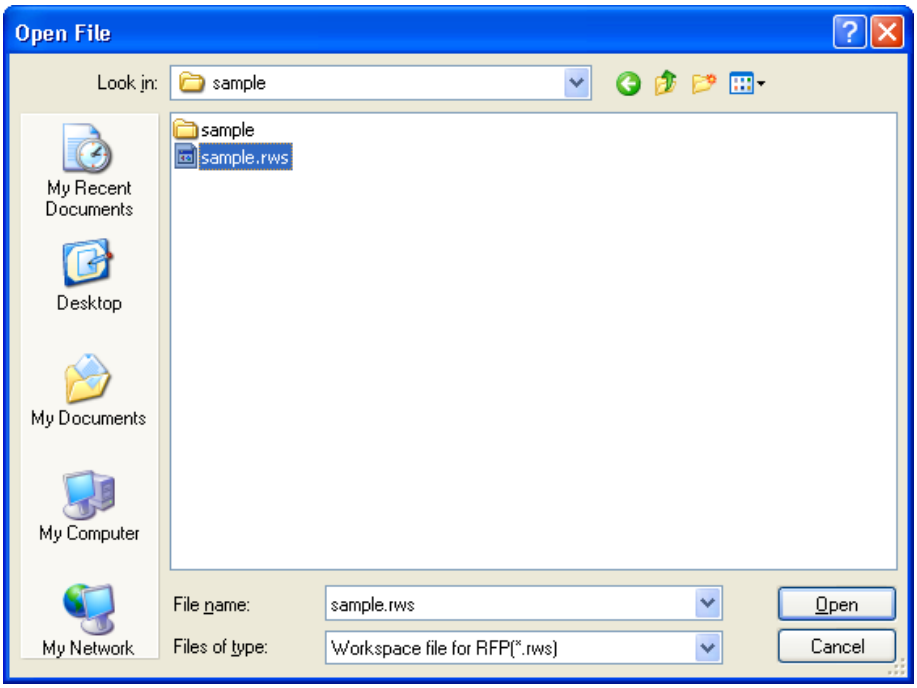
Figure 5-16. [Create a new workspace] Dialog Box



(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, refer to 5.2.8.

Figure 5-17. [Open File] Dialog Box



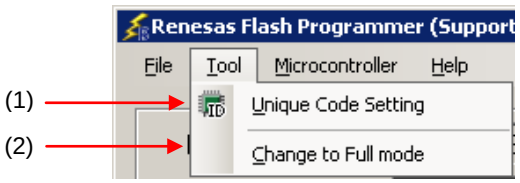
(3) [Exit]

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

5.4.2 [Tool] menu

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

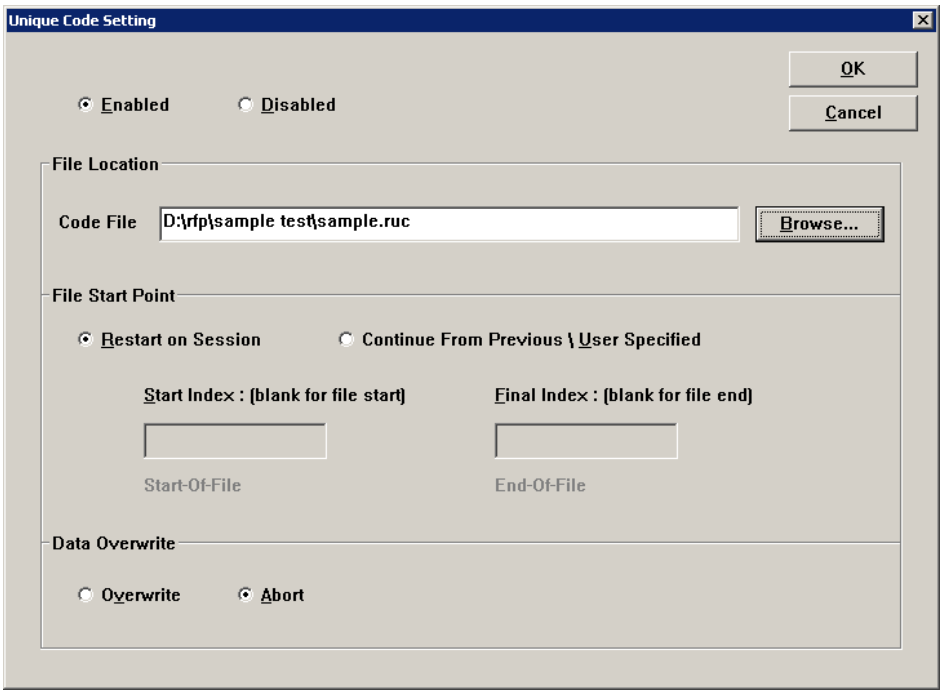
Figure 5-18. [Tool] Menu



(1) [Unique Code Setting]

Selecting this option displays the [Unique Code Setting] dialog box, in which you make settings for imbedding unique codes. Save the project file that has been created. For the items in the dialog box, refer to Chapter 11.

Figure 5-19. [Unique Code Setting] Dialog Box



(2) [Change to Full mode]

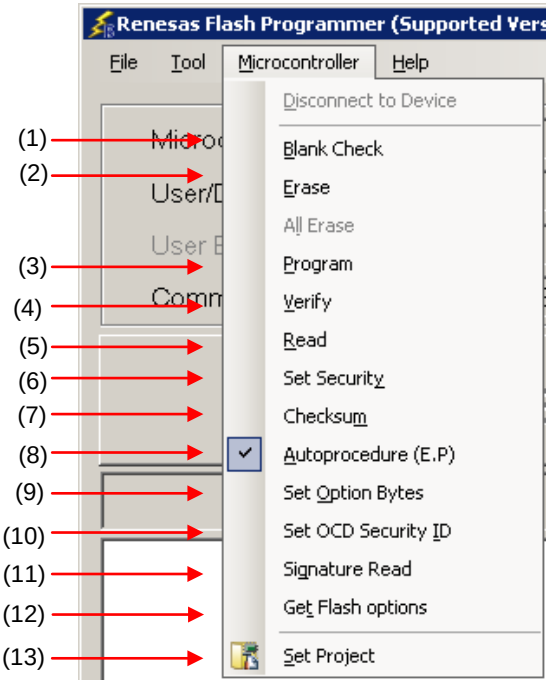
Selecting this option switches the mode from basic to full in the main window. Save the project file that has been created. For the full mode features, refer to Chapter 7.

5.4.3 [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 5-20. [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 OCD Security ID] 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. The progress of erasing is displayed on the output panel. When erasing is complete, the result is displayed. 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 progress of programming is displayed on the output panel. When programming is complete, the result is displayed. 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 **5.4.3 (13) (d) <9> [Command Options] category**.

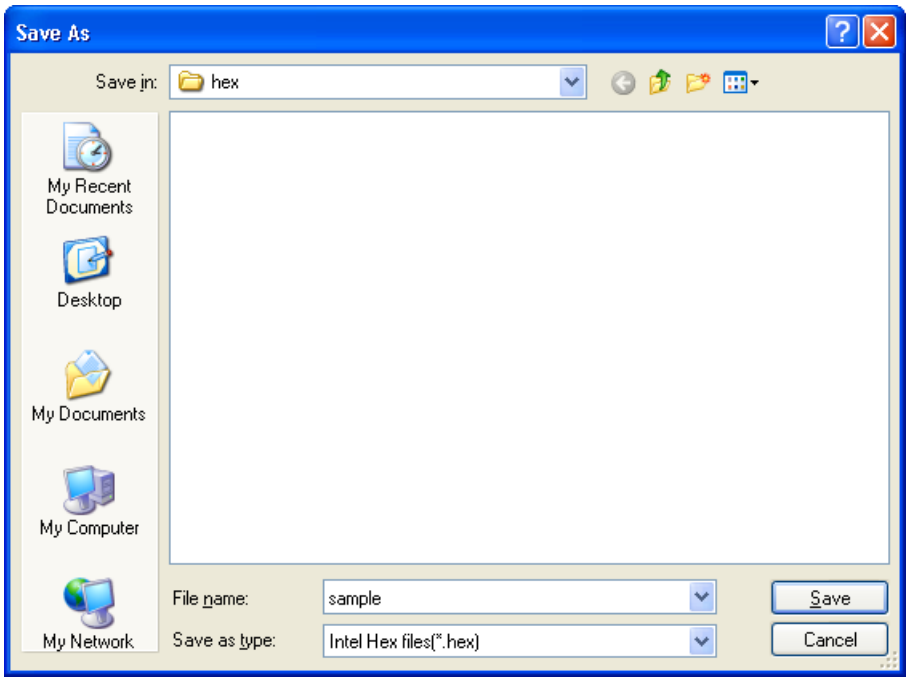
(4) [Verify] command

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. The progress of verifying is displayed on the output panel. When verifying is complete, the result is displayed.

(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 5-21. [Save As] Dialog Box



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 **5.4.3 (13) (d) <7> [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 **5.4.3 (13) (d) <7> [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 5-22. 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
  Range: Area specified by the [Operation mode] parameter under [Command Options] in the [Other Settings] tab of the [Project Settings] dialog box

Figure 5-23. 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 **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 5-24. 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 Figure B-3. 16-bit CRC Calculation Specifications in Appendix B Supplementary Information.

(8) [Autoprocedure (E.P)] command

This command is used to erase and write to the flash memory. The progress of execution is displayed on the output panel. When execution is complete, the result is displayed. 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 **5.4.3 (13) (d) <9> [Command Options] category**.

Figure 5-25. Output Panel After [Autoprocedure (E.P)] Command Execution

```
========== (Connect) ==========
------ Start(Autoprocedure(E.P)) ------
Blank check Code flash: Not blank, Erase need.
Erasing...
Erase Chip : PASS
Program Code flash:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
Autoprocedure(E.P) PASS
------ End(Autoprocedure(E.P)) ------
========== (Disconnect) ==========
```

(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 [OPBT*n*] 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 **5.4.3 (13) (d) <7> [Flash Options] category**.

(10) [Set OCD Security ID] 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 **5.4.3 (13) (d) <7> [Flash Options] category**.

(11) [Signature Read] command

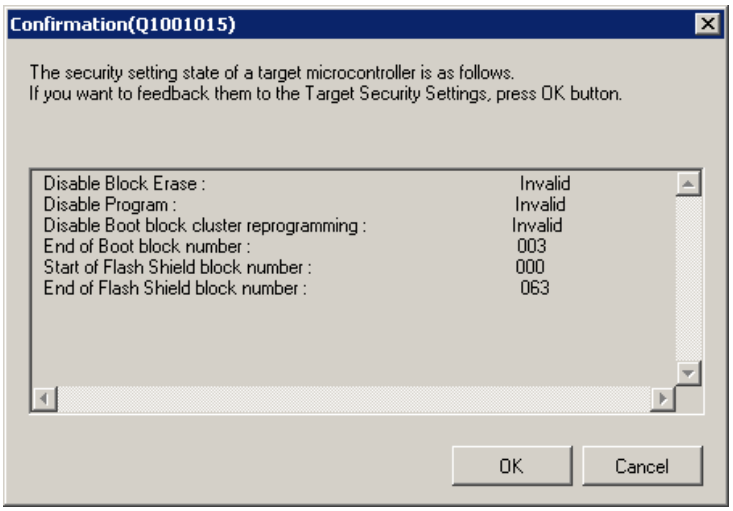
This command is used to read the target microcontroller's product information, such as the microcontroller name and flash memory information. The read result is displayed in the output panel.

(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 OCD Security ID] command; the settings for the flash option settings can thus be checked. For details about the flash option settings, see **5.4.3 (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.

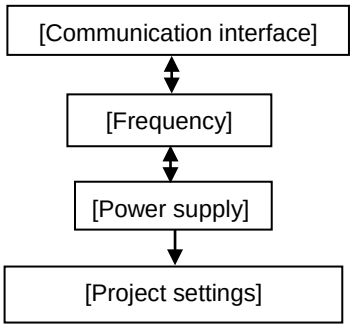
Figure 5-26. Items Read by the [Get Flash options] Command



(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 5-26), 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 5-27. Flow of Setting Modification with the [Modify…] Button



(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.

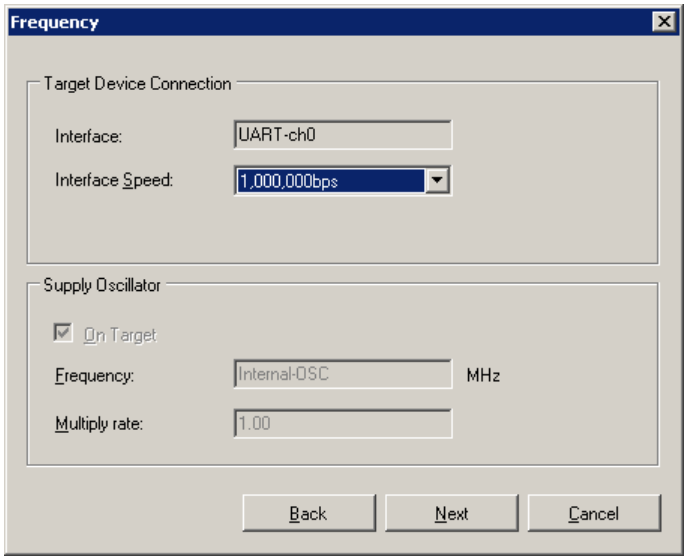
Figure 5-28. [Communication Interface] Dialog Box

For details about each item, see **5.2.3**.
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 5-29. [Frequency] Dialog Box



For details about each item, see **5.2.4**.

Clicking the [Back] button displays the previous dialog box.

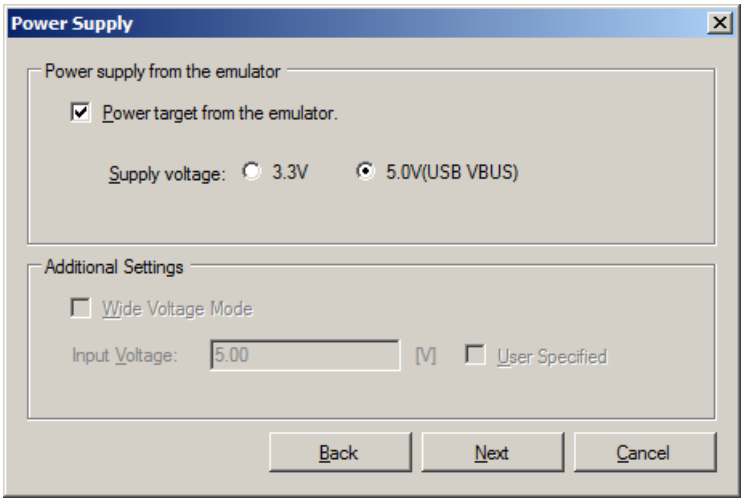
Clicking the [Next] button displays the next dialog box.

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 5-30. [Power Supply] Dialog Box



For details about each item, see **5.2.5**.

Clicking the [Back] button displays the previous dialog box.

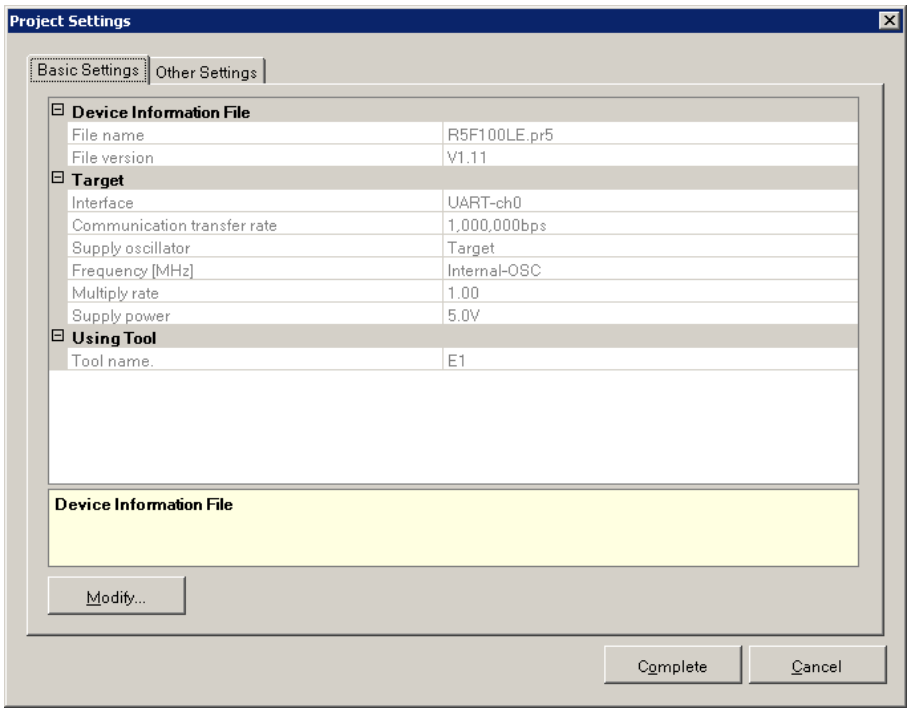
Clicking the [Next] button displays the next dialog box.

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 5-31. [Project Settings] Dialog Box



[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 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.

File name	Displays the device information file name.
File version	Displays the version of the device information file.

<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.

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

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.

Tool name	Displays the name of the tool used.
Firmware version	Displays the version of the MINICUBE2 firmware.

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.

Wide voltage mode	Select whether to write in wide voltage mode.	
	Valid	Data is written in wide voltage mode.
	Invalid	Data is not written in wide voltage mode.

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.

File name	Displays the selected program file name.	
Updated date	Displays the date that the program file selected by [File name] was last modified.	
Type	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.	
Check sum type	Select the checksum calculation method for the program file selected by [File name].	
	Arithmetic check sum (16-bit)	The checksum calculated using 16-bit subtraction.
	CRC sum (32-bit)	Calculated using 32-bit CRC.
	CRC sum (16-bit)	Calculated using 16-bit CRC.
Range	Select the area from which to calculate the checksum.	
	Range of the Program file	The area to which the program file selected by [File name] is assigned is subject to checksum calculation.
	Range of target microcontroller	All flash memory area built into the microcontroller specified by the project is subject to checksum calculation.
	User optional range (Code Flash)	An area from [Start address of Code Flash] to [End address of Code Flash] is subject to checksum calculation.
	User optional range (Data Flash)	An area from [Start address of Data Flash] to [End address of Data Flash] is subject to checksum calculation.
	User optional range (Code Flash + Data Flash)	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.
Start address of Code Flash	Enter the start address of the code flash memory for which to calculate the checksum.	
End address of Code Flash	Enter the end address of the code flash memory for which to calculate the checksum.	
Check sum of Code Flash	Displays the results of checksum calculation using the method selected by [Check sum type].	
Start address of Data Flash	Enter the start address of the data flash memory for which to calculate the checksum.	
End address of Data Flash	Enter the end address of the data flash memory for which to calculate the checksum.	
Check sum of Data Flash	Displays the results of checksum calculation using the method selected by [Check sum type].	

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. With the 16-bit arithmetic (subtraction) mode, the lower 4 digits of the result from which a value is subtracted from 00h in 1-byte units are displayed. With the 32-bit CRC mode, the 8-digit result of CRC32 function calculation is displayed. For details about the arithmetic specifications, see **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 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.

Operation mode	Select the unit in which the flash memory is accessed.	
	Chip	The flash memory is accessed in chip units.
	Block (Code Flash)	The code flash memory is accessed in block units.
	Block (Data Flash)	The data flash memory is accessed in block units.
	Block (Code Flash + Data Flash)	The flash memory is accessed in block units.
Start block number of Code Flash	Select the starting block when accessing code flash memory in block units.	
End block number of Code Flash	Select the ending block when accessing code flash memory in block units.	
Start block number of Data Flash	Select the starting block when accessing data flash memory in block units.	
End block number of Data Flash	Select the ending block when accessing data flash memory in block units.	
Supplied Power	Displays the voltage supplied to the target microcontroller.	

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].

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.

Disable Chip Erase	Used to disable execution of the chip erase command on the flash memory.	
	Valid	Execution of the chip erase command is disabled.
	Invalid	Execution of the chip erase command is enabled.
Disable Block Erase	Used to disable execution of the block erase command on the flash memory.	
	Valid	Execution of the block erase command is disabled.
	Invalid	Execution of the block erase command is enabled.
Disable Program	Used to disable execution of the write command on the flash memory.	
	Valid	Execution of the write command is disabled.
	Invalid	Execution of the write command is enabled.
Disable Read	Used to disable execution of the read command on the flash memory.	
	Valid	Execution of the read command is disabled.
	Invalid	Execution of the read command is enabled.
Disable boot block cluster reprogramming	Used to disable writing to the boot area.	
	Valid	Writing to the boot area is disabled.
	Invalid	Writing to the boot area is enabled.
End of boot block number	Displays the end of the boot area.	
Reset vector address	Displays the reset vector address of the microcontroller.	
Start of flash shield block number	Select the starting block of the flash shield window.	
End of flash shield block number	Select the ending block of the flash shield window.	
OCD Security ID	Enter the on-chip debug security ID.	
OPBT*n*	Select the option byte.	

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.

Target microcontroller name	Displays the microcontroller name.
Firmware version	Displays the version of the microcontroller firmware.

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

<9> [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.

Blank Check before Erase[Note]	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.	
	Valid	Data is erased after checking the status of the flash memory.
	Invalid	Data is erased without checking the status of the flash memory.
Verify after Program	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.	
	Valid	Data match is verified after writing is complete.
	Invalid	Data match is not verified after writing is complete.
Security after Program[Note]	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.	
	Valid	The security settings are applied after writing is complete.
	Invalid	The security settings are not applied after writing is complete.
Check Sum after Program	Select whether or not to read the checksum of the data written to the flash memory after writing is complete.	
	Valid	The checksum is read after writing is complete.
	Invalid	The checksum is not read after writing is complete.
Set Option Bytes after Program[Note]	Select whether or not to apply the option byte settings specified in the [Flash Options] category after writing to the flash memory is complete.	
	Valid	The option byte settings are applied after writing is complete.
	Invalid	The option byte settings are not applied after writing is complete.
Set OCD Security ID after Program[Note]	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.	
	Valid	The on-chip debug security ID is applied after writing is complete.
	Invalid	The on-chip debug security ID is not applied after writing is complete.
Program to the reset mask products	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.	
	Valid	Enable this option to use a function other than reset. Executing individual commands displays a confirmation dialog box (Q1001026) for reentering the target power supply.
	Invalid	Disable this option if the reset function is to be used.

Reset Pin as Low	Select whether or not to set the reset pin to the low level when disconnecting the device.	
	Valid	The reset pin is set to low level.
	Invalid	The reset pin is set to high impedance.
Program file size monitor function	Halts execution of programming command if the program file size exceeds the programmable range.	
	Valid	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 “Error (E1002018): HEX file exceeds target device flash range.” is displayed on the output panel and command execution is halted.
	Invalid	The message “Truncate the HEX File.” is displayed on the output panel and command execution continues.

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.

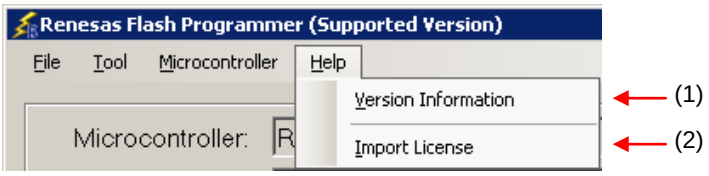
Remarks 1. The results of executing the command in accordance with the specified options are shown in the output panel.

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

5.4.4 [Help] menu

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

Figure 5-32. [Help] Menu



(1) [Version Information]

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

Figure 5-33. Version Information Dialog Box

(2) [Import License]

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

5.5 [Microcontroller] Area

This area displays the selected target microcontroller.

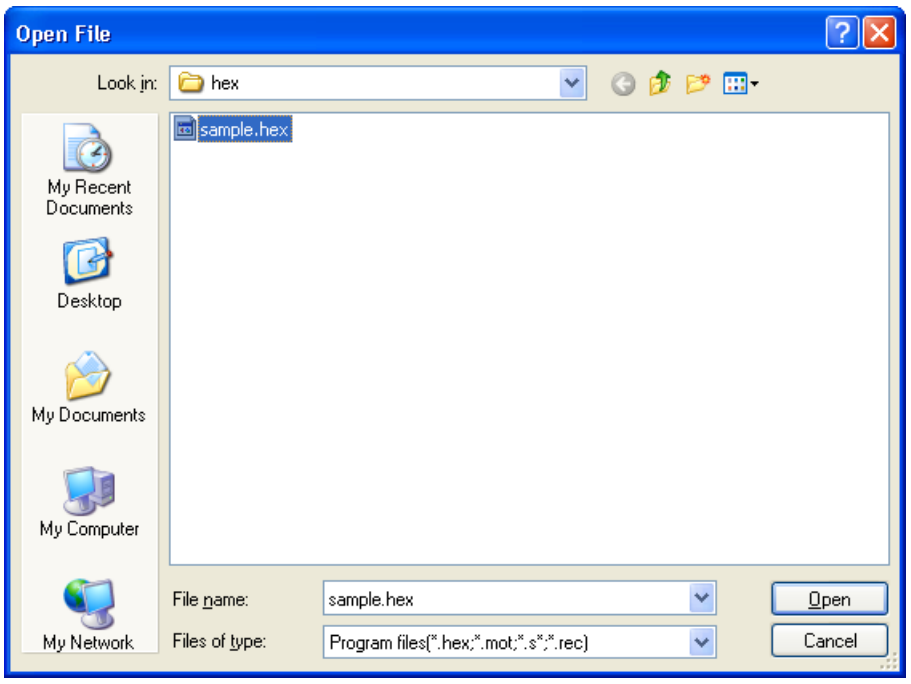
Figure 5-34. [Microcontroller] Area

5.6 [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 5-35. [Program File] Area

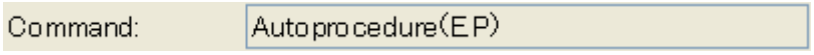
Figure 5-36. [Open File] Dialog Box



5.7 [Command] Area

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

Figure 5-37. Command Area

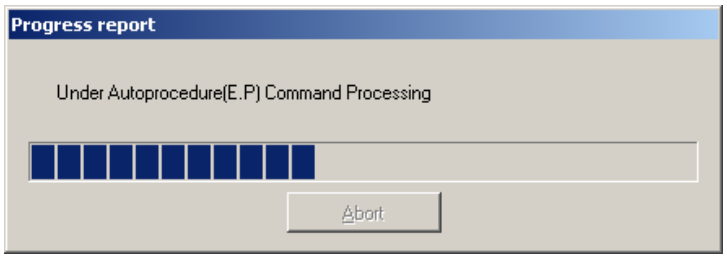


5.8 Start Button

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 5-38. Start Button

Figure 5-39. [Progress report] Dialog Box



5.9 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 5-40. Status Bar

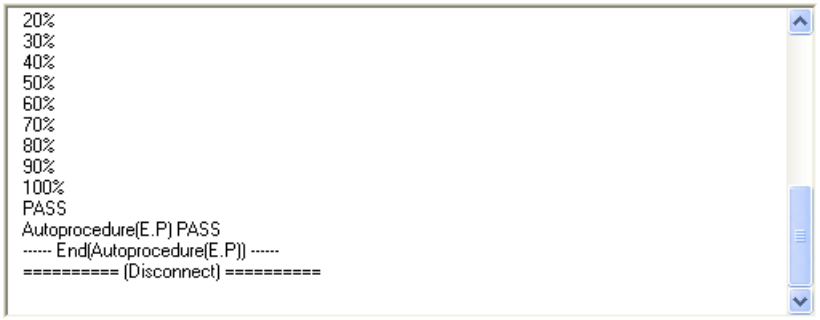
Table 5-1. Status Bar Displays

	After startup or when the [Clear Output Panel] button is clicked
BUSY	A command is being executed.
PASS	The command finished executing normally
ERROR	The command terminated abnormally.

5.10 Output Panel

The output panel displays the execution status of the command selected on the [Microcontroller] menu in text. Up to 500 lines can be displayed. If the text exceeds 500 lines, lines will be deleted, starting from the first line.

Figure 5-41. Output Panel



(a) Output Panel Context Menu

Right-clicking the output panel displays a context menu.

Table 5-2 Output Panel Context Menu

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

5.11 Clear Output Panel Button

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

Figure 5-42. Clear Output Panel Button

CHAPTER 6 FUNCTION DETAILS (BASIC MODE) - RX -

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

6.1 Introduction

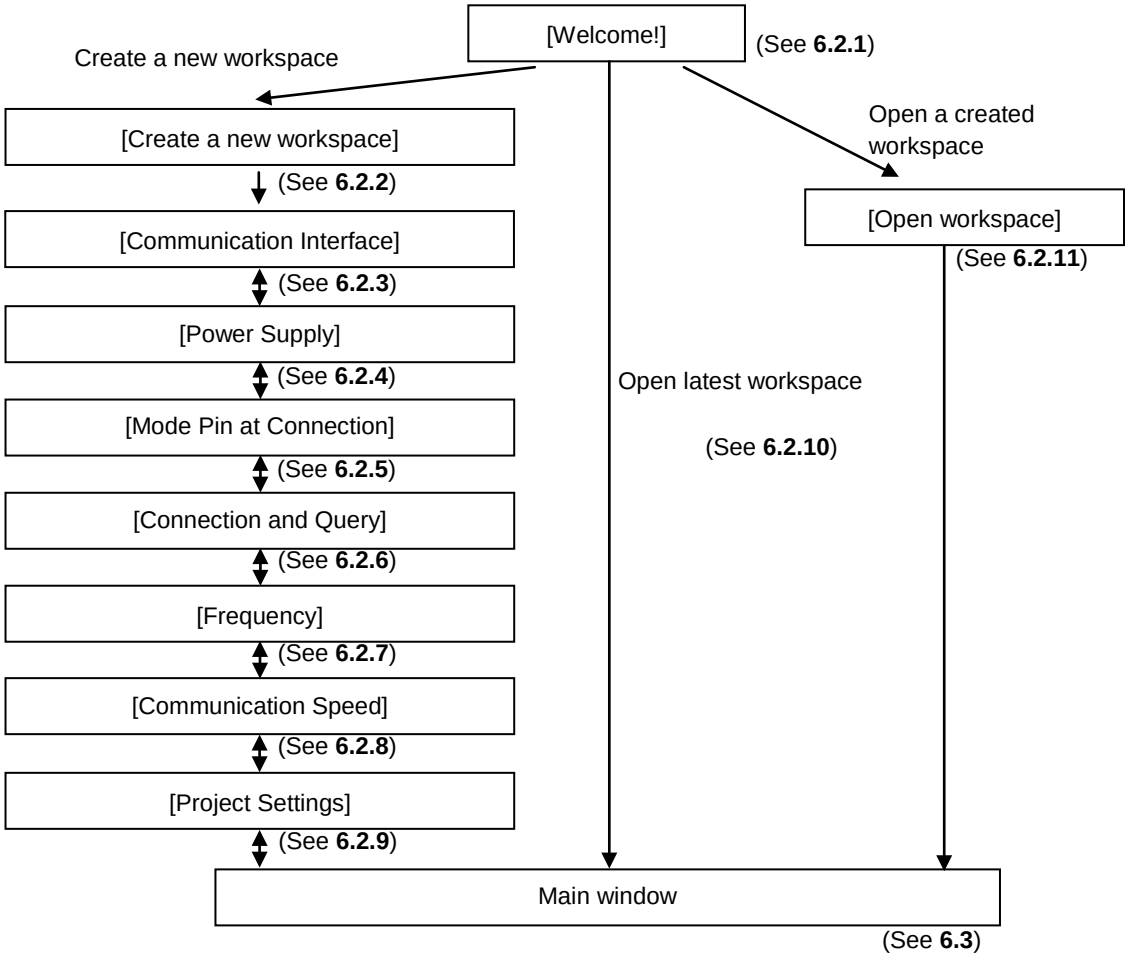
Make sure that the RFP package is installed. For how to install the RFP package, see **CHAPTER 2 RFP INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

6.2 Starting up

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

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The [Power Supply], [Mode Pin at Connection], [Frequency], and [Communication Speed] dialog boxes are skipped depending on the selected connection method.

Figure 6-1. 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.

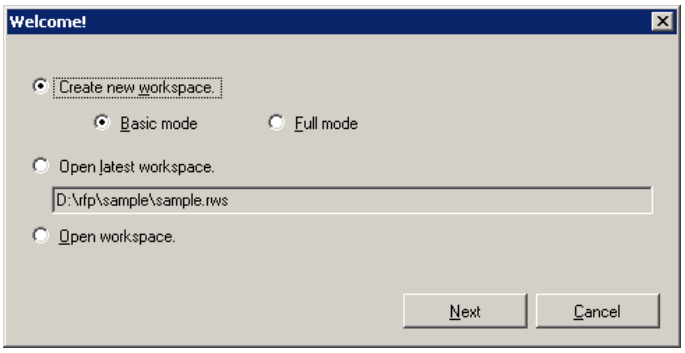
(2) Dragging and dropping a workspace file onto RFP.exe.

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

6.2.1 [Welcome!] dialog box

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

Figure 6-2. [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.].

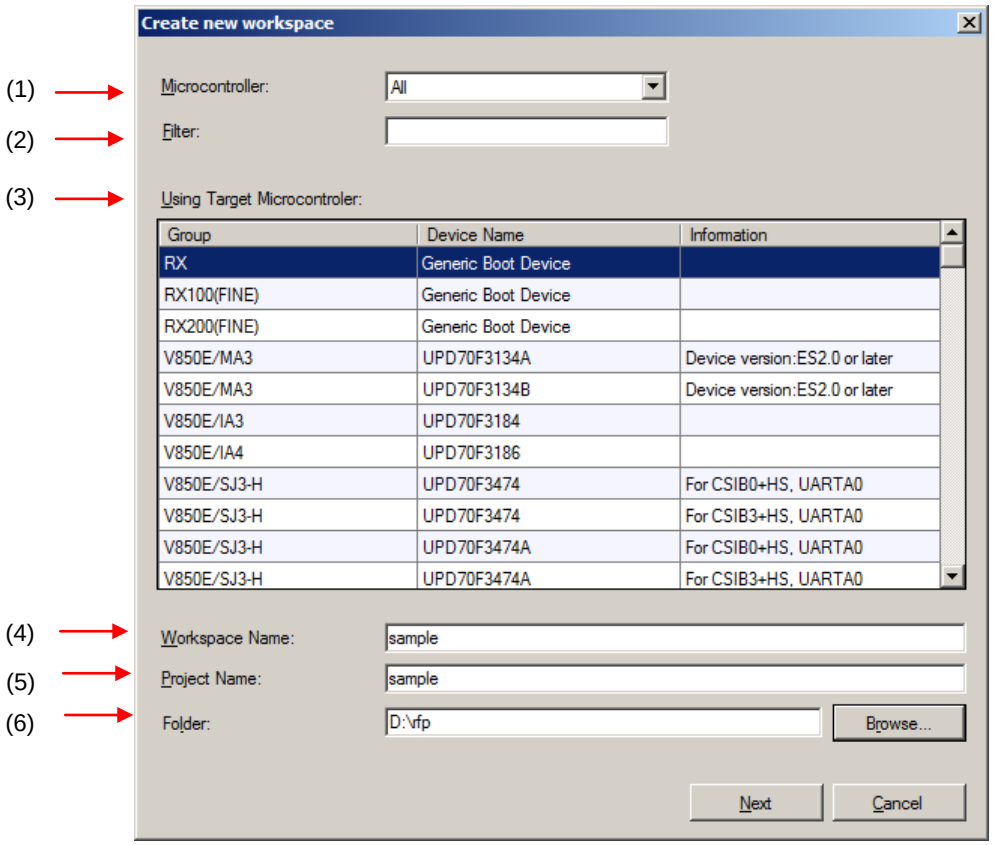
Clicking the Next button displays the next dialog box.

Clicking the Cancel or the X button terminates RFP.

6.2.2 [Create a new workspace] dialog box

This dialog box is used to create a new workspace.

Figure 6-3. [Create a 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.

(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.

6.2.3 [Communication Interface] dialog box

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

Figure 6-4. [Communication Interface] Dialog Box

(1) Tool image panel

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

Figure 6-5. Tool Image Panel

(2) [Tool:] list box

Select the tool to be used.

- E1
- E20
- USB Direct
- COMx

(3) [Interface:] list box

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

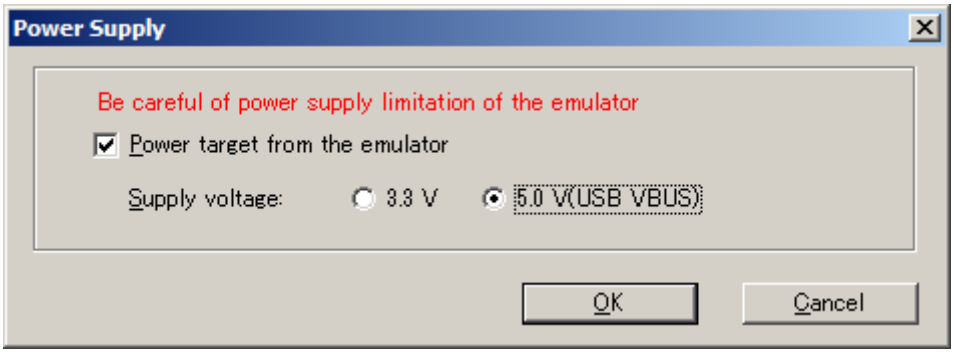
- 2 wire UART (when RX is selected)
- FINE (when <RX100 (FINE) and RX200 (FINE) are selected)

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

6.2.4 [Power Supply] dialog box

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

Figure 6-6. [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).

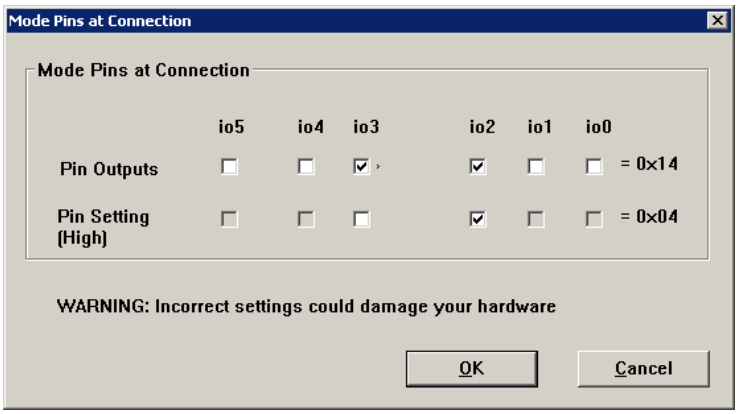
Caution E1 supports the power supply function. In the mass-production process, do not use the power supply function of E1. Instead, supply the power suitable for the microcontroller specifications from the target system. The supply voltage from E1 is dependent on the USB power performance of the host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

Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

6.2.5 [Mode Pin at Connection] dialog box

This dialog box is used to select the pin to control the mode pin of the target microcontroller from io0 to io5 pins of E1/E20.

Figure 6-7. [Mode Pin at Connection] **Dialog Box**



[Pin Outputs] check box

Select 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

Set 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 **Figure B-1. E1 and E20 Pins - RX -** in **APPENDIX B**.

Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

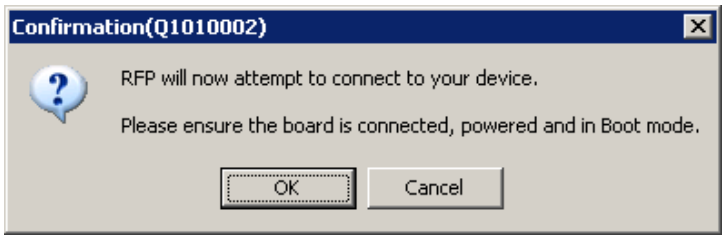
6.2.6 [Connection and Query] dialog box

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

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

(1) Confirm before connecting to the target microcontroller.

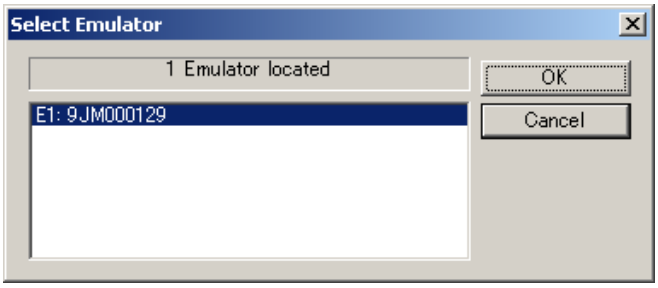
Figure 6-8. [Confirmation] Dialog Box



Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

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

Figure 6-9. [Select Emulator] Dialog Box

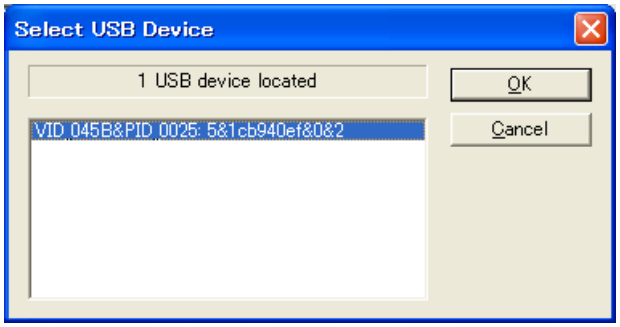


Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

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

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

Figure 6-10. [Select USB Device] Dialog Box

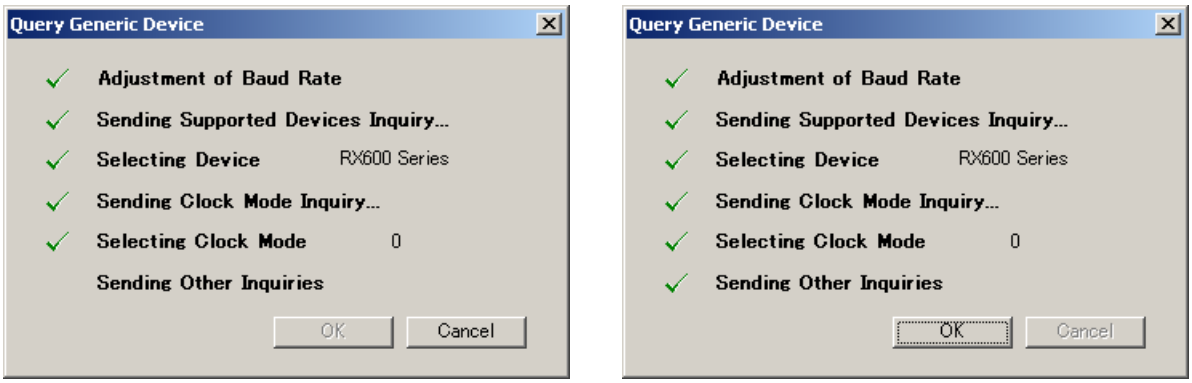


Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

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

(4) A query for the target microcontroller is performed.

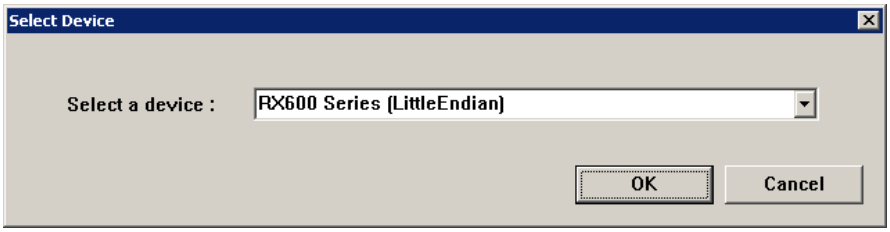
Figure 6-11. [Query Generic Device] Dialog Box



Clicking the OK button displays the next dialog box.
Clicking the Cancel or the X button returns you to the [Communication Interface] dialog box.

(5) For some microcontrollers, the [Select Device] dialog box opens at the time of query by [Select Device]. Select a device from the [Select a device:] box.

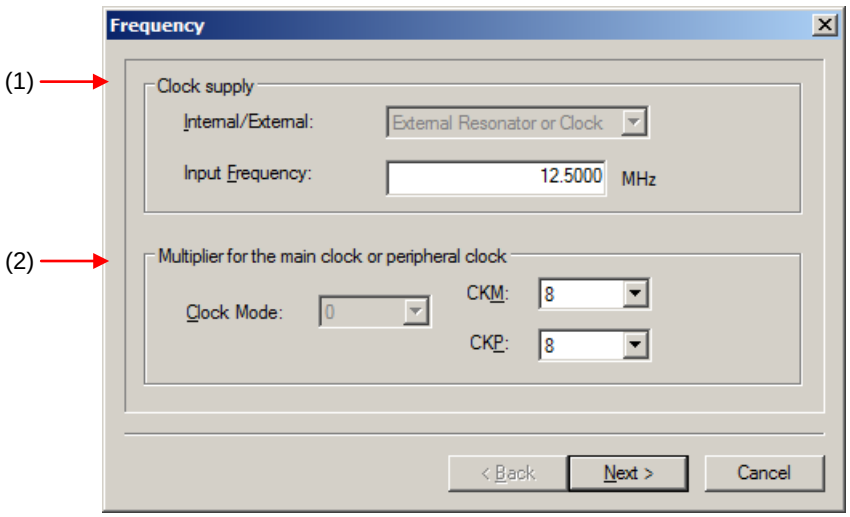
Figure 6-12 [Select Device] Dialog Box



6.2.7 [Frequency] dialog box

This dialog box is used to set clock supply and multipliers for the main clock and peripheral clock.

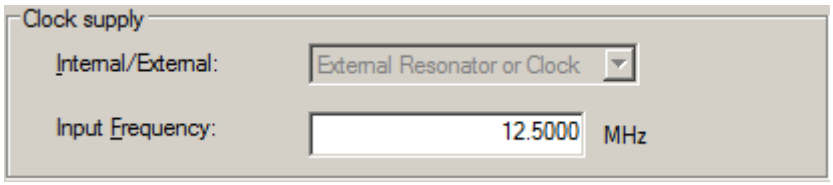
Figure 6-13. [Frequency] Dialog Box



(1) [Clock supply] area

This area is used to select the communication speed at the port.

Figure 6-14. [Clock supply] Area



[Internal/External:] list box

Displays the type of clock supplied to the target microcontroller.

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

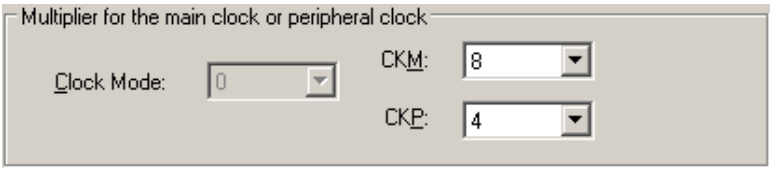
[Input Frequency:] list box

Enter the clock supplied to the target microcontroller.

(2) [Multiplier for the main clock or peripheral clock] area

Set the clock mode, CKM, and CKP.

Figure 6-15. [Multiplier for the main clock or peripheral clock] Area



[Clock Mode:] list box

Select a value.

[CKM:] list box

Select a multiplication ratio of the main clock.

[CKP:] list box

Select a multiplication ratio of the peripheral clock.

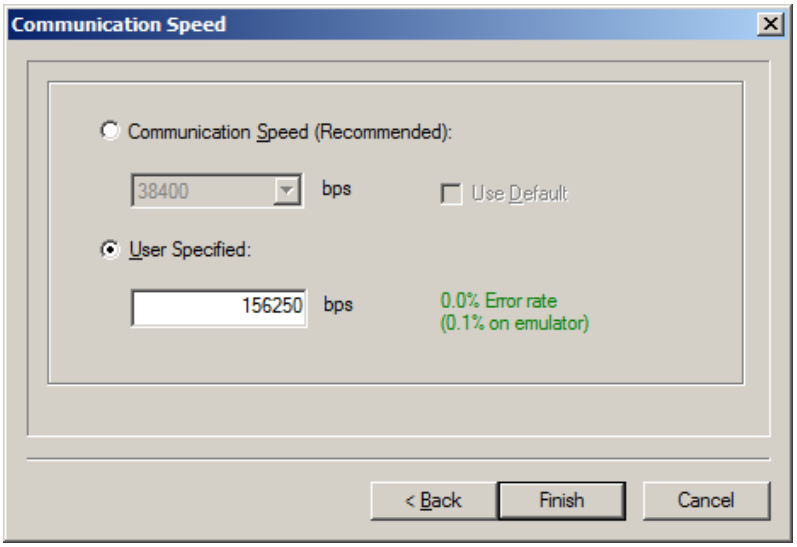
Remark For available multiplication ratios, refer to the user's manual of the target microcontroller.

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.

6.2.8 [Communication Speed] dialog box

This dialog box is used to set communication speed.

Figure 6-16. [Communication Speed] Dialog Box



(1) [Communication Speed (Recommended):] list box

If the [Use Default] check box is selected, “38400” is selected. If the check box is cleared, one of the recommended baud rates can be selected.

(2) [User Specified:] box

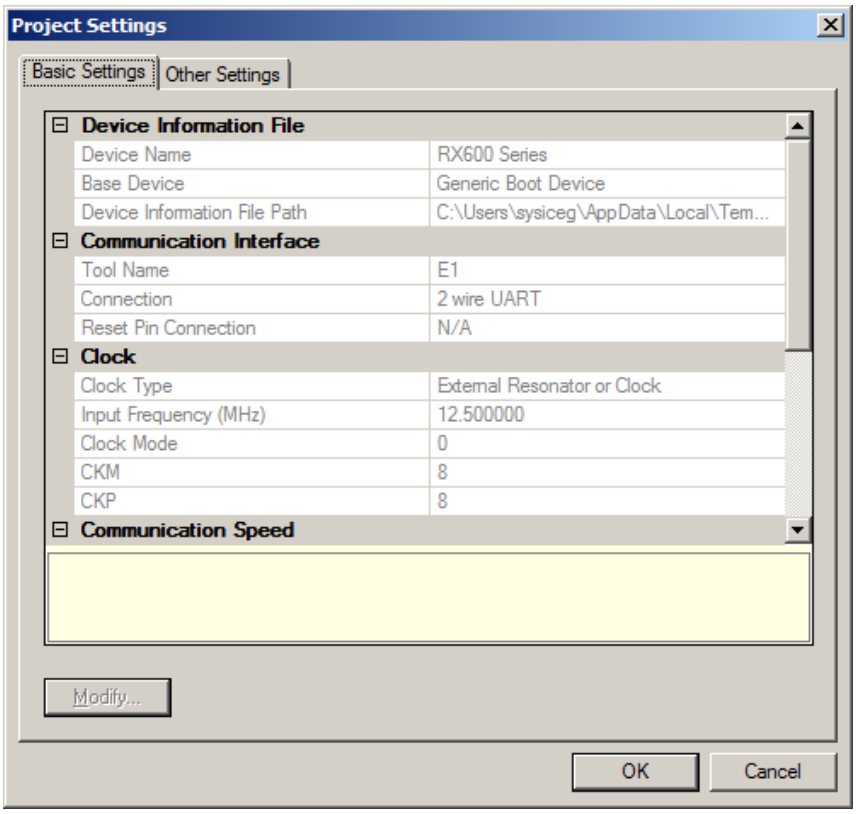
When E1/E20 is selected, a non-standard communication speed can be entered. The displayed error takes into account the peripheral clock of the microcontroller, communication speed calculation formula, and the characteristics of E1/E20.

Clicking the [< Back] button displays the previous dialog box.
Clicking the [Finish] button displays the next dialog box.
Clicking the [Cancel] or the [X] button terminates RFP.

6.2.9 [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.

Figure 6-17. [Project Settings] Dialog Box



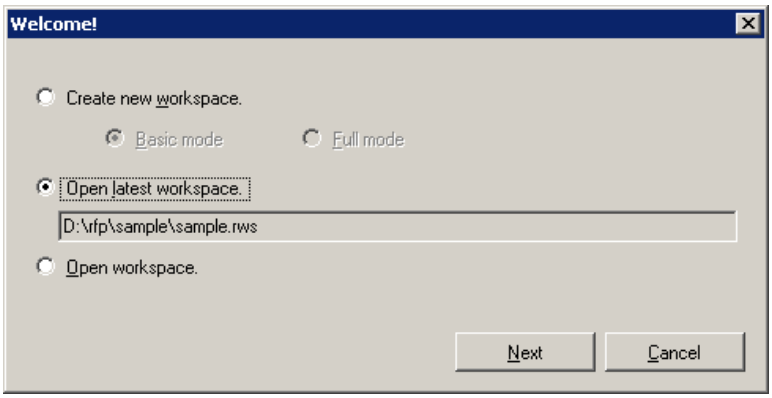
For details about each item, see **6.4.2 (5) (f) [Project Settings] dialog box**.
Clicking the Modify... button opens the [Communication Interface] dialog box.
Clicking the OK button saves the project file and opens the main window.
Clicking the Cancel or the X button terminates RFP.

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

6.2.10 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 6-18. [Open latest workspace.]



6.2.11 Open workspace

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

Figure 6-19. [Open workspace.]

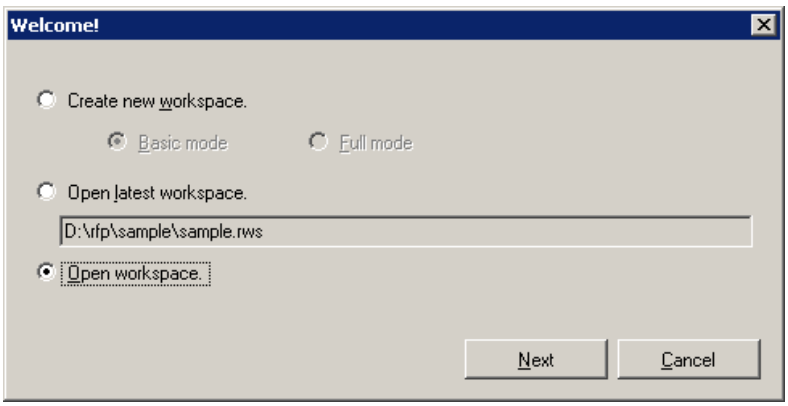
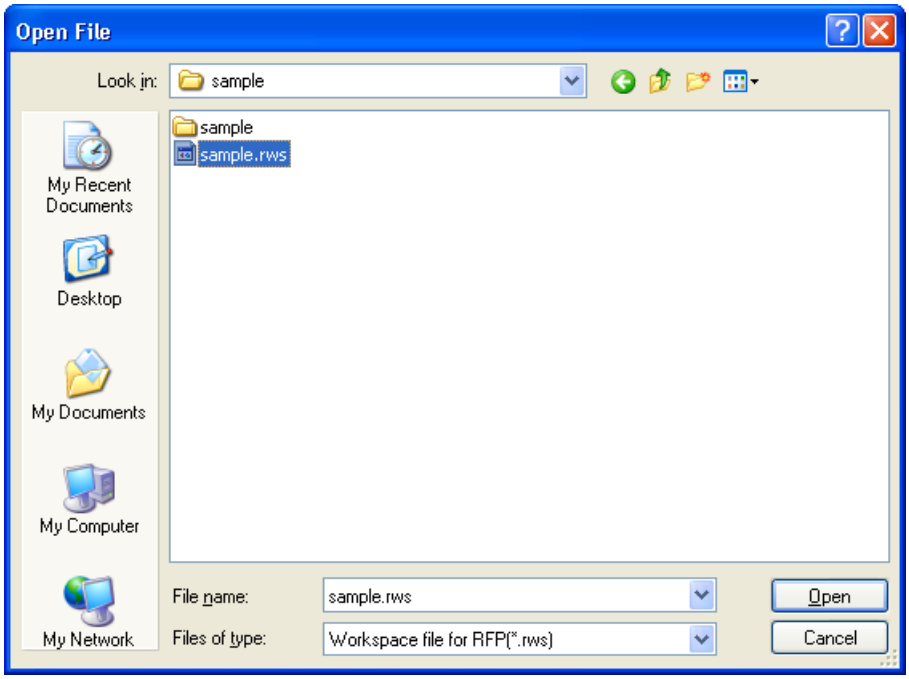


Figure 6-20. [Open File] Dialog Box

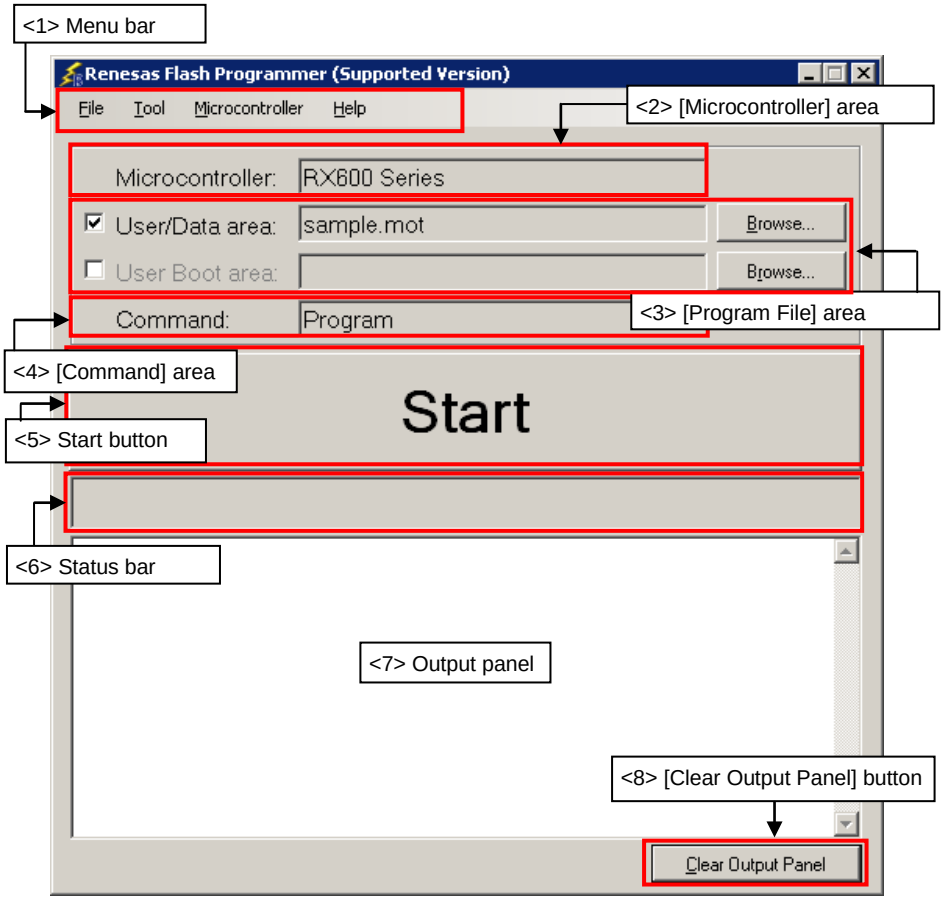


Select a workspace file, and then click the Open button. The main window is displayed with the settings for the specified workspace.
Clicking the Cancel or the X button closes the [Open File] dialog box and returns you to the [Welcome!] dialog box.

6.3 Main Window

The main window consists of the following items:

Figure 6-21. Main Window



Name		Description	See
<1>	Menu bar	Displays the selectable menus	6.4
<2>	[Microcontroller] area	Displays the selected target microcontroller	6.5
<3>	[Program File] area	Displays the selected program file	6.6
<4>	[Command] area	Displays the selected command	6.7
<5>	Start button	Executes the selected command	6.8
<6>	Status bar	Displays the command execution status in colors and text	6.9
<7>	Output panel	Displays in detail what is executed by the command	6.10
<8>	[Clear Output Panel] button	Clears the output panel display	6.11

6.4 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.

6.4.1 [File] menu

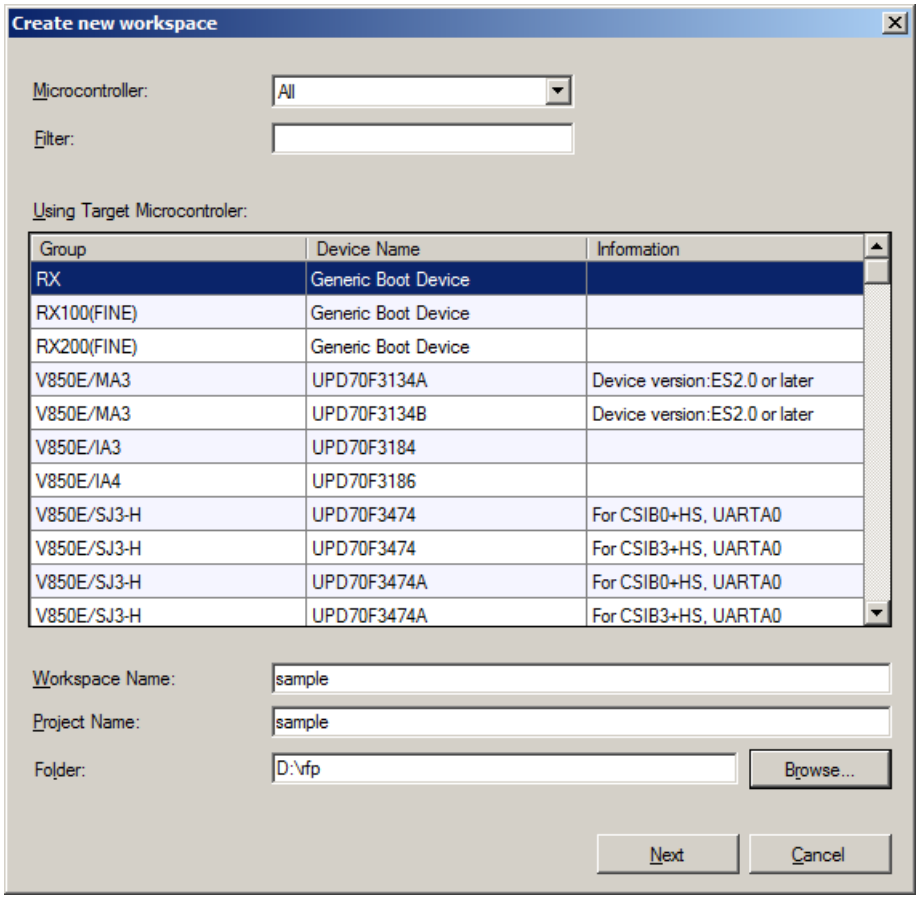
The following pull-down menu appears by selecting the [File] menu.

Figure 6-22. [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 **6.2.2**.

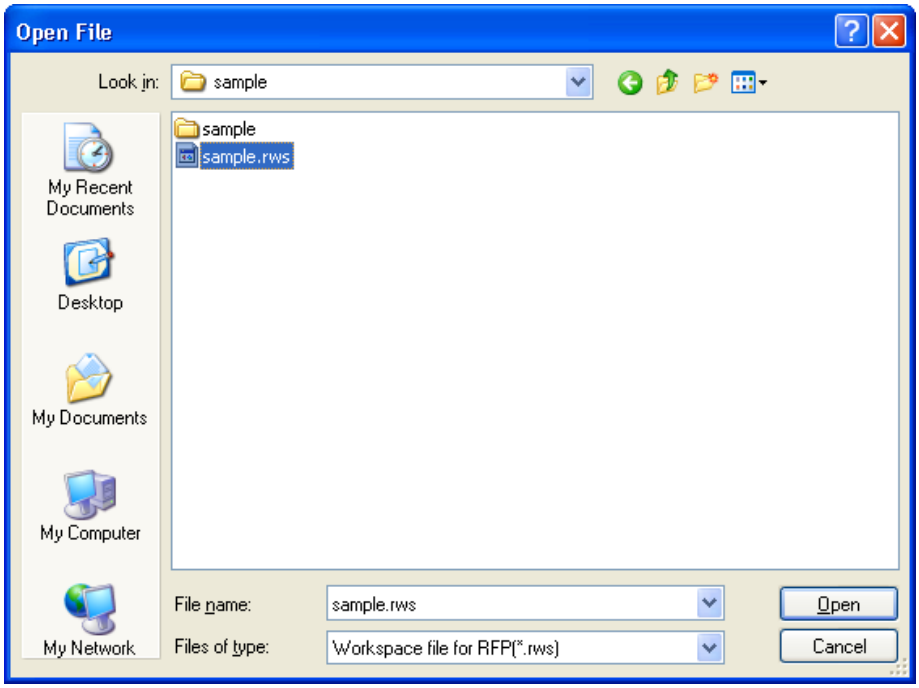
Figure 6-23. [Create new workspace] Dialog Box



(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 6.2.11.

Figure 6-24. [Open File] Dialog Box



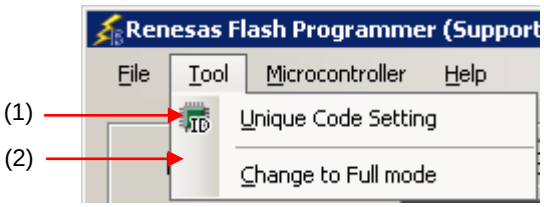
(3) [Exit]

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

6.4.2 [Tool] menu

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

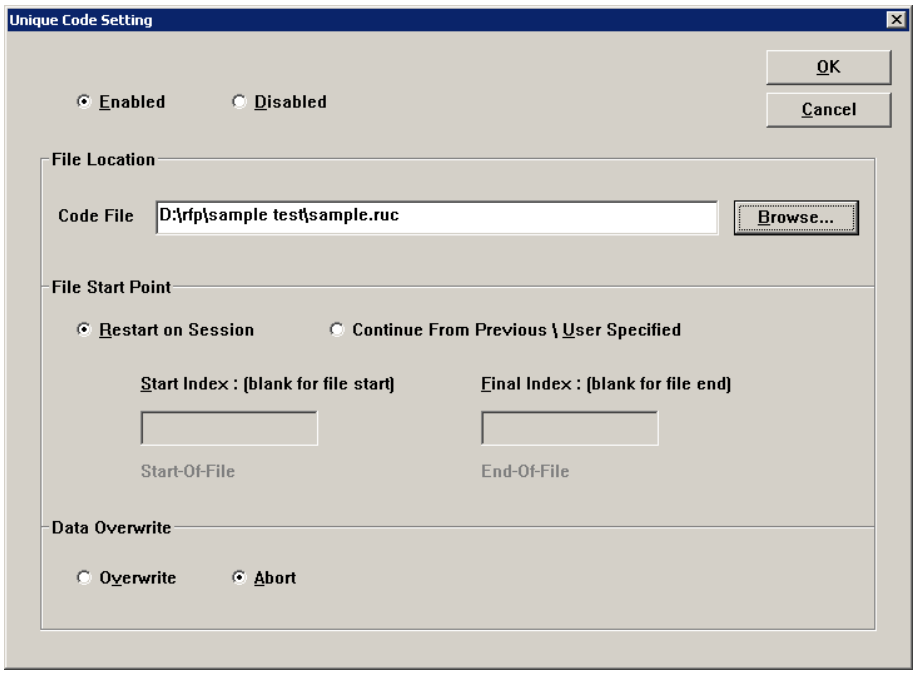
Figure 6-25. [Tool] Menu



(1) [Unique Code Setting]

Selecting this option displays the [Unique Code Setting] dialog box, in which you make settings for imbedding unique codes. Save the project file that has been created. For the items in the dialog box, refer to Chapter 11.

Figure 6-26. [Unique Code Setting] Dialog Box



(2) [Change to Full mode]

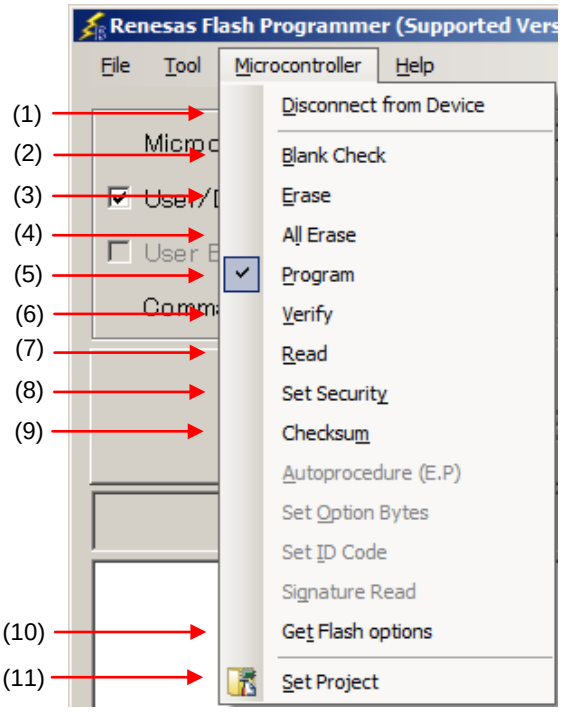
Selecting this option switches the mode from basic to full. Save the project file that has been created. For the full mode features, refer to Chapter 7.

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

6.4.3 [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 to Device] and [Set Project] commands are not assigned to the Start button.

Figure 6-27. [Microcontroller] Menu



(1) [Disconnect To 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.

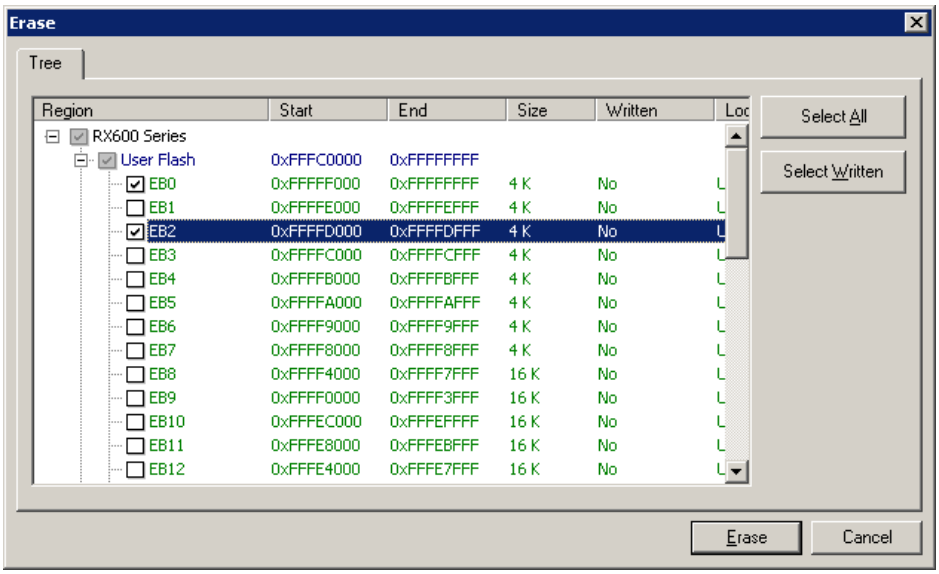
(2) [Blank Check] command

This command executes blank check on all flash memory blocks. The progress is displayed on the output panel during command execution. The result is displayed when the command finishes.

(3) [Erase] command

This command erases the specified flash memory block. Executing the [Erase] command opens the [Erase] dialog. The blocks whose checkboxes are selected will be erased. The [Erase] command is executed in accordance with the settings of [Erasure Permission] of the [User Boot Area Options] category in the [Other Settings] tab of the [Project Settings] dialog box. Refer to 6.4.3. (11) (f) <13> [User Boot Area Options] category for details.

Figure 6-28. [Erase] Dialog Box



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

(4) [All Erase] command

This command is used to erase all blocks of the flash memory. The progress of erasing is displayed on the output panel. The operation of the [All Erase] command is subject to the setting of [Erasure Permission] of the [User Boot Area Options] category in the [Other Settings] tab of the [Project Settings] dialog box. For details, see 6.4.3 (11) (f) <13>, [User Boot Area Options] category.

(5) [Program] command

This command is used to write the program file selected in the program file area to the flash memory. The progress of programming is displayed on the output panel. When programming is complete, the result is displayed. The operation options related to the [Program] command are according to the settings of [Readback Verification], [All Erase Before Program], [Request Checksum], and [File Over Warning] in the [Command Options] category of the [Other Settings] tab in the [Project Settings] dialog box. For details, see **6.4.3 (11) (f) <8> [Command Options] category**.

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

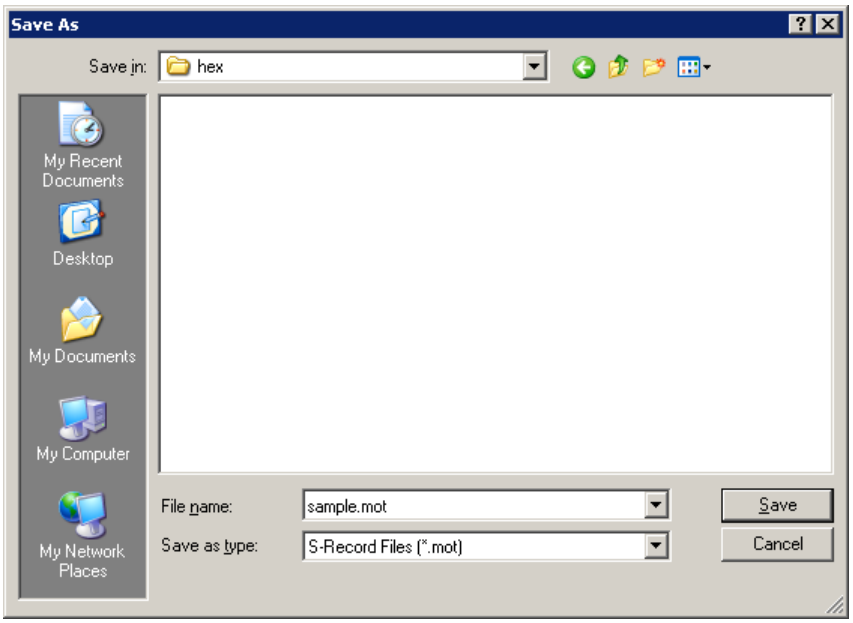
(6) [Verify] command

This command is used to verify that the data written to the flash memory is the same as the data in the program file selected in the program file area.

(7) [Read] command

This command reads the specified flash memory block. Executing the [Read] command opens the [Save As] dialog box.

Figure 6-29. [Save As] Dialog Box

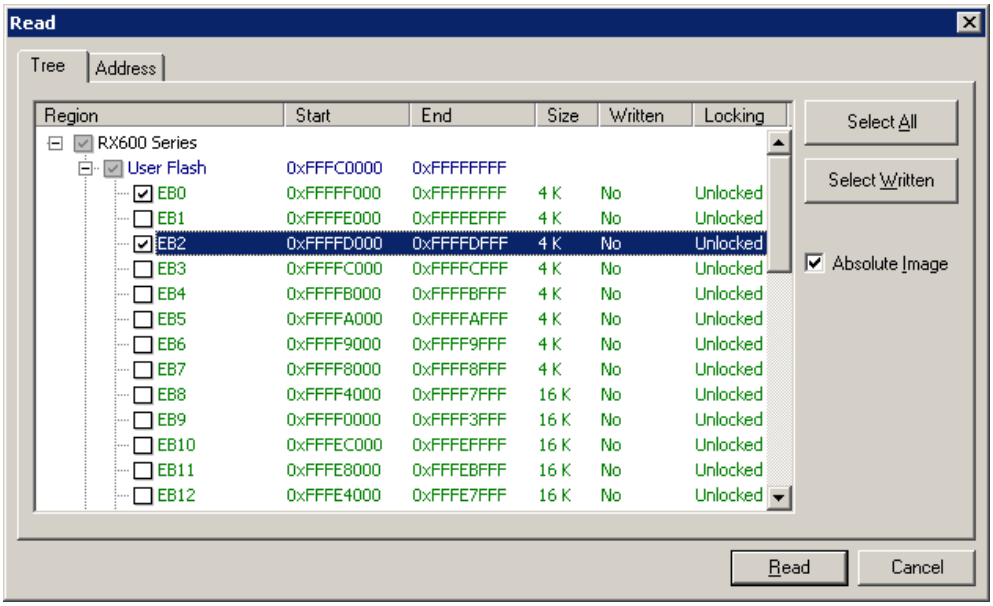


Enter a filename in the [File name:] box. A saving format "S-Record File (*.mot)" is specified in the [Save as type:] list box.

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

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

Figure 6-30. [Tree] Tab of the [Read] Dialog Box



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

[Absolute Image] checkbox

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.

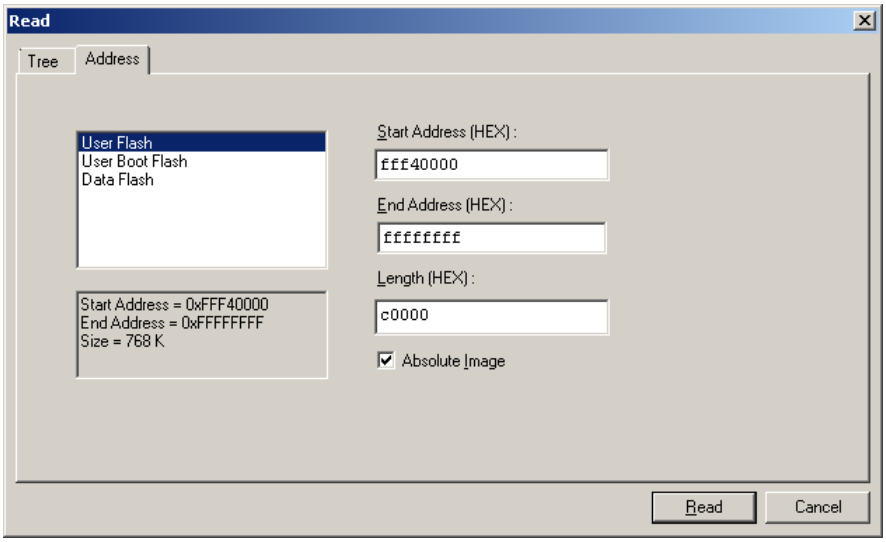
Clicking [Select All] selects all blocks for reading.

Clicking [Select Written] selects all blocks that have been programmed for reading.

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

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

Figure 6-31. [Address] Tab of the [Read] Dialog Box



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

[Absolute Image] checkbox

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 [Read] 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 [Cancel] or [x] closes the dialog box without performing reading.

(8) [Set Security] command

This command is used to set security of the target microcontroller. When the [Set Security] command is executed, the contents that are set in the [Security Setting (Flash Shield Window)] category in the [Other Settings] tab of the [Project Settings] dialog box are reflected to the target microcontroller. For details of settings including the security settings, see **6.4.3 (11) (f) <14> [Security Setting (Flash Shield Window)] category.**

(9) [Checksum] command

This command reads the checksum calculated in the target microcontroller and displays it on the output panel.

Checksums are calculated as follows:

Calculation method: 32-bit sum method

Calculation scope: The user area, the user boot area, and the data area

Figure 6-32. Output Panel after Execution of [Checksum] Command

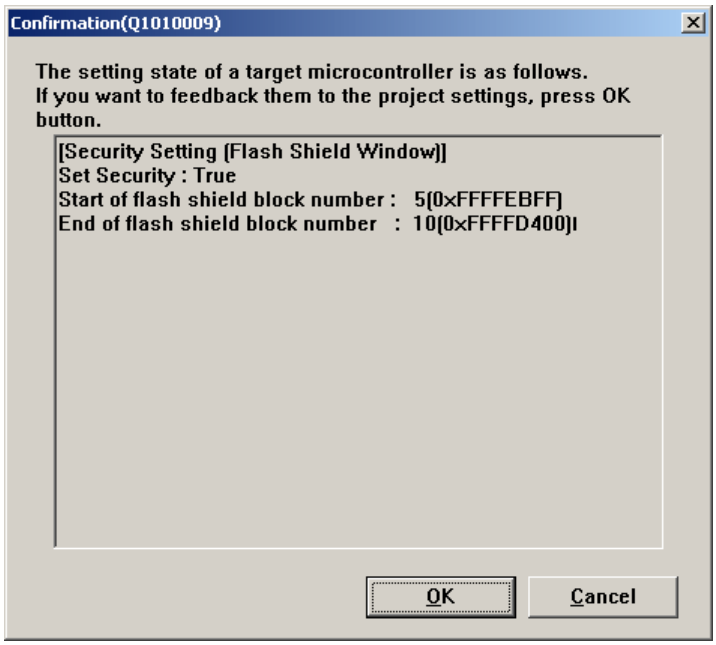
```
Getting the checksum of the device
Checksum of the flash: 0x03FC0000 User Flash
Checksum of the flash: 0x003FC000 User Boot Flash
Checksum of the flash: 0x0048AAC4 Data Flash
```

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

(10) [Get Flash options] command

This command is used to read the contents of the flash options settings of the target microcontroller. The read results are reflected to the [Security Setting (Flash Shield Window)] category in the [Other Settings] tab of the [Project Settings] dialog box and displayed. When this command is executable, the flash options settings can be verified by executing this command before executing the [Set Security] command, [Set OCD Security ID] command, or [Set Option Bytes] command. For details of flash options settings, see **6.4.3 (11) (f) <14> [Security Setting (Flash Shield Window)] category.**

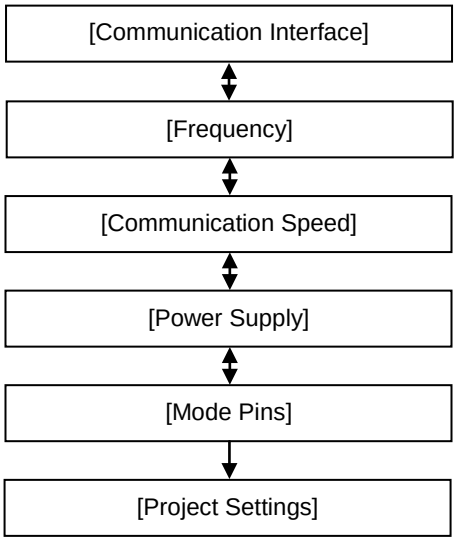
Figure 6-33. [Get Flash options] Command



(11) [Set Project]

When [Project Settings] 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 6-34**). 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 E1 or E20 and two-wire UART is selected.

Figure 6-34. Flow of Setting Change with the [Modify...] Button



(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 6-35. [Communication Interface] Dialog Box

For details about each item, see **6.2.3**.

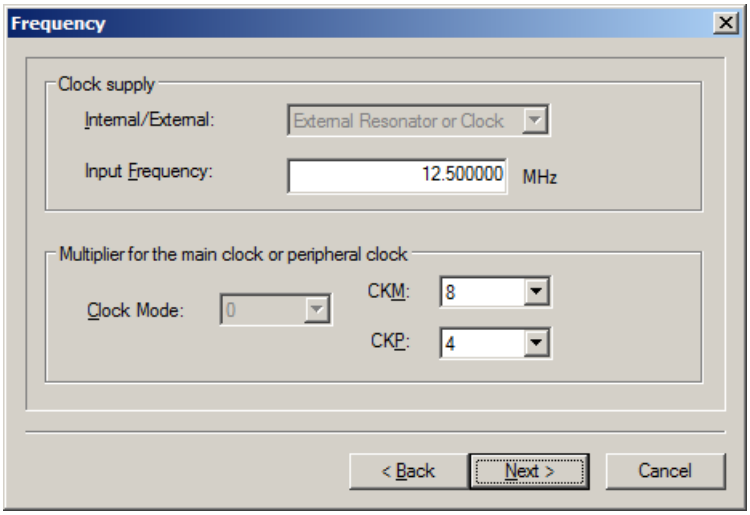
Clicking the [Next >] button displays the next dialog box.

Clicking the [Cancel] or the [X] button returns you to the [Project Settings] dialog box.

(b) [Frequency] dialog box

This dialog box is used to set clock supply and multiplication ratios for the main clock and peripheral clock.

Figure 6-36. [Frequency] Dialog Box

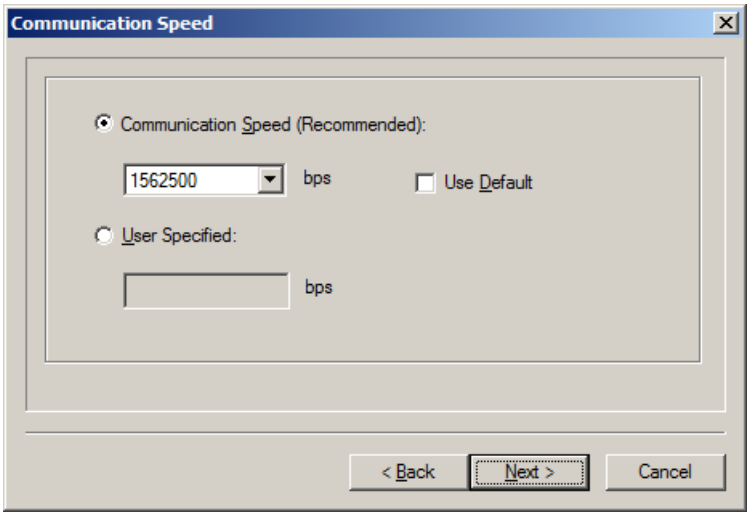


For details about each item, see **6.2.7**.
Clicking the [< Back] button displays the previous dialog box.
Clicking the [Next >] button displays the next dialog box.
Clicking the [Cancel] or the [X] button returns you to the [Project Settings] dialog box.

(c) [Communication Speed] dialog box

This dialog box is used to set communication speed.

Figure 6-37. [Communication Speed] Dialog Box

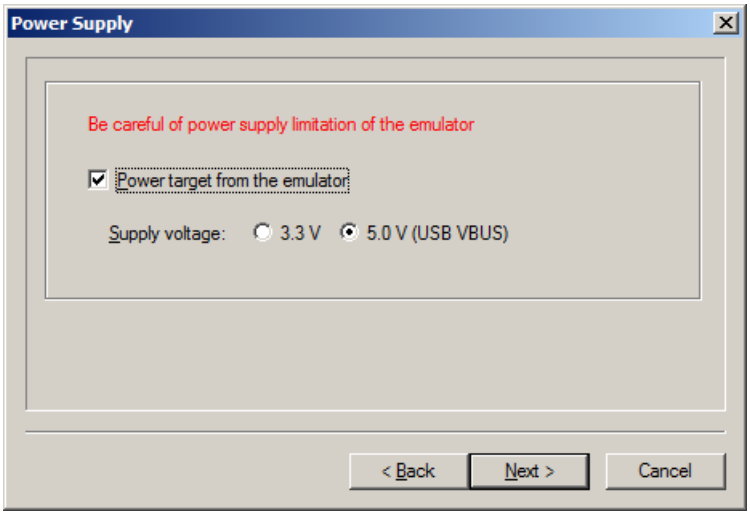


For details about each item, see **6.2.8**.
Clicking the [< Back] button displays the previous dialog box.
Clicking the [Next >] button displays the next dialog box.
Clicking the [Cancel] or the [X] button returns you to the [Project Settings] dialog box.

(d) [Power Supply] dialog box

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

Figure 6-38. [Power Supply] Dialog Box

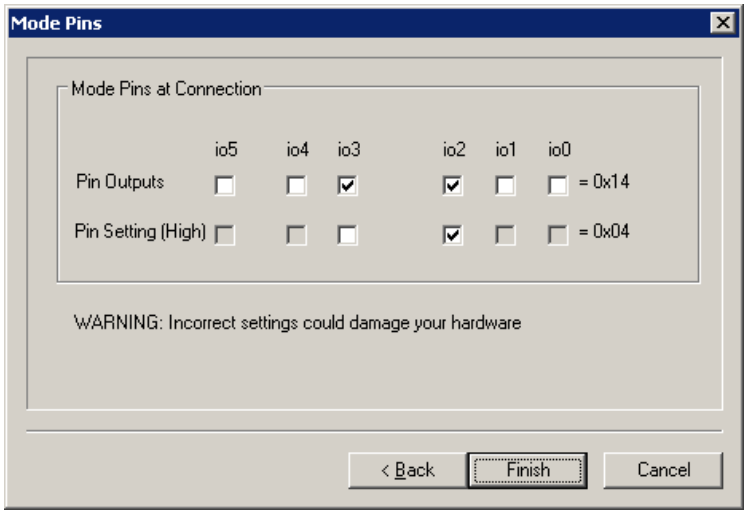


For details about each item, see **6.2.4**.
Clicking the [< Back] button displays the previous dialog box.
Clicking the [Next >] button displays the next dialog box.
Clicking the [Cancel] or the [X] button returns you to the [Project Settings] dialog box.

(e) [Mode Pins] dialog box

This dialog box is used to select the pin to control the mode pin of the target microcontroller from io0 to io5 pins.

Figure 6-39. [Mode Pins] Dialog Box



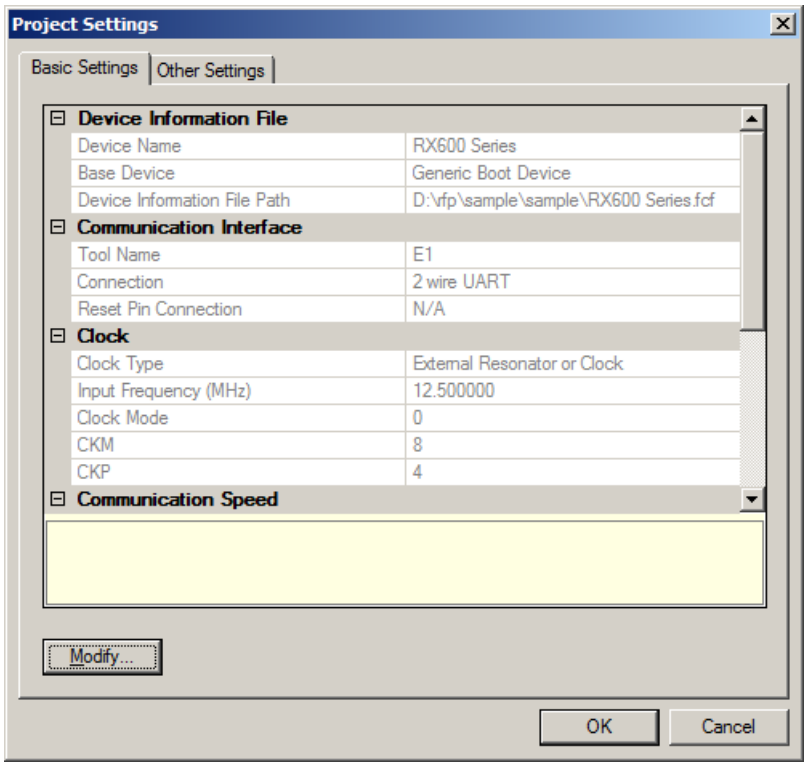
Remark For the io0 to io5 pins of E1 and E20, refer to **Figure B-1. E1 and E20 Pins - RX** - in **APPENDIX B**.

For details about each item, see **6.2.5**.
Clicking the [< Back] button displays the previous dialog box.
Clicking the [Finish] button saves the workspace file and returns you to the [Project Settings] dialog box.
Clicking the [Cancel] or the [X] button 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.

Figure 6-40. [Project Settings] Dialog Box



[Basic Settings] tab

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

[Other Settings] tab

<7> [Basic Mode Option] category
<8> [Command Options] category
<9> [Mode Pins at Disconnect] category
<10> [Lock Bit] category
<11> [ID Option] category
<12> [Timeout Option] category
<13> [User Boot Area Options] category
<14> [Security Setting (Flash Shield Window)] 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.
Clicking the Cancel or the X button returns you to the main window.

<1> [Device Information File] category

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

Device Name	Displays the device name.
Base Device	Displays the base device of the device.
Device Information File Path	Displays the parameter file path of the device.

<2> [Communication Interface] category

This category displays Tool and Connection.

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

<3> [Clock] category

This category displays clock-related information such as Clock Type, Frequency, CKM, and CKP.

Clock Type	Clock is supplied to the device via internal or external clock.
Frequency [MHz]	Displays the input frequency of the device.
Clock Mode	Displays the clock mode of the device.
CKM	Displays the multiplication or frequency dividing of the main clock.
CKP	Displays the multiplication or frequency dividing of the peripheral clock.

<4> [Communication Speed] category

This category displays communication speed-related information such as Communication speed Specified By, Communication speed Value (bps), and Use Default Value.

Communication speed Specified By	Displays the communication speed based on the Recommended Speeds or User Specified.
Communication speed Value (bps)	Displays the communication speed with the device.
Use Default Value	Displays if the recommended default communication speed is used or not.

<5> [Target Power Supply] category

This category displays Power Supply of the target device.

Power Supply	Displays the power supply for the target device.

<6> [Mode Pins at Connection] category

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

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

<7> [Basic Mode Option] category

This category is used to select whether or not to automatically disconnect after execution.

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

<8> [Command Options] category

This category is used to select Readback Verification, All Erase Before Program, Request Checksum, and File Over Warning.

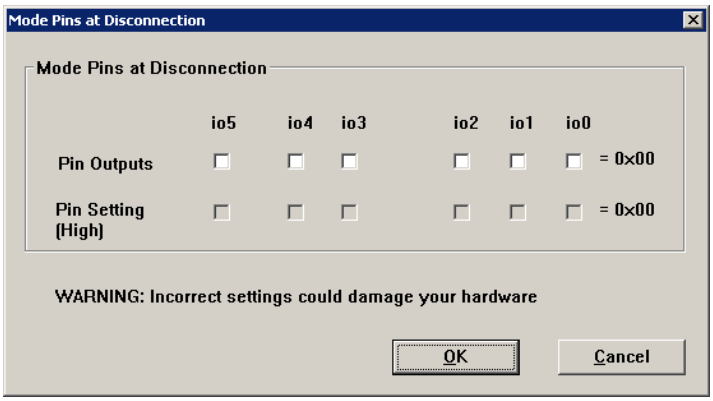
Readback Verification	Selects whether to execute readback verification after programming.	
	True	Enabled
	False	Disabled
All Erase Before Program	Selects whether to erase all blocks before programming.	
	True	Enabled
	False	Disabled
Request Checksum	Selects whether to obtain the checksum of the device after programming.	
	True	Enabled
	False	Disabled
File Over Warning	Selects whether to display the warning dialog when the program file exceeds the ROM size of the flash.	
	True	Enabled
	False	Disabled
Security after Program	Selects whether to set security after programming.	
	True	Enabled
	False	Disabled

Remark The checksum is the eight lower-order digits of the result of adding the values of all bytes in the flash memory.

<9> [Mode Pins at Disconnect] category

This category displays or is used to select Reset Pin As Low, Reset Device, and Mode Pins Information.

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



[Pin Outputs] check box

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

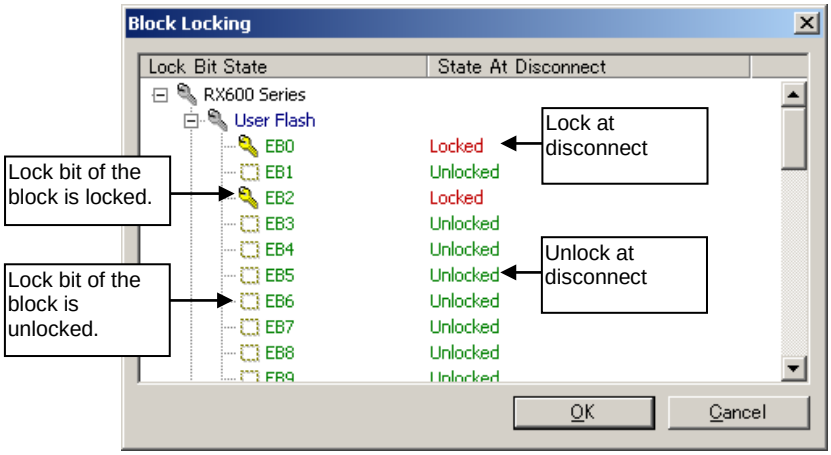
[Pin Setting (High)] check box

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

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

<10> [Lock Bit] category

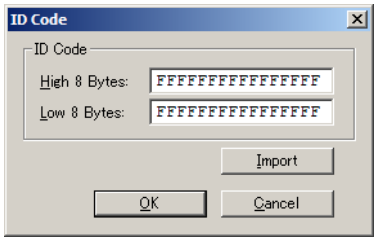
This category is used to specify lock-bit-related settings such as Connect Option, Disconnect Option, and Lock Blocks At Disconnect.

<table>
<tr><td rowspan="4">Disconnect Option</td><td>Selects whether to set block lock when disconnecting from the device.</td></tr>
<tr><td>• Set</td></tr>
<tr><td>• Displays the setting dialog</td></tr>
<tr><td>• Do Nothing</td></tr>
<tr><td>Lock Blocks At Disconnect</td><td>Changes the lock state of the block when disconnecting from the device.
 

The lock bit setting at disconnection is changed to “Locked” or “Unlocked.” For “N/A”, the lock function is not supported.</td></tr>
</table>

<11> [ID Option] category

This category is used to specify ID code.

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


[High 8 Bytes:] box
Enter the 8 higher order bytes of the ID code.
[Low 8 Bytes:] box
Enter the 8 lower order bytes of the ID code.
[Import] button
The [Open] dialog box is opened; when an ID code file 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. For a microcontroller with 8-byte ID code, leave High 8 Bytes blank, or enter 0xFF.
2. If the value of each input field is less than 8 bytes, RFP automatically input 0xFF from the beginning of the field.
3. For a device with control code, enter the value at the first byte of the effective data bytes.
Example 1: When Effective data bytes = 16, Control code = H'45, ID code = H'010203, H'04050607, H'08090A0B, H'0C0D0E0F -> 'High 8 Bytes:' 4501020304050607 'Low 8 Bytes:' 08090A0B0C0D0E0F
Example 2: When Effective data bytes = 8, Control code = H'45, ID code = H'010203, H'04050607 -> 'High 8 Bytes:' FFFFFFFFFFFFFFFF 'Low 8 Bytes:' 4501020304050607
• <Output to file…>
The [Save As] dialog box is opened and the name of an ID code file in the "RFP ID Code Files (*.rid)" format to be created is specified.
</td></tr>
<tr><td rowspan="3">Automatic authentication</td><td colspan="2">This option selects whether or not to send the ID code automatically on ID code authentication.</td></tr>
<tr><td>True</td><td>Enables automatic verification of the ID code.</td></tr>
<tr><td>False</td><td>The [ID Code] dialog box is opened on connection to a device to which an ID code has been written.</td></tr>
<tr><td rowspan="3">Save to the project file</td><td colspan="2">This option selects whether or not to save the ID code in the project file.</td></tr>
<tr><td>True</td><td>Enables the option.</td></tr>
<tr><td>False</td><td>Disables the option.</td></tr>
</table>

<12> [Timeout Option] category

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

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

<13> [User Boot Area Option] category

This category is used to specify whether or not to include the user boot area in the scope of erasure.

Permission of erasure	Specifies whether to include the user boot area in the scope of erasure.	
	True	Included
	False	Not included

<14> [Security Setting (Flash Shield Window)] category

This category is used to set security.

Set Security	Specifies whether to set the flash shield window.	
	True	Set
	False	Not set
Start of flash shield block number	Inputs the starting block of the flash shield window.	
End of flash shield block number	Inputs the ending block of the flash shield window.	

6.4.4 [Help] menu

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

Figure 6-41. [Help] Menu

(1) [Version Information]

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

Figure 6-42. Version Information Dialog Box

(2) [Import License]

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

6.5 [Microcontroller] Area

This area displays the selected target microcontroller.

Figure 6-43. [Microcontroller] Area

6.6 [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.

Figure 6-44. [Program File] Area

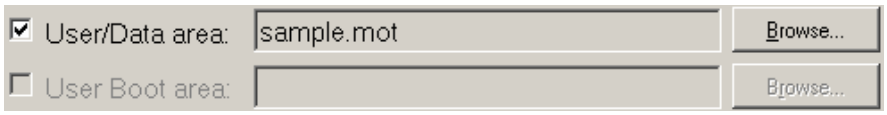
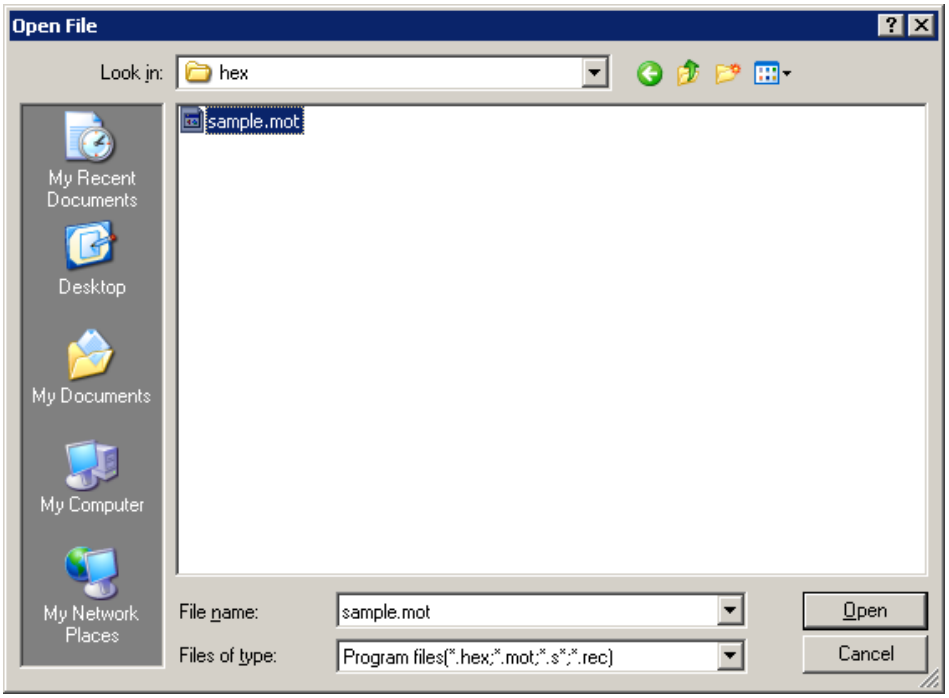


Figure 6-45. [Open File] Dialog Box



6.7 [Command] Area

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

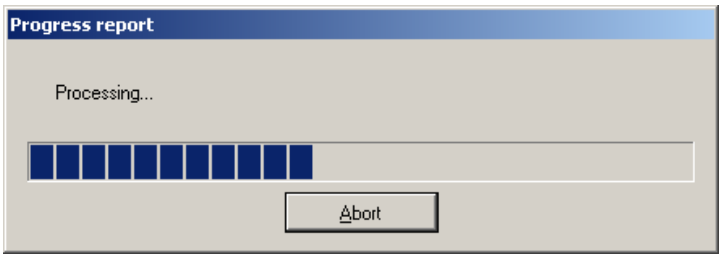
Figure 6-46. Command Area

6.8 Start Button

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

Figure 6-47. Start Button

Figure 6-48. [Progress report] Dialog Box



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

6.9 Status Bar

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

Figure 6-49. Status Bar

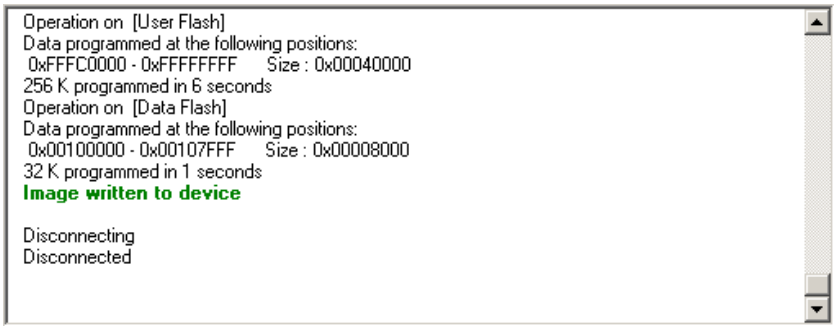
Table 6-1 List of Status Bar Display

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

6.10 Output Panel

The output panel displays the execution status of the command selected on the [Microcontroller] menu in text. Up to 500 lines can be displayed. If the text exceeds 500 lines, lines will be deleted, starting from the first line.

Figure 6-50. Output Panel



(a) Output Panel Context Menu

Right-clicking the output panel displays a context menu.

Table 6-1 Output Panel Context Menu

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

6.11 Clear Output Panel Button

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

Figure 6-51. Clear Output Panel Button

CHAPTER 7 FUNCTION DETAILS (FULL MODE) - RL78, 78K, V850 -

This chapter describes function details of the commands, windows, and dialog boxes of the full mode of RFP for the RL78, 78K, and V850.

7.1 Introduction

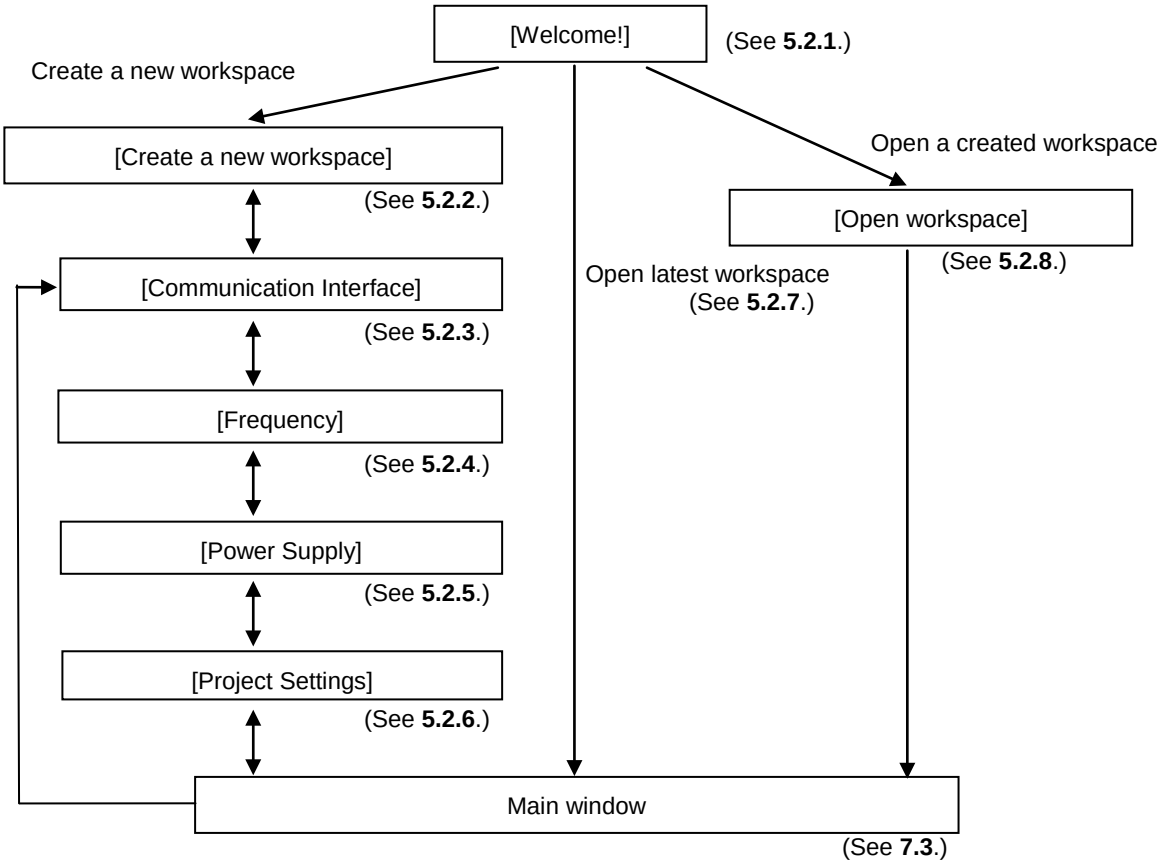
Make sure that the RFP package is installed. For how to install the RFP package, see **CHAPTER 2 INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

7.2 Starting up

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

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The [Frequency] and the [Power Supply] dialog boxes are skipped if it is not necessary to change the setting.

Figure 7-1. 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.

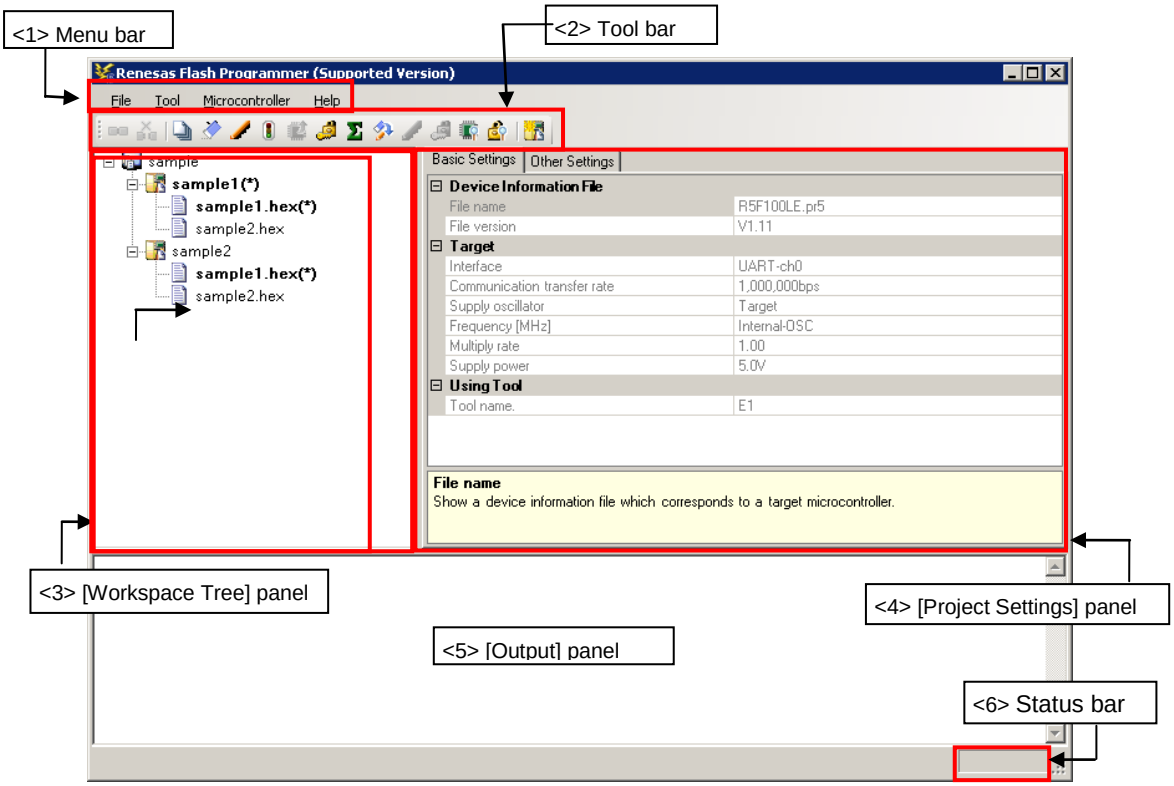
(2) Dragging and dropping a workspace file onto RFP.exe.

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

7.3 Main Window

The main window consists of the following items:

Figure 7-2. Main Window



Name		Description	See
<1>	Menu bar	Displays the selectable menus.	7.4
<2>	Tool bar	Displays buttons for frequently used commands.	7.5
<3>	[Workspace Tree] panel	Displays the workspace in a tree form.	7.6
<4>	[Project Settings] panel	Displays the project settings.	7.7
<5>	[Output] panel	Displays the command execution output.	7.8
<6>	Status bar	Displays the command execution status in colors and text	7.9

7.4 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.

7.4.1 [File] menu

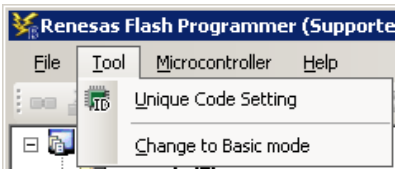
The following pull-down menu appears by selecting the [File] menu. Refer to 5.4.1 for details of each menu.

Figure 7-3. [File] Menu

7.4.2 [Tool] menu

Selecting the [**Tool**] menu displays the pull-down menu as shown in the figure below. Refer to 5.4.2 for details of each menu.

Figure 7-4 [Tool] Menu

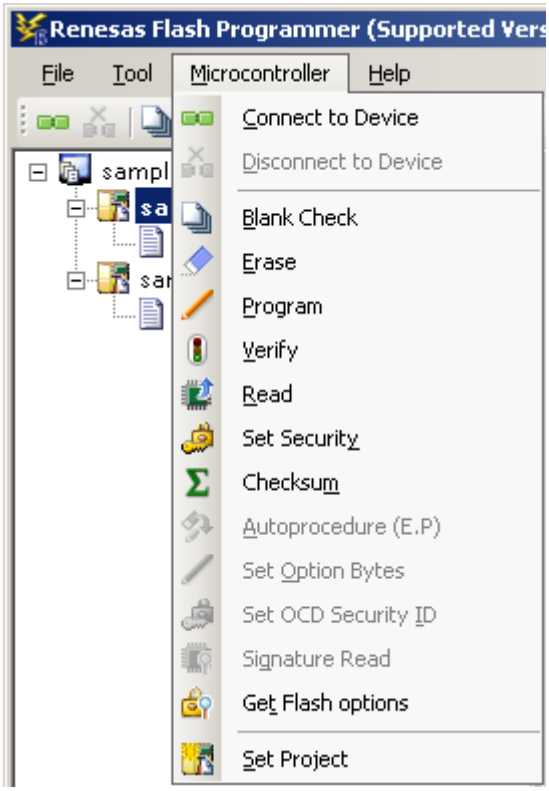


7.4.3 [Microcontroller] menu

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 5.4.3 for details of each command.

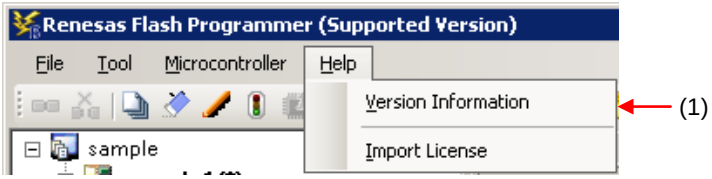
Figure 7-5. [Microcontroller] Menu



7.4.4 [Help] menu

Clicking the [Help] menu displays the following pull-down menu. Refer to 5.4.4 for details of each menu.

Figure 7-6. [Help] Menu



7.5 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 5.4.3 for details of each command.

Figure 7-7. Tool Bar

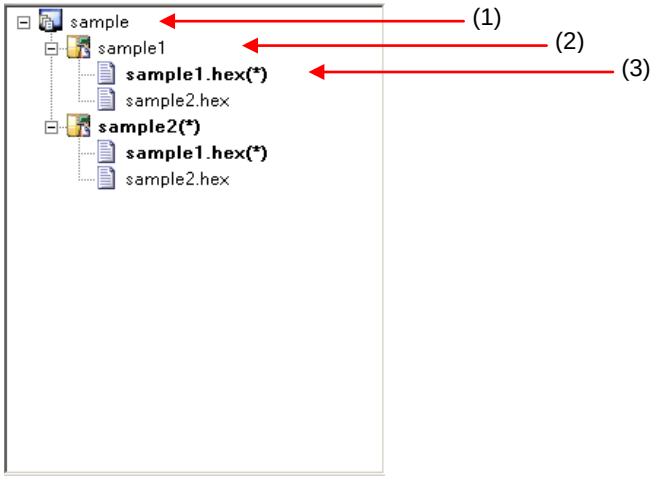
Table 7-1. Tool Bar

(1)	Executes the [Blank Check] command.
(2)	Executes the [Erase] command.
(3)	Executes the [Program] command.
(4)	Executes the [Verify] command.
(5)	Executes the [Read] command.
(6)	Executes the [Set Security] command.
(7)	Executes the [Checksum] command.
(8)	Executes the [Autoprocedure (E.P)] command.
(9)	Executes the [Set Option Bytes] command.
(10)	Executes the [Set OCD Security ID] command.
(11)	Executes the [Signature Read] command.
(12)	Executes the [Get Flash options] command.
(13)	Opens a wizard-type dialog for changing the project basic settings.

7.6 [Workspace Tree] Panel

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

Figure 7-8. [Workspace Tree] Panel



(1) Workspace node

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

(a) Context menu of the workspace node

Right-clicking the workspace node displays its context menu.

Table 7-2. Context Menu of the Workspace Node

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

(2) Project nodes

A project node represents a project within the workspace. You can manipulate and edit one of the multiple projects (maximum of 64) at a time. The project that can be manipulated and edited is 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 7-3. Context Menu of Project Nodes

Set Project Active	Makes the selected project available for manipulation and edition. The project that has been manipulated and edited is saved.
Delete Project	Deletes the selected project from the list. The project file itself is not deleted. This menu item is enabled when the project is not being manipulated or edited.
Add Program File	Adds a program file to the selected project. The [Open File] dialog box opens for adding a program file.

(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 bold and marked by "(*)". Double-clicking one of other nodes makes it available for programming and verification.

(a) Context menu of program file nodes

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

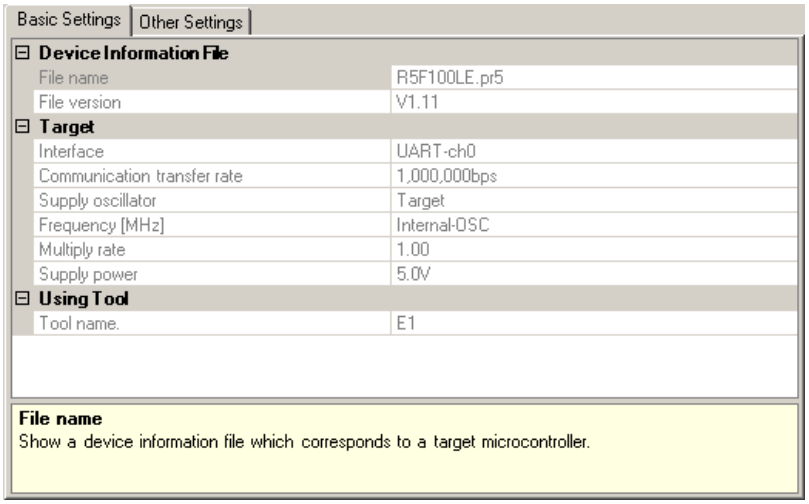
Table 7-4. Context Menu of Program File Nodes

Set Program File Active	Makes the selected program file available for programming and verification.
Delete Program File	Deletes the selected program file from the list. The program file itself is not deleted. This menu item is enabled when the program file is not selected for programming and verification.
Area	Not used.
Program	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.
Autoprocedure(E.P.)	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.

7.7 [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 5.4.3 (13) (d), [Project Settings] dialog for details.

Figure 7-9. [Project Settings] Panel



7.8 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 500 lines can be displayed. If the text exceeds 500 lines, lines will be deleted, starting from the first line. Refer to 5.10 for details.

Figure 7-10. Output Panel

7.9 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 7-11. Status Bar

Table 7-5. Status Bar Displays

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

CHAPTER 8 FUNCTION DETAILS (FULL MODE) - RX -

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

8.1 Introduction

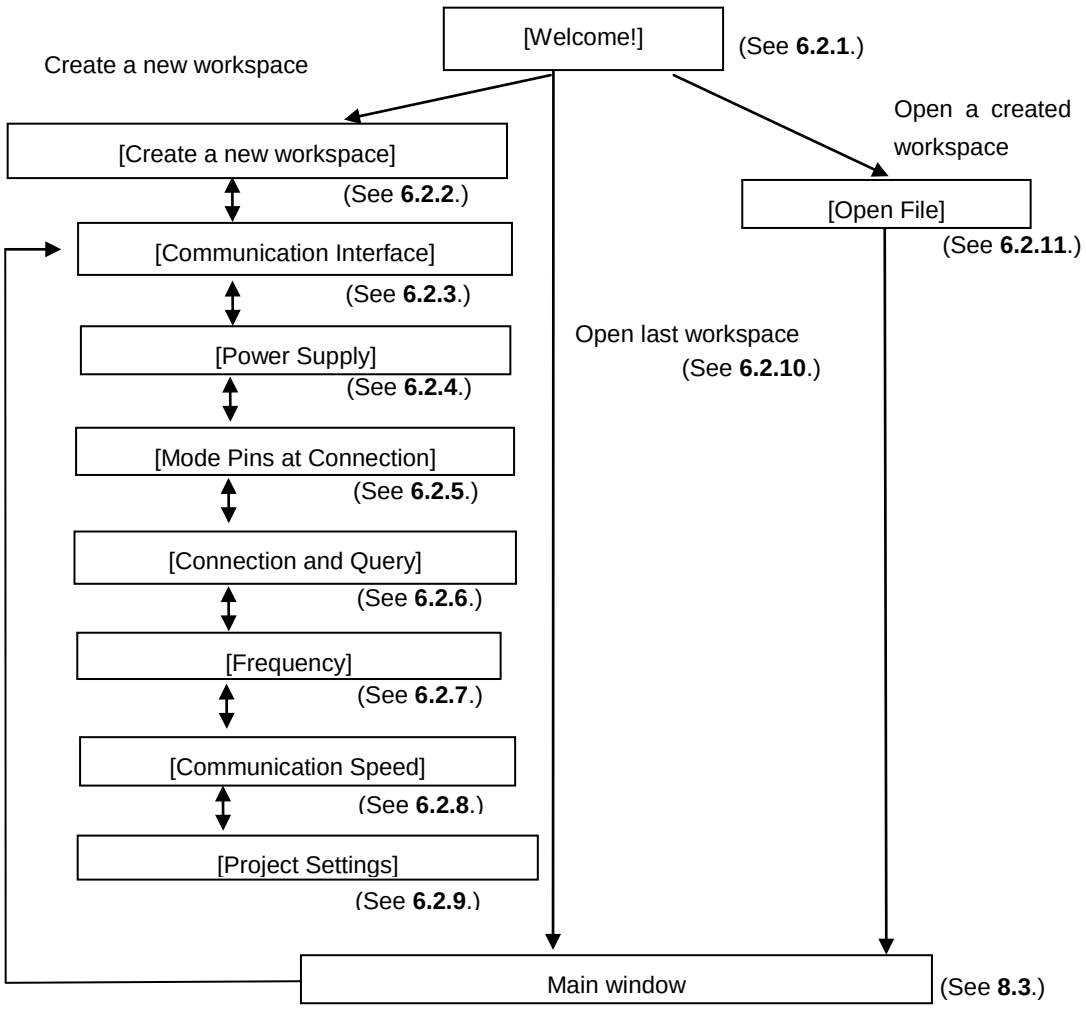
Make sure that the RFP package is installed. For how to install the RFP package, see **CHAPTER 2 INSTALLATION**. Before starting RFP, make sure that the debugger and utility are not running.

8.2 Starting up

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

Follow the instructions that appear in the wizard. When setup is finished, the main window is displayed. The [Power Supply], [Mode Pins at Connection], [Frequency] and [Communication Speed] dialog boxes are skipped according to the selected connection method.

Figure 8-1. Flow of Dialog Boxes Until the Program is Activated



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

(1) Double clicking a workspace file.

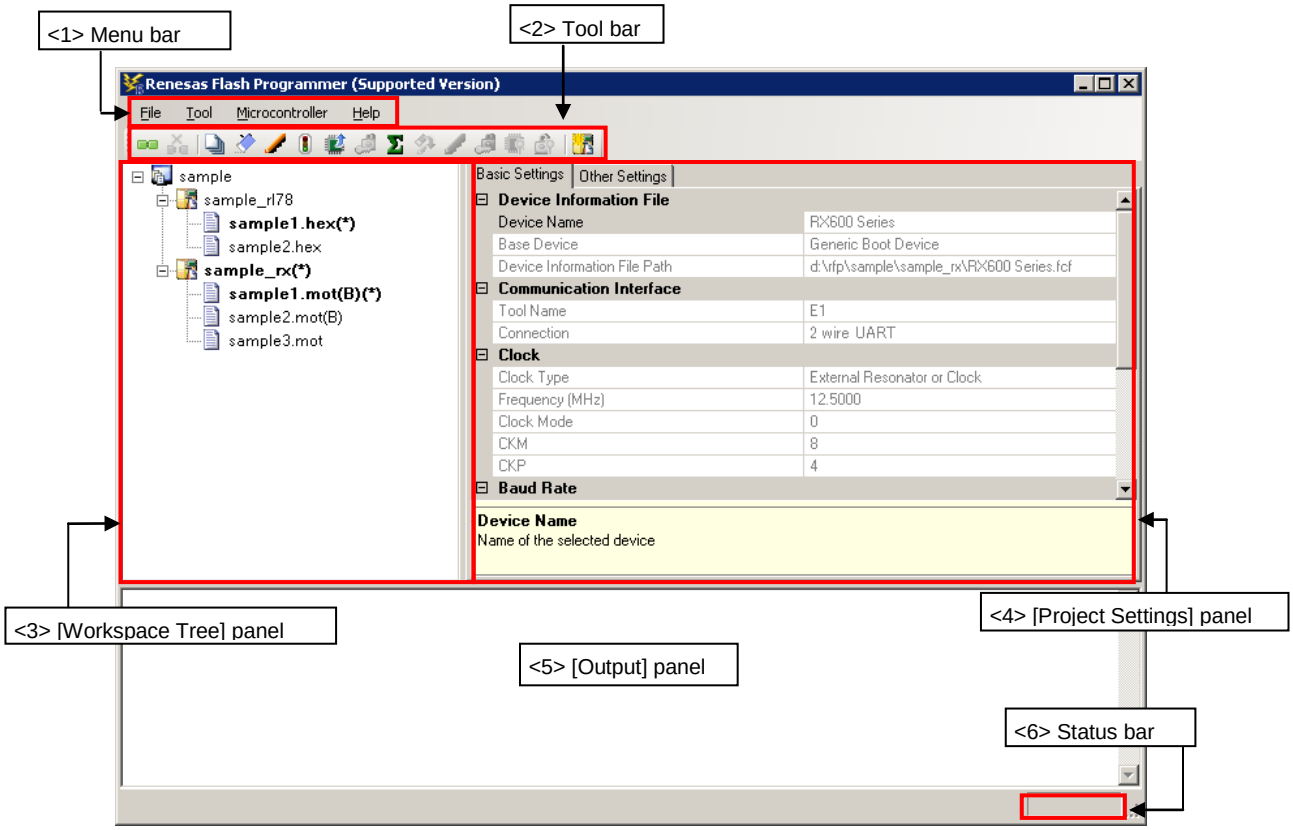
(2) Dragging and dropping a workspace file onto RFP.exe.

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

8.3 Main Window

The main window consists of the following items:

Figure 8-2. Main Window



Name		Description	See
<1>	Menu bar	Displays the selectable menus.	8.4
<2>	Tool bar	Displays buttons for frequently used commands.	8.5
<3>	[Workspace Tree] panel	Displays the workspace in a tree form.	8.6
<4>	[Project Settings] panel	Displays the project settings.	8.7
<5>	[Output] panel	Displays the command execution output.	8.8
<6>	Status bar	Displays the command execution status in colors and text	8.9

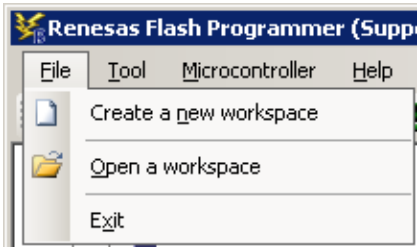
8.4 Menu Bar

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.

8.4.1 [File] menu

The following pull-down menu appears by selecting the [File] menu. Refer to 6.4.1 for details of each menu.

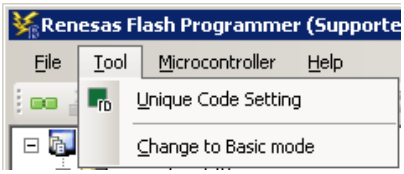
Figure 8-3. [File] Menu



8.4.2 [Tool] menu

Selecting the [**Tool**] menu displays the pull-down menu as shown in the figure below. Refer to 6.4.2 for details of each menu.

Figure 8-4. [Tool] Menu

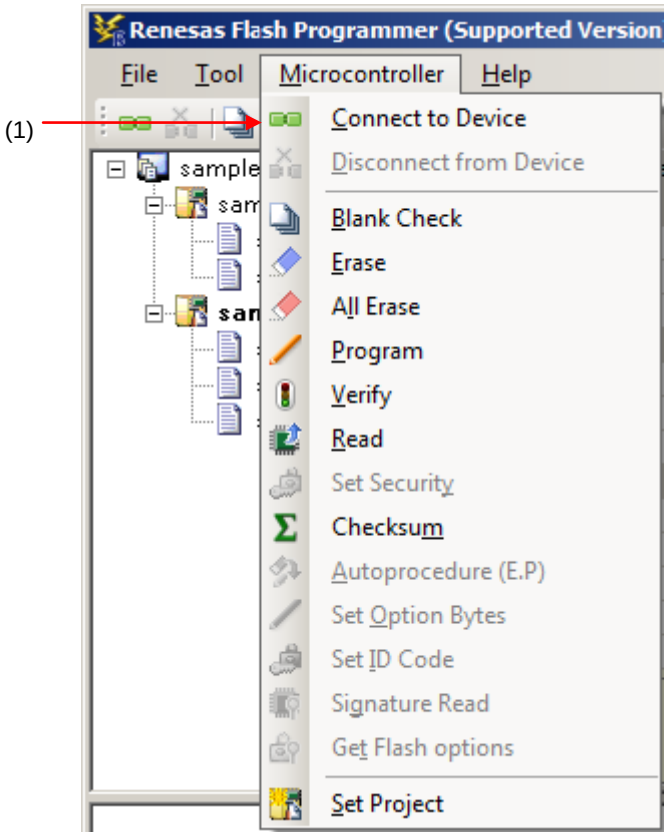


8.4.3 [Microcontroller] menu

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. Refer to section 6.4.3 for more information on commands other than [Connect to Device] and [Checksum].

Remark The [Set Project] option is deselected while the target microcontroller is connected. To enable the option, select [Disconnect from Device] from the [Microcontroller] pull-down menu.

Figure 8-5. [Microcontroller] Menu



(1) [Connect To Device]

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

8.4.4 [Help] menu

Clicking the [Help] menu displays the following pull-down menu. Refer to 6.4.4 for details of each menu.

Figure 8-6. [Help] Menu

8.5 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 6.4.3 for details of each command.

Figure 8-7. Tool Bar

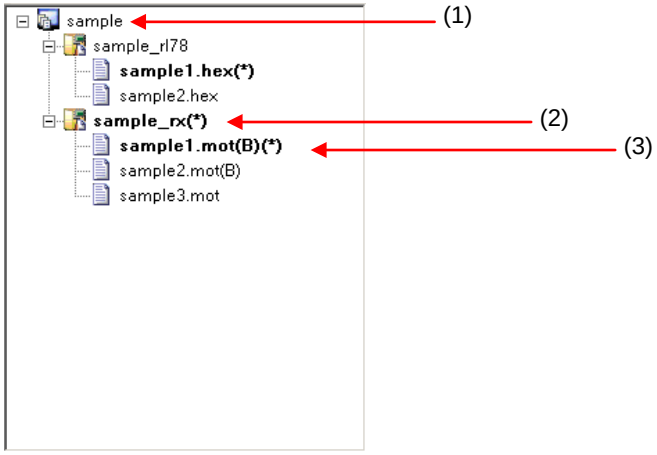
Table 8-1. Tool Bar

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

8.6 [Workspace Tree] Panel

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

Figure 8-8. [Workspace Tree] Panel



(1) Workspace node

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

(a) Context menu of the workspace node

Right-clicking the workspace node displays its context menu.

Table 8-2. Context Menu of the Workspace Node

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

(2) Project nodes

A project node represents a project within the workspace. You can manipulate and edit one of the multiple projects (maximum of 64) at a time. The project that can be manipulated and edited is displayed bold and marked by "(*)". Double-clicking one of other project nodes makes it available for manipulation and edition. Selecting [User Boot Area] from the context menu of a program file node displays the project node bold, and marks the program file node with "(B)".

(a) Context menu of project nodes

Right-clicking a project node displays its context menu.

Table 8-3. Context Menu of Project Nodes

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

(3) Program file nodes

A program file node represents a program file of a project. A project 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 bold and marked by "(*)". Double-clicking one of other nodes makes it available for programming and verification.

(a) Context menu of program file nodes

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

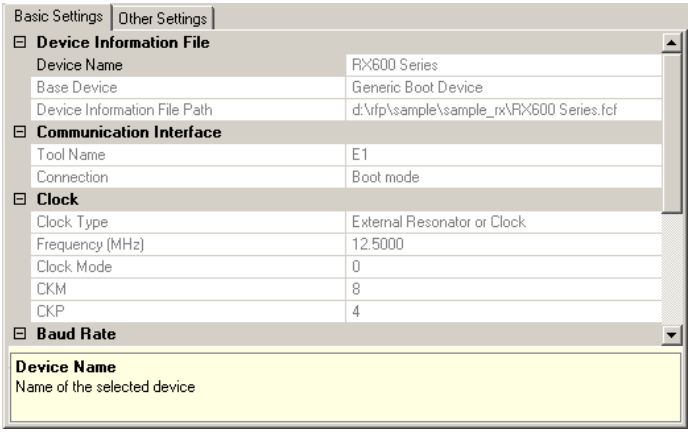
Table 8-4. Context Menu of Program File Nodes

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

8.7 [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 5.4.3 (13) (d), [Project Settings] dialog for details.

Figure 8-9. [Project Settings] Panel



8.8 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 500 lines can be displayed. If the text exceeds 500 lines, lines will be deleted, starting from the first line. Refer to 6.10 for details.

Figure 8-10. Output Panel

8.9 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 8-11. Status Bar

Table 8-5. Status Bar Displays

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

CHAPTER 9 SCRIPT EXECUTION FUNCTION - RL78, 78K, V850 -

This chapter explains about the script execution function for RL78, 78K, and V850.

9.1 Overview

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

Note Processing automatically proceeds in response to clicking on 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.

9.2 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 the script file is not correct, the script execution function terminates and the [Welcome!] Dialog Box will 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 Rusult Code：%ErrorLevel%
PAUSE
```

9.3 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
```

9.4 Script commands

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

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

Symbol	Description
Characters within angle brackets < >	Information that must be provided

Table 9-1. Script Commands

Function	Script command Description
Specify a log file	log <filename> Specifies a log file. For more details, see **9.5**. <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> 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 (" ").

Wait	wait <time>
	Waits for the specified time. <time>: specifies the wait time (unit: msec, range: 1-2147483647)
Blank check	blankcheck
	Executes the blankcheck command.
Erase	erase
	Executes the erase command.
Program	program
	Executes the program command.
Verify	verify
	Executes the verify command.
Security setting	security
	Executes the security setting command.
Checksum	checksum
	Executes the checksum command.
Program after erasure	ep
	Executes the program command after erasure.
Signature read	signature
	Executes the signature read command.

9.5 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

[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)

(2) Saved log file example

```
[23-Apr-12 13:17:12:223] workspace d:\rfp\sample test\sample\sample.rws
[23-Apr-12 13:17:13:602] log d:\rfp\sample_test\sample.log
[23-Apr-12 13:17:13:628] programfile d:\hex\sample.hex
[23-Apr-12 13:17:14:110] verify
====== (Connect) ======
------ Start(Verify) ------
Verify Code flash:
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
PASS
Verify PASS
------ End(Verify) ------
====== (Disconnect) ======
```

CHAPTER 10 SCRIPT EXECUTION FUNCTION - RX -

This chapter explains the script execution function for RX.

10.1 Overview

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

Note Processing automatically proceeds in response to clicking on OK button in the [Confirmation] dialog box. Note, however, that when the firmware of the emulator needs updating, this is indicated in the [Confirmation] dialog box. Alternatively, depending on the settings, a dialog box might be shown while the program is running (see section 10.6).

10.2 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 the script file is not correct, the script execution function terminates and the [Welcome!] Dialog Box will 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 Rusult Code : %ErrorLevel%
PAUSE
```

10.3 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 test\sample.log"
workspace "d:\rfp\sample test\sample\sample.rws"
programfile d:\hex\sample.mot userdata
serial e1 9jm000129
connect
checksum
disconnect
```

10.4 Script commands

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

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

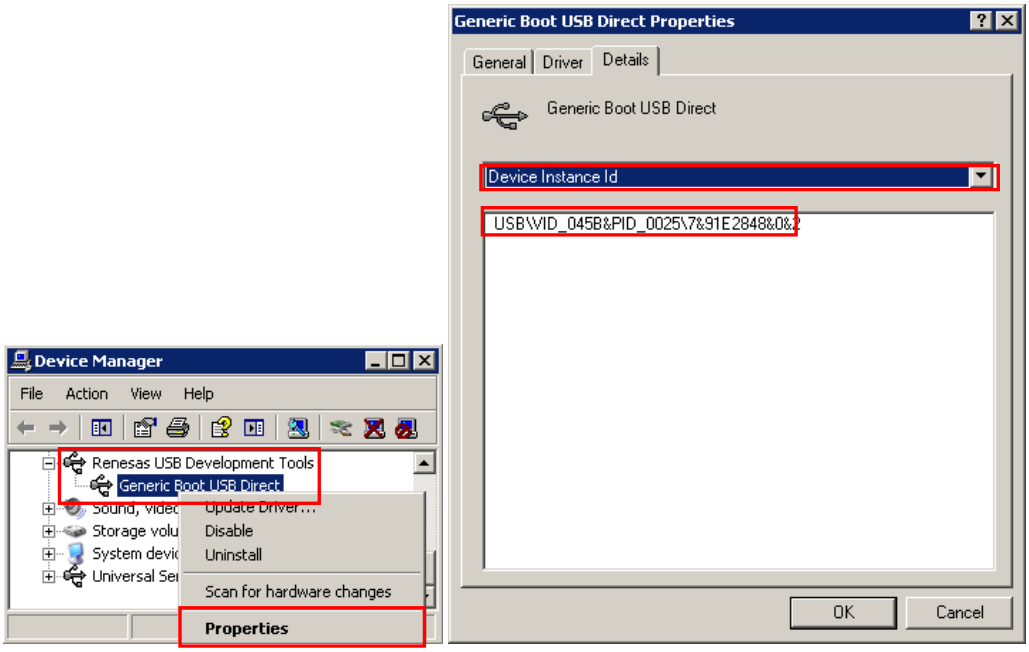
Symbol	Description
Characters within angle brackets < >	Information that must be provided
Characters within square brackets [ ]	Optional information
Slash /	Options where only one option must be selected

Table 10-1 Script Commands

Function	Script command Description
Specify a log file	log <filename>
	Specifies a log file. For more details, see **9.5**. <filename>: the full path of the log file. If the full path contains spaces, use double quotation marks to enclose the full path (" ").
Specify a workspace	workspace <filename>
	Specifies a workspace file. The script execution function uses an active project and an active program file. <filename>: the full path of the workspace file. If the path contains spaces, use double quotation marks to enclose the path (" ").
Specify a program file	programfile <filename> <area>
	Specifies a program file. When multiple files are specified, the last file is active. <filename>: the full path of the program file. If the path contains spaces, use double quotation marks to enclose the path (" "). <area>: specifies the area (userdata / userboot) userdata: specifies the user and data area. userboot: specifies the user boot area.
Specify an ID code file	idcodefile <filename>
	Specifies an ID code file for authentication. When multiple files are specified, the command is only effective for the last file to be specified. Note that the command leads to the ID code settings in a project file being ignored. <filename>: Use double quotation marks (“ ”) in cases where the full pathname of the program file is specified or the filename includes a space.
Specify the serial number	serial <connection> <serial_id>
	Specifies the serial number of the tool used. <connection>: specifies the connection method. (e1/ e20/ usb) e1: specifies “E1.” e20: specifies “E20.” usb: specifies “USB Direct.” <serial_id>: When "E1" or "E20" is selected, the serial number marked on the chassis: Example) 9jm000129 When "USB Direct" is selected, the USB port number* : Example) VID_045B&PID_0025\6&3234B9D9&0&3
Wait	wait <time>
	Waits for the specified time. <time>: specifies the wait time (unit: msec, range: 1-2147483647)
Connect to the device	connect
	Executes the connect to the device command.
Disconnect from the device	disconnect
	Executes the disconnect from the device command.

Blank check	blankcheck <area> [<option>]
	Executes the blankcheck command. <area>: specifies the area (user / data/ userboot/ all) user: specifies the user area. data: specifies the data area. userboot: specifies the user boot area. all: specifies all the area. If data or userboot is specified for a microcontroller that does not have a data area or user boot area, the result code “0” is returned. <option>: specifies the action (stoponwritten / stoponblank) stoponwritten: if the area specified with <area> is not blank, terminate the script execution function. stoponblank: if the area specified with <area> is blank, terminate the script execution function.
Erase	erase <block>
	Executes the erase command. <block>: specifies using either one of the following options. Using block numbers: Example) 0|1|4|7 Using block names: Example) EB0|EB1|EB4|EB7 written: all written blocks will be erased. device: all blocks will be erased.
Program	program
	Executes the program command.
Set security	security
	Executes the set security command.
Verify	verify
	Executes the verify command.
Checksum	checksum
	Executes the checksum command.

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



10.5 Log file

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

(1) Log file format

[DD-Mon-YY HH:MM:SS.mmm] <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)

(2) Saved log file example

[23-Apr-12 12:30:14:455] workspace d:\rfp\sample test\sample\sample.rws
[23-Apr-12 12:30:18:724] log d:\rfp\sample test\sample.log
[23-Apr-12 12:30:18:739] programfile .d:\hex\rx\sample.mot userdata
[23-Apr-12 12:30:18:740] serial e1 9jm000129
[23-Apr-12 12:30:18:782] connect
External Resonator or Clock = 12.5000MHz, Clock mode = 0, CKM = 8, CKP = 4
Connected device: 'RX600 Series', Tool used: 'E1', Connection method: 'Boot mode'
No problem with adapter version
(Current E1/E20 version = Adaptor Software (Level 0), Version bundled with the RFP = 1.00.00.000, In order to execute the RFP, version 1.00.00.000 is required.)
No problem with adapter version
(Current E1/E20 version = Adaptor Software (Level 1), Version bundled with the RFP = 1.01.00.000, In order to execute the RFP, version 1.01.00.000 is required.)
E1/E20 configuration data downloaded
Starting device boot sequence
Connecting at 9600bps
Generic Boot device detected
Device selection command sent
Device selection - device selected, code 7003
Clock mode selection command sent
Clock mode selection - clock selected, code 0
Baud rate changing to 1562500bps
Baud rate changed to 1562500bps
ID code: (Upper 8 bytes = 0x4545454500000000, Lower 8 bytes = 0x0000000000000000)
ID code confirmation successful
Connection established

[23-Apr-12 12:30:20:647] verify
Verifying...
Verified successfully

[23-Apr-12 12:30:24:365] disconnect
Disconnecting
Disconnected

10.6 How to Handle Dialog Boxes Opened while the Program is Running

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

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

(2) [Confirmation] dialog box
<Condition>
The [Confirmation] dialog box is displayed when bits are locked on connection of a microcomputer that supports lock bits.
<Action by user>
Select [Lock Blocks (allow to program or delete)] or [Do Nothing] for [Disconnect Option] in the [Lock Bit] category below the [Other Settings] tab in the [Project Settings] dialog box.

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

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

CHAPTER 11 UNIQUE CODE EMBEDDING FUNCTION

This chapter explains the unique code embedding function.

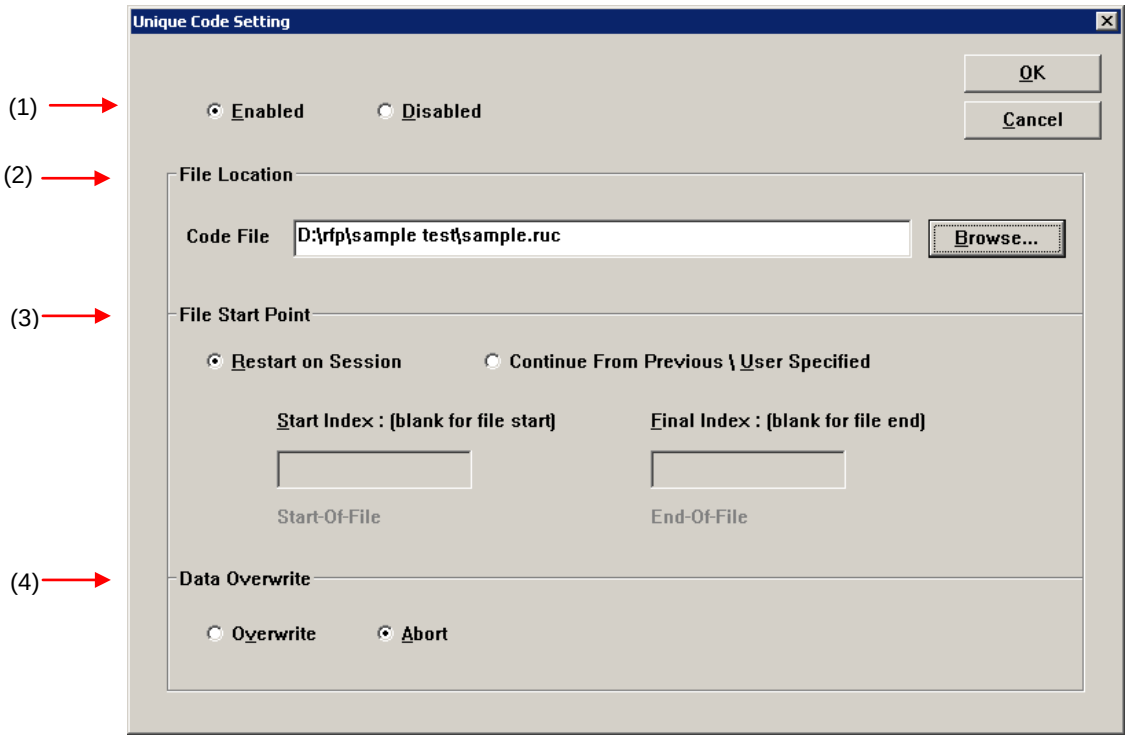
11.1 Overview

The unique code embedding function embeds a unique code in the specified area in the loaded program file. To enable this function, describe unique codes and a specified area in the unique code file and configure the setting in the [Unique code setting(U)] dialog box. A unique code file can specify one specified area and multiple unique codes. Each unique code has an index. When [Program] command or [Autoprocedure] command (for RL78, 78K, V850 only) finishes normally, the index is updated to the next index. When [Verify] command or [Checksum] command finishes normally, the index is not updated.

11.2 [Unique code setting] dialog box

This dialog box is used to configure the settings for a unique code (the enable/disable status of the unique code embedding function, definition file, start/end positions of the definition file, and the action when there is a conflict with the program file code).

Figure 11-1. [Unique Code Setting] Dialog Box



(1) [Enabled/ Disabled] option button

Specifies whether to enable/disable the unique code embedding function.

(2) [File Location] area

Specifies the full path of the unique code file. Enter the file name in the [File name:] text box directly, or click the Browse... button and open the [Browse for folder] dialog box to specify the file.

(3) [File Start Point] area

Specifies the start/end positions for the indexes described in the unique code file.

[Start from the beginning of the file] option button

The lines from the first to the last are specified. When the RFP restarts, it starts at the first line.

[Start at the last position (start/end positions can be specified)] option button

Specifies the start/end positions. When the RFP restarts, it starts at the last position.

[Next position (blank if it is the beginning of the file)] box

The next position is displayed or specified. The unique code is displayed under the box.

[End position (blank if it is the end of the file)] box

The end position is displayed or specified. The unique code is displayed under the box.

(4) [Data Overwrite] area

Selects the action from the option buttons when data (other than FFh) exists in the area in the loaded program file where the unique code is to be embedded (that means a conflict exists). If [Overwrite] is selected, the unique code will overwrite. If [Abort] is selected, the error message is displayed and the command is aborted.

When the OK button is pressed, the settings are saved temporarily and the dialog box closes.
When the Cancel button or the X button is pressed, the settings are discarded and the dialog box closes.

11.3 Unique code file

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

(1) File extension

*.ruc

(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	:format
The second line	:area
The third line	:address
The fourth line	:size
The fifth line	:index data
The sixth line and after	:index number and unique code

The lines starting with // are comment lines and will be skipped.

Caution: The index number should be incremented by 1.

(4) Example

```
//Sample unique code file
format hex
area user flash
address 0xf000
size 6
index data
000001 abcdef000001
000002 abcdef000002
000003 abcdef000003
```

11.4 Unique code definition

This section describes the unique code definition described in a unique code file. The command interpreter is case-insensitive.

Table 11-1. Unique Code Definition

Function	Unique code definition
	Description
Specify the format	format <hex | ascii>
	Specifies the format of the unique code. <hex>: hexadecimal format <ascii>: ASCII format (0x21-0x7e)
Specify the area	area <user flash | data flash | user boot flash>
	Specifies the area of the flash memory. <user flash>: User area <data flash>: Data area <user boot flash>: User boot area
Specify the address	address <address>
	Specifies the start address of the area where the unique code will be embedded. <filename>: hexadecimal format starting with ”0x” or ”H”
Specify the size	size <size>
	Specifies the size of the area where the unique code will be embedded.
	<size>: the size in bytes is specified (range: 1-2048, integer)
Unique code declaration	index data
	Declares the unique code data starts at the next line.
Index and unique code	<index> <unique code>
	Specifies the Index and unique code. (Maximum: 17280) <index> : the index is specified (range: 0-4294967295, integer) <unique code>: the unique code is specified (big endian format, with specified format and size)

CHAPTER 12 TROUBLESHOOTING

This chapter explains how to troubleshoot RFP.

Remark Using the diagnostic tool, the user can find out why RFP does not run normally, such as due to a defect in the tool used, or problems in other hardware. For how to use the diagnostic tool, see the user's manual of the tool used.

12.1 Problems During Startup

This section explains how to troubleshoot problems that might occur in the process from installation to startup.

(1) When the tool is connected to the host PC via a USB interface, the driver is not recognized by Plug and Play.

Cause:

The USB connector might not be inserted properly into the USB port of the host PC.

Action:

Check that the USB connector is fully inserted into the USB port of the host PC. Alternatively, disconnect the USB connector, and then insert the USB connector again after a while.

(2) The USB driver file cannot be found at the specified location.

Cause:

The USB driver might not have been installed normally.

Action:

See **CHAPTER 2 RFP INSTALLATION** and reinstall the USB driver.

(3) The tool is connected to the host PC but the power LED on the tool is not turned on.

Cause:

The USB port of the tool or the host PC might have a defect.

Action:

Check a defect of the tool using the diagnostic tool for the tool used. If a defect is found, consider repair. If there is no defect, try connecting the tool to another host PC.

(4) The "Add New Hardware Wizard" screen appears when tool is connected with the host PC.

Cause:

If the USB connector of the tool is inserted into a port that differs from the one used during installation, the tool might be recognized as a new hardware item.

Action:

Select "Search for a suitable driver for my device (recommended)" and install the USB driver.

12.2 Problems During Operation

This section describes the troubleshooting for problems that may occur during operation.

Remark For causes and actions for the messages displayed in the internal error, fatal error, selection, and warning dialog boxes, and output panel, see **APPENDIX A MESSAGES**.

(1) One of the following errors is displayed on the output panel.

Error (E1000001) : *E1/E20/MINICUBE2/COMx* communication time out.
Error (E1000009) : *E1/E20/MINICUBE2/COMx* communication error.

Cause 1:

The USB cable might not be connected properly or the USB driver might not have been installed normally.

Action 1:

See **4.1 Problems During Startup** and take an appropriate action.

Cause 2:

The installed USB driver is not displayed in the Device Manager. Alternatively, the “!” or “×” is prefixed.

Action 2:

<1> With RFP connected to the host PC, right-click the driver marked with the “!” or “×”, and then click [Uninstall].
<2> Execute [Scan for hardware changes] in the Device Manager.
<3> Reinstall the USB driver by Plug and Play.

Cause 3:

The tool might not have been recognized (when connected via a USB hub).

Action 3:

Try the following:

<1> Disconnect the USB cable and then reconnect it.
<2> Connect the USB connector to another port on the USB hub.
<3> If the above measures do not resolve the problem, do not use the USB hub but directly connect the USB connector to the USB port of the host PC main unit.

(2) The following message is displayed in the output panel and the flash memory programming mode cannot be entered.

```
Error (E1002001) : No response from Target Microcontroller (FLMD).
Error (E1002002) : No response from Target  Microcontroller (RESET).
Error (E1002003) : No response from Target Microcontroller (FREQ).
```

Cause 1:

If MINICUBE2 is used, the mode select switch might be specified incorrectly.

Action 1:

Check the target microcontroller and the mode select switch setting.

Cause 2:

If MINICUBE2 is used, the 78K0-OCD board might be connected.

Action 2:

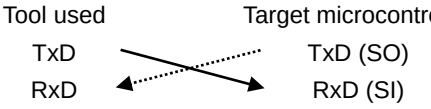
Remove the 78K0-OCD board.

Cause 3:

The connection between the target cable and target system might be wrong.

Action 3:

<1> If 78K or V850 is used, connect the TxD and RxD signals from the target cable with TxD (SO) and RxD (SI) of the target microcontroller so that signal input/output are consistent.



<2> The signal lines used for programming must be isolated from other devices, using jumper switches or the like; otherwise, malfunction might occur.

Cause 4:

The wrong microcontroller name might be selected in the [Create a new workspace] dialog box.

Action 4:

Select the same name as that of the target microcontroller.

Cause 5:

No clock might be able to be supplied to the target microcontroller.

Action 5:

<1> Check if the settings in the [Supply Oscillator] dialog box are correct. For the correct settings, see the user's manual of the target microcontroller.

<2> Check the clock supply on the target system.

Cause 6:

Power might not be supplied normally to the target microcontroller.

Action 6:

<1> Check the power supply setting.

<2> Check that the power is supplied on the target system. If the power is supplied from the tool used, a power shortage might occur. In such a case, supply power from the target system.

Cause 7:

For the RX, the I/O signal setting does not match the wiring of the target system.

Action 7:

Check if the settings in the [Mode Pin Settings] dialog match the wiring of the target system.

(3) The following message is displayed on the output panel and normal communication is not performed in the flash memory programming mode.

```
Error (E1002004) : Communication failure or timeout.
```

Cause 1:

The clock or power supply might not be stable.

Action 1:

Confirm that the clock or power is stably supplied on the target system.

Cause 2:

Communication might not be stable.

Action 2:

<1> Check that there is no noise on the communication line.

<2> Confirm that the tool used is properly connected with the target system.

<3> Confirm that unused pins are properly handled.

<4> Confirm that the correct clock and communication rate are selected. Stable programming might be achieved by setting a lower value for the clock or communication rate.

(4) When the RX is selected, the driver for USB boot is not recognized in the [Select USB Device] dialog box.

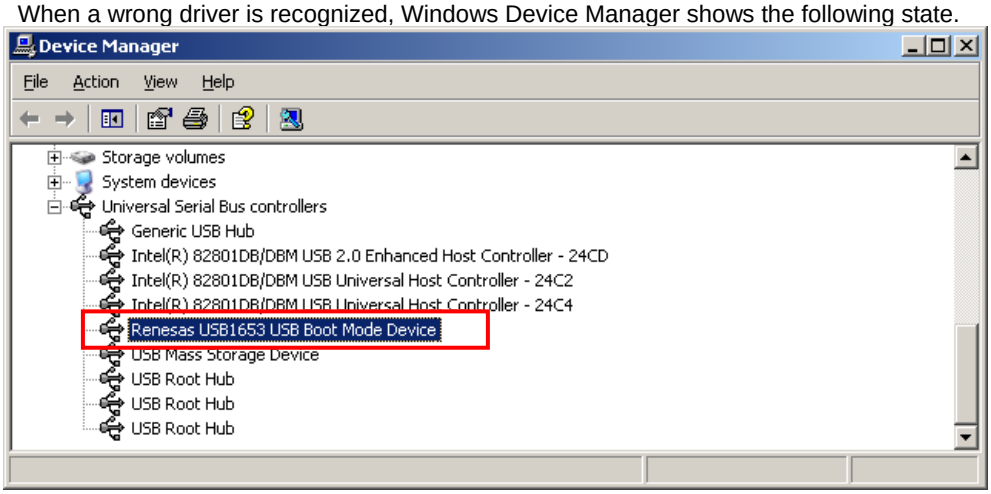
Cause:

A wrong driver may be recognized as the driver for USB boot. Normally “Generic Boot USB Direct” should be recognized.

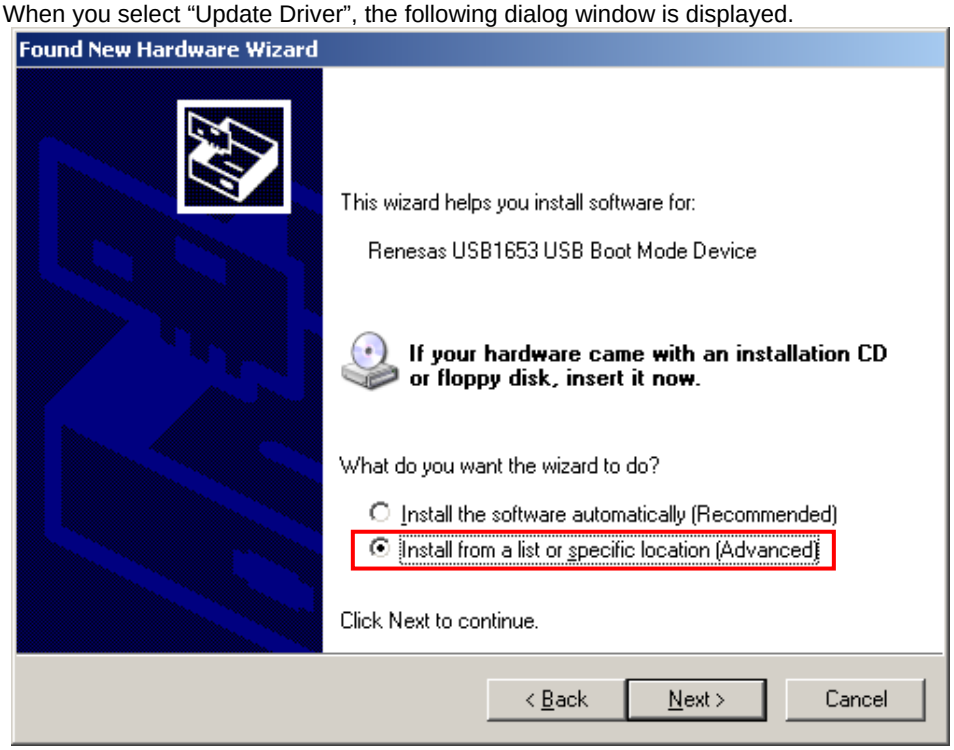
Action:

Install the correct driver in the following steps (Windows XP is used in this example).

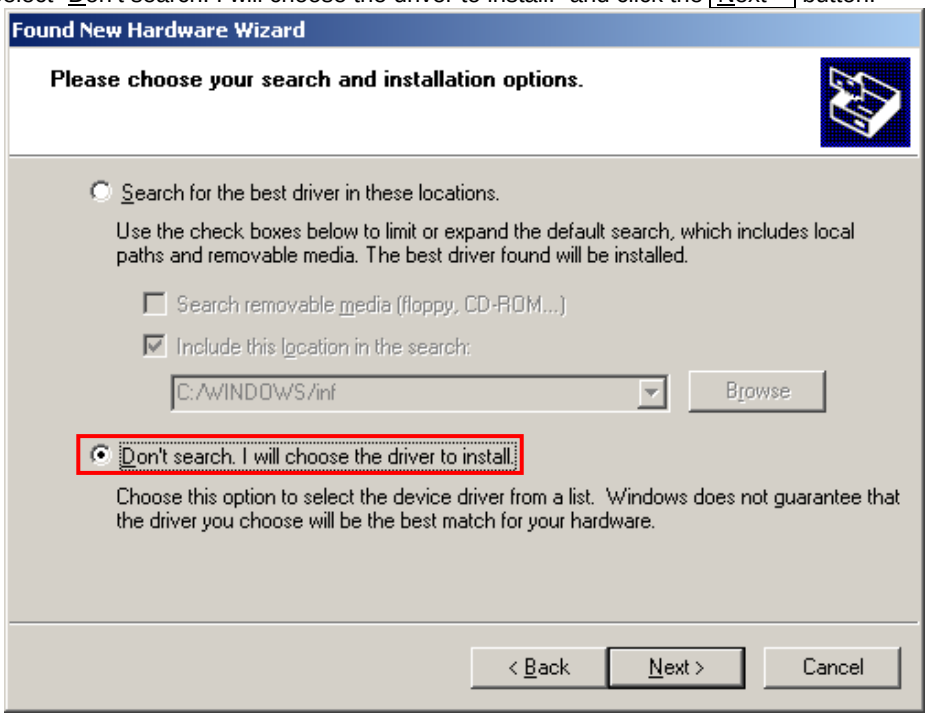
<1> When a wrong driver is recognized, Windows Device Manager shows the following state.



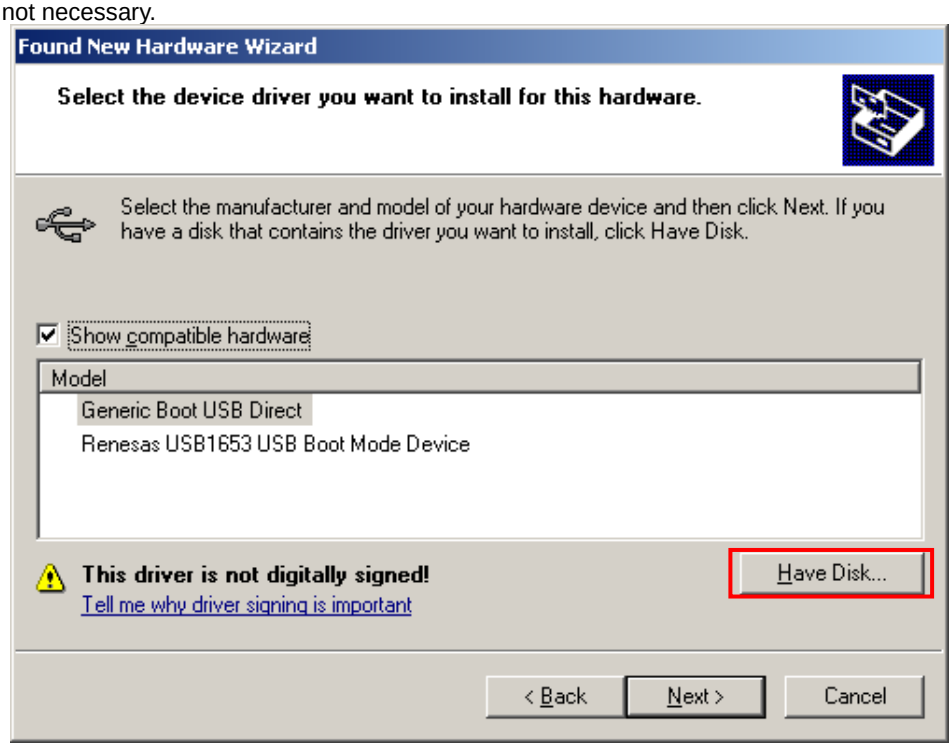
<2> When you select “Update Driver”, the following dialog window is displayed.



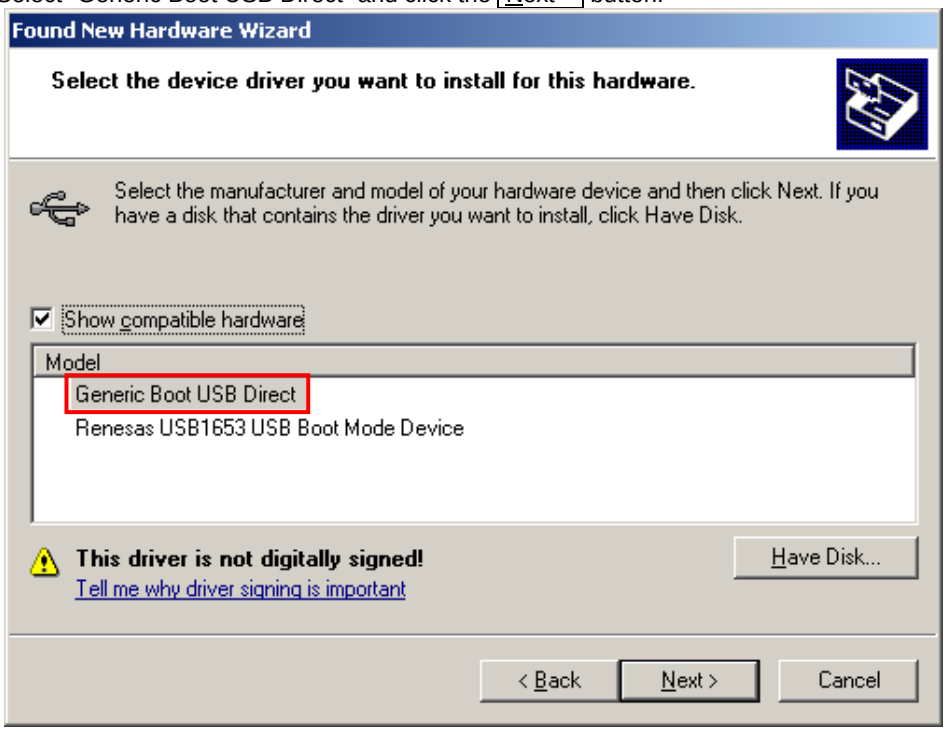
<3> Select "Don't search. I will choose the driver to install." and click the Next > button.



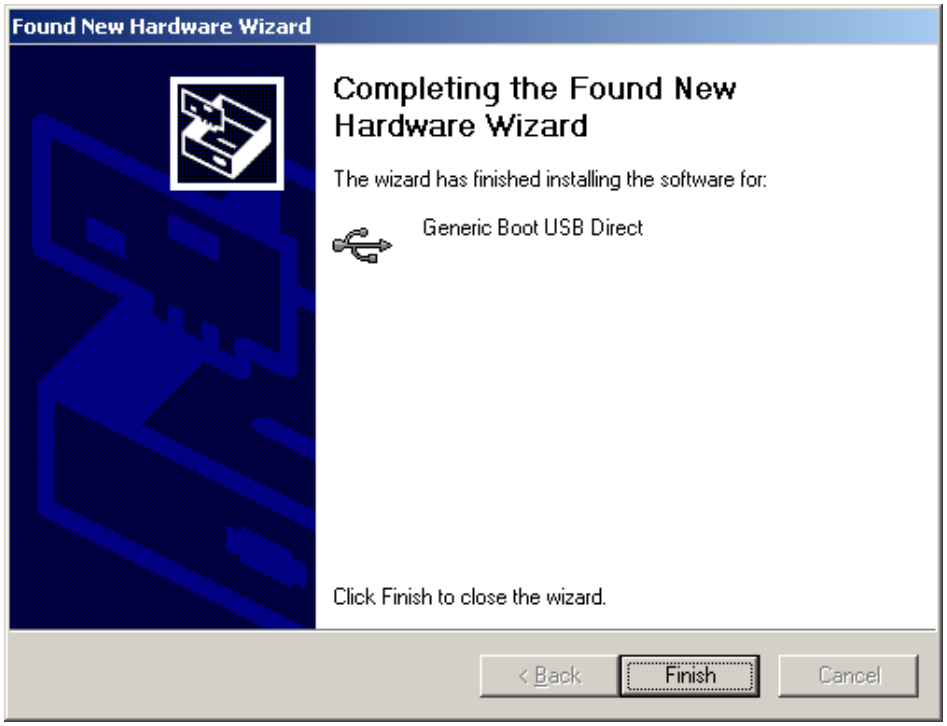
<4> Click the Have Disk... button, and select "hmseusb.inf" in "C:\Windows\inf". Note that when "Generic Boot USB Direct" is displayed as shown in the dialog box below, clicking on the [Have Disk...] button is not necessary.



<5> Select “Generic Boot USB Direct” and click the Next > button.



<6> Installation of the driver for USB boot is finished.



(5) When you forget the ID code of the RX. Or when a wrong ID code is entered.

Action:

Refer to the address in the program file to which the ID code was set. For details, refer to the user’s manual of the target device.

When the control code for the ID code is set so that the entire erasure is performed after entering a wrong ID code three times consecutively, you can write in the flash memory after another entry into boot mode.

CHAPTER 13 CAUTIONS

This chapter describes cautions of RFP.

13.1 Connecting Two or More E1s or E20s

Applies to: RX

The following restriction applies when two or more E1s or E20s are connected to a single host computer. If the USB cable is connected to or disconnected from an E1 or E20 or the power for an E20 is turned on or off during communication, the RFP may encounter a communications error or be terminated.

13.2 Manipulating the User Boot Mat

Applies to: RX610

If none of the valid ID codes has been set before a generic boot device is connected (i.e. the device is not protected), manipulation of the user boot mat gets disabled on completion of the connection. To enable manipulation of the user boot mat, set a valid ID code before connecting the generic boot device.

13.3 Mapping of Data Flash Memory

[Microcontroller] V850

Mapping of data flash memory might differ according to whether the MCU is in normal operation or flash memory programming mode. Refer to the user's manual of the microcontroller for more information on mapping in the flash memory programming mode.

APPENDIX A MESSAGES

A.1 Message Format

Messages are displayed in the internal error, fatal error, selection, and warning dialog boxes and on the output panel.

Figure A-1. Internal Error Dialog Box

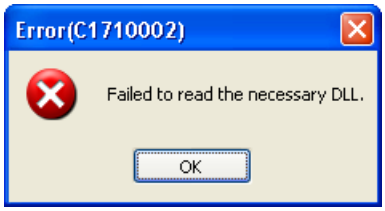


Figure A-2. Fatal Error Dialog Box

Figure A-3. Selection Dialog Box

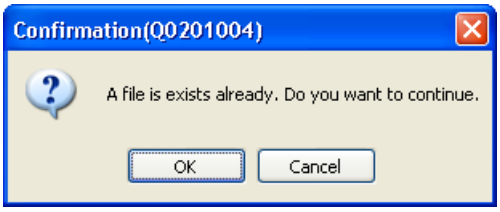


Figure A-4. Warning Dialog Box

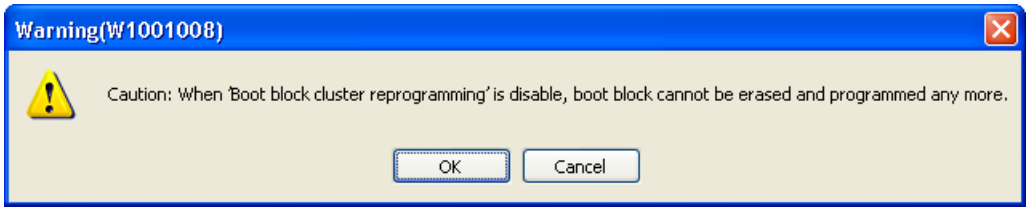
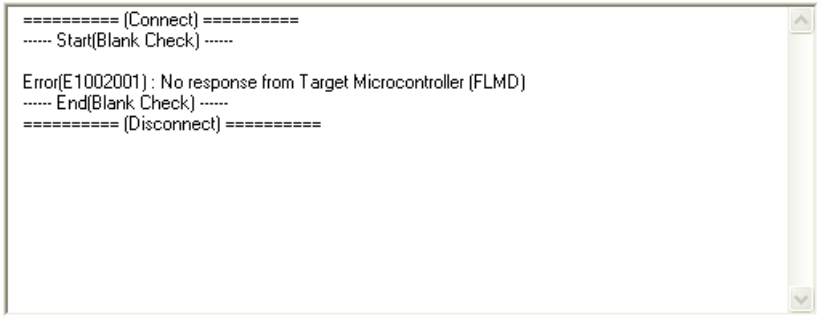


Figure A-5. Output Panel



A.2 Messages Displayed in Internal Error, Fatal Error, Selection, and Warning Dialog Boxes - Common -

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C1090002	Message	Failed to read the necessary DLL.
	Action by user	Restart RFP. If this does not resolve the problem, reinstall RFP.
E1011001	Message	Invalid Program File.
	Description	This error is displayed when the program file is invalid. Make sure that the file format is supported and a valid program file has been specified.
E1011002	Message	Unique code: a conflict occurs at 0xxxxx.
	Description	This error is displayed when data already exists where the unique code is tried to be written.
E1011003	Message	Unique code: invalid header (xxxx).
E1011004	Message	Unique code: invalid area name (xxxx).
E1011005	Message	Unique code: unique code address is outside the xxxx area.
E1011006	Message	Unique code: unique code acquisition failed.
E1012001	Message	Unrecognised code file syntax.
E1012002	Message	The project information is not valid.
E1091002	Message	Check whether the file or folder has been set to read-only.
	Description	This error occurs when the program fails to save project information.
	Action by user	Make sure that the folder or file is not read-only.
E1092005	Message	The project file is broken.
	Description	This error occurs when the program fails to parse a file.
	Action by user	Specify a project file that is compatible with RFP.
E1092007	Message	The project information cannot be restored.
	Description	This error occurs when the program fails to restore or convert project information. It will also occur if the program fails to extract the structure of a project to copy. This error is also output if a project file created by a newer RFP than the one currently used is selected.
	Action by user	Specify a project file that is compatible with RFP.
E1092008	Message	This is not a valid project file.
	Description	This error occurs when the program fails to restore project information.
	Action by user	Specify a project file that is compatible with RFP.
E1092011	Message	The project information is invalid.
	Description	This error occurs when the program fails to parse a file.
	Action by user	Specify a project file that is compatible with RFP.
E1093001	Message	The specified file could not be opened.
	Description	This error occurs when a file could not be opened.
	Action by user	Make sure that the file exists and is not corrupt. Check the access privileges to the file.
E1091026	Message	Invalid workspace name.
	Description	The characters <, >, |, :, *, ?, \, /, and " cannot be used to specify workspace names.
	Action by user	Remove the illegal character (<, >, |, :, *, ?, \, /, or ") from the workspace name.
E1093002	Message	The project with the same name already exists.
	Description	This error occurs if a project with the same name already exists in the currently opened workspace when a project is tried to be added in the Full mode.
	Action by user	Change the project name. Or, delete the existing project with the same name if necessary.

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E1093003	Message	A program file with the same name exists.
	Description	This error occurs if a program file with the same name already exists in the currently opened project when a program file is tried to be added in the Full mode.
	Action by user	Change the program file name. Or, delete the existing program file with the same name if necessary.
Q1091004	Message	File already exists. Overwrite?
	Description	This message is used for various dialog boxes when the dialog box has a field to specify a filename.
	Action by user	[Yes]: The command is executed. The file is overwritten. [No]: The command is canceled. The file is not overwritten and the focus will be returned to the original dialog box.
Q1012001	Message	Specified code file does not exist Continue?
W1011001	Message	Unique code: all data up to the last (Index xxxx) have been processed.
W1012001	Message	No code file specified.
W1012002	Message	Start value exceeds End value.
W1012003	Message	Please enable Unique Code Setting to drop files.
W1012004	Message	Cannot load multiple dropped files.
W1012005	Message	Code file size does not match data list size.
W1012006	Message	Invalid Index.

A.3 Messages Displayed in Fatal Error, Selection, and Warning Dialog Boxes - RL78, 78K, V850 -

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E1000001	Message	E1/E20/MINICUBE2/COMx/USB Direct communication time out.
	Description	After being connected to E1/E20/MINICUBE2/COMx/USB Direct, communication was not established and the process timed out.
	Action by user	Make sure that the connection to E1/E20/MINICUBE2/COMx/USB Direct is properly set up.
E1000002	Message	MINICUBE2 Firmware version too old.
	Description	The MINICUBE2's firmware version might be outdated and unable to operate correctly.
	Action by user	Access the update service site, download the latest firmware, and update the utility.
E1000003	Message	Program File not found.
	Description	Program File was not loaded correctly.
	Action by user	Specify a Program File.
E1000004	Message	Device Information File not found.
	Description	The Device Information File was not loaded correctly.
	Action by user	Restart RFP. If this does not resolve the problem, reinstall RFP.
E1000005	Message	Programmer software already started.
	Description	RFP might already be running, so execute the RFP command after terminating one of the RFPs.
E1000006	Message	Related software already started.
	Action by user	A related tool (such as the self-diagnostics tool) might already be running, so execute the RFP command after terminating the tool.
E1000007	Message	Detection error by 78K0-OCD adapter board.
	Action by user	Please remove the 78K0-OCD board. It is connected but cannot successfully communicate with the target.
E1000008	Message	Reading error of Flash Programming Tool information from Project file.
	Description	An error occurred when trying to open the specified project file.
	Action by user	Specify a project file that is compatible with RFP.
E1000009	Message	Unable to connect E1/E20/MINICUBE2/COMx/USB Direct.
	Description	E1/E20/MINICUBE2/COMx Direct could not be connected.
	Action by user	Make sure that the connection to E1/E20/MINICUBE2/COMx/USB Direct is properly set up.
E1001001	Message	Invalid Device Information File.
	Description	The device information file might be invalid.
	Action by user	Restart RFP. If this does not resolve the problem, reinstall RFP.
E1001002	Message	Not supported Device Information File.
	Description	There might be an unsupported device information file.
	Action by user	Access the Version-up Service website, download the latest firmware, and update the device information file by using the utility.
E1001003	Message	Invalid Program File.
	Description	The file format might be unsupported, or an invalid program file might have been specified.
	Action by user	Specify a correct program file.
E1001004	Message	Device Information File not found.
	Description	No device information file has been loaded.
	Action by user	- The project file cannot be read because the device information file has been changed. Create a new project file. - Restart RFP. If this does not resolve the problem, reinstall RFP.

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E1001005	Message	Not specify Program File.
	Description	No program file has been loaded.
	Action by user	Specify a Program File.
E1001006	Message	Illegal supply frequency setting
	Description	The frequency specified to be supplied to the target microcontroller might be incorrect.
	Action by user	Check the frequency setting, and make sure that the correct clock frequency and divider/multiplier values are set.
E1001013	Message	Value is out of clock range
	Description	The frequency set to be supplied to the target microcontroller is incorrect.
	Action by user	See the microcontroller's manual, and set the correct clock frequency and divider/multiplier values.
E1001014	Message	Can't Upload Read Data.
	Description	Files cannot be saved while the read command is running. The program file might be inaccessible (e.g. in use by another program).
E1001018	Message	Illegal setting data.
	Description	The setting failed due to illegal (invalid) data.
	Action by user	Revise the setting.
E1001019	Message	Error of reading the wireless registry.
	Description	The registry key for the wireless unit (QB-MINI2-RF) might be corrupted or not exist.
	Action by user	Start the MINICUBE2 RF utility, and make the setting.
E1001020	Message	The all flash options of a target microcontroller aren’t able to read because a protection error occurs.
	Description	This message appears when all Flash option settings could not be acquired, because a protection error occurred when executing the command to retrieve the Flash options.
E1001021	Message	OCD Security ID setting is invalid.
	Description	The value entered in OCD security ID is invalid.
	Action by user	Make sure that the number of characters and value entered are correct.
E1001022	Message	Option bytes setting is invalid.
	Description	The value entered in OPBT is invalid.
	Action by user	Make sure that the number of characters and value entered are correct.
E1001024	Message	Value is out of Vdd range.
	Description	An incorrect value has been specified for the power to be supplied to the target microcontroller.
	Action by user	Specify a correct power supply value, referring to the user's manual of the microcontroller.
E1001025	Message	HCUHEX file does not accord with flash range of target microcontroller.
	Action by user	Specify a correct program file.
E1001027	Message	An operation was canceled.
E1002001	Message	No response from Target Microcontroller (FLMD).
	Description	There might have been a problem switching to serial programming mode. - Bad connection between utilizing tool and target microcontroller. - The clock or power source is not supplied correctly. - Bad target microcontroller.

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E1002002	Message	No response from Target Microcontroller (RESET).
	Description	There might have been a problem switching to serial programming mode. - Bad connection between utilizing tool and target microcontroller. - The clock or power source is not supplied correctly. - Bad target microcontroller.
E1002003	Message	No response from Target Microcontroller (FREQ).
	Description	There might have been a problem switching to serial programming mode. - Bad connection between utilizing tool and target microcontroller. - The clock or power source is not supplied correctly. - Bad target microcontroller.
E1002004	Message	Communication failure or timeout.
	Description	There might have been a problem establishing normal communications after switching to serial programming mode. - The clock or power supply is unstable. - Bad target microcontroller. - There might be a fault in the communication port.
E1002005	Message	Synchronization failure for baud rate.
	Action by user	See the microcontroller's manual, and select a supported baud rate.
E1002006	Message	Invalid Signature reading.
	Description	The selected device information file does not match the target microcontroller.
	Action by user	Specify a correct microcontroller.
E1002007	Message	Invalid Device Information file version.
	Action by user	The level of the selected device information file might be outdated. Download the latest RFP.
E1002008	Message	Not Blank.
	Action by user	Make sure all data is erased and memory is blank before programming to the flash memory.
E1002009	Message	Erasing operation failed.
	Description	There might have been an erase failure due to bad Flash memory.
E1002010	Message	Programming operation failed.
	Description	An area already containing data might have been overwritten with different data. There might have been a programming failure due to bad Flash memory.
E1002011	Message	Verifying operation failed.
	Description	Different data might have been written to the program file and the target microcontroller. There might have been a verification failure caused by a lead fault due to bad Flash memory.
E1002012	Message	Security flag setting failed.
	Description	The security setting might have been changed from [Disabled] to [Enabled]. This setting only allows the chip to be erased. Some microcontrollers do not allow security settings to be added. Erase the chip, and then perform all settings at once. There might have been a failure to configure security due to bad Flash memory.
E1002013	Message	Protection by security setting.
	Description	The specified command might have failed to execute because the security of the target microcontroller has already been configured. Although some security flags can be cleared by erasing with Chip mode, others cannot. See the microcontroller's manual for details.
E1002014	Message	Check sum verification failed.
	Description	The data programmed to the target microcontroller might be different from the program file.

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E1002015	Message	Retry status over.
	Description	The command operation has exceeded the specified number of retries. The microcontroller might be defective.
E1002016	Message	Illegal status from Microcontroller.
	Description	The status code returned from the microcontroller is invalid (not a designated code). There might be a runaway process. Check the operating environment, and try running the command again. The communication port might be unstable due to external factors.
E1002018	Message	HEX file exceeds target device flash range.
	Description	The address range of the downloaded program file exceeds the range specified for [Operation mode] in the [Target] category.
E1009001	Message	Not Initialized.
	Description	There might have been a failure to acquire working memory on startup, or a failure to start a thread process.
	Action by user	Try changing host PC and starting RFP again.
E1009002	Message	Illegal parameter.
	Description	There might have been a failure to perform normal control due to an unstable USB communication port.
E1009003	Message	Control failed. Please restart the Flash programming tool.
	Action by user	The tool used might be locked up. Disconnect the USB, and try connecting again.
E1009004	Message	Wait status timeout.
	Action by user	The microcontroller might be defective. Replace it with a good sample.
E1090001	Message	Unknown error occurred.
	Description	Illegal processing was detected.
	Action by user	Restart RFP. If this does not resolve the problem, reinstall RFP.
M1001027	Message	The security setting state of a target microcontroller is as follows.
Q1001015	Message	The security setting state of a target microcontroller is as follows. If you want to feedback them to the Target Security Settings, press OK button.
Q1001026	Message	Turn on the power source for the target again.
W1000010	Message	Check the voltage applied to the target system
	Description	USB VBUS (5 V) from the host PC is applied to the target system. Check if the voltage satisfies the specifications of the microcomputer
W1001007	Message	Caution: When ’Chip Erase’ is disable, chip cannot be erased and programmed any more.
	Description	This warning message appears when the "CHIP erase protection" security flag is set, to warn the programmer that it will not be possible to clear a flag.
W1001008	Message	Caution: When ’Boot block cluster reprogramming’ is disable, boot block cannot be erased and programmed any more.
	Description	This warning message appears when the "boot block area overwrite protection" security flag is set, to warn the programmer that it will not be possible to clear a flag.
W1001016	Message	Caution: The latest program file exists. Program file is forced to update.
W1001023	Message	If Disable Block Erase is specified and a security command is executed, the Security Release command cannot be executed and the target security setting cannot be cleared again.

A.4 Messages Displayed in Fatal Error, Selection, and Warning Dialog Boxes - RX -

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E1010001	Message	Access to the project file failed.
	Description	This error is displayed when the project file cannot be accessed. The file might be corrupted. Remake the project file.
E1010002	Message	Generic device query failed.
	Description	This error is displayed when the device specification query fails for some reason. Make sure that the settings for the RFP and the target board are correct.
E1010003	Message	Operation failed.
	Description	This error is displayed when an operation fails in program, erase, check sum, or blank check.
E1010006	Message	Connection failed.
	Description	This error is displayed when connection to the microcontroller fails for some reason. Make sure that the settings for the RFP and the target board are correct.
E1010008	Message	Erasing xx (0xxxxx - 0xxxxx) fails.
	Description	This error is displayed when erasing the indicated block failed.
E1010011	Message	No data to compare.
	Description	This error is displayed when the file to compare does not have any data in the ROM address area of the microcontroller.
E1010012	Message	Verification failed.
	Description	This error is displayed when the data in the file to compare does not match the ROM data in the microcontroller.
E1010013	Message	Cannot verify.
	Description	This error is displayed when the verify data cannot be read for some reason.
E1010014	Message	The operation is aborted.
	Description	This error is displayed when the operation is aborted by the user manually.
E1010015	Message	Saving the read data failed.
	Description	This error is displayed when saving data failed. Make sure that the folder or file is not read-only.
E1010016	Message	Reading data failed.
	Description	This error is displayed when data cannot be read from the ROM for some reason.
E1010021	Message	The project information cannot be restored.
E1010028	Message	Failed to export the ID code. (xxxx)
E1010029	Message	Failed to import the ID code. (xxxx)
E1010030	Message	Failed to load a module.
E1011001	Message	Invalid Program File.
E1013001*	Message	This device is not a generic device.
E1013002*	Message	Selection of Device - Checksum error.
E1013003*	Message	Selection of Device - Invalid device code error.
	Description	This error is displayed when the device code mismatches in the device specification query. Make sure that the correct product name for the microcontroller on the target board is selected.
E1013004*	Message	Selection of Device - Invalid response.
E1013005*	Message	The device sent an unrecognised response: xxxx
E1013006*	Message	Selection of Clock mode - Checksum error.
E1013007*	Message	Selection of Clock mode - Invalid clock mode error
E1013008*	Message	Selection of Clock mode - No clock mode needed

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E1013009*	Message	Selection of Clock mode - Invalid response.
E1013010*	Message	Unable to create temporary file. Generic query failed.
E1013011*	Message	The checksum received in response from a device is not consistent with the calculated checksum.
E1014001*	Message	The device sent an unrecognized reponse: xxxx.
E1014002*	Message	This device is not a generic device.
E1014003*	Message	The device does not support this command.
E1014004*	Message	Selection of Device - Checksum error.
E1014005*	Message	Selection of Device - Invalid device code error.
	Description	This error is displayed if the device code mismatches when connecting to the microcontroller. Make sure that the correct product name for the microcontroller on the target board is selected.
E1014006*	Message	Selection of Device - Invalid response.
E1014007*	Message	Selection of Clock Mode - Checksum error.
E1014008*	Message	Selection of Clock Mode - Invalid clock mode error.
E1014009*	Message	Selection of Clock Mode - No clock mode needed.
E1014010*	Message	Selection of Clock Mode - Invalid response.
E1014011*	Message	Changing baud rate - Checksum error.
E1014012*	Message	Changing baud rate - Unable to set baud rate error.
	Description	This error is the unable-to-set-baud-rate error (serial baud rate error too large) that occurs when the baud rate is changed. In [Setting Clock], [Clock supply] and [Multiplier for the main clock and peripheral clock] must be entered. The most frequently reported errors in those settings are regarding the multiplier of the peripheral clock. For those clock settings, see the hardware manual of the microcontroller. Also, check the clock of your target board (microcontroller).
E1014013*	Message	Changing baud rate - Input clock error.
	Description	This error is displayed when the input frequency setting in [Setting Clock] exceeds the operating range of the microcontroller. In [Device Setting], [Input clock], [Multiplier for the main clock], and [Multiplier for the peripheral clock] must be entered. The most frequently reported errors in those settings are regarding the multiplier of the peripheral clock. For those clock settings, see the hardware manual of the microcontroller. Also, check the clock of your target board (microcontroller).
E1014014*	Message	Changing baud rate - Operating frequency error.
	Description	This error is displayed when the clock setting does not meet the operating frequency specification of the microcontroller. Based on the input conditions (input frequency and multiplier) from the RFP, only a range check (calculation only) for operating frequency is performed in the device side. Check the input conditions (input frequency and multiplier) of the RFP.
E1014015*	Message	Changing baud rate - Invalid multiplication ratio error.
E1014016*	Message	Changing baud rate - Invalid response.
E1014017*	Message	Unable to set baud rate value xxxx bps.

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E1014018*	Message	End of Setting Data - Erase error.
	Description	This error is displayed when data erasure of the flash memory upon the startup of the microcontroller in the Boot mode was executed but failed. Possible causes of the error (failure to erase) include 1) Power supply voltage to the microcontroller is not applied properly (power supply from E1/power supply from the target board), 2) The microcontroller cannot operate properly because of the pin settings, and 3) The microcontroller has been damaged for some reason. Check the items 1) through 3) above.
E1014019*	Message	End of Setting Data - Invalid response.
	Description	This error is displayed when an invalid command is received in the state waiting for the data setting complete command. Check the product name of the microcontroller on the target board as well as the pin settings.
E1014020*	Message	Checking ID Code - Checksum error.
E1014021*	Message	Checking ID Code - Invalid ID error.
	Description	This error is displayed when an ID code different from the one set in the microcontroller to be programmed is entered. The ID code is written to a specific address on the ROM. Check the value of the address of the written program. Operation is dependent on the control code. If you forgot the configured ID code, basically, you cannot read, write, or erase the microcontroller with a serial writer.
E1014022*	Message	Checking ID Code - Erase error.
E1014023*	Message	Checking ID Code - Invalid reponse.
E1014024*	Message	ID code check failure.
E1014025*	Message	Reading Lock Bit - Checksum error.
E1014026*	Message	Reading Lock Bit - Address error.
E1014027*	Message	Reading Lock Bit - Invalid response.
E1014028*	Message	Lock Bit Disable Failed.
E1014029*	Message	Lock Bit Enable Failed.
E1014030*	Message	Setting Lock Bit - Checksum error.
E1014031*	Message	Setting Lock Bit - Address error.
E1014032*	Message	Setting Lock Bit - Write error.
E1014033*	Message	Setting Lock Bit - Invalid response.
E1014034*	Message	Error during preparation of Erasing operation.
E1014035*	Message	Erasing Block - Checksum error.
E1014036*	Message	Erasing Block - Block number error.
E1014037*	Message	Erasing Block - Erase error.
	Description	This error is displayed when data erasure of the flash memory of the microcontroller was executed but failed. Possible causes of the error (failure to erase) include 1) Power supply voltage to the microcontroller is not applied properly (power supply from E1/power supply from the target board), 2) The microcontroller cannot operate properly because of the pin settings, 3) The microcontroller has been damaged for some reason, and 4) Communication between the microcontroller and the PC failed** so the command was not executed. Check the items 1) through 4) above. ** Proper communication may not be expected when a USB-RS232C converter, a self-made cable, a self-made extension cable for connection with E1/E20, or the like is used.

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E1014038*	Message	Erasing Block - Invalid response.
E1014039*	Message	Error during preparation of Writing operation.
E1014040*	Message	Reading Data - Checksum error.
E1014041*	Message	Reading Data - Address error.
E1014042*	Message	Reading Data - Length error.
E1014043*	Message	Reading Data - Invalid response.
E1014044*	Message	Writing Data - Checksum error.
E1014045*	Message	Writing Data - Address error.
E1014046*	Message	Writing Data - Write error.
	Description	This error is displayed when programming to the microcontroller cannot be done for some reason. It may be due to a wrong pin setting or power supply not being supplied to the microcontroller properly.
E1014047*	Message	Writing Data - Invalid response.
E1014048*	Message	Read Checksum mismatch.
E1014049*	Message	Checksum Read Error.
	Description	This error is displayed when the sum of the response data of the sum check command is invalid. In the protocol of some microcontrollers, a sum code (1 byte) is added to ensure the integrity of the command data (no error if the sum of the command data and the sum code is 0 [lower 1 byte]). This error means the sum of the response data (+ sum code) of the sum check command received from the device is not 0. A possible cause is that serial communication between the RFP and the microcontroller is unstable. Possible causes of unstable serial communication include improper handling of microcontroller pins (TxD/RxD pins not pulled up, wrong Vcl pin handling) and a long communication cable between the PC and the microcontroller (target).
E1014050	Message	Get Flash options - Checksum error
E1014051	Message	Security Setting - Checksum error
E1014052	Message	Security Setting - Address error
E1014053	Message	Security Setting - Write error
E1014054	Message	Get Flash options - Invalid response
E1014055	Message	Security Setting - Invalid response
E1015001*	Message	Unable to open comms.
	Description	This error is displayed when the communication port cannot be recognized. Check the port setting of your PC. Frequently reported cases of this error include: the PC has no RS232C port and 1) a commercially-available USB-RS232C converter is used or 2) a self-made conversion circuit (board) using a USB-serial conversion IC is used. In both above cases, communication control timing is slightly slower because, unlike the case using a built-in RS-232 port on the PC, the port is driven via USB, and timing adjustment between the RFP and the microcontroller on the target board may not work properly. As a preventive measure, use a PC equipped with a RS-232 port, or use an E1/E20 emulator that can be connected with a PC via USB.
E1015003*	Message	Error in setting of configuration.
E1015004*	Message	Invalid receive buffers.
E1015005*	Message	Invalid command is supplied.
E1015006*	Message	Unable to transmit.

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E1015008*	Message	Invalid transmission buffers.
E1015009*	Message	Unable to receive.
E1015011*	Message	Unable to close comms.
	Description	This error is displayed when the communication port cannot be recognized. Check the port setting of your PC. Frequently reported cases of this error include: the PC has no RS232C port and 1) a commercially-available USB-RS232C converter is used or 2) a self-made conversion circuit (board) using a USB-serial conversion IC is used. In both above cases, communication control timing is slightly slower because, unlike the case using a built-in RS-232 port on the PC, the port is driven via USB, and timing adjustment between the RFP and the microcontroller on the target board may not work properly. As a preventive measure, use a PC equipped with a RS-232 port, or use an E1/E20 emulator that can be connected with a PC via USB.
E1015012*	Message	Comms is already closed.
E1015013*	Message	COMx connection timed out
	Description	This error is displayed when a communication problem occurs between the microcontroller and the RFP (PC) for some reason, resulting in a timeout. The RFP allows you to set a baud rate, but communication cannot be done if the specified baud rate does not match the actual setting of the target board (microcontroller). Check the following points. (This error may be displayed along with "Generic device query failed.") ■ Check the baud rate. - Check the operating frequency of the microcontroller to see if the baud rate exceeds the allowable communication rate and if the baud rate is appropriate. ■ Check the clock setting. - Check if the operating frequency of the microcontroller set in the RFP and the clock of the target board (microcontroller) match. ■ Check the connection between the target board (microcontroller) and the PC. - Proper communication may not be expected when a USB-RS232C converter, a self-made cable, or the like is used.
E1015014*	Message	Error in setting timeout configuration.
E1015015*	Message	Error setting Device Control Block.
E1015016*	Message	Unable to locate device.
E1015017*	Message	Device access is denied.
E1015018*	Message	Device has not been initialised.
E1015019*	Message	Invalid parameters supplied.
E1015020*	Message	Unable to create comms event.
E1016001*	Message	RComms.dll not found or incorrect version of DLL.
E1016002*	Message	USB Open error.
E1016003*	Message	USB connection timed out.
	Description	This error is displayed when a communication problem occurs between the microcontroller and the RFP (PC) for some reason, resulting in a timeout. Check the following points. (This error may be displayed along with "Generic device query failed.") ■ Check the clock setting. - Check if the operating frequency of the microcontroller set in the RFP and the clock of the target board (microcontroller) match.
E1016004*	Message	Failed to write the data.

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E1016005*	Message	No data port is available.
E1017001	Message	Sync mode is not supported.
E1017003	Message	Configure file is invalid.
E1017004	Message	Failed to load BFW file (xxx)
E1017005	Message	Loading FPGA data failed.
E1017006	Message	Failed to initialize FPGA.
E1017007	Message	Failed to get Setup Information.
E1017008	Message	Can't open xxxx.
E1017009	Message	Invalid timeout (xxxx)
E1017010	Message	E1/E20 communication error.
E1017012	Message	Failed to start up MCU.
E1017013	Message	No emulator chosen.
E1017014	Message	Failed to set mode pin.
E1017015	Message	Failed to reset target.
E1017016	Message	Failed to set time out.
E1017018	Message	Can not allocate memory.
E1017019	Message	Adaptor update failed.
E1017020	Message	xxx bps is invalid baudrate.
E1017021	Message	E1/E20 transmit error.
E1017022	Message	E1/E20 receive error
E1017023	Message	E1/E20 connection timed out.
	Description	This error is displayed when a communication problem occurs between the microcontroller and the RFP (PC) for some reason, resulting in a timeout. The RFP allows you to set a baud rate, but communication cannot be done if the specified baud rate does not match the actual setting of the target board (microcontroller). Check the following points. (This error may be displayed along with "Generic device query failed.") ■ Check the baud rate. - Check the operating frequency of the microcontroller to see if the baud rate exceeds the allowable communication rate and if the baud rate is appropriate. ■ Check the clock setting. - Check if the operating frequency of the microcontroller set in the RFP and the clock of the target board (microcontroller) match. ■ Check the connection between the target board (microcontroller) and the PC. - Proper communication may not be expected when a self-made extension cable for connection with E1/E20** is used. ** When E1/E20 is used, operation is not guaranteed if an extension cable or the like except an attached cable is used.
E1017024	Message	Target is already powered.
E1017025	Message	Target is not powered.
E1017026	Message	Description stating entry to the mode is incorrect (xxxx).
Q1010001	Message	The specified communication speed has more than xxxx% error. Do you want to continue?
Q1010002	Message	Connecting to the device. Check the connection to the target board, power, and mode entry.
Q1010004	Message	Unlocking blocks. The blocks will be erased due to this action. Do you want to continue?

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Q1010005	Message	The size of the xxxx file exceeds the flash ROM size of the xxxx device. Do you want to continue downloading?
Q1010007	Message	The specified communication speed has more than xxxx% error. Do you want to continue?
Q1010008	Message	A block requires erasing. Do you want to continue?
Q1010010	Message	The entered communications speed is out of range. Do you want to continue?
Q1017003	Message	xxxx requires updating. (The current version is xxxx, and the updated version is yyyy.)
W1010001	Message	Enter the frequency.
W1010002	Message	The entered frequency is out of range. Enter the value between xxxx and xxxx.
W1010004	Message	The entered communication speed is out of range. Cannot connect at this speed.
W1010005	Message	The entered communication speed is out of range. Cannot connect at this speed.
W1010006	Message	Timeout must be set between 1 and 50 seconds.
W1010007	Message	The downloaded xxxx file contains data that exceeds the flash ROM size of the xxxx device.
W1010008	Message	Data cannot be read from the specified address because it is outside the area.
W1010009	Message	Data at 0xxxxx does not match -> file: 0xxxxx, read: 0xxxxxx.
E1010010	Message	The following file does not have valid data in the flash memory area (all H'FF). Or, the data lies outside the flash memory area.
E1010011	Message	Size of file xxxx exceeds the flash ROM size of device xxxx.
W1017002	Message	Updating of the firmware has been completed.
W1017003	Message	Update cancelled.

* Those messages are displayed in the Output Panel only.

APPENDIX B SUPPLEMENTARY INFORMATION

Figure B-1. E1 and E20 Pins - RX -

Pin No.	E1	E20	
	Pin Name	Pin Name (14-pin Compatible)	Pin Name (38-pin)
1	io4	io4	io1
2	GND	GND	io2
3	io5	io5	io0
4	io0	io0	–
5	SEND	SEND	UCONNECT (connected to GND of the target board)
6	io1	io1	–
7	io3	io3	–
8	UVCC (whether 3.3V or 5.0V is supplied or whether power is supplied to the target can be detected)	UVCC	io3
9	UVCC2	UVCC2	RESET
10	io2	io2	–
11	RECEIVE	RECEIVE	SEND
12	GND	GND	–
13	RESET	RESET	–
14	UCONNECT (connected to GND of the target board)	UCONNECT (connected to GND of the target board)	UVCC
15			io4
16			–
17			UVCC2
18			–
19			RECEIVE
20			–
21			io5
22			–
23			–
24			–
25			–
26			–
27			–
28			–
29			–
30			–
31			–
32			–
33			–
34			–
35			–
36			–
37			–
38			–

"-" indicates an unused pin.

Figure B-2. 32-bit CRC Calculation Specifications

```
  /*  The generator polynomial used for this table is                  */
  /*  x^32+x^26+x^23+x^22+x^16+x^12+x^11+x^10+x^8+x^7+x^5+x^4+x^2+x^1+x^0  */
  /*  according to Autodin/Ethernet/ADCCP protocol standards            */
  /*  Binary: 0x04c11db7                                               */
  const uint32_t CRC32_Tab [256]= {
     0x00000000, 0x04c11db7, 0x09823b6e, 0x0d4326d9, 0x130476dc, 0x17c56b6b, 0x1a864db2, 0x1e475005,
     0x2608edb8, 0x22c9f00f, 0x2f8ad6d6, 0x2b4bcb61, 0x350c9b64, 0x31cd86d3, 0x3c8ea00a, 0x384fbdbd,
     0x4c11db70, 0x48d0c6c7, 0x4593e01e, 0x4152fda9, 0x5f15adac, 0x5bd4b01b, 0x569796c2, 0x52568b75,
     0x6a1936c8, 0x6ed82b7f, 0x639b0da6, 0x675a1011, 0x791d4014, 0x7ddc5da3, 0x709f7b7a, 0x745e66cd,
     0x9823b6e0, 0x9ce2ab57, 0x91a18d8e, 0x95609039, 0x8b27c03c, 0x8fe6dd8b, 0x82a5fb52, 0x8664e6e5,
     0xbe2b5b58, 0xbaea46ef, 0xb7a96036, 0xb3687d81, 0xad2f2d84, 0xa9ee3033, 0xa4ad16ea, 0xa06c0b5d,
     0xd4326d90, 0xd0f37027, 0xddb056fe, 0xd9714b49, 0xc7361b4c, 0xc3f706fb, 0xceb42022, 0xca753d95,
     0xf23a8028, 0xf6fb9d9f, 0xfbb8bb46, 0xff79a6f1, 0xe13ef6f4, 0xe5ffeb43, 0xe8bccd9a, 0xec7dd02d,
     0x34867077, 0x30476dc0, 0x3d044b19, 0x39c556ae, 0x278206ab, 0x23431b1c, 0x2e003dc5, 0x2ac12072,
     0x128e9dcf, 0x164f8078, 0x1b0ca6a1, 0x1fcdbb16, 0x018aeb13, 0x054bf6a4, 0x0808d07d, 0x0cc9cdca,
     0x7897ab07, 0x7c56b6b0, 0x71159069, 0x75d48dde, 0x6b93dddb, 0x6f52c06c, 0x6211e6b5, 0x66d0fb02,
     0x5e9f46bf, 0x5a5e5b08, 0x571d7dd1, 0x53dc6066, 0x4d9b3063, 0x495a2dd4, 0x44190b0d, 0x40d816ba,
     0xaca5c697, 0xa864db20, 0xa527fdf9, 0xa1e6e04e, 0xbfa1b04b, 0xbb60adfc, 0xb6238b25, 0xb2e29692,
     0x8aad2b2f, 0x8e6c3698, 0x832f1041, 0x87ee0df6, 0x99a95df3, 0x9d684044, 0x902b669d, 0x94ea7b2a,
     0xe0b41de7, 0xe4750050, 0xe9362689, 0xedf73b3e, 0xf3b06b3b, 0xf771768c, 0xfa325055, 0xfef34de2,
     0xc6bcf05f, 0xc27dede8, 0xcf3ecb31, 0xcbffd686, 0xd5b88683, 0xd1799b34, 0xdc3abded, 0xd8fba05a,
     0x690ce0ee, 0x6dcdfd59, 0x608edb80, 0x644fc637, 0x7a089632, 0x7ec98b85, 0x738aad5c, 0x774bb0eb,
     0x4f040d56, 0x4bc510e1, 0x46863638, 0x42472b8f, 0x5c007b8a, 0x58c1663d, 0x558240e4, 0x51435d53,
     0x251d3b9e, 0x21dc2629, 0x2c9f00f0, 0x285e1d47, 0x36194d42, 0x32d850f5, 0x3f9b762c, 0x3b5a6b9b,
     0x0315d626, 0x07d4cb91, 0x0a97ed48, 0x0e56f0ff, 0x1011a0fa, 0x14d0bd4d, 0x19939b94, 0x1d528623,
     0xf12f560e, 0xf5ee4bb9, 0xf8ad6d60, 0xfc6c70d7, 0xe22b20d2, 0xe6ea3d65, 0xeba91bbc, 0xef68060b,
     0xd727bbb6, 0xd3e6a601, 0xdea580d8, 0xda649d6f, 0xc423cd6a, 0xc0e2d0dd, 0xcda1f604, 0xc960ebb3,
     0xbd3e8d7e, 0xb9ff90c9, 0xb4bcb610, 0xb07daba7, 0xae3afba2, 0xaafbe615, 0xa7b8c0cc, 0xa379dd7b,
     0x9b3660c6, 0x9ff77d71, 0x92b45ba8, 0x9675461f, 0x8832161a, 0x8cf30bad, 0x81b02d74, 0x857130c3,
     0x5d8a9099, 0x594b8d2e, 0x5408abf7, 0x50c9b640, 0x4e8ee645, 0x4a4ffbf2, 0x470cdd2b, 0x43cdc09c,
     0x7b827d21, 0x7f436096, 0x7200464f, 0x76c15bf8, 0x68860bfd, 0x6c47164a, 0x61043093, 0x65c52d24,
     0x119b4be9, 0x155a565e, 0x18197087, 0x1cd86d30, 0x029f3d35, 0x065e2082, 0x0b1d065b, 0x0fdc1bec,
     0x3793a651, 0x3352bbe6, 0x3e119d3f, 0x3ad08088, 0x2497d08d, 0x2056cd3a, 0x2d15ebe3, 0x29d4f654,
     0xc5a92679, 0xc1683bce, 0xcc2b1d17, 0xc8ea00a0, 0xd6ad50a5, 0xd26c4d12, 0xdf2f6bcb, 0xdbee767c,
     0xe3a1cbc1, 0xe760d676, 0xea23f0af, 0xeee2ed18, 0xf0a5bd1d, 0xf464a0aa, 0xf9278673, 0xfde69bc4,
     0x89b8fd09, 0x8d79e0be, 0x803ac667, 0x84fbdbd0, 0x9abc8bd5, 0x9e7d9662, 0x933eb0bb, 0x97ffad0c,
     0xafb010b1, 0xab710d06, 0xa6322bdf, 0xa2f33668, 0xbcb4666d, 0xb8757bda, 0xb5365d03, 0xb1f740b4
  };

  uint32_t CalcMemoryCRC32 (uint32_t address, uint32_t length)
  {
         uint32_t i, rd_ptr, crc_accum;
         uint8_t  byte, data [16];

         crc_accum= 0xFFFFFFFF;      /* Init Pattern */
         for (i= 0, rd_ptr= 16; i < length; i++)
         {
                  /* Check flash read buffer and fill if needed */
                  if (rd_ptr == 16)
                  {
                           Memory_Read (address, 16, data);
                           rd_ptr= 0;
                           address+= 16;
                  }
                  byte= ((crc_accum >> 24) ^ data [rd_ptr++]) & 0xFF;
                  crc_accum= (crc_accum << 8) ^ CRC32_Tab [byte];
         }
         return crc_accum;

}
```

Figure B-3. 16-bit CRC Calculation Specifications

```
  /* The generator polynomial used for this table is: */
  /* x^16+x^12+x^5+x^0 according to CCITT-16 standard. */
  /* Binary: 0x1021 */
  const uint16_t CRC16_Tab [256]= {
         0x0000,0x1021,0x2042,0x3063,0x4084,0x50A5,0x60C6,0x70E7,
         0x8108,0x9129,0xA14A,0xB16B,0xC18C,0xD1AD,0xE1CE,0xF1EF,
         0x1231,0x0210,0x3273,0x2252,0x52B5,0x4294,0x72F7,0x62D6,
         0x9339,0x8318,0xB37B,0xA35A,0xD3BD,0xC39C,0xF3FF,0xE3DE,
         0x2462,0x3443,0x0420,0x1401,0x64E6,0x74C7,0x44A4,0x5485,
         0xA56A,0xB54B,0x8528,0x9509,0xE5EE,0xF5CF,0xC5AC,0xD58D,
         0x3653,0x2672,0x1611,0x0630,0x76D7,0x66F6,0x5695,0x46B4,
         0xB75B,0xA77A,0x9719,0x8738,0xF7DF,0xE7FE,0xD79D,0xC7BC,
         0x48C4,0x58E5,0x6886,0x78A7,0x0840,0x1861,0x2802,0x3823,
         0xC9CC,0xD9ED,0xE98E,0xF9AF,0x8948,0x9969,0xA90A,0xB92B,
         0x5AF5,0x4AD4,0x7AB7,0x6A96,0x1A71,0x0A50,0x3A33,0x2A12,
         0xDBFD,0xCBDC,0xFBBF,0xEB9E,0x9B79,0x8B58,0xBB3B,0xAB1A,
         0x6CA6,0x7C87,0x4CE4,0x5CC5,0x2C22,0x3C03,0x0C60,0x1C41,
         0xEDAE,0xFD8F,0xCDEC,0xDDCD,0xAD2A,0xBD0B,0x8D68,0x9D49,
         0x7E97,0x6EB6,0x5ED5,0x4EF4,0x3E13,0x2E32,0x1E51,0x0E70,
         0xFF9F,0xEFBE,0xDFDD,0xCFFC,0xBF1B,0xAF3A,0x9F59,0x8F78,
         0x9188,0x81A9,0xB1CA,0xA1EB,0xD10C,0xC12D,0xF14E,0xE16F,
         0x1080,0x00A1,0x30C2,0x20E3,0x5004,0x4025,0x7046,0x6067,
         0x83B9,0x9398,0xA3FB,0xB3DA,0xC33D,0xD31C,0xE37F,0xF35E,
         0x02B1,0x1290,0x22F3,0x32D2,0x4235,0x5214,0x6277,0x7256,
         0xB5EA,0xA5CB,0x95A8,0x8589,0xF56E,0xE54F,0xD52C,0xC50D,
         0x34E2,0x24C3,0x14A0,0x0481,0x7466,0x6447,0x5424,0x4405,
         0xA7DB,0xB7FA,0x8799,0x97B8,0xE75F,0xF77E,0xC71D,0xD73C,
         0x26D3,0x36F2,0x0691,0x16B0,0x6657,0x7676,0x4615,0x5634,
         0xD94C,0xC96D,0xF90E,0xE92F,0x99C8,0x89E9,0xB98A,0xA9AB,
         0x5844,0x4865,0x7806,0x6827,0x18C0,0x08E1,0x3882,0x28A3,
         0xCB7D,0xDB5C,0xEB3F,0xFB1E,0x8BF9,0x9BD8,0xABBB,0xBB9A,
         0x4A75,0x5A54,0x6A37,0x7A16,0x0AF1,0x1AD0,0x2AB3,0x3A92,
         0xFD2E,0xED0F,0xDD6C,0xCD4D,0xBDAA,0xAD8B,0x9DE8,0x8DC9,
         0x7C26,0x6C07,0x5C64,0x4C45,0x3CA2,0x2C83,0x1CE0,0x0CC1,
         0xEF1F,0xFF3E,0xCF5D,0xDF7C,0xAF9B,0xBFBA,0x8FD9,0x9FF8,
         0x6E17,0x7E36,0x4E55,0x5E74,0x2E93,0x3EB2,0x0ED1,0x1EF0
  };

  uint16_t CalcMemoryCRC16 (uint32_t address, uint32_t length)
  {
         uint32_t i, rd_ptr;
         uint16_t crc_accum;
         uint8_t byte, data [4];

         crc_accum= 0x0000; /* Init Pattern */
         for (i= 0, rd_ptr= 0; i < length; i++)
         {
                  /* Check flash read buffer and fill if needed */
                  if (rd_ptr == 0)
                  {
                           Memory_Read (address, 4, data);
                           rd_ptr= 4;
                           address+= 4;
                  }
                  byte= (crc_accum >> 8) ^ data [--rd_ptr];
                  crc_accum= (crc_accum << 8) ^ CRC16_Tab [byte];
         }
         return crc_accum;

}
```

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