User's Manual

Renesas Flash Programmer V2.05

Flash memory programming software

User's Manual: Common

Renesas Electronics
www.renesas.com

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How to Use This Manual

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

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

Organization This manual includes the following sections.

- Overview
- Installation
- 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.

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 Renesas Flash Programmer manual are as follows:

(1/3)

Term	Meaning
RFP	Abbreviation of the Renesas Flash Programmer software for programming flash memory
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. Caution: Use workspace files that correspond to the version of the generated RFP. An error occurs when the RFP reads files from other RFP versions. In such cases, create new workspace files.
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.
Signature	Information about the microcontroller.
rfp.ini	This file is where the RFP settings are saved. The settings are saved when RFP is terminated.
OCD security ID[Note 3]	A security feature related to on-chip debugging of a 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]	Authentication code used in the ID authentication mode and in OCD. For details, refer to the user's manual of the microcontroller.
Lock bit[Note 3]	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.
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, or RH850 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.**
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 For the RH850: Code 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 For the RH850: User boot area or extended user 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.
ID authentication mode**Note 3**	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.
Command protection mode**Note 3**	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.
OTP**Note 3**	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.
OFS**Note 3**	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.

Term	Meaning
Trusted Memory[Note 3]	One of the security functions of the microcontroller. For details, refer to the user's manual of the microcontroller.
Option-Setting Memory[Note 3]	Collective term for registers that determine the state of the MCU after release from reset. For details, refer to the user's manual of the microcontroller.

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 V2.05 Common	This manual
Renesas Flash Programmer V2.05 RL78, 78K, V850	R20UT2907E
Renesas Flash Programmer V2.05 RX100, RX200, RX600 (Except RX64M)	R20UT2908E
Renesas Flash Programmer V2.05 RH850, RX700 (Include RX64M)	R20UT2909E
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, RX200 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)
- Automatic writing by the script execution function
- 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

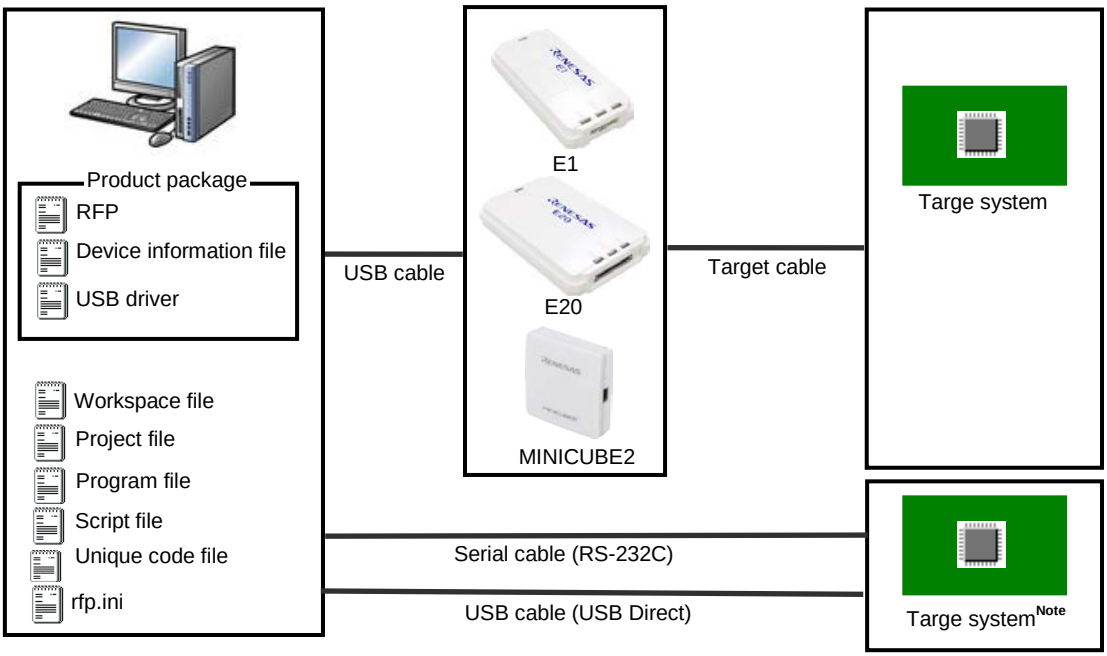
Microcontrollers supported by RFP are listed on the following websites:

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 PC 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

- 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 Vista (32-bit and 64-bit)
- Windows 7 (32-bit and 64-bit)
- Windows 8/8.1 (32-bit and 64-bit)
- Microsoft .NET Framework 4
- Runtime library of Microsoft Visual C++ 2010 SP1

For any of these, we recommend having the latest service pack installed.

1.6 Handling of HCUHEX Files

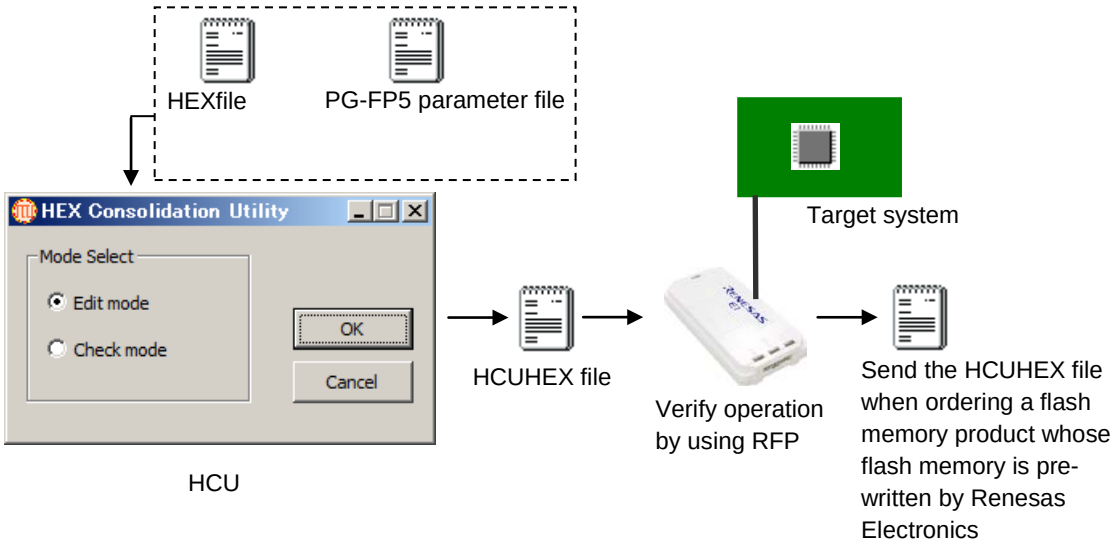
An HCUHEX file is required for ordering flash memory products whose flash memories are pre-written by Renesas Electronics. After being generated by the HEX Consolidation Utility (HCU), operation based on the HCUHEX file must be verified by using the flash memory programmer. Because RFP handles the HCUHEX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

Some RL78, 78K, V850, and RH850 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



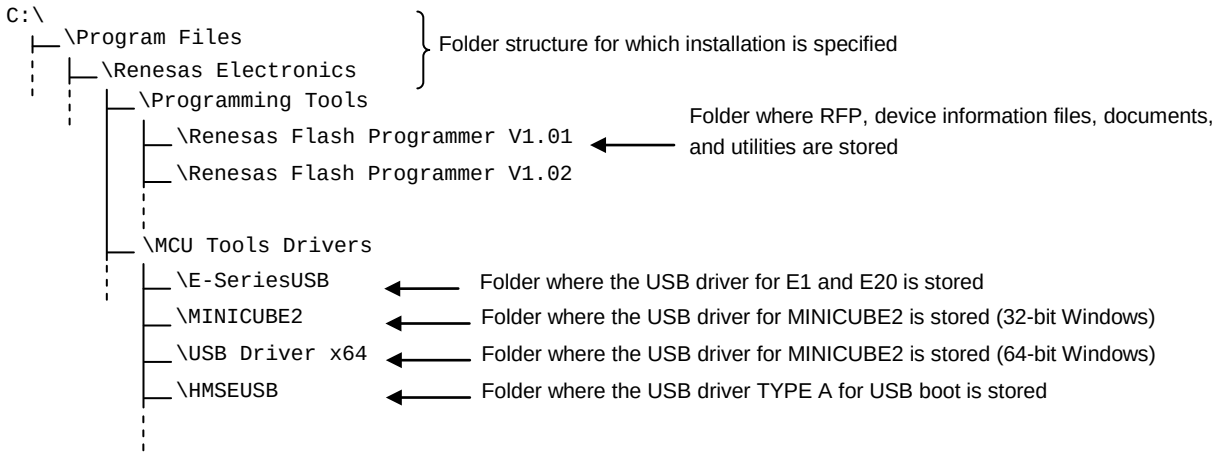
CHAPTER 2 INSTALLATION

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) The Microsoft .NET Framework and the Microsoft Visual C++ runtime libraries are required to run the installer. If the Microsoft .NET Framework or the Microsoft Visual C++ runtime libraries are not installed, the RFP will install them.

(8) If you install the free evaluation version, make sure that your host PC is connected to the network before installing the program. If you wish to install the program on a host PC that is not connected to the network, first go to the Microsoft Download Center and install the Microsoft .NET Framework 4 before installing RFP.

(9) 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+\

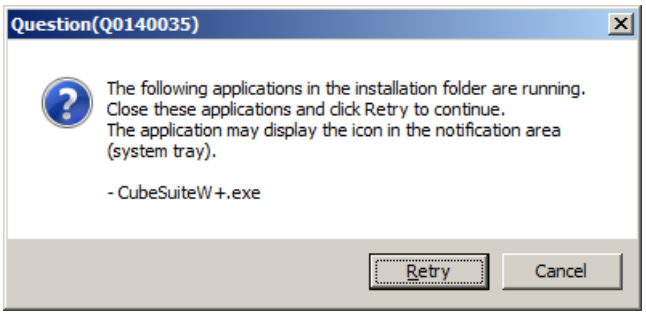
(10) To change the folder of the installed tools, uninstall all the CS+ related software and the programming GUI for RFP, and install them again.

(11) In the environment where the CS+, 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 CS+ integrated uninstaller. If you don't want to delete them, remove them from the uninstallation targets.

(12) 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.

(13) If a CS+ 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 “Programs and Features” on the Control Panel. The CS+ 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:

- RFP
  http://www.renesas.com/rfp
- MINICUBE2
  http://www.renesas.com/minicube2

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

For the E1 and E20, check that the RFP has the correct versions of the E1 and E20 firmware. If the firmware does not match, the firmware will automatically be updated.

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 UNIQUE CODE EMBEDDING FUNCTION

This chapter explains the unique code embedding function.

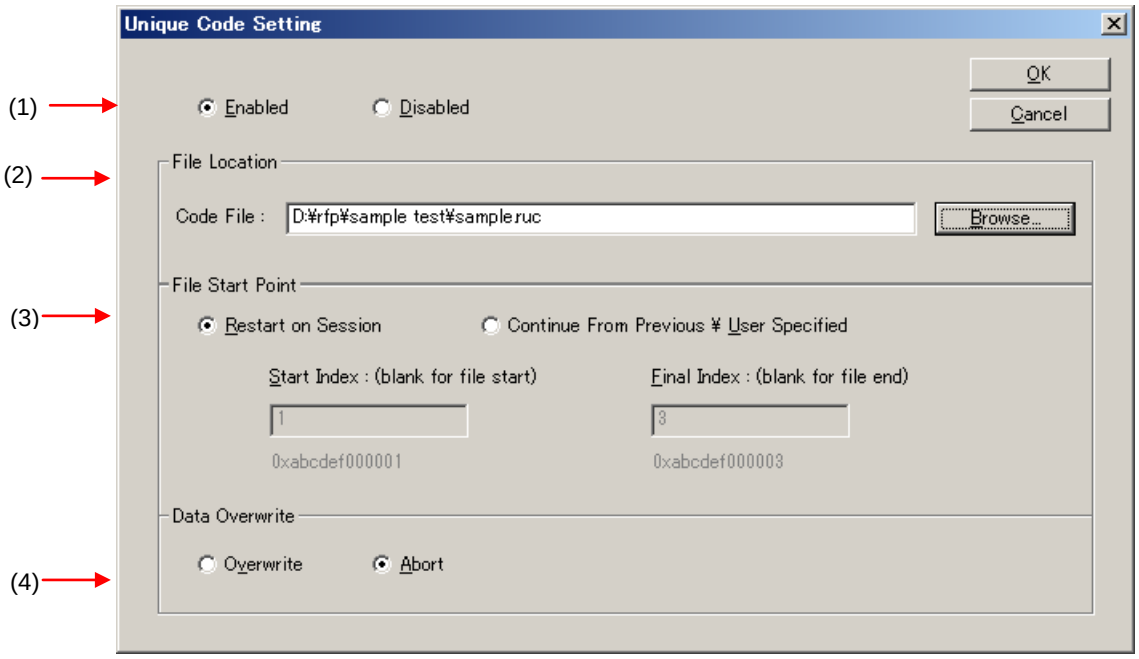
3.1 Overview

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.

3.2 [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 3-1. [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.

3.3 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

3.4 Unique code definition

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

Table 3-1. 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 : When the RH850 is used	area <code flash 1 | code flash 2 | user boot area | data flash 1 | data flash 2>
	Specifies the area of the flash memory. <code flash 1>: Code area (BANK A) <code flash 2>: Code area (BANK B) <data flash 1>: Data area (BANK A) <data flash 2>: Data area (BANK B) <user boot area>: User boot area
Specify the area : When the except RH850 is used	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 4 TROUBLESHOOTING

This chapter explains how to troubleshoot RFP.

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

4.1 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.

4.2 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:

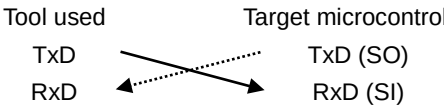
Remove the 78K0-OCD board.

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.

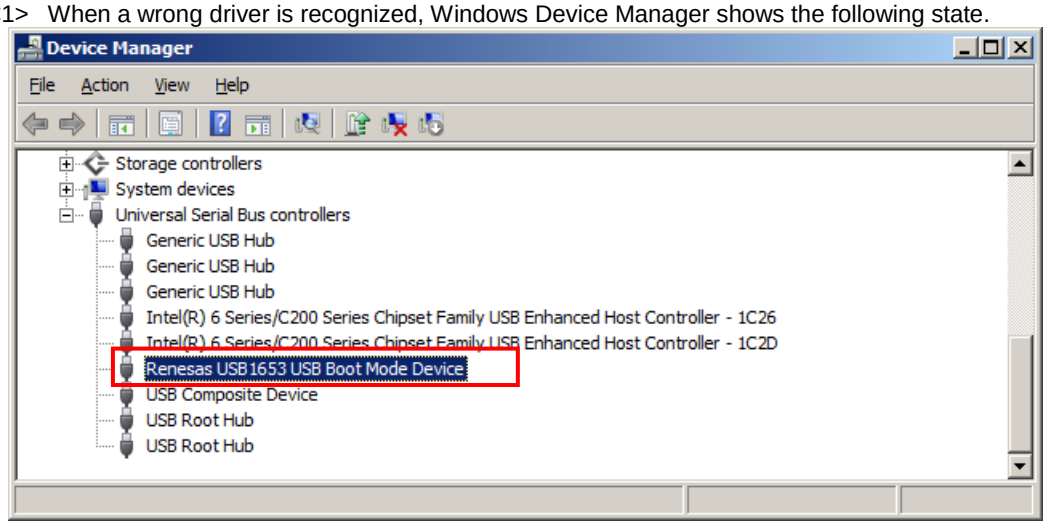
Cause:

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

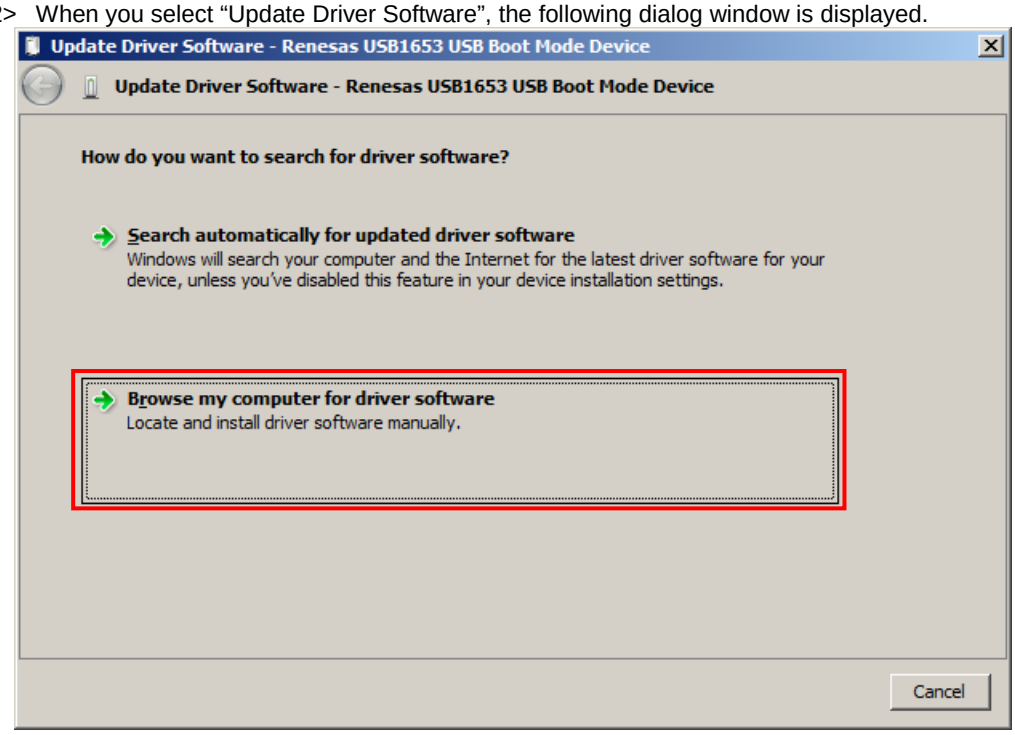
Action:

Install the correct driver in the following steps (Windows 7 is used in this example).

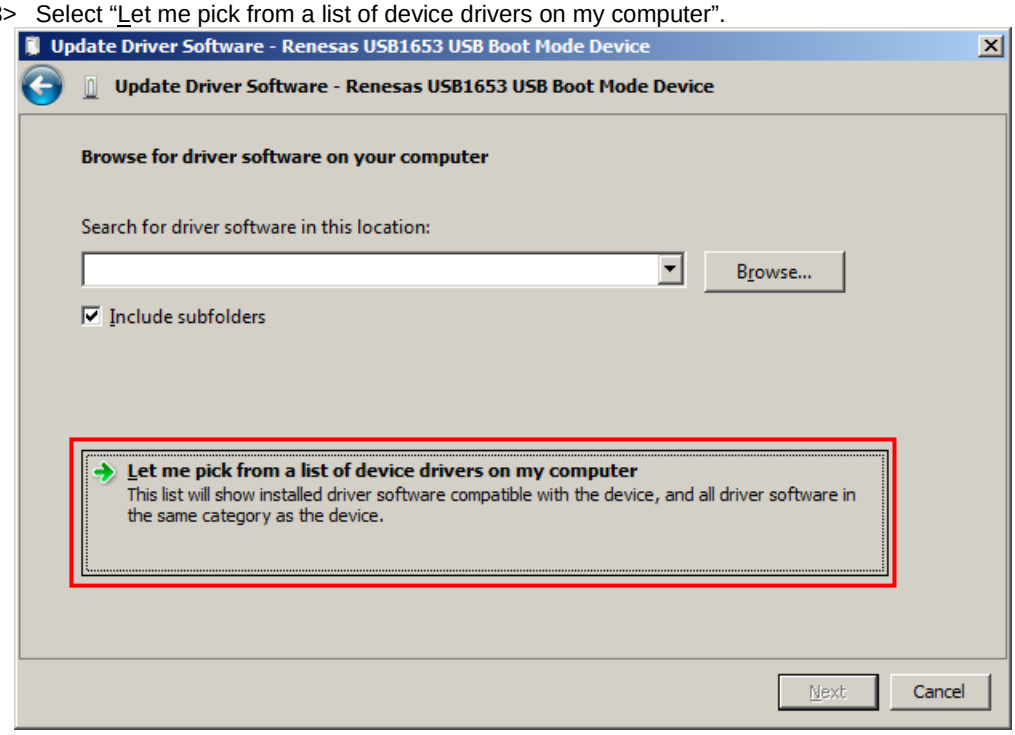
<1> When a wrong driver is recognized, Windows Device Manager shows the following state.



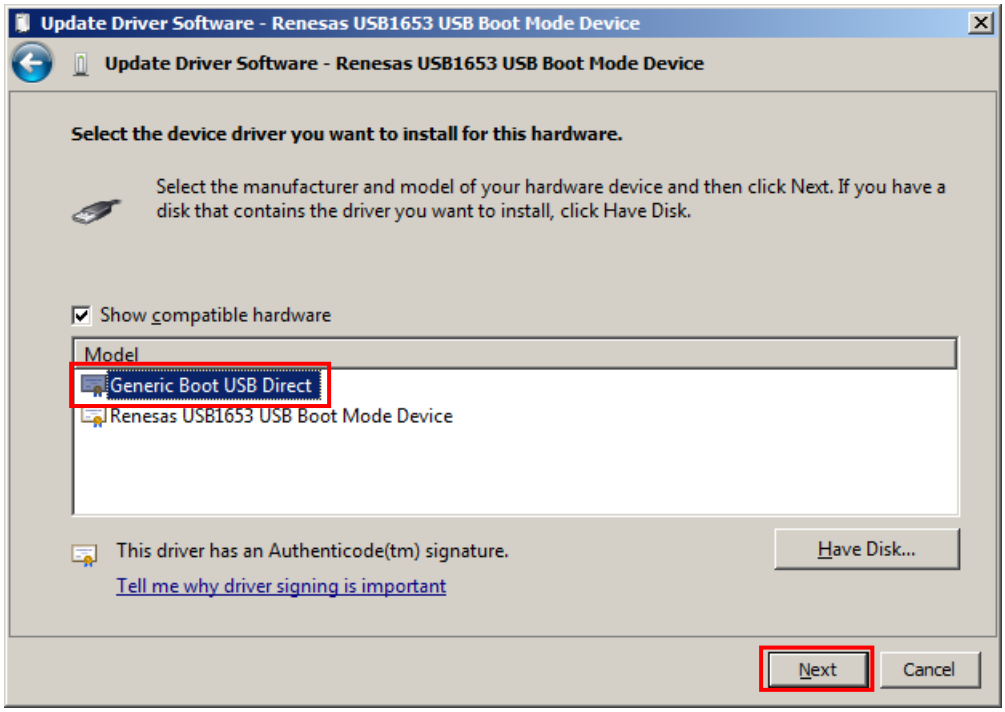
<2> When you select “Update Driver Software”, the following dialog window is displayed.



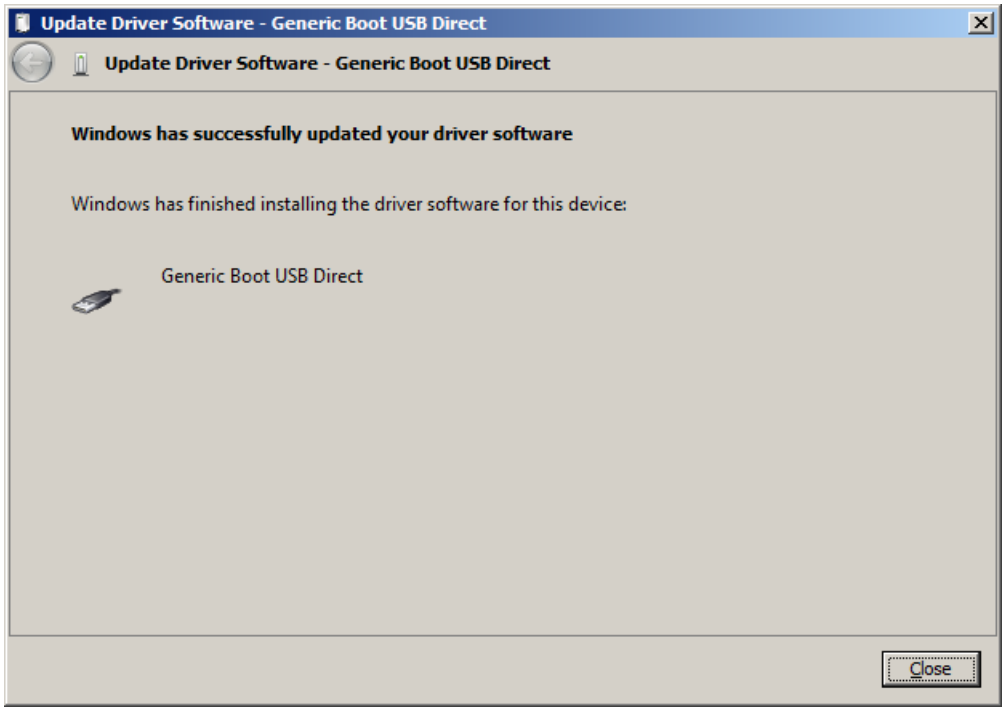
<3> Select "Let me pick from a list of device drivers on my computer".



<4> The dialog box below is shown. If "Generic Boot USB Direct" is not displayed, re-install the USB driver for the USB boot MCU Type A in the RFP installer. Select "Generic Boot USB Direct" and click the Next > button.



<5> 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 5 CAUTIONS

This chapter describes cautions of RFP.

5.1 Connecting Two or More E1s or E20s

Applies to: RX, RH850

The following restriction applies when two or more E1s or E20s are connected to a single host PC. 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.

5.2 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.

5.3 Mapping of Data Flash Memory

Applies to: 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.

5.4 Host PC

Applies to: All microcontrollers

Some tools (E1, E20, MINICUBE2, serial interface, and USB interface) may not work with the host PC you are using. If this is the case, check the connection between the tool and the host PC. If the tool still does not work, you may need to use a different host PC.

5.5 USB-to-serial converter

Applies to: All microcontrollers

We do not recommend the use of a USB-to-serial converter because it may cause delays in timing and data being lost due to the specifications of the converter.

5.6 Option-Setting Memory

Applies to: RX

If a program file includes valid data for any register in the the option-setting memory area, the option-setting memory is set. All bits in sections for which there are no data are filled with“1”.

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

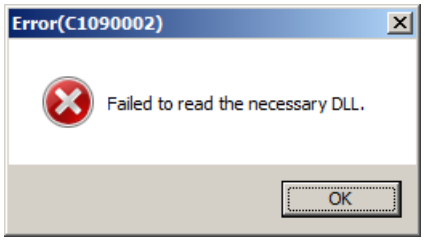


Figure A-2. Fatal Error Dialog Box

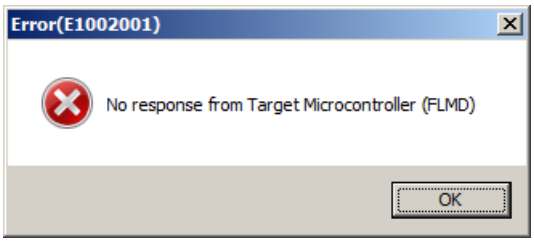


Figure A-3. Selection Dialog Box

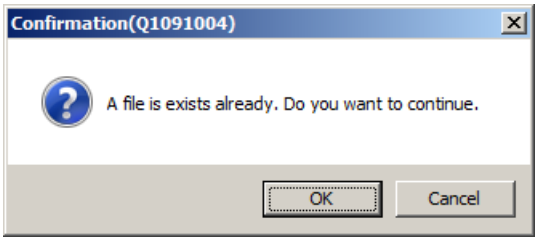


Figure A-4. Warning Dialog Box

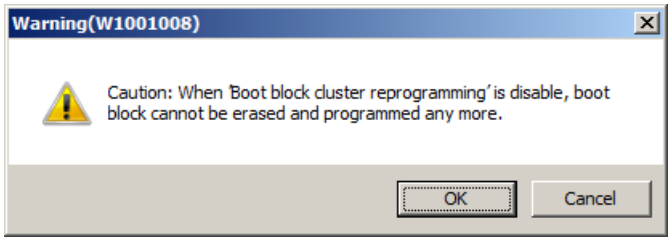
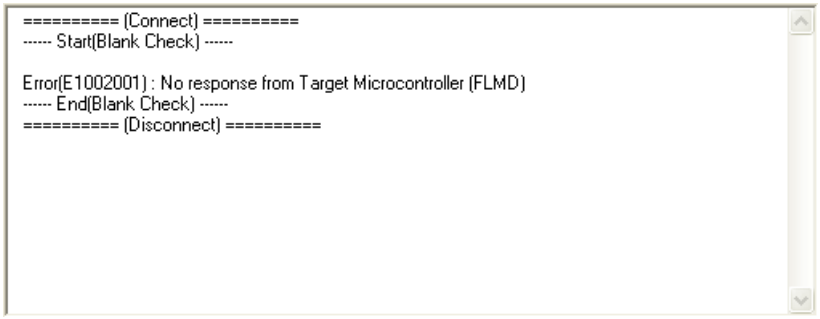


Figure A-5. Output Panel



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.
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.
W1012007	Message	Specified code file does not exist

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

(1/4)

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, RH850 -

(1/9)

E1010001	Message	The project information is not valid
	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.
E1010004	Message	Lock failed
E1010005	Message	Unlock failed
E1010006	Message	Connect 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.
E1010007	Message	One or more erase blocks are currently locked and cannot be erased:
E1010008	Message	Erase failed for xx (0xxxxx - 0xxxxx)
	Description	This error is displayed when erasing the indicated block failed.
E1010009	Message	One or more erase blocks are currently locked and cannot be written:
E1010011	Message	No data to compared
	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	Unable to verify.
	Description	This error is displayed when the verify data cannot be read for some reason.
E1010014	Message	Operation aborted
	Description	This error is displayed when the operation is aborted by the user manually.
E1010015	Message	Failed to save read data
	Description	This error is displayed when saving data failed. Make sure that the folder or file is not read-only.
E1010016	Message	Upload failed
	Description	This error is displayed when data cannot be read from the ROM for some reason.
E1010017	Message	Invalid parameter
E1010018	Message	Invalid command
E1010019	Message	Option bytes setting is invalid
E1010020	Message	Verify command failed for 0xXXXX - 0xXXXX
E1010021	Message	The project information cannot be restored.
E1010023	Message	Set OTP failed
E1010024	Message	Failed to validate ICU
E1010025	Message	Failed to set command protection
E1010026	Message	Failed to disable serial program
E1010028	Message	Failed to export ID Code. (xxxx)
E1010029	Message	Failed to import ID Code. (xxxx)

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E1010030	Message	Failed to load module
E1010031	Message	This device is not a generic device
E1010032	Message	The device sent an unrecognized reponse: 0xXX
E1010033	Message	Failed to set ID code (ID Authentication Mode)
E1010034	Message	OFS setting is invalid
E1010035	Message	Failed to set ID code (Command Protection Mode)
E1010036	Message	Data in Option-Setting Memory is not correct.
E1010037	Message	Failed to set option bytes
E1010038	Message	Failed to set OFS
E1010039	Message	Failed to set Trusted Memory
E1010040	Message	Failed to set endian
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: 0xXX
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
E1013009*	Message	Selection of Clock mode - Invalid response.
E1013010*	Message	Unable to create temporary file. Generic query failed.
E1013011*	Message	Response data does not match checksum
E1014001*	Message	The device sent an unrecognized reponse: 0xXX.
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).

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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
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

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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.
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

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E1014056*	Message	Writing Data - Data length error
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.
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. Data received from the microcontroller may be dropped. ■Quit the software except RFP, or lower the baud rate.

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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
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 (xxxx)
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 chosed.
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	xxxx bps is invalid baudrate.
E1017021	Message	E1/E20 transmit error.
E1017022	Message	E1/E20 receive error

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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	Invalid MODEENTRY (xxxx).
E1020001	Message	Unsupported command error
E1020002	Message	Packet error
E1020003	Message	Checksum error
E1020004	Message	Flow error
E1020005	Message	Address error
E1020006	Message	Input frequency error
E1020007	Message	CPU clock frequency error
E1020008	Message	Baud rate range error
E1020009	Message	Baud rate margin error
E1020010	Message	Sum check method error
E1020011	Message	Endian error
E1020012	Message	Data set error
E1020013	Message	Protection error
E1020014	Message	Serial programming ID-code discord error
E1020015	Message	Serial programming Disable error
E1020016	Message	Lock-bit unlock error
E1020017	Message	OTP enable error
E1020018	Message	Blank error
E1020019	Message	Erase error
E1020020	Message	Write error
E1020021	Message	Verify error
E1020022	Message	FCURAM Access error
E1020023	Message	Sequencer error
E1020024	Message	Configuration Data Access error

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E1020025	Message	Configuration Table Access error
E1020026	Message	OTP Access error
E1020027	Message	Protection terminal Error
E1020028	Message	Hardware access error
E1020029	Message	Generic Code error
E1020030	Message	Erase error
E1020031	Message	Verify error
E1020032	Message	Device information file is invalid!
E1020033	Message	Unable to create temporary file. Generic query failed
E1020034	Message	Invalid response error
E1020035	Message	The device sent an unrecognized reponse: 0xXX
E1020036	Message	The device does not support this command
E1020037	Message	This device is not supported.
E1020038	Message	No response from the device.
E1020039	Message	Connection is failed. Click the back button. Please retry to connect to device.
E1020040	Message	Fatal error!
E1020041	Message	Area error
E1020042	Message	Device type mismatch error
Q1010001	Message	The current user specified connection speed has an error rate above xxxx% on target device. Continue with this value anyway?
Q1010002	Message	RFP will now attempt to connect to your device. Please ensure the board is connected, powered and in Boot mode.
Q1010003	Message	The device reports one or more erase blocks are currently locked Should RFP temporarily disable this locking to allow erase and program?
Q1010004	Message	RFP will unlock some blocks, but this will require them to be erased. Continue?
Q1010005	Message	xxxx file exceeds the flash ROM size of xxxx device. Continue download?
Q1010006	Message	The User Boot Area is not blank. Continue?
Q1010007	Message	The current user specified connection speed has an error rate above xxxx% on emulator. Continue with this value anyway?
Q1010008	Message	Some blocks will need to be erased. Continue?
Q1010009	Message	The setting state of a target microcontroller is as follows. If you want to feedback them to the project settings, press OK button.
Q1010010	Message	The current user specified connection speed is out of range. Continue with this value anyway?
W1010001	Message	Please enter a crystal frequency
W1010002	Message	The specified crystal frequency is out of range. Valid values are between xxxx and xxxx
W1010004	Message	The current user specified connection speed is out of range. The interface board is unable to communicate at this rate.
W1010005	Message	The current user specified connection speed is out of range. The device is unable to sync to this rate.
W1010006	Message	Timeout should be set between 1 to 50 seconds.
W1010007	Message	download xxxx file which exceeds the flash ROM size of xxxx device.
W1010008	Message	The specified upload range exceeds the area address space and cannot be uploaded.
W1010009	Message	Values at index 0xXXXX not equal -> File Data 0xXXXX, Read 0xXXXX

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W1010010	Message	The following file does not contain any data (or the data may be out of range of the device flash area): xxxx
W1010011	Message	xxxx file exceeds the flash ROM size of xxxx device.
W1010012	Message	Blocks which have been set as OTP should be set again at disconnect.
W1010013	Message	Blocks which will be written have not been selected.
W1010014	Message	The communication speed has been changed to xxxx bps.
W1010015	Message	If Disable Serial Program is set, RFP can not connect to the targete device again.
W1010016	Message	If Disable Erase is set, RFP can not remove this set.
W1010017	Message	The device is set as ID Authentication mode. Please disconnect RFP form the device.

* 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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