User's Manual

IECUBE Utility IEQBUTL

User's Manual

Target Devices
V850 Microcontrollers
RL78 Family
78K0R Microcontrollers
78K0 Microcontrollers
78K0S Microcontrollers

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How to Use This Manual

Readers	This manual is intended for users who wish to use IECUBE utility in IECUBE environment. The readers of this manual are assumed to be familiar with the IECUBE usage, and to have knowledge of debuggers.
Purpose	This manual is intended to give users an understanding of the correct usage of the IECUBE utility.
Organization	This manual is divided into the following sections. • Overview of IEQBUTL • Installation and Startup • IECUBE Self-Testing Function • F/W Download Function • FPGA Download Function • Version Confirmation
How to Read This Manual	It is assumed that the readers of this manual have general knowledge in the fields of electrical engineering, logic circuits, and microcontrollers.

CONTENTS

1 Overview of IEQBUTL

This section explains the IECUBE utility (hereafter referred to as IEQBUTL) and its functional overview.

1.1 Introduction

IEQBUTL is an application that performs IECUBE self-testing and upgrade of firmware and FPGA data.
Use IEQBUTL mainly for IECUBE self-testing. Note that IECUBE may not operate normally if the upgrade function of firmware and FPGA data is used during ordinary operation.

1.2 Functions Details

The following functions are provided in IEQBUTL. The functional overview is described below.

♦ **Self-testing function**

IEQBUTL performs the following access tests for abnormality in IECUBE.

Test items	V850	RL78 78K0R	78K0	78K0S
IECUBE register test: Checks the initial value of the register controlling the IECUBE emulation function and performs a read/write test.	✓	✓	✓	-
IROM test: Performs an internal ROM read/write test.	✓	✓	✓	✓
IRAM test: Performs an internal RAM read/write test.	✓	✓	✓	✓
Trace memory test: Performs a trace memory read/write test.	✓	✓	✓	-
Coverage memory test: Performs a coverage memory read/write test.	-	✓	✓	-
CPU register test: Performs a microcontroller general-purpose register read/write test.	✓	✓	✓	✓
Emulation ROM test: Performs an emulation ROM read/write test.	-	-	✓	-
Bank ROM test: Performs a bank ROM read/write test.	-	-	✓	-
Port test: Performs a test for the target interface block.	-	-	-	✓

♦ **F/W download function**

This function is used for upgrading the firmware program of the internal flash memory of the USB control microcontroller inside IECUBE. Do not use this function in ordinary operation; otherwise IECUBE may not operate normally.

♦ **FPGA download function**

This function is used for upgrading FPGA configuration data of the FPGA flash memory incorporated in the boards in IECUBE. Do not use this function in ordinary operation; otherwise IECUBE may not operate normally.

2 Installation and Startup

This section explains how to install and startup IEQBUTL.

2.1 How to Install IEQBUTL

Install IEQBUTL by using one of the following methods.
Installation method is different depending on the debugger software environment.

(1) IEQBUTL can be installed during the debugger software installation.
(2) Extract the IEQBUTL (ZIP file) which is provided individually to any folder.

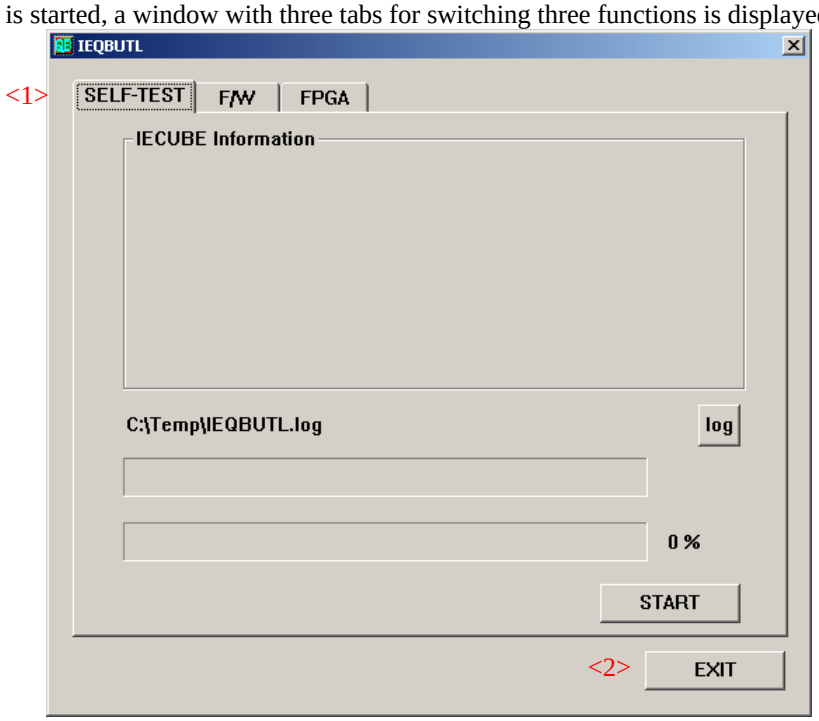
2.2 How to Start IEQBUTL

Start IEQBUTL by using one of the following methods.
Starting method is different depending on the debugger software environment.

(1) Click "IECUBE self-testing tool" on Windows start menu which is registered during the debugger software installation.
(2) Double click "IEQBUTL.EXE" in the folder where IEQBUTL is stored.

2.3 Explanation of Each Area

When IEQBUTL is started, a window with three tabs for switching three functions is displayed.



<1> SELF-TEST, F/W, and FPGA tabs
The self-testing, firmware download, and FPGA download functions can be switched.

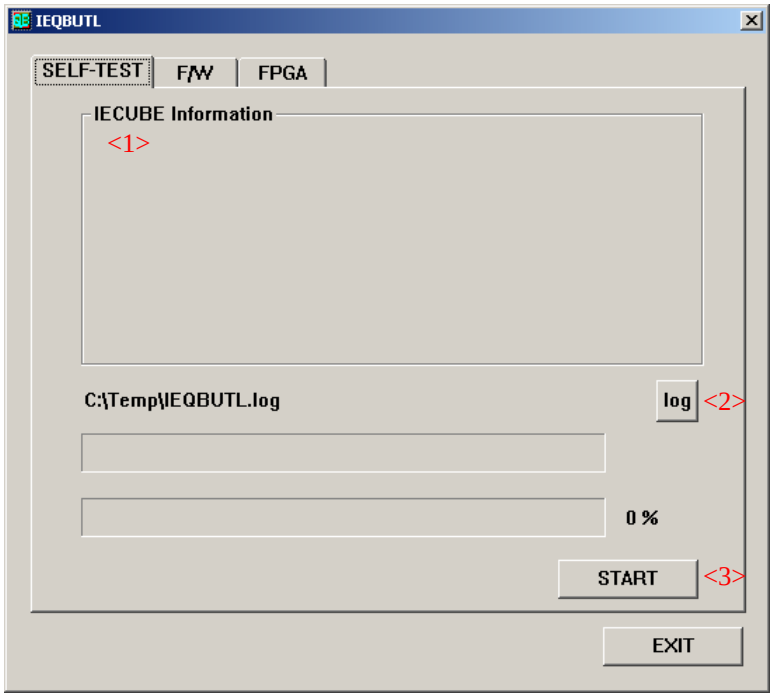
<2> EXIT button
Terminates IEQBUTL.

3 IECUBE Self-Testing Function

This section explains how to use the self-testing function.

3.1 Explanation of Each Area

The following window is displayed by clicking the SELF-TEST tab. Explanation of each area is described below.



<1> IECUBE Information area

Displays the IECUBE hardware information.

<2> log button

When this button is clicked, the path for the log file can be changed. When self-testing has not been performed, IEQBUTL.log is displayed by default.

<3> START button

When this button is clicked, a confirmation dialog box appears and self-testing is started by clicking the [OK] button.

3.2 Execution of Self-Testing

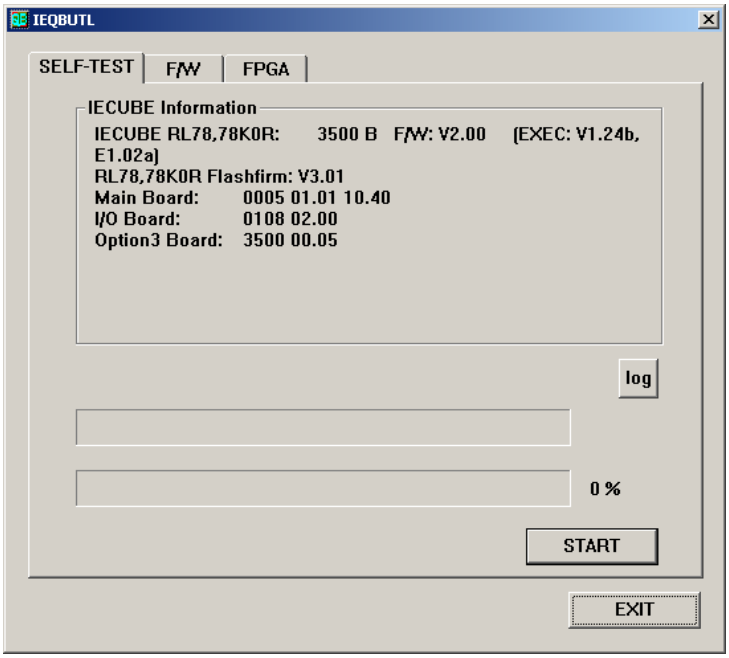
Note the following points when executing the self-testing function.

- **Do not connect Emulation probe, Socket and IECUBE to the target system.**
- **Reset the IECUBE clock setting to the factory setting.**
- **Terminate the debugger software.**

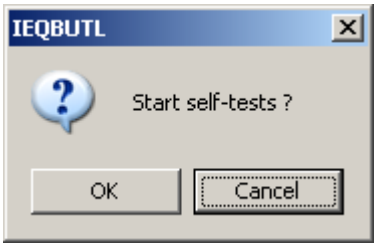
Execute self-testing using the following procedure.

(1) Specify the location in which the log file will be saved by clicking the [log] button. The self-testing result will be output to this log file. Refer to **3.3 Log File** for descriptions on the log file.

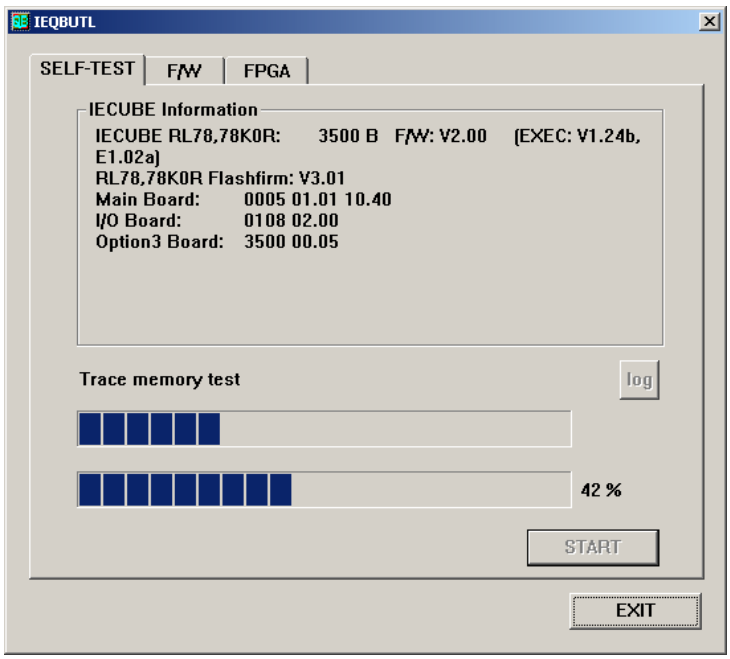
(2) When the [START] button is clicked, IEQBUTL checks the IECUBE connection status and displays the hardware information in the “IECUBE Information” field.



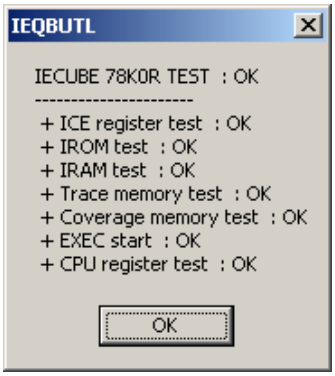
(3) A dialog box to confirm whether or not to start self-testing is displayed.

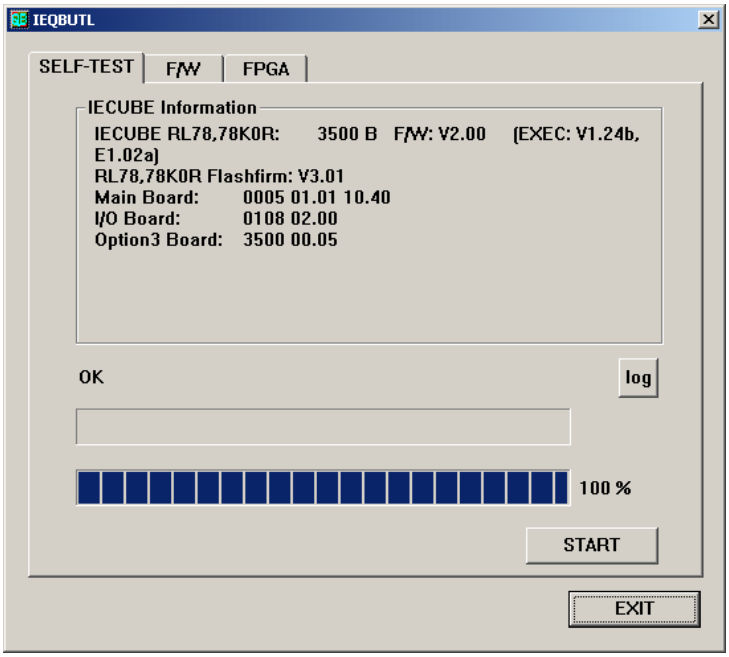


(4) Self-testing is started by clicking the [OK] button. The upper progress bar indicates the progress status of the test currently being performed. The lower progress bar indicates the status of progress for overall self-testing. It will take about five minutes until self-testing is completed.



(5) When all the tests are complete, the final result dialog box is displayed as shown below. The final result is output to a log file that is automatically created by clicking the [OK] button, self-testing is then terminated. If an error occurs during self-testing, see **3.4 If Error Occurs During Self-Testing** and take relevant action.





3.3 Log File

After self-testing is performed, a log file is created to hold the result. The log file is overwritten each time self-testing is performed. The format and the location for saving the log file are described below.

- Format of log file

  The following shows an example of the log file.

```
---------- Log file example ----------
== 3/1/2013 17:43:42  Test start. ==

IECUBE RL78,78K0R:  3500 B   F/W: V2.00     (EXEC: V1.24b, E1.02a)
RL78,78K0R Flashfirm: V3.01
Main Board:    0005 01.01 10.40
I/O Board:      0108 02.00
Option3 Board:              3500 00.05

-- 17:43:42 + ICE register test
-- 17:43:57 +- OK

-- 17:43:57 + IROM test
-- 17:45:31 +- OK

-- 17:45:31 + IRAM test
-- 17:45:37 +- OK

-- 17:45:37 + Trace memory test
-- 17:48:02 +- OK

-- 17:48:02 + Coverage memory test
-- 17:48:17 +- OK

-- 17:48:17 + EXEC start
-- 17:48:18 +- OK

-- 17:48:18 + CPU register test
-- 17:48:25 +- OK

OK
 ----------------------------------------------------
```

- Specification of location for saving log file

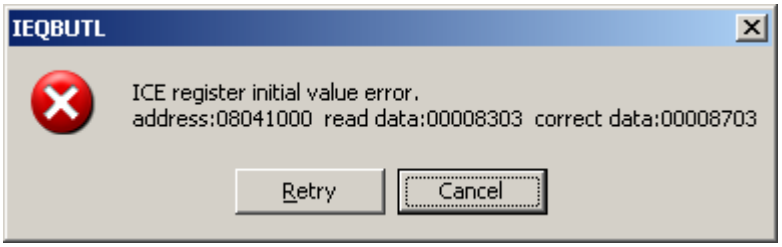
  The location for saving the log file can be changed by clicking the [log] button. The log file is created as "IEQBUTL.LOG" in a temporary folder by default. Normally, the temporary folder is a folder for which “tmp” or “temp” is specified by the environmental variable of Windows.

3.4 If Error Occurs During Self-Testing

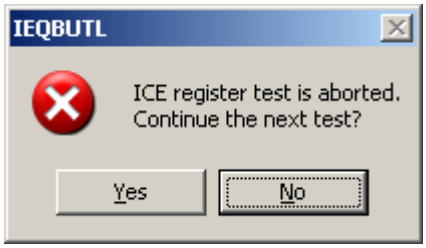
This section explains the operation when an error occurs during self-testing, error messages, and relevant actions for handling the error.

3.4.1 Operation when error occurs during self-testing

A dialog box like that shown below is displayed if an error occurs during self-testing.

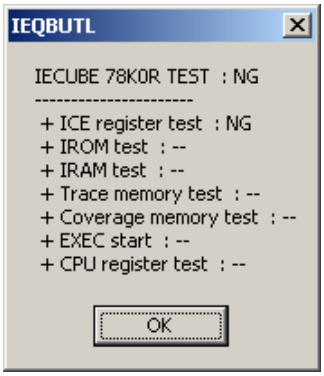


If the [Retry] button is clicked, the test for the item for which an error was detected will be resumed. If the [Cancel] button is clicked, the test for that item is terminated and the following dialog box is displayed.



If the [Yes] button is clicked, the next item is tested. If the [No] button is clicked, the subsequent items are not tested and self-testing is terminated.

If an error is detected, “NG” is displayed for the item for which an error was detected in the final result dialog box, as shown below. If testing is canceled, “--” is displayed for the items that have not been tested.



3.4.2 Error messages and action

The errors that may occur during self-testing and relevant actions for handling the errors are listed below.

No.	Error No.	Error Message and Action
1	F0002	**[DLL file not found. Stop this self-test.]**
		Confirm that IEQBUTL.EXE, the executable file of the diagnostic tool, is installed in the folder in which the debugger software is installed.
2	F0c00	**[Monitor file not found. Stop this self-test.]**
		Confirm that IEQBUTL.EXE, the executable file of the diagnostic tool, is installed in the folder in which the debugger software is installed.
3	F0100	**[Connection of emulator cannot be performed. Stop this self-test.]**
		Confirm that the host machine is connected to IECUBE, and power to IECUBE is on. In addition, confirm that the USB driver is installed normally.
4	F0c43	**[ICE register cannot be accessed. Continue the next test?]**
		Confirm that the host machine is connected to IECUBE, and power to IECUBE is on. In addition, confirm that the USB driver is installed normally.
5	F01a6	**[EXEC already work. Stop this self-test.]** The debugger software is running. Terminate the debugger software.

No.	Error Message and Action
6	**[Is this ICE connected the target board?]**
	This message is displayed when the target is connected. Click the [Yes] button, disconnect the target, and retry execution.
7	**[Target connector check function error. Continue the next test?]**
	This message is displayed when the target is connected. Click the [Yes] button, disconnect the target, and retry execution.
8	**[DCU register initial value error. address: xxxx write data: xxxx, The setting for the clock module may be wrong.]**
	The clock setting of IECUBE may not be correct. Confirm that the default clock setting is selected. If correct, click the [Retry] button and retry execution.
9	**[IE-V850E1-CD-NW/QB-V850MINI is connected. Please use N-Wire Checker for a detailed test.]**
	This message is displayed when the IE-V850E1-CD-NW or QB-V850MINI(L) is connected. Use the N-Wire Checker or V850 JTAG OCD Checker for emulator testing mentioned above.

If an error message other than above is displayed, the cause may be a defect in IECUBE.

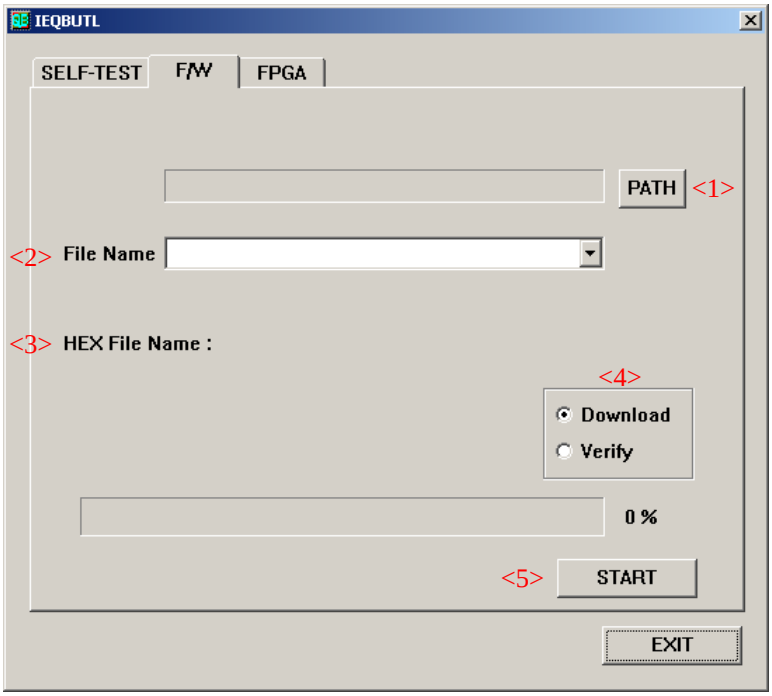
In addition, if the same error message is displayed even after the above action is implemented, the cause may be a defect in IECUBE. Contact your local distributor.

4 F/W Download Function

This function is used for upgrading the firmware program of the internal flash memory of the USB control microcontroller inside IECUBE.

Do not use this function in ordinary operation; otherwise IECUBE may be damaged.

Details of each area in the window are explained below.



<1> PATH button

The File dialog box is opened by clicking this button. Specify the path to the folder in which the file to be downloaded is placed. The specified path is displayed in the text box.

<2> File Name drop-down list

Select the HEX file to be downloaded from the drop-down list. The HEX files placed in the folder specified by the above path are displayed in the drop-down list.

<3> HEX File Name

The HEX file to be downloaded is displayed.

<4> Download/Verify radio buttons

HEX file can be downloaded by selecting “Download”.

Whether the HEX file to be downloaded and firmware already written match can be checked by selecting “Verify”.

<5> START button

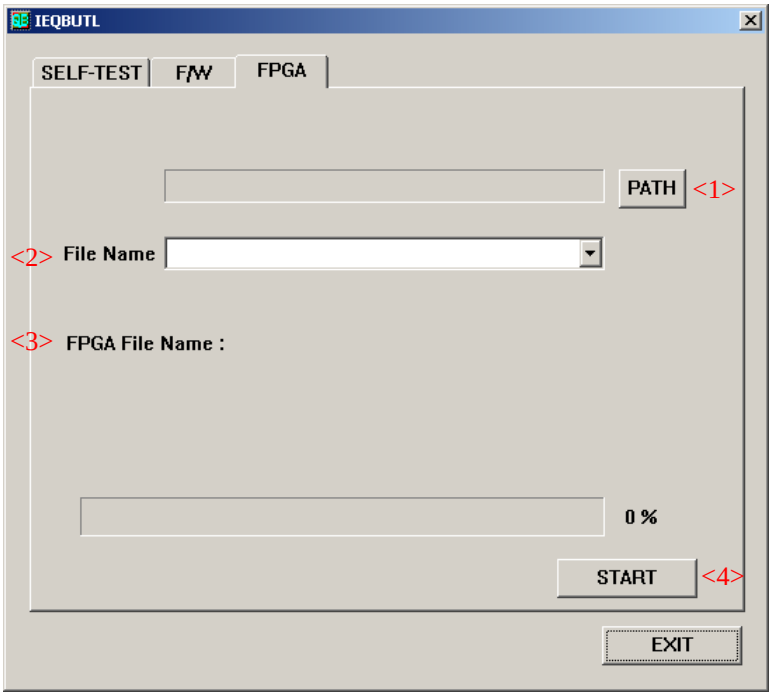
When this button is clicked, a confirmation dialog box appears and the downloading is started by clicking the [OK] button.

5 FPGA Download Function

This function downloads FPGA configuration data of the FPGA flash memory.

Do not use this function in ordinary operation; otherwise IECUBE may be damaged.

Details of each area in the window are explained below.



<1> PATH button

The File dialog box is opened by clicking this button. Specify the path to the folder in which the file to be downloaded is placed. The specified path is displayed in the text box.

<2> File Name drop-down list

Select the XSVF file to be downloaded from the drop-down list. The XSVF files placed in the folder specified by the above path are displayed in the drop-down list.

<3> FPGA File Name

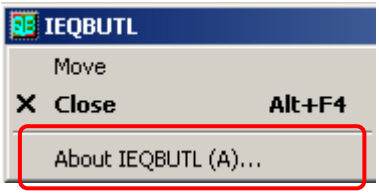
The XSVF file to be downloaded is displayed.

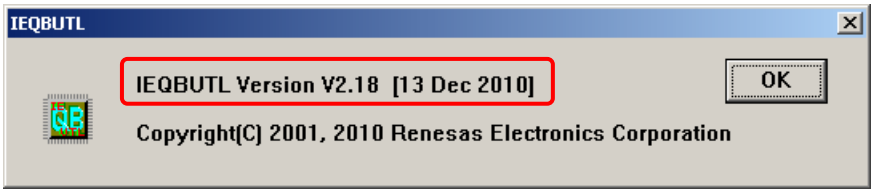
<4> START button

When this button is clicked, a confirmation dialog box appears and the downloading is started by clicking the [OK] button.

6 Version Confirmation

The system menu is displayed by left-clicking the icon on the title bar or by right-clicking the title bar.





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Renesas Electronics America Inc.
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-651-700, Fax: +44-1628-651-804

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.
11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

Colophon 1.3

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