MINICUBE2 Setup Manual
On-Chip Debug Emulator with Programming Function

1 Preface

Thank you for purchasing MINICUBE2. MINICUBE2 is an on-chip debug emulator that can be used for flash memory programming, as well as on-chip debugging of Renesas Electronics on-chip flash memory microcontrollers.
Please entirely read this document first; you will obtain an overview of information on preparation for using MINICUBE2, startup, support, and so on.

<1> Checking the package contents
Check the package contents in accordance with the packing list supplied with MINICUBE2. If there are any missing or damaged items, consult an Renesas Electronics sales representative or distributor.

<2> MINICUBE2 software and documentation
Renesas Electronics software and documentation for MINICUBE2 are available on the following website (hereinafter referred to as TOOLWEB)

http://www.renesas.eu/update?oc=Y-QB-MINI2-EE

Use of the latest version of software is recommended. If you wish to receive an upgrade notification concerning Y-QB-MINI2-EE hardware or software components, complete the registration for the upgrade notification service, found on the TOOLWEB home page.

2 Software installation

MINICUBE2 software must be installed before using MINICUBE2. The following explains how to install Renesas Electronics software.
Caution: Do not connect MINICUBE2 to the host machine until installation of software is completed.

<1> Debugger
A debugger is required to perform on-chip debugging.
- Download IAR C-SPY debugger upgrade(s), if necessary, which is supported by the target device, from TOOLWEB. Go to the website

http://www.renesas.eu/update?oc=Y-QB-MINI2-EE

Download the necessary files and follow the installation instructions given in the README file.

<2> Device file
A device file is required to perform on-chip debugging.
Download the device file corresponding to the target device from TOOLWEB and run the selfextracting file.

<3> Programming GUI (Renesas Flash Programmer)
The Renesas Flash Programmer is required to perform flash programming.

- Download the Renesas Flash Programmer from.

http://www.renesas.eu/update?oc=RFP-EE

- Run the executable file downloaded. The installation wizard starts. To install the Renesas Flash Programmer, follow the directions on the screen.

<4> MINICUBE2 utilities
MINICUBE2 utilities are required to perform a Self-Test and a Firmware check or update.

- Download the MINICUBE2 utilities from TOOLWEB.

http://www.renesas.eu/update?oc=Y-QB-MINI2-EE

- Extract the MQB2UTL executable to the desired MINICUBE2 utilities installation folder.

<5> USB driver installation

- Download the MINICUBE2 USB drivers from TOOLWEB.

http://www.renesas.eu/update?oc=Y-QB-MINI2-EE

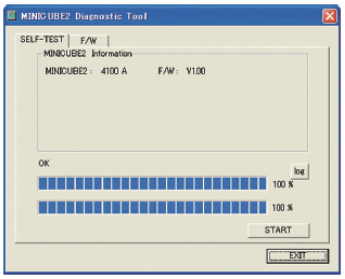
- Connect the MINICUBE2 to the HostPC. With Windows XP (or later), the “Found New Hardware” wizard starts. If the MINICUBE2 is not automatically detected, select “Install from a list or specific location (Advanced)“, and then proceed to the subsequent procedures.

3 Self-Testing of MINICUBE2 and checking firmware

Check if MINICUBE2 has an initial failure, and the firmware is the latest. If the firmware version is not the latest, debugging of the target microcontroller or flash programming may not be possible.

<1> MINICUBE2 utilities startup
Connect MINICUBE2, which is in the state just after purchase, to the host machine as shown in the right-hand figure, and then start the MINICUBE2 diagnostic tool from the MINICUBE2 utilities installation folder.

<2> Execution of self-testing and checking of firmware version



Click the Start button on the initial screen of the MINICUBE2 diagnostic tool. Self-testing then starts. If "MINICUBE2 TEST:OK" is displayed, your MINICUBE2 is normal. If not, consult a Renesas Electronics sales representative or distributor. The firmware version is the latest if the displayed version matches the one shown under "MINICUBE2 firmware" posted on TOOLWEB (see figure right-hand).
MINICUBE2 software page: Go to the website

http://www.renesas.eu/update?oc=Y-QB-MINI2-EE

If the firmware version is not the latest, refer to the MINICUBE2 diagnostic tool user's manual and update the firmware. After self-testing and firmware version checking are completed, disconnect MINICUBE2 and the host machine once.

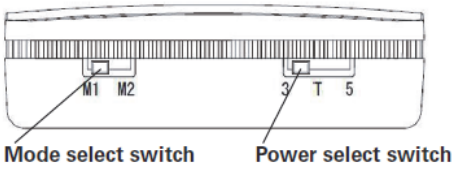
4 Setting and connecting hardware

Perform settings on MINICUBE2 and then connect MINICUBE2 to the target system. The following description assumes that the target system circuits have already been connected. For information on target system circuit design, refer to the MINICUBE2 user's manual.

<1> Switch setting

Set the switches on the MINICUBE2 main unit (see following figure) as follows.

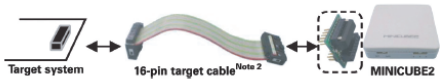
- Mode select switch:
  Set to "M2" when the target device is a V850 or 78K0 microcontroller.
  Set to "M1" when the target device is a 78K0S or 78K0R microcontroller.
- Power select switch:
  Set to "T" when the power supply of the target system is used (recommended).
  Set to "3" when 3 V is supplied to the target system (current rating: 100 mA).
  Set to "5" when 5 V is supplied to the target system (current rating: 100 mA).



<2> Connection

Do not turn on power to the target system before connection! Connect hardware in the order shown below. Connect the 78K0-OCD board[Note1], enclosed by a dashed line, to MINICUBE2 in advance when performing on-chip debugging for a 78K0 microcontroller (not necessary when performing flash programming). After connection, the mode LED (see figure right-hand) is lit. For the meaning of the mode LED light, refer to the MINICUBE2 user's manual.

(I) Connect to target system using target cable



(II) Connect to host machine using USB cable

Note 1: A 20 MHz clock is mounted on the 78K0-OCD board at shipment. To change the setting, refer to the user's manual.
Note 2: A 10-pin target cable can also be used to perform on-chip debugging for a 78K0 microcontroller.

<3> Power application to target system

Turn power on to the target system.

5 Securing the user resources and setting the security ID

Before on-chip debugging is performed with MINICUBE2, the user resources, such as memory spaces, must be secured. The security ID must be set in order to prevent the program from being read by an unauthorized person. For details on these settings, refer to the MINICUBE2 User's Manual. If the flash memory of the target device has already been erased (0xFF is written to the entire flash memory space), the debugger starts without problem. This enables checking of the target system circuit design. Devices whose flash memory has been erased have the security ID "0xFFFFFFFFFFFFFFFFFFFF" (10 bytes).

6 Renesas Flash Programmer startup

Start the Renesas Flash Programmer from the Start menu. For the operation after startup, refer to Renesas Flash Programmer User's Manual.

7 Debugger startup

Start the debugger from the IAR Embedded Workbench (C-SPY). For the operation after startup, refer to C-SPY Debugger Reference Manual.

Information

For further information or questions, please contact Renesas Electronics Europe via http://www.renesas.eu/contact

<1> Notes on target system circuit design

A circuit dedicated to communication between MINICUBE2 and the target device must be designed on the target system. For information on the circuit connection, refer to the MINICUBE2 user's manual.

<2> Troubleshooting

If there seems to be any problem with the MINICUBE2 operation, use the following check tools to discover the problem.

- MINICUBE2 utilities (MINICUBE2 diagnostic tool)
- OCD checker (tool for checking target system communication)

If the above tools cannot resolve the problem, see the FAQ on the website, or access the following URL for consulting: http://www.renesas.eu/contact

<3> Optional products

Target boards for a trial use are available for MINICUBE2. A connector for MINICUBE2 is mounted on this board, so you can start checking of the device operation soon after opening the package.
For availabilitry and ordering information, please contact your Renesas Electronics sales representative.

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