

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

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Note that the following URLs in this document are not available:

<http://www.necel.com/>

<http://www2.renesas.com/>

Please refer to the following instead:

Development Tools | <http://www.renesas.com/tools>

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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 NEC 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 NEC Electronics sales representative or distributor.

<2> MINICUBE2 product information and documents

For information on MINICUBE2, access the following NEC Electronics website (hereinafter referred to as MINICUBE2 information site).

<http://www.necel.com/micro/english/product/sc/allflash/minicube2.html>

Documents related to MINICUBE2 hardware are available at the above website. The "MINICUBE2 user's manual" that appears in this leaflet is also available on this website.

<3> MINICUBE2 software

NEC Electronics software for MINICUBE2 is available on the following website (hereinafter referred to as ODS).

<http://www.necel.com/micro/ods/eng/>

Use of the latest version of software is recommended.

If you wish to receive an upgrade notification concerning the following software, complete the registration for the upgrade notification service, found on the ODS home page.

- Debugger
- Device file
- Parameter file

When using software provided by an NEC Electronics partner, refer to the documents prepared by the partner company.

2 Software installation

MINICUBE2 software must be installed before using MINICUBE2. The following explains how to install NEC 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 integrated debugger IDxxQB, which is supported by the target device, from ODS.

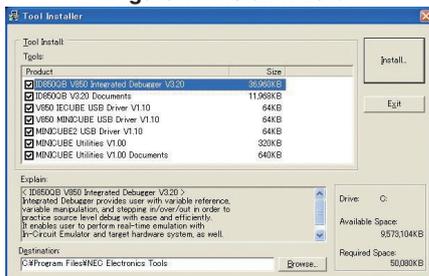
Example:

Debugger for V850 microcontrollers: ID850QB

Debugger for 78K0 microcontrollers: ID78K0-QB

- Run the executable file downloaded. The installation wizard starts (Figure 1), so install the debugger, USB driver and MINICUBE2 utilities, following the directions on the screen.

Figure 1 - Install Wizard

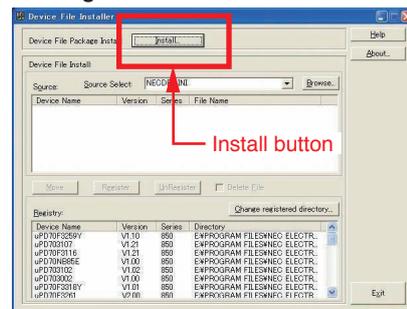


<2> Device file

A device file is required to perform on-chip debugging.

- Download the device file corresponding to the target device from ODS and decompress the file.
- Start Device File Installer (Figure 2) from the Start menu and click the Install button.
- Specify the folder where the decompressed files are stored, specify NECSETUP.INI (_csetup.INI in English version OS), and then continue the subsequent procedures.

Figure 2 - Device File Installer



<3> Programming GUI (QB-Programmer)

The QB-Programmer is required to perform flash programming.

- Download the QB-Programmer from ODS.
- Run the executable file downloaded. The installation wizard starts, so install the QB-Programmer, USB driver, and MINICUBE2 utilities following the directions on the screen. It is not necessary to select components that have already been installed in step <1>.

<4> Parameter file

A parameter file is required to perform flash programming.

- Download the parameter file corresponding to the target device from ODS and decompress the file. A .prm file is decompressed in a folder.
- Copy the decompressed parameter file to arbitrary folder. Specify the copied parameter file when specifying a parameter file at the QB-Programmer device setup procedure.

<5> USB driver recognition

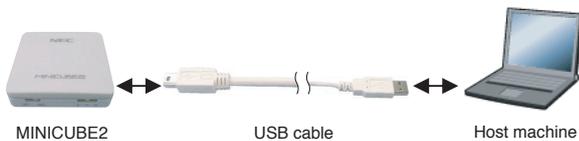
After installation of software is completed, connect MINICUBE2 to the host machine. The USB driver is then recognized. With Windows XP, the "Found New Hardware" wizard starts. Select "Install the software automatically (Recommended)", and then proceed to the subsequent procedures.

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

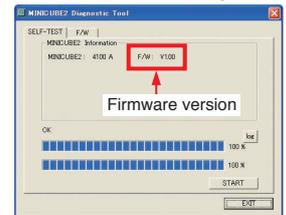
Connect MINICUBE2, which is in the state just after purchase, to the host machine as shown in the right-hand figure, and then start the MINICUBE2 diagnostic tool from the Start menu.



<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 an NEC Electronics sales representative or distributor. The firmware version is the latest if the displayed version matches the one shown under "MINICUBE2 firmware" posted on ODS (see figure right-hand).



MINICUBE2 software page:

http://www.necel.com/micro/ods/eng/tool/MINICUBE2_Software/list.html

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

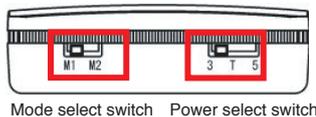
Perform settings on MINICUBE2 and then connect MINICUBE2 to the target system. The following description assumes that the target system circuits have already been connected. For information on target system circuit design, refer to the MINICUBE2 user's manual.

<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.

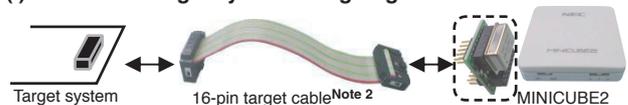
Connect hardware in the order shown below. Connect the 78K0-OCD board^{Note1}, enclosed by a dashed line, to MINICUBE2 in advance when performing on-chip debugging for a 78K0 microcontroller (not necessary when performing flash programming). After connection, the mode LED

(see figure right-hand) is lit.

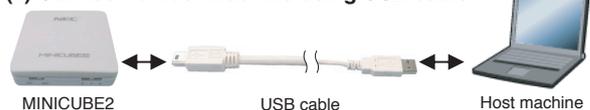
For the meaning of the mode LED light, refer to the MINICUBE2 user's manual.



(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.

On-chip debugging

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 "0xFFFFFFFFFFFFFFFF" (10 bytes). The setting of security ID is unnecessary in 78K0S.

6 Debugger startup

Start the debugger from the Start menu. For the operation after startup, refer to user's manual of the debugger.

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Information

<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.necel.com/en/contact/contact_e.html

For where to inquire, access the following NEC Electronics website.

http://www.necel.com/en/contact/contact_e.html

5 Flash programming QB-Programmer startup

Start the QB-Programmer from the Start menu. For the operation after startup, refer to user's manual of the QB-Programmer.

<3> Software provided by NEC Electronics partners
When using software provided by an NEC Electronics partner, refer to the documents prepared by the company.

<4> Optional products

A target board for a trial use is available for MINICUBE2 used with one of the following devices. A connector for MINICUBE2 is mounted on this board, so you can start checking of the device operation soon after opening the package.



V850 microcontrollers:	78K microcontrollers:
V850ES/KG2	78K0/LG2
V850ES/HG2	78K0/KF2
V850ES/JG2	78K0S/KB1+
V850ES/IE2	78K0R/KG3

More devices will be supported in the future. For ordering information and other optional products, refer to MINICUBE2 information site (1 Preface <2>).