78K0 Series Integrated Debugger
ID78K0-QB V2.81
Operating Precautions

Windows Based

Be sure to read this document before using the product.

CONTENTS

Thank you for purchasing this 78K0 Series development tool.

The 78K0 Series integrated debugger ID78K0-QB V2.81 is included with the following products.

    IECUBE (QB-78K0KX1H):   In-circuit emulator

    MINICUBE (QB-78K0MINI): On-chip debug emulator

This document explains the cautions and usage restrictions that apply when using this tool, and describes the MINICUBE self-check tool and document correction.

Be sure to read this document before using ID78K0-QB V2.81.

1. USER'S MANUAL

The following user's manual is available for this version as a PDF file only.

- Integrated Debugger ID78K0-QB Ver.2.81 - Operation (document number: U16996J (Japanese), U16996E (English))

2. SUPPORTED TOOLS

Use the following tool versions when used in combination with ID78K0-QB V2.81.

- Assembler: RA78K0 V3.70 or later
- Compiler: CC78K0 V3.60 or later
- USB driver: USB driver V1.00 or later
- Project manager: PM plus V5.20 or later

3. CAUTIONS

Cautions on using ID78K0-QB V2.81 are described below.

3.1 Device File

A device file is necessary to execute the ID78K0-QB.   The device file is not included in the ID78K0-QB.   Download the device file via ODS (online delivery service).

NEC Electronics Microprocessor website (URL: http://www.necel.com/micro/index_e.html)

→ [Development Tools Download] → [DeviceFile]

3.2 USB Driver

A USB driver is necessary to execute the ID78K0-QB.

The USB driver can be installed when installing the ID78K0-QB.

This USB driver is not installed by the Windows Plug&Play function, so do not connect the emulator and the host machine until installation is complete.

3.3 Cautions on Installation

3.3.1 Product ID

A product ID is required to install the ID78K0-QB.   The product ID is shown on the medium or medium case.

3.3.2 Caution on activating installer

Insert the CD-ROM of ID78K0-QB V2.81 in the CD-ROM drive. The installer is started automatically. If it does not start automatically, execute "setup.exe" in the directory DISK1 under ID78K0-QB from Windows Explorer.

3.3.3 Caution on restarting computer

Because it may be necessary to restart the computer after installation, terminate all other applications.

3.3.4 Caution on authority for installation

Administrator right is required for installation of ID78K0-QB V2.81 in Windows 2000 or Windows XP.

3.3.5 Caution on installation directory

Do not install ID78K0-QB V2.81 in a directory with a name containing a space; otherwise the development tools may not be correctly executed.

3.3.6 Caution on re-installation

To re-install ID78K0-QB V2.81, uninstall the copy of ID78K0-QB V2.81 already installed. If this product is installed in a different directory without uninstalling the first copy of ID78K0-QB V2.81, the first copy of ID78K0-QB V2.81 already installed cannot be uninstalled.

3.3.7 Caution on file created at installation

The following file will be created after ID78K0-QB V2.81 has been installed. This file is necessary for uninstalling ID78K0-QB V2.81 and must not be deleted (the installation destination is assumed to be C:\NECTools32).

      C:\NECTools32\SETUP*.*

3.3.8 Caution on help

The help is supplied in the HTML help format. If the help does not operate correctly, proceed as follows.

- Install Microsoft Internet Explorer 5.0 or later (IE5.5 SP2 or later recommended)

3.3.9 Caution on project manager

The project manager is not supported in ID78K0-QB V2.81 or later. Use PM plus. PM plus is included in RA78K0 V3.60 or later, but upgrade to RA78K0 to V3.70 or later when using it in combination with ID78K0-QB V2.81. If the project manager is used with ID78K0-QB V2.81, the following warning is displayed.

    Wf109: project manager cannot be used with the debugger of this version. Please use PM plus.

3.4 Cautions Related to ID78K0-QB

3.4.1 Memory window

The cursor in the ASCII display area does not follow changes in the display address on the memory window

3.4.2 IAR compiler

The IAR compiler V3.30A or later is supported.

3.4.3 SFR selection dialog box

When the SFR names in several lines are selected in the SFR Select dialog box, the order of the selected SFR names cannot be changed.   As a workaround for this problem, select the lines one by one and change the SFR display order.

3.4.4 Watch window

Up to 10,000 lines can be displayed in the Watch window.   If the number exceeds 10,000, an error message will be output.

3.4.5 Number of lines in C source file

Up to 65535 lines can be supported (displayed) in a C source file.   If the number exceeds 65535, divide the source.

3.4.6 Switching application while icon is being dragged

If an application is switched for any reason while an event icon is being dragged, the icon cannot be dropped.   In such a case, release the drag status using the ESC key.

3.5 Cautions When IECUBE Is Connected

3.5.1 Standby mode during step execution

Standby mode is released if it is set during step execution.

3.5.2 Execution operation while external reset signal is input

When the SFR window is displayed and execution or step execution is performed while an external reset is not masked (TARGET RESET is not checked in the Configuration dialog box) and an external reset signal has been input, the program has to wait for a timeout in communication with the emulator, which drastically degrades the operability.

3.5.3 Software break in RAM area

Do not overwrite the program in which a software break has been set to the internal low-speed RAM area or external RAM area; otherwise the break may not occur normally. Even if the break occurs, the program before being overwritten is automatically restored. Therefore, be sure set a software break after the program is overwritten.

3.5.4 Access display in Memory window

When the cumulative display is disabled (not checked) on the [View] menu in the Memory window, data write may not be displayed in color even if a write instruction is executed on the data.

In addition, display of an access being executed does not necessarily change in the order of access because data is read by the emulator in block units.

3.6　Cautions When MINICUBE Is Connected

3.6.1 Reserved area used by on-chip debugger

The following reserved areas are used by the on-chip debugger.

(1) Flash memory area

- Addresses 0x02 and 0x03
- Addresses 0x7E and 0x7F (when using a software break)
- Address 0x84
- Addresses 0x85 to 0x8E
- Addresses 0x8F to 0x18F: Standard value of program

(2) Internal high-speed RAM area

- 7 or 9 bytes as stack area: Standard value of stack

(9 bytes when using software breaks)

3.6.2 Values specified by linker option (-GO)

Among the reserved areas used by the on-chip debugger, the following areas can be secured using a linker option (-GO).

- Addresses 0x02 and 0x03
- Address 0x84
- (Size of program specified from address 0x8F) + 1

Specify the -GO option default value, 256, for the program size for on-chip debugging.

	Value Specified by Option	Program Size	Program Area	Description (Stack Size)
Standard	256	257	0x8F to 0x18F	7 or 9 bytes

The value specified by the option may change when the function is expanded in future.

3.6.3 Values at addresses 0x02, 0x03, and 0x8F or higher

Values other than 0xFF cannot be downloaded to address 0x02, 0x03 or the program area starting from address 0x8F. 0xFF is always displayed in the Memory window in order to prevent errors that occur by changing the value. Uploaded data is also displayed as 0xFF.

In addition, on-chip debugging cannot be performed on these areas after they are overwritten by self-programming.

3.6.4 Value at address 0x84

Values other than 0x02 and 0x03 cannot be written to address 0x84. The processing is performed so that 0x00 (the value set to disable on-chip debugger connection) or any other illegal value is not written. When setting 0x00, use the flash memory programmer (PG-FP4).

If address 0x84 is overwritten by 0x00 by self-programming, communication is disabled after reset and debugging can no longer be performed. The target microcontroller and MINICUBE can no longer be connected even after the debugger is restarted.

3.6.5 Values at addresses 0x85 to 0x8E

The security ID of addresses 0x85 to 0x8E can be changed in the Memory window, etc. If addresses 0x85 to 0x8E are overwritten by self-programming, communication is disabled after reset and debugging can no longer be performed.

When the debugger is restarted, set the new security ID in the Configuration dialog box. If the security ID is unknown, on-chip debugging can not be performed.

3.6.6 Stack pointer set value

Use address 0xFEDE or lower for the stack area.

The internal RAM area varies depending on the value set to the IMS register. If the RAM address starts from 0xFB00, the stack pointer set value is 0xFB07 to 0xFEDF (0xFB09 to 0xFEDF when using software breaks).

The stack size to be used may change when the function is expanded in future.

Using address 0xFEDF for the stack area is disabled, but it can be used as the variable area. The on-chip debugger temporarily uses address 0xFEDF as a flag for processing the program during a break, but the original value is held.

3.6.7 8-bit timer (TM50)

The 8-bit timer (TM50) is used by firmware during self-programming, but it is also used in the following operations during on-chip debugging.

- Manipulation in Download dialog box
- Manipulation in Memory Fill dialog box
- Manipulation in Memory Copy dialog box
- Manipulation to change memory in Memory window
- On-line assembly in Assemble window
- Program execution when using software break
- Program execution when emulating Power Off and using hardware break

Make allowances for the above operations when using the 8-bit timer (TM50).

3.6.8 GUI operability

Flash memory writing is performed when the operation described in **3.6.7 8-bit timer (TM50)** is performed, but it takes time for returning the control to GUI from completion of flash writing.

3.6.9 Boot swap during self-programming

When using the boot swap function during self-programming, it is performed in cluster units. The cluster varies depending on the device used; cluster 0 (0000H to 0FFFH) and cluster 1 (1000H to 1FFFH) are used in the μPD78F0148HD. In this case, cluster 0 (0000H to 0FFFH) includes the area described in **3.6.1 Reserved area used by on-chip debugger (1) Flash memory area**, so data in these areas must be copied to cluster 1 (1000H to 1FFFH), that is, the area in which 1000H is added to the address.

3.6.10 Software break during self-programming

When a software break is set, the debugger temporarily substitutes the debug instruction for the instruction to which the break is set, and restores the original instruction. Therefore, do not set a software break to the program area that is targeted to be overwritten by self-programming; otherwise the debugger writes back the original instruction to the instruction overwritten by self-programming.

3.6.11 Emulation in self-programming mode A1

When using the functions of each firmware by self-programming, the mode is switched from normal mode to self-programming mode A1.

```
        MOV PFCMD,#0A5H
        MOV FLPMC,#1H      ← (1)
        MOV FLPMC,#0FEH
        MOV FLPMC,#1H
                  ---------------------- From this position
        CALL !08100H        ← (2)                 ↑
        MOV PFCMD,#0A5H
        MOV FLPMC,#0H                     Mode A1
        MOV FLPMC,#0FFH
        MOV FLPMC,#0H      ← (3)                  ↓
                  ---------------------- To this position
```

The section between (2) and (3) is in self-programming mode A1 (including A2). Step execution or a break by STOP or a breakpoint cannot be performed by the debugger in this section.

In addition, do not set a software break in the section between (1) and (3); otherwise the execution continues without a break but emulation is not performed normally.

3.6.12 Break function for stack pointer initialization failure

This function executes a break when an interrupt occurs or a PUSH instruction is executed while the initial setting has not been made for the stack pointer.

If the manipulation or instruction shown below is executed immediately after a reset operation, the break function for stack pointer initialization failure becomes invalid.

- Setting a software break
- Write to the stack pointer from the Register window
- Write to the flash memory from the Memory window, etc

If a software break occurs while the initial setting has not been made for the stack pointer, the message "Uninitialized Stack Pointer" is displayed on the status bar.

3.6.13 Caution on downloading HEX file

When downloading a HEX file while a value other than 0xFF is specified as the filling value using an object converter option (-U), the operation contradicts that described in **3.6.3 Values at addresses 0x02, 0x03, and 0x8F or higher**.   In such a case, keep consistency using the following program, instead of using the linker option (-GO).

Example:

```
ORG 0002h
DB 0ffh,0ffh

ORG 008fh
DB 0ffh
DB 0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh
DB 0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh
        :
        : 16 lines      1 byte + 16 bytes × 16 = 257 bytes
        :
DB 0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh,0ffh
```

3.7   Caution on option byte

When IECUBE is connected, emulation is performed without using the value set to the option byte assigned to 80H to 83H (refer to the user's manual of the device used for the address and function), so set the value in the Mask Option dialog box.   When MINICUBE is connected, emulation is performed using the value set to the option byte after a reset.

4. USAGE RESTRICTIONS

4.1 List of Usage Restrictions

No.	Usage Restrictions
1	Display digit of bit variable and bit field is wrong in Watch window
2	Read-only project file can be overwritten
3	Active project cannot be switched correctly in PM
4	Bug in changing file type by inputting "*.hex"
5	Source path cannot be added even if addition is specified by PM plus
6	Bug in redraw
7	Target mapping cannot be set for more than three locations in Configuration dialog box
8	Only write data is displayed in Trace window (only when IECUBE is connected)
9	Address in PC is decremented by 1 when an event break has occurred (only when IECUBE is connected)
10	Event does not occur at execution start address (only when IECUBE is connected)
11	Break does not occur at the subsequent instruction to which a before-execution break is set (only when IECUBE is connected)

4.2 Details of Usage Restrictions

No.1   Display digit of bit variable and bit field is wrong in Watch window

[Description]

If both a bit variable and bit field are displayed in the Watch window, the digit is not displayed as 1 digit, but as 16 digits (in binary, not 0b1 but 0b0000000000000001).   The contents of data are correct.

[Workaround]

There is no workaround.

No.2   Read-only project file can be overwritten

[Description]

Project files (*.prj, *pri) can be overwritten depending on the OS even if the file attribute is set to Read-only.

[Workaround]

There is no workaround.

No.3   Active project cannot be switched correctly in PM plus

[Description]

When both PM plus and the ID are activated and the active project is switched by PM plus, if the activated project does not include the project file (.pri) of the debugger, the load module loaded by the previous active project is not reset and remains as is.

[Workaround]

Select "Execute symbol reset after download" in the Debugger Settings dialog box by selecting [Debugger settings…] on the [Tool] menu of PM plus before creating a project.

No.4   Bug in changing file type by inputting "*.hex"

[Description]

Even if the display of the extension select area is changed by specifying the file type as "*.hex" in the file selection area in a file selection dialog box, the change is not reflected internally.

[Workaround]

Specify the file type in the extension select area.

No.5   Source path cannot be added even if addition is specified by PM plus

[Description]

When a project is saved in the ID78K0-QB and then a new source path is added in PM plus, the new source path cannot be added to the debugger.

[Workaround]

Add the source path manually.

No.6   Bug in redraw

[Description]

If the caret is moved when the Memory window or Coverage window is activated, the line on which the caret was placed cannot be redrawn normally.

[Workaround]

Redraw can be performed by moving the caret to a line on which redraw was not performed.

No.7   Target mapping cannot be set for more than three locations in Configuration dialog box

[Description]

"Target" cannot be set for more than three locations in the Memory Mapping field in the Configuration dialog box.

[Workaround]

There is no workaround.

No.8   Only write data is displayed in Trace window (only when IECUBE is connected)

[Description]

If read and write are simultaneously performed in one frame, only write data is displayed as the trace result.

[Workaround]

There is no workaround.

No.9 Address in PC is decremented by 1 when an event break has occurred (only when IECUBE is connected)

[Description]

If a software breakpoint is set to the address where an event break has occurred, the address in the PC may be decremented by 1.

Example 1: When a before-execution break and software breakpoint are set to the same address

Example 2: When a software breakpoint is set to the next instruction to the one to which an after-execution break is set

[Workaround]

Increment the PC value by 1 address in the Register window before executing a program after a break.

No.10   Event does not occur at execution start address (only when IECUBE is connected)

[Description]

If a software breakpoint is set to the execution start address, the event that should be established at the execution start address does not occur. The following functions are affected.

(1) Start of section trace

(2) Start of section measurement

(3) Trace delay trigger

(4) Event after execution

(5) Access event

[Workaround]

Delete the software breakpoint set to the execution start address.   To generate a break when the program is re-executed from the execution start address, set a before-execution break to the execution start address.

No.11   Break does not occur at the subsequent instruction to which a before-execution break is set
(only when IECUBE is connected)

[Description]

If a software breakpoint is set to the execution start address and a before-execution break is set to the subsequent instruction, the break does not occur at the subsequent instruction.

[Workaround]

Delete the software breakpoint set to the execution start address.   Perform step execution instead, if there is no problem.

5. MINICUBE SELF-CHECK TOOL

The MINICUBE self-check tool is a simple tool for detecting failure in MINICUBE or problems during use.

Cautions 1. The data in the flash memory is erased after the MINICUBE self-check tool is executed.

2. The MINICUBE self-check tool can be executed regardless of the security flag setting performed in the flash memory programmer (PG-FP4).
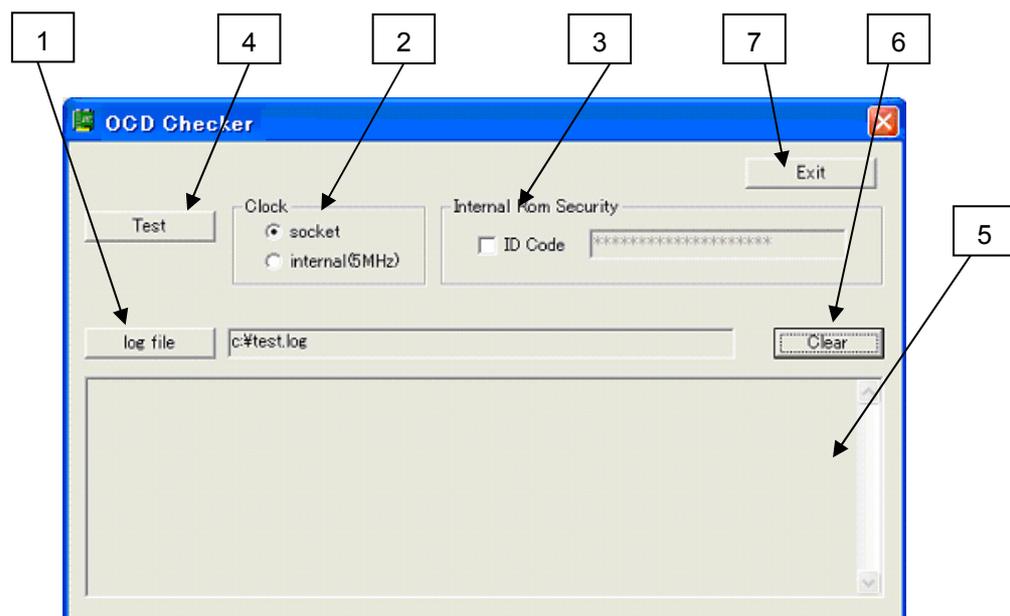
5.1 Installation

The MINICUBE self-check tool is installed when the ID78K0-QB is installed.

5.2 How to Use Check Tool

Follow the procedure below.

(1) Connect the MINICUBE probe to the self-check board.

(2) Connect the MINICUBE USB cable to the host machine.

(3) Select [Start] → [NECTools32] → [OCD Checker] to activate the MINICUBE self-check tool.

(4) Execute the MINICUBE self-check tool by referencing the explanation in **5.3 How to Operate GUI Screen**.

(5) Confirm the result by referencing the explanation in **5.4 Test Result**.

(6) Terminate the MINICUBE self-check tool.

5.3 How to Operate GUI Screen

(1) Log file button

Specifies the log output file.

(2) Clock selection area

Select the clock mounted in the CLK1 socket or the internal clock.   The internal clock is fixed to 5 MHz.   Do not mount a clock in the CLK1 socket if this item is selected; otherwise the error message shown below will be displayed.

(3) Internal ROM Security setting area

Check "ID code" before inputting the ID code; otherwise the MINICUBE self-check tool regards that all the ID code digits are specified as FFh.

(4) Test button

Starts the test.

(5) Log window

Displays the test result.

(6) Clear button

Clears the contents in the log window.

(7) Exit button

Terminates the MINICUBE self-check tool.

5.4 Test Result

A test is started by clicking the Test button and the result is displayed in the log window.

The tested items include the target voltage, clock, communication with the target device, ID check, download of flash memory data, access to the memory and SFR, and RUN/BREAK operation.   These items are checked simply.   When the test operation is complete without detecting an error, "**ALL OK**" is displayed as shown the following display example.

Display example:

Emulator firmware version: V1.00   [18 Mar 2004]
Target Power: 4.53V [OK]
Target Clock: 5.00MHz [OK]
Target Reset: HIGH
Test Rom firmware version: 1.0
Device Name: 0148H
Program Download: OK
Run Test: OK
Flash Erase: OK
ALL OK
Emulator Test End

♦ Error message and action

"Communication error"

There is no response from the target device.

Address 0x84 (on-chip emulator use enable flag) is set to 0x00 (disable use) or the target device and MINICUBE are not connected correctly.

Confirm the file of the program written to the target device and connection between the target device and MINICUBE.

"Driver open error"

The USB cable may not be connected correctly, or the USB driver may not be operating normally.

Confirm the cable connection and the USB driver setup.

"Target Power: 0.00V [NG]"

The target voltage is off (1.8 V or lower).

The voltage may not be being applied to the target connector or the power supply to the target board may be off.

Supply a voltage on which the target device can operate.

"Target Clock: 0.00MHz [NG]"

The clock mounted in the CLK1 socket does not operate.

Confirm the clock oscillation, or remove the clock mounted in the CLK1 socket and use the internal clock.

"Log file write error."

The specified log file cannot be accessed.

Confirm the file name.

"Incorrect ID code"

The input ID code is incorrect.

Confirm the ID code written to the target device and re-input the ID code.

"Test Rom Command(xxH) Error" and "Monitor Command(xxH) Error"

Communication between the target device and MINICUBE has failed.

The cause may be a problem in the electrical specifications of the cable or the target board, or the USB driver may not be operating normally.

Confirm the connection and restart Windows on the host machine.

"Write Memory,Read Memory,Data verify error"

The internal RAM cannot be accessed.   The target device may be damaged.

Exchange the target device.

"_FlashEnv Error"

"_FlashGetInfo Error"

"_FlashBlockBlankCheck Error"

"_FlashBlockErase Error"

"_FlashWordWrite Error"

"_FlashBlockVerify Error"

"_FlashWordRead Error"

"Data Verify Error"

An error occurred while writing to the flash memory. The target device may be damaged.
Exchange the target device.

"Break Timeout"

"ERROR:SP Break Test"

"ERROR:Execute Break Test1"

"ERROR:SFR Access Break Test"

"ERROR:Read Access Break Test1"

"ERROR:Read Access Break Test2"

"ERROR:Write Access Break Test1"

"ERROR:Write Access Break Test2"

"ERROR:Step Break Test"

"ERROR:Execute Break Test2"

The break function does not operate.   The target device may be damaged.
Exchange the target device.

6.   DOCUMENT CORRECTION

The following items have been modified in the ID78K0-QB V2.81 Operation User's Manual.

- **Addition and Modification in "6.2 Explanation of Windows" in CHAPTER 6 WINDOW REFERENCE**

♦ Configuration dialog box

(3) Main Clock indicates "When MINICUBE is connected, this area is fixed to Clock Board and cannot be selected because the clock that is output from the clock socket or supervisor on the emulator is used as the main clock source."; but "System" can also be selected.

The display of the area described in (6) Peripheral Break is now not dimmed and can be selected.

Break	When IECUBE is connected, all the peripheral function operations are stopped during a break. When MINICUBE is connected, operations other than those below are stopped during a break. • 8-bit timer/event counter 50

Non Break	Operations other than the following peripheral functions are continued during a break (default).
	  • Watchdog timer
	  • 8-bit timer H1 (operation stopped only when the Ring-OSC clock is selected).

A supplement for the reset operation according to the combination of the setting in **(9) Target Power Off** and the setting of "TARGET RESET" in **(11) Mask** is described below.   The Target Power Off setting can be selected only when MINICUBE is connected.

Setting in Target Power Off Field	Setting in TARGET RESET	Reset Operation Resulted
"Permit" selected	Selected	Reset operation is performed.
"Permit" selected	Not selected	The program runs immediately after the reset operation.
"Not Permit" selected	Selected	Reset operation is not performed.
"Not Permit" selected	Not selected	The program runs immediately after the reset operation (when IECUBE is connected). A break occurs immediately after the reset operation (when MINICUBE is connected).

The setting in **(10) Fail-safe Break** is possible only when IECUBE is connected.
In addition, the Fail-safe Break dialog box can be used only when IECUBE is connected.

♦ Event dialog box
Among the items in the drop-down list in **(3) Access Size**, "Word" and "No Condition" can be selected only when IECUBE is connected.

The address value when banks are not used in **(4) Address** is "$0 \leq$ address value $\leq$ 0xFFFF" when IECUBE is connected (as is described in the user's manual), but it is "$0xF800 \leq$ address value $\leq$ 0xFFFF" when an access event occurs when MINICUBE is connected.

Among the items in the drop-down list in **(4) Address**, "No Condition" can be selected only when IECUBE is connected.
In addition, the description of **Caution** ("No Condition" can be specified to be either address condition ((a) Address) or data condition ((a) Data)) in **(5) Data, Mask** only applies when IECUBE is connected.

♦ About dialog box

　The "OCD Control Code version" has been added for when MINICUBE is connected.

- **Modification in "7.11 Explanation of Commands" in CHAPTER 7 COMMAND REFERENCE**

Among the options specified for "breakpoint", "-size" and "-pass" can be selected only when IECUBE is connected.

- **Addition and Modification in "D.3 Message Lists" in APPENDIX D MESSAGES**

　♦ Addition:

　　　F0b66: Cannot use the break before execution event and the software break at the same time.

　　　F0c33: Disabling the on-chip debug function is prohibited.

　　　F0c34: Writing to the on-chip debug reserved area is prohibited.

　　　Af60a: Incorrect ID Code. Flash memory was erased.
　　　　　　　Abort the debugger.

　　　Af60b: Disabled ID Code. Flash memory was erased.
　　　　　　　Abort the debugger.

　　　Ff603: Incorrect ID Code.

　　　Af604: Incorrect ID Code.
　　　　　　　Abort the debugger.

　♦ Correction:

　　　Incorrect: F0316: Overfloewd the number of mapping.
　　　Correct: F0316: Overflowed the number of mapping.

　　　Incorrect: F0ca2: Device file which does not correspond to on tip debug.
　　　Correct: F0ca2: This device file does not include the on-chip debug information.

　　　Incorrect: F0ca3: Information that it does not support is included in on tip debug information
　　　　　　　　　　　on device file.
　　　Correct: F0ca3: Unsupported information is included in the on-chip debug information in the
　　　　　　　　　　　device file.

　　　Incorrect: F0ca4: Device file which does not correspond to IECUBE.
　　　Correct: F0ca4: This device file does not include the IECUBE information.

7. REVISION HISTORY

- 1st edition (issued on March 26, 2004, SUD-DT-04-0156)
- 2nd edition (issued on April 15, 2004, SUD-DT-04-0156-1) (this document)
  - Addition of **3.5**
  - Addition of (1) Flash memory area and (2) Internal high-speed RAM area to **3.6.1**
  - Change of "flash writing" to "flash memory writing" in **3.6.8**
  - Addition of **3.6.9** and **3.6.10**
  - Change of description in **3.6.11**
  - Addition of **3.6.12**
  - Addition of **3.7**
  - Addition of No.9 to No.11 to **4.1** and **4.2**
  - Change of "MINICUBE Checker" to "OCD Checker" in **5.2** and **5.3**
  - Deletion of description "The field located on the right side of this button is blank when the MINICUBE self-check tool is activated for the first time, so specify any file name" from (1) log file button in **5.3**
  - Addition of "(6) Peripheral Break" to **Configuration dialog box** in **section 6**
  - Addition of description "The Target Power Off setting can be selected only when MINICUBE is connected." in (9) Target Power Off in **Configuration dialog box** in **section 6**
  - Deletion of description of **Extended Option dialog box** in **section 6**