NEC

# Supplement

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ID78K0R-QB User's Manual

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**[Description]**
(1) **<p.45>** Modify Remark in chapter "**5.3.3 Mixed display mode (Source Window)**"

<Previous>

**Remark:** When scrolling is performed using the cursor keys in the Mixed display mode, excessive scrolling may occur. Also, scrolling down to the last line may not be possible using the cursor keys.

<New>

***Remark:*** ***The disassemble section cannot be edited in the Source window even if the Source window is set to the mixed display mode. Edit the disassemble section in the Assemble window.***

(2) **<p.46>** Deletion of conversion symbol in "**Table 5-5 Specifying symbols**"

<Previous>

Table 5-5 Specifying Symbols

| Conversion Target | Specification Method |
|---|---|
| Variable | var<br>file#var (to specify a static variable with file name)<br>func#var (to specify a static variable with function name)<br>file#func#var (to specify a static variable with file name and function name) |
| Function | func<br>file#func (to specify a static function with file name) |
| Label | label<br>file#label (to specify a local label with file name) |
| EQU symbol | equsym<br>file#equsym (to specify a local EQU symbol with file name) |
| Bit symbol | bitsym<br>file#bitsym(to specify a local bit symbol with file name) |
| Line number of source file | file#no<br>prog$file#no |
| I/O port name | portname |
| SFR name | sfrname |
| Register name | regname |
| PSW flag name | pswname |

<New>

Table 5-5 Specifying Symbols

| Conversion Target | Specification Method |
|---|---|
| Variable | var<br>file#var (to specify a static variable with file name)<br>file#func#var (to specify a static variable with file name and function name) |
| Function | func<br>file#func (to specify a static function with file name) |
| Label | label<br>file#label (to specify a local label with file name) |
| EQU symbol | equsym<br>file#equsym (to specify a local EQU symbol with file name) |
| Bit symbol | bitsym<br>file#bitsym(to specify a local bit symbol with file name) |
| Line number of source file | file#no<br>prog$file#no |
| I/O port name | portname |
| SFR name | sfrname |
| Register name | regname |
| PSW flag name | pswname |

(3) **<p.50>** Modify Caution in chapter "**(2) Software break**"

<Previous>

**Caution:** If a software break is set to the execution start address in order to re-execute the code in the execution start address, the following events which are set to the address are not generated. **[IECUBE]**
(1) Start of section trace
(2) Start of section measurement
(3) Trace delay trigger
(4) Event after execution
(5) Access event
To re-execute the code in the execution start address, use a break for the event before execution.

<New>

**Caution 1:** If a software break is set to the execution start address in order to re-execute the code in the execution start address, the following events which are set to the address are not generated. **[IECUBE]**
(1) Start of section trace
(2) Start of section measurement
(3) Trace delay trigger
(4) Event after execution
(5) Access event
To re-execute the code in the execution start address, use a break for the event before execution.

***Caution 2:*** ***Do not overwrite programs in which a software break has been set to the internal 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, use software breaks to set breaks to programs in the RAM area.***

(4) **<p.84>** Changes in chapter "**5.15 DMM Function [IECUBE]**"
**<p.84>** Third line in **remark**
**<p. 199> (3) Break When Write**

<Previous>

<1><p.84>
**5.15 DMM Function [IECUBE]**

<2><p.84>
**Remark:** After "Break When Write" is selected in the DMM Dialog Box, DMM (pseudo DMM) by software simulation is selectable (execution of the user program momentarily breaks upon a write).
If an area for which a real-time write is not permitted (register or SFR) is specified in the DMM Dialog Box, the setting is fixed to pseudo DMM.

<3><p.199>
Select this item when performing DMM via software emulation (pseudo DMM function) (this item is not selected by default).

<New>

<1><p.84>
***5.15 DMM Function***

<2><p.84>
**Remark:** After "Break When Write" is selected in the DMM Dialog Box, DMM (pseudo DMM) by software simulation is selectable (execution of the user program momentarily breaks upon a write).
If an area for which a real-time write is not permitted (register or SFR) is specified in the DMM Dialog Box, ***or when MINICUBE2 is used***, the setting is fixed to pseudo DMM.

<3><p.199>
Select this item when performing DMM via software emulation (pseudo DMM function) (this item is not selected by default). ***When MINICUBE2 is used, however, this item is always selected.***

(5) **<p.112>** Modifiy **Remark**

<Previous>

**Remark:** If the screen resolution is low (800 - 600, etc.), all the statuses may not be displayed on the status bar.

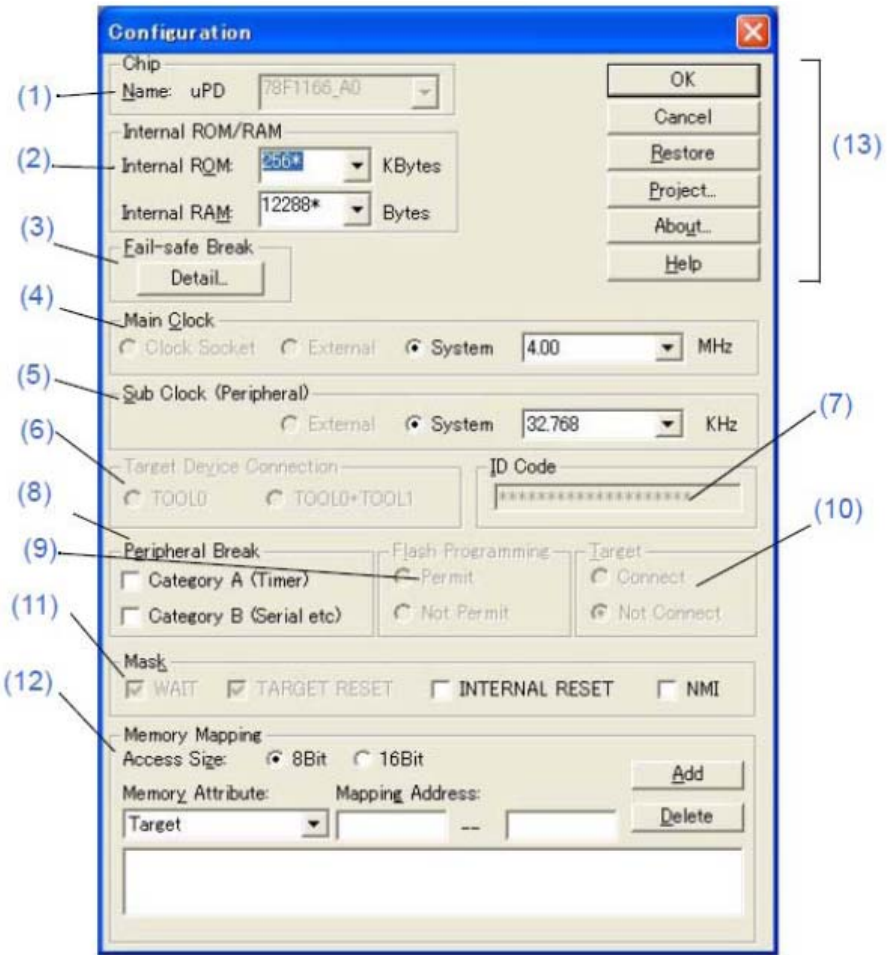
<New>

**Remark:** If the screen resolution is 800 × 600 or lower, some statuses are not displayed.
***With 800 × 600, for example, the enclosed area in the following figure will not be displayed***.

(6) **<p.115>** Change in Configuration dialog box

<Previous>

<1><p.115>
**Figure 6-5 Configuration dialog box**




<2><p.116>
Description in **(1) Chip**

This area is used to select the chip name. A chip name is selected from the drop-down list. On the drop-down list, only the chip names registered to the registry from the device file installer are displayed.
This area can be specified only when the debugger is started up.

<3><p.117>
Description in **(6) Target Device Connection [MINICUBE2]**

This area is used to select the port to be connected for serial communication between MINICUBE2 and the device on the target system.

The 1-wire mode (TOOL0) and 2-wire mode (TOOL0 + TOOL1) are supported as the communication interface.
If the 2-wire mode (TOOL0 + TOOL1) is selected, (1) Use MINICUBE Extended Function [MINICUBE2] in the Extended Option dialog box becomes selectable.
The type of port that can be selected depends on the device used.

This area can be specified only when the debugger is started up.

<4><p.118>
**(8) Peripheral Break**

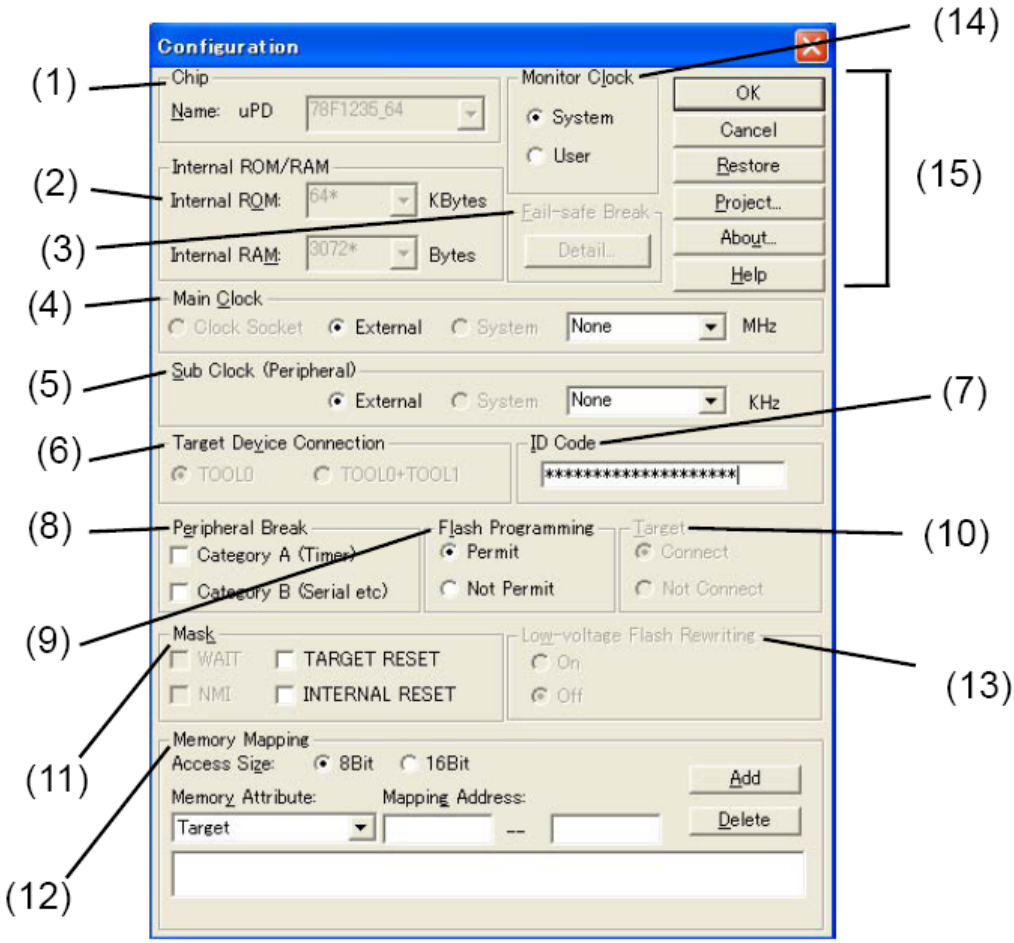
<5><p.120>
Above **(13) Function buttons**

<6><p.120>
Below **(13) Function buttons**

<7><p.120>
Item number of **(13) Function buttons**

<New>

<1><p.115>
**Figure 6-5 Configuration dialog box**




<2><p.116>
Description in **(1) Chip**

This area is used to select the chip name. A chip name is selected from the drop-down list. On the drop-down list, only the chip names registered to the registry from the device file installer are displayed. This area can be specified only when the debugger is started up.
***(After the debugger is started, this area appears dimmed and the setting cannot be changed.)***
***If a project file to which a different chip is specified is loaded after the debugger startup, the chip name specified in the project file is ignored.***

<3><p.117>
Description in **(6) Target Device Connection [MINICUBE2]**

This area is used to select the port to be connected for serial communication between MINICUBE2 and the device on the target system.
The 1-wire mode (TOOL0) and 2-wire mode (TOOL0 + TOOL1) are supported as the communication interface. The type of port that can be selected depends on the device used. This area can be specified only when the debugger is started up.
***If the 1-wire mode (TOOL0) is selected, the RRM function can be set to the 1-wire mode (TOOL0) in the Extended Option dialog box. For details, refer to the descriptions of Extended Option dialog box.***

<4><p.118>
**(8) Peripheral Break**

***Caution: If the target device is the 78K0R/Ix3, the open break function is enabled by selecting Category A.***
***The open break function is used to set to Hi-Z the timer pins, which control a motor, so as to stop the motor safely if the motor control signal is not fed back due to CPU stoppage (break) and the signal may have an adverse effect on the motor.***
***The device and pins subject to manipulation by the open break function are listed in the following table. When the open break function is used, the motor stops upon a break and thus the program cannot be re-executed. In such a case, reset the CPU.***

| Target Device | Function | Target Pins |
|---|---|---|
| 78K0R/Ix3 | 6-phase PWM output function | TO02, TO03, TO04, TO05, TO06, TO07 |
| | Triangular wave PWM output function | TO02, TO03, TO06, TO07 |

<5><p.120>
Above **(13) Function buttons**

***(13) Low-voltage Flash Rewriting [MINICUBE2]***
***This area is used to select whether to enable flash rewriting at 1.8 V or higher. (Applicable to 78K0R/Kx3-L only)***

| | |
|---|---|
| On | Enables downloading of load module files or software break rewriting at 1.8 V or higher. |
| Off (default) | Enables rewriting at 2.7 V or higher. |

<6><p.120>
Below **(13) Function buttons**

**(14) Monitor Clock**
This area is used to select whether to use the high frequency for the monitor program during a break.

| | |
|---|---|
| System (default) | Switch the clock to the high frequency one for the monitor program during a break (default). This accelerates the processing (such as displaying variables) during a break.<br>**Caution:** The ID78K0R-QB manipulates the CKC, RMC and CSC registers. The frequency is reset to the original value when the execution returns to the user's program. |
| User | Does not switch the frequency for the monitor program during a break. However, rewriting to the flash memory cannot be performed if the frequency is too low. Therefore, the frequency is switched when rewriting must be performed, such as when downloading a load module file. |

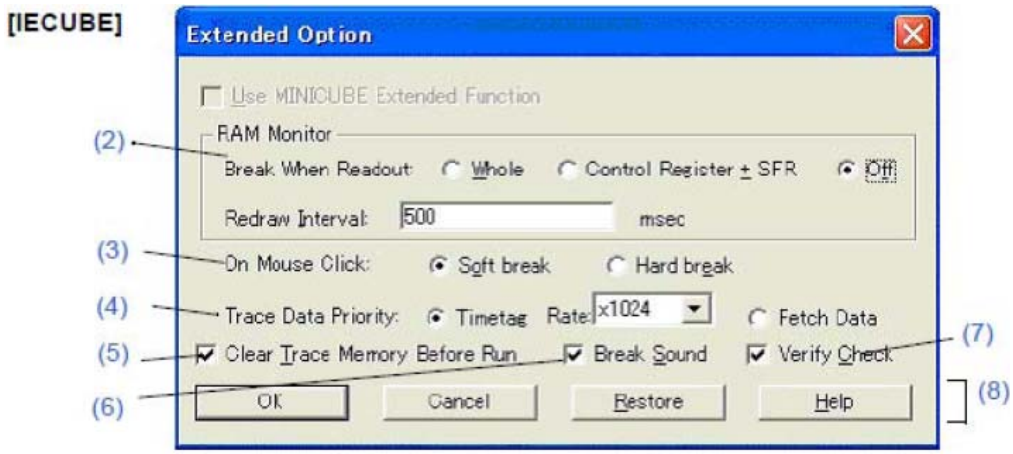
<7><p.120>
Item number of **(13) Function buttons**

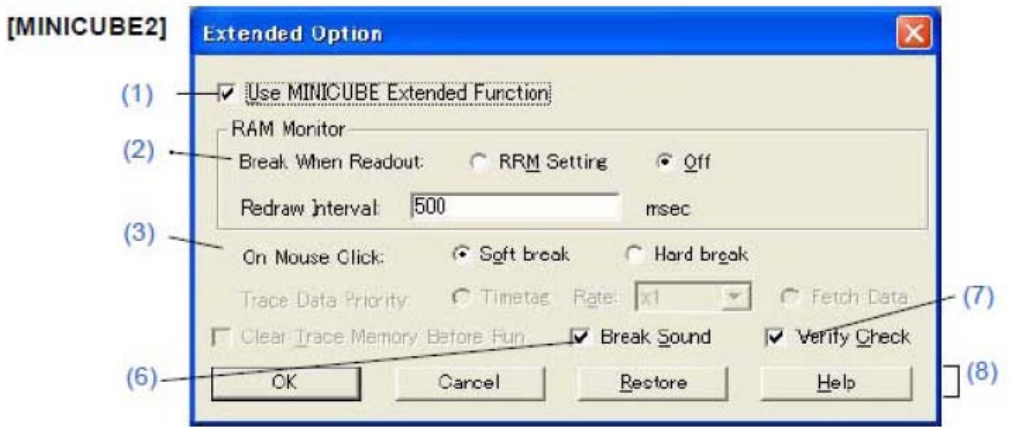
***(15)*** **Function buttons**

(7) **<p.121>** Change in Extended Option dialog box

<Previous>

<1><p.121>
**Figure 6-6 Extended Option Dialog Box**




<2><p.122>
**(1) Use MINICUBE Extended Function [MINICUBE2]**
To use the MINICUBE Extended Function, this area is selected.
If this item is selected, the RRM function is enabled, (2) RAM Monitor can be selected.

<3><p122 to p.124>
**(2) RAM Monitor**
**(3) On Mouse Click:**
**(4) Trace Data Priority [IECUBE]**
**(5) Clear Trace Memory Before Run [IECUBE]**
**(6) Break Sound**
**(7) Verify Check**
**(8) Function buttons**

<4><p.122>
**(2) RAM Monitor**
This area is used to set about RAM monitor function. (Refer to "5.14 RRM Function".)
If (1) Use MINICUBE Extended Function [MINICUBE2] is selected, this area can be selected.
[MINICUBE2]

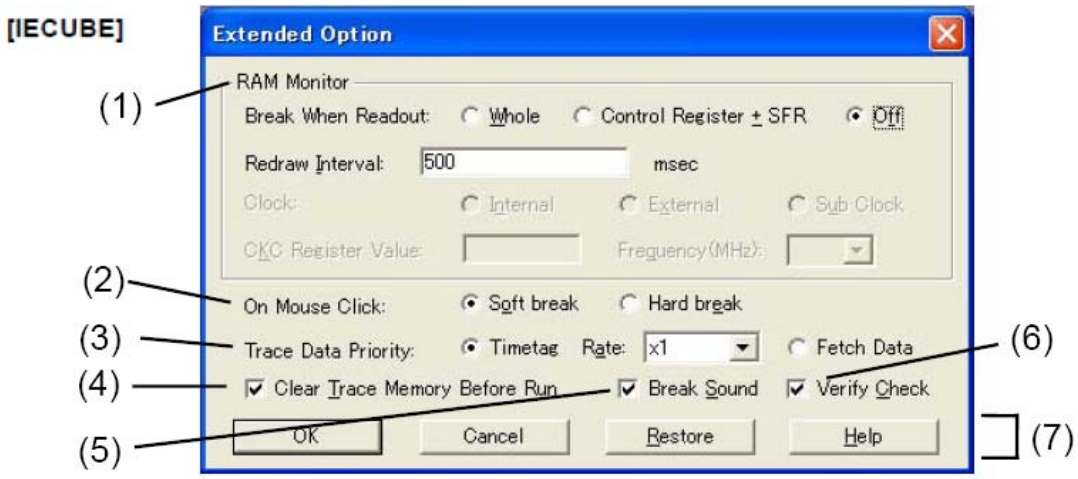
| | | |
|---|---|---|
| Break When Readout: | Select this item to specify the target range of RAM sampling by instantaneously generating a break in the user program execution. (Refer to "5.14.2 Pseudo real-time monitor function (Break When Readout)".) The area where sampling by the real time monitor function is possible doesn't become it within this range of the object. (Reading by the real time monitor function is always done.) (Refer to "Table 5-19 Areas for Which Sampling Can Be Performed with Real-time Monitor Function".) Select " Off " if execution of the user program will not be stopped momentarily to perform sampling. | |
| | Whole<br>**[IECUBE]** | Whole memory space.<br>The user program execution is stopped for a long time when a large number of windows are opened because the range from which memory is read out is wid. |
| | Control Register + SFR<br>**[IECUBE]** | Control registers and SFR area (except PC) |
| | RRM Setting<br>**[MINICUBE2]** | Specified area in the RRM Setting dialog box. |
| | Off | Pseudo real-time monitor function (Break When Readout) is disabled.<br>Memory areas other than internal ROM and internal RAM areas and PC values are displayed as "**". |
| Redraw Interval: | Specify the sampling interval of the real-time monitor function. (Refer to"5.14.1 Realtime monitor function [IECUBE]".)<br>It can be specified in 100-ms units from 0 to 65500.<br>If 0 is specified, or if this area is blank, the data is not displayed in real time. | |

<New>

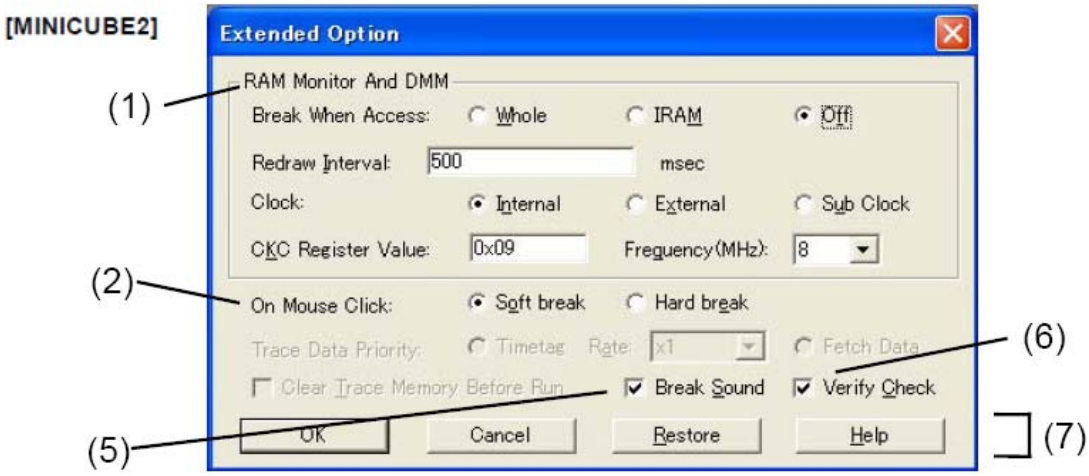
<1><p.121>
The IRAM option button (for [MINICUBE2] only) and items Clock, CKC Register Value, and Frequency have been added to the RAM Monitor area.

**Figure 6-6 Extended Option Dialog Box**

[IECUBE]




[MINICUBE2]




<2><p.122>
Deleted

<3><p.122 to p.124>
***(1)* RAM Monitor [IECUBE] and *RAM Monitor And DMM* [MINICUBE2]**
***(2)* On Mouse Click:**
***(3)* Trace Data Priority [IECUBE]**
***(4)* Clear Trace Memory Before Run [IECUBE]**
***(5)* Break Sound**
***(6)* Verify Check**
***(7)* Function buttons**

<4><p.122>
***(1)* RAM Monitor *[IECUBE] and RAM Monitor And DMM [MINICUBE2]***
***This area is used to set RAM monitor functions, and DMM functions (for MINICUBE2 only).***
***(Refer to "5.14 RRM Function" and "5.15 DMM Function".)***

***Caution 1: If the pseudo real-time monitor function is used while the Memory window is open, the operability is degraded significantly (due to an excessive amount of communication data).***
***When using the pseudo real-time monitor function, therefore, closing the Memory window is highly recommended. [MINICUBE2]***

***Caution 2: The Clock option buttons are used to select the CPU operation clock for RAM monitoring. This setting determines the communication speed, so the CPU operation clock cannot be changed during RAM monitoring. [MINICUBE2]***

| | | |
|---|---|---|
| Break When Readout: **[IECUBE]**<br>Break When Access: **[MINICUBE2]** | Select this item to specify the target range of RAM sampling by instantaneously generating a break in the user program execution. (Refer to "5.14.2 Pseudo real-time monitor function (Break When Readout)".)<br>The area where sampling by the real time monitor function is possible doesn't become it within this range of the object. (Reading by the real time monitor function is always done.) (Refer to "Table 5-19 Areas for Which Sampling Can Be Performed with Real-time Monitor Function".)<br>Select " Off " if execution of the user program will not be stopped momentarily to perform sampling. | |
| | Whole | Whole memory space **[IECUBE]**<br>Internal RAM, general-purpose registers and SFRs **[MINICUBE2]**<br>When this function is used, the user program execution is stopped for a long time if the memory range subject to read is wide or several windows are open. |
| | Control Register + SFR **[IECUBE]** | Control registers (except the PC) and SFR area |
| | IRAM **[MINICUBE2]** | Internal RAM area and SFR area |
| | Off | Sampling is not performed during user program execution.<br>Values other than those read from the internal ROM, internal RAM and PC values are displayed as "**". |
| Clock **[MINICUBE2]**<br>Available in 1-wire mode (Tool0) only | Internal | Selects internal high-speed oscillator. |
| | External | Selects external clock. |
| | Sub Clock | Selects subsystem clock. |
| CKC Register Value **[MINICUBE2]**<br>Available in 1-wire mode (Tool0) only | Sets the CKC value for RAM monitoring.<br>Selectable only when 1-wire mode (Tool0) is selected. | |
| Frequency (MHz) **[MINICUBE2]**<br>Available in 1-wire mode (Tool0) only | Sets the frequency used during RRM when the internal high-speed oscillator is used.<br>Selectable only when 1-wire mode (Tool0) is selected. | |
| Redraw Interval: | Specify the sampling interval of the real-time monitor function. (Refer to "5.14.1 Realtime monitor function [IECUBE]".)<br>It can be specified in 100-ms units from 0 to 65500.<br>If 0 is specified, or if this area is blank, the data is not displayed in real time. | |

(8) **<p.133>** Addition of cautions to **"(1) Source Path"** below Remark 3"

<Previous>

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<New>

***Caution 1:*** ***When a project file is open, the [Base:] setting specifies a folder to which the project file has been loaded. Even if a load module file is downloaded from another folder, the source file is therefore searched for from the folder to which the project file has been loaded.***
***The following shows an example.***
***C:\TEST\ ←Folder to which the project file has been loaded***
***D:\TEST\TEST.LMF ←Downloaded load module file***
***Under such conditions, if source files with the same name exist under both C:\TEST\ and D:\TEST and D:\TEST\TEST.LMF is downloaded, the source file stored under C:\TEST\ is opened.***

***Caution 2:*** ***When a project file is not open and the source path has been set to the text box, the source file is searched for from the folder set as the source path even if a load module file is downloaded from a folder different from the one set as the source path.***
***The following shows an example.***
***C:\TEST\ ←Folder set as the source path***
***D:\TEST\TEST.LMF ←Downloaded load module file***
***Under such conditions, if source files with the same name exist under both C:\TEST\ and D:\TEST and D:\TEST\TEST.LMF is downloaded, the source file stored under C:\TEST\ is opened.***

(9) **<p.139>** Change description of [File name] in **”(1) Save file setting area”**

<Previous>

Up to 257 characters string with an extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(10) **<p.140>** Change description of [File name] in **”(1) Load file setting area”**

<Previous>

Up to 257 characters string with an extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(11) **<p.142>** Change descriptions of [File name] in **"(1) Load file setting area"** and **"(2) Load"**

<Previous>

**(1) Load file setting area**
[File name] Up to 257 characters string with a extension can be specified.

**(2) Load**
Sets a load condition.
This setting is valid only if a file in the load module format is specified.

<New>

***(1) Load file setting area***
***[File name] A string of up to 259 characters with a path name and an extension can be specified.***

***(2) Load***
***Sets a load condition.***
***This setting is valid only when downloading a load module file.***
***(If an item other than "Load Module" is selected as a file type, the [Load] area appears dimmed and the setting becomes invalid. Even if "Load Module" is selected as a file type, the [Load] area setting is ignored if a file other than a load module file (such as a hex file) is specified as a file type by directly typing it.)***

(12) **<p.144>** Change description of [File name] in **“(1) Upload file setting area”**

<Previous>

Up to 257 characters string with an extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(13) **<p.153>** Add remark below the **"Context menu table"**

<Previous>

-

<New>

***Remark 1:*** ***When code that includes too many instructions in one line exists in the Source window (cases such as one line being repeatedly executed), step-wise execution of this one line takes time. As a result, processing of step-wise execution may be aborted in mid-flow. If aborted, the execution is suspended in the middle of the source line.***

***The following shows an example:***

```
int i;

for(i = 0; i < 10000; i ++){}
```

***In the above example, the for statement in the second line is intended to repeat instruction processing 10,000 times. If such code is executed, processing of step-wise execution may be aborted mid-flow.***
***This does not apply if the processing involves multiple lines. In the above example, the following code can avoid the case.***

```
int i;

for(i = 0; i < 10000; i ++){}
```

***In this case, if step-wise execution is performed for the for statement in the second line, the current PC line moves to "}" in the fourth line, step-wise execution of the fourth line is performed, and then the current PC line moves again to the second line.***
***The number of instructions performed in one step-wise execution is reduced, so step-wise execution processing is not aborted.***

***Remark 2:*** ***When step-wise execution completes processing of the last prologue ("}") of the main function in the Source window, processing seems as if it returns to the beginning of the main function.***
***Since the main function is called from the startup routine, the current PC line moves to the startup routine after main function processing is completed. If the PC is in the startup routine, the current PC line is placed at the beginning of the main function in the Source window.***

(14) **<p.154>** Change description of [Find What] in **“(1) condition specification area”**

<Previous>

This area is used to specify the data to be searched. (Up to 256 character.)

<New>

***This area is used to specify the data to be searched. (Up to 150 characters.).***

(15) **<p.159>** Add description of **"(4) Disassemble display area"**

<Previous>

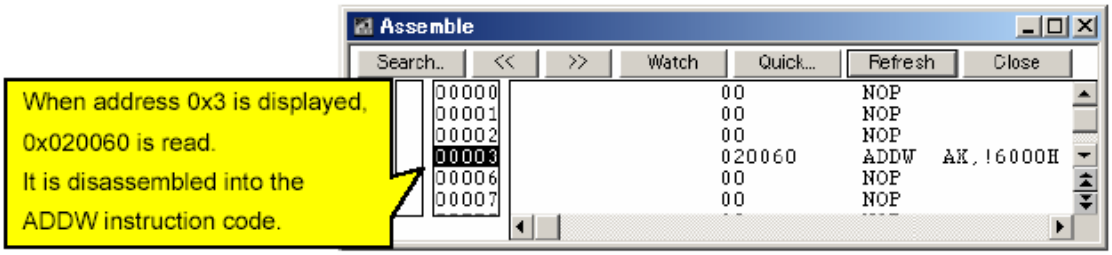
-

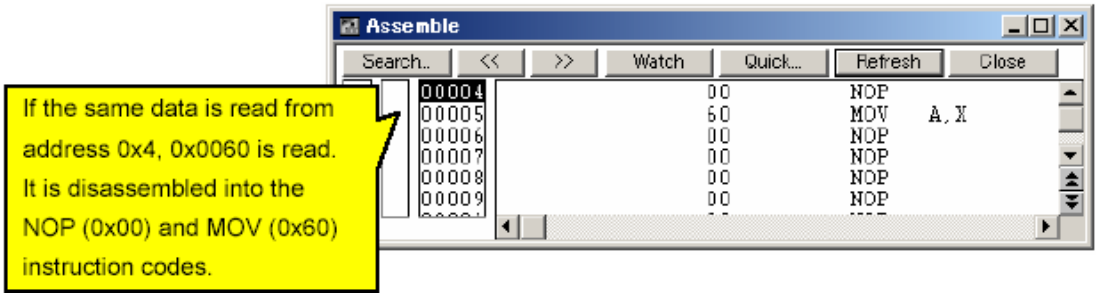
<New>

***Remark 1:*** ***When displaying an SFR access instruction while an SFR with another name exists at the address where the accessed SFR exists, an SFR with a different name may be displayed in the disassemble display area.***

***Remark 2:*** ***The disassemble display is a function for reaing data at each address and converting it into assembly code. (With the ID78K0R-QB, for example, "0x00" is read and it is converted into "nop".)***
***Since the instruction length may be multiple bytes, the disassemble data may not be displayed correctly under the circumstances where the start address of an instruction cannot be identified correctly.***

***The following shows an example of disassemble display output by the ID78K0R-QB.***




***Conditions where the start address of an instruction cannot be identified correctly include the following.***

- ***If an address different from the start address of the instruction is specified in the Address Move dialog box. (Above example)***
- ***A range that includes areas where no instructions are written (such as data area) is displayed.***
- ***The window is scrolled up (toward lower addresses) for 500 bytes (equivalent to 0x200) or more.***

***If the display becomes incorrect as a result of scrolling the window up, click the [Refresh] button, or select the [Move...] command from the context menu to move to the start address of the instruction.***

(16) **<p.154>** Add remark to **"Figure 6-23 Assemble Search Dialog Box"** and description of [Find What] in **"(1) Search condition specification area"**

<Previous>

This area is used to specify the data to be searched. (Up to 256 character.)

<New>

***Remark:*** ***Search cannot be performed during program execution. (The function button appears dimmed.)***

***This area is used to specify the data to be searched. (Up to 150 characters.).***

(17) **<p.171>** Change/Add **Remark 1**
**<p.171>** Change/Add remark above **Figure 6.27**
**<p.173>** Change/Add caution
**<p.175>** Change/Add remark below **Context menu table**

<Previous>

**<p.171>**

**Remark 1:** If a local variable and a global variable exist with the same name, the local variable takes priority.

**<p.171>**

**Remark 2:** A maximum of 10,000 lines can be displayed in the Watch Window.

**<p.173>**

-

**<p.175>**

-

<New>

**<p.171>**

***Remark 1:*** ***If a local variable and a global variable exist with the same name, the local variable takes priority.***
***Remark 2:*** ***When a variable is referenced in the Watch window during program execution, the data currently being changed may be displayed at the timing of the variable change.***

**<p.171>**

***Remark 3:*** ***A maximum of 10,000 lines can be displayed in the Watch Window.***
***Remark 4:*** ***Multiple lines cannot be selected in the Watch Window.***

**<p.173>**

***Caution:*** ***Even if Hex is selected for Radix in the Watch Default field in the Debugger Option dialog box, the number of array variables is not displayed in hexadecimal in the Watch window. (The following shows examples when array “ary" is displayed.)***
***Desired display example:***

- ***ary [0x2]*** ***←Hexadecimal***
- ***ary[0x0]*** ***←Hexadecimal***
- ***ary[0x1]*** ***←Hexadecimal***

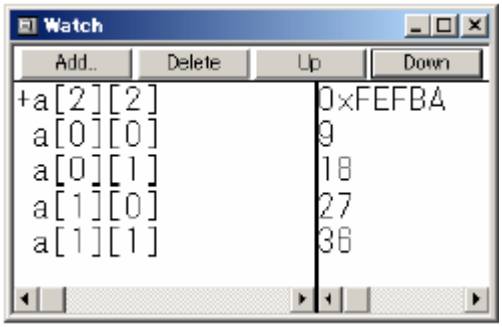
***Actual display example:***

- ***ary [0x2]*** ***←Decimal***
- ***ary[0x0]*** ***←Hexadecimal***
- ***ary[0x1]*** ***←Hexadecimal***

**<p.175>**

***Remark:*** ***If elements such as structures and arrays are registered in the Add Watch dialog box and they are referenced in the Watch window, the display with which each member is displayed and the display radix setting are not saved in the project file. To save these items to the project file, each member must also be registered in the Add Watch dialog box.***
***The following is an example of saving the display for each member of the array "a" shown below.***
***char a[2][2];***
***Register the array "a" in the Add Watch dialog box and then display its members in the***
***Watch window; the following display appears. Even if this state is saved in the project file and the project file is reloaded, the members are not displayed.***


***To save the state with members displayed, register in the Add Watch dialog box the members to be displayed. In this example, register not only the array "a", but also its members "a[0][0]", "a[0][1]", "a[1][0]", and "a[1][1]". By taking this measure, the following display can be saved.***




***Caution:*** ***When Auto variables are used to display local variables, accurate values cannot be displayed at a prologue (“{”) or epilogue (“}”) of a function.***
***(The Auto variable addresses are the relative addresses from the address pointed to by the stack pointer (SP), so their addresses are not determined until the SP value is determined in the function. The SP is manipulated via prologues or epilogues, so the accurate value cannot be displayed.)***

(18) **<p.183>** Add caution to table **"(1) Local variable display/variable value changing area"**

<Previous>

-

<New>

***Caution:*** ***When Auto variables are used to display local variables, accurate values cannot be displayed at a prologue ("{") or epilogue ("}") of a function.***
***(The Auto variable addresses are the relative addresses from the address pointed to by the stack pointer (SP), so their addresses are not determined until the SP value is determined in the function. The SP is manipulated via prologues or epilogues, so the accurate value cannot be displayed.)*** ***Open the project file.***

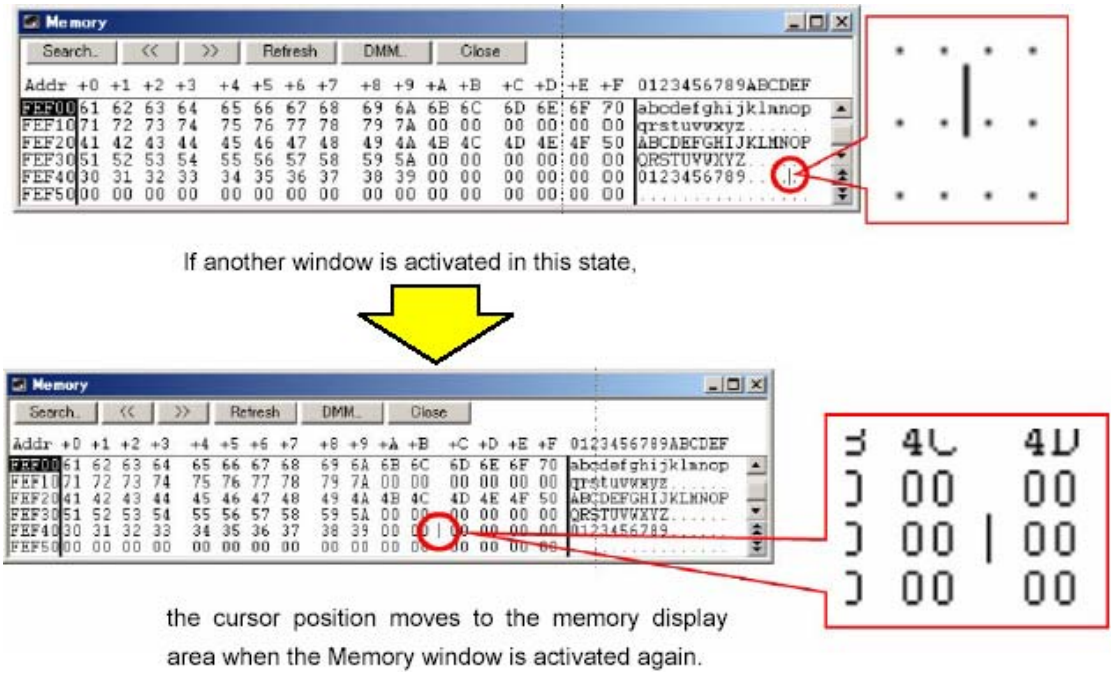
(19) **<p.189>** Change remark below **"(3) 0 1 2 3…."**

<Previous>

**Remark:** When the display address is changed, the position of the cursor in the ASCII display area is not synchronized.

<New>

**Remark:** If a window is activated and then the Memory window is activated while the cursor is placed in the ASCII display area, the cursor position moves to the memory display area.



(20) **<p.192>, <p.193>** Changes in **“Memory Search dialog box”**

<1><p.192>
Below caution
<2><p.193>
Description of [Find What] in **(1) Search condition specification area**
<3><p.193>
Description of [Find What] (When searching in ascii display area) in **(1) Search condition specification area**

<Previous>

<1>
–
<2>
This area is used to specify the data to be searched. (Up to 256 character.)
<3>
Up to 256 characters can be specified.

<New>

***<1>***
***Remark:*** ***Search cannot be performed during program execution. (The function button appears dimmed.)***
***<2>***
***This area is used to specify the data to be searched. (Up to 150 character.)***
***<3>***
***Up to 150 characters can be specified.***

(21) **<p.203>, <p.204>, <p.205>** Changes in **"Memory Search dialog box"**

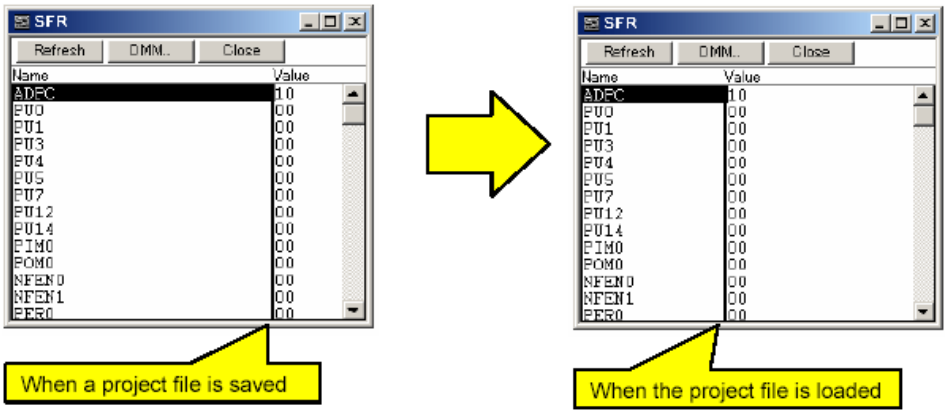
<1><p.203>
Below **Remark 2**
<2><p.204>
Description of [Attribute] area in **(1) SFR display/change area**
<3><p.204>
Below the description table of **(1) SFR display/change area**
<4><p.205>
Description of [Move…] in **Context menu**

<Previous>

<1>
–
<2>
It can be specified whether this area is displayed or not, by selecting [View] menu -> [Attribute].
<3>
–
<4>
Opens the Address Move dialog box.

<New>

***<1>***
***Remark 3: Multiple lines cannot be selected in the SFR window.***
***<2>***
***It can be specified whether this area is displayed or not, by selecting [View] menu -> [Attribute]Note.***
***<3>***
***Note: If the [Attribute] area is hidden, the information of the vertical boundary position in the SFR window is not stored into the project file. As a result, the vertical boundary position will not be restored when the project file is loaded.***




***<4>***
***Opens the Address Move dialog box.***

***If an SFR that satisfies the two conditions shown below exists when an SFR name is input in the Address Move dialog box, the focus does not move to the specified SFR address but may move to the SFR that satisfies these two conditions.***

- ***An SFR whose address is the same as that of the input SFR***
- ***An SFR whose name is different from that of the input SFR***

***SFR names that satisfy the above two conditions include the I/O port names added in the Add I/O Port dialog box.***

(22) **<p.217>, <p.218>** Addition to Trace View window

<1><p.217>
Above **Figure 6-46**
<2><p.218>
Below the description table of **(1) Trace result display area**

<Previous>

-

<New>

***<1>***
***Remark: The traced data cannot be referenced during program execution.***
***<2>***
***Caution: When no trace result is displayed, the Help for the Trace View window is not displayed even if the F1 key on the keyboard is pressed. In such a case, select the [Help] menu →[Current Window] to open the Help.***

(23) **<p.223>** Change in Trace Search dialog box

<Previous>

**Caution:** This dialog box cannot be called if picking up the first M1 fetch frame (BRM1) after program branch is specified using the menu bar or in the Trace Data Select Dialog Box.

<New>

***Caution 1:*** ***This dialog box cannot be called if picking up the first M1 fetch frame (BRM1) after program branch is specified using the menu bar or in the Trace Data Select Dialog Box.***

***Caution 2:*** ***Search can be performed during program execution by executing the Tracer Stop command.***

(24) **<p.223>** Addition of Coverage - Color dialog box after the descriptions of the Code Coverage Window

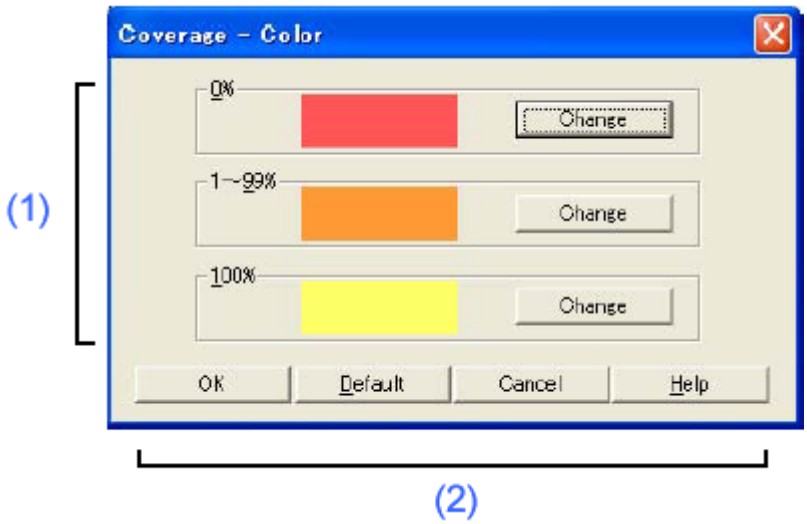
<Previous>

-

<New>

*Coverage - Color dialog box*

*This dialog box is used to select the coverage color to be displayed in the Source window and Assemble window.*




***Opening***

***Click the [Color...] button in the Debugger Option dialog box.***

***Explanation of each area***

***(1) Coverage color setting area***

***Click the [Change] button for 0%, 1~99% or 100% to select the color from the color setting dialog box of a common dialog box.***

***(2) Function buttons***

| | |
|---|---|
| OK | Applies the settings to the Source window or Assemble window and closes this dialog box. |
| Default | Restores the default color for coverage. |
| Cancel | Closes this dialog box without changing colors. |
| Help | Displays the help window of this dialog box. |

(25) **<p.246>** Changes in break before execution **“(2) Event Status”**

<Previous>

**Note:** "Before Execution" can only be set as a break event condition.
4 to 8 Before Execution items can be set. (The number of settable events varies depending on the address and instruction to be set).

<New>

***Note:*** ***"Before Execution" can only be set as a break event condition.***
***4 Before Execution items can be set.***

***Caution:*** ***Breaks before execution can be set to internal ROM only. When setting them during execution, they cannot be set if flash self-programming has been executed.***

(26) **<p.263>** Change of description of [File name] in **(1) Save file setting area** of **View File Save dialog box**

<Previous>

Up to 257 characters string with a extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(27) **<p.269>** Change of description of [File name] in **(1) Load file setting area** of **View File Save dialog box**

<Previous>

Up to 257 characters string with a extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(28) **<p.271>** Change of description of [File name] in **(1) Save file setting area** of **Environment Setting File Save dialog box**

<Previous>

Up to 257 characters string with a extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(29) **<p.272>** Change of description of [File name] in **(1) Load file setting area** of **Environment Setting File Load dialog box**

<Previous>

Up to 257 characters string with a extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(30) **<p.277>** Change of description of [File name] in **(1) Open file setting area** of **Browse dialog box**

<Previous>

Up to 257 characters string with a extension can be specified.

<New>

***A string of up to 259 characters with a path name and an extension can be specified.***

(31) **<p.292>, <p.293>** Addition of –*verbose* option to breakpoint command

<Previous>

-

<New>

***Input format***

***breakpoint -information ?-verbose?***

***Functions***

| | |
|---|---|
| **-verbose** | If specified with -information, the detailed contents of the breakpoint are displayed. |

***Usage example***

***(IDCON) 1 % breakpoint -information -verbose***
***1 Brk00001 enable [S]EX-B [Z]NC [AR]EQ [A]0x10D***

(32) **<p.295>** Addition of *–append* option to download command

<Previous>

-

<New>

Added description:

| | |
|---|---|
| **-append** | Another HEX file is downloaded. |

(33) **<p.316>** Change in description of the *tkcon* command

<Previous>

| | |
|---|---|
| **tkcon buffer ?size?** | Sets and references the maximum buffer size (number of lines) of the console.<br>If the specified buffer size is exceeded, the excessive lines are deleted from the oldest order. |

<New>

| | |
|---|---|
| **tkcon buffer ?size?** | Sets and references the maximum buffer size (number of lines) of the console.<br>If the specified buffer size is exceeded, the excessive lines are deleted from the oldest order. The default buffer size is 1,000 lines. |

(34) **<p.320>** Change in description of the *where* command

<Previous>

## where

where - Stack trace

### Input format

**where**

### Functions

Executes the back-trace of the stack.

### Usage example

(IDCON) 1 % where
1: test2.c#sub2(int i)#13
2: test.c#num(int i)#71
3: test.c#main()#82

<New>

## where

where - Stack trace

### Input format

**where**

### Functions

Executes the back-trace of the stack.
***When the message "---Information below might be inaccurate" is displayed, the subsequent displays may be incorrect.***

### Usage example

***Example 1***

```
(IDCON) 1 % where
1: test2.c#sub2(int i)#13
2: test.c#num(int i)#71
3: test.c#main()#82
```

***Example 2***

```
(IDCON) 1 % where
1: func2.c# func2()#8
---Information below might be inaccurate.
2: func.c# func(register int_i)#34
3: main.c#main()#77
```

(35) Changes in expansion windows

<Previous>

<1><p.326>
**Table A-1 List of Expansion Window (Sample)**

| Window Name | Function |
|---|---|
| List Window | Displays a list of the source files and functions. |
| Grep Window | Searches a character string. |
| Hook Window | Sets the hook procedure. |
| SymInspect Window | Searches through a list of properly described symbols. |

<2><p.331>
After SymInspect Window

-

<New>

<1><p.326>
**Table A-1 List of Expansion Window (Sample)**

| Window Name | Function |
|---|---|
| List Window | Displays a list of the source files and functions. |
| Grep Window | Searches a character string. |
| Hook Window | Sets the hook procedure. |
| SymInspect Window | Searches through a list of properly described symbols. |
| OpenBreak Window | Sets the open break function. |

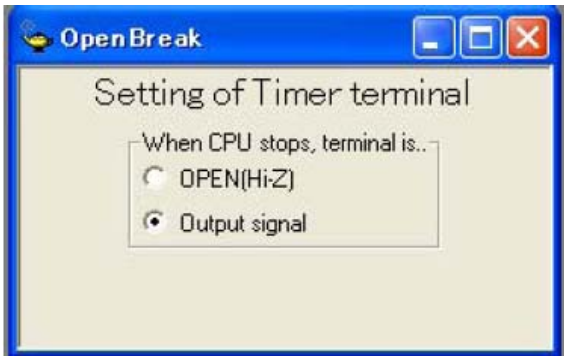
<2><p.331>
After SymInspect Window

***OpenBreak window (addition)***
***This window is used to set the open break function. [IECUBE]***
***The open break function is used to set to Hi-Z the timer pins, which control a motor, so as to stop the motor safely if the motor control signal is not fed back due to CPU stoppage (break) and the signal may have an adverse effect on the motor.***
***The device and pins subject to manipulation by the open break function are listed in the following table. When the open break function is used, the motor stops upon a break and thus the program cannot be re-executed. In such a case, reset the CPU.***

| Target Device | Function | Target Pins |
|---|---|---|
| 78K0R/Ix3 | 6-phase PWM output function | TO02, TO03, TO04, TO05, TO06, TO07 |
| | Triangular wave PWM output function | TO02, TO03, TO06, TO07 |

***The following shows the operation of the OpenBreak window.***

***Figure A-5 OpenBreak Window***




| Bit | Function |
|---|---|
| OPEN [Hi-Z] | The open break target pin becomes the Hi-Z state after the CPU is stopped |
| Output signal | The open break target pin outputs the signal even after the CPU is stopped |

- ***When the open break function is set, keep the OpenBreak window open or minimized. (The setting is cleared when the window is closed.)***
- ***The setting made in the OpenBreak window can be saved into the current project file while the OpenBreak window is open. The setting is restored together with the settings made in other windows when the project file is opened next time.***
- ***The open break target pins are set to the Hi-Z state by selecting "Category A (Timer)" in the Peripheral Break area in the Configuration dialog box. [MINICUBE2]***

(36) **<After APPENDIX B EXPANSION WINDOW>** Addition of "**APPENDIX B CAUTIONS**"

<Previous>

-

<New>

**APPENDIX B CAUTIONS**

This chapter describes general cautions for this product. For details on individual restrictions or cautions, refer to the Operating Precautions document for each product.

(1) Cautions on switching log-on user of Windows XP

If a log-on user is switched using the Windows XP Switch User function while the ID78K0R-QB is starting, the operation of the ID78K0R-QB that was used by the previous user is not guaranteed. The operation of the ID78K0R-QB used by the new user is also not guaranteed. (The ID78K0R-QB prohibits duplicated activation on one computer, but duplicated activation is possible by using the Windows XP Switch User function.)

(2) Cautions related to Windows standby and hibernate modes

If Windows enters standby or hibernate mode while the ID78K0R-QB is starting, the operation of the ID78K0R-QB is not guaranteed after Windows returns from the mode. In such a case, restart the emulator and ID78K0R-QB.

(3) Cautions on changing load module file names

If a project file is saved while PM+ and the ID78K0R-QB are active and the load module file name is changed in PM+, and the debug button of PM+ is clicked while the ID78K0R-QB has not been started, the load module file of the previous name will be downloaded.
If the debug button of PM+ is clicked while the ID78K0R-QB is already started, the load module file of the new name will be downloaded.
If the load module file name is changed, the debug button of PM+ must therefore be clicked while the ID78K0R-QB is already started.
If the ID78K0R-QB is not already started, click the debug button once, start the ID78K0R-QB and then click the debug button again.

(4) Cautions on Return Out execution for recursive functions

If Return Out is executed during processing of a recursive function (function that calls itself), the execution cannot return to the desired position. The operation varies as follows according to how many times the recursive function is called.

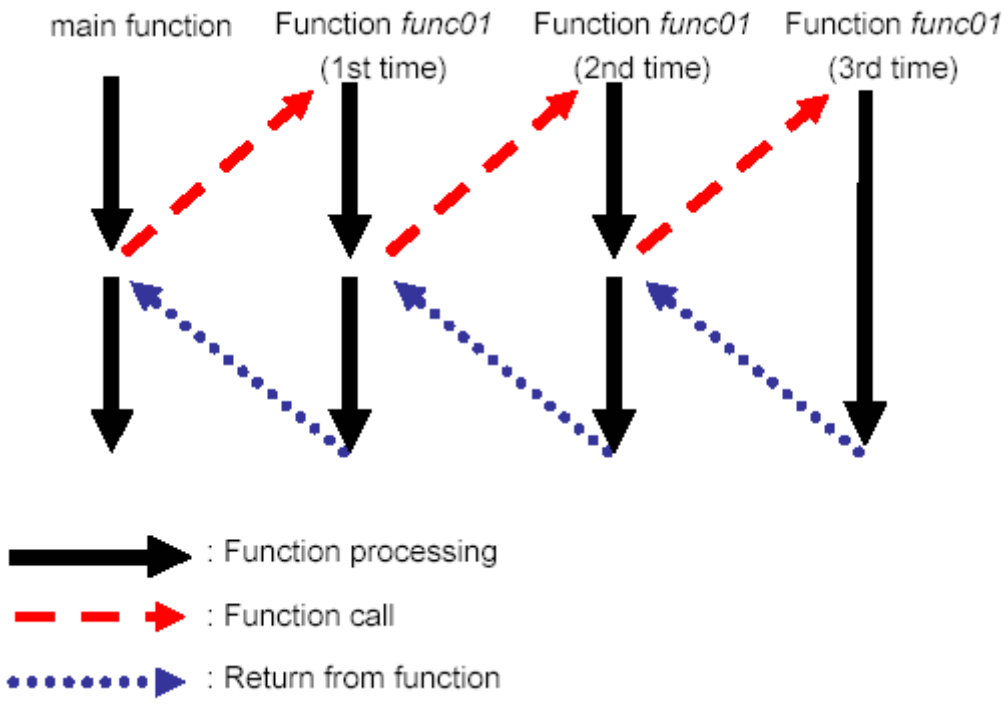
| Current PC Line Before Return Out Execution | Return Out Execution Result |
|---|---|
| During processing of the 1st recursive function | Returns to the position at which the function was called (desired operation). |
| During processing of the 2nd to *n*th recursive function | Breaks during processing of the *n*th recursive function. |
| After processing of the *n*th recursive function ends | Returns to the position at which the function was called (desired operation). |

Even if the execution fails to return correctly, the subsequent program execution is performed correctly.

The following shows an operation example.

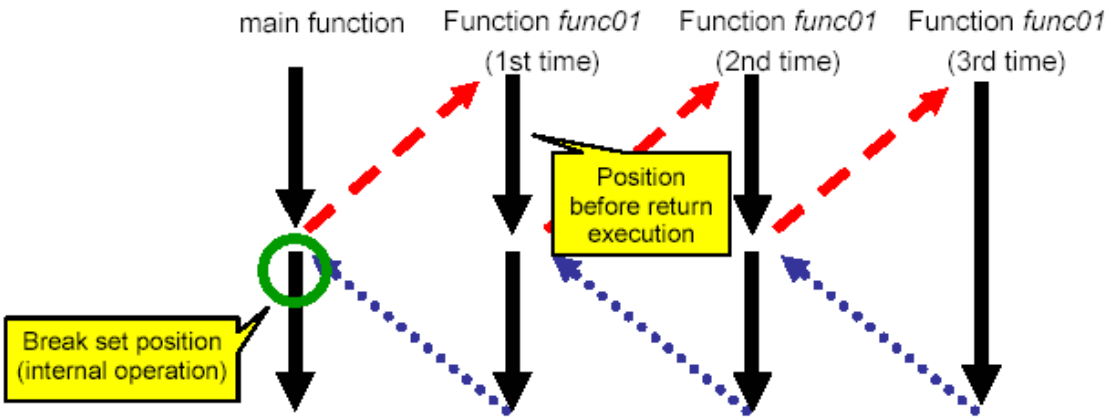
```
void func01(char count)
{
        count --;
        if (count > 0)
        {
                func01(count); /* 2nd and 3rd call */
        }
}

void main(void)
{
        func01(3); /* 1st call */
}
```

In this example, "func01" is the recursive function. The above program flows as follows.



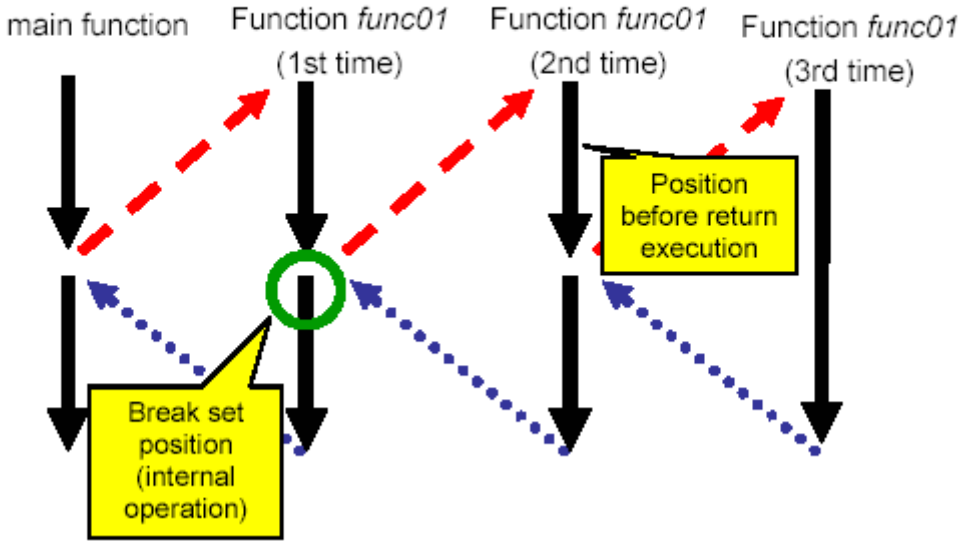
The following explains the Return Out operation in detail.

**[Return Out during processing of the 1st recursive function]**



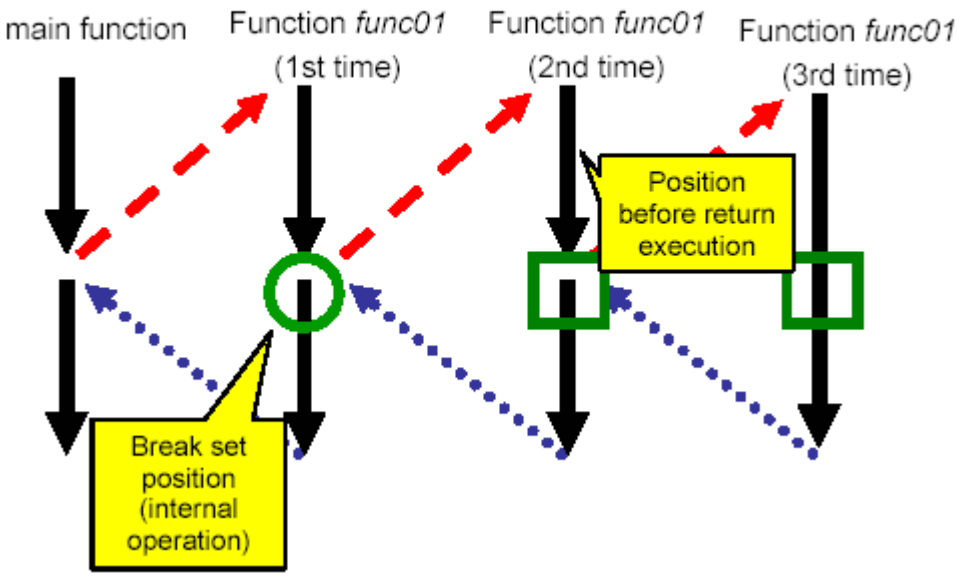

If Return Out is executed during the first processing of function *func01*, the execution returns to the circle-marked position. The ID78K0R-QB sets a breakpoint at this position internally and executes the program. In this case, the program will stop at the desired position (circle-marked position).

**[Return Out during processing of the 2nd to *n*th recursive function (1)]**



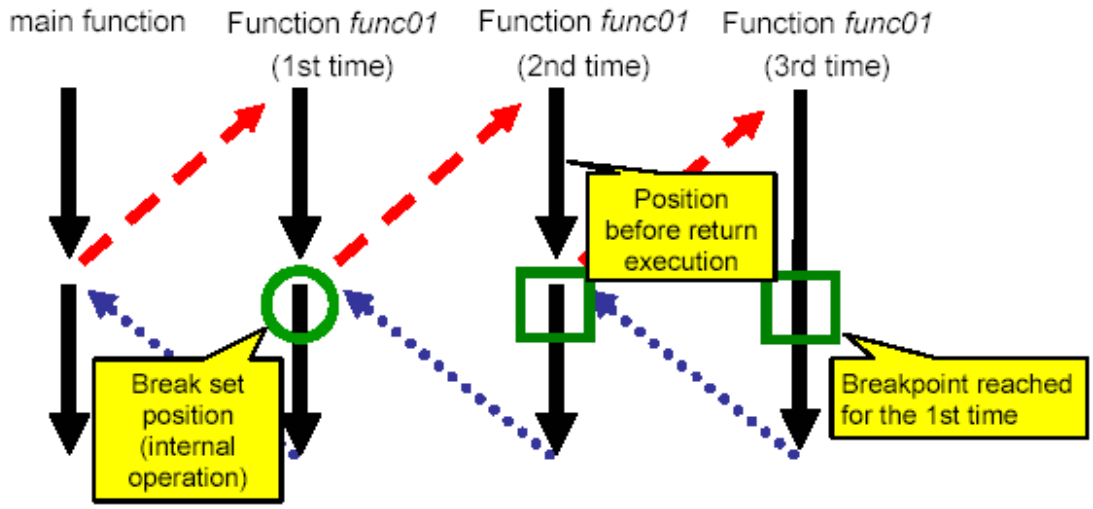
If Return Out is executed during the second and third processing of function *func01*, as in the above case, the ID78K0R-QB sets a breakpoint at the desired return position (circle-marked position).

**[Return Out during processing of the 2nd to *n*th recursive function (2)]**



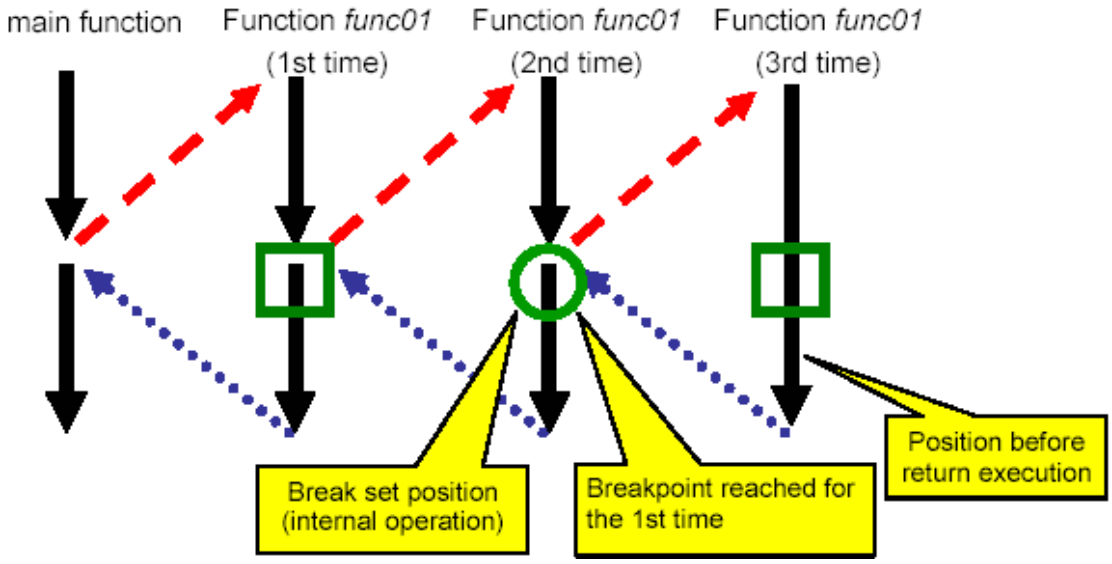

However, the set breakpoint is also included in the recursive processing, so breaks also occur at the square-marked positions.

**[Return Out during processing of the 2nd to *n*th recursive function (3)]**



As a result of program execution, a break occurs at the first breakpoint (the rightmost square-marked position in the above figure), which is not the desired position. This is because the execution passes through the desired position before reaching the desired position.
Although it is not the desired result, program execution is performed as is coded. Even if the program is reexecuted from this position, the operation results are normal.

**[Return Out after processing of the *n*th recursive function ends]**




If Return Out is executed after the third *func01* processing (the rightmost square-marked position in the above figure), it is desired to return to the circle-marked position, but a breakpoint is also set at the square-marked position. This execution breaks at the desired position, however. This is because the first breakpoint to be reached during recursive processing is the circle-marked position.

(5) Caution when a function entity is defined in header file
If a function entity is defined in the header file, breakpoint setting, step-wise execution, or Return Out cannot be performed in the Source window. Moreover, information on this function is not displayed in the Code Coverage window.
The case where “a function entity is defined in the header file” means that function processing itself is described in the header file. It does not include the case where only function declaration, such as prototype declaration and EXTERN declaration, is described in the header file.

(6) Caution on *longjmp* function
If Step In or Next Over is performed for the *longjmp* function, execution processing may not complete and may wait for a time-out. If Return Out is performed in a function that called the *longjmp* function, breaks may not occur.

(7) Standby mode

The standby mode is released under any of the following conditions.

<1> The standby mode is entered during step-wise execution.

<2> Execution is stopped by a forced break in standby mode

<3> A standby instruction is executed before the execution stops due to a break after execution or an access break, which takes several extra instructions until the execution stops.

<4> A break after execution or an access break is used as an event of a snap-shot or event DMM, a standby instruction is executed before the execution stops due to the break, each processing is complete, and then the execution is restarted. (IECUBE)

(8) Mirrored non-map area

A mirrored non-map area is not indicated as “??”. If IROM = 64 KB and MAA = 1, for example, the non-map area starting from address 0x10000 is mirrored. At this time, 0x10000 to 0xF0FFF are indicated as “??” in the Memory window, but values can be read from or written to 0xF1000 to 0xFFEFF.

(9) External memory

<1> For external memory, the code coverage cannot be measured and memory accessing cannot be monitored. (IECUBE)

<2> When the RAM monitor function is off, data cannot be read from or written to the external RAM during execution. (IECUBE)

<3> The following two restrictions apply when a ROM is connected as an external memory.
(IECUBE)

(a) If step-wise execution is performed for the following instructions in instruction mode, an extra instruction is executed.

a. RETI/RETB instruction
An instruction immediately after returning from the interrupt servicing will be executed.

b. Conditional skip instruction (condition is not satisfied)
The instruction next to the conditional skip instruction will be executed.

(b) Execution does not stop as is expected if one of the following operations is performed.
The execution continues, or stops at the next breakpoint. (IECUBE, MINICUBE2)

a. Step In in source mode, whose execution stops at a location in external ROM

b. Next Over whose execution stops at a location in external ROM

c. Return Out whose execution stops at a location in external ROM

d. Come Here executed with the cursor placed in external ROM

(10) Cautions when IECUBE is connected

<1> Execution operation while external reset signal is input

When the SFR window or the like is displayed and execution or step-wise execution is performed while an external reset is not masked (the TARGET RESET check box is not selected 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.

<2> Coverage function

(a) The PC points to the instruction that has not been executed, but for code coverage measurement, one or two bytes from the top of the instruction pointed to by the PC are counted by the code coverage execution. In addition, the address at which a break occurs is also counted.

(b) Display of an access being executed does not necessarily change in the order of access in the Memory window.

<3> Display of internal ROM area during execution

During execution, data in the internal ROM area before starting execution is saved temporarily and displayed. The display is therefore not updated until the execution breaks, even if the data is overwritten by flash self-programming or event DMM.

<4> Events

Up to two extra instructions after a snap-shot event, event DMM, trace event, or timer event is measured.

<5> Change of PSW values in DMM dialog box

When changing the PSW values, do not specify a PSW bit (ie, z, rbs1, ac, rbs0, isp, or cy) in the [Register Name] field in the DMM dialog box. If attempted, an error message will be output. Be sure to change the PSW values in 8-bit units.

(37) **<p.338>** Addition of quantitative upper limit list as "**B.6. Quantitative Upper Limit List**"

<Previous>

-

<New>

Table B-7 ID78K0R-QB Quantitative Upper Limits

| Window Name | Item | Upper Limit |
|---|---|---|
| (Common to windows) | File name (not including path name) | 255 single-byte characters |
| | File name (including path name) | 259 single-byte characters |
| | Number of character strings that can be displayed per line | 400 single-byte characters |
| | Number of character strings that can be searched for | 150 single-byte characters |
| | Number of characters that can be used for symbol names (function names, variable names, etc.) | 2,048 single-byte characters |
| Download dialog box | Number of load module files that can be downloaded at a time | 1 |
| Trace View window | Number of frames that can be displayed | 128K frames |
| Event dialog box | Number of character strings that can be used for event names | 8 single-byte characters |
| Watch window | Number of lines that can be displayed | 10,000 lines |
| | Number of array dimensions of that can be displayed | 4 |
| Source window | Number of source file and include file lines that can be displayed per line | 65,535 lines |
| Assemble window | Highest address that can be displayed | 0xFFFFE |
| Add I/O Port dialog box | Number of character strings that can be used for I/O register names and SFR names | 15 single-byte characters |
| Software Break Manager | Number of software breaks that can be set | 2000 points |