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# M16C R8C Simulator Debugger V.1.04.00

## Release Notes

This document describes the notes of this debugger, and please read before you start to use this debugger.

And also, please refer to the “High-performance Embedded Workshop Release Notes” about the notes of High-performance Embedded Workshop IDE.

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# 1 Notes

## 1.1 Line Assembly

Regardless of the Radix setting, the default for line assembly input is decimal. Specify H as the radix for a hexadecimal input.

## 1.2 Event Setting

1. TAB order in Set Event Status dialog box  
Even when you press [TAB] key, the next input control may not be focused on the Set Event Status dialog boxes opened from Trace Point.
2. In-place-edit mode on event list  
On event list in Trace Point, High-performance Embedded Workshop will not escape from in-place-edit mode even when you press the [ESC] key.
3. Event setting by BIT SYMBOL  
When the specified address is odd numbers, the setting by BIT SYMBOL can not set the correct condition. Use DATA ACCESS setting and specify the compared data with the data mask. For details about how to set the conditions for odd number addresses, refer to the online help.
4. Event detection for BIT SYMBOL  
When the event is set to detect the access to specified bit, it will be detected even if the other bit of the same address as the specified bit is accessed. This is because the access to the bit from MCU is byte access.

## 1.3 Output Port

1. Use of Symbol  
If you use a symbol to specify an address in the Set Port Dialog box, an error "Can't find symbol." will occur, when you restart the HEW or get back to the session.

## 1.4 Data Trace

1. Split-bar behavior when double-clicking  
If you double-click the split-bar, which divides view up and down, the horizontal scroll-bar, vertical scroll-bar, and tabs in the upper view will vanish. Drag the split-bar to display them again.

## 1.5 Trace

1. Specifying function in SRC mode  
In the SRC mode, when you specify a function to display it, if the current displayed source file includes the function, the top of the source file will be displayed.
2. Saving of tracing result in text
  - When you save a tracing result in text with only "BUS" and "DATA" buttons ON, the vertical position of some headers will shifts from the corresponding data. Check "Tab Separated Format" and open it with spreadsheet applications to display them correctly.
  - When you save a tracing result that includes BUS and DATA access information in text, some headers can not be correct. When you check "Tab Separated Format", the headers will be correct.
3. Time concerned data  
Displayed time concerned data is not measured, though time concerned buttons and items in pop-up menu are active.(Time measurement is not supported.)
4. Loading the trace image file  
Trace window can not load the trace image file saved by PDxx debuggers. And also, trace window can not load the trace image file saved by the different target from the current target.

## 1.6 RAM Monitor

1. Proportional Fonts  
When a proportional font is selected, a part of the characters in the view may be hidden. Fixed fonts are recommended.

## 1.7 Memory

1. 8 bytes data operations  
To set, fill, and copy 8 bytes data are not supported.

## 1.8 Script

1. Result of interactive command  
When you invoke an interactive command, for example, Assemble and setMemoryByte, the running dialog box will appear and may hide the view of the results.
2. SCOPE Command  
When you refer current scope name with SCOPE command after program execution, the scope of the start-up module will be returned even if scope has been changed to the other.

## 1.9 Real-time OS debugging functions

1. When several labels are allocated to the entry address of the tasks or handlers, the task name or the handler name displayed in the windows may be different from the actual function name.
2. When you use the feature to issue system-calls by the script command (MR SYS), the target program should be built with a specific option. For details, refer to the topic "Prepare the real-time OS debug" in the online help.

## 1.10 Macro recording function

The debug windows which support the macro recording function are memory, registers, IO, ASM watch, and C watch. And also, the debug operations which support this are Reset CPU, Go, Reset Go, Go To Cursor, Step In, Step Over, Step Out, Add/Delete break points, Add/Delete address match interrupt break points, and Download the target program.

## 1.11 Test facility function

The contents to be compared by the test facility functions are memory, registers, I/O, Output, stack race, ASM watch, and C watch.

## 1.12 Using cast operators for the member variable

When you use cast operators for the member variable to refer to it as the pointer of the structure, you would not refer to it correctly.

## 1.13 Download module dialog box

This debugger does not support the setting of "Offset", "Memory verify on download", and "Access Size" in the download module setting dialog box. These are always treated as "Offset: 0", "Memory verify: off", and "Access Size: 1".

## 1.14 The option "Always treat variables of enumerator type with unknown size as 1 byte"

The "Always treat variables of enumerator type with unknown size as 1 byte" option is effective after downloading the program. When the option status is changed, target program should be downloaded again.

And also, this option is effective for all variables of enumerator type in the program, even if the compiling options are different for each file.

## 1.15 Debugging for assembler macros

When the break points are set at the assembler macro codes, the break points would be set at the different address or not be displayed as the PC line.

## 1.16 Debugging for inline functions

When stepping the function including the call for a inline function, local variables would not be able to be referred.

## 1.17 Automatic target connection on changing the session

When the target connection is not performed on changing the session, select the menu [Debug] -> [Connect]. To perform automatic target connection, remove the check from the option "Do not perform automatic target connection" in the Option tab on Debug Setting dialog box which is invoked by the menu [Debug] -> [Debug Settings...].

## 1.18 Run program option

The "Run Program" dialog box enables to specify several temporary PC breakpoints, but this debugger only supports one breakpoint which is listed first in the "Temporary PC breakpoints" list box.

## 1.19 Selection of the object format for download module

When the specified file format in the debug setting dialog box is different from the format of the object module file, downloading the file may cause a freeze of the debugger. Please select the correct object format. And also, when selecting the object format for download module file, if there are two or more object format, whose name includes the vender name another ones do not include it, prioritize the file whose name includes vender name leading the object format name.

## 1.20 Using the Simulator Debugger Customizing Kit (I/O DLL kit)

When you use the I/O DLL Kit, you should specify I/O DLL file name to sim30.exe's environment setup file "sim30.ini".

The sim30.ini file is stored in the directory shown below:

"Workspace directory\Project directory"

Please specify the I/O DLL file name to the sim30.ini file of the above-mentioned directory when you use the I/O DLL kit.

## 1.21 Notes on Debugging (M16C R8C Simulator Debugger)

### 1.21.1 Variables assigned to registers

When you build a target program, IAR EWM16C may generate the warning like following:

```
Warning [w23]: Cannot represent location of Register pair variable  
'R1H:R1L'
```

In this case, you can not see the variable, which is assigned to R1 in the simulator software. IAR will fix it by upgrading XLINK in near future. Please ask IAR about it for more details.

### 1.21.2 Memory space expansion

The simulator debugger does not support the memory space expansion feature of the MCU. Only normal mode is supported.

### 1.21.3 The executed cycle of divide instructions (DIV / DIVU/ DIVX)

In the divide instruction, the number of cycles may decrease when an overflow occurs or depending on the value of the divisor or dividend. But the cycle measurement function of the simulator debugger doesn't correspond to a decrease in the number of execution cycles of divide instructions.

## 2 System Requirements

### 2.1 Operating Environment (Windows® XP or Windows® 2000)

PC Environment	
PC	IBM PC/AT compatible
OS	32-bit editions of Windows® XP *1 *2 Windows® 2000 *1
CPU	Pentium 4 running at 1.6 GHz or more recommended
Memory	768 Mbytes or larger (more than 10 times the file size of the load module) recommended
Hard disk	Installation of the simulator debugger requires free space of 200 Mbytes or larger. Also keep additional free space that is at least twice the memory capacity (four times or larger recommended) for use as swap space.
Display resolution	1024 × 768 or higher recommended

### 2.2 Operating Environment (Windows Vista®)

PC Environment	
PC	IBM PC/AT compatible
OS	32-bit editions of Windows Vista® *1 *3
CPU	Pentium 4 running at 3 GHz or Core 2 Duo running at 1 GHz or more recommended
Memory	1.5 Gbytes or larger (more than 10 times the file size of the load module) recommended
Hard disk	Installation of the simulator debugger requires free space of 200 Mbytes or larger. Also keep additional free space that is at least twice the memory capacity (four times or larger recommended) for use as swap space.
Display resolution	1024 × 768 or higher recommended

\*1: Windows and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

\*2: The 64-bit editions of Windows® XP is not supported.

\*3: The 64-bit edition of Windows Vista® is not supported.

## 3 Version Report

This section describes the specification of the changed software.

### 3.1 M16C R8C Simulator Debugger V.1.04.00

In this version, the following specifications were changed from the previous version M16C R8C Simulator Debugger V.1.03.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.04.00, V.4.04.01, V.4.05.00 and V.4.05.01. For more details, please refer to the RENESAS TOOL NEWS “071216/tn5” issued on December 16, 2007, “080118/tn1” issued on January 18, 2008, “081125/tn1” issued on November 25, 2008 and “090201/tn3” issued on February 1, 2009.

#### 3.1.1 Revisions to Restrictions

1. A limitation has been corrected: Incorrect descriptions are found in the IO files for the R8C/2A, /2B, /2C, and /2D MCU groups included in the above products. Due to these incorrect descriptions, the name of the mode register for UART2 is expressed as UART0 in the IO windows on each debugger. (For more details, refer to the RENESAS TOOL NEWS “080616/tn8” issued on June 16, 2008).

#### 3.1.2 Functional Extensions and Modifications

1. The 32-bit editions of Windows Vista® is supported. You can run the revised product on Windows Vista® by using your user rights.
2. The accuracy of cycle count measurement has been improved. In this version you can measure cycle counts in consideration of bus width, instruction-queue buffers, and the number of wait states.

### 3.2 M16C R8C Simulator Debugger V.1.03.00

In this version, the following specifications were changed from the previous version M16C R8C Simulator Debugger V.1.02.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.02.00 and V.4.03.00. For more details, please refer to the RENESAS TOOL NEWS “061216/tn2” issued on December 16, 2006 and “070701/tn1” issued on September 1<sup>st</sup>, 2007.

#### 3.2.1 Revisions to Restrictions

1. A limitation has been corrected: If the On Demand check box is checked in the Debugging Information tab of the Init dialog box, which appears when you invoke your debugger, target programs may not be loaded successfully on MCUs and not run properly. (For more details, refer to the RENESAS TOOL NEWS “070416/tn8” issued on April 16, 2007).
2. A limitation has been corrected: If the size of the variable to be referred by the quick watch feature is larger than 256 bytes, High-performance Embedded Workshop would crash. (For more details, refer to the RENESAS TOOL NEWS “070601/tn5” issued on June 1<sup>st</sup>, 2007).

#### 3.2.2 Functional Extensions and Modifications

1. Displaying source files information automatically in the Workspace Window. When a download module file is downloaded, the High-performance Embedded Workshop obtains source files information contained in the download module file through its debug information, and displays it under "download module" node in the Projects tab on the Workspace Window. Note that this function is available only for debugging the debug-only projects.
2. Supports C watch window included in High-performance Embedded Workshop V.4.03. The feature Changing scope of the variable and suppression leading zero are supported.
3. The option to specify the size (1byte or 2byte) of enumerator type is added.
4. Supports “Disconnect target” feature.
5. When the instruction is modified by the line assemble feature, if the old instruction length is longer than the new instruction length, NOP instructions are inserted automatically so as to suit the old instruction length.

6. The instruction format specifier is displayed for each instruction in disassembly. And also, can be switched not to display.
7. Supports to substitute the bit field member variable.
8. The default value of “Reset CPU after download module” is changed to be checked.

### **3.3 M16C R8C Simulator Debugger V.1.02.00**

In this version, the following specifications were changed from the previous version M16C R8C Simulator Debugger V.1.01.00.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.01.00 and V.4.01.01. For more details, please refer to RENESAS TOOL NEWS “060701/tn1” issued on July 1, 2006 and “060801/tn1” issued on August 1, 2006.

#### **3.3.1 Revisions to Restrictions**

1. A limitation has been corrected: The structure member variables, union member variables, or class member variables whose name begins with a letter of ‘e’ or ‘E’ immediately followed by a numeral, are not referenced. (For more details, refer to the RENESAS TOOL NEWS RSO-M3T-PD32RM-060116D issued on January 16, 2006).

#### **3.3.2 Functional Extensions and Modifications**

1. The real-time OS, M3T-MR30/4 which is compliant to  $\mu$ ITRON 4.0 specifications, has been supported.
2. The ELF/DWARF2 format files generated using KPIT GNUM16C have been supported.
3. These commands, which can be invoked in Command Line, have been supported:  
breakpoint, breakpoint\_disable, breakpoint\_display, breakpoint\_clear  
register\_display, register\_set  
disassemble, assemble

### **3.4 M16C R8C Simulator Debugger V.1.01.00**

In this version, the following specifications were changed from the previous version M16C R8C Simulator Debugger V.1.00.01.

This version supports all of the function extensions and the revisions to the restrictions in the High-performance Embedded Workshop V.4.00.02. For more details, please refer to RENESAS TOOL NEWS RSO-HEW\_1-050701D issued on July 1, 2005.

#### **3.4.1 Revisions to Restrictions**

1. A limitation has been corrected: To keep quickly pushing the step button on the toolbar switches the source mode of the source window into the disassembly mode.
2. Trace window may not read trace memory image files which was saved in the Trace window.

#### **3.4.2 Functional Extensions**

1. The following windows for the real-time OS debugging are added to this version.
  - (a) MR Window
  - (b) MR Trace Window
  - (c) MR Analyze Window
  - (d) Task Trace Window
  - (e) Task Analyze Window

### **3.5 M16C R8C Simulator Debugger V.1.00.01**

In this version, the following specifications were changed from the previous version M16C R8C Simulator Debugger V.1.00.00.

#### **3.5.1 Revisions to Restrictions**

1. A limitation has been corrected: The automatic backup function of workspaces does not operate properly.

For more details, please refer to RENESAS TOOL NEWS RSO-HEW\_1-050216D issued on February 16, 2005.

2. A limitation has been corrected: If any of the following operations is performed with the C Watch window being undocked, the High-performance Embedded Workshop abnormally shut down.
  - (a) Switching between sessions
  - (b) Closing a workspace
  - (c) Terminating an application program

For more details, please refer to RENESAS TOOL NEWS RSO-HEW\_2-050301D issued on March 1, 2005.

3. A limitation has been corrected: C watch window may not load correct variable names which are registered in the watch tab.

This problem occurs if a variable name is entered in any of the following ways:

- (a) An element of an array is specified using [ ] operator.  
Example: a[0]
- (b) A member of a structure or union is specified using . operator.  
Example: str.a
- (c) The destination of a pointer is pointed to using -> operator.  
Example: pstr->a
- (d) An Address or indirection operator (& or \*) is used.  
Example: &a or \*a

For more details, please refer to RENESAS TOOL NEWS RSO-HEW\_3-050301D issued on March 1, 2005.

4. A limitation has been corrected: The drag and drop operation in memory window may cause the general protection failure.

### **3.5.2 Functional Extensions**

1. Script window is modified to be able to change the display font.
2. The menu to open the online help for the emulator is added.