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

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Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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M3T-PD308 (Discontinued Product)

Emulator Debugger for M32C/80, M16C/80 Series [for PC4701 Emulators]

Target Devices

- M16C Family M32C/80 Series (32/16-bit)
- M16C Family M16C/80 Series (16-bit)

Overview

This product is an emulator debugger (software) included with a Renesas' full-featured emulator package. Easy-to-use GUI (Graphical User Interface) and many advanced debugging features improve the debugging efficiency of applications on your target system.

This debugger also allows you to customize with a programming tool such as Microsoft Visual C++ or Visual Basic (the PSDK COM kit required). For example, you can create a user-defined window and interface between the debugger and other COM-compliant applications.

Applicable Emulator

- [PC4701U](#) (Emulator for M16C,7700,740 Family)
- PC4701M (Discontinued product)
- PC4701HS (Discontinued product)

Notes

*Included with an applicable emulator. Not available alone.

Features

- Easy operations with overlapping multi-windows and GUI
- Comfortable debugging environment provided by drag & drop operation
- C language and assembly language source level debugging and many other basic debug features
- Real-time OS support
- Real-time RAM monitoring
- Real-time tracing, C0 coverage, Time measurement and other advanced features
- Creating user-defined windows and commands
- Productivity-enhancing interface with the integrated development environment HEW.
- USB, Serial, parallel and LAN interfaces support^{*1}
- On-line help in HTML

*1. Available host computer interfaces depend on an emulator. (See PC Interfaces)

Operating Environment

- IBM PC/AT compatibles (Windows XP, Windows Me, Windows 98, Windows 2000, Windows NT 4.0)

PC Interfaces

	PC4701U	PC4701M (Discontinued product)	PC4701HS (Discontinued product)
LAN	LAN (10Base-T)	None	LAN (10Base-T, 10Base-5)
USB/Serial	USB (*1) (USB 1.1, Full-speed)	RS-232C (max. 38,400bps)	RS-232C (max. 38,400bps)
Parallel	LPT parallel (*2)	LPT parallel (*2)	Renesas proprietary parallel (*3)

*1. A USB I/F is available on Windows XP, Windows Me, Windows 98 and Windows 2000. It is unavailable under Windows NT 4.0.

*2. It is a printer port which supports ECP, EPP, Byte/Compatibility and Nibble/Compatibility modes.

*3. PCA4202G02 parallel interface board (optional) is required. On Windows XP, the Renesas proprietary parallel interface is not supported.

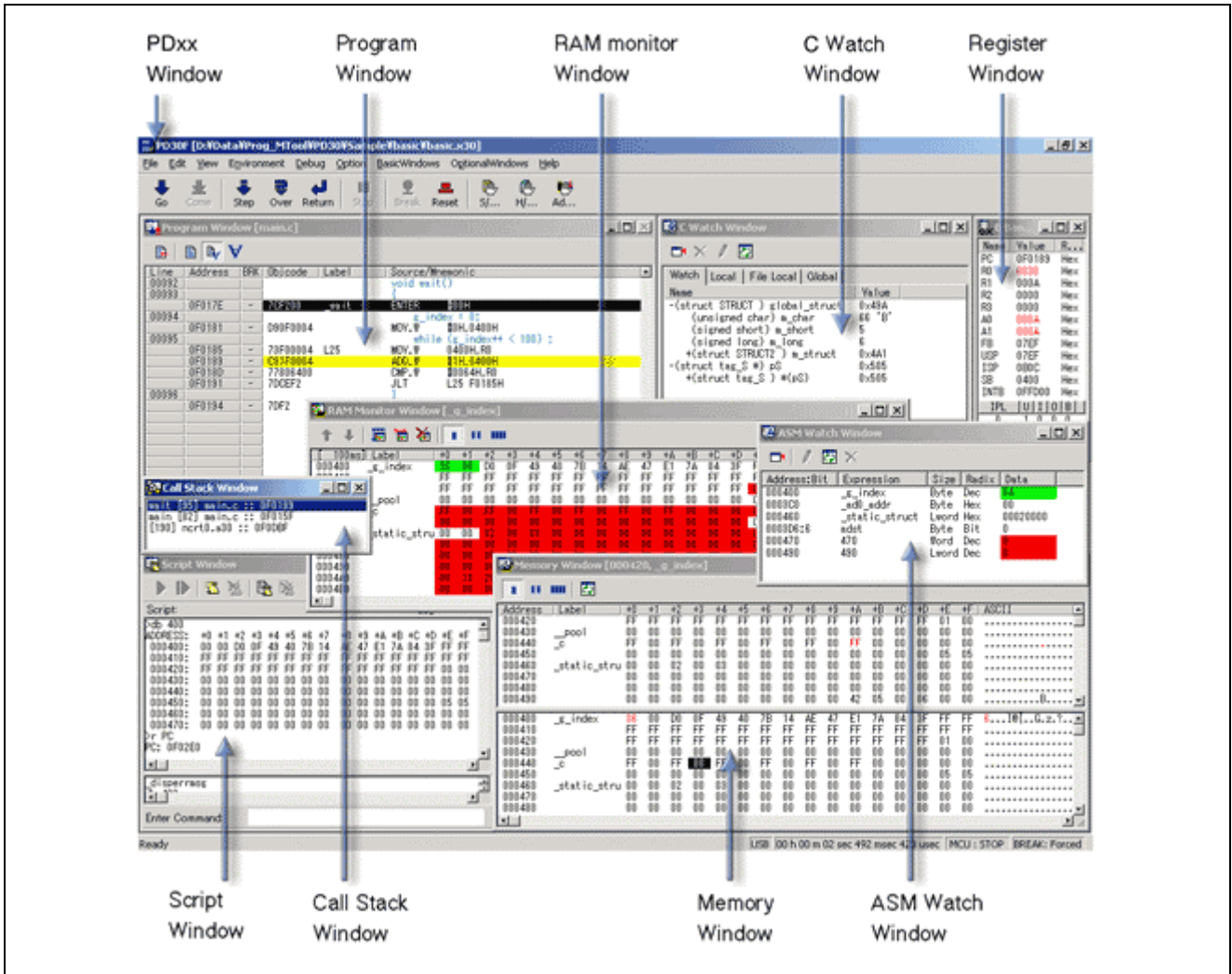
Specifications

Software break	64 points
Hardware break	6 points
Real-time trace	<ul style="list-style-type: none"> • 32K cycles • 6 trace points by events • Trace write condition can be specified.
Real-time RAM monitor	1024 bytes
Time measurement	Between from RUN to STOP / Other 4 points interval
C0 coverage	Available
Exception event detection	Access protect

Basic Functions

Window	Function
PD308 Window	Controls an entire debugger. You can perform the following basic debugging commands by using the tool bar buttons: program execution/stop, step execution, execution up to cursor position, and break point setting/cancel. You can also open various other windows from this window.
Program Window	Displays the program. Source code is editable here. Matching address line is displayed in color for the program counter (PC). You can select display format from among "source", "disassemble" or "mixed". You can also set or cancel break points.
Source Window	Displays the designated place of a program. Source code is editable here. Unlike the program window, you can open more than one window. The window is displayed continuing a certain function or task, and is convenient when break points have to be set and canceled repeatedly.
Register Window	Displays/changes content of flags and registers particular to the MCU.
Memory Window	Displays the contents of contiguous memory in dump format with "address" and "label". Can be displayed in binary, decimal, hexadecimal, and ASCII. Allows to modify the contents of memory, and also to fill and move specified blocks of memory.
RAM Monitor Window	Displays memory content changed during target program execution. The area read during program execution is displayed in green, and the area written is displayed in red. (You can set colors of your choice.)
ASM Watch Window	Monitors changes of memory contents and variable contents declared on assembly language level. Display format can be selected from among binary, decimal, and hexadecimal. If the specified address is within the real-time RAM area, area read is displayed in green, and the area written is displayed in red. (You can set colors of your choice.)
C Watch Window	Displays C variable contents. In addition to a window that displays variable formula of your choice, there are windows that display external variables, local variables within a file, and local variables within a function.
Call Stack Window	Displays function call information of C language.
Script Window	The window for executing commands from the keyboard or script files. An area is provided for displaying command execution results and command history. Execution results can be output to a file.
S/W Break Point Setting Window	For setting/clearing software break points. Can set 64 break points maximum (OR condition).

Screen Image : Basic Windows



Advanced Functions

Window	Function
Protect Window	Sets the protect function that halts program execution when a reserved area is accessed. An access attribute (Access Disable, Read Only or R/W Enable) can be specified in one byte batch of memory.
H/W Break Point Setting Window	Sets/cancels hardware break points. Can set 6 break points maximum and specifies the combination condition of break events. As a combination condition, there is a choice of not only AND and OR but also state transition specification with a transition chart. Using this feature allows you to easily detect abnormalities caused by multiple interrupts and task status transition in a program with a real-time OS.
Trace Point Setting Window	Specifies conditions for trace events like the H/W Break Point Setting Window.
Trace Window	Displays the results of real-time tracing in the emulator. The following three display modes are supported: Bus mode, Disassemble mode, Source mode and MIX mode (Disassemble & accessed data).
Data Trace Window	Graphically shows the data access information on the results of real-time tracing.
Task Trace Window	Graphically shows task execution histories of programs using real-time OS.
Task Analyze Window	Shows the results of statistical processing of measured data within the range specified with the Task Trace Window. This window shows the occupancies of tasks in a CPU.
MR Window	Shows the state of the real-time OS M3T-MR308.
MR Trace Window	Graphically shows task execution histories of programs using the real-time OS M3T-MR308. Also, each history of interrupt handling, task state transition and system call issuing are shown.
MR Analyze Window	Shows the results of statistical processing of measured data in the range specified with the MR trace window. And, shows a list of the following records: occupation status per interrupt handler or task, history of system call issuing.
MR Task Pause Window	Window for executing "task pause" for the real-time OS M3T-MR308. During target system execution, a user-specified task can be stopped (paused) or cleared in this window.
Coverage Window	Shows coverage measurement results of C functions. Results can be checked in separate windows: "Coverage window" displaying coverage results and start and end addresses of each function, and "Coverage source window" used to see whether each source line has been executed.
Time Measurement Window	Displays the minimum/maximum/average execution time and measurement count at any measurement point. The execution time of up to 4 measurement points can be measured simultaneously.
GUI Input Window	Shows key input panels of user target system. You can make virtual key input buttons by simple mouse operation. While the program is running, pressing the button generates data input.
GUI Output Window	Shows output panels of user target system. You can make virtual output LEDs or labels by simple mouse operation.

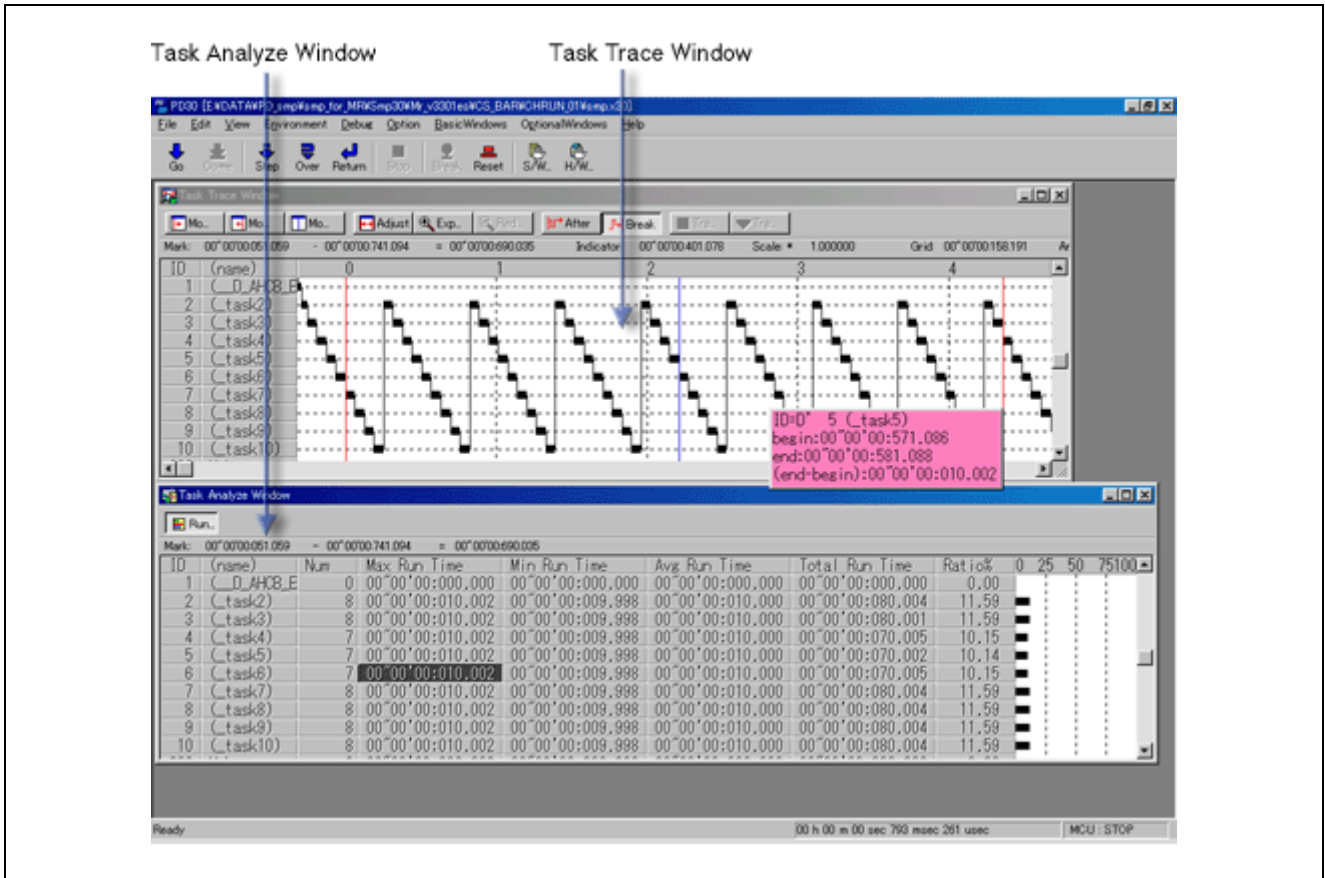
Screen Image : Advanced Windows for the Emulator (1/3)

The screenshot displays the M3T-PD308 emulator interface with several windows open. Blue arrows point to specific windows with labels:

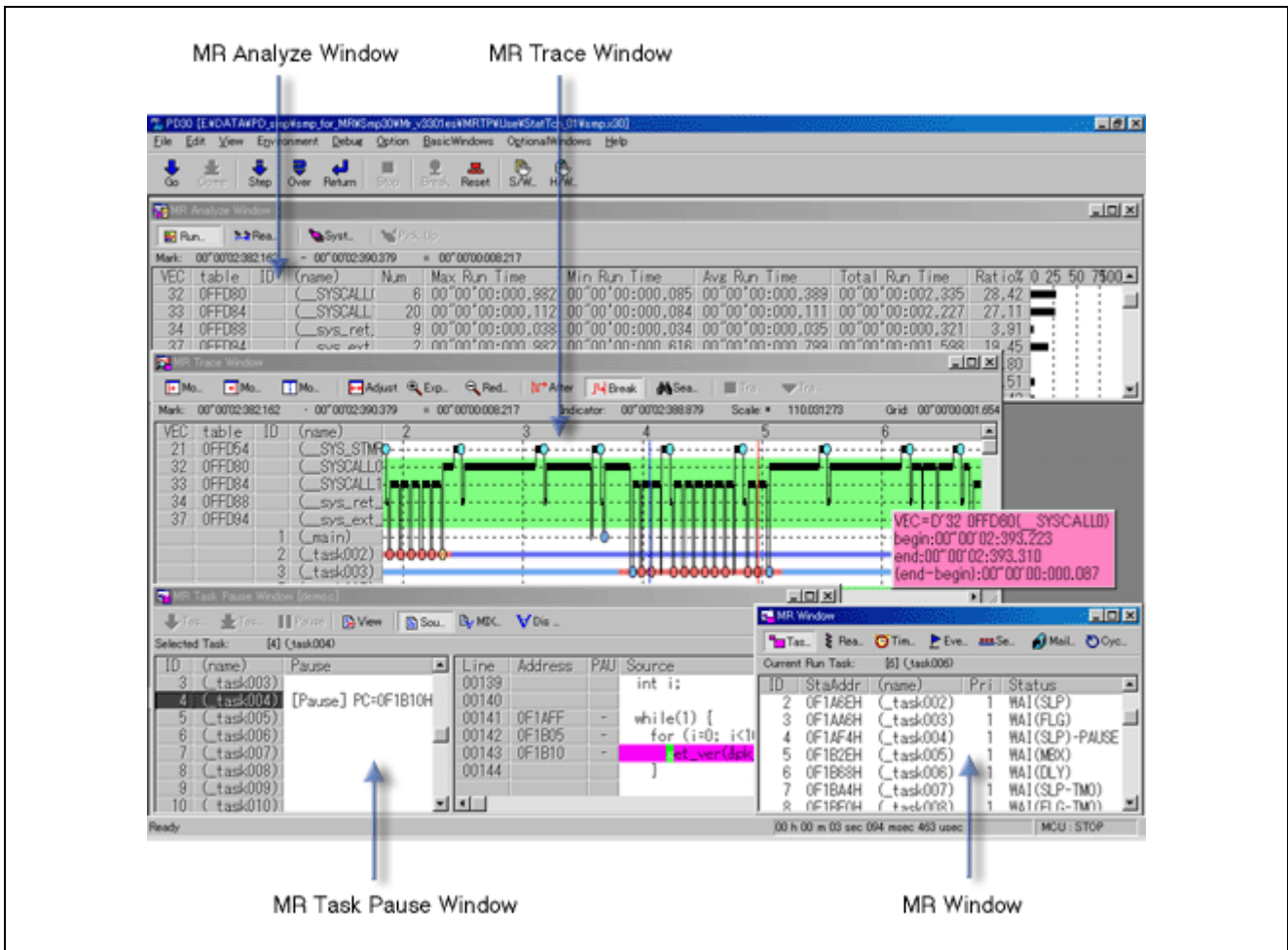
- Protect Window:** Shows memory protection settings with columns for Start, End, Attribute, and Break Mode.
- Trace Window:** Displays a table of execution cycles with columns for Cycle, Label, Address, Data, BUS, BIU, R/W, RWT, CPU, QN, B-1, Q-1, and a hex/hex/dec value.
- H/W Break Point Setting Window (and State Setting Dialog box with the state transition diagram):** Contains a table for hardware break points and a state transition diagram below it.
- GUI Output Window:** Shows a 2x2 grid of red and white squares.
- GUI Input Window:** Shows six buttons labeled Key1 through Key6.
- Data Trace Window:** Shows a waveform graph with a red signal and a scale of 350%.

At the bottom of the emulator window, the status bar shows: Ready, USB: (B:002) 00 h 00 m 00 sec 470 msec 521 usec, (MCU) STOP, BREAK: Forced.

Screen Image : Advanced Windows for the Emulator (2/3)



Screen Image : Advanced Windows for the Emulator (3/3)



Upgrade Information

M3T-PD308 debugger was revised to V.5.20 Release 1 in April 1, 2004.

New feature(s):

- Distributed without charge for users of every kind of PC4701 emulator including PC4701HS. (The latest version is available by online upgrade.)
- Some improvements (For details, see the Apr. 1, 2004 issue of TOOL NEWS)

[Online-upgrading]

Users of an applicable emulator can download and use the latest version (free-of-charge). For details, see the applicable emulator's "Download" site.

Website and Contact Information

- Renesas Technology Software and Tools
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