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Renesas Electronics Corporation

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M3T-PD30F (Discontinued Product)

Emulator Debugger for M16C/60, M16C/30 and M16C/Tiny Series [for PC7501 Emulator]

Target Devices

- M16C Family M16C/60 Series (16-bit)
- M16C Family M16C/30 Series (16-bit)
- M16C Family M16C/Tiny 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 PDSDK COM kit required). For example, you can create a user-defined window and interface between the debugger and other COM-compliant applications.

Applicable Emulator

- [PC7501](#) (Emulator for M16C Family)

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
- Productivity-enhancing interface with the integrated development environment HEW.
- USB, LPT parallel, and LAN interfaces support
- On-line help in HTML

Operating Environment

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

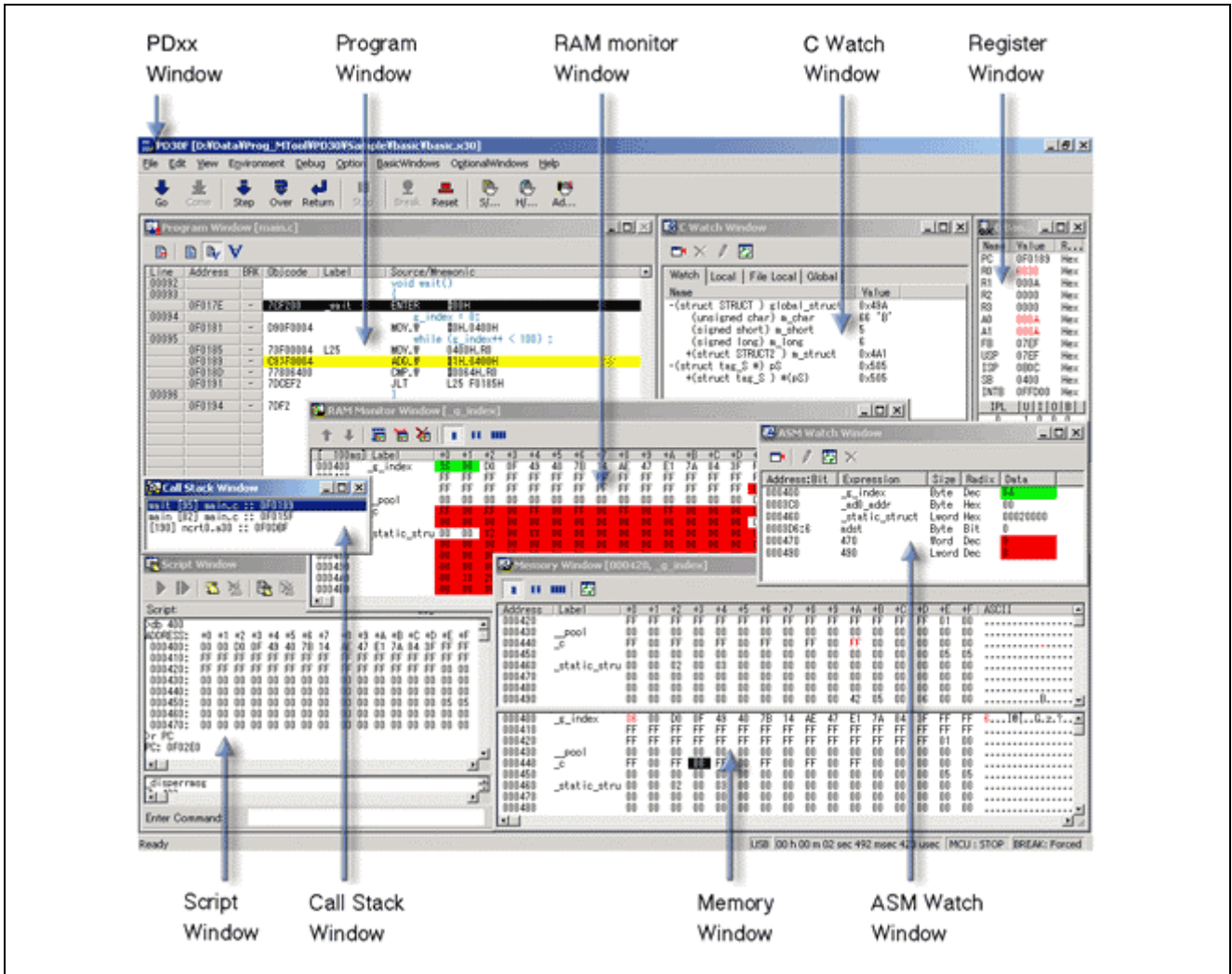
Specifications

Software break	64 points
Hardware break	8 points
Real-time trace	<ul style="list-style-type: none">• 256K cycles• 8 trace points by events• Trace write condition can be specified.
Real-time RAM monitor	4096 bytes (256-byte x 16 blocks)
Time measurement	Between from RUN to STOP / Other 4 points interval
C0 coverage	Available (A 256K-byte space x 32 blocks)
Exception event detection	Access protect

Basic Functions

Window	Function
PD30F 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/clearing. 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.)
RAM Monitor Area Setting Window	Specifies the RAM monitor area referred to in RAM Monitor Window. 16-block of the RAM monitor area (for PC7501) can be arranged freely.
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, Write Only or R/W Enable) can be specified in 256-byte batch of memory.
H/W Break Point Setting Window	Sets/cancels hardware break points. Can set 8 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 features 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 and Source mode and MIX mode (Disassemble & accessed data).
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-MR30.
MR Trace Window	Graphically shows task execution histories of programs using the real-time OS M3T-MR30. 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-MR30. 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.

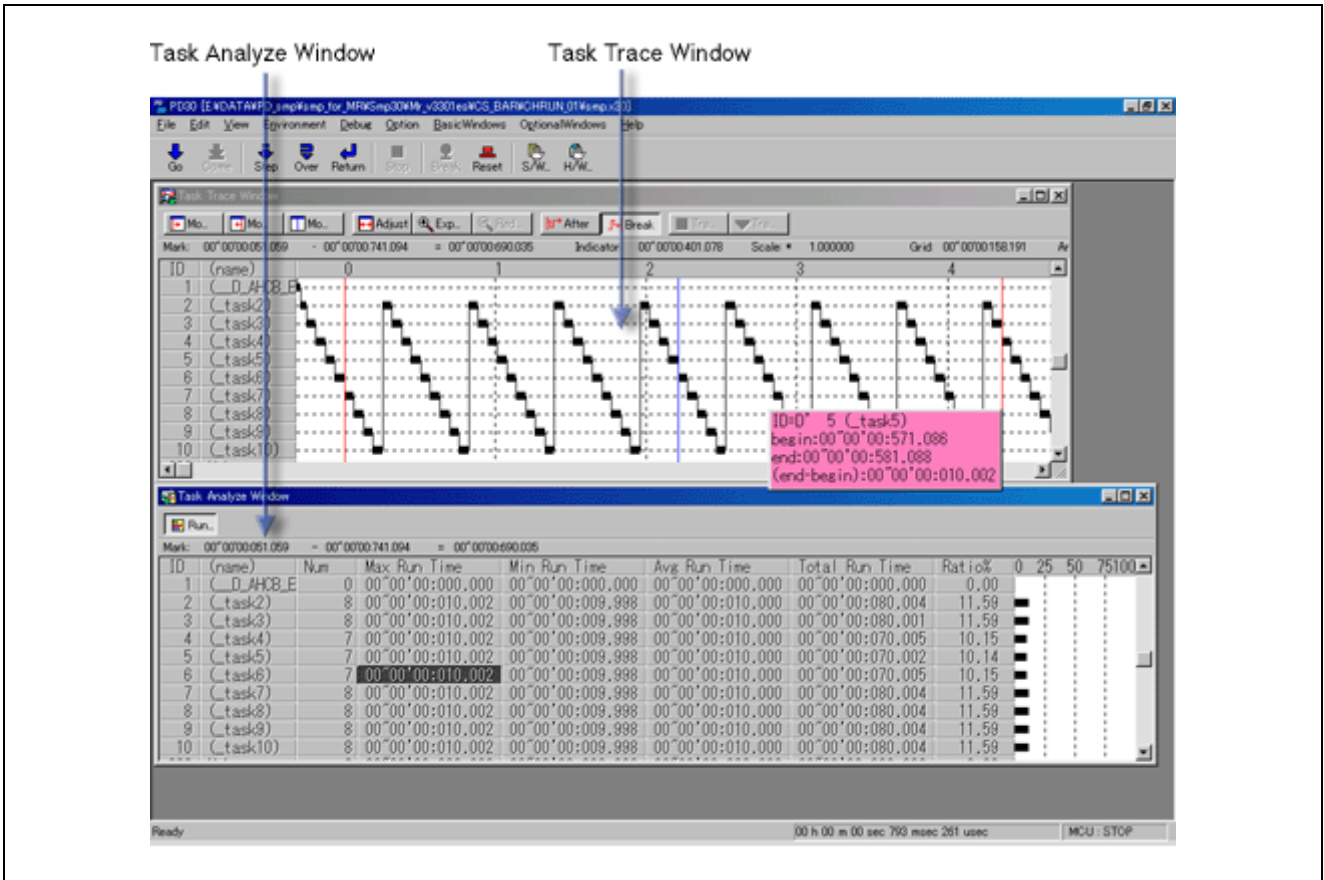
Screen Image : Advanced Windows for the Emulator (1/3)

The screenshot displays the Renesas emulator's advanced windows interface. The main window shows a trace table with columns for Cycle, Label, Address, Data, BUS, BIU, R/W, RWT, CPU, ON, B-T, O-T, and 785432. Below the trace table is the Time Measurement Window, which includes a table for measurement points (MP1, MP2, MP3, MP4) and their results (Max, Min, Avg, and Count). The H/W Break Point Setting Window is open, showing a table for break points with columns for Pass, E, ADDRESS, ACCE, and CONDITION. The Protect Window shows memory protection settings with columns for Start, End, and Attribute. The GUI Input Window contains a grid of keys labeled Key1 through Key9. The GUI Output Window shows a grid with a blue pattern. The Time Measurement Window also includes a State Transition diagram with states labeled A11, A12, A13, and A15.

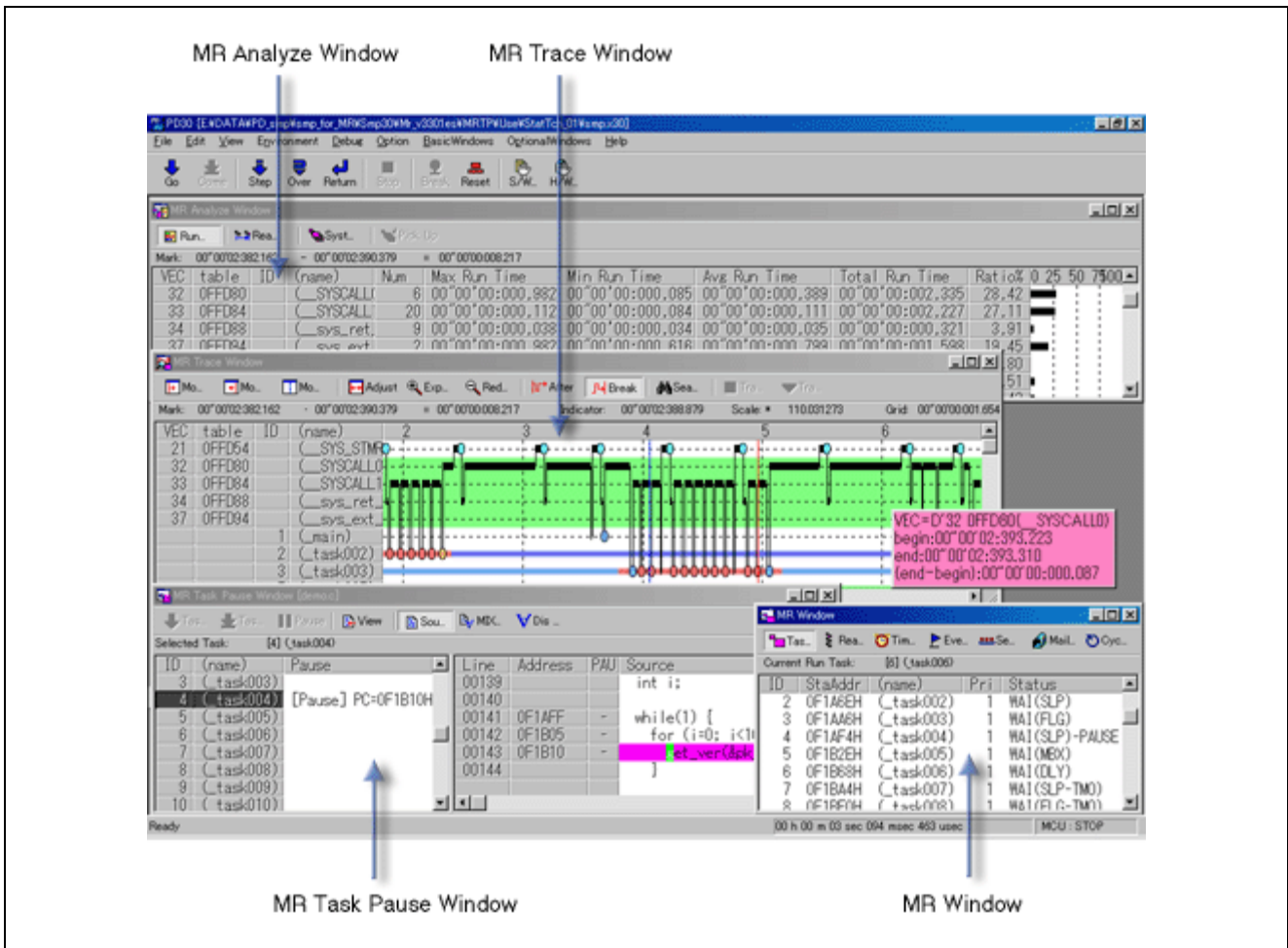
Labels pointing to the windows in the image:

- Trace Window
- H/W Break Point Setting Window
- Protect Window
- GUI Input Window
- Time Measurement Window
- GUI Output Window

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



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



Upgrade Information

M3T-PD30F debugger was revised from V.2.10 Release 1 to V.2.20 Release1 in April 1, 2004.

New feature(s) :

- Bundled with the PC7501 Emulator (The latest version is available by online upgrade.)
- M16C/Tiny Series M16C/26A, M16C/28 and M16C/29 Groups support
- 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 PC7501 "Download" site.

Website and Contact Information

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