



RTOS Debugger for QUADROS

ARM
ColdFire

- Real Time, Non-Intrusive Display of RTXC Quadros System Resources
- Task Related Breakpoints
- Task Stack Coverage
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The TRACE32 System includes a configurable RTOS debugger to provide symbolic debugging in real time operating systems. Our software package contains a ready-to-run configuration for the RTXC Quadros Real Time Operating System from Quadros Systems

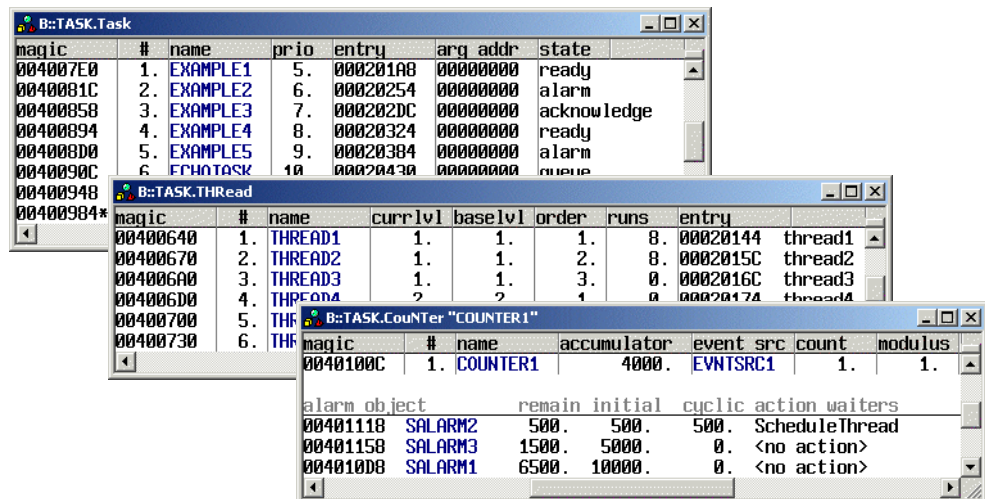
The RTXC Quadros awareness provides easy access to task lists and other kernel information, generates performance analysis data and enables you to do a most effective debugging with the TRACE32 systems on targets running RTXC Quadros

RTOS Debugging on TRACE32 with RTXC Quadros

Real Time, Non-Intrusive Display of RTXC Quadros System Resources

The TRACE32 RTOS debugger for RTXC Quadros provides display functions to show the system resources of RTXC Quadros. All objects, such as tasks, threads, mailboxes, semaphores etc. can be displayed and inspected. In addition, by using the

emulators dual-port memory (if available), the display of all these regions can be viewed non-intrusively in real time. The tables are updated permanently ("On The Fly"), without affecting the application at all.

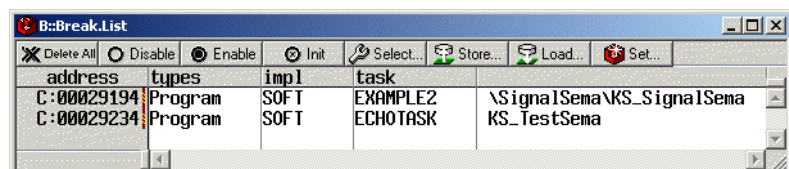


Task list window, thread list window and detailed counter window

Task Related Breakpoints

Any breakpoint set in the TRACE32 debugger can be set dependent to a specific task. This means, that the

breakpoint will then only halt, if hit by the specified task. This allows task related debugging even in shared code.

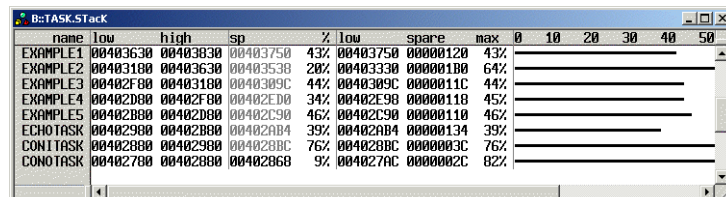


Breakpoint list with task dependent breakpoints

Task Stack Coverage

In real time systems it is quite important to know, how much stack space each task consumes. For this purpose,

a special window shows the current and the maximum usage of the stack of each separate task



name	low	high	sp	%	low	spare	max
EXAMPLE1	00403630	00403830	00403750	43%	00403750	00000120	43%
EXAMPLE2	00403180	00403630	00403530	20%	00403330	000001B0	64%
EXAMPLE3	00402F80	00403180	0040309C	44%	0040309C	0000011C	44%
EXAMPLE4	00402D80	00402F80	00402E00	34%	00402E30	00000110	45%
EXAMPLE5	00402B80	00402D80	00402C90	46%	00402C50	00000110	46%
ECHOTASK	00402980	00402B80	00402A04	39%	00402A04	00000134	39%
CONITASK	00402880	00402980	004028BC	76%	004028BC	0000003C	76%
CONOTASK	00402780	00402880	00402868	9%	004027AC	0000002C	82%

Task stack coverage window

Task Context Display

The TRACE32 RTOS Debugger provides an easy way to switch the current displayed context to another task. Usually all register related windows (e.g. listing at current PC, local variables or

function call stack) are displayed to the actual context (i.e. current executed task). You can switch to the context of another task, to see all this information at the time this task was scheduled.

Dynamic Task Performance Measurement

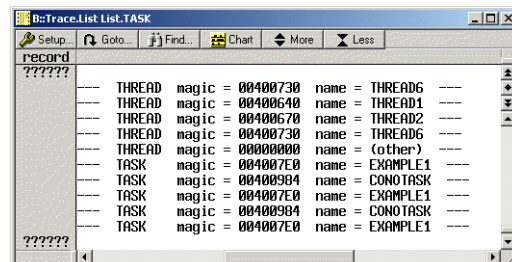
While RTXC Quadros is running, TRACE32 is capable of recurrently evaluating the current running task and collecting the results. The percentage, each task consumes of the system, is

then displayed graphically and updated permanently. The longer time you let the measurement run, the more exact are the results. This feature is available even without any hardware trace.

RTXC Quadros Specific Display of Trace Listing

The data recorded in the real time trace buffer (if available) can be displayed and interpreted specific to the operat-

ing system. The task switches are displayed symbolically, either exclusively or in addition to other information.



```

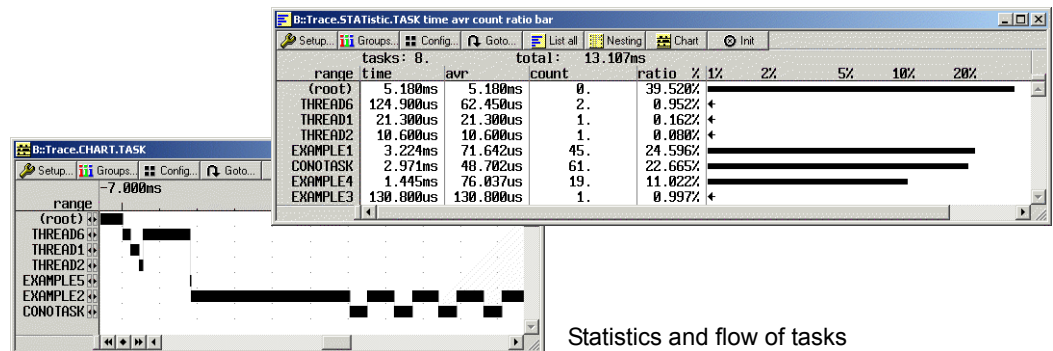
B:\Trace.List.LIST.TASK
record
??????
--- THREAD magic = 00400730 name = THREAD6 ---
--- THREAD magic = 00400640 name = THREAD1 ---
--- THREAD magic = 00400670 name = THREAD2 ---
--- THREAD magic = 00400730 name = THREAD6 ---
--- THREAD magic = 00000000 name = (other) ---
--- TASK magic = 004007E0 name = EXAMPLE1 ---
--- TASK magic = 00400904 name = CONO TASK ---
--- TASK magic = 004007E0 name = EXAMPLE1 ---
--- TASK magic = 00400904 name = CONO TASK ---
--- TASK magic = 004007E0 name = EXAMPLE1 ---
??????
  
```

Trace listing, displaying task & thread switches

Statistic Evaluation and Graphic Display of Task Run Times

Out of the real time trace buffer (if available), the analyzer can calculate statistic tables of task run times and task switches. A graphical diagram shows

which task was active at a specific time, giving a clear view of the behaviour of the system.



Task Related Evaluation of Function Run Times

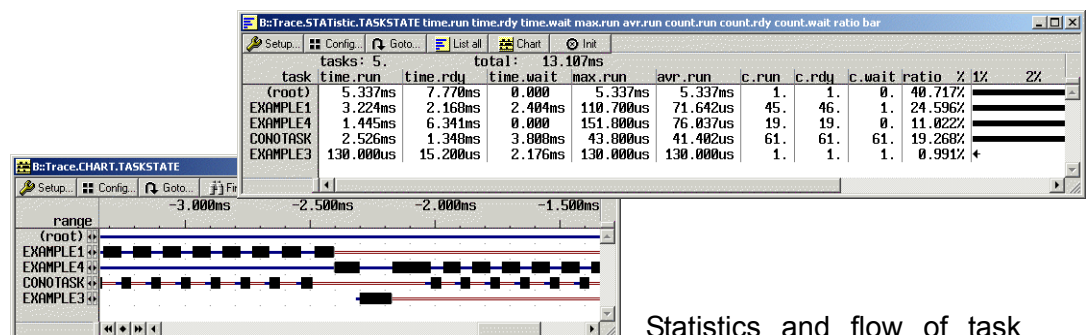
The statistic and graphic evaluation of function calls and function run times (if available) can be done dependant to the actual running task. This is neces-

sary, if different tasks call one single function at the same time, or if a task switch occurs in between the function.

Statistic Evaluation and Graphic Display of Task States

If covered by the real time trace, these tabular and graphical analyses of the status of tasks show the various states (i.e. running, ready, waiting, suspended

and undefined) and the times each task spent in each state. A graphical view of the data can help to highlight prioritisation problems, critical paths etc.



PRACTICE Functions for OS Data.

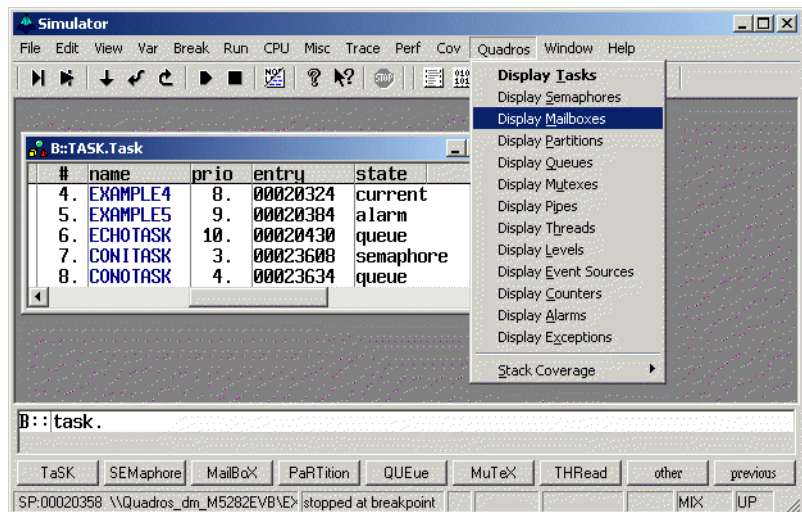
The support includes extended PRACTICE functions for RTX Quadros specific data, to be used in setup and test scripts. E.g. the function “task.con-

fig(magic)” returns the address of the so called magic value, which corresponds to the id of the current executing task.

RTXC Quadros related pull-down menu

Because the menu bar of the TRACE32 user interface can be fully customized, you can create a new pull down menu, including operating system specific commands. We deliver

RTXC Quadros support with an example for such specific menus, which provides fast access to the RTX Quadros awareness features.



TRACE32 with RTX Quadros menu

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