



SMX[®]

RTOS Debugger for SMX

ARM
ColdFire
PowerPC
SuperH

- Real time, non-intrusive display of SMX system resources
- SMX specific display of analyzer listing
- Statistic evaluation and graphic display of task run times
- Task related evaluation of function run times
- Task stack coverage
- Task context display
- PRACTICE functions for OS data
- SMX related pull-down menu

The TRACE32 System includes a configurable multitask debugger to provide symbolic debugging in real time operating systems. Our software package contains a ready-to-run configuration for the SMX Real Time Kernel from Micro Digital Inc.

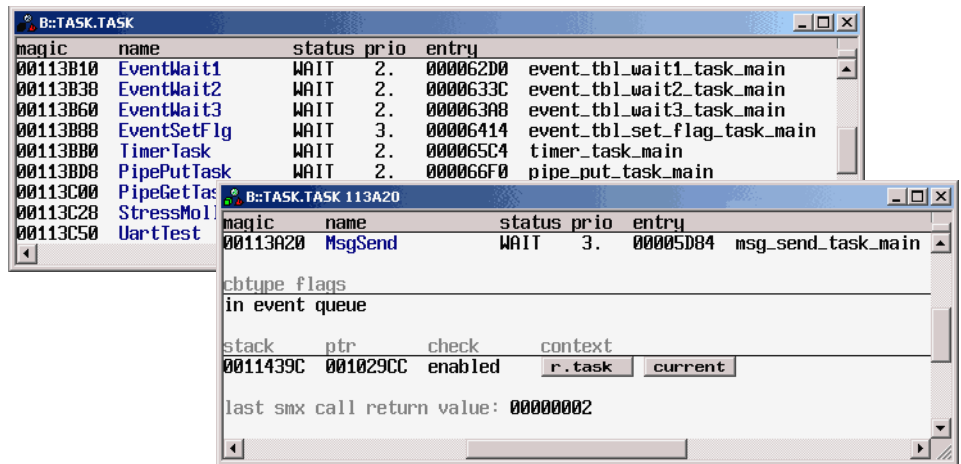
In close cooperation with Micro Digital we built a special multitask support for SMX on PowerPC or SuperH processors. This leaflet will guide you through the additional implemented features in TRACE32, to do an effective debugging on SMX systems.

Multitask Debugging on TRACE32 with SMX

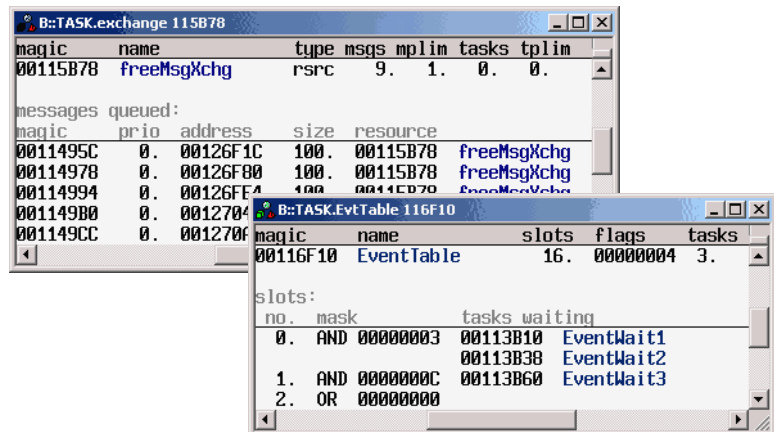
Real time, non-intrusive display of SMX system resources

The TRACE32 multitask debugger for SMX provides display functions for all SMX resources. The system resources tasks, pools, blocks, messages, events, pipes, and many more can be displayed. In addition, by using the emula-

tors dual-port memory, 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 and detailed window of one specific task



Detailed window of an exchange and an event table

SMX specific display of analyzer listing

The data recorded in the analyzer can be displayed and interpreted specific to the operating system.

The task switches can be displayed symbolically.

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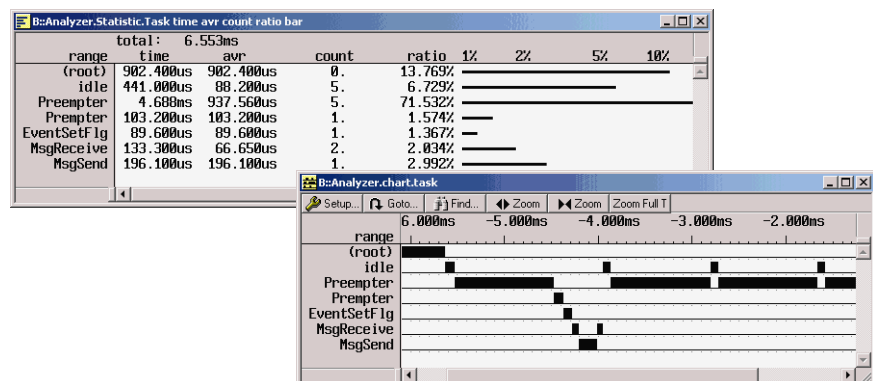
record
--- TASK = 00113B88 EventSetFlg
    }
    {
645     switch (cnt)
649     case 3: flag = FLAG3; break;
    }
652     set_flags(event_table, flag); /* set FLAG1 or FLAG2 o
653     count(15, ticks, INF);
--- TASK = 00113A48 MsgReceive
385     }
    {
381     msg = receive(mailXchgA, INF); /* wait for msg_send_
/* to send message to
383     sendx(msg, mailXchgB); /* return the message
--- TASK = 00113A20 MsgSend
/* message to mailXchgB
364     for (i=0; i<100; i++) /* make sure the data message hasn't
  
```

Analyzer listing, display of task switches and source lines

Statistic evaluation and graphic display of task run times

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.

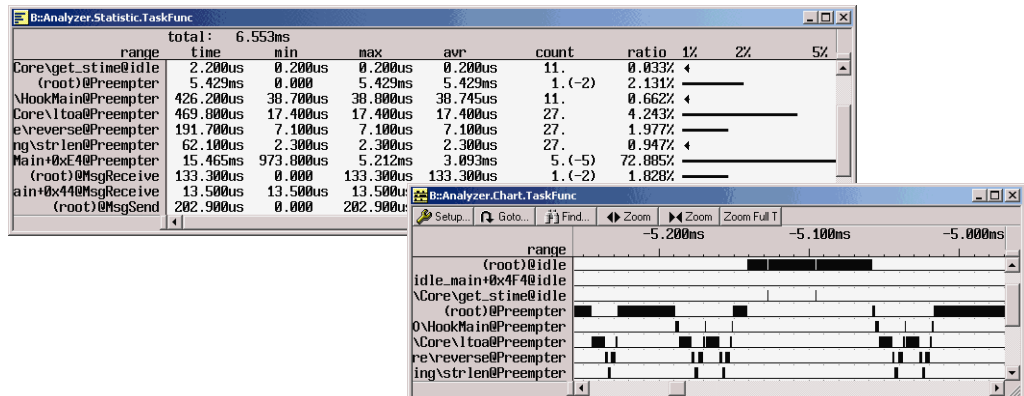


Statistics and flow of tasks

Task related evaluation of function run times

The statistic and graphic evaluation of function calls and function run times can be done dependent to the actual running task. This is necessary, if dif-

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

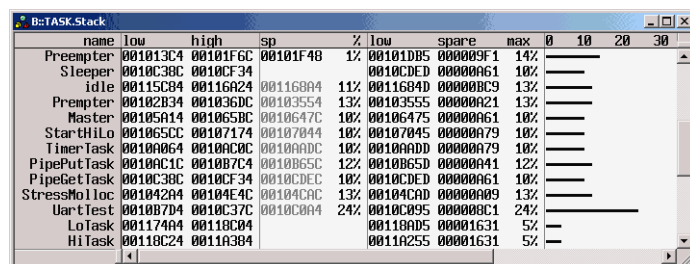


Statistics and flow of task dependent function run times

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 each separate task.



Task stack coverage window

Task Context Display

The TRACE32 Multitask debugger provides an easy way to switch the current displayed context to another task.

Normally all register related windows (e.g. listing at current PC, local variables or function call stack) are dis-

played related 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.

PRACTICE functions for OS data.

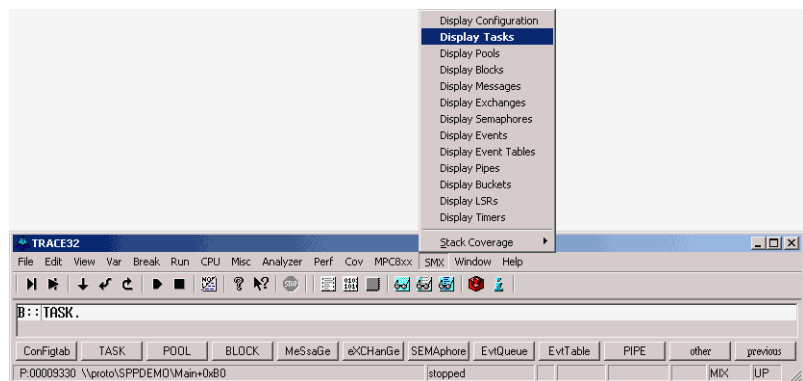
The support includes extended PRACTICE functions for SMX specific data. E.g. the function "TASK.CONFIG

(magic)" returns the address of the so called magic value, which corresponds to the id of the current executed task.

SMX 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 sys-

tem specific commands. We deliver SMX support with an example for such specific menus, which provides fast access to the SMX features.



TRACE32 with SMX menu

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