



## RTOS Debugger for Symbian OS (EKA1)

### ARM

- Real-time non-intrusive display of SymbianOS system resources
- Symbian OS specific display of trace listing
- Statistic evaluation and graphic display of thread run times
- Thread related evaluation of function run times
- Statistic evaluation and graphic display of thread states
- Thread stack coverage
- Thread context display
- PRACTICE functions for OS data
- Symbian OS related pull-down menu

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 Symbian OS Real Time Kernel (formerly called EPOC) from Symbian.

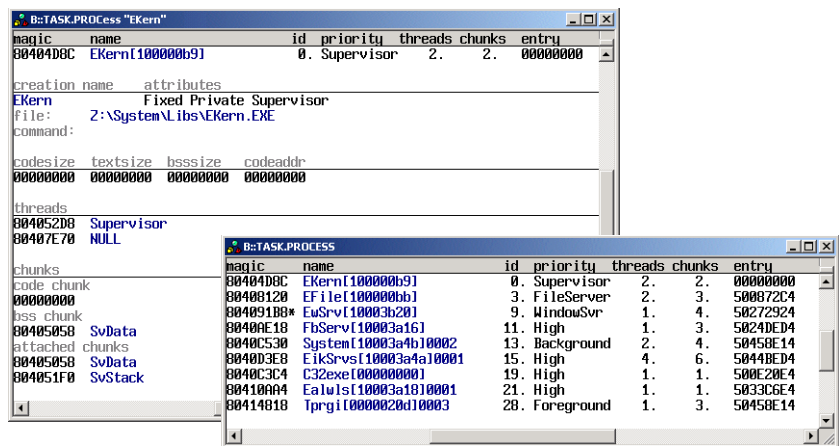
In close cooperation with Symbian, we built a highly sophisticated Symbian OS awareness, which enables you to do a most effective debugging with the TRACE32 systems on targets running Symbian OS.

## RTOS Awareness on TRACE32 for Symbian OS

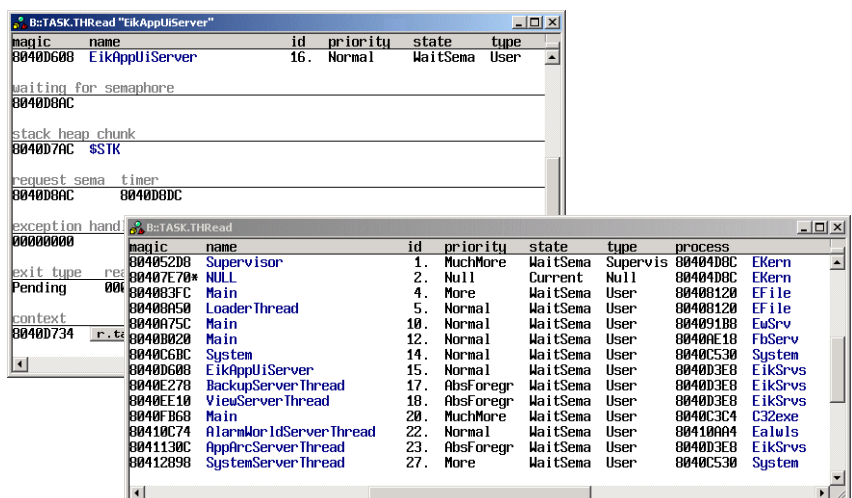
### Real Time, Non-Intrusive Display of Symbian OS System Resources

The TRACE32 RTOS debugger for Symbian OS provides display functions to show the system resources of Symbian OS. All objects, such as processes, threads, libraries and chunks can be displayed and inspected. In addition, by using the processors capability of reading the target memory

while the application is running, or 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.



Process list window and detailed window of one specific process



Thread List and detailed window of one thread

## Thread Related Breakpoints

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

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

## Thread Stack Coverage

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

pose a special window shows the current and the maximum usage of each separate thread.

name	low	high	sp	%	low	spare	max	0	10
Main@EFile	01600000	0160C000	01601E84	84%	01600C88	0000C88	93%		
LoaderThread@EFile	01800000	01806000	01803EC4	34%	018028C8	000028C8	57%		
Main@EwServ	01F00000	01F0F000	01F01E70	87%	01F00A50	00000A50	95%		
Main@FbServ	02100000	0212C000	02101E2C	95%	0210056C	0000056C	99%		
System@System	00400000	02418000	00401E8C	79%	00403644	00003644	85%		
EikAppUIServer@EikSrvs	01E00000	01F08000	00401E78	-	01E00598	00000598	96%		
BackupServerThread@EikSrvs	04700000	04708000	00602E50	-	047029F8	000029F8	67%		
Main@C32exe	04900000	04904000	04901E8C	52%	04900904	00000904	85%		
AlarmWorkIdServerThread@EaIwIs	04B00000	04B09000	00401E74	-	04B016A8	000016A8	84%		
AppArcServerThread@EikSrvs	04C00000	04C12000	00801E78	-	04C00D40	00000D40	95%		
SystemServerThread@System (other)	02500000	02508000	02503E1C	51%	02502CF8	00002CF8	64%		

Thread stack coverage window

## Thread Context Display

The TRACE32 RTOS Debugger provides an easy way to switch the current displayed context to another thread. Normally all register related windows (e.g. listing at current PC, local variables or function call stack)

are displayed related to the actual context (i.e. current executed thread). You can switch to the context of another thread to see all this information at the time this thread was scheduled.

## Debugging Drivers, Processes, Libraries and Applications

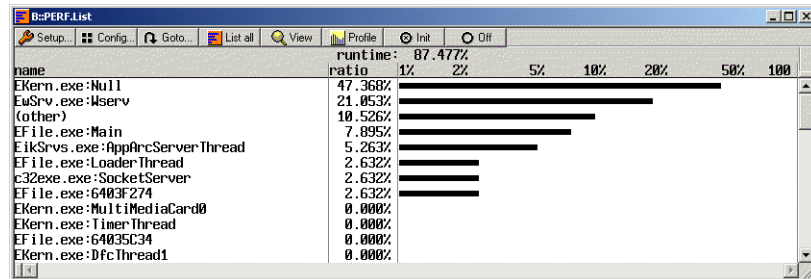
Due to the fact, that TRACE32 is a hardware debugging tool, you are able to debug anything you want, including bootstrap code, initialization phase, interrupt routines, drivers, kernel, etc. TRACE32 includes a complete MMU support, providing mechanisms to inspect the target memory using virtual addresses or physical addresses and to show the translation tables.

Additionally, TRACE32 has a special MMU support for several address spaces, which allows you to debug several Symbian OS processes and applications at once. An internal logic provides you with an easy access to all process memory spaces. A special process detection mechanism allows to halt the application exactly on the entry point of a process, allowing you to debug your process right from the beginning.

## Dynamic Thread Performance Measurement

While Symbian OS is running, TRACE32 is capable of recurrently evaluating the current running thread and collecting the results. The percentage, each thread 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.



Performance measurement list

## Symbian OS Specific Display of Trace Listing

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

The thread switches are displayed symbolically, either exclusively or in addition to other information.

## Statistic Evaluation and Graphic Display of Thread Run Times

The analyzer can calculate statistic tables of thread run times and thread switches. A graphical diagram shows

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

## Thread Related Evaluation of Function Run Times

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

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

## Statistic Evaluation and Graphic Display of Thread States

These tabular and graphical analyses of the status of threads show the various states (i.e. running, ready, waiting, suspended and undefined) and times

each thread spent in each state. A graphical view of the data can help to highlight prioritisation problems, critical paths etc.

## PRACTICE functions for OS data.

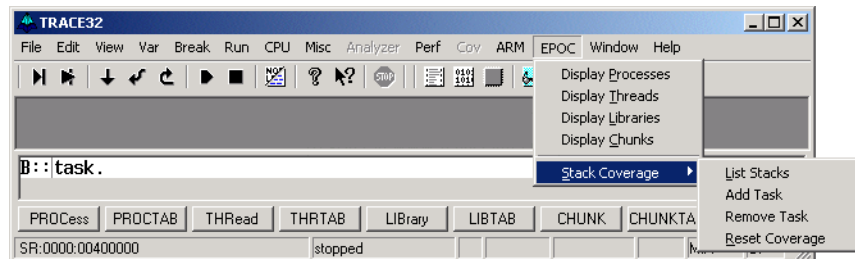
The support includes extended PRACTICE functions for Symbian OS specific data. E.g. the function "TASK.CONFIG

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

## Symbian OS 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 Symbian OS support with an example for such specific menus, which provides fast access to the features.



TRACE32 with Symbian OS menu

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