LAUTERBACH
DEVELOPMENT TOOLS

TRACE32®

DEBUG & TRACE

TriCore™ AURIX™

TriCore™

TriCore™ AURIX™ at a glance

For more than 20 years Lauterbach has been supporting the latest TriCore™ AUDO™ and AURIX™ microcontrollers. Our tool-chain offers:

- Debugging of all TriCore CPUs and auxiliary cores.
- Tracing of TriCore CPUs and some auxiliary cores via on-chip trace, high-speed serial trace or DAP streaming even for production devices with miniMCDS.
- Code Coverage according to ISO 26262 (Tool Qualification Support Kit)
- AUTOSAR-aware debugging & profiling
- Support for Rust includes source code level debugging.

TriCore™ AURIX™

TriCore™ AURIX™ Debug Solutions

Single debug solution for all cores

target system	core type	core state
1: Chip		
1: SMP Sub System	TriCore	
0: TriCore0	TriCore	stopped
1: TriCore1	TriCore	stopped
2: TriCore2	TriCore	stopped
3: TriCore3	TriCore	stopped
4: TriCore4	TriCore	stopped
5: TriCore5	TriCore	stopped
2: Core	HSM\ARM	stopped
3: SMP Sub System	GTM	
0: Core	GTM	stopped
1: Core	GTM	stopped
2: Core	GTM	stopped
3: Core	GTM	stopped
4: Core	GTM	stopped
5: Core	GTM	stopped
6: Core	GTM	stopped
7: Core	GTM	stopped
4: TC3X_SCR	i8051	running

TRACE32® enables concurrent debugging of all TriCore™ CPUs as well as all auxiliary cores of an AURIX™ SoC.
This allows to examine their interaction in depth.
The above includes:

- TC4x: up to 6 TriCore™ CPUs, CSRM (TriCore™), SCR (XC800), PPU (ARC), GTM and cDSP
- TC2xx/3xx: up to 6 TriCore™ CPUs, HSM (Cortex®-M), SCR (XC800), GTM

Beside standard features like Step/Go/Break and flash programming TRACE32® offers:

- AUTOSAR-aware debugging
- Debugging of multi-OS configurations
- Hypervisor-aware debugging for Memory Protection Unit (MPU) hypervisors

DISCOVER MORE: www.lauterbach.com/supported-platforms/architectures/tricore

TriCore™ AURIX™ Trace Solutions

- Records information, generated by the MCDS module, about instruction execution and data accesses of multiple TriCores™ CPUs, GTM, ,cDSP and PPU as wells as transfers on the on-chip buses and peripheral state transitions.
- Provides triggers and filters to limit recorded data and to use trace buffers effectively.
- Enables long-term recoding by streaming trace data to the host (TRACE32® trace streaming).
- Allows to generate timestamps for correlating the program flow with external signals
- Trigger programming language (CTL) allows to use precise trace filters and exact triggers without detailed MCDS knowledge.

(feature availability depdends on used device)

Multicore Trace

Setup... | Config... | Goto... | Find... | Chart | Profile | MIPS | More | Less

record	run	address	cycle	data	symbol	ti.back	busmaster
	0	/* Enabling core3 : tc3.. */					
	0	void TC0_StartCore3()					
	0	{					
	0	extern void __noinline__ __noreturn__ __jump__ _start_tc3(void);					
50	0	CPU3_PC.U = (unsigned int)_start_tc3;					
	0	movh.a a15,#0xF888					
	0	st.w [a15]-0x1F8,d15					
+00004136	0	D:F887FE08 wr-data		70101348		0.080us	
+00004148	1	P:70100EA6 ptrace			…_intmem\cstart_tc1_start+0x86	2.080us	
	1	isync					
	1	st16.w [a15],d15					
+00004154	1	D:F0036258 wr-data		FFFC00F3		0.000us	
	1	ld16.w d15,[a15]					
+00004166		D:F00362A8 rd-spb		FFFC000F			CPU0 DMI
+00004175	1	D:F0036258 rd-data		FFFC000F		0.000us	
	1	movh.a a15,#0x0_					

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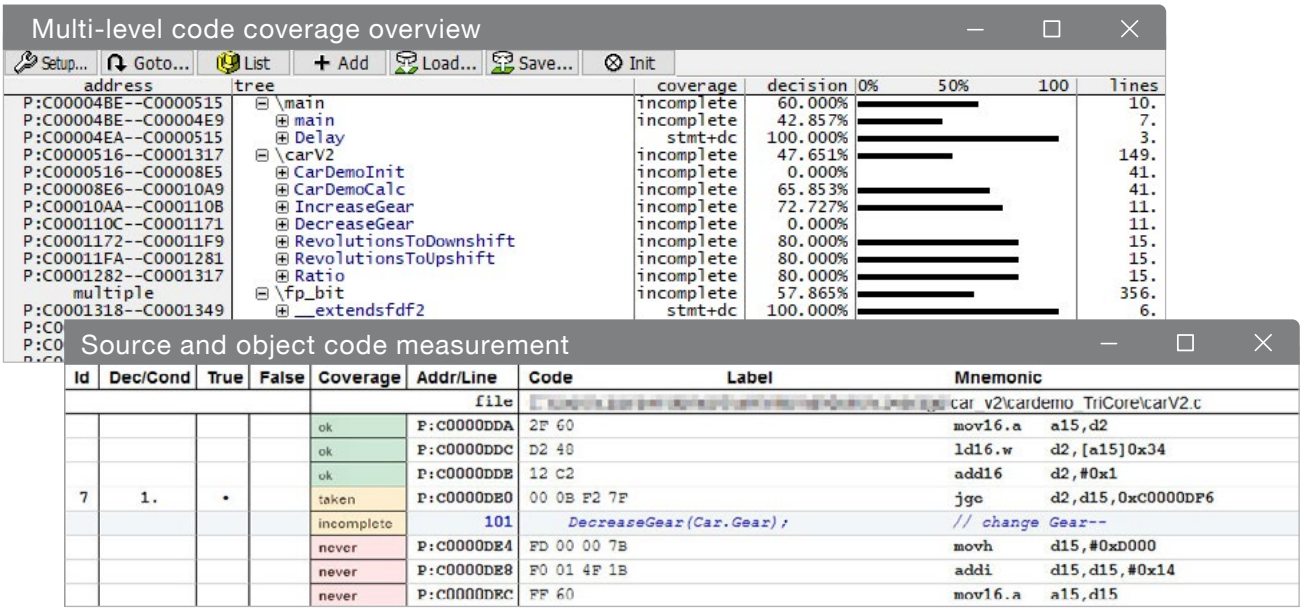
TriCore™

Code Coverage for Functional Safety

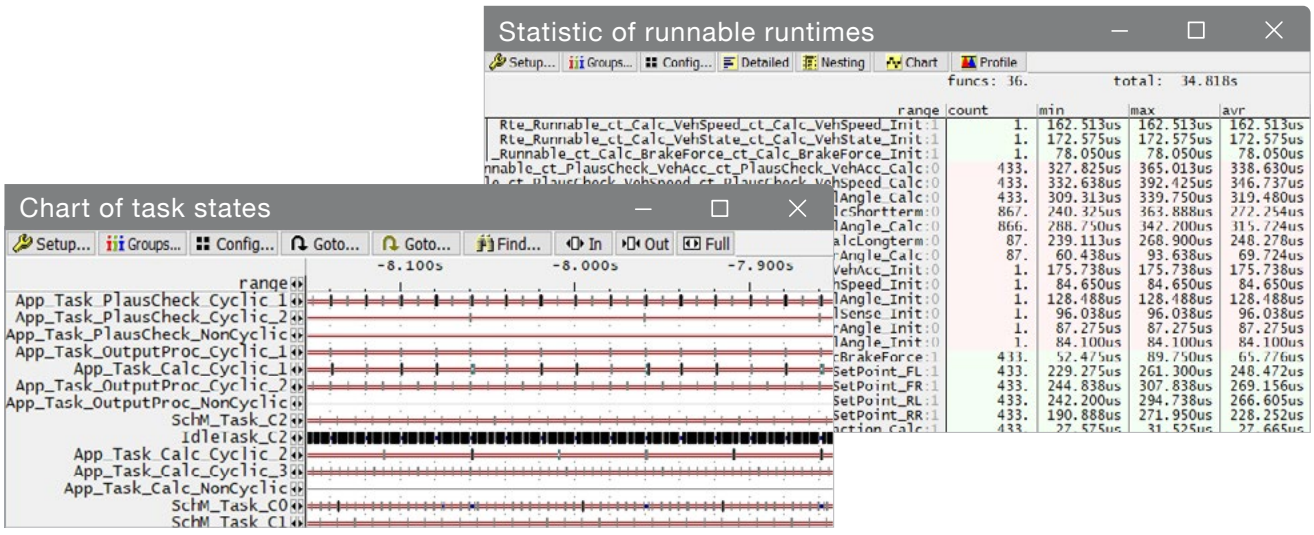
- The code coverage funtionality supports all metrics required for ISO26262 and other safety standards: statement, branch, MC/DC, function and call coverage.
- The TRACE32® Tool Qualification Support-Kit streamlines TRACE32® tool qualification effort and costs for the TRACE32® Instruction Set Simulator and all TriCore™ trace solutions.



DISCOVER MORE: www.lauterbach.com/use-cases/tool-qualification

Profiling for AUTOSAR Classic Platform

- The support for the ARTI standard provides profiling of task state changes, runnables, and interrupts including their state changes. An export to the standardized ARTI format allows data exchange with 3rd-party timing tools.
- The support for the ORTI standard provides profiling of running tasks and (interrupt) service routines as well as a proprietary export.
- These use cases are supported by all TRACE32® trace solutions.



DISCOVER MORE: www.lauterbach.com/os-awareness

DEBUG & TRACE SYSTEM
for any Infineon AURIX™ Microcontroller

PowerDebug System

Powerful, modular, flexible debug system supporting TriCore™ and all auxiliary controllers

DISCOVER MORE:
lauterbach.com/debugger

PowerTrace System

Highest Performance Trace Recording of entire TriCore™-based microcontrollers

CombiProbe 2

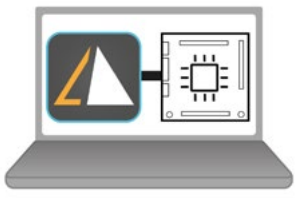
Streaming of on-chip trace via DAP debug port to external trace memory for AUTOSAR Profiling

DISCOVER MORE:
lauterbach.com/trace

SOFTWARE-Only Solutions

DEBUG & TRACE
VIA XCP

DEBUG & TRACE
OF SYNOPSYS VDK



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