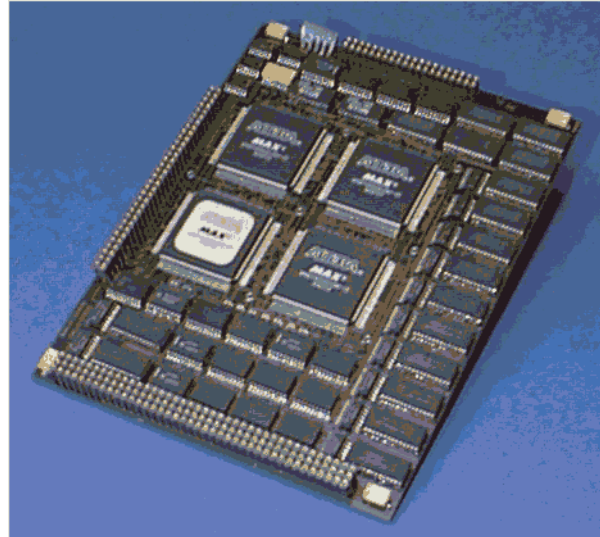


Highspeed Compact Analyzer

- 120 Channel Trace
- Trigger Unit
- 25 ns Time Stamp
- Master-Slave Trigger
- Selective Trace
- Statistic Display
- Timing Display
- Coverage Analysis

The TRACE Analyzer HAC is designed as a high-speed state analyzer for CPU cycle times up to 50ns . Because of recent and very fast integrated circuits, the analyzer offers a 32 Kbyte trace memory with a system synchronized time stamp unit and with powerful trigger capabilities. All important line of the CPU are automatically connected to the analyzer.

State Analyzer HAC



The TRACE Analyzer HAC is designed as a high speed analyzer for CPU cycle times up to 50 ns. It is a part of the ECC32 and a cheap solution with reduced but sufficient trigger capabilities for most of the common hardware and software designer demands. The analyzer offers a 32 Kbyte trace memory with a system synchronized time stamp unit and powerful and complex

trigger capabilities. All important lines of the CPU are automatically connected to the analyzer. Universal input and output lines for trigger and stimulation can be connected via additional probes. For more complex requirements, a HA120 can be mounted on the system without removing the HAC.

88 Channel Trace

The HAC samples 88 bit per record. For 32 bit processors, additional trace buffer are located on the base modules. Up to 312 bit per record can therefore be controlled by the analyzer.

- 24 bit address
- 4 bit address range
- 16 bit data
- 8 bit state signals
- 4 bit bank access signals
- 16 bit universal channels
- 3 bit markers
- 3 bit 8 trigger levels
- 8 bit external trigger inputs
- 1 bit DMA access
- 4 bit task no.
- 8 bit reserved
- 5 bit internal

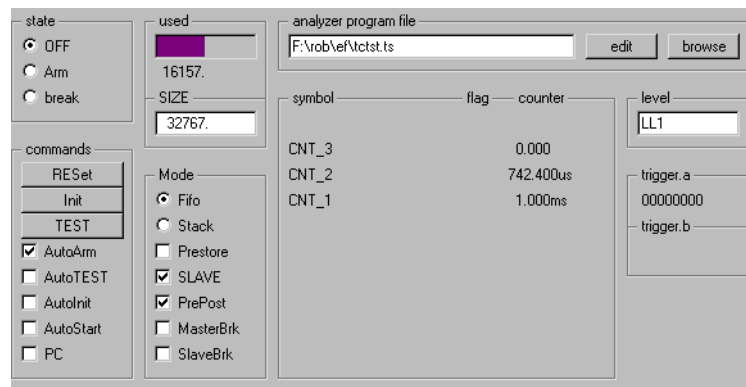
High-Speed down to 50ns Cycle Time

If necessary , CPU cycles up to 50 ns can be recorded. Also complex trigger input and output functions can be performed in 50 ns without touching real time program execution.

Large Trace Depth (32 KFrames)

The trace depth reaches 32 KFrames . This is much more than necessary , because of the flexible trigger unit, which allows exactly to specify the contents of the trace memory.

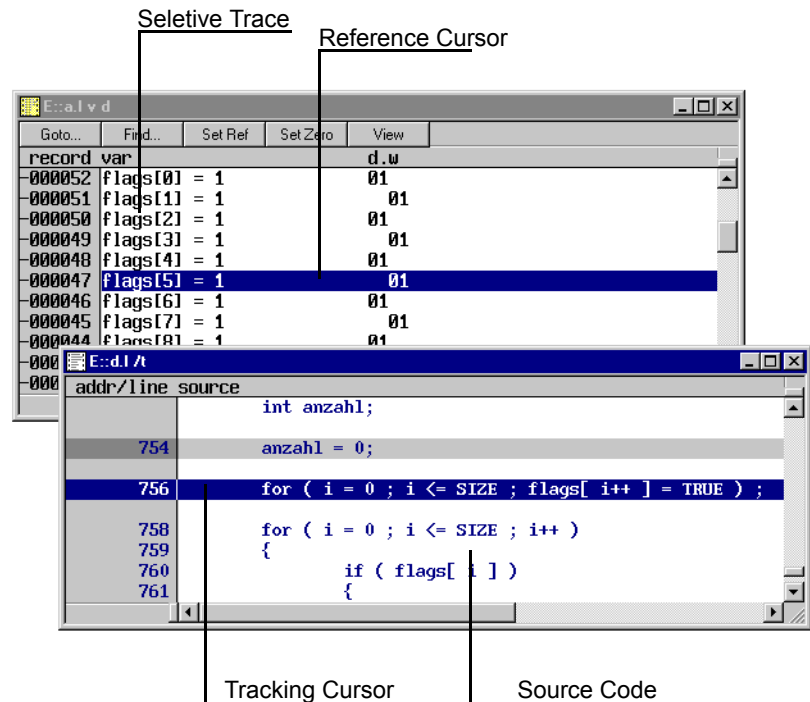
Operation Modes



- FIFO mode
 - records all until user program has been stopped.
- STACK mode
 - records from program start until the trace memory is full.

PRESTORE Function

In the PRESTORE mode, the analyzer samples always an additional previous Opfetch cycle forced by hardware, if only data transfers should be sampled selected by the trigger unit.



Internal Expansion Capability

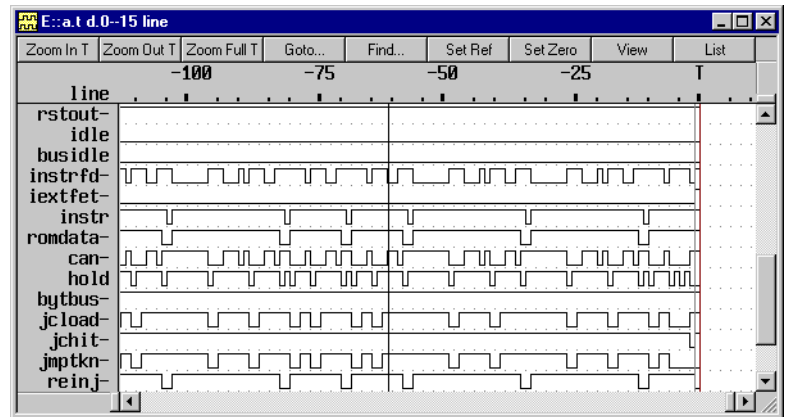
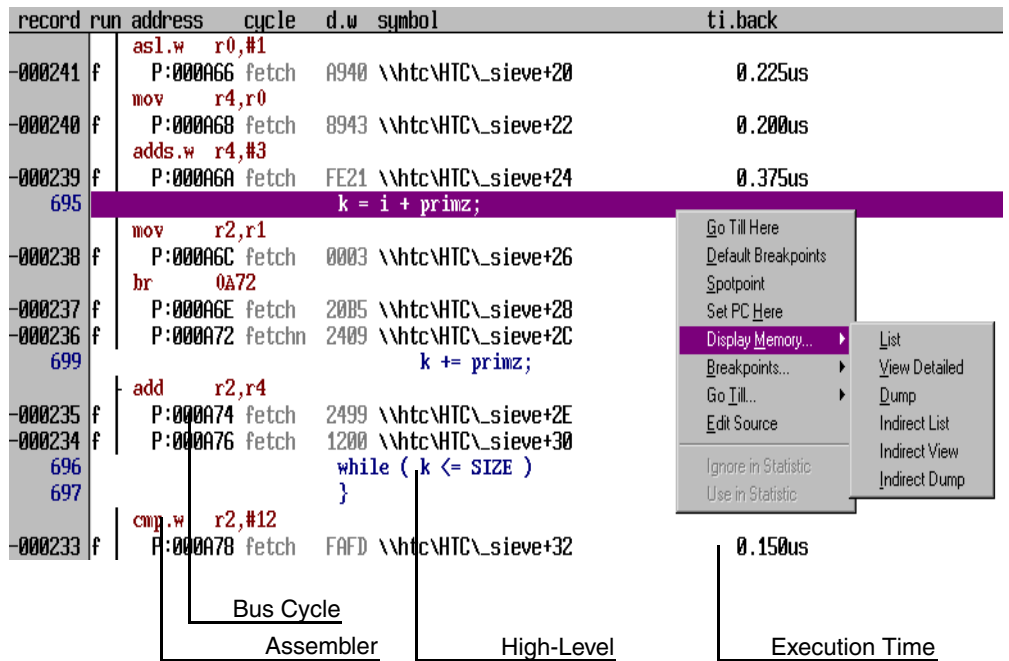
For emulator modules which need more trace capacity, the necessary extra bits are built into the emulator

module itself (e.g. 64 additional channels with the trace board on microcontroller emulation heads).

Various Trace Memory Display

- List
- Timing
- Chart
- Recordwise
- Assembler mnemonic
- Hex, binary, ASCII, etc.
- High Level Language
- Mixed language

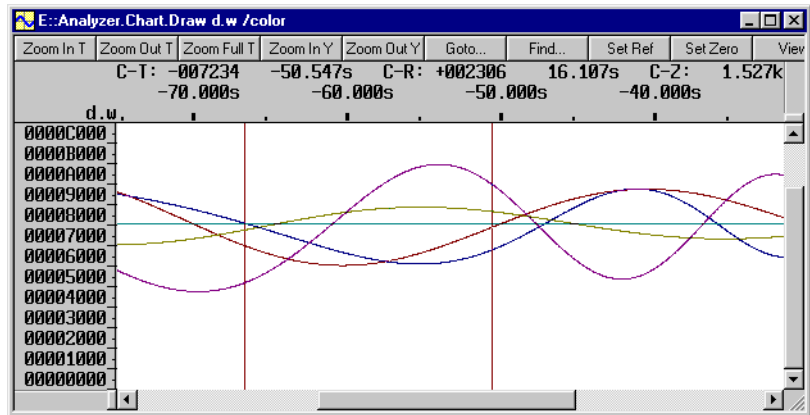
Program source tracking



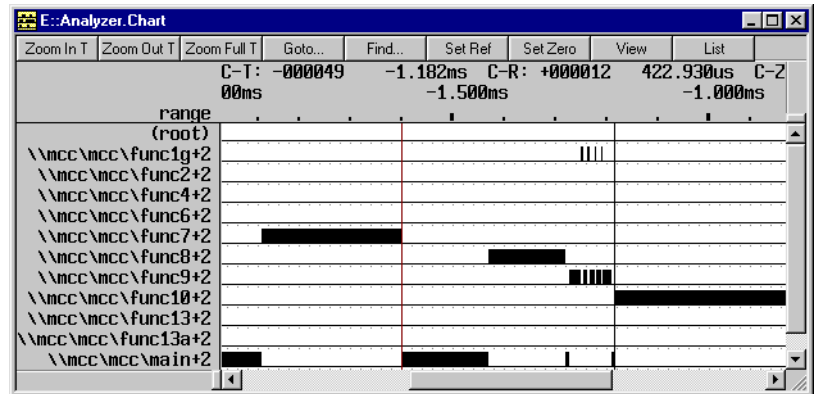
Cursor

Ref. Cursor

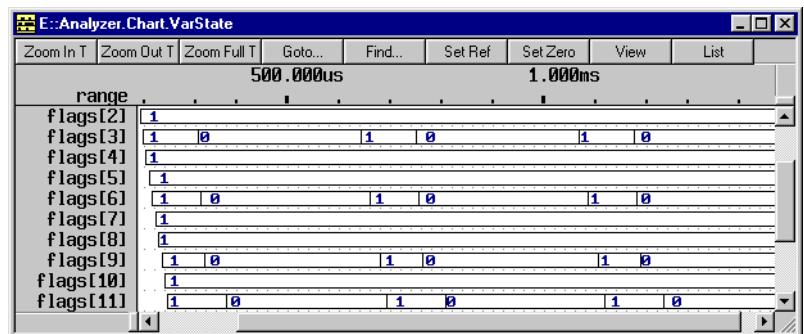
Trigger



Graphical Display



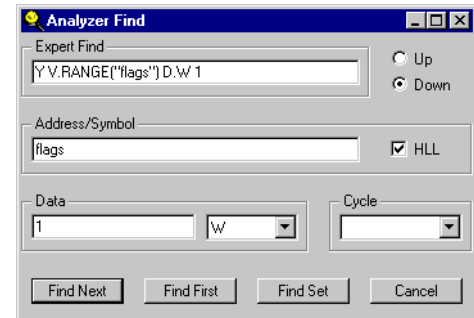
Execution Time Chart



Variable Time Chart

Powerful Trace Memory Manager

- Save memory
 - Load memory
 - Print memory
 - Compare memory
 - Find specific entry
 - Goto record
 - Time and record number evaluation.
 - Referenz pointer
- User defined display



Analyzer Trigger Unit with 3 Levels

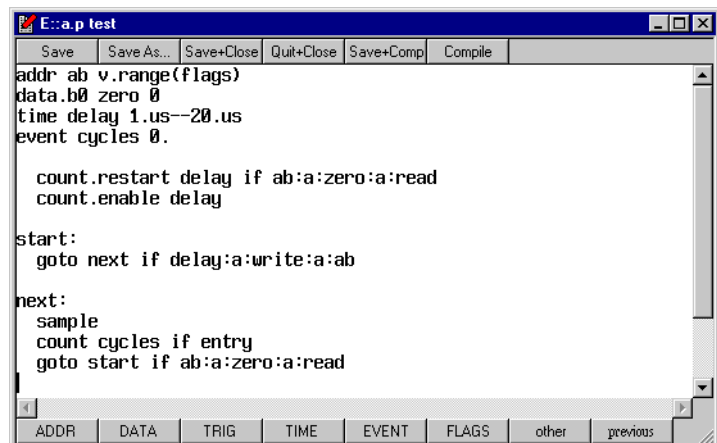
The level structure of the trigger unit allows quite flexible trigger combinations and sequences in consecutive and nonconsecutive order. Each level has the same priority and almost the same capabilities. A trigger program

defines, under which circumstances a level can be reached or left, and therefore which trigger conditions or operations are the current or the next.

Analyzer Programming via a special Window

The programming of this complex trigger unit is done in an assembler like language for maximum flexibility. Using this language, the programming of very

complex trigger sequences or operations can be defined. For simple demands, a pull down menu improves the programming for beginners.



Symbolic Operations for Analyzer Programming

All output operators and input variables can be entered in symbolic form. The target program symbols can also be used.

Trigger Sources

- Up to 2 address ranges
- Up to 2 data events (mask, range, ASCII, hex, binary)
- Up to 2*8 bit external trigger events
- CPU state (MEM READ, IO WRITE, INTA, ...)
- Counter outputs

External Trigger Inputs

- 1 inputs with 8 channels
- 1 trigger qualifiers for each trigger level
- Static levels of the trigger inputs can be read at any time
- Free format definition of external trigger events Hex and Mnemonic Display of Trace Data
-

Trigger Operations

- Count.Enable
- Sample.Enable
- Trigger.Emulator
- Trigger.Exception
- Out (Target Stimulation)
- Break
- Spot
- GOTO level , CONTINUE

Free Format Definition of Data, Address and Trigger Events

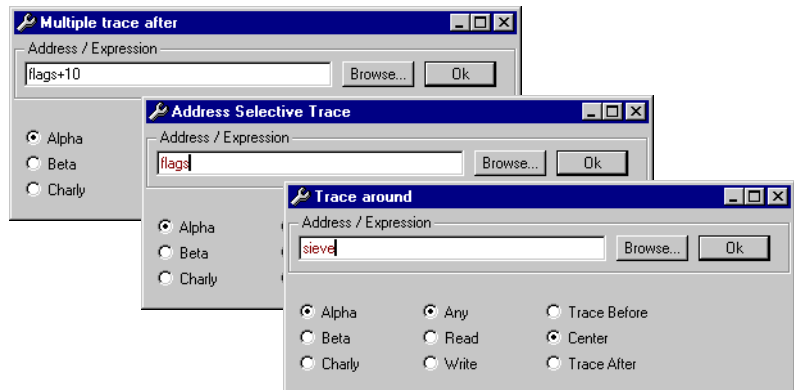
- Hex and hex masks
- Binary and binary masks
- ASCII character and string
- Data ranges

Wizards for Standard Trigger Problems

Time and Event Measurements with up to 3 Counters

There are 2*16 bit counter for event measurement or event triggering and there is a 16 bit delay counter available. All counters are re-triggerable and can

be evaluated as a part of an expression in the trigger sequences. Each counter can be used for timing measurements or as a counter for events.



- Event count 1 to 65536
- Cycles 1 to 65536
- Time 100ns resolution
- Retriggerable
- Selective release
- Trigger event when counter is zero
- Definition of time and event windows
- All Counters can be read 'on the fly'

Trigger Monitor

A display of the counter values, the trigger values, the trigger levels and the trigger flags is available in the trigger monitor window.

symbol	flag	counter	level
CNT_3		0.000	LL1
CNT_2		742.400us	trigger.a
CNT_1		1.000ms	00000000
			trigger.b

State of counters or flags

Trigger level

Input level

Statistic Analyzer

Time Stamp

The Time Stamp Unit tags each trace record with a time value. These values are absolute and synchronized with all the other time values within the TRACE32 system.

Recording depth max. 32K

32 time stamp recording channels

Resolution 100ns/1us

Function Analysis

Min. and max. time

Include and exclude time

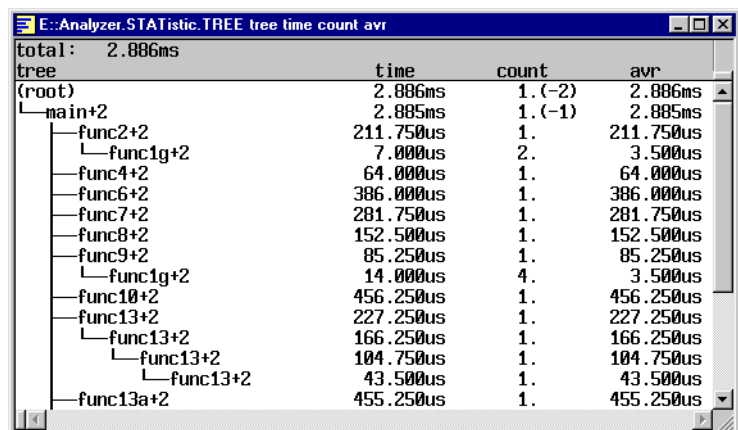
Passes

Link Analysis

Callers

Calls

Min. and max. times

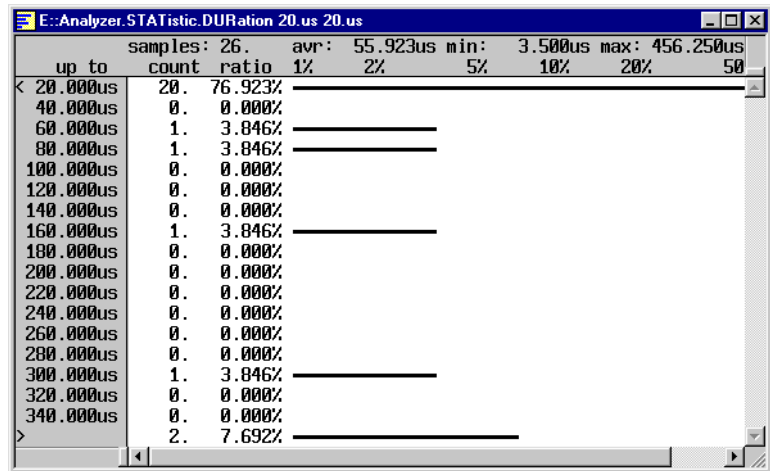


tree	time	count	avr
total:	2.886ms		
(root)	2.886ms	1. (-2)	2.886ms
└─main+2	2.885ms	1. (-1)	2.885ms
└─func2+2	211.750us	1.	211.750us
└─func1g+2	7.000us	2.	3.500us
└─func4+2	64.000us	1.	64.000us
└─func6+2	386.000us	1.	386.000us
└─func7+2	281.750us	1.	281.750us
└─func8+2	152.500us	1.	152.500us
└─func9+2	85.250us	1.	85.250us
└─func1g+2	14.000us	4.	3.500us
└─func10+2	456.250us	1.	456.250us
└─func13+2	227.250us	1.	227.250us
└─func13+2	166.250us	1.	166.250us
└─func13+2	104.750us	1.	104.750us
└─func13+2	43.500us	1.	43.500us
└─func13a+2	455.250us	1.	455.250us

Duration

Execution time

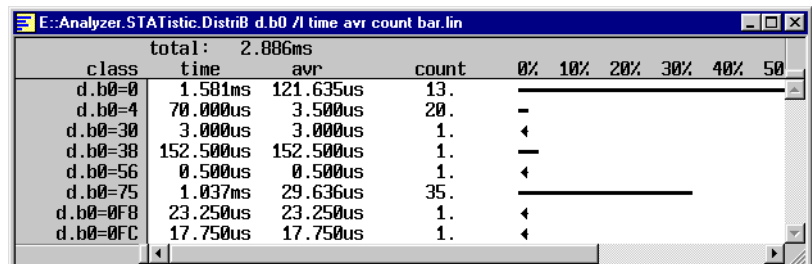
- Response time



Distance

- Time between samples

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Detailed Order Information

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