TRACE32®

Technical Information

ICE-68300

13.03.19

In-Circuit Emulator for MC68000 and MC6830X

TMP68301
TMP68303

■ Support for all family members

■ 33 MHz no-waitstate emulation

■ 3.3V and 5V support

■ Support for single and dual-chip emulation mode

■ Address reconstruction unit

■ On-Circuit emulation with clip-over adapter

■ Interface with all compilers

■ C++ support

■ CASE tools interface

■ RTOS support

■ Windows9x, NT and Motif interface
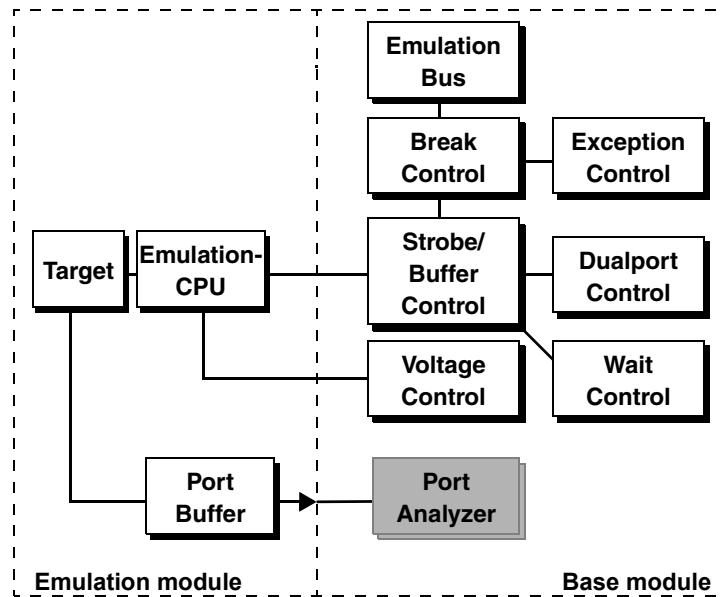
The TRACE32-ICE68300 supports all members of the 68000/683xx-family from Freescale and some members of 683xx-family from Toshiba. The system is designed for bondout and non-bondout controllers. Its modular and open technology allows the fast integration of new chip designs.

A software compatible ROM Monitor is also available.

TRACE32 works with the highest variety of host interfaces. The communication link to the host is done by the printer port, a fibre optic interface or ethernet allowing a high-speed transfer.

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Features
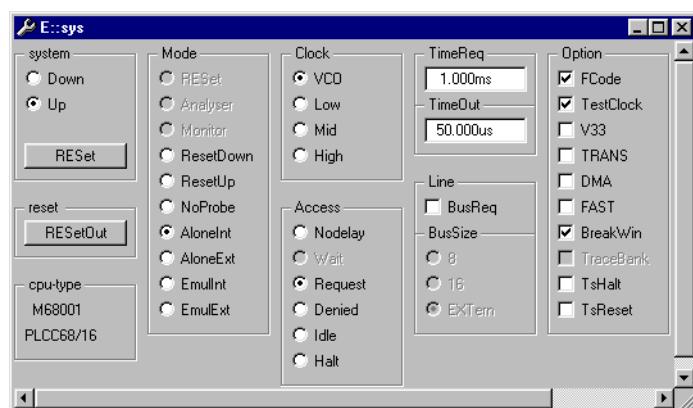
Basics of Operation

Operating Modes

The Emulator can work in stand-alone mode with internal clock or in active mode with internal or the target clock. On power-down of the target system the emulator tristates its output buffers and isolates its internal emulation circuits.

The operation modes are as follows: ❑ Reset Down

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❏ Reset Up

❏ Alone Internal

❏ Alone External

❏ Emulation Internal

❏ Emulation External

Clock

❏ Operation with external or internal Clock

❏ 1..35 MHz internal clock

Dual-Port Access

All TRACE32 memories are dual-ported. The dual-port access makes it possible to display and modify the contents of the overlay memory, to set or delete breakpoints or use the flag memory while the application is running in real-time.

There are 3 modes for dual-port access

❏ Request

❏ Nodelay

❏ Idle

❏ Halt
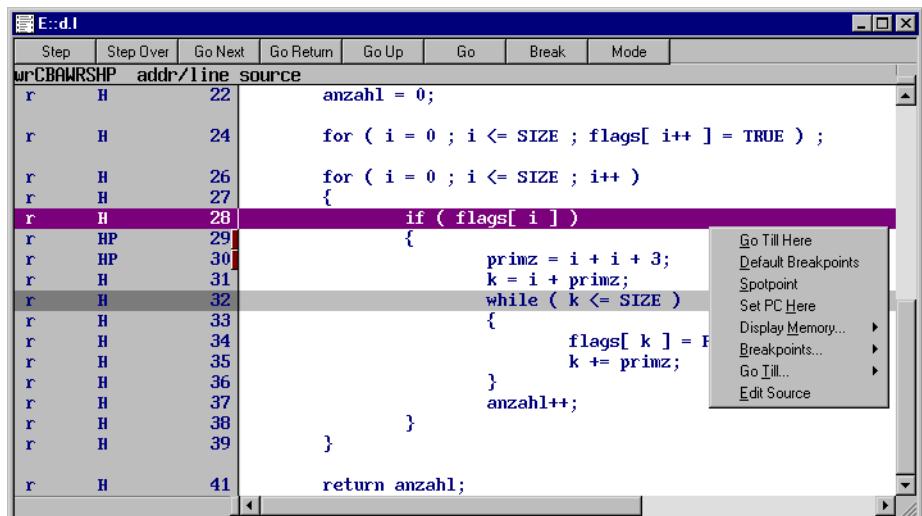
The *REQUEST mode* is the default methode accessing memory in real-time. It only works if the Busrequest/ BusGrand function is available.

In *NODELAY mode* the Dualport access is done while the buscycle is not active (AS- is HIGH). This access mode was made for CPU's which have no BR- line (68LC302, 68PM302). With 25ns SRAM this mode works up to 19..20MHz.

In *IDLE mode* the Dualport access is done while the CPU is running an Idle cycle. Like NODELAY mode this access mode was made for CPU's which have no BR- line. It only works if there are idle cycles in the executed program. With 25ns SRAM the speed limit is at 20..21MHz.

HALT mode enables dualport access by forcing the HALT-pin. This mode is required if none of the other modes will work. It has no speedlimit but there might be malfunction if the program is using RESET instructions.

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HLL Debugging

Multitask Debugging

To keep the user application running (Interrupts etc.), while emulation using single steps or watching variables, parts of the user program can still be active.

❏ One foreground task

❏ One background task
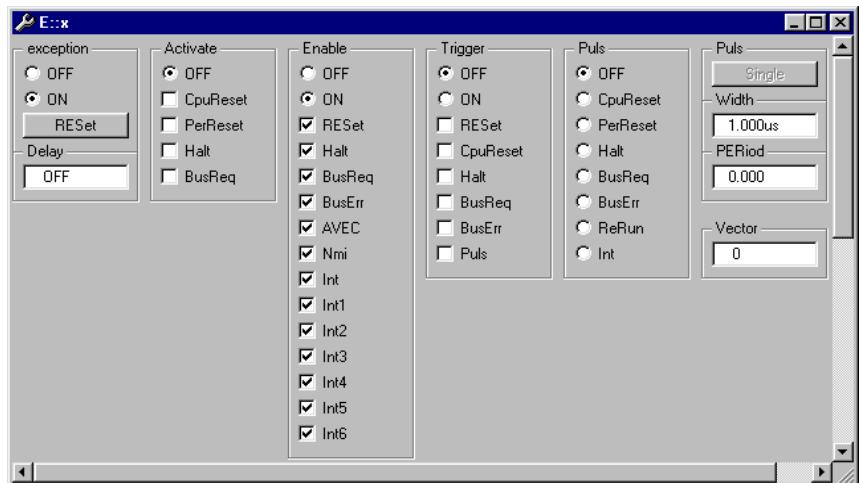
Target Clock and Voltage Monitoring

This feature prevents failures caused by missing clock or undervoltage.

Wait System

❏ Additional wait cycles (1-15) may be specified

❏ Up to 250 wait cycles (4K blocks global and bytewise)

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Exception Control

The TRACE32 exception controller allows you to permanently activate an exception, to enable or disable specific exceptions, to trigger on specific exceptions or to stimulate an exception.

❑ Static exception setting
  ■ CPURESET
  ■ PERRESET
  ■ HALT
  ■ BUSREQ

❑ Exception Trigger
  ■ RESET
  ■ CPURESET
  ■ HALT
  ■ BUSREQ
  ■ BUSERR
  ■ Simulated Exception

❑ Exception Control
  ■ RESET
  ■ HALT
  ■ BUSERR
  ■ AVEV
  ■ INT1 .. INT6
  ■ NMI

Port Analyzer

On the emulation base there is an extra slot for the TRACE32 Port Analyzer. Depending on CPU type various signals can be traced. Some probes have connectors to trace external target lines.

On-Circuit Emulation

❑ Support for Clip-Over adapters

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Modules Overview

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Debug Interfaces

Compiler

Language	Compiler	Company	Option	Comment
ADA	ALSYS-ADA		IEEE	limited support (IEEE)
ADA	TELESOFT-ADA	Telesoft	IEEE	limited support (IEEE)
ASM	RTOS	IEP GmbH	SYM/LOC	Source level debugging
ASM	ASM68K	Mentor Graphics Corporation	IEEE	Source level debugging
ASM	VERSADOS-ASM	NXP Semiconductors	VERSADOS	symbols only
ASM	OS-9-ASSEMBLER	Radisys Inc.	ROF	Source level debugging
ASM	AS68	TASKING	IEEE	
C	HP-64000-C		HP	no type/locals info
C	ORGANON	CAD-UL ElectronicServices GmbH	BOUND	
C	C68K	Cosmic Software	COSMIC	
C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF	
C	GNU-C	Free Software Foundation, Inc.	COFF	
C	GNU-C	Free Software Foundation, Inc.	ELF/DWARF	
C	GREEN-HILLS-C	Greenhills Software Inc.	COFF	
C	ICC68K	Introl Corporation	ICOFF	
C	MCC	Mentor Graphics Corporation	IEEE	

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Language	Compiler	Company	Option	Comment
C	HT-68K	Microchip Technology Inc.	HITECH	
C	HICROSS-68K	NXP Semiconductors	HICROSS	
C	CC68K	NXP Semiconductors	COFF	
C	ULTRA-C	Radisys Inc.	ROF	OS/9 compilers
C	OS/9-C	Radisys Inc.	ROF	
C	CROSSCODE-C	SDSI	SDS	
C	SCC68K	Sierra	COFF	
C	SUN3-CC	Oracle Corporation	DBX	
C	ICC68K	TASKING	COFF	
C	ICC68K	TASKING	IEEE	
C	TT-68K	TASKING	IEEE	
C	TCC68K	TASKING	AOUT	only source and syms
C	TEKTRONIX-C	Tektronix	COMFOR	
C	D-CC	Wind River Systems	IEEE	
C	D-CC	Wind River Systems	ELF/DWARF	
C++	ORGANON-C++	CAD-UL ElectronicServices GmbH	BOUND	
C++	GNU-C++	Free Software Foundation, Inc.	DBX	
C++	GNU-C++	Free Software Foundation, Inc.	ELF/DWARF	
C++	CCC68K	Mentor Graphics Corporation	IEEE	
C++	HICROSS-68K	NXP Semiconductors	HICROSS	
C++	CODEWARRIOR	NXP Semiconductors	ELF/DWARF	
C++	CROSSCODE-C++	SDSI	SDS	

Language	Compiler	Company	Option	Comment
C++	D-C++	Wind River Systems	ELF/ DWARF	
MODULA	MOD68K	Introl Corporation	ICOFF	
MODULA	MCS2	Multichannel systems GmbH	COFF	
MODULA	MCDS	NXP Semiconductors	MCDS	
PASCAL	MPC	Mentor Graphics Corporation	IEEE	
PEARL	RTOS	IEP GmbH	SYM/ LOC	no type/locals info

RTOS Support

Company	Product	Comment
Atego Ldt.	AdaWorld ARTK	
KadakProducts Ltd.	AMX	
Oracle Corporation	ChorusOS	
CMX Systems Inc.	CMX-RTX	
Synopsys, Inc	MQX	2.40 and 2.50, 3.6
	MTOS-UX	
Mentor Graphics Corporation	Nucleus PLUS	
Radisys Inc.	OS-9	
Enea OSE Systems	OSE Classic	(OS68)
Enea OSE Systems	OSE Delta	4.x and 5.x
	RealTime Craft	(XEC68k)
Quadros Systems Inc.	RTXC 3.2	
IBM Corp.	SDT-Cmicro	

Company	Product	Comment
-	uCLinux	Kernel Version 2.4 and 2.6, 3.x
Mentor Graphics Corporation	VRTX32	
Mentor Graphics Corporation	VRTXmc	
Mentor Graphics Corporation	VRTXsa	
Wind River Systems	VxWorks	5.x and 6.x

Debugger Support

CPU	Tool	Company	Host
	WINDOWS CE PLATF. BUILDER	-	Windows
	CODE::BLOCKS	-	-
	C++TEST	-	Windows
	ADENEO	-	
	X-TOOLS / X32	blue river software GmbH	Windows
	CODEWRIGHT	Borland Software Corporation	Windows
	CODE CONFIDENCE TOOLS	Code Confidence Ltd	Windows
	CODE CONFIDENCE TOOLS	Code Confidence Ltd	Linux
	EASYCODE	EASYCODE GmbH	Windows
	ECLIPSE	Eclipse Foundation, Inc	Windows
	CHRONVIEW	Inchron GmbH	Windows
	LDRA TOOL SUITE	LDRA Technology, Inc.	Windows

CPU	Tool	Company	Host
	UML DEBUGGER	LieberLieber Software GmbH	Windows
	SIMULINK	The MathWorks Inc.	Windows
	ATTOL TOOLS	MicroMax Inc.	Windows
	VISUAL BASIC INTERFACE	Microsoft Corporation	Windows
	LABVIEW	NATIONAL INSTRUMENTS Corporation	Windows
	TPT	PikeTec GmbH	Windows
	CANTATA	QA Systems Ltd	Windows
	RAPITIME	Rapita Systems Ltd.	Windows
	RHAPSODY IN MICROC	IBM Corp.	Windows
	RHAPSODY IN C++	IBM Corp.	Windows
	TESSY	Razorcat Development GmbH	Windows
	DA-C	RistanCASE	Windows
	TRACEANALYZER	Symtavision GmbH	Windows
	ECU-TEST	TraceTronic GmbH	Windows
	UNDODB	Undo Software	Linux
	TA INSPECTOR	Vector	Windows
	VECTORCAST UNIT TESTING	Vector Software	Windows
	VECTORCAST CODE COVERAGE	Vector Software	Windows
68K	OS68 DEBUGGER	Enea OSE Systems	-
68K	SDT CMICRO	IBM Corp.	Windows
68K	DIAB RTA SUITE	Wind River Systems	Windows

Operation Frequency

The maximum operation frequency of TRACE32-ICE68300 depends on:

❏ The max. frequency of the CPU

❏ The access time of the overlay memory (15ns or 35ns)

❏ The mapper mode (**S**low or **F**ast)

❏ The number of waitstates
(WO = 0 waitstates
 W1 = 1 waitstate)

❏ The dual-port access mode

Denied, Request and Halt Access

Gap Access

Dimensions

Module Dimensions

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Connectors

On each emulation module there are half-size connectors to:

❏ Connect the emulation module directly to the target by providing the corresponding connectors also on the target hardware

❏ Connect a standard adapter from Emulation Technologie, YAMAICHI, AMP etc.

The following table lists the physiacal dimensions of these half size connectors.
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Adapter

Not necessary.

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Available Tool Chain

TRACE32 provides a complete set of development tools for the 16x family. This includes:

❏ The In-Circuit Emulator TRACE32-ICE

❏ The high speed RISC Emulator TRACE32-FIRE

❏ The BDM/JTAG/ONCE etc. based In-Circuit Debugger TRACE32-ICD

❏ The ROM Monitor based In-Circuit Debugger TRACE32-ICD

❏ Evaluation boards, which can be used until the target hardware is available.

The following list give an overview which development tools are available for the specific derivatives of the 16x-family.
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Order Information

Module Description

Detailed Order Information

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