

## ICE In-Circuit Emulator

- Timing Analyzer
- Emulation Memory
- Memory Banking
- ICE Module
- State and Performance Analyzer
- Emulation Controller
- System Controller

TRACE32-ICE is a state of the art In-Circuit Emulator, which offers unlimited hardware breakpoints and up to 16MByte dual-ported emulation memory. The real-time trace and trigger work up to the max. speed of the CPU. The analyzer offers selective trace

as well as performance analysis and statistic functions.

The system offers an interface to all programming languages for most compilers and a multitask debugger for a wide range of RTOS. 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.

TRACE32-ICE is universal In-Circuit Emulator and supports a wide range of 8- to 32-bit microprocessors and microcontrollers. Its modular architecture allows:

1. to adapt the emulator to your project requirements

2. to integrate the emulator in any project environment

3. to adapt the emulator easily to different CPUs

4. to support new CPUs in record time

## TRACE32-ICE Features

### Universal Emulator for 8- to 32-bit Microprocessors

TRACE32-ICE supports a wide range of microprocessors and microcontrollers at 3.3V or 5V.

### Open Software Architecture

TRACE32-ICE works seamlessly with

- Most programming languages (C, C++, ADA, Pearl etc.)
- Most third party compilers in all object file formats
- A wide range of RTOS
- Third party debuggers
- Third party CASE tools

### Interface to all Hosts

TRACE32-ICE can be linked to a PC, any workstation or mainframe. Software drivers are available for all standard operation systems and all graphical user interfaces.

- Parallel, fibre optic and ethernet interface
- Same "Look and Feel" on all supported host systems
- Fast download

### Scalable Tool Chain

TRACE32-ICE is the high end tool of Lauterbach's TRACE32 tool chain. We also offer:

- TRACE32-ICD  
ROM monitor based debugger  
Debug interface based debugger (BDM, JTAG etc.)
- TRACE32-ICD TRACE  
TRACE32-ICD enhanced by trace and trigger capabilities
- TRACE32-FIRE  
Full featured RISC Emulator

The uniform, compatible GUI for all products of the TRACE32 series makes it easy to migrate to a more complex tool or to use different complex tools side by side in the same project.

### Up to 16 MByte Dual Ported Emulation Memory

- The emulation memory access time of 15ns allows zero-waitstate emulation up to the max. speed of the processor.
- The dual-port technology allows on-the-fly access to the emulation memory to display and modify runtime variables.

## Banking Support

TRACE32-ICE supports even very complex banking systems up to 16MByte:

- Max. 256 banks
- With external bank logic
- With internal bank logic
- Banked EPROM

## Shadow RAM

The Shadow RAM allows to monitor real-time variable and memory for special CPUs.

## Unlimited Hardware Breakpoints

TRACE32-ICE provides up to 16MByte dual ported break memory.

## Powerful, Integrated High Level Language Debugger

### Multitask Debugger

TRACE32-ICE provides symbolic debugging of complex multitask applications and the detailed analysis of the real time behaviour of the system. It

supports internally developed and a wide range of off-the-shelf realtime kernels.

### Code Coverage

Up to 16 MByte Flag memory traces all CPU access in real time for a comprehensive code coverage, for a stack depth verification or for the detection of unused or uninitialized variables.

### Up To 4 MFrame Trace Buffer

- Up to 344 trace channels
- Up to 50 MHz
- Time Stamp

### Real Time Trace and Trigger

The multilevel trigger system allows to use advanced trigger sequences to find even complex errors in record time.

- External trigger inputs
- Trigger outputs to trigger external devices.

### Performance Analysis

TRACE32-ICE offers comprehensive performance analysis on program, function or module base or on areas defined by the user.

### Statistic Functions

TRACE32 allows detailed analysis of:

- Functions
  - Min. and max. time
  - Passes
  - Include and exclud time
- Link analysis
  - Callers
  - min. and max. times
  - Calls
- Duration
  - Execution time
  - Response time
- Distance

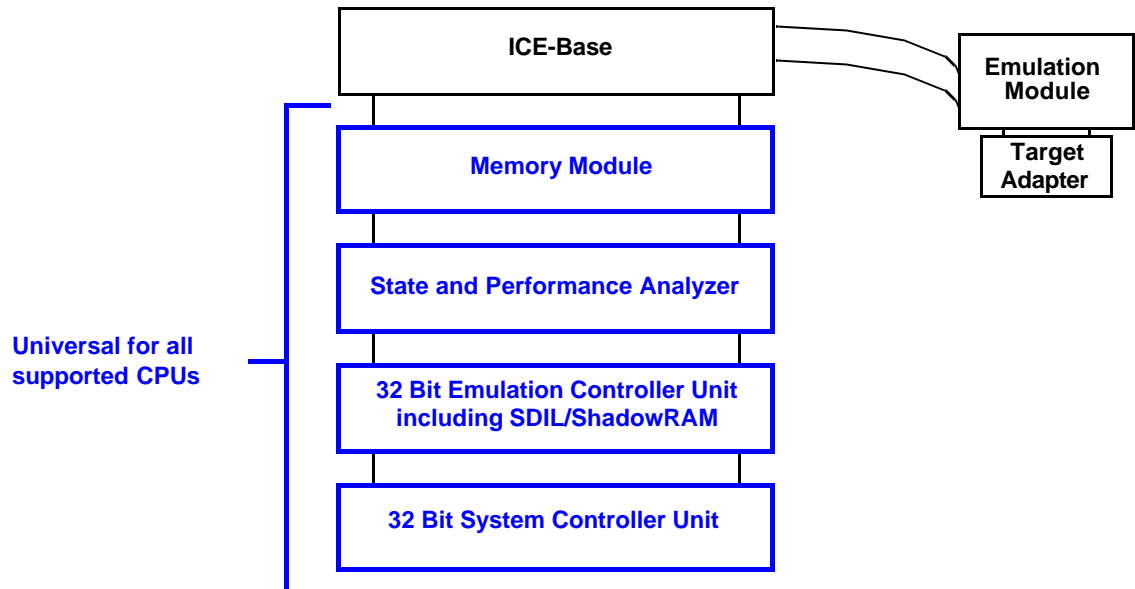
### Powerful Graphical Analysis Functions

Most statistic and runtime analysis can also be displayed in a graphical way to offer an intuitive interpretation.

### Powerful Batch Language

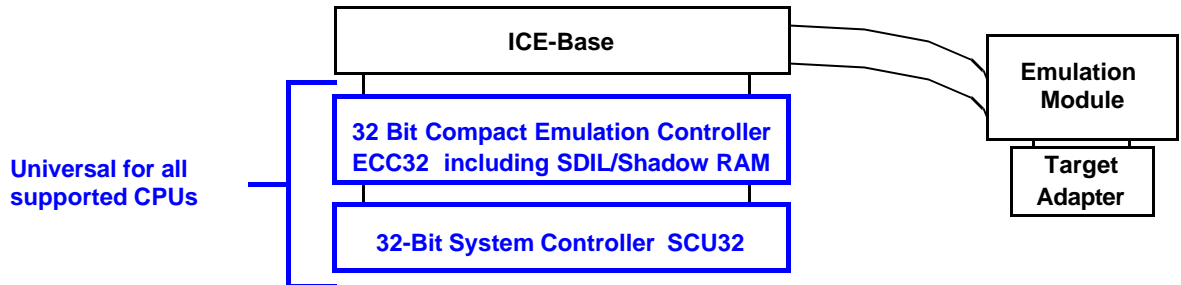
TRACE32-ICE offers a powerful batch language for automatic set ups and automatic testing. It is supported by its own debugger.

## System Architecture TRACE32-ICE



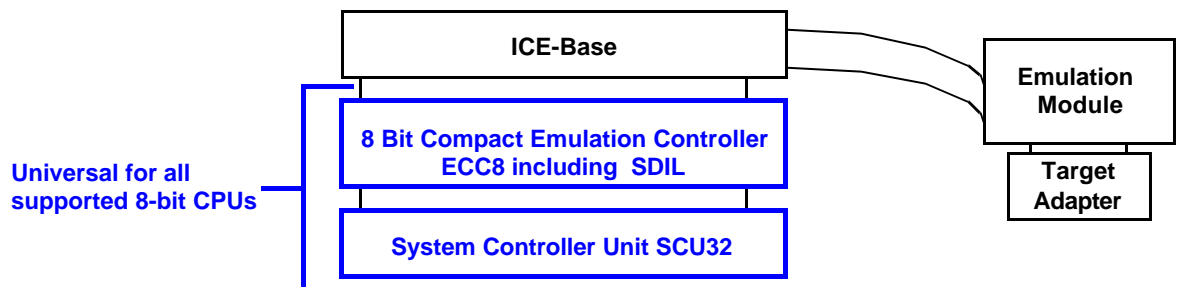
TRACE32-ICE uses a modular technology and consists of the following parts:

- 32 Bit System Controller SCU32 (universal)**  
 The System Controller is the interface between the host and the emulator. It contains the host interface card, the power supply and the main controller for the emulator.
- 32 Bit Emulation Controller ECU32 (universal)**  
 The Emulation Controller Unit contains all part of an emulator, which are independent form the specific CPU e.g.memory mapper, trigger logic, universal counter, pulse generator.It also includes the connectors for the static emulation memory card and the shadow RAM.
- State and Performance Analyzer HA120 (universal)**  
 The High Speed State Analyzer consists of the trace memory, a programable trigger unit and a performance analyzer unit.
- Emulation Memory Module SRAM (universal)**  
 The SRAM allway offers all 3 types of memory for TRACE32-ICE:
  - Overlay/emulation memory
  - Break memory for the hardware breakpoints
  - Flag memory to analyse read and write access to specific addresses
- ICE-Base**  
 The ICE-Base is the family module for a complete CPU family.
- Emulation Module with Target Adapter**

TRACE32-ICE<sub>COMPACT32</sub>

TRACE32<sub>COMPACT32</sub> is a cost effective compact solution for all supported CPUs. The 32 Bit Compact Emulation Controller is a high integration of the 32 Emulation Controller ECU32 and the State

and Performance Analyzer HA120. The functionality of the integrated State and Performance Analyzer is especially adapted for the use small and medium sized projects.

TRACE32-ICE<sub>COMPACT8</sub>

TRACE32<sub>COMPACT8</sub> is a cost effective compact solution for all supported 8-bit CPUs. It is entirely designed for the development of 8-bit target systems.

## Contact

### International Representative

#### Australia

Embedded Logic Solutions Pty Ltd  
Mr. Ramzi Kattan  
23/1 Maitland Place  
Baulkham Hills NSW 2153  
Phone: ++61 02 9899 1703  
FAX: ++61 02 9899 1723  
EMAIL: sales@emlogic.com.au

#### Austria

Lauterbach Datentechnik GmbH  
Mr. Norbert Weiss  
Fichtenstr. 27  
D-85649 Hofolding  
Phone: ++49 8104 8943 183  
FAX: ++49 8104 8943 170  
EMAIL: info\_de@lauterbach.com

#### Belgium

Tritec Benelux B.V.  
Mr. Robbert de Voogt  
Stationspark 550  
NL-3364 DA Slidrecht  
Phone: ++31 184 41 41 31  
FAX: ++31 184 42 36 11  
EMAIL: software@tritec.nl

#### Brazil

ANACOM Software e Hardware Ltd  
Mr. Rodrigo Ferreira  
Rua Nazareth, 807, Bairro Barc  
BR-09551-200 Sao Caetano do Sul  
Phone: 0055 11 3422-4200  
FAX: 0055 11 3422-4242  
EMAIL: rferreira@anacom.com.br

#### Canada

Lauterbach Inc.  
4 Mount Royal Ave.  
USA-Marlborough, MA 01752  
Phone: ++1 508 303 6812  
FAX: ++1 508 303 6813  
EMAIL: info\_us@lauterbach.com

#### China

Suzhou Lauterbach Technologies Co.,Ltd.  
Mr. Yue Zhao  
Room 1605, Xing Hai International Square  
No.200, Xing Hai Street  
Suzhou, 215021 PR of China  
Phone: 0086-512 6265 8030  
FAX: 0086-512 6265 8032  
EMAIL: info\_cn@lauterbach.com

#### Denmark

Nohau Danmark A/S  
Mr. Flemming Jensen  
Klausdalsbrovej 493  
DK-2730 Herlev  
Phone: ++45 44 52 16 50  
FAX: ++45 44 52 26 55  
EMAIL: info@nohau.dk

#### Egypt

Wantech  
Mr. Nawara  
5 Shafik Ghalie St., Suite 2  
Off Pyramids Road, Giza  
Cairo 12111  
Phone: ++20 2 5848020  
FAX: ++20 2 5877303  
EMAIL: sales@wantech.net

#### Finland

Nohau  
Mr. Leevi Lehtinen  
Teknobulevardi 3-5  
FI-01531 Vantaa  
Phone: ++358 40 546 1469  
FAX: ++358 9 2517 8101  
EMAIL: leevi.lehtinen@nohau.se

#### France

Logic Instrument  
Mr. Stephane Morice  
BP 116  
71, route de Saint-Denis  
F-95170 Deuil la Barre  
Phone: ++33 1 342861 70  
FAX: ++33 1 342800 50  
EMAIL: s.morice@logic-instrument.com

#### Germany

Lauterbach Datentechnik GmbH  
Mr. Norbert Weiss  
Fichtenstr. 27  
D-85649 Hofolding  
Phone: ++49 8104 8943 0  
FAX: ++49 8104 8943 170  
EMAIL: info\_de@lauterbach.com

#### Germany North

Lauterbach Datentechnik GmbH  
Mr. Klaus Hommann  
Leonhardring 5  
D-31319 Sehnde  
Phone: ++49 5138 6185 0  
FAX: ++49 5138 6185 3  
EMAIL: klaus.hommann@lauterbach.com

#### India

Electro Systems Ass. Pvt. Ltd.  
Mr. G. V. Gurunatham  
4215 JK Complex First Main Rd.  
IND-Bangalore 560 021  
Phone: ++91 80 23577924  
FAX: ++91 80 23475615  
EMAIL: esaindia@vsnl.com

#### Ireland

Lauterbach Ltd.  
Mr. Barry Lock  
11 Basepoint Enterprise Centre  
Stroudley Road  
Basingstoke, Hants RG24 8UP  
Phone: ++44-1256-333-690  
FAX: ++44-1256-336-661  
EMAIL: info\_uk@lauterbach.com

#### Israel

Itec Ltd.  
Mr. Mauri Gottlieb  
P.O.Box 10002  
IL-Tel Aviv 61100  
Phone: ++972 3 6491202  
FAX: ++972 3 6497661  
EMAIL: general@itec.co.il

#### Italy

Lauterbach Srl  
Mr. Maurizio Menegotto  
Via Enzo Ferrieri 12  
I-20153 Milano  
Phone: ++39 02 45490282  
FAX: ++39 02 45490428  
EMAIL: info\_it@lauterbach.com

#### Japan

Lauterbach Japan, Ltd.  
Mr. Kenji Furukawa  
3-9-5 Shinyokohama  
Kouhoku-ku  
Yokohama-shi, Japan 222-0033  
Phone: ++81-45-477-4511  
FAX: ++81-45-477-4519  
EMAIL: info@lauterbach.co.jp

#### Luxemburg

Tritec Benelux B.V.  
Mr. Robbert de Voogt  
Stationspark 550  
NL-3364 DA Slidrecht  
Phone: ++31 184 41 41 31  
FAX: ++31 184 42 36 11  
EMAIL: software@tritec.nl

**Malaysia**

Flash Technology  
Mr. Teo Kian Hock  
No 61, # 04-15 Kaki Bukit Av 1  
Shun Li Industrial Park  
SGP-Singapore 417943  
Phone: ++65 6749 6168  
FAX: ++65 6749 6138  
EMAIL: teokh@flashtech.com.sg

**Netherlands**

Tritec Benelux B.V.  
Mr. Robbert de Voogt  
Stationspark 550  
NL-3364 DA Sliedrecht  
Phone: ++31 184 41 41 31  
FAX: ++31 184 42 36 11  
EMAIL: software@tritec.nl

**New Zealand**

Embedded Logic Solutions Pty Ltd  
Mr. Ramzi Kattan  
23/1 Maitland Place  
Baulkham Hills NSW 2153  
Phone: ++61 02 9899 1703  
FAX: ++61 02 9899 1723  
EMAIL: sales@emlogic.com.au

**Norway**

Nohau Elektronik AB  
Mr. Greger Andersson  
Derbyvägen 4  
S-21235 Malmö  
Phone: ++46 40 59 22 00  
FAX: ++46 40 59 22 29  
EMAIL: info@nohau.se

**Poland**

Quantum Sp.z o.o. Korp. Transf  
Mr. Czeslaw Bil  
ul. Skwierzynska 21  
53-521 Wrocław  
Phone: ++48 71 362 6356  
FAX: ++48 71 362 6357  
EMAIL: bil@quantum.com.pl

**Portugal**

Captura Electronica,SCCL  
Mr. Juan Martinez  
c/Albert Einstein s/n  
Edificio Forum de la Tecnol.  
E-08042 Barcelona  
Phone: ++34 93 291 76 33  
FAX: ++34 93 291 76 35  
EMAIL: info@captura-el.com

**Singapore**

Flash Technology  
Mr. Teo Kian Hock  
No 61, # 04-15 Kaki Bukit Av 1  
Shun Li Industrial Park  
SGP-Singapore 417943  
Phone: ++65 6749 6168  
FAX: ++65 6749 6138  
EMAIL: teokh@flashtech.com.sg

**South Korea**

MDS Technology Co.,Ltd.  
Mr. Hyunchul Kim  
15F Kolon Digital Tower Vilant  
#222-7, Guro-3dong, Guro-gu  
Seoul, 152-848, ROK  
Phone: ++82 2 2106 6000  
FAX: ++82 2 2106 6004  
EMAIL: trace32@mdstec.com

**Spain**

Captura Electronica,SCCL  
Mr. Juan Martinez  
c/Albert Einstein s/n  
Edificio Forum de la Tecnol.  
E-08042 Barcelona  
Phone: ++34 93 291 76 33  
FAX: ++34 93 291 76 35  
EMAIL: info@captura-el.com

**Sweden**

Nohau Elektronik AB  
Mr. Magnus Engström  
Derbyvägen 4  
SE-21235 Malmö  
Phone: ++46 40 59 22 00  
FAX: ++46 40 59 22 29  
EMAIL: info@nohau.se

**Switzerland**

JDT Jberg DatenTechnik  
Mr. Andreas Jberg  
Zimmereistrasse 2  
CH-5734 Reinach AG  
Phone: ++41 62 7710 886  
FAX: ++41 62 7717 187  
EMAIL: Andreas.Jberg@jdt.ch

**Taiwan**

Superlink Technology Corp.  
Mr. Sulin Huang  
3F-8, No. 77, Shin-Tai-Wu Rd. Sec1  
Taipei Hsien 221, Taiwan, R.O.C.  
Phone: ++886 2 26983456  
FAX: ++886 2 26983535  
EMAIL: info.stc@superlink.com.tw

**Turkey**

Bildem Bilgisayar Ltd. Sti.  
Mr. Hakan Yavuz  
Koroglu Cad. 64/3 G.O.Pasa  
TR-06700 Ankara  
Phone: ++90 312 4472700  
FAX: ++90 312 4472702  
EMAIL: info@bildem.com.tr

**UK**

Lauterbach Ltd.  
Mr. Barry Lock  
11 Basepoint Enterprise Centre  
Stroudley Rd  
Basingsstoke, Hants RG24 8UP  
Phone: ++44 (0) 1256-333690  
FAX: ++44 (0) 1256-336661  
EMAIL: info\_uk@lauterbach.com

**USA East**

Lauterbach Inc.  
Mr. Udo Zoettler  
4 Mount Royal Ave.  
USA-Marlborough, MA 01752  
Phone: ++1 508 303 6812  
FAX: ++1 508 303 6813  
EMAIL: info\_us@lauterbach.com

**USA West**

Lauterbach Inc.  
Mr. Jerry Flake  
13256 SW Hillshire Drive  
USA-Tigard, OR 97223  
Phone: ++1 503 524 2222  
FAX: (503) 524 2223  
EMAIL: jerry.flake@lauterbach.com

## Additional Information

<http://www.lauterbach.com>

### Lauterbach Datentechnik GmbH

Fichtenstr. 27  
D-85649 Hofolding  
Tel. ++49 8104 8943-188 FAX -187  
info@lauterbach.com  
<http://www.lauterbach.de>

### Lauterbach Inc.

4 Mount Royal Ave.  
Marlboro MA 01752  
Phone (508) 303 6812 FAX (508) 303 6813  
info\_us@lauterbach.com  
<http://www.lauterbach.com/usa>

### Lauterbach Ltd.

11 Basepoint Enterprise Ctre Stroudley Road  
Basingstoke, Hants RG24 8UP  
Phone ++44-1256-333-690 FAX -661  
info\_uk@lauterbach.com  
<http://www.lauterbach.co.uk>

### Lauterbach Japan, Ltd.

3-9-5 Shinyokohama Kouhoku-ku  
Yokohama-shi Japan 222-0033  
Phone ++81-45-477-4511 FAX -4519  
info\_j@lauterbach.com  
<http://www.lauterbach.co.jp>

### Lauterbach s.r.l.

Lauterbach s.r.l.  
Via Enzo Ferrieri 12  
I-20153 Milano  
Phone ++39 02 45490282  
FAX ++39 02 45490428  
info\_it@lauterbach.it  
<http://www.lauterbach.it>

### Suzhou Lauterbach Consulting Co.,Ltd.

Room 1605, Xing Hai International Square  
No.200, Xing Hai Street  
Suzhou, 215021 PR of China  
Phone: 0086-512 6265 8030  
FAX: 0086-512 6265 8032  
info@lauterbach.cn  
<http://www.lauterbach.cn>

## Disclaimer

The information presented is intended to give overview information only.  
Changes and technical enhancements or modifications can be made with-