TRACE32®
Technical Information

FIRE-ST10

FIRE Emulator for ST10

C165
C167
C167C
C167CR
C167CS
C167CW
C167SR
ST10F163
ST10F167
ST10F168
ST10F169
ST10F251
ST10F251M
ST10F252
ST10F252M
ST10F269
ST10F271
ST10F271B
ST10F271M
ST10F272
ST10F272B
ST10F272M
ST10F273
ST10F273M
ST10F275
ST10F276
ST10F280
ST10F293
ST10F296

- Full support for ST10 family
- Full support for KEIL, TASKING, COSMIC and GNU compilers
- 50 MHz no-wait-state operation
- Dual-port access for ROM and external bus
- Dual-port access for XRAM
- Shadow-RAM for IRAM and XRAM
- FLASH Programming Support
- Trace on internal and local variables
- Selective trace on registers, peripherals and local variables
- Trigger on internal register access, bit, byte, and word variables
- Trace on external and BONDOUT busses, bus and clock cycle trace
- Clip-Over, Solder-On and YAMAICHI adapters

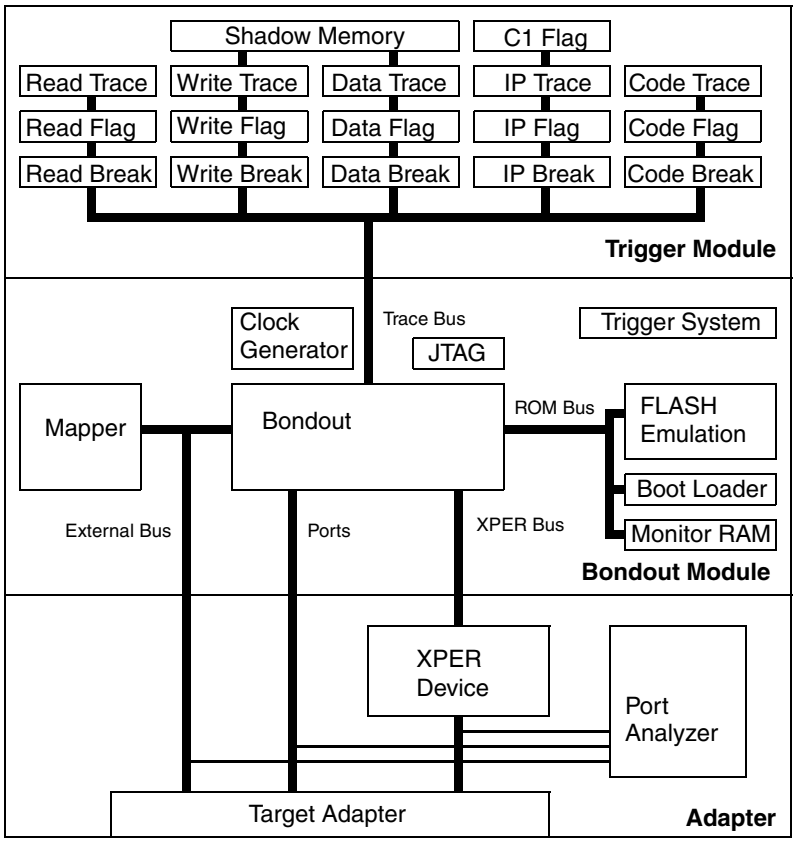
The FIRE-ST10 emulator module supports the whole ST10 family. All features of the BONDOUT chips are supported, trigger and selective trace is possible on internal addresses and data, on registers and on peripheral accesses. 128 extra trace channels are used to trace all BONDOUT signals. The ROM and FLASH memory is emulated by an extra emulation system with separate

LAUTERBACH
DEVELOPMENT TOOLS

breakpoints and execution flags for code coverage. The emulator can simulate bootstrap sequences and FLASH operation.

Features

Basics of Operation



The TRACE32-FIRE-ST10 supports all features provided by the bondout chip. The bondout chip has 4 bus systems:

- External bus
- ROM emulation bus
- XPER bus
- Bondout trace bus

The ***ROM emulation bus*** emulates together with the 512K emulation RAM on the base module the on-chip ROM or FLASH memory.

The ***XPER bus*** is needed for the emulation of CAN, ASC1 or IIC derivatives. Since the bondout chip does not contain any peripherals, there is a socket on the emulation module to add the specific CAN derivative. For the operation, the core of the derivative is disabled and the bondout CPU uses the XPER bus to emulate the peripherals.

The ***Bondout trace bus*** provides all signals for tracing on internal operations. Since most of the transfers are made between the internal RAM, registers and internal peripherals, these busses are a big help for analyzing the application´s behaviour.

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.

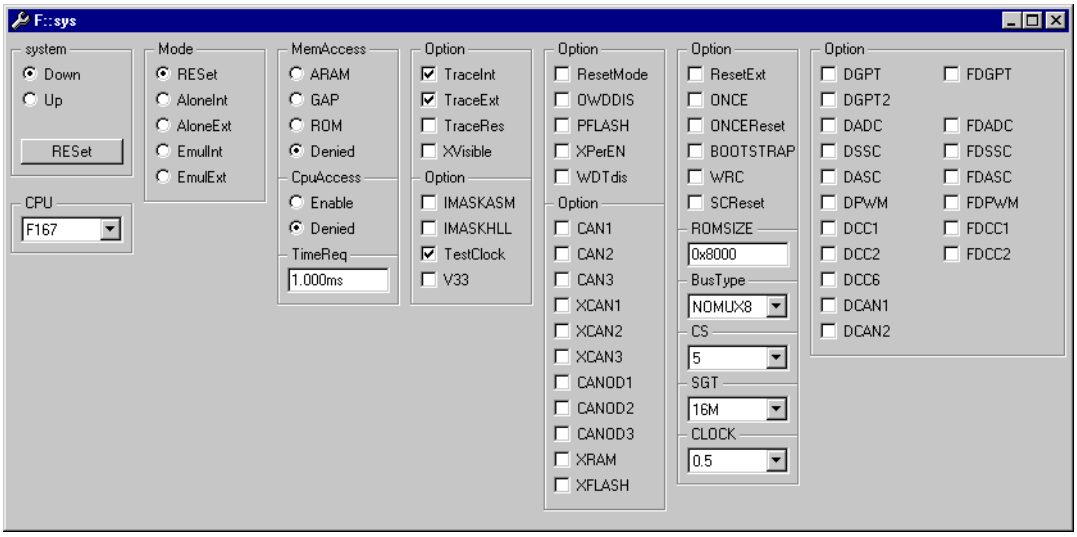
The operation modes are as follows:

- ❏ Reset
- ❏ Alone Internal
- ❏ Alone External
- ❏ Emulation Internal
- ❏ Emulation External

Clock

- ❏ Operation with external or internal Clock
- ❏ 1..150 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.

The dual-port access on the ROM bus (on-chip ROM and FLASH emulation) is always possible. Their are no limitations on breakpoint and flag usage.

The external bus has 3 modes for dual-port access

- ❏ ARAM
- ❏ GAP
- ❏ ROM
- ❏ CPU

The ***GAP modes*** need extra time, as the dual-port cycle is inserted while the CPU bus is set to idle. This means that less than 1% of the performance is lost by dualport cycle. In ***ARAM*** mode dual-port cycles are done in interleave mode to the ARAM dualported RAM module.

Dualport in ***ROM*** is possible at any time without extra wait states.In ***CPU*** mode the injected access is used. This mode allows access to all type of memories including memories on target systems.

JTAG Support

A hardware based JTAG controller drives the TAP controller with 20MHz. Downloads by JTAG can be done with 300 kBytes/sec.

ROM Emulation

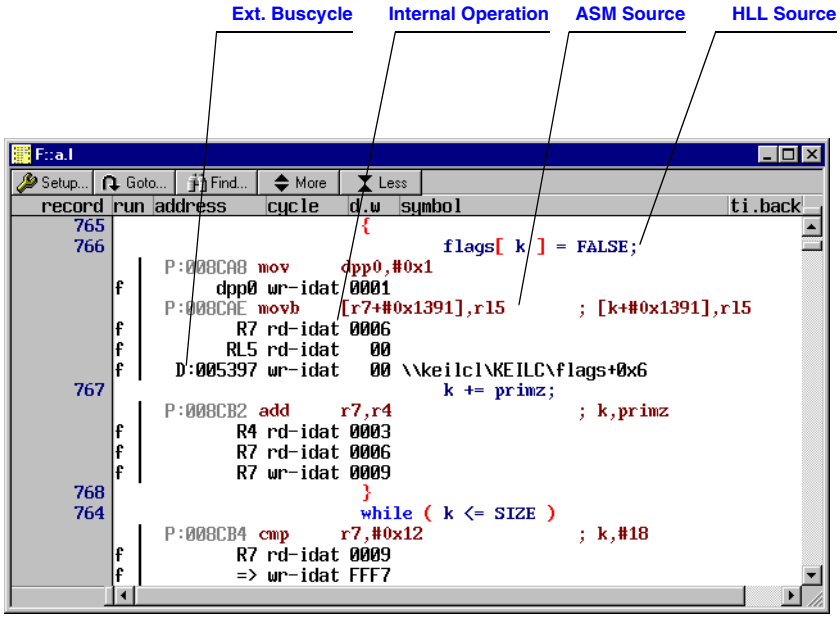
The ROM emulation circuits build a separate emulator system to emulate all on-chip FLASH or ROM based applications.

- ❏ 512K ROM emulation memory
  - ■ FLASH and ROM emulation
- ❏ 64K Bootloader RAM
  - ■ Bootstrap loader support

Bondout Trace

128 additional trace channels are supported by TRACE32-FIRE-ST10 to trace all signals delivered by the bondout busses.The trace can display internal operations like register to internal memory, peripheral to registers, etc. Stack operations cannot be displayed because there is no information on the bus.

The bondout trigger and trace system uses a complex de-pipeline mechanism to make trace and trigger settings easy for the user. Operand or instruction addresses can be combined very easy for triggering on local variables.



Trace Channels

The bondout trace samples the 128 channels for BONDOUT busses. These channels provide the following information:

- ❏ Instruction execution address
- ❏ Operand read address
- ❏ Operand write address
- ❏ Operand data
- ❏ Control lines
- ❏ Instruction code

Trace Operation

The trace can work on the external bus, the internal bus or on both busses (mixed trace) to sample:

- ❏ Internal CPU cycles (BONDOUT only)
- ❏ External bus cycles
- ❏ Mixed trace

Bondout Trace

The bondout trigger and trace system uses a complex de-pipeline mechanism to make trace and trigger settings easy for the user. Operand or instruction addresses can be combined very easy for triggering on local variables.

Bondout Trigger System

The bondout trigger system works on the code flow and the other bondout signals to qualify states for internal trigger accesses. Trigger points can be set on operation results, on 24 bit addresses. All trigger points can be qualified by program segments like functions, program lines, etc.

The following trigger points are available:

- 4 1 Mbyte areas for operand read breakpoints with data qualifiers (Results of operation)
- 4 1 Mbyte areas for operand write breakpoints with data qualifiers (Results of operation)
- 2 separate data breakpoints (value, range or pattern)
- 8 1 MByte areas for instructions breakpoints (hardware breaks)

Every breakpoint can be used to stop emulation or as a input event for the trigger sequencer of the analyzer.

Data Coverage

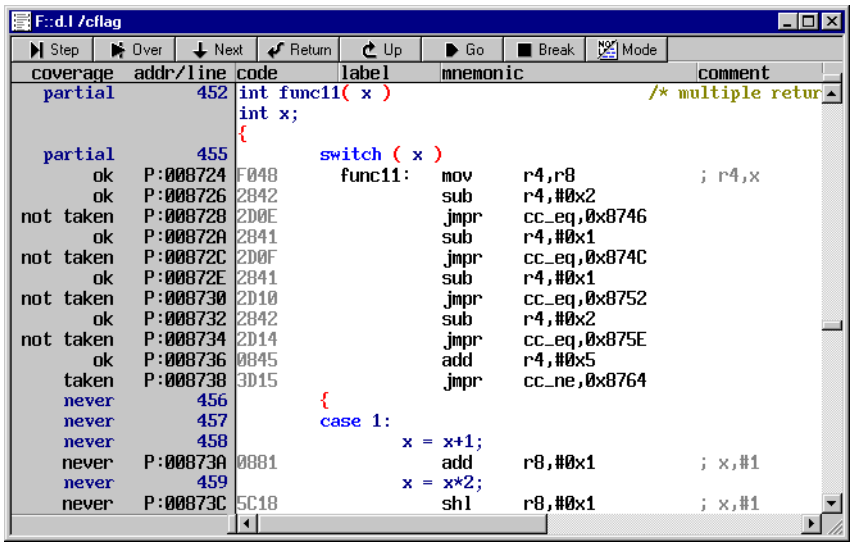
For the read and write operations 2 flags systems are available. All systems have single byte resolution.

- 2 Read Flag Areas with 1 (4) MByte each.
- 2 Write Flag Areas with 1 (4) MByte each.

Code Coverage

The code coverage system allows 100% true code coverage and 100% C1 analysis. Prefetches are ignored.

- 2 Ranges with 1 (4) Mbyte each
- C1 Analysis



Shadow Memory

Schadow memory can be mapped for the external bus and for the XBUS. Emulation of extra XRAM areas is possible. An 1 MByte shadow memory on the bondout busses shows memory states on external busses, **XRAM** and **IRAM**.

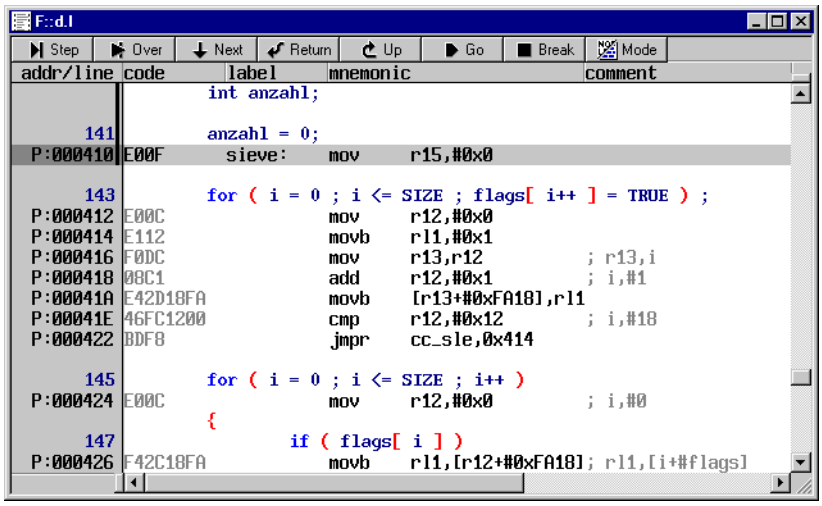
- ❏ 1 MByte Shadow memory

Execution Breakpoints

The emulator supports execution breakpoints on the ROM and external area. All breakpoints are 'break-before-make' breakpoints. Emulation is stopped before execution.

- ❏ Unlimited number of software breakpoints
- ❏ Support for Onchip hardware breakpoints

HLL Debugging

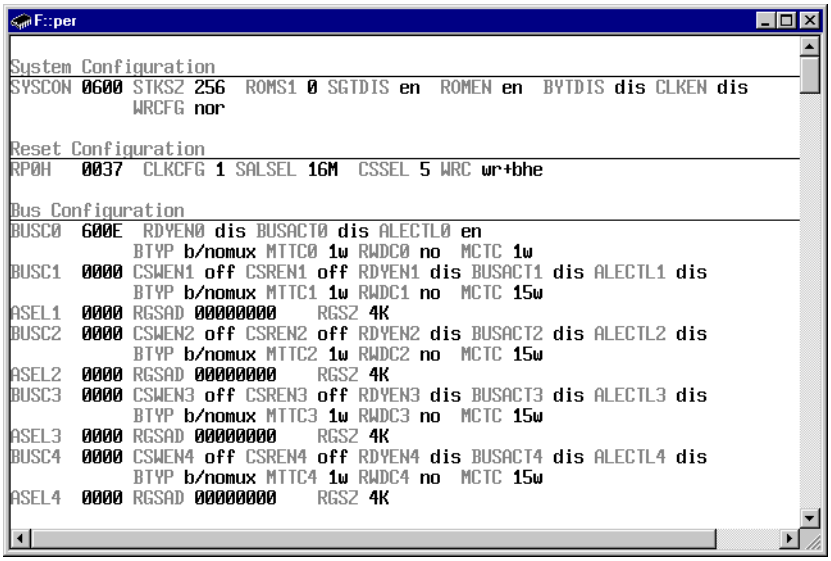


Full support in real-time for:

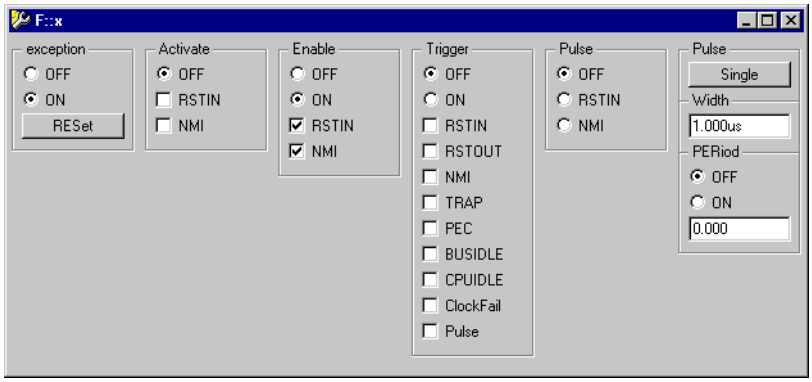
- ❏ ROM and external busses
- ❏ Break-before-line operation
- ❏ HLL single step in real-time
- ❏ Trigger and trace on local variables
- ❏ Trigger on bit variables

Voltage and Clock Monitors

- On-Line Display for SYSCON and BUSCON
- 3.3 V and 5 V Standalone operation



Exception Control



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

- Static exception setting
  - RSTIN
- Target exception control
  - RSTIN
  - NMI

- Exception trigger
  - RSTOUT
  - RSTIN
  - PWRDOWN
  - IDLE
  - TRAP
  - PEC

Port Analyzer

On the emulation base there is an extra slot for the TRACE32 Port Analyzer. The following additional signals can be traced:

- Port 0
- Port 1
- Port 2
- Port 3
- Port 4
- Port 6
- Port 7
- Port 8
- Port 9
- READY

On-Circuit Emulation

- Support for Clip-Over adapters

Emulation Modules

Modules Overview

tbd

PowerView IDE

TRACE32-PowerView supports most compilers, realtime operation systems and debuggers.

New integrations are mostly done on customers request. If your compiler or RTOS is not supported now, please ask us !

Compiler Support

CPU	Language	Compier	Company	Option
C166	C	XC16X/ ST10	Cosmic Software	ELF/DWARF
C166	C	GNU-GCC166	HighTec EDV-Systeme GmbH	DBX
C166	C	C166	ARM Germany GmbH	EOMF-166
C166	C	C166	TASKING	IEEE
C166	C++	GNU-CPP166	HighTec EDV-Systeme GmbH	DBX
C166	C++	CP166	TASKING	IEEE

RTOS Support

Company	Product	Comment
ARM Germany GmbH	ARTX-166	
CMX Systems Inc.	CMX-RTX	
Elektrobit Automotive GmbH	Elektrobit tresos	via ORTI
Evidence	Erika	via ORTI
Mentor Graphics Corporation	Nucleus PLUS	
Vector	osCAN	via ORTI
Enea OSE Systems	OSE Basic	(OS166)
Enea OSE Systems	OSE Epsilon	(OS166), 3.x
-	OSEK	via ORTI
Elektrobit Automotive GmbH	ProOSEK	via ORTI
HighTec EDV-Systeme GmbH	PXROS	
ARM Germany GmbH	RTX166/-tiny	
Quadros Systems Inc.	RTXC 3.2	
Quadros Systems Inc.	RTXC Quadros	
Articus Systems AB	Rubus OS	
IBM Corp.	SDT-Cmicro	
Micrium Inc.	uC/OS-II	2.0 to 2.92

Debugger Support

CPU	Debugger	Company
	WINDOWS CE PLATF. BUILDER	-
	CODE::BLOCKS	-
	C++TEST	-
	ADENEO	-
	X-TOOLS / X32	blue river software GmbH
	CODEWRIGHT	Borland Software Corporation
	CODE CONFIDENCE TOOLS	Code Confidence Ltd
	CODE CONFIDENCE TOOLS	Code Confidence Ltd
	EASYCODE	EASYCODE GmbH
	ECLIPSE	Eclipse Foundation, Inc
	CHRONVIEW	Inchron GmbH
	LDRA TOOL SUITE	LDRA Technology, Inc.
	UML DEBUGGER	LieberLieber Software GmbH
	SIMULINK	The MathWorks Inc.
	ATTOL TOOLS	MicroMax Inc.
	VISUAL BASIC INTERFACE	Microsoft Corporation
	LABVIEW	NATIONAL INSTRUMENTS Corporation
	RAPITIME	Rapita Systems Ltd.
	RHAPSODY IN MICROC	IBM Corp.

CPU	Debugger	Company
	RHAPSODY IN C++	IBM Corp.
	DA-C	RistanCASE
	TRACEANALYZER	Symtavision GmbH
	TA INSPECTOR	Timing Architects GmbH
	UNDODB	Undo Software
	VECTORCAST UNIT TESTING	Vector Software
	VECTORCAST CODE COVERAGE	Vector Software
C166	SDT CMICRO	IBM Corp.

Operation Voltage and Frequency

The maximum operation frequency of TRACE32-FIRE depends on:

- ❏ The max. frequency of the CPU
- ❏ The access time of the overlay memory (10ns)
- ❏ The mapper mode (**S**low or **F**ast)
- ❏ The number of waitstates (WO = 0 waitstates W1 = 1 waitstate)
- ❏ The dual-port access mode
- ❏ If no emulation memory is used, the frquency limit depends on the trace speed (TRACE)
- ❏ Some probes use extra high-speed memory on the emulation adapter (HEAD RAM)

Max. Frequency with ROM and ARAM Dualport Access

Operation Voltage

This list contains information on probes available for other voltage ranges. Probes not noted here supply an operation voltage range from 4.5V to 5.5V.

tbd

Dimensions

Modules

tbd

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 Technology, YAMAICHI, AMP, TOKYO ELETECH etc.

The following table lists the physical dimensions of these connectors.

tbd

Adapter

The adapters connect in different ways

- ❏ With Clip-Over Adapters the CPU can stay on the target board.
- ❏ With Solder-ON adapters the CPU must be removed
- ❏ YAMAICHI and AMP adapters fit to the CPU socket

The following table lists the physical dimensions of these adapters.

Not necessary.

Available Tool Chain

TRACE32 provides a complete set of development tools for this 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
- The ICD Trace, a trace externsion to the BDM/JTAG debuggers or ROM monitors
- Evaluation boards, which can be used until the target hardware is available.
- The Instruction Set Simulator (SIM), a software tool for code test without any hardware

The following list give an overview which development tools are available for the specific derivatives of this family.

tbd

Order Information

Module Description

Detailed Order Information

Contact

International Representative

Argentina
Anacom Eletronica Ltda.
Mr. Rafael Sorice
Rua Nazareth, 807, Barcelona
BR-09551-200 São Caetano do Sul, SP
Phone: +55 11 3422 4200
FAX: +55 11 3422 4242
EMAIL: rsorice@anacom.com.br

Australia
Embedded Logic Solutions P/L
Mr. Ramzi Kattan
Suite 2, Level 3
144 Marsden Street
Parramatta NSW 2150
Phone: +61 2 9687 1880
FAX: +61 2 9687 1881
EMAIL: sales@emlogic.com.au

Austria
Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@lauterbach.com

Belgium
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

Brazil
Anacom Eletronica Ltda.
Mr. Rafael Sorice
Rua Nazareth, 807, Barcelona
BR-09551-200 São Caetano do Sul, SP
Phone: +55 11 3422 4200
FAX: +55 11 3422 4242
EMAIL: rsorice@anacom.com.br

Canada
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

China Beijing
Lauterbach Technologies Co., Ltd
Mr. Linglin He
Beijing Office
A3,South Lishi Road, XiCheng District
Beijing 100037, P.R. China
Phone: +86 10 68023502
FAX: +86 10 68023523
EMAIL: linglin.he@lauterbach.com

China Shenzhen
Lauterbach Technologies Co., Ltd
1406/E Xihaimingzhu Building
No.1 Taoyuan Road, Nanshan District
Shenzhen 518052, P.R. China
Phone: +86 755 8621 0671
FAX: +86 755 8621 0675
EMAIL: emily.zhang@lauterbach.com

China Suzhou
Lauterbach Technologies Co., Ltd
Mr. Linglin He
Hengyu Square, Rm 709
No. 188, Xing Hai Street
Suzhou, 215021 P.R. of China
Phone: +86 512 6265 8030
FAX: +86 512 6265 8032
EMAIL: info_cn@lauterbach.com

Czech. Republic
Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@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 Egypt
Mr. Wagih A. Nawara
5 Shafik Ghalie St., Suite 2
Off Pyramids Road, Giza
Cairo 12111
Phone: +20 100 1251955
FAX: +20 100 1250349
EMAIL: sales@wantechnet.com

Finland
Nohau Solutions Finland
Mr. Martti Viljainen
Teknobulevardi 3-5
FI-01531 Vantaa
Phone: +358 40 546 1469
FAX: +358 9 2517 8101
EMAIL: sales@nohau.fi

France
Lauterbach S.A.R.L.
Mr. Jean-Pierre Paradiso
Europarc - Le Hameau B
135 Chemin Des Bassins
F-94035 Créteil Cedex
Phone: +33 1 49 56 20 30
FAX: +33 1 49 56 20 39
EMAIL: info_fr@lauterbach.com

Germany
Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@lauterbach.com

Germany North
Lauterbach GmbH
Mr. Klaus Hommann
Leonhardring 5
D-31319 Sehnde
Phone: +49 8102 9876 174
FAX: +49 5138 6185 3
EMAIL: klaus.hommann@lauterbach.com

Germany South
Lauterbach GmbH
Andreas Grimm
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 190
FAX: +49 8102 9876 187
EMAIL: andreas.grimm@lauterbach.com

Greece
Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@lauterbach.com

Hungary
Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@lauterbach.com

India-Bangalore
Electro Systems Associates Pvt. Ltd.
Mr. G. V. Gurunatham
S-606, World Trade Center
Malleswaram West, No.26/1, Dr. Rajkumar Road
India - Bangalore 560055
Phone: +91 80 67648888
FAX: +91 80 23475615
EMAIL: Trace32sales@esaindia.com

India-Chennai
Electro Systems Associates Pvt. Ltd.
Mr. D. Kannan
No.109 /59A , Ground Floor
IV Avenue, Ashok Nagar
India - Chennai - 600 083 Tamilnadu
Phone: +91 044-24715750
FAX: ++91 44 24715750
EMAIL: chennai@esaindia.com

India-Delhi
Electro Systems Associates Pvt. Ltd.
Mr. R.K. Bhandari
No. 705, 7th Floor, Laxmi Deep
Shivajinagar
India - Delhi - 110 092
Phone: +91 11-22549351
FAX:
EMAIL: delhi@esaindia.com

India-Hyderabad
Electro Systems Associates Pvt. Ltd.
Mr. C.V.M. Sri Ram Murthy
Shop No. 14, "Global Enclave"
Bhagyanagar Colony, Kukat pally
India - Hyderabad 500 072
Phone: +91 40-23063346
FAX: +91 40-23063346
EMAIL: hyderabad@esaindia.com

India-Pune
Electro Systems Associates Pvt. Ltd.
Mr. R K Bhandari
Shriram Complex,1126/1, Model Colony
Shivajinagar
India - Pune - 411 016
Phone: +91 20 - 30462035 / 25663
FAX: +91 20-25677202
EMAIL: pune@esaindia.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
3-8-8 Shinyokohama
Kouhoku-ku, Nisso 16th Building
Yokohama-shi, Japan 222-0033
Phone: +81 45 477 4511
FAX: +81 45 477 4519
EMAIL: info@lauterbach.co.jp

Luxembourg
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

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

Mexico
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

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 P/L
Mr. Ramzi Kattan
Suite 2, Level 3
144 Marsden Street
Parramatta NSW 2150
Phone: +61 2 9687 1880
FAX: +61 2 9687 1881
EMAIL: sales@emlogic.com.au

Norway
Nohau Solutions AB
Mr. Jörgen Nilsson
Derbyvägen 4
SE-21235 Malmoe
Phone: +46 40 592 206
FAX: +46-40 592 229
EMAIL: sales@nohau.se

Poland
QUANTUM Sp. z o.o.
Mr. Aleksander Bil
ul. Jeleniogorska 6
54-056 Wroclaw
Phone: +48 71 362 6356
FAX: +48 71 362 6357
EMAIL: info@quantum.com.pl

Portugal

Captura Electronica,SCCL
Mr. Juan Martinez
c/Duero, 40
E-08031 Barcelona
Phone: +34 93 429 5730
FAX: +34 93 407 0778
EMAIL: info@captura-el.com

Romania

Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Phone: +49 8102 9876 0
FAX: +49 8102 9876 999
EMAIL: info@lauterbach.com

Russia

RTSoft
Mr. Alexey Isaev
Nikitinskaya 3
RUS-105037 Moscow
Phone: +7 495 742 6828
FAX: +7 495 742 6829
EMAIL: sales@rtsoft.msk.ru

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, Pangyo

MDS Technology Co.,Ltd.
Mr. Sangheon Lee
3FL. Hancom Tower
49, Daewangpangyo-ro 644, Bundang-gu
Seongnam-si, Gyeonggi-do, 463-400, ROK
Phone: +82-31-627-3000
FAX: +82-31-627-3100
EMAIL: trace32@mdstec.com

Spain

Captura Electronica,SCCL
Mr. Juan Martinez
c/Duero, 40
E-08031 Barcelona
Phone: +34 93 429 5730
FAX: +34 93 407 0778
EMAIL: info@captura-el.com

Sweden

Nohau Solutions AB
Mr. Jörgen Nilsson
Derbyvägen 4
SE-21235 Malmoe
Phone: +46 40 592 206
FAX: +46 40 592 229
EMAIL: sales@nohau.se

Switzerland

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

Taiwan

Superlink Technology Corp.
Mr. Sulin Huang
3F-8,No.77,Sec.1,Xintaiwu Rd.,Xizhi District,
New Taipei City 22101, Taiwan, R.O.C.
Phone: +886 2 26983456
FAX: +886 2 26983535
EMAIL: info.stc@superlink.com.tw

Tunisia

Lauterbach Consulting S.A.R.L.
Mr. Khaled Jmal
Route El Ain Km 3.5
TN-3062 Sfax
Phone: +216-74611730
FAX: +216-74611723
EMAIL: info_tn@lauterbach.com

Turkey-1

Tektronik Muh. ve Tic. A.S.
Mr. Hakan Yavuz
CyberPlaza B-Blok, 702B
Bilkent
06800 Ankara
Phone: +90 312 437 3000
FAX: +90 312 437 1616
EMAIL: info@tektronik.com.tr

Turkey-2

G3TEK Embedded Technologies Ltd.
Mr. Celal Aygun
Ilkyerlesim Mah. 445.
Sok. No: 48
06370 Batikent/Ankara
Phone: +90 312 3324769
FAX: +90 312 3324769
EMAIL: info@g3tek.com

UK

Lauterbach Ltd.
Mr. Barry Lock
11 Basepoint Enterprise Centre
Stroudley Rd
Basingstoke, Hants RG24 8UP
Phone: +44 1256 333 690
FAX: +44 1256 350 301
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. Bob Kupyn
1111 Main Street, Suite 620
USA-Vancouver, WA. 98660
Phone: +1 503 524 2222
FAX: +1 503 524 2223
EMAIL: bob.kupyn@lauterbach.com

Additional Information

http://www.lauterbach.com

Lauterbach GmbH
Altlaufstr. 40
D-85635 Höhenkirchen-Siegertsbrunn
Tel. ++49 8102 9876-0 FAX -999
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.us.lauterbach.com

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 S.A.R.L.
135 Chemin Des Bassins
F-94035 Créteil Cedex
Phone ++33-149-562-030
FAX ++33-149-562-039
info_fr@lauterbach.com
http://www.lauterbach.fr

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_cn@lauterbach.cn
http://www.lauterbach.cn

Disclaimer