



## RTOS Debugger for osCAN

**C167**  
**68HC12**

- Real time, non-intrusive display of osCAN system resources
- osCAN specific display of analyzer listing
- Statistic evaluation and graphic display of task run times
- Statistic evaluation and graphic display of service run times
- Task related evaluation of function run times
- Task stack coverage
- PRACTICE functions for OS data
- osCAN related pull-down menu

The TRACE32 System includes a multitask debugger to provide symbolic debugging in real time operating systems. Our software package contains a ready-to-run configuration for the OSEK/VDX conform Real Time Kernel osCAN from Vector Informatik.

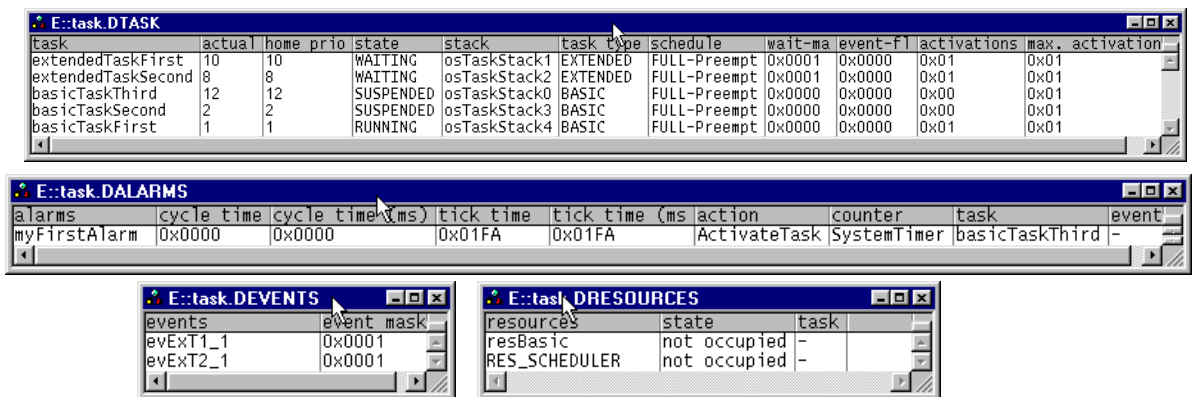
Based on the ORTI (OSEK Runtime Interface) all informations of the osCAN RTOS and its configuration can be explored. This leaflet will guide you through the additional implemented features in TRACE32, to do an effective debugging on osCAN systems.

## Multitask Debugging on TRACE32 with osCAN

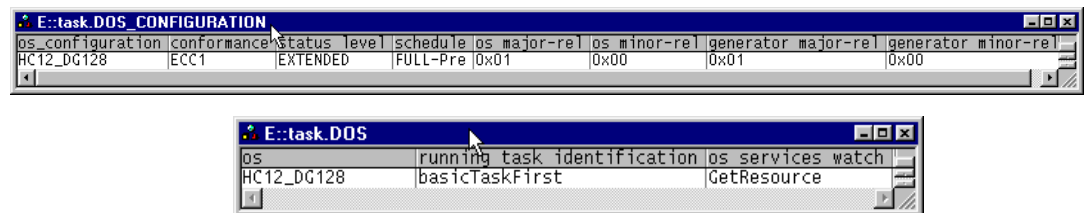
### Real time, non-intrusive display of osCAN system resources

The TRACE32 multitask debugger for osCAN provides special display functions. The system resources such as task list, messages, counters, alarms, stacks and resources can be displayed. In addition, by using the emulators

dual-port memory, the display of all these regions can be viewed non-intrusively in real time. The tables are updated permanently ("On The Fly"), without affecting the application at all.



Task list window, alarm window, event window and resources window

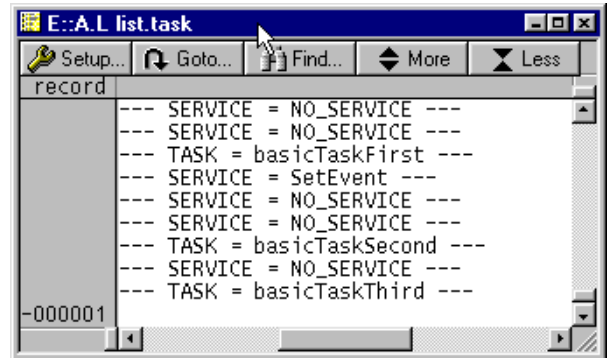


Configuration of osCAN operating system window

### osCAN specific display of analyzer listing

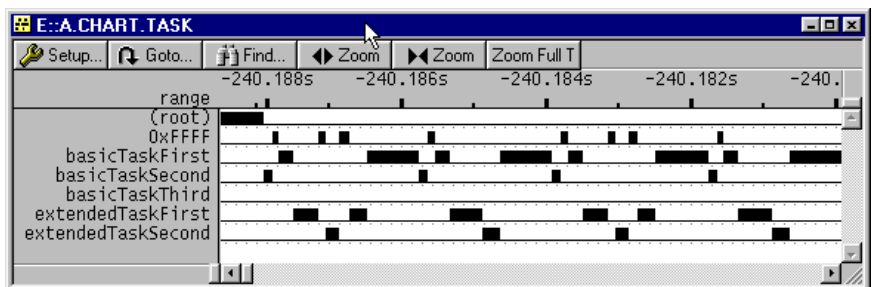
The data recorded in the analyzer can be displayed and interpreted specific to the operating system. Task switches are displayed symbolically.

Analyzer listing, task selective recording, display of task switches and assembler mnemonics



### Statistic evaluation and graphic display of task run times

The analyzer can calculate statistic tables of task run times and task switches. A graphical diagram shows which task was active at a specific time, giving a clear view of the behaviour of the system.



The screenshot shows a window titled "E::A.STAT.TASK" displaying a table of statistics for the total time of 240.189s.

range	time	avr	maxintr	count	ratio 1%	2%	5%	10%	20%
(root)	583.975us	583.975us	0.000	0.	0.000%				
0xFFFF	59.961s	12.014ms	0.000	4991.	24.964%				
basicTaskFirst	83.947s	16.830ms	0.000	4988.	34.950%				
basicTaskSecond	7.353s	2.947ms	0.000	2495.	3.061%				
basicTaskThird	35.322s	11.774s	0.000	3.	14.705%				
extendedTaskFirst	5.633s	1.505ms	0.000	3742.	2.345%				
extendedTaskSecond	47.973s	19.235ms	0.000	2494.	19.972%				

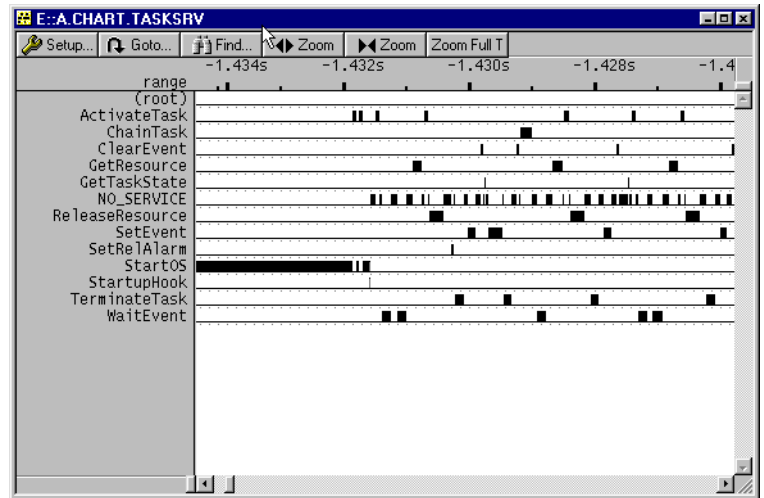
Statistics and flow of tasks

### Statistic evaluation and graphic display of service run times

The statistic and graphic evaluation of service calls and service run times can be done. This is necessary, if one ser-

vice need much time and is called very often the performance of the operating system goes down..

E::A.STAT_TASKSRV										
total: 1.465s										
range	time	avr	maxintr	count	ratio	1%	2%	5%	10%	20%
(root)	25.953ms	25.953ms	0.000	0.	1.771%					
ActivateTask	77.759ms	69.428us	0.000	1120.	5.307%					
ChainTask	68.222ms	191.635us	0.000	356.	4.656%					
ClearEvent	44.334ms	41.473us	0.000	1069.	3.026%					
GetResource	178.450ms	115.801us	0.000	1541.	12.181%					
GetTaskState	18.109ms	25.151us	0.000	720.	1.236%					
NO_SERVICE	428.528ms	51.088us	0.000	8388.	29.251%					
ReleaseResource	176.522ms	203.133us	0.000	869.	12.049%					
SetEvent	131.384ms	102.724us	0.000	1279.	8.968%					
SetRelAlarm	46.000us	46.000us	0.000	1.	0.003%					
StartOS	7.237ms	1.809ms	0.000	4.	0.493%					
StartupHook	9.500us	9.500us	0.000	1.	0.000%					
TerminateTask	144.586ms	135.254us	0.000	1069.	9.869%					
WaitEvent	163.839ms	148.540us	0.000	1103.	11.183%					

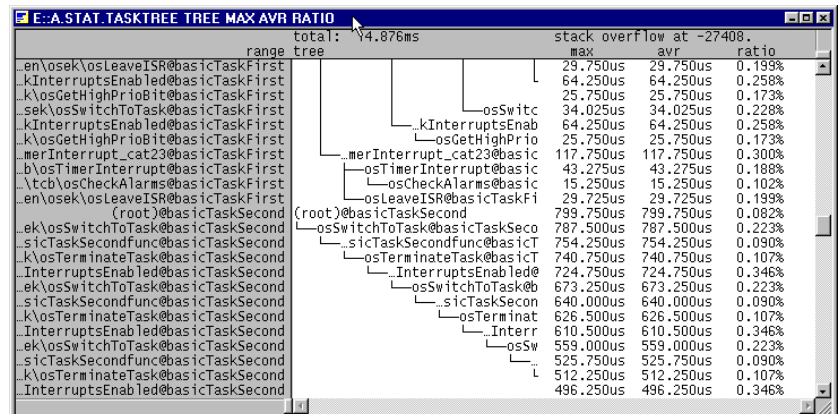


Statistics and flow of services

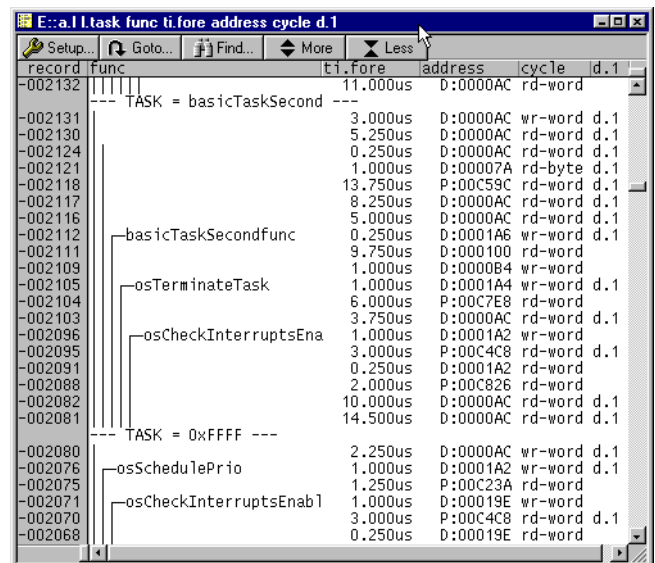
## Task related evaluation of function run times

The statistic and graphic evaluation of function calls and function run times can be done dependant to the actual running task. This is necessary, if dif-

ferent tasks call one single function at the same time, or if a task switch occurs in between the function.



Statistics on function hierarchy, process related



Analyzer listing, function call hierarchy and process switches

## Task Stack Coverage

In real time systems it is quite important to know, how much stack space each task consumes. For this purpose

a special window shows the current and the maximum usage of each separate task.

name	low	high	sp	%	low	spare	max	0	10	20	30	4
osSystemStack	00000000	00000050			00000040	00000040	20%	[Progress bar]				
osTaskStack0	000001A8	000001F8			000001E8	00000043	16%	[Progress bar]				
osTaskStack1	00000248	00000298			00000280	00000038	30%	[Progress bar]				
osTaskStack2	000001F8	00000248			00000233	0000003B	26%	[Progress bar]				
osTaskStack3	00000158	000001A8			00000197	0000003F	2.1%	[Progress bar]				
osTaskStack4	00000108	00000158	00000152	7%	00000142	0000003A	27%	[Progress bar]				

Process stack coverage window

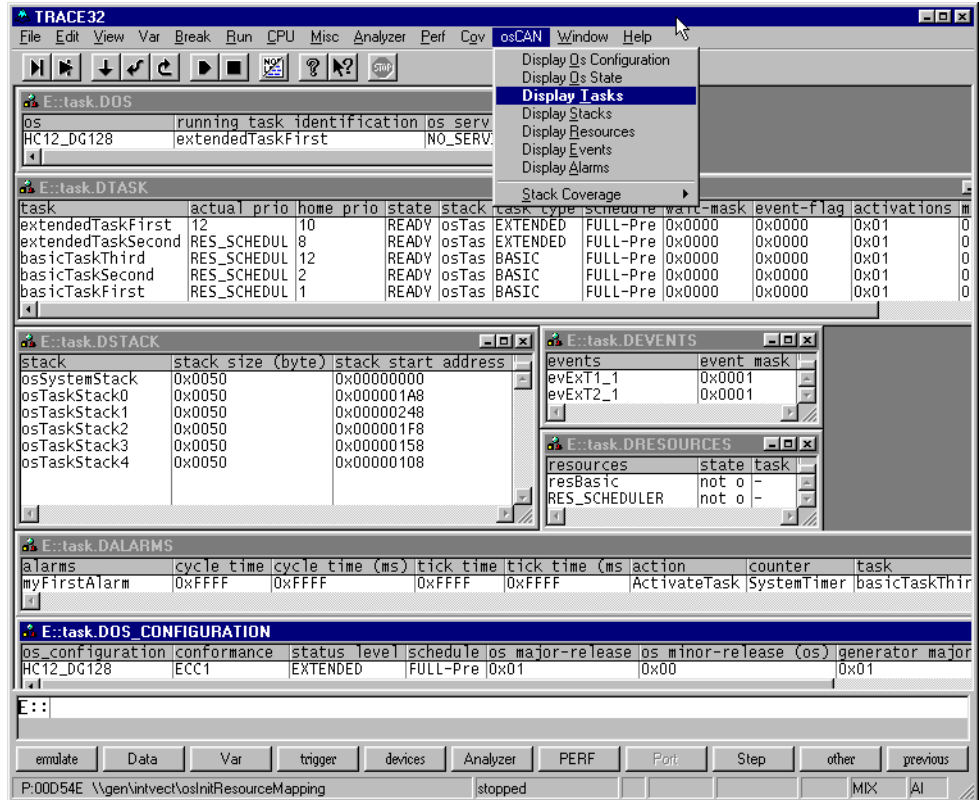
## PRACTICE functions for OS data

The support includes extended PRACTICE functions for process specific data. E.g. the function "TASK.CONFIG(magic)" returns the address of the so called magic value.

## osCAN related pull-down menu

Because the menu bar of the TRACE32 user interface can be fully customized, you can create a new pull down menu, including operating sys-

tem specific commands. We deliver osCAN support with an example for such specific menus, which provides fast access to the osCAN features.



TRACE32 with osCAN menu

## 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 Kaffan  
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  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@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 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  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@lauterbach.com

#### Denmark

Nohau Danmark A/S  
Mr. Flemming Jensen  
Hørkær 26, Plan 4  
DK-2730 Herlev  
Phone: +45 44 52 16 50  
FAX: +45 44 52 26 55  
EMAIL: info@nohau.dk

#### Egypt

Lauterbach GmbH  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@lauterbach.com

#### Finland

Nohau Solutions Finland  
Mr. Martti Viljainen  
Tekniikantie 14  
FI-02150 Espoo  
Phone: +358 40 546 0142  
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  
Sales Team Germany  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@lauterbach.com

#### Greece

Lauterbach GmbH  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@lauterbach.com

#### Hungary

Lauterbach GmbH  
Alllaufstr. 40  
D-85635 Höhenkirchen-Siegertsbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@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-Kolkata**

Electro Systems Associates Pvt. Ltd.  
Mr. Arun Roy  
India - Kolkata  
Phone: +91 98305 78843  
FAX:  
EMAIL: kolkata@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. Richard Copeman  
11 Basepoint Enterprise Centre  
Stroudley Road  
Basingstoke, Hants RG24 8UP  
Phone: 0044-118 328 3334  
FAX:  
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  
Kohoku-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@emilogic.com.au

**Norway**

Nohau Solutions AB  
Mr. Jörgen Nilsson  
Derbyvägen 6D  
SE-21235 Malmö  
Phone: +46 40 592 206  
FAX: +46-40 592 229  
EMAIL: Jorgen.nilsson@nohau.se

**Poland**

QUANTUM Sp. z o.o.  
Mr. Aleksander Bil  
ul. Jeleniogorska 6  
54-056 Wrocław  
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-Siegersbrunn  
Phone: +49 8102 9876 130  
FAX: +49 8102 9876 187  
EMAIL: sales@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**

Hancom MDS Inc.  
Mr. Dongwook Jun  
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@hancommds.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 6D  
SE-21235 Malmö  
Phone: +46 40 592 206  
FAX: +46 40 592 229  
EMAIL: Jorgen.nilsson@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: +216-31361061  
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 Battikent/Ankara  
Phone: +90 312 3324769  
FAX: +90 312 3324769  
EMAIL: info@g3tek.com

**UK**

Lauterbach GmbH  
Mr. Richard Copeman  
Altlaufstr. 40  
D-85635 Höhenkirchen-Siegersbrunn  
Phone: +49 8102 9876 190  
FAX: +49 8102 9876 187  
EMAIL: sales@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

The information presented is intended to give overview information only. Changes and technical enhancements or modifications can be made without notice.