

BAE SYSTEMS gains a first UKAS accreditation for frequency generation/measurement using Fluke 910R GPS-Controlled Frequency Reference

Like most other laboratories, the Marine Calibration Facility of BAE SYSTEMS established traceability for its frequency based systems by means of traditional off-air frequency receiver technology. This receiver was used to plot the long-term fractional frequency error of their in-house Cesium standard. BAE's UKAS accreditation for frequency generation/measurement at 10 MHz was 3×10^{-11} , limiting frequency calibration to precision frequency counters, etc.

Employing a Cesium standard is a costly process; the units typically cost in the region of \$50,000 and they have a life span of approximately seven years. As these standards approach the end of their life span, the next Cesium standard needs to be commissioned while the known standard remains for comparison. So the Cesium standards actually need to be replaced every six to seven years.

The Cesium systems were very expensive to maintain, and traceability was limited by the old technology of off-air frequency receivers. With the continuous drive to minimize cost, BAE was looking for a better, but less costly, solution. The Fluke 910R GPS-Controlled Frequency Reference offered exactly what BAE was looking for. BAE could get the accuracy of a Cesium standard using a GPS-disciplined Rubidium at a fraction of the cost of maintaining the old system, with the additional benefit of an improved UKAS



BAE SYSTEMS is a global systems company dedicated to making the intelligent connections needed to deliver innovative solutions to military customers. BAE SYSTEMS in Barrow work in conjunction with the US military on the Trident missile program and, as such, need to comply with the rigorous calibration regime according to NAVAIR procedures.

uncertainty claim. The life of the Rubidium standard is expected to be at least 20 years.

BAE purchased a Fluke 910R GPS-Controlled Frequency Reference and compared the standard frequency output from this to their original Cesium system. The correlation of measurements was excellent. The GPS Plus software package proved to have some very useful features which helped in proving traceability with the UKAS assessors.

The BAE SYSTEMS Marine Calibration Facility now has a UKAS accreditation of 1.5×10^{-12} for meas-

continued on page 2

inside

Customers and Applications

Page 1

BAE SYSTEMS gains a first UKAS accreditation for frequency generation/measurement

Page 5

Modern precision multi meter measurements: putting theory to the test

Page 5

Improving accuracy of power and power quality measurements

Product News

Page 2

Fluke debuts new MET/CAL® Plus Version 7.0 Metrology Software

Page 3

Fluke introduces two new options for the 525A Temperature/Pressure Calibrator

Page 3

Fluke DVMP Care Plan provides accredited calibrations

Fluke News

Page 4

Fluke previews new temperature lab in Norwich, UK

Seminars and Events

Page 2

MET/CAL® Version 7 classes and computer-based training now available

Page 6

Fluke Customer Training

Page 8

Events

BAE SYSTEMS . . .

continued from page 1

urement/ generation of frequency at 10 MHz. This is a dramatic improvement, enabling calibration of Rubidium standards to manufacturer's specification.

Improved frequency accreditation also complements our other parameters such as dc Voltage (0.2 ppm at 10 V), resistance (0.6 ppm at 100 ohm) and pressure (0.01 1% + 0.5 MPa at up to 60,000 psi/413.8 MPa). This all helps the Marine Calibration Facility provide the highest quality calibrations to BAE's customers.

More detailed information about the 910R GPS-Controlled Frequency Reference is available on calibration.fluke.com. To request a free data sheet, just check the appropriate box on the enclosed reply form.

Fluke debuts new MET/CAL® Plus Version 7.0 Metrology Software

New features include greater ease of use, broader workload coverage and expanded measurement uncertainty verification

Fluke is pleased to introduce the new MET/CAL® Plus Version 7.0 software suite, designed specifically for metrologists who need highly accurate, automated calibration procedures.

Designed to serve as the most complete calibration software suite available to meet the increasing demands of calibration laboratories, MET/CAL Plus V 7.0 allows metrologists to automate the operation and management of their calibration facilities. MET/CAL Plus V 7.0 includes a host of new features designed for improved navigation, multi-tasking and quick results:

- Powerful, yet easy to learn and use
- Expanded feature set to perform automated calibrations
- Configure and report a wider range of measurement uncertainty parameters
- Convenient maintenance history and asset status
- Import Portocal II data into MET/CAL Plus V 7.0
- Increased security model/password management
- New results tables, uncertainty tables and math functions
- Supports new instruments including the new Fluke 8508A, Agilent 33250A, Agilent E4418A, and Agilent E4419A
- Built-in limited support for five languages

MET/CAL Plus V 7.0 combines the asset tracking functions of the standard MET/TRACK® module with the procedure execution ability of MET/CAL, in addition to a core library of procedures. Additional Warranted Procedures are available as part of the MET/SUPPORT Gold program or as an individual purchase online. MET/SUPPORT Gold members also receive the upgrade to MET/CAL 7 free of charge.



More detailed information about MET/CAL® Plus V 7.0 is available on the web at calibration.fluke.com. To receive a free product data sheet, just check the appropriate box on the enclosed reply form.

MET/CAL® Version 7 classes and computer-based training now available

Fluke's selection of training options is designed to help you get the most out of MET/CAL® Plus. All software training classes are being updated to the new version 7.0. These classes are ideal for helping new metrology technicians get up and running quickly with the latest version of MET/CAL Plus. They can also help experienced users become expert users. Classes include hands-on, basic sessions as well as more advanced classes in procedure writing.

MET/CAL Computer-Based Training is also available. This CD-ROM is a cost-efficient and convenient way to learn the basics of using MET/CAL and Crystal Reports. Use it to supplement instructor-led courses or gain an overview of the new features of MET/CAL V 7.

Details about these and other Fluke courses, including dates and locations, are available on calibration.fluke.com. For a free course planner, check the appropriate box on the enclosed reply form.

Fluke introduces two new options for the 525A Temperature/Pressure Calibrator

The 525A Temperature Calibrator now has an optional general-purpose interface bus (GPIB) that enables the 525A to be connected with computer-controlled systems and integrated into automated test equipment (ATE).

Also new is a series of precision pressure modules developed in partnership with San Marcos, Texas-based Mensor, Inc. The 525A-P Series pressure modules offer ranges from -15 to 3000 PSI, with precision to 0.01 % full scale. These cost-effective modules can be used with the 525A calibrator to calibrate precision pressure modules and process field calibration instruments, as well as a wide variety of pressure instruments and signal-conditioning modules requiring pressure inputs.

The 525A Temperature/Pressure Calibrator combines high accuracy and broad functionality for temperature and pressure instrument calibration. Compact and economical, the 525A is Fluke's most accurate temperature calibrator, sourcing and measuring a complete range of RTDs, thermocouples and the thermistor in addition to its pressure measurement capabilities.

A free data sheet provides more detailed information and specifications about the 525A Temperature/Pressure Calibrator. To get your copy, just check the appropriate box on the enclosed reply form. Information is also available on calibration.fluke.com.



Fluke can provide users of Fluke 732A and 732B Solid State Standards with a calibration accredited by the National Voluntary Laboratory Association Program (NVLAP) – at the user's site. The Fluke Direct Voltage Maintenance Program (DVMP) Care Plan can save customers virtually 100 % downtime, shipping costs, and potential damage, while achieving measurement uncertainty as low as 0.1 ppm (NIST publishes 0.19 ppm). This on-

Fluke DVMP Care Plan provides accredited calibrations

site service also demonstrates the competency and proficiency of the user making the measurements.

As a bonus feature, after a customer participates in the Fluke DVMP Care Plan just three times, Fluke provides a special "Characterization and Projection Report" depicting projected uncertainties over time particular to the customer's standard.

Fluke's Primary Standards Laboratory in its Everett, Washington US headquarters maintains traceability for the DVMP Care Plan through its Josephson Array Voltage Standard, using processes and procedures accredited by NIST's NVLAP.

The Fluke DVMP Care Plan is currently available in the United States. As the program expands into other areas, look to this newsletter and the Fluke web site for announcements.

Details about the Fluke DVMP Care Plan are available on our web site at calibration.fluke.com. You can also get a free data sheet describing the program. Just check the appropriate box on the enclosed reply form.

Fluke previews new temperature lab in Norwich, UK

Fluke hosted a special preview of its new temperature lab on July 30 so that customers could see first-hand what its world-class capabilities will be. Over the next few months, the calibration equipment and standards used in the lab will undergo extensive testing and data analysis, with full services expected to be offered by late 2002. Fully accredited services will become available during 2003.

Virtually all the equipment used in the new lab was designed and built by Hart Scientific, a Fluke company: ITS-90 fixed-point cells, maintenance furnaces, SPRTs, thermometer readouts, and fluid baths. Additional electrical standards are supplied by Fluke, and a dc resistance bridge is being used as an SPRT readout standard.

Services to be supplied in Norwich will include calibrations of SPRTs by fixed-point and by comparison, PRTs and thermistors by comparison, thermocouples by fixed point, and calibrations of resistance- and voltage-based readout standards. Calibrations will be available from -200°C to 1000°C . As with the Hart lab in American Fork, Utah, US, the Norwich lab is expected to achieve uncertainties that approach those of many national temperature laboratories.



Fluke expands service for Hart Scientific products in Europe and Asia

In addition to the new temperature lab in Norwich, the Fluke European Repair Center in Eindhoven, The Netherlands, can provide service for Hart baths and industrial calibrators such as dry-wells. Their calibration laboratory is accredited by the NKO (Netherlands Calibration Organization).

Through Fluke subsidiaries in Asia, Hart has also begun service operations in China, and a second lab has been



commissioned in Singapore. The Singapore lab includes a full line of fluid baths, SPRTs, and readout standards for comparison calibrations of all thermometer types from -200°C to 550°C . This

facility will support customers needing calibrations throughout the Asia-Pacific region and is expected to become accredited during 2003.

If you have questions about where to obtain service for your Fluke or Hart Scientific products, contact your local Fluke representative. Information is also available on the Fluke web site, www.fluke.com, and the Hart Scientific web site, www.hartscientific.com.

Modern precision multimeter measurements: putting theory to the test

In a controlled experiment, Fluke asked five laboratory technicians to perform some basic measurements using the same precision digital multimeter (DMM). The results yielded an unusually wide spread of readings. The resulting concern about whether basic metrology principles were being followed led to the creation of a white paper, prepared by Fluke Precision Measurement marketing manager Peter Dack. Peter presented the paper at last year's National Conference of Standards Laboratories International (NCSLI). Fluke has now published this paper on our web site, calibration.fluke.com.

The paper discusses a variety of possibilities for error, concentrating on two sources: interconnections and resulting types of interference, and measurement corrections using nulling or zeroing offsets.

The paper will expose the new calibration technician to some of the many measurement issues he or she will face on the job, and it provides a "refresher course" for the more experienced user of precision DMMs.

To download the paper (available in .pdf file form), visit the Application Notes area of calibration.fluke.com.



Improving accuracy of power and power quality measurements

To calibrate power and power quality measurement instruments such as flicker meters or harmonic measurement devices, several alternative techniques are generally used or proposed:

- Using a reference device to make measurements which can be compared against those made by the unit under test
- Applying variable loads to a static, impedance-loaded power line to induce required conditions
- Generating the required signals with a precision signal source

A paper presented at this year's Measurement Science Conference by marketing manager David Coombes discusses the benefits and problems with each approach. It explains why the third option enables the calibration professional to eliminate many causes of measurement uncertainty.

This paper has recently been published in the Application Notes section of calibration.fluke.com. It is available free in .pdf file format.



Fluke Customer Training Schedule

Fluke Customer Training helps you get the most out of your test and measurement instruments and software. The following table lists upcoming courses scheduled around the world. Courses are taught in English except where indicated otherwise (in parentheses).

Fluke courses, October – December 2002

October			
Date	Course Length	Course Name	Location
October 7	5 days	MET/CAL Database and Reports	Dallas, TX, US
October 8	1 day	Starting in Electrical Calibration	United Kingdom
October 14	5 days	Principles of Metrology	Seattle, WA, US
October 14	5 days	MET/CAL Procedure Writing	Dallas, TX, US
October 15	3 days	MET/CAL <i>Plus</i> Procedure Writing – Basic	Germany (German)
October 15	3 days	MET/CAL <i>Plus</i> Procedure Writing – Basic	Spain (Spanish)
October 15	4 days	Advanced MET/CAL Procedure Writing I	Seattle, WA, US
October 21	5 days	Cal Lab Management	Seattle, WA, US
October 22	4 days	MET/CAL <i>Plus</i> Procedure Writing – Advanced	Spain (Spanish)
October 22	3 days	MET/CAL <i>Plus</i> Procedure Writing – Basic	Sweden
October 28	5 days	MET/CAL Database and Reports	Seattle, WA, US
October 28	4 days	MET/CAL <i>Plus</i> Procedure Writing – Advanced	Germany (German)

November			
Date	Course Length	Course Name	Location
November 4	5 days	MET/CAL Procedure Writing	Seattle, WA, US
November 11	5 days	Principles of Metrology	Orlando, FL, US
November 11	5 days	Metrology for Technicians	United Kingdom
November 11	5 days	Metrology for Technicians	Spain (Spanish)
November 11	5 days	Metrology for Technicians	Italy (Italian)
November 11	5 days	Metrology for Technicians	Sweden
November 12	4 days	MET/CAL <i>Plus</i> Procedure Writing – Advanced	France (French)
November 18	5 days	Cal Lab Management	Norwich, United Kingdom
November 25	5 days	MET/CAL Procedure Writing, Database Management and Reports	Singapore
November 26	4 days	MET/CAL <i>Plus</i> Procedure Writing – Advanced	Sweden
November 12	3 days	MET/CAL <i>Plus</i> Report Writing	Germany (German)

December			
Date	Course Length	Course Name	Location
December 2	1 day	Starting in Electrical Calibration	Germany (German)
December 2	5 days	MET/CAL Database and Reports	Orlando, FL, US
December 3	3 days	MET/CAL <i>Plus</i> Report Writing	Sweden
December 8	1 day	Starting in Electrical Calibration	Sweden
December 9	5 days	Principles of Metrology	San Diego, CA, US
December 9	5 days	MET/CAL Procedure Writing	Orlando, FL, US

For more details about course descriptions, locations or schedules, circle the appropriate number on the enclosed reply form. You can also find Fluke Precision Measurement training information on the web at calibration.fluke.com.

Events

Austria

October 1-3 Messtechnik, Vienna

Belgium

November 20 Calibration Seminar, Brussels

Canada

October 24-25 Canadian NCSL, Montreal

France

October 22-24 Forum Mesure 2002 Exhibition, Paris

Germany

November 11-15 Electronica Exhibition, München

Italy

November 19-23 Bias 2002 Exhibition, Milano

Netherlands

November 4-8 Het Instrument 2002 Exhibition, Jaarbeurs Utrecht

November 19 Calibration Seminar, Utrecht

United Kingdom

November 12-14 TEAM Exhibition, NEC Birmingham

United States

October 21-24 "The 8th Symposium on Temperature: Its Measurement and Control in Science and Industry," McCormick Place South, Chicago, Illinois

October 21-24 ISA 2002, Instrumentation, Systems and Automation Conference and Exhibition, McCormick Place South, Chicago, Illinois

October 27-31 Power Electronics Technology Exhibit and Conference, Donald E. Stephens Convention Center, Rosemont, IL

total solutions

in calibration

We promised. Now we're delivering. New Fluke products. New Fluke solutions.

What did we promise? When we acquired Wavetek-Datron back in 2000, I said that the merger of our two organizations would be a "win-win-win" for our customers. One of the "wins" was stated this way:

"Most importantly, you can look forward to enhanced product and service solutions as we explore new opportunities through our combined organizations. Our engineers and service organizations are already working together to share best practices and define superior calibration solutions."

What are we delivering? Although we have been introducing new products steadily since 2000, I think that this year you can really see the innovation that occurs when two former competitors start working together. We presented four exciting new products to customers at NCSL that show our strong commitment to precision digital multimeters, data acquisition, and calibration software, while also expanding into new exciting areas like power calibration:

- 8508A Reference Multimeter
- 6100A Electrical Power Standard
- MET/CAL Plus Version 7 Calibration Management Software
- 2680 Series Data Acquisition Systems

What do we mean by "solutions"? We are committed to delighting our customers and finding innovative new ways to help them keep their world up and running. Introducing great new hardware products is certainly part of that commitment. Developing great software is another important part. But we recognize that great hardware and software products are only part of the story. We also work hard to support our customers before and after the sale; provide efficient repair and calibration service; and offer training to help customers maximize their investment.

Now that Hart Scientific is part of the Fluke Precision Measurement family, investments like the new temperature labs in the United Kingdom and Singapore will help us provide an even wider range of calibration solutions to our customers.

We will continue to expand our range of Fluke solutions throughout the calibration lab. As we develop more partnerships with companies whose products and services complement our own, and as we continue to introduce exciting new products and services, I believe you will find it easier than ever to look to Fluke whenever you have a precision measurement requirement.

Sincerely,



Thomas Johnson
General Manager, Fluke Precision Measurement



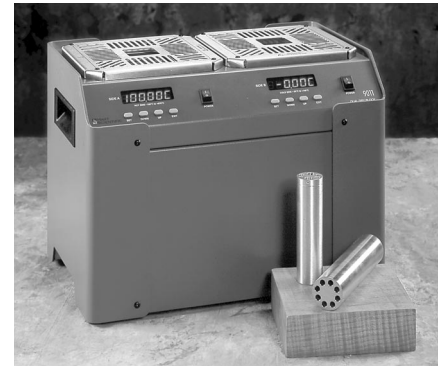
New temperature products from Hart Scientific, a Fluke Company



With the new Model 9011 Dual-Well Calibrator from Hart Scientific, a Fluke Company, you get two extreme-temperature wells in one convenient package. The 9011's "cold block" covers temperatures from $-30\text{ }^{\circ}\text{C}$ to $140\text{ }^{\circ}\text{C}$. Four fixed wells provide for a variety of probe sizes. A fifth well accepts multi-well inserts for additional probe sizing. Calibrated accuracy in the removable insert is $+0.25\text{ }^{\circ}\text{C}$ and stability at $-30\text{ }^{\circ}\text{C}$ is $+0.02\text{ }^{\circ}\text{C}$.

The "hot block" also accepts multi-well inserts (up to 8 wells) and generates stable temperatures ($+0.01\text{ }^{\circ}\text{C}$ to $+0.06\text{ }^{\circ}\text{C}$) from $50\text{ }^{\circ}\text{C}$ to $670\text{ }^{\circ}\text{C}$.

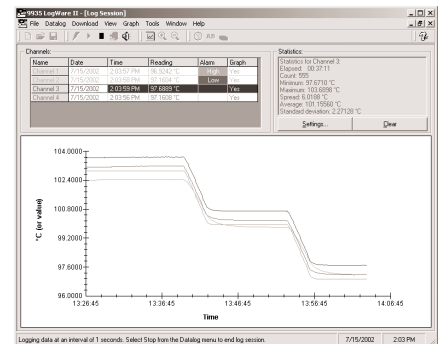
The 9011 features a Hart temperature controller and includes RS-232, Hart Interface-it software, and six-inch depth in both blocks.



9935 LogWare II

Hart's new Model 9935 LogWare II works with any multi-channel Hart thermometer readout to collect and analyze data from up to 96 thermometers simultaneously. LogWare II lets you set alarm conditions, delay start times, select an acquisition interval and more. Raw data can be collected in ohms, millivolts, ratios, or multiple temperature scales. It even lets you configure your readout using its Microsoft Windows[®] interface.

Whether used to monitor data in real time, store data to individual text files, or analyze data collected in the memory of the ChubE-4 Thermometer, this program offers tremendous power, flexibility, and ease of use.



9100S and 9102S Handheld Dry-Well

Hart introduced the first dry-wells in 1994. By incorporating Hart's newest proprietary temperature controller, the new 9100S and 9102S handheld calibrators offer broader temperatures, better performance, and automation capabilities – yet still fit into the smallest packages available today.

The Model 9100S covers temperatures from $35\text{ }^{\circ}\text{C}$ to $375\text{ }^{\circ}\text{C}$ with calibrated accuracy ranging from $+0.25\text{ }^{\circ}\text{C}$ to $+0.5\text{ }^{\circ}\text{C}$. Stability is $+0.07\text{ }^{\circ}\text{C}$ at $50\text{ }^{\circ}\text{C}$ and $+0.3\text{ }^{\circ}\text{C}$ at $375\text{ }^{\circ}\text{C}$. Small enough to fit in your hand, the 9100S comes with any of four block options, each including a different variety of well sizes.

The Model 9102S features stability of $+0.05\text{ }^{\circ}\text{C}$ over its entire range of $-10\text{ }^{\circ}\text{C}$ to $122\text{ }^{\circ}\text{C}$. Calibrated accuracy is $+0.25\text{ }^{\circ}\text{C}$ at all temperatures. Like the 9100S, the 9102S changes temperatures and stabilizes quickly. The 9102S includes two wells for matching removable sleeves with specific probes.

Both calibrators include a serial port for an RS-232 interface and ship with Hart's Interface-it software.



More information about these products is available on Hart's web site, www.hartscientific.com. To receive free product data sheets, just check the appropriate box on the enclosed reply form.

Contact us:

Austria
Analog & Digital Messtechnik GmbH
 Südstrandstrasse 15,
 Postfach 16
 1232 Wien
 Tel.: +43-1/6175320-30
 Fax: +43-1/6175320-10
 E-mail: pacher@aandd.at
 Internet: www.aandd.at

Belgium
BFi OPTILAS Belgium
 Cipalstraat 3
 B-2440 GEEL
 Belgium
 Phone +32-14570670
 Fax +32-14570679
 E-mail:
 sales.be@bfioptilas.avnet.com

Denmark
Palcon Instruments
 Skovlytoften 26 6
 DK-2840 Holte
 Tel.: +45 35 82 04 55
 Fax: +45 45 41 11 68
 E-mail: mail@palcon.dk
 Internet: www.palcon.dk

European Headquarters
Fluke Europe B.V.
 P.O. Box 1186
 5602 BD Eindhoven
 Tel.: +31-40-2675200
 Fax: +31-40-2675222

Eastern Europe/Middle East/Africa
Fluke Europe B.V.
 Export Department
 Science Park Eindhoven 5110
 P.O. Box 1186
 5602 BD Eindhoven
 Tel.: +31-40-2675264
 Fax: +31-40-2675260
 E-mail: info-export@fluke.com

Finland/Estonia
Professional Test Equipment Harrico Oy
 PL 43
 SF-00421 Helsinki
 Tel.: +358 9 530 66 50
 Fax: + 358 9 530 66 530
 E-mail: info@harrico.com

France
MB Electronic
 606, Rue Fourny - Z. I.
 B.P. 31
 78533 BUC CEDEX
 Tel. 01 39 67 67 67
 Fax. 01 39 56 53 44

Germany
CalPlus GmbH
 Heerstrasse 32
 14052 Berlin
 Tel.: +49 030/214 982-0
 Fax: +49 030/214 982-50
 E-mail: Office@calplus.de
 Web: www.calplus.de

Greece
George D. Zis & SIA O.E. Test & Measuring Equipment
 Zacharitsa 27
 Athens 117 41
 Tel.: 30 1 9246915
 Fax: 30 1 9249087
 E-mail: fluke@ath.forthnet.gr

Italy
DELO Instruments
 Via Piemonte, 14
 20090 Fizzinasco
 Pieve E. (MI)
 Italy
 Tel. +39 02907 22441
 Fax +39 02907 22742
 E-mail: sales@delo.it
 Internet: www.delo.it

The Netherlands
BFi OPTILAS B.V.
 P.O. Box 222
 2400 AE Alphen a/d Rijn
 Tel.: +31 172-446060
 Fax: +31 172-443414
 E-mail:
 sales.nl@bfioptilas.avnet.com
 Internet:
 www.bfioptilas.avnet.com

Norway
Instrutek
 Skreppestad Naeringspark
 N-3261 Larvik
 Tel.: +47 33 16 56 90
 Fax: +47 33 16 57 01
 E-mail: post@instrutek.no

South Africa
Spescom MeasureGraph (Pty) Ltd.
 Spescom Park
 Cnr. Alexandra Ave. & Second Rd.
 Halfway House, Midrand 1685
 P.O. Box 288
 Halfway House,
 South Africa, 1685
 Tel. 27 11 266 1572
 (Johannesburg)
 Tel. 27 21 424 9686 (Cape Town)
 Tel. 27 31 309 3421 (Durban)
 Fax: 27 11 266 1725
 E-mail: Fluketm@spescom.com

Spain & Portugal
Megacal Instruments Iberica S.L.
 C/ Azahar, 6
 28020 MADRID
 Tel.: +34-91-5791888
 Fax.: +34-91-5712346
 E-mail: ventas@megacal.com

Sweden
Caltech AB
 Fågelviksvägen 7
 S-145 53 Norsborg
 Tel.: +46-8-53 47 03 40
 Fax: +46-8-53 17 21 00
 E-mail: janbergqvist@caltech.se
 Internet: www.caltech.se

Switzerland
ELCAL AG
 Heimstrasse 46
 CH-8953 Dietikon
 Tel.: +41-1-742 20 00
 Fax: +41-1-742 20 48
 E-mail: info@elcal.ch
 Internet: www.elcal.ch

United Kingdom
Fluke Precision Measurement Ltd.
 Hurricane Way
 Norwich
 NR6 6JB
 Tel: +44 (0) 1603 256600
 Fax: +44 (0) 1603 483670
 E-mail:
 precision.measurement@fluke.com
 Internet: www.fluke.co.uk/fpm

Corporate Headquarters
Fluke Corporation
 P.O. Box 9090
 Everett, WA 98206-9090
 USA
 Tel.: +1-425-446.5500
 Fax: +1-425-446.5116

Fluke on the World Wide Web: <http://calibration.fluke.com>
Fluke e-mail: fluke-info@fluke.com

Fluke. Keeping your world up and running.

Fluke Corporation
 PO Box 9090, Everett, WA USA 98206
 Fluke Europe B.V.
 PO Box 1186, 5602 BD
 Eindhoven, The Netherlands
 For more information call:
 In the U.S.A. (800) 443-5853 or
 Fax (425) 446-5116
 In Europe/M-East/Africa (31 40) 2 675 200 or
 Fax (31 40) 2 675 222
 In Canada (800) 36-FLUKE or
 Fax (905) 890-6866
 From other countries +1 (425) 446-5500 or
 Fax +1 (425) 446-5116
 Web access: <http://www.fluke.com/>