

Input flexibility impresses midwestern U.S. manufacturer



A navigation and communications equipment manufacturer scoured the calibration market for new equipment to automate production in the manufacture of their next-generation navigation avionics.

This midwestern U.S. company needed an automated calibration solution that accepted a variety of inputs in a host of variations. What's more, the new line of navigation equipment they were building needed to perform flawlessly to meet strict FAA regulations. So, the company turned to the Fluke 525A Temperature/Pressure Calibrator with a General-Purpose Interface Bus (GPIB) to validate circuits during sub-components testing in the manufacturing process.

The new Fluke 525A-GPIB offered extraordinary application user flexibility that this Fluke customer found very appealing. Using one test unit, they can monitor and test every sensor in the manufacturing process for high quality assurance. Instead of batch testing the units, each product off the

assembly line is tested to assure it meets or exceeds company specifications and FAA requirements.

"When we designed the 525A-GPIB," said Bruce Fuller, Fluke Precision Measurement marketing manager, "we did so to accommodate diverse applications. Automated test equipment needs to span such disparate inputs as thermocouples to altimeters."

Flexibility is just part of the automated test equipment (ATE) story. The Fluke 525A sources and measures a complete range of RTDs, thermocouples, and thermistors. It also measures pressure covering common ranges from 1 inch (6900 Pa) of water up to 10,000 PSI (69 MPa) using the Fluke 700 Series or 525A-P pressure modules. Plus, the dc voltage and current specifications of the 525A enable users to calibrate other process calibrators and a wide variety of other instruments. This is an operational cost- and time-saving device that has fast return on investment.

Information about the Fluke 525A Temperature/Pressure Calibrator is available on our web site at calibration.fluke.com. To request a free data sheet, circle the appropriate number on the enclosed reply form.

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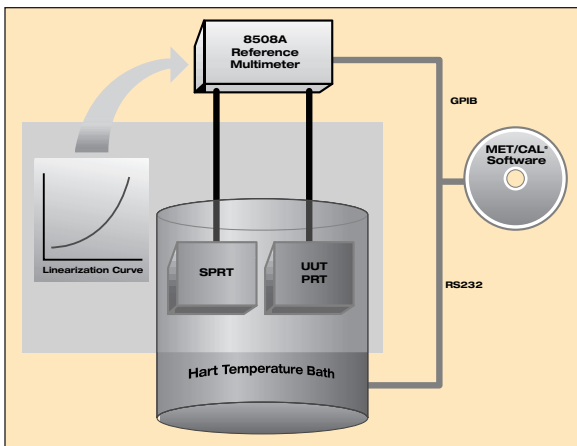


More reasons why the 8508A is the metrologist's reference multimeter

Since its introduction in mid-2002, the Fluke 8508A Reference Multimeter has been welcomed with enthusiasm by the metrology community. Its reference standard accuracy and stability, versatile functionality, and ease of use make it ideally suited to a wide range of cal lab applications. In fact, the 8508A can replace eight reference instruments, because it functions as a multimeter, resistance bridge, voltage divider, null detector, ac/dc transfer standard, precision thermometer, ac/dc current shunt resistor, and an electrometer/pico-ammeter.

Accuracy, stability, versatility, and ease of use – let's see how those features can benefit you in four typical applications.

Calibrating temperature probes

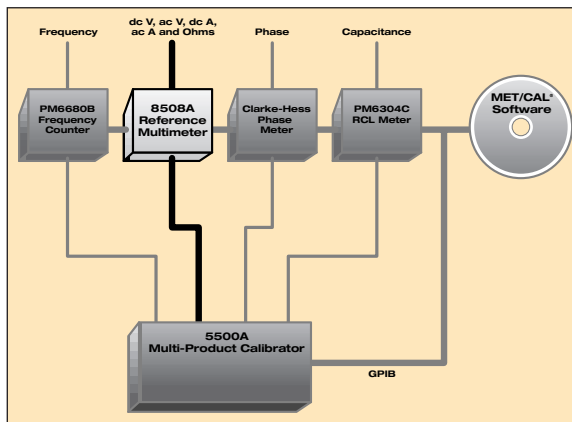


The precision SPRT and PRT temperature readout on the 8508A extends its functionality into advanced temperature metrology. Simultaneous display of temperature and resistance lets you see both parameters at once. The resistance function, with its selectable low excitation current, lets you choose the optimum current for your application, reducing errors due to self-heating of the probe's resistor.

Two, three and four-wire Tru-Ohms configuration with automatic current reversal compensates automatically for any static or changing thermal emfs in the potential difference sensing path.

This reduces measurement uncertainties when you are calibrating many different types of resistance thermometry probes. The 8508A supports both ITS or Callendar-Van Dusen scaling of six constants per probe, storing up to 100 individual probe coefficients. A range of temperature probes can be used with the 8508A without having to re-state coefficients repeatedly. SPRT and PRT probes, as well as a range of temperature baths supplied by Hart Scientific, a Fluke company, are available accessories to the 8508A Reference Multimeter.

Calibrating calibrators



Calibrating a calibrator can be complex and time consuming. The 8508A helps you to simplify the process, allowing you to verify and adjust a wide range of calibrators. It calibrates the primary ranges of many calibrators, including ac and dc voltage, ac and dc amps, and resistance, so you get broad functionality within a single box.

The 8508A can be automated with Fluke's MET/CAL[®] Plus Calibration Management Software, simplifying the process even further. With MET/CAL Plus, calibrations are performed consistently and efficiently, with documented procedures and results.

More reasons ... continued on page 5

Using the Fluke 6100A in manufacturing test

Reliability, throughput, and a wide range of traceable power signals make the Fluke 6100A Electrical Power Standard an ideal solution for testing power measurement products.

If your test station fails, testing stops. You need the most reliable test equipment possible to help maximize throughput while verifying the accuracy and operability of power measuring instruments on the manufacturing floor. The Fluke 6100A Electrical Power Standard offers rock solid reliability and a comprehensive signal set, with the accuracy and stability you need to feel confident about its performance. It replicates power waveforms, distortions events and phenomena such as harmonic distortion, phase errors, flicker and dips and swells – simultaneously, if required. Different signal types can be generated simultaneously, enabling you to validate the independence of different measurement types. And the 6100A's high compliance current effectively overcomes voltage drops associated with the cables, relays and switches commonly found in automated test equipment systems.

Maximizing throughput is vital to minimizing testing time. The 6100A offers direct and indirect modes of operation, so you can program it for the next test while it is still running the current test. Output levels adjust rapidly to new programmed levels, reducing the waiting time before new measurements can be made.

Ease of use is another important feature of the 6100A. Its familiar Microsoft Windows interface can be accessed through the front panel knobs and buttons, or by connecting a mouse and keyboard. A 9-inch, high-resolution TFT display makes it easy to see the status of up to four phases plus more detailed information about the current parameters being set or adjusted.



Whether your application is manufacturing test, engineering design, service or calibration, the Fluke 6100A gives you the tools you need to get your job done – quickly, reliably and precisely. More details are available on the web at calibration.fluke.com. To request a free brochure, circle the appropriate number on the enclosed reply form.

Find out what MET/CAL® Plus V7 can do for you – FREE!



The recently released MET/CAL Plus Version 7 features even greater flexibility, enhanced measurement uncertainty configuration and verification, broader workload coverage, and a more intuitive MET/TRACK® user interface. Now you can explore the features of this powerful software package yourself, easily and at no cost. The MET/CAL Sample CD-ROM puts MET/CAL Plus V7 on your desktop, so you can put it through its paces.

The sample software is a fully functional version of MET/CAL Plus V7, which will be operational for 30 days

after you install it. A booklet included on the CD in PDF file format contains a series of easy-to-follow exercises that quickly help you see what the software can do for you.

If you have never used MET/CAL Plus, the Sample CD will show you how automating your calibrations can help you to increase throughput, maintain consistency, and manage your measurement assets efficiently. If you already use MET/CAL, using the sample is a great way to learn about the new features of Version 7.

To get your free copy of the MET/CAL Plus Version 7 Sample CD, circle the appropriate number on the enclosed reply form. Detailed product information is also available on our web site at calibration.fluke.com.

Fluke adds new capabilities to the 910/910R GPS Controlled Frequency Standards

GPS technology and connectivity offers primary-standard traceability from any location.



Detailed information about the 910/910R GPS Controlled Frequency References is available on the Fluke web site at calibration.fluke.com. To request a free data sheet, circle the appropriate number on the enclosed reply form.

With the introduction of five new options, the Fluke 910/910R GPS Controlled Frequency Standards now provide users with multiple connectivity choices that provide unique flexibility for instrument and data management.

- The 910X-FL-15 GPS Antenna Fiber Link provides greater flexibility to position both the antenna and the 910/910R instrument and offers EMP immunity and electrical isolation for the 910/910R.
- The 910X-76 Ethernet Port offers central, remote, and even simultaneous data management capability.

- Options 71, 72, and 73 provide more outputs at seven industry standard frequencies, for greater flexibility and elimination of distribution amplifiers. These new reference frequencies (0.1 MHz, 1 MHz, 2.048 MHz, 10 MHz, 13 MHz) are valuable to operators who work with Synchronous Digital Hier-archy (SDH) or who typically use GSM technologies and need to maintain exceptionally high frequency accuracy.

Frequency standards like the 910/910R are typically used in primary and secondary calibration laboratories, third party electrical calibration labs, and the metrology labs of many companies in the telecommunications, military and aerospace industries. The Fluke 910/910R features a unique architecture with a built-in measurement kernel, which makes it a frequency reference that is continuously traceable to national standards. This means that, unlike other frequency standards, it does not need to be removed from service for annual calibrations.

Fluke Kassel cal lab extends accreditations

Fluke's calibration laboratory at the European Competence Center for Calibration (ECC) in Kassel, Germany, has extended its accreditations to include frequency and revolutions (rev./min.) These new accreditations have been granted by the DKD (Deutscher Kalibrierdienst bei der Physikalisch-Technischen Bundesanstalt), and are effective from 1 June 2002. They are based on use of the Fluke 910R GPS-Controlled Frequency Standard, with its built-in ultra-high stability rubidium atomic clock as local oscillator.

This extended accreditation enables the cal lab in Kassel to calibrate frequency counters, generators and oscillators, from simple quartz-based models right up to the highest-stability rubidium timebase instruments such as the Fluke PM 668X/668XR Series. These precision timer-counters are increasingly being used for the maintenance and control of GSM mobile telephony transmitter/receiver installations as well as the new UMTS networks.

The extended accreditation covers the frequency range from 0.01 Hz to 4.7 GHz, with an accredited uncertainty of 6×10^{-12} in the frequency range 1 to 10 MHz. These figures mean Fluke's cal lab now has one of the lowest frequency uncertainties in Germany, and it can calibrate all new and existing Fluke instruments for frequency generation and measurement with a DKD certificate.

Fluke 8508A named Best in Test by *Test & Measurement World* magazine



The Fluke 8508A Reference Multimeter was named one of 12 Best in Test award winners for 2002 by *Test & Measurement World* magazine. Nominations for the award are gathered from manufacturers, users, and *T&MW's* editors for products that were introduced between November 1, 2001 and October 31, 2002. The list of winners was published in *T&MW's* December 2002 issue.

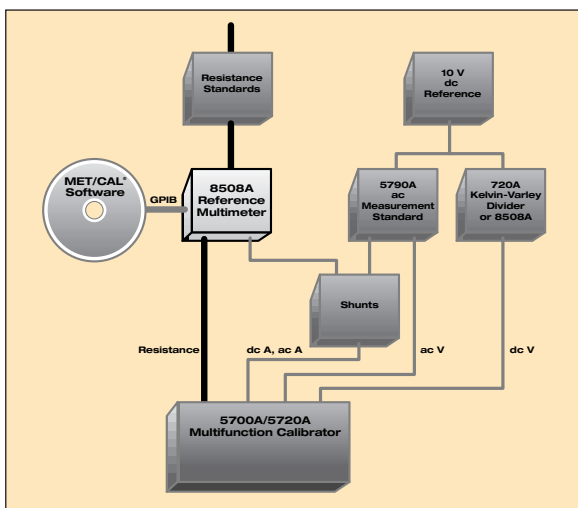
The editors of *Test & Measurement World* were looking for products they consider "particularly innovative or useful," according to the *T&MW* December 2002 online newsletter. With its ability to replace as many as eight reference instruments, its superior accuracy and stability, and exceptional ease of use, the 8508A qualifies on both counts. According to *T&MW*, "The meter's 8½ digit resolution and 2.9 ppm/year stability place the 8508A at the top of the calibration chain in most labs."

To find out more about how the 8508A can fit into your cal lab, visit our web site at calibration.fluke.com. To receive a product brochure, circle the appropriate number on the enclosed reply form.

More reasons . . .

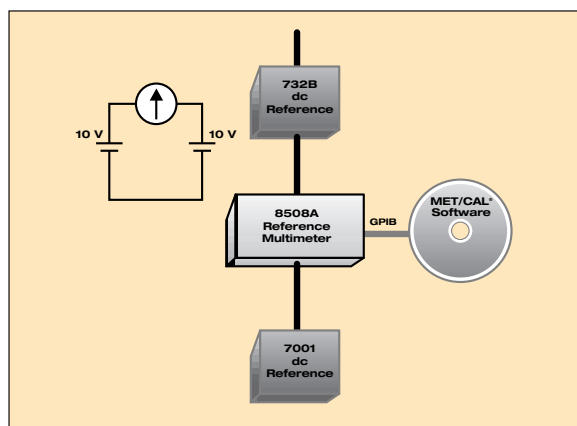
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Calibrating resistance



Capable of measurement values from 10 nΩ to 20 GΩ, the 8508A gives you the flexibility to calibrate many resistance devices, all with very low uncertainties. Automated ratiometric measurements provide repeatability. The resistance ratio function replaces many measurements normally associated with expensive resistance bridges. Autoranging covers a wide dynamic measurement range without forcing you to select the range, automating the transfer between a fixed resistor standard and resistors of different values.

Comparing voltage references



Connected in differential mode, the 8508A enables you to automate a measurement transfer between similar dc values, performing the function of an automated null detector. Its low noise input amplifier design reduces measurement uncertainty, giving you the flexibility to calibrate more equipment.

With 1 nanovolt sensitivity on the 200 mV range, the 8508A can measure differential voltages between the two sources. Extremely high measurement input impedance reduces the chance that sensitive voltage sources will be damaged, reducing repair costs.

Detailed information about the Fluke 8508A Reference Multimeter is available on calibration.fluke.com. To request a free product data sheet, circle the appropriate number on the enclosed reply form.

Fluke Customer Training Schedule

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

March 2003 Courses

Date	Course Length	Course Name	Location
March 3-7	5 days	Principles of Metrology	Atlanta, GA, USA
March 3-7	5 days	MET/CAL Procedure Writing	Orlando, FL, USA
March 3-7	4 days	Metrology for Technicians	Norwich, United Kingdom
March 4-6	3 days	MET/CAL <i>Plus</i> Procedure Writing - Basic	Spain (Spanish)
March 4-6	3 days	MET/CAL <i>Plus</i> Procedure Writing - Advanced	Spain (Spanish)
March 11-13	3 days	MET/CAL <i>Plus</i> Report Writing	Norwich, United Kingdom
March 17-21	5 days	Calibration Laboratory Management	Seattle, WA, USA
March 18-20	3 days	MET/CAL <i>Plus</i> Procedure Writing - Basic	Norwich, United Kingdom
March 18-20	4 days	MET/CAL <i>Plus</i> Procedure Writing - Advanced	France (French)
March 24-28	5 days	MET/CAL Database & Reports	Dallas, TX, USA
March 25-28	4 days	Advanced MET/CAL Procedure Writing I	Seattle, WA, USA
March 31-April 4	5 days	MET/CAL Procedure Writing	Dallas, TX, USA
March 31-April 3	4 days	Advanced MET/CAL Procedure Writing II	Seattle, WA, USA

April 2003 Courses

Date	Course Length	Course Name	Location
April 7-11	5 days	Principles of Metrology	Seattle, WA, USA
April 8-11	4 days	MET/CAL <i>Plus</i> Procedure Writing - Advanced	Norwich, United Kingdom
April 15-17	2½ days	MET/CAL-7 Transition	Seattle, WA, USA
April 28 - May 2	5 days	MET/CAL Database & Reports	Seattle, WA, USA
April 29	1 day	Starting in Electrical Calibration	Norwich, United Kingdom

May 2003 Courses

Date	Course Length	Course Name	Location
May 5-9	5 days	Principles of Metrology	Dallas, TX, USA
May 5-9	5 days	MET/CAL Procedure Writing	Seattle, WA, USA
May 13-15	3 days	MET/CAL <i>Plus</i> Procedure Writing	Norwich, United Kingdom
May 20-22	2½ days	MET/CAL-7 Transition	Seattle, WA, USA
May 20-22	3 days	MET/CAL <i>Plus</i> Procedure Writing	Spain (Spanish)
May 20-22	4 days	MET/CAL <i>Plus</i> Procedure Writing - Advanced	Spain (Spanish)
May 20-22	3 days	MET/CAL <i>Plus</i> Report Writing	Norwich, United Kingdom
May 26-30	5 days	Cal Lab Management	Norwich, United Kingdom

June 2003 Courses

Date	Course Length	Course Name	Location
June 2-6	5 days	MET/CAL Database & Reports	Detroit, MI, USA
June 9-13	5 days	Principles of Metrology	Orlando, FL, USA
June 9-13	5 days	MET/CAL Procedure Writing	Detroit, MI, USA
June 24-26	2½ days	MET/CAL-7 Transition	Seattle, WA, USA

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

Denmark

March 11-13 Measurement and Quality, Odense

Finland

March 25-27 Elkom, Helsinki

Germany

March 26-27 MessTechnik, Stuttgart

May 13-15 Sensor & Test 2003, Nurnberg

Norway

March 23-26 Normet, Gol

United Kingdom

May Instrumentation North, Leeds

United States

August 17-21 NCSL International, Tampa Marriott Hotel, Tampa, Florida

NCSL INTERNATIONAL WORKSHOP & SYMPOSIUM

The Spectrum of Metrology: From the State-of-the-Art to the Everyday

The 2003 Conference is intended to provide a forum for those involved across the entire spectrum of metrology and will provide a unique opportunity to network with other measurement professionals.



August 17 - 21, 2003

Papers, Panels & Workshops: The Workshop & Symposium offers papers, panels, and workshops that explore this year's Conference theme, and are organized into the following five categories:

- ▶ Theoretical
- ▶ Applied
- ▶ Management
- ▶ International
- ▶ Quality

Exhibits: See the latest standards, measuring and test equipment, and services available from the top manufacturers and consultants from industry and government. In many cases, you can interact with technical experts from over 150 innovators from around the world. This is a must Conference for keeping up with the latest measurement equipment, technology, and services.

Networking: Meet with key executives, technical experts, and consultants in the field of Metrology in order to gain new information and insight that will assist in solving problems and learning about the latest metrology techniques and procedures. This is an unparalleled opportunity to obtain a fresh perspective, sharpen your skills, and develop new partnerships. In addition to the traditional electrical, mechanical, and physical metrology fields, expand your involvement in new areas such as automotive, chemical, pharmaceutical, and forensics, to name a few.

Tutorials: The 2003 Conference will again include a series of one-day and half-day tutorials on up-to-date topics that will provide new staff, as well as seasoned professionals, much needed training and networking opportunities. Check the web site for a current list of topics and instructors.

Please join us in Tampa, Florida prepared to learn, to teach and to develop new professional relationships with fellow "Metrologists".

For more information, go to www.ncsli.org/conference/2003/

1800 30th Street, Suite 305, Boulder, Colorado 80301-1026 • Tel: (303) 440-3339 • info@ncsli.org

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 26B
 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
 E-mail: calibration_info@fluke.nl

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/ Infanta Mercedes, 96
 28020 MADRID
 Tel.: +34-91-5710024
 Fax.: +34-91-5712346
 E-mail: ventas@megacal.com
 Internet: www.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 USA (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/>