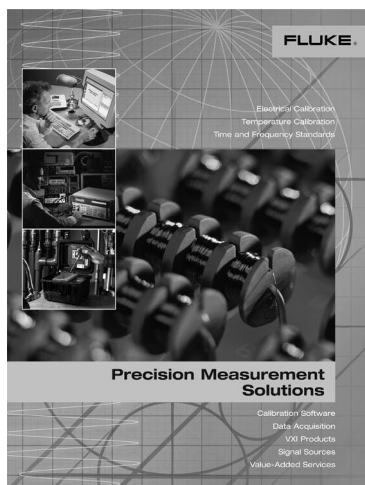


total solutions

in calibration

To our readers: as you know, we have reduced the number of pages in the printed Total Solutions in Calibration newsletter. Our online newsletter, however, is not restricted by length, so occasionally you will find longer articles, or "bonus" articles that do not appear in the printed newsletter. Visit the online version of Total Solutions in Calibration at www.fluke.com/TCALnl to read the additional content, or to subscribe and receive e-mail notification of newly published issues.

New FPM catalog provides comprehensive product information.



Complete product information about Fluke products is readily available on the web at www.fluke.com. But sometimes you might prefer a reference that you can pull from your bookshelf and carry with you. The new 256-page Fluke Precision Measurement catalog is designed to fill that need. It contains detailed information about Fluke electrical and temperature calibrators and standards, signal sources, time and frequency standards, data loggers, software, services, and support programs. It also includes summary-level information and selection charts for Fluke Industrial, Fluke Biomedical, and Raytek, a Fluke company product lines.

Your local Fluke representative will be happy to present you with a free copy of the FPM catalog – just ask him or her. Or circle the appropriate number on the enclosed reply form. You can also visit your local Fluke web site and select on the homepage "request a catalog"

Fluke introduces Priority Gold CarePlan

The Gold CarePlan promise: your calibrators will be ready to work when you are

The new Fluke Priority Gold CarePlan enables you to schedule your calibration and reduce repair downtime effectively. It is a comprehensive instrument calibration and repair support plan that minimizes your downtime and protects your investment in your Fluke calibrators.

Priority Gold CarePlan features include:

- Annual standard or accredited calibration, with three-day in-house turnaround
- Free repairs with first-on-bench priority
- Free priority pickup and delivery service of your instrument
- Priority Gold telephone help line and web support member assistance
- Free product updates
- One-, three-, and five-year plans available, with discount options on renewal
- 10 % off calibration product upgrades
- 20 % off any Fluke metrology training for any of your personnel
- Automatic 45-day and 15-day calibration-due notification
- Free transit case for your instruments

Priority Gold CarePlan
FLUKE

A Priority Gold CarePlan from Fluke guarantees your calibrators are ready to work when you are.

Priority Gold Plan features:

- Annual calibration (standard or accredited) with guaranteed three-day in-house turnaround
- Free repair with first-on-bench priority
- Free-pickup, priority freight on return of instrument
- Special Priority Gold telephone help line or web support member assistance
- Free product updates
- Three-year, three-year and five-year with discount options on renewal
- 10 % off on calibration product upgrades
- 20 % off any Fluke metrology training for any of your personnel
- Automatic 45-day and 15-day calibration-due notifications

*Optional three-year or five-year, 12 days of calendar, 10 days of repair

When your calibrator is out of your lab for scheduled calibration or unexpected repair, it isn't working for you. What's worse, you may not know exactly when to expect it back in your lab. Now, with the Fluke Priority Gold CarePlan, you can schedule your calibration and reduce repair downtime effectively, because you will know exactly when to expect your calibrator back in your lab. Your Priority Gold CarePlan puts you in control of your downtime and in control of your business.

Technical Data

Free repairs
If you request Fluke instrument repair, we'll repair it at no charge, with first-on-bench priority turnaround time.

Free product updates
Keep your instrument up to date. When you need an instrument for calibration or repair, our technicians will take the time to ensure the instrument is up to date. Fluke will notify you in advance of any updates to your instrument.

10 % discount on product upgrades
Special three-year product upgrade and upgrade your calibrator with a 10% discount on product upgrades like the 5500A, 5500B and 11500 model.

20 % discount on Fluke metrology training classes
Send 20 % discount on all Fluke metrology training classes throughout the membership period.

Priority Gold support
Our "no touch" get your questions answered service, member priority support line or special web support line at www.fluke.com. Schedule priority status for repair or installation, discuss technical issues about your calibrator, or inquire about your order status.


Three-day in-house annual treatment
Schedule your instrument or device to be calibrated or repaired in-house within three days of the repair. This means you can get your instrument back in your lab with no days of downtime.

There's been a work. Two weeks before you expect the Fluke Priority Gold Service Center to deliver your instrument. It will be correct. The Fluke Priority Gold Service Center will deliver your instrument. It will be correct. The Fluke Priority Gold Service Center will deliver your instrument. It will be correct.

Day 1: your calibrator arrives at a Fluke Service Center and is repaired by calibration.

Day 2: you instrument is returned to you by express.

Day 3: the Fluke Service Center ships your instrument to you via priority delivery.



Detailed information about the Fluke Priority Gold CarePlan is available on the web at www.fluke.com/CarePlan. You may also have information sent to you by circling the appropriate number on the enclosed reply form.

It's time to begin planning for NCSLI

This is a good time to make arrangements to attend the 2005 NCSL International Workshop & Symposium, scheduled for August 7-11, 2005 at the Washington Hilton & Towers in Washington, DC. This year's theme is "Advances in Science and Technology – Their Impact on Metrology."

Don't miss this great opportunity to attend one or more of 20 special tutorials and more than 120 papers, panels, and workshops that focus on various aspects of quality, measurement, metrology, and management. Some of these are presented by Fluke metrology experts. Check out the titles and find more information on the NCSLI web site at www.ncsli.org/conference/2005/.

Fluke continues to be a strong supporter of this conference and will have an exhibit full of the latest technologies from us and Hart Scientific. And, we will be hosting you at the traditional Fluke Hospitality Event. You can find detailed information as it becomes available on the web at "calibration.fluke.com".

Fluke will also be hosting a MET/CAL® user group meeting for users of MET/CAL Plus Software in conjunction with the conference. With the introduction of MET/CAL Plus Version 7.1, this meeting is sure to have many interesting discussion topics. We will post an invitation and RSVP form online at calibration.fluke.com when final dates and details are available.



Find out more information about NCSLI and becoming a member on their website at <http://www.ncsli.org>.

Automating with MET/CAL® Plus Software saves time

Test & Measurement World article describes time savings

MET/CAL Plus calibration management software helps calibration managers realize big productivity improvements over calibrating manually. An article in the December 1, 2004 issue of *Test & Measurement World's* online newsletter put that statement to the test. The article describes how Scientific Atlanta, a video equipment manufacturer, reduced the time it takes to calibrate signal generators from three hours or more down to one hour or less.

Scientific Atlanta put together two automated systems using MET/CAL Plus Software and calibration standards from Agilent Technologies. The company's engineers developed some of the automated calibration procedures that were required for the tests and purchased

others from third party developers. Tests included harmonic distortion, frequency accuracy, AM/FM accuracy, modulation distortion, residual AM/FM, RF output level accuracy, and flatness.

The two automated systems are located in two different cities. At one location, 60-65 % of the instruments being calibrated can now be returned to service within one day. In the second location 70-78 % of the instruments are returned to service within one day.

Continued on page 2

The complete article is available online (in English) at www.tmwworld.com. Search for the article by its title: "Automate and calibrate."

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Calculating the Power Triangle with the



When calibrating power measurement instruments, the Fluke 6100A Electrical Power Standard has the ability to display the resultant real power (watts), apparent power (S) and reactive power (Q). These three values are often referred to as the Power Triangle.

The 6100A power calculation is first based on a user-requested magnitude of voltage, current and phase. These values can either be keyed into the 6100A front panel or programmed over the IEEE bus interface.

Resultant displayed power is also determined by selecting from one of six available power definitions:

- Budeanu
- Fryze
- Kusters & Moore
- Shepherd & Zakikhani
- Sharon/Czarnecki
- IEEE

Automating with MET/CAL® Plus Software saves time *(continued)*

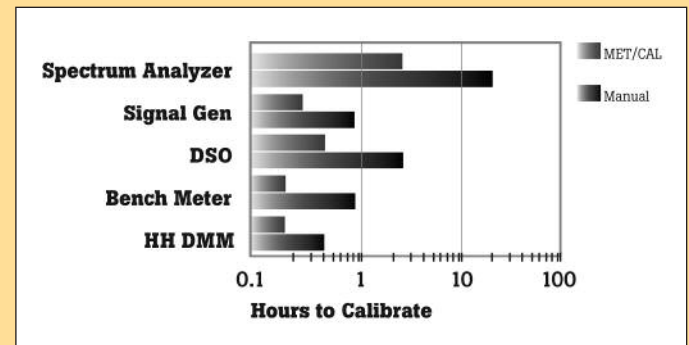
Users realize substantial productivity improvement

MET/CAL® Plus Software provides an integrated solution that includes both automated calibration and asset management. Its true client-server architecture allows multiple workstations with one database as a repository for all results data. Procedure/driver-based calibration provides maximum flexibility for executing complex calibration procedures while being easier to read and verify.

Users report that MET/CAL Software is four to eight times faster than manual calibration and provides consistent, fast calibration across your entire workload.

MET/CAL Plus V7.1 has recently been released. It includes a host of new features that will help to boost productivity and ease of use:

- More powerful searching capabilities.
- A custom screen layout for individual users.
- Support for several languages, including Spanish, German, French and Italian. Limited support for Japanese reports is also provided.



- Formatted dates and numeric display configured in the operating system.
- Procedure language enhancements, including color coded statements that make procedures easier to read.
- "Quick Report Builder" for fast report creation.
- Extended data storage
- An improved security model
- ...and much more

Detailed information about MET/CAL Plus V7.1 is available on the web at www.fluke.com/MC7. To request a free brochure, check the appropriate number on the enclosed reply form.

Fluke 6100A

The power calculation is complicated further for non-sine signals, where additional voltage and current harmonics and their relative phases are added.

Here is an example of the calculation for reactive power (Q) for a specific 6100A configuration and Budeanu definition.

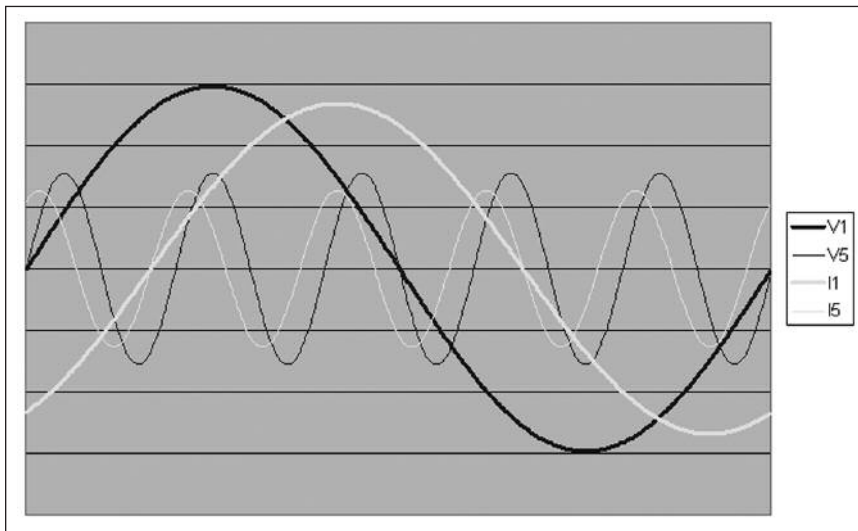
- Voltage fundamental = 120 volts
- Current fundamental = 5 amps
- Phase = -60 degrees
- Fifth voltage harmonic = 10 % of fundamental
- Phase of voltage harmonic = 0
- Fifth current harmonic = 20 % of fundamental
- Phase of fifth harmonic = 0

Therefore,

$$Q = 120 * 5 * \sin(-60) + 12 * 2 * \sin(5 * -60) = 120 * 5 * \sin(-60) + 12 * 2 * \sin(-300) = -498.8 \text{ VAR}$$

The chart below shows this graphically. The yellow waveforms are voltage and the others current. The fifth harmonic is in phase with the fundamental for both volts and current. The current fundamental lags voltage by 60 degrees but the current fifth harmonic is leading the voltage fifth harmonic by 60 degrees.

The interpretation of harmonic current phase angle can be derived from the above equation. The current harmonic phase angles are relative to the current fundamental phase angle, the fifth harmonic is shifted by the -60 degree phase angle of the fundamental. However, a -60 degrees shift in the current fundamental is equivalent to $5 * -60 = -300$ degrees of phase shift in the fifth harmonic current relative to the fifth voltage harmonic.



The Fluke 6100A Electrical Power Standard is the most accurate, comprehensive and flexible source of electrical power signals. Detailed product and application information is available on the web at www.fluke.com/6100A. To receive a free product brochure, circle the appropriate number on the enclosed reply form.

New 290 Series Waveform Generators

1, 2, or 4 channel generators provide 80 MS/s waveform capability

The new Fluke 290 Series Waveform Generators combine many generators into one instrument. Their extensive signal simulation capabilities include arbitrary waveforms, function generator, pulse/pulse train generator, sweep generator, trigger generator, tone generator, noise generator and amplitude modulation source.

Three models are available. The 29 features one output channel; the 292 has two channels, and the 294 has four.

The 290 Series uses Direct Digital Synthesis techniques, as well as variable clock sampling technology, to provide a fully featured programmable function and arbitrary waveform capability.

These instruments can easily simulate complex signals while being easy to use, compact, and affordable. Waveform Manager Plus software provides all of the features needed for creating, manipulating and managing arbitrary waveforms within a single Windows-based program.



Detailed product information, including specifications, is available on the web at www.fluke.com/290. Product information is also available in the Fluke Precision Measurement Catalog. To get your free copy, circle the appropriate number on the enclosed reply form.

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