

FLUKE®

MET/TEMP

Metrology Software

Users Manual

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MET/TEMP

Metrology Software

Introduction

This manual describes the installation and use of MET/TEMP Software. It is designed to serve two groups of users:

- Those who are familiar with and use MET/BASE products for data storage.
- Those who want to produce data output as a CSV (comma separated value) file.

If you currently use MET/BASE products, the *Metrology Software Users Manual* and the *Metrology Software Installation and Upgrade Guide* are valuable resources as well.

This manual is divided into sections. Each section contains important information to help you understand and use MET/TEMP Software successfully.

Section 1: Product Overview

MET/TEMP Software provides a PC Windows-based Graphic User Interface (GUI) and controller to allow you to calibrate multiple thermocouples or thermal switches at one time, using the Hydra Series II Data Bucket and Fluke 500 Series Dry-Block Temperature calibrators.

MET/TEMP software can be used as a standalone program, with data downloaded into CSV (comma separated value) file, or with MET/BASE software with data stored in an SQL database.

Features Available in Standalone and MET/BASE Versions

With either version of MET/TEMP Software, standalone or with MET/BASE, you can:

- Calibrate up to 20 thermocouples or thermal switches simultaneously.
- Store calibration results to a CSV file that can be read by most data viewers.
- Select one of the following temperature reference standards:
 - a. Precision PRT / SPRT attached to two or four of the Hydra's 20 channels.
 - b. Temperature sensors intrinsic to the Fluke 500 Series Dry-Block Temperature calibrators.
- Conduct a full range of automated tests and save calibration data.
- Logically account for ramp and soak times.
- Automatically set up an appropriate temperature schedule for thermal switches.
- Provide visual feedback to the operator on the current status of a test.
- Select a schedule of 1 to 15 discreet temperatures.
- Store a schedule of temperatures, Hydra setup, and asset list to reduce setup time during future procedures.

Features Available Only When Bundled With MET/BASE

- Output data directly to the MET/BASE database
- Verify that the selected reference standard exists and is in calibration.
- Add new UUT assets on the fly.
- Print certificates and result reports
- Prompt for required data

System Requirements

Fluke Metrology Software runs on a variety of platforms. However, the main text of this manual describes only installation on machines running Microsoft Windows 95, Windows 98, Windows NT and Windows 2000.

The minimum requirements for a standalone workstation installation are as follows:

- IBM PC or compatible with at least a Pentium 133 Mhz microprocessor
- VGA monitor
- 64 megabytes of RAM (128 recommended)
- 80 megabytes available on the hard drive
- Windows 95 or later
- Two COMM (serial) ports

Section 2: Installation

You can install MET/TEMP Software as standalone software with data saved to a CSV file, or as an accessory to MET/BASE software, with data saved to the MET/BASE database.

Installation as a Standalone

1. If you are installing MET/TEMP Software to run as a standalone system (without MET/BASE), simply insert the provided CD. If your system does not automatically start the install process, browse to your CD drive and double-click the **setup.exe** file. Follow the screen prompts and select "Standalone" installation where appropriate.
2. As the install proceeds, allow the software to install to the defaults provided unless you have a compelling reason for not doing so.
3. Apply MET/TEMP license disk.

Installation as an Accessory to MET/CAL

Until MET/TEMP Software is integrated with MET/BASE, follow these steps:

1. Install MET/BASE, following the instructions in the *Fluke Metrology Software Installation and Upgrade Guide*.
2. Install MET/TEMP Software files into the shared MET/CAL directory on the server by simply inserting the provided CD. If your system does not automatically start the install process, browse to your CD drive and double-click the setup.exe file. Follow the screen prompts and select "Database" installation where appropriate.

3. Install MET/TEMP Software files into the shared MET/CAL directory on clients by running setup from the \metcal\client directory on the server, as described in the *Metrology Software Installation and Upgrade Guide*.
4. For MET/CAL Version 6.10 or later, run setup from the \metcal\client\mettemp directory on the server.
5. Apply the MET/BASE license disk, following the instructions in the *Fluke Metrology Software Installation and Upgrade Guide*.

Section 3: Hardware Setup

Open MET/TEMP Software. The main dialog appears.

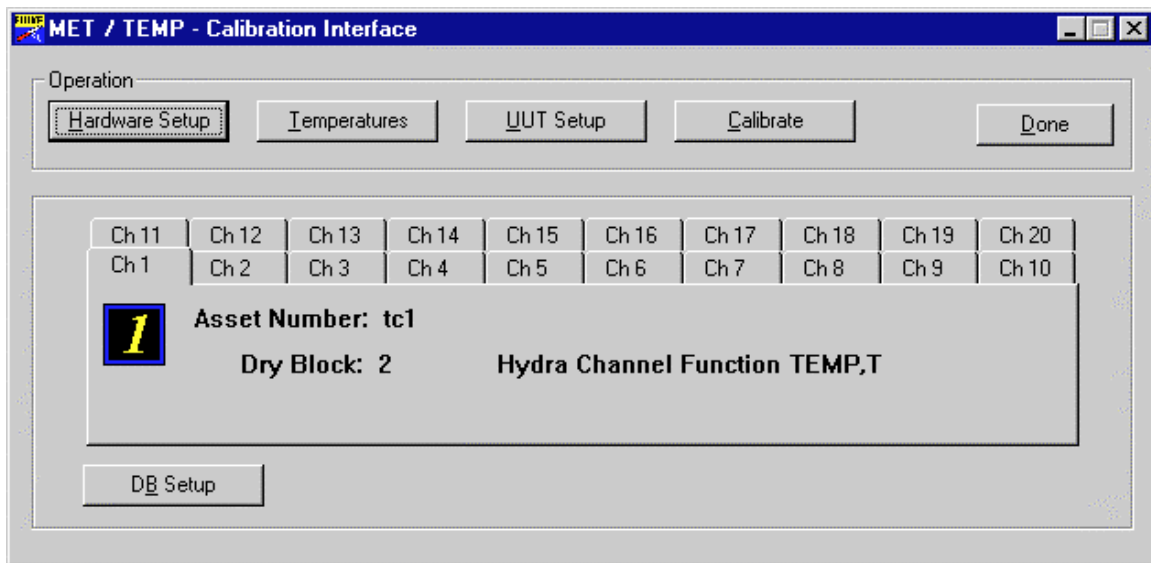
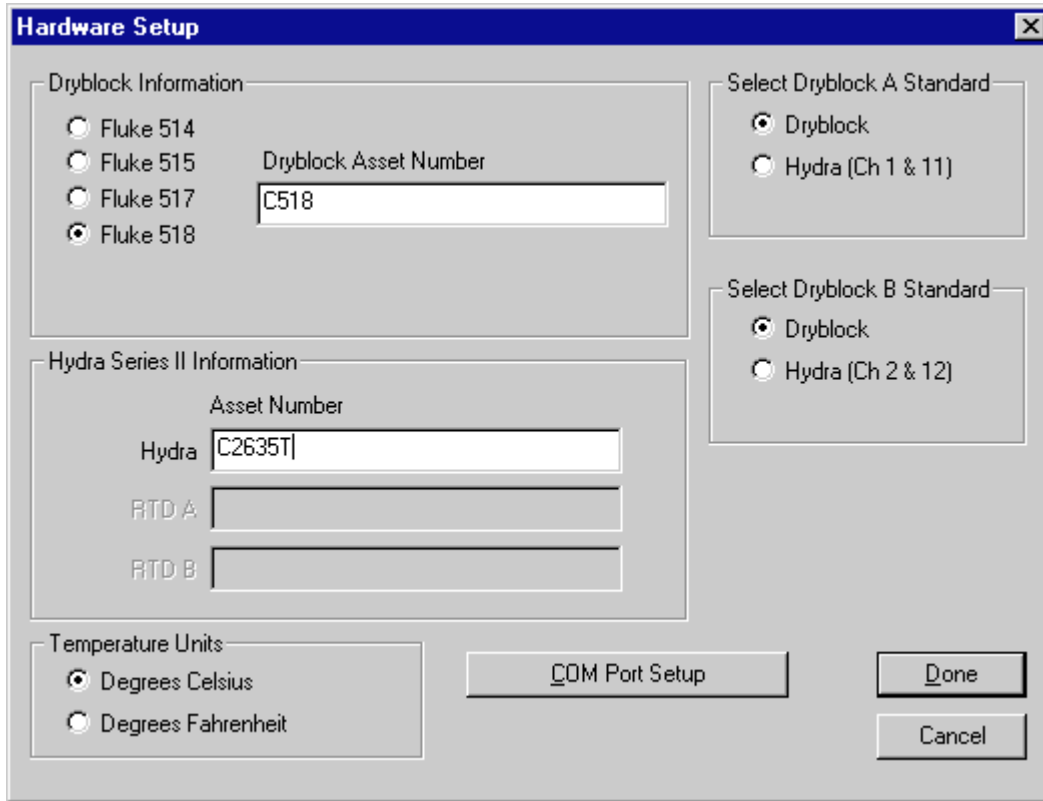


Figure 1. Main Dialog

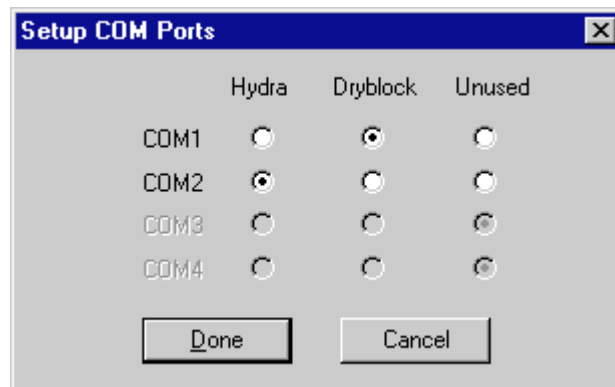
1. Select **DB Setup**. Enable or disable database mode. Enable will only work if you have MET/BASE installed.
2. Select the **Hardware Setup** feature. The following setup dialog appears:



afp02s.bmp

Figure 2. Setup Dialog

- a. Enter the Dry-Block you are using and enter the asset number.
- b. Enter the Hydra Series II asset number.
- c. Select whether the reference standard is Dry-Block or Hydra PRT / SPRT.
3. From the setup dialog box, select **COMM Port Setup**. At the following dialog box, indicate which ports to use with the Dry-Block and the Hydra.



afp03s.bmp

Figure 3. Set Up COMM Ports

4. Click **OK**.

Note

When selecting a com port to communicate with either a Hydra or Dryblock, the appropriate port settings for the instrument are selected by the program and cannot be changed by the user. For the Hydra, the port settings used are 9600, 8, N, 1, XON/XOFF. For the Dryblock, the settings used are 2400, 8, N, 1, NO HANDSHAKE.

Section 4: Temperature Setup

From the main dialog, select **Temperatures**. The following dialog appears:

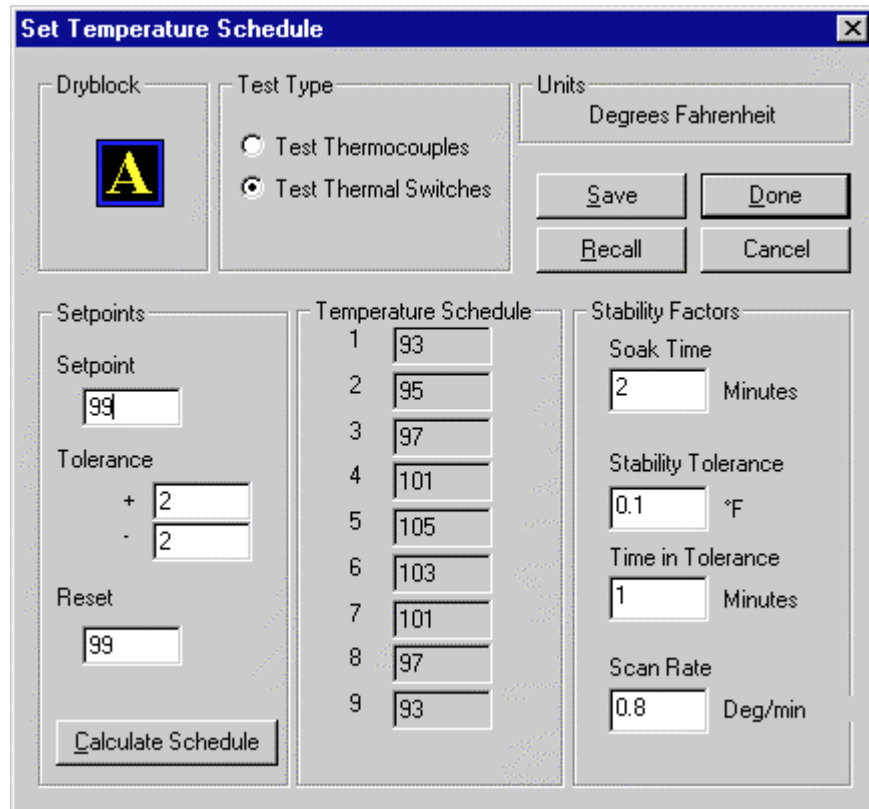
The dialog box 'Set Temperature Schedule' contains the following elements:

- Dryblock:** A button with a yellow '1' on a blue background.
- Test Type:** Two radio buttons: 'Test Thermocouples' (selected) and 'Test Thermal Switches'.
- Units:** A dropdown menu showing 'Degrees Celsius'.
- Temperature Schedule:** A grid of 15 numbered input fields. Fields 1-6 contain the values 100, 160, 220, 280, 340, and 400 respectively. Fields 7-15 are empty.
- Stability Factors:** Three input fields: 'Soak Time' (4 Minutes), 'Stability Tolerance' (0.1 °C), and 'Time in Tolerance' (1 Minutes).
- Buttons:** 'Save', 'Done', 'Recall', 'Cancel', and 'Calculate Schedule'.

Figure 4. Set Temperature Schedule

afp04s.bmp

1. Under Test Type, select **Test Thermocouples** or **Test Thermal Switches**.
2. To test thermocouples, enter the temperature test point schedule. You can have this calculated automatically by entering your low- and high-range figures and selecting **Calculate Schedule**.
3. To test thermal switches, enter setpoint and upper and lower tolerances. You can have this calculated automatically by entering your low- and high-range figures and selecting **Calculate Schedule**.



afp08s.bmp

Figure 5. Set Thermal Switch Schedule

4. Once your temperature schedule is set, select **Done**.

You may also recall old temperature schedules that you have saved using the **Recall** button, or save the current settings using the **Save** button if you plan to use the same temperature schedule in the future.

Section 5: UUT Setup

If the UUT or standard is already entered in your MET/BASE database, the prompts are similar to those described in the previous section for the standalone version.

From the main dialog box:

1. Select UUT setup.
2. Select the channels you are using.
3. Select the appropriate Hydra function for each channel.
4. Select **Edit Asset List**.
5. Select **Channel In Use**.
6. Enter the asset number of the UUT to be calibrated on this channel.
7. Select the next appropriate channel number and repeat steps 2 and 3.

If the UUT is not a current asset in the database, the software prompts you to enter data for each required field in the inventory record of the database. Prompts also direct you to enter required data for the calibration table in order to save the completed calibration record.

Section 6: Performing Calibrations

Once you have performed the input necessary to set up a calibration event, return to the main dialog and do the following:

1. From the main dialog, select **Calibrate**.
2. At the next screen, confirm your calibration setup.

Note

*You cannot make changes here. If an item is incorrect, select **Cancel** and make necessary changes in the main dialog.*

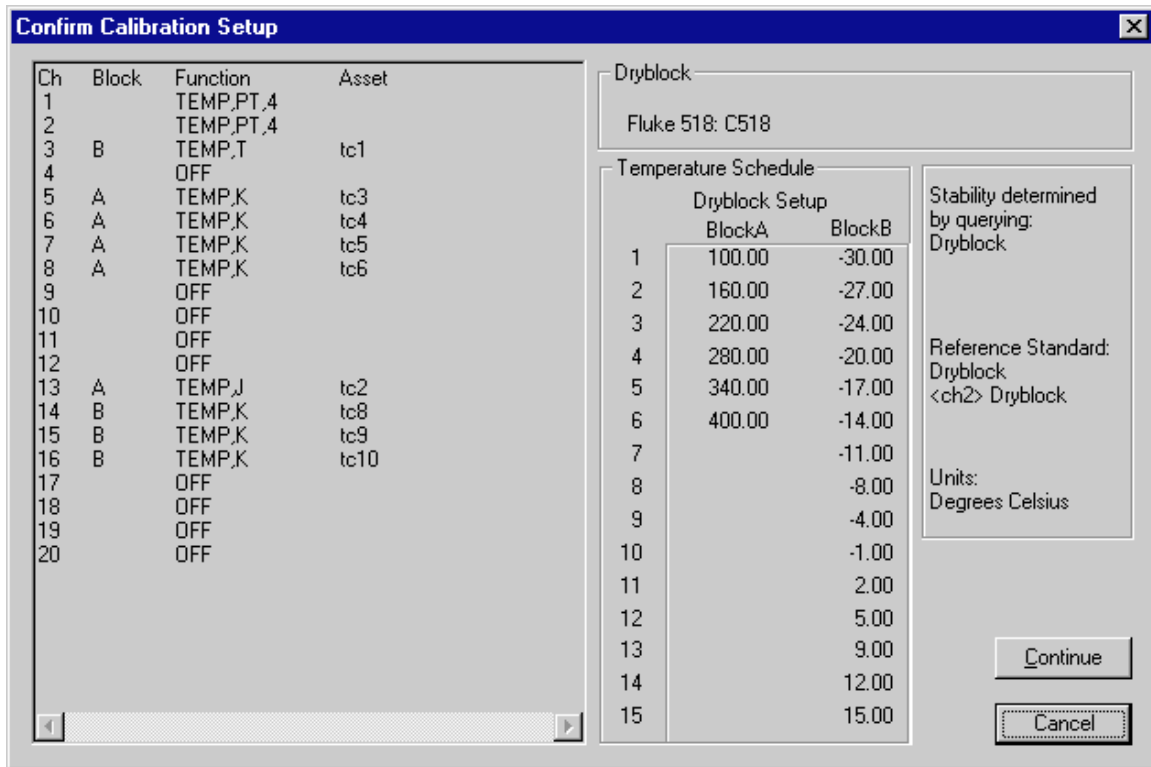


Figure 6. Confirm Calibration Setup

afp05s.bmp

If you wish to stop the calibration before it is complete, select **Interrupt Calibration** in the main dialog box.

During the calibration, a graph on the dialog displays the calibration event in progress. It only displays a scrolling window for up to 1 ½ hours of time.

Other Calibration Functions

The **Save Settings** button allows you to save the Hydra set-up, switch schedule, or thermocouple schedule information to a file.

The **Recall Settings** button produces a dialog that allows you to recall previously saved asset data.

The **Clear Settings** button clears all the asset information from the current event

Use the **Done** button to close the application after the calibration is complete. This button is disabled while a calibration is in progress.

Section 7: Post-Calibration Procedures

Once the calibration is complete, you have the option of saving the data. You can save data to a standard, comma-separated value file if you are running MET/TEMP Software as a standalone product, or a postrun dialog if you are in database mode.

Post Run in MET/BASE Database

The post run dialog appears as follows. The UUT list is a multiple selection. The reports list is a single selection.

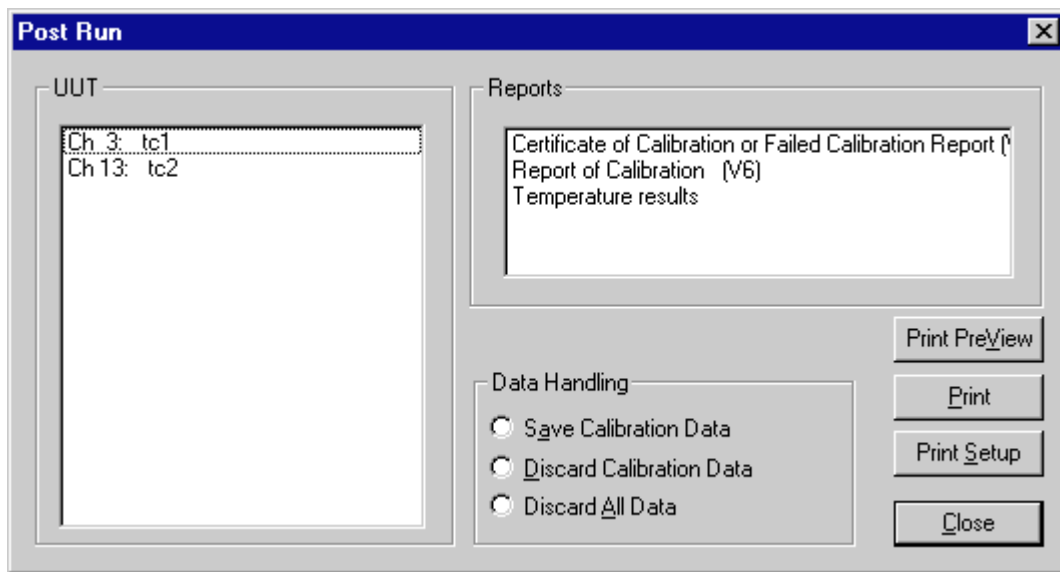


Figure 7. Post Run Dialog

afp07s.bmp

Post Run in the Standalone Version

In the standalone version of MET/TEMP Software, a standard file save dialog displays at the end of the temperature schedule execution.

Data Storage

Standalone Operation

When MET/CAL is used in standalone mode (DB disabled), calibration data files are stored after each calibration. These files are automatically stored in a folder on your hard drive, C: Metcal/station. These files are named with the date and time of initial calibration (e.g. mt0A_20001123_1213.csv). A sample of a CSV data file from a calibration is shown below:

Test Point	UUT 1	±UUT 1 Acc	±UUT 1 Tolerance	UUT 1 Error	Actual °C	Setpoint
1	-0.53	0.51	0	-0.55	0.02	0
2	24.89	0.51	0	-0.1	24.99	25
3	50.18	0.51	0	0.2	49.98	50
4	75.42	0.51	0	0.44	74.98	75
5	100.66	0.51	0	0.69	99.97	100

Or, for a thermocouple reading in mV or ohms:

Test	Setpt	Ref Std	Std Acc	UUT Obs(Unit)	Unc ±(Unit)
1	30.00	30.01	0.46	30.1040	0.09
2	50.00	50.00	0.46	249.9932	0.01
3	70.00	69.99	0.46	1469.9723	0.02

Database Mode

When using MET/CAL with the DB mode enabled, data are placed directly into the associated MET/BASE asset file by the data engine, in addition to information regarding the standards used to calibrate the UUT.

The formatted data is stored in the calresults table field C2501. Calresults field C2501 will include column header information so that information need not be written on any report using this table.

The data placed in C2501 uses the following format for thermocouples:

Test	Setpt	Ref Std	UUT Obs	Acc	Tol	Err
1	__30.00	__30.01	__30.10	0.46	_2.20	+0.09
2	__50.00	__50.00	__49.99	0.46	_2.20	-0.01
3	__70.00	__69.99	__69.97	0.46	_2.20	-0.02

The data placed in C2501 uses the following format for thermocouples if the output is in ohms:

Test	Setpt	Ref Std	Std Acc	UUT Obs(Unit)	Unc ±(Unit)
1	30.00	30.01	0.46	30.1040	0.09
2	50.00	50.00	0.46	249.9932	0.01
3	70.00	69.99	0.46	1469.9723	0.02

The data placed in C2501 uses the following format for thermostats:

Test	Unit	Cond	Nominal/Tol+/-	Observed	Acc	Err
Reset Cond		CLOSED				
Setpoint	Cels	OPEN	__30.00/+_1.00/_-0.50	__30.01	0.46	_0.01
Reset Point	Cels	CLOSED	__28.50	__28.60	0.46	_0.10
Deadband	Cels			1.41		

For releases through 6.11, the formatted lines are not configurable.

Measurement Uncertainty

In database mode, measurement uncertainty is calculated for each measurement. The following components are included:

- Uncertainty of the reference standard: Uses the published accuracy of the standard normalized to one standard deviation using a NORMAL distribution. Standard accuracies are stored in the file HYDACC._SD.
- Uncertainty associated with the resolution of the UUT: Uses the accuracy of smallest meaningful displayed digit normalized using a rectangular distribution..
- Uncertainty associated with measurement repeatability: Takes a specified number of measurements and calculates the standard deviation. It then applies students if desired.

Once the uncertainty components are calculated, they are combined using the square root of the sum of the squares. The uncertainties are assumed that the measurement uncertainties associated in this calculation are not correlated.

Section 8: Backup for MET/TEMP Software

For backup procedures, see Chapter 2 in the *Metrology Software Users Manual*.

Section 9: Contacting MET/SUPPORT

About the MET/SUPPORT Program

Fluke Metrology Software is supported by a highly skilled and conscientious team of professionals who are available to answer questions, help solve unique problems, and assist in troubleshooting in the event you run into difficulties.

Telephone Support

Telephone support is available, but only to registered users of Fluke software. Be sure to register your software as soon as possible so you can make use of this service should the need arise.

Within the United States, toll free telephone support is available from 8:00 AM to 4:30 PM, Pacific Standard Time.

Phone: 1-800-825-7411

Mail, FAX, E-Mail and World Wide Web

You may also contact us by mail, E-Mail, FAX, or by visiting the Fluke World Wide Web site.

FLUKE Corporation	Phone	1-425-446-5350
PO Box 9090	FAX	1-425-446-5992
Everett, WA 98206-9090	E-Mail	metsupport@fluke.com
Attention: MET/SUPPORT, MS 275G	WWW	http://www.fluke.com

Before Calling Technical Support

You may be able to discover the answer for yourself, so take the following steps before calling for support:

- Check the manual
- Check the MET/CAL online help
- Check the Fluke World Wide Web site

Please Have the Following Information Available

If you do find it necessary to call for assistance, take a few moments to jot down some information. If this information is readily available, the support person can more quickly get to the exact details of the difficulty you are having, and will be able to resolve the issue more efficiently.

- Product name, applicable licenses, version and serial numbers
- Manual title, part number and version
- Operating system and version
- Network information if applicable
- List of steps necessary to recreate the problem
- Contents of autoexec.bat and config.sys files if applicable
- Version of Crystal Reports

International Support

For more information on international MET/SUPPORT™, please contact the Fluke office nearest you or your local representative.

Location	Telephone	Fax
Fluke Canada	905-890-7600	905-890-6866
Fluke China	86-10-6 512-3435	86-10-6 516-3437
Fluke Europe UK	44 1603 256625	44 1603 256688
Fluke Japan	81-3-3434-0181	81-3-3434-0170
Fluke Singapore	65-276-5565	65-738-9949

