Instruction Manual

Temp-360

RTD Data logging Thermometer

OAKTON®

Part of Thermo Fisher Scientific

ISO 9001 SUPPLIER CERTIFIED

68X526601 Rev 2 06/10

TABLE OF CONTENTS

1. INTRODUCTION

This versatile hand-held instrument provides highly accurate temperature measurements. The instrument is designed for easy operation and includes the following features:

- Menu driven setup and operation
- Data logging for up to 2000 points
- USB output
- Operator selection of Celsius or Fahrenheit scale
- Resolution of up to 0.01°C/ °F
- Large backlit LCD and dot-matrix graphic LCD display
- Hold feature for temporarily retain a reading
- Displays minimum, maximum and average readings
- Field calibration capability
- Disabling of Auto-Off function
- Low battery warning
- Three-pin Din connector input
- Operates with a wide selection of probes

2. SAFETY PRECAUTIONS

WARNING:

1. This instrument is designed to accept low level signals supplied by standard RTDs. Under NO circumstances should the input voltage exceed the specified 50V RMS.
2. To prevent ignition of a hazardous atmosphere, batteries must only be changed in an area known to be non-hazardous.

CAUTION:

1. Do not use or store this instrument in microwave ovens or any abnormally hot or cold areas.
2. Weak batteries should not be left in the instrument. Dead batteries can leak and cause damage to unit.

DANGER:

1. Voltages present at the RTD may also be present at the battery terminals. Always disconnect the RTD when changing batteries.

3. SPECIFICATIONS

RTD Thermometers

Temperature Range:
-201 to 1210°C (-330 to 2210°F)

Out of range display:
- - - -

Resolution:
0.1 °C/°F: From -330.0 to -100 °C/°F
0.01 °C/°F: From -99.99 to 99.99 °C/°F
0.1 °C/°F: From 100.0 to 999.9 °C/°F
1 °C/°F: Above 1000 °C/°F

Accuracy:
±0.1 °C/ ±0.2 °F:
From -330.0 to -100 °C/°F
±0.03 °C/±0.06 °F:
From -99.99 to 99.99 °C/°F
±0.1 °C/ ±0.2 °F:
From 100.0 to 999.9 °C/°F
±1 °C/ ±2 °F: Above 1000 °C/°F

Display:
Backlit Dot-matrix 50mm X 37.2mm

Data Logging:
2000 points

Logging Interval:
2 sec to 60 min

Min/Max/Avg Function:
Yes

Auto Off (Adjustable Time):
Enable/Disable option available

Stability Criteria:
Yes, upon stability of 5 seconds

Display Update Rate:
0.5 sec per update

Input:
One three-pin DIN connector

Input Protection:
50V rms

Storage:
– 40°C to 65°C (– 40°F to 149°F)

Humidity:
10% to 90% (non-condensing)

Battery Life:
Size: Three AA, 1.5V; Alkaline
Life: 400 hours continuous, typical, (without backlighting and buzzer on)

Dimensions:
Without Armor:
175mm (L) X 97mm (W) X 42mm (H)
With Armor:
180mm (L) X 102mm (W) X 52mm (H)

Weight with Batteries:
Without Armor: 267g
With Armor: 362g

Ingress Protection:
Meets IEC-529 IP-54 for dust and water resistant enclosures (with probe attached)

CE Compliance:
EN61326-1/A1: 1998
(EU EMC Directive)

4. BATTERY INSTALLATION AND REPLACEMENT

The total battery life without backlighting is about 400 hours. Remaining battery power is indicated by the battery life indicator.

Indicator	Voltage
 Cell + 3 bars	More than 4.1 V
 Cell + 2 bars	More than 3.6 V
 Cell + 1 bars	More than 3.0 V
 Cell + empty bars flashing	More than 2.85 V
 Adaptor power supply	Main power supply connected
USB power supply	USB power

Selected settings are stored in memory and will remain in memory even after power is turned off, or while batteries are being replaced.

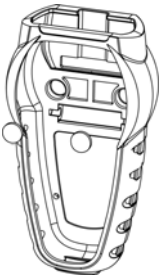
1. Before changing battery, turn instrument off and disconnect RTD.
2. Loosen screw and lift battery cover off back of case.
3. Remove the three AA batteries.
4. Insert three new batteries observing polarity.
5. Install cover and tighten screw.

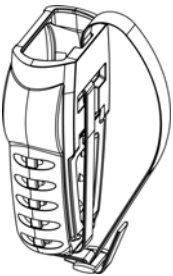
5. INSERTING AND REMOVING OPTIONAL RUBBER ARMOUR

1. To insert thermometer into the optional rubber armor, slide in from the top of meter before pushing the bottom edges of meter down to set it into position. Lift up the stand at the back of meter for bench top applications if necessary.
2. To remove thermometer from armor, push out from the bottom edges of meter until it is completely out of boot.

6. ASSEMBLING OPTIONAL HANDSFREE ACCESSORIES

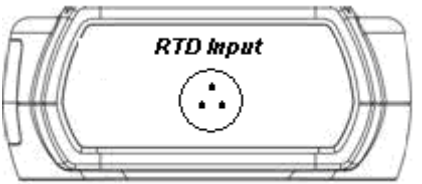
You can use the optional magnets and strap in the Handsfree Kit accessories for hands free operations.





7. CONNECTING A RTD

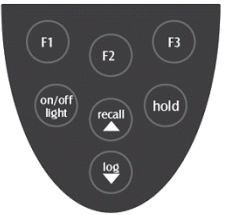
Use the correct 100 Ω RTD (alpha = 0.003850) for your instrument. Using an incorrect probe type will result in erroneous readings. Insert the 3-pin plug into the mating connector on the top of the instrument.



If no probe is connected the display will read “open”.

RTDs are sensitive at the tip or sensing element. When taking measurements, allow time for the reading to stabilize. Multiplying the time constant of the probe by 5 will give you the approximate time required.

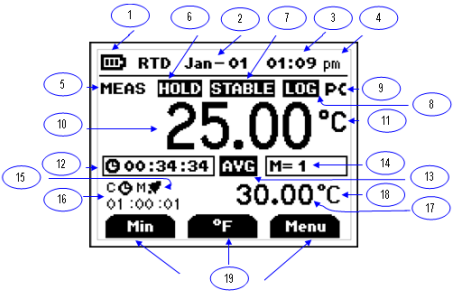
8. KEY FUNCTIONS



F1	Step through Min, Max and Avg readings
F2	Toggle between F and C display
F3	Toggle between menu and measure mode
hold	Freeze display
on/off light	Turns meter on and off (press and hold for 3 seconds to turn off) Press momentarily to turn on backlight
recall▲	Recalls and steps through stored readings
log▼	Stores current measured value to memory

Note: Function keys change in setup mode to provide advanced operation flexibility. Text above key will indicate function.

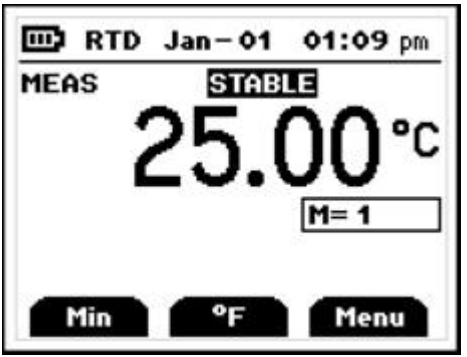
9. DISPLAY OVERVIEW



The dot matrix display features a large primary display, smaller secondary displays for channel info or min/max/ave, and helpful annuciators for added measurement data.

1	Power supply indicator (Battery/Main adaptor/USB)
2	Date (format of mm – dd)
3	Time (hour:min)
4	Time format (am/pm/hrs)
5	Measurement mode
6	Hold function indicator
7	Stable indicator
8	Data logging indicator
9	PC data logging indicator
10	Main reading display
11	Current reading unit indicator
12	Min/Max/Avg elapsed time
13	Current Min/Max/Avg reading indicator
14	Meter logging memory location
15	Measurement alarm active indicator
16	Countdown time indicator with countdown time
17	Min/Max/Avg display
18	Min/Max/Avg unit indicator
19	Function keys

10. MEASUREMENT MODE



On initial start-up the meter will display the measured value in the primary display.

Pressing the **F2** key will toggle reading between F and C display.

Pressing the **F1** key initiates and toggles through the Minimum, Maximum, and Average Reading modes.

Pressing the **F3** key accesses the Setup mode.

11. HOLD FUNCTION

Press the **hold** key to retain the reading on the display. Press the **hold** key again for normal operation.

12. MIN, MAX, AND AVE FUNCTION

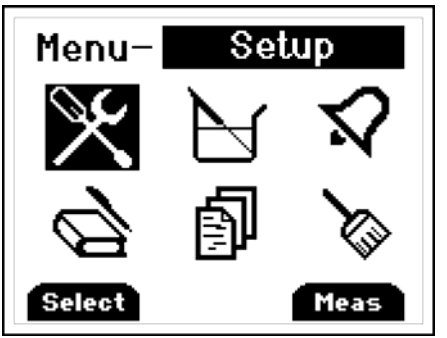
Press the **F1** key to toggle between the minimum, maximum, and average readings. The minimum and maximum reading function is ideal for monitoring unattended operations while continually displaying every temperature change that occurs. The minimum and maximum values are sensed and automatically stored.
To exit and clear this function, press the **F3** key to access the Menu functions. See the CLEAR/RESET SCREEN section for more details.

13. DATA LOGGING

Press the **log** ▼ key to store the current reading to memory. The memory indicator M = 1234 shows the memory location for the next stored reading. Press the **recall** ▲ key to review stored readings.
See the DATA LOGGING section for timed logging, and logging to a computer. See the CLEAR/RESET SCREEN section for information on clearing stored readings.

14. SETUP MODE

To access the setup mode from measurement mode press the “Menu” key (**F3**).



Press the ▲▼ keys on the meter key pad to scroll through options.

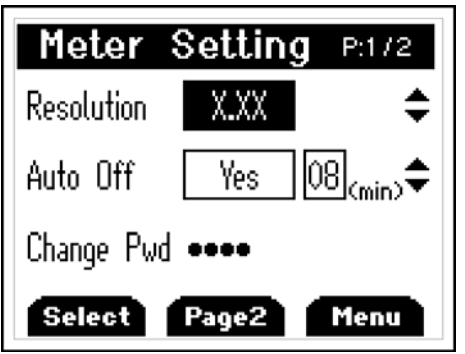
To enter a setup screen press the “Select” key **(F1)**.

To return to the measurement mode press the “Meas” key **(F3)**. The following menu options are listed:

1. General setup
2. User field calibration
3. Alarm settings
4. Data logging settings
5. View user calibration report
6. Clear/Reset options

15. GENERAL SETUP SCREEN

The first page of the General Setup screens let you set resolution, auto-off time, and password.



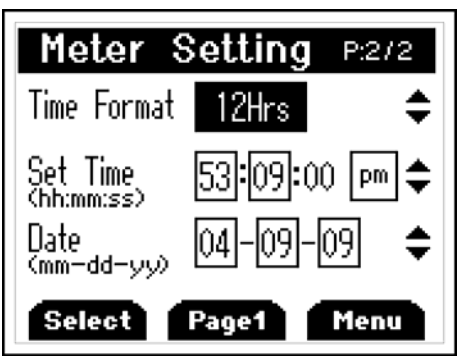
Press the **F1** key to indicate that you want to change the setting of the current parameter or press the **recall** ▲ key or **log**▼ key to move to the next parameter.

Press the **recall** ▲ key or **log** ▼ key to change the options.

Press the **F2** key to choose the next setting. When the option is set, press the **F1** key to accept the choice.

The screen below is used to reset/change the password. If the user forgets the password, 5586 can be used to reset to a new value.

On the second screen you can set the time and date.



16. CALIBRATION SCREEN

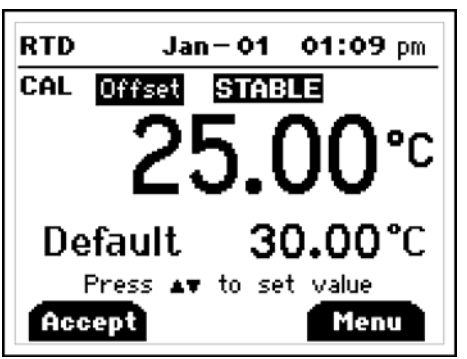
The thermometer is factory calibrated and does not require calibration before use. The Calibration function allows a single point calibration of the thermometer, at any temperature point, to compensate for RTD offset error. It is NOT necessary to perform a field calibration to obtain the specified meter accuracy. Use the field calibration feature to improve thermometer/probe accuracy or to compensate for RTD drift.

Before going into the Calibration mode, the user must enter the password. Press the **F2** key to change to the next digit. (Default Password is 9900)

There are two calibration options:

Offset – adjusts at a single point. Offset calibration can be performed at any temperature in the offset range of ±10.00 °C or ±18.00 °F.

Slope – adjusts at two points. The two calibration points must be at least 40.00 °C (72.00 °F) apart. The second calibration point should be at a higher value than the first calibration point.

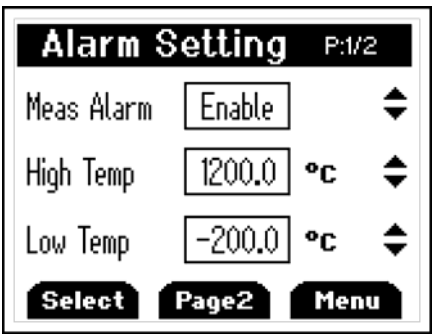


Press the ▲ or ▼ key to adjust the value to match a known temperature standard. Press the **F1** key to accept.

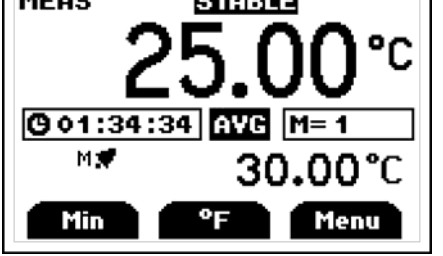
17. ALARMS SCREEN

There are two kinds of alarm settings available in the alarm setting options:

MEASUREMENT ALARM

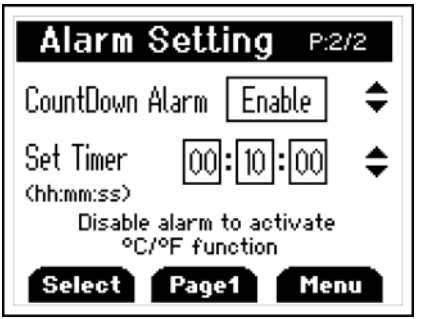


Disable or enable the alarm by pressing the **recall** ▲ or **log** ▼ key and the **F1** key to accept. Increase or decrease the individual limit by pressing the **recall** ▲ or **log** ▼ key.



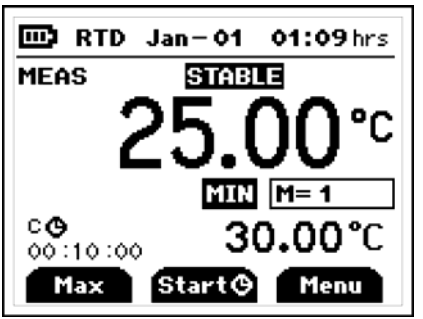
Meter in alarm mode

COUNTDOWN ALARM

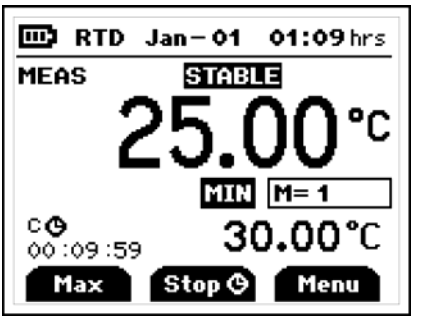


You can enable/disable the countdown alarm and set the countdown time from 5 seconds to 1 hour.

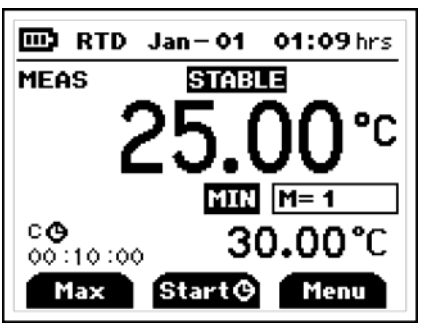
After setting (enabling) the countdown alarm, the measurement screen will look like this:



Press the **F2** key to start the countdown:



Press the **F2** key in the middle of a countdown to stop the process:

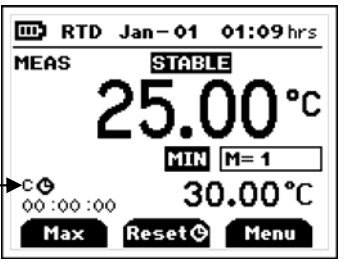


Restart the countdown by pressing the "Start" key (**F2**).

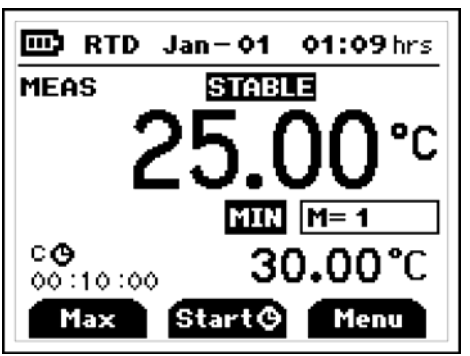
Alternatively, press the "Menu" key (**F3**) to go into the timer menu and disable the alarm.

The buzzer will sound for 30 seconds or until the “Reset” key (**F2**) is pressed at the end of the countdown.

Flashing icon indicates that the countdown has expired



To reset the timer, press the “Reset” key (**F2**). The display will look like this:



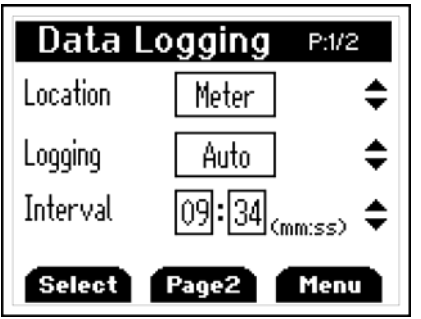
To repeat functions, press the **F2** key.

Note: The °C/ °F function is disabled when the countdown function is enabled. To activate the °C/ °F function on the measurement screen, see the COUNTDOWN ALARM

section and disable the countdown alarm function.

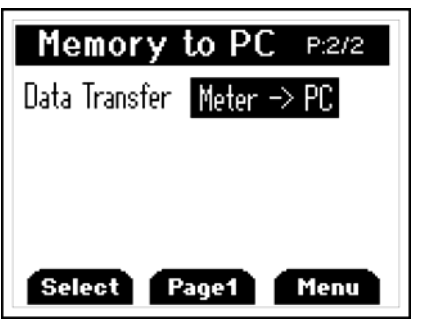
When activated, the countdown timer temporarily overrides the auto-off function until the countdown is completed or manually stopped. If the meter is manually or automatically shut off, the countdown alarm is automatically set to “Disable” each time the meter is shut off. The “Timer” key will revert back to the “°C/°F” key.

18. DATA LOGGING SCREEN



Press the **recall** ▲ key or **log** ▼ key to choose the logging methods as auto or manual. If auto logging is selected, use the **recall** ▲ key or **log** ▼ key to set the time interval. Its range is from 2 minutes to 60 minutes.

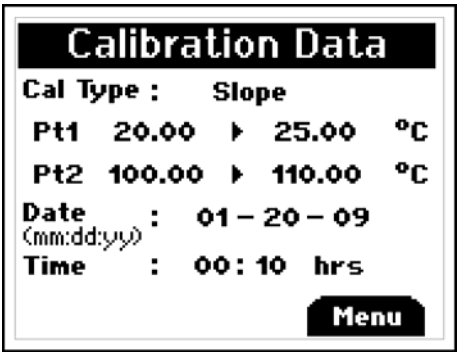
DATA TRANSFER FROM METER TO COMPUTER



Once the USB connection is established with a PC, press the “Select” key (**F1**) to download data from Meter to PC using HyperTerminal.

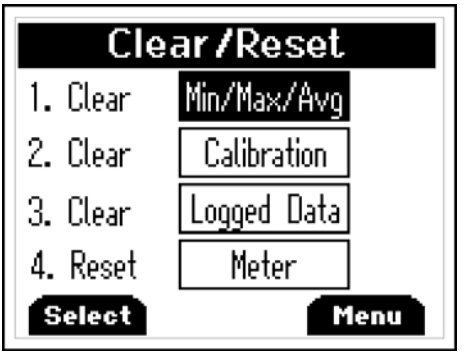
*****NOTE: METER MUST BE TURNED ON PRIOR TO CONNECTING USB CABLE OR COMPUTER MAY NOT RECOGNIZE THE INSTRUMENT*****

19. CALIBRATION REPORT SCREEN



The calibration report will show the time and date along with results of the last user calibration.

20. CLEAR / RESET SCREEN



Press the **F1** key to select the data you want to clear or reset. For calibration, logged data and reset all, you will have to enter the password to proceed. (Default Password is 9900)

21. MAINTENANCE

Properly used, the thermometer should maintain calibration indefinitely and not require service other than occasional cleaning of the housing and changing of the batteries.

22. CLEANING

WARNING:
TO PREVENT IGNITION OF A HAZARDOUS ATMOSPHERE BY ELECTROSTATIC DISCHARGE, CLEAN WITH DAMP CLOTH.

Do not clean with abrasives or solvents. Use mild detergents, never immerse nor use excessive fluid.

23. BATTERIES

If there is no display when the thermometer is turned on, check the condition of the three AA batteries. Also check that the battery terminals are clean and batteries are properly installed. If replacement is necessary, refer to the BATTERY INSTALLATION AND REPLACEMENT section for the replacement procedure.

24. TROUBLESHOOTING

The following chart lists the most probable faults. There are no internal adjustments or user-replaceable parts.

FAULT	ACTION
NO Display	Check condition of batteries. Check that batteries are inserted properly.
Display shows OVER / UNDER	Out of range indication
Display Shows OPEN	No RTD connected in the connector
Display Shows Err	If display shows this message other than during the field calibration mode, please return the instrument for servicing
Cannot connect to PC	Ensure that the meter is powered on and measuring prior to connecting to USB port. Before and after the driver is installed, your PC may not recognize the Temp-360 if the Temp-360 is not powered on prior to connecting the USB to the computer.

25. ACCESSORIES

Replacement Meters and Meter Accessories

Item	Part Number
Temp 360 Thermometer	35426-60
Rubber Armour with Stand	35427-80
Handsfree Kit (Two Magnets and a Strap)	35427-85
General Purpose Probe (immersion into liquids)	08117-70
Penetration Probe (meat, semi-soft materials)	08117-85
Surface Probe (direct contact on hot surfaces)	08117-78
Air/gas Probe	08117-90

26. WARRANTY

The Manufacturer warrants this product to be free from significant deviations from published specifications for a period of **three** years. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

27. PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the instrument carefully and insure it against possible damage or loss. The Manufacturer will not be responsible for damage resulting from careless or insufficient packing.

28. INNOCAL® CALIBRATION AND REPAIR SERVICES

Optimum performance of your temperature-measuring instrument is not a timeless condition. To ensure quality measurements, have your instrument calibrated regularly. Trust InnoCal® to satisfy your calibration and equipment repair needs. With over a decade of service, we've helped thousands of customers meet ISO, FDA, EPA, GLPs/cGMPs and other quality standards.

Conformity*
ISO/IEC 17025:2005 accredited
NIST Handbook 150, 2000 Edition
ANSI/NCSL Z540-2-1997
NIST Technical Note 1297
ISO 9000:2000

Fast Service
Our substantial inventory of replacement parts ensures a fast turnaround and prevents costly downtime. Most instruments serviced in five business days!

Excellent Value
Get quality at a fair price. Our InnoCal® NIST-traceable certificates offer extensive test data on a broad range of measurement parameters without breaking the bank!

Reliable Support
Trust in our free diagnostic support and troubleshooting advice. Our factory-trained metrologists and technicians have years of experience and extensive technical data.

Convenient Reminders
It's so easy to keep your instruments functioning properly. Based on your requirements, InnoCal will send you a reminder when it's time to re-certify or service your instrument.

We provide you with the documentation you need to meet your most stringent quality requirements for the control of inspection, measuring, and test equipment.

Certification includes certificate of calibration with test data, including:

- description and identification of the item certified
- condition of the item
- issue date
- identification of calibration procedure
- calibration date
- as found/as left test data (where applicable)
- signature of technician
- statement of estimated uncertainty
- list of equipment used to perform calibration (including their calibration dates)

With today's high quality standards such as ISO 9000, certification is becoming increasingly important. Traceability is not a timeless condition. It must be verified and maintained over the life of the calibration to ensure the highest accuracy possible. When you have your calibration done by InnoCal, we will send you an automatic reminder when it is time to recalibrate your instrument.

Are your calibration certificates good enough?
InnoCal surpasses the competition by providing the most complete certificates as required by NIST. All of our certificates include measured data and point-by-point measurement uncertainty, and by request, we'll provide test accuracy and test uncertainty ratios at no extra cost. Call us today and see why InnoCal is The Choice of Quality.

*See our Scope of Accreditation for any limitations.

Calibration test points against NIST-traceable standards	Meter only	Probe only	System (meter + probe)*
Four test points across range of instrument. 0, 100, 165, 230 C (-4, 32, 446, 770F)	17000-04	17001-04	17002-04

InnoCal—The Choice of Quality
1-866-InnoCal (1-866-466-6225)
InnoCalSolutions.com

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

For more information on OAKTON Instruments Products, please contact your nearest distributor or visit our web site listed below:

Oakton Instruments
625 E Bunker Court
Vernon Hills, IL 60061
USA
Tel: (1) 888-462-5866
Fax: (1) 847-247-2984
info@4oakton.com
www.4oakton.com

Distributed by: