

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES PRECISION THERMOMETER

PRECISION PRODUCTS MANUFACTURED AND DISTRIBUTED BY ALPHA TECHNICS:

4600 SERIES NIST TRACEABLE THERMOMETERS:

-40°C to +150°C range; accuracies up to 0.015°C; accepts Alpha Technics and YSI standard probes, and Alpha Technics interchangeable and wireless probes; functions/features include: RS-232 data interface and optional PC software, Delta T, Store, Min/Max, Hold, °C/°F selection, and more

4400 SERIES NIST TRACEABLE THERMOMETERS:

-20°C to +130°C range; accuracies up to 0.015°C; accepts Alpha Technics' and YSI probes; "HOLD" AND °C/°F functions

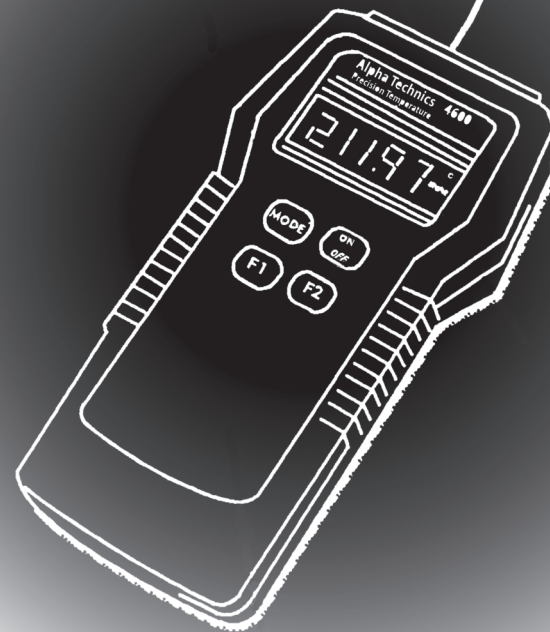
4300 SERIES NIST TRACEABLE THERMOMETERS:

Temperature range: 8°C (in customer specified ranges); accuracies up to 0.015°C; permanently attached Alpha Technics and other's probes

OEM AND OTHER PRODUCTS AVAILABLE:

Multi-channel high-accuracy PC data loggers
THERMAL VIEW software for data logging
Interchangeable and wireless probes
Stock and custom probes
Surface thermometer
Computer systems
Custom software
and more

For more information:
Sales: (800) 893-4224
OEM: (800) 893-4225



OPERATOR'S
MANUAL

THE ULTRA-HIGH ACCURACY EXPERTS

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

About...

ALPHA TECHNICS PRECISION TEMPERATURE

Founded in 1968, Alpha Technics Precision Temperature has become a recognized leader in the precision hand-held thermometer field. For many years we have designed and manufactured, in high volume, precision temperature products for specialized O.E.M. customers who need thermometers with high accuracy, durability, dependability, and affordability. With this experience, we are now able to bring high accuracy thermometers to the commercial marketplace.

The Model 4440 and 4600 thermometers, and other products, are the result of technological breakthroughs, years of design and manufacturing experience, and good old fashion hard work. We pride ourselves on our research and development programs. These on-going experiments and programs allow us to internally generate the cutting edge technology and processes which makes precision hand-held thermometry possible.

When you need a cost-effective source for high-quality products, talk with us and find out how we can assist in your success. Our award-winning engineering and production teams are here to help with your specialized needs.

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

- G L O S S A R Y -

ACCURACY: The degree of absolute conformity to a standard.

NIST: National Institute of Standards and Technology

PRECISION: The accuracy with which a number can be represented; sharply defined; conforming to a pattern; tolerance

REPEATABILITY: The ability of a probe or instrument to give the same output or reading under repeated identical conditions.

RESOLUTION: The least significant digits shown on a digital display.

RS-232: A standard computer interface protocol.

SENSOR SELF-HEATING: The internal heat generated in the sensor by passing a current through the sensor to measure its resistance.

TEMPERATURE STANDARD: An instrument whose calibration is directly traceable to the NIST.

STABILITY: The ability of a device to maintain a constant output with the application of a constant input.

SYSTEM ACCURACY: The total accuracy of the probe plus the accuracy of the thermometer.

SYSTEM CALIBRATION: Calibration of a thermometer and probe combination.

THERMISTOR: A temperature sensing element composed of semiconductor material whose resistance varies greatly, in a known manner, with the change of temperature. (The 4600 uses negative temperature coefficient thermistors - as temperature increases, resistance decreases).

P/N 139225 REV. A

28

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES THERMOMETER

- ACCESSORIES - (continued)

PROBES:

ALPHA TECHNICS 1400 SERIES PROBES for Model 4400-2 & 4600-2 Thermometers

EUT1401	0.030" Stainless Steel Needle Probe
EUT1402	7.5" Stainless Steel Probe 3/16" Dia.
EUT1403	1/8" Dia. Stainless Steel 1/4"-18 Threaded
EUT1404	Stainless Steel Spring Surface Probe
EUT1405	0.200" Dia. Surface Probe, "Pencil Style"
EUT1406	Small Epoxy Probe
EUT1407	0.285" Aluminum Thermal Cycler Probe*
EUT1408	0.260" Aluminum Cylindrical Probe**

*Conical shape; dry measurement (no oil needed)

**For mercury thermometer replacement

ALPHA TECHNICS 2400 SERIES PROBES for Model 4400-1 & 4600-1 Thermometers (Compatible with YSI 400 Series probes)

EUT2401	Vinyl Tip General-Purpose Probe
EUT2402	Small Vinyl Tip General-Purpose Probe
EUT2404	Glass Tubular Probe
EUT2406	Stainless Steel Tubular Probe
EUT2410	Tubular Probe with NPT Fitting
EUT2416	Autoclavable Tubular Probe
EUT2418	Pointed Tubular Probe
EUT2408	Banjo Surface Probe
EUT2409A	High-Temperature Surface Probe
EUT2309B	Surface Probe
EUT2421	Autoclavable Surface Probe
EUT2427	Small Surface Probe
EUT2405	Air/Gas Probe
EUT2441	Airway Probe
EUT2451	1mm Flexible General-Purpose

4600 SERIES THERMOMETER

- TABLE OF CONTENTS -

INTRODUCTION	1
OPERATING INSTRUCTIONS.....	3
RS-232 INTERFACE.....	11
THERMAL VIEW SOFTWARE	12
BATTERY REPLACEMENT.....	13
CARE AND CLEANING	14
RECALIBRATION	15
REPAIR	16
LIMITED WARRANTY	17
SPECIFICATIONS; 4600-1 & 4600S	18
SPECIFICATIONS; 4600-2	23
ACCESSORIES	26
ACCESSORIES: PROBES.....	27
GLOSSARY	

4600 SERIES THERMOMETER INSTRUCTION MANUAL

Copyright 1995 Eutechnics, Div. of Alpha Sensors

4 6 0 0 S E R I E S T H E R M O M E T E R

- INTRODUCTION -

FUNCTIONS & FEATURES

- Ø Ultra-High Accuracy (up to $\pm 0.015^{\circ}\text{C}$)
- Ø High Resolution (up to 0.00001°C with PC output)
- Ø Wide Range (-40°C to $+ 150^{\circ}\text{C}$)
- Ø Accepts YSI Series 400 thermistor probes
- Ø Hold, Min/Max, Delta T, Store, F/C functions
- Ø Auto Shut-Off (selectable auto/manual shut-off)
- Ø Over/Under Range Indication
- Ø Low Battery Indication
- Ø RS-232 with optional Software and Cable available
- Ø User-Friendly Key Pad
- Ø User-Assigned Special Functions
- Ø NIST Traceable

The Model 4600 Series are multi-purpose, economical, ultra-high accuracy high-resolution, hand-held digital thermometers which accept standard YSI Series 400 thermistor probes and other probes. A very high system accuracy can be achieved by calibrating a thermometer to a probe.

Along with HOLD, degrees F/C selection, MIN/MAX, STORE, DELTA T, and low battery indication features, the RS-232 port can also down-load data from the thermometer to a standard PC. Data can be manipulated and sent to other programs using the optional software package **Thermal View**.

Thoughtful design has resulted in a user-friendly enclosure and key pad format. All functions can be easily accessed through the MODE and FUNCTION keys. Functions are user-assigned to desired keys.

4 6 0 0 S E R I E S T H E R M O M E T E R

- ACCESSORIES -

EUT4650 Thermal View Software

See page 12 for details.

EUT4651 RS-232 Cable

10' cable to connect the 4600 to a PC.

EUT4652 Carrying Case

Space for the 4600 and a probe.

EUT4652D Deluxe Carrying Case

Space for the 4600, several probes, power supply, **Thermal View** software, Cal plugs, etc.

EUT4653 Calibration Plug Kit

Allows the user to field check the calibration of the 4600 at several temperatures.

EUT4654 Tripod

Screws into an insert on the back of the 4600 thermometer.

EUT4660 Power Cable Kit

Battery eliminator plug with 6-foot lead and instructions for connection to any 12VDC regulated power supply.

EUT4661-4663 US, UK, EURO Power Supplies

Eliminates the need for batteries when the 4600 is used in a lab, or when doing extended data logging.

4600 SERIES THERMOMETER

- NOTES -

25

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES THERMOMETER

- INTRODUCTION -

Large Probe Selection

The model 4600 accepts standard YSI Series 400 thermistor probes with phone jack termination. Alpha Technics high-accuracy probes are also available.

Computer Interface

An RS-232 computer interface allows the user to download information from the 4600 to their own PC to create reports and graphs. PC software, called **Thermal View**, is available.

"Friendly" Key Pad

A user-friendly KEY PAD allows the operator to program the most frequently used functions into the unit. The functions include: HOLD, MIN/MAX, F/C selection, STORE for recording readings, delta T for measuring the difference between a stored value and the current reading.

Big Display

Large .6" LCD numbers allows for easy viewing. All functions such as HOLD, STORE, Delta T, F/C, etc., are easily readable and logically arranged.

Battery Door

The 9 Volt Alkaline battery is easily accessible.

Low Noise Circuitry

Proprietary circuitry allows for very clean low noise signals. Even background electronic noise is substantially reduced. Self-heating, lead resistance, thermistor anomalies and other factors are corrected for, and taken into account.

2

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

- OPERATING INSTRUCTIONS -

1. Determine that a probe is connected to the unit.
2. Press the green colored rubber key marked "ON/OFF" to turn the unit ON. (Pressing this key again will turn the unit OFF.)

3 READOUT:

Display	Explanation
°C/°F symbols	Reading is displayed in degrees C or F
-40.00 to +150.00* (-40.00 to +299.98)	Actual temperature in degrees Celsius (Fahrenheit)
"LO"*	Temperature is below -40.00°C (-40.00°F) or a probe is not inserted
"HI"*	Temperature is above 150.00°C (299.98°F)
Flashing battery symbol	Battery needs replacement**

*Some versions of 4600 Series thermometers will have different temperature ranges. See the special specifications in the back of this manual or packed separately with the unit.

**To ensure that erroneous results are not displayed, the numerical segments are disabled (all turned on or all off) one hour, of running time, after the battery symbol starts flashing.

4 6 0 0 S E R I E S T H E R M O M E T E R

- NOTES -

4600 SERIES THERMOMETER

- NOTES -

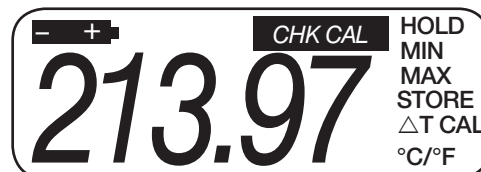
23

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES THERMOMETER

- OPERATING INSTRUCTIONS -

4. FUNCTIONS:



LCD Readout

HOLD: "Freezes" the display at the present temperature when the HOLD function is activated.

MIN/MAX: Displays the lowest (MIN) and highest (MAX) temperature from the time of turning on the meter.

STORE: Records a temperature when the STORE function is activated. (The "STOREd" value can be retrieved and displayed in the DELTA T function.) The value is kept in memory until it is replaced or the unit is turned off.

DELTA T: Calculates and displays the present temperature minus the STOREd temperature.

***CAL:** Allows for user calibration of the unit at specific temperature.

°C/°F: Selects the temperature display units to be displayed in degrees Celcius or Fahrenheit.

***CHK CAL:** CHECK CALIBRATION allows the user to verify the calibration accuracy of the thermometer at specific temperatures by using certified calibration plugs.

*These functions are available on special 4600 versions only. See instructions with Calibration and Cal. Plug Kits.

4

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES THERMOMETER

- OPERATING INSTRUCTIONS -**5. KEY PAD OPERATION:**

MODE

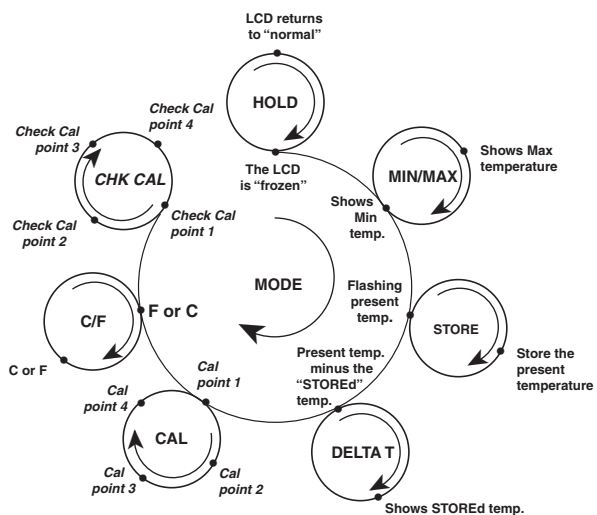
ON/OFF

F1

F2

Key Pad

All functions can be accessed through the MODE and FUNCTION (F1 & F2) keys. The user can assign any of the aforementioned functions to either the F1 or F2 keys by scrolling through the functions using the MODE key, then pressing either F1 or F2.

**Key pad functional flow chart**

5

ALPHA TECHNICS PRECISION TEMPERATURE

4600 SERIES THERMOMETER

- SPECIFICATIONS -**MODEL 4600-2 SPECIFICATIONS:**INSTRUMENT ACCURACYVS. TEMPERATURE**

(Not including probe error)

<u>TEMPERATURE</u>		<u>ACCURACY</u>	
(°C)	(°F)	(°C)	(°F)
-40	(-40)	0.100	(0.180)
-30	(-22)	0.060	(0.108)
-20	(-4)	0.035	(0.063)
-10	(14)	0.025	(0.045)
0	(32)	0.020	(0.036)
10	(50)	0.015	(0.027)
20	(68)	0.015	(0.027)
30	(86)	0.015	(0.027)
40	(104)	0.017	(0.031)
50	(122)	0.019	(0.034)
60	(140)	0.020	(0.036)
70	(158)	0.020	(0.036)
80	(176)	0.025	(0.045)
90	(194)	0.030	(0.054)
100	(212)	0.035	(0.063)
110	(230)	0.040	(0.072)
120	(248)	0.050	(0.090)
130	(266)	0.060	(0.108)
140	(284)	0.080	(0.144)
150	(302)	0.100	(0.180)

**Ambient temperature: 18 to 28°C (64 to 82°F)

22

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

- OPERATING INSTRUCTIONS -
5. KEY PAD OPERATION:

Example #1: *You want F1 to be the F/C function, and F2 to be the HOLD function.*

Turn on the unit.

After the unit has initialized, press the MODE key down 5 times (C or F will be flashing).

Press F1. (F1 is now the degrees C/F function key. The thermometer has also changed from C to F or from F to C.)

Now, assign HOLD to the F2 key.

Press MODE once. (HOLD is flashing)

Press F2. (F2 is now the HOLD function. The thermometer has also been put into the HOLD mode. Press F2 again to go back to normal mode.)

Example #2: *You want to take delta T measurements. (The difference between a value you have stored, using the STORE function, and the meter's present reading. In this example, let us assume that you are taking the temperature difference between two beakers of water, beaker A and beaker B.)*

4 6 0 0 S E R I E S T H E R M O M E T E R

- SPECIFICATIONS -
MODEL 4600-1 & 4600S* SPECIFICATIONS:
INSTRUMENT ACCURACY
VS. TEMPERATURE**

(Not including probe error)

<u>TEMPERATURE</u>		<u>ACCURACY</u>	
(°C)	(°F)	(°C)	(°F)
-40	(-40)	0.100	(0.180)
-30	(-22)	0.050	(0.090)
-20	(-4)	0.025	(0.045)
-10	(14)	0.020	(0.036)
0	(32)	0.015	(0.027)
10	(50)	0.015	(0.027)
20	(68)	0.015	(0.027)
30	(86)	0.015	(0.027)
40	(104)	0.015	(0.027)
50	(122)	0.015	(0.027)
60	(140)	0.020	(0.036)
70	(158)	0.025	(0.045)
80	(176)	0.030	(0.054)
90	(194)	0.045	(0.081)
100	(212)	0.065	(0.117)
110	(230)	0.080	(0.144)
120	(248)	0.110	(0.198)
130	(266)	0.150	(0.270)
140	(284)	0.240	(0.432)
150	(302)	0.320	(0.576)

**Ambient temperature: 18 to 28°C (64 to 82°F)

*The 4600S is a standard 4600 which is calibrated at a specific temperature or temperatures, up to four. The thermometer and probe are calibrated as a system and must stay together to maintain the system level accuracy specification shown on page 19.

4600 SERIES THERMOMETER

- SPECIFICATIONS -

MODEL 4600-I & 4600S SPECIFICATIONS:

PROBE: YSI 400 Series (2,252 Ohms @25°C)

CONNECTOR: 1/4" phone jack

MEASUREMENT RANGE:

-40.00°C to +150.00°C
(40.00°F to +299.98°F)

RESOLUTION:

0.01°C (0.01°F) from -40 to 102°C
(-40 to 215°F)

0.02°C (0.05°F) from 102 to 150°C
(215 to 299.98°F)

REPEATABILITY:

0.002°C to 0.01°C at -20 to 70°C
(0.004 to 0.02°F) at (-4 to 158°F)
typical for one week at constant
ambient temperature

4600-I SYSTEM ACCURACY:

When used in combination with an Alpha Technics Series 1400 or YSI's Series 400 0.1°C probes, the thermometer/probe system will have an overall system accuracy of $\pm 0.13^\circ\text{C}$ or better when the temperature to be measured is between 0°C and $+70^\circ\text{C}$.

4600S SYSTEM ACCURACY:

When calibrated between -20 to 100°C over a 70°C user specified range, accuracy equaling the meter itself plus $\pm 0.020^\circ\text{C}$ is possible.

4600 SERIES THERMOMETER

- OPERATING INSTRUCTIONS -

5. KEY PAD OPERATION:

First, you need to assign the STORE function to the F1 key, and the DELTA T function to the F2 key. (You can assign them differently if you wish.)

Press the mode key 3 times. (The STORE icon is flashing.)

Press the F1 key. (F1 is now the STORE function.)
Press F1 again to return to normal operation.

Press the MODE key 4 times. (The DELTA T icon is flashing.)

Press the F2 key. (F2 is now the DELTA T function) Press F2 two more times to get back to normal operation.

Now, F1 is STORE, and F2 is DELTA T.

TAKING THE DELTA T READING:

Put your probe into beaker A. Allow the reading to stabilize.

Press F1 (the STORE function). The STORE icon and the temperature numbers are flashing on and off. This lets you know that you are about to put a value into memory (erasing any previous value which had been stored). When F1 is pressed a second time, the value on the display is put into memory and the thermometer returns to normal operation.

4 6 0 0 S E R I E S T H E R M O M E T E R

- O P E R A T I N G I N S T R U C T I O N S -**5. KEY PAD OPERATION:**

Put the temperature probe into beaker B.

Press F2 (DELTA T). The DELTA T icon will appear and the numerical reading will show the difference between the stored value, beaker A, and the temperature of the present reading, beaker B. This is a real-time delta measurement. As the temperature of beaker B changes, you will see the difference between beaker B and the earlier stored value of beaker A.

Press F2 again. The stored value is displayed (beaker A). Press F2 again, and the thermometer returns to normal operation. Press F2 again, and you will see the delta measurement again, and so on.

4 6 0 0 S E R I E S T H E R M O M E T E R

- S P E C I F I C A T I O N S -**GENERAL INSTRUMENT SPECIFICATIONS:**

(Specifications for different models of Series 4600 thermometers may vary. If you have ordered a special version, see the special specification sheets in the following pages or packed with the unit.)

ENVIRONMENTAL CONDITIONS:

Operating:

Temperature 15 - 30°C (59 to 86°F)

Humidity 0 - 85%

Storage:

Temperature 0 - 60°C (32 to 140°F)

Humidity 0 - 70%

READING RATE: 2/sec. (one reading every 524msec)

DISPLAY: 4 1/2 digit LCD

POWER: 9 VDC battery, alkaline. Auto shut off time: 10 minutes. Auto shut off can be disabled or changed via the RS-232 port. Optional 110VAC adapter.

BATTERY LIFE: 20 hours typical; battery symbol flashes when less than 5% of life, one hour running time remains. All LCD segments turn on or off after the one hour of running time.

DIMENSIONS: 210H x 108W x 44D mm
(8.25"H x 4.25"W(max) x 1.75"D(max))

WEIGHT: 405g (14oz.)

4 6 0 0 S E R I E S T H E R M O M E T E R

- W A R R A N T Y -**ALPHA TECHNICS THERMOMETER
1 YEAR LIMITED WARRANTY**

The thermometer manufacturer, Alpha Technics, warrants your thermometer to be free from defects in material and workmanship under normal use and service. The warranty period for the Thermometer is 1 YEAR from the date of purchase and DOES NOT apply to batteries, or when the instrument has been misused, altered or damaged by accident or abnormal conditions of operation.

For warranty service, send the instrument with a description of the difficulty, postage prepaid, to Alpha Technics. Alpha Technics assumes no risk for damage in transit. Alpha Technics will, at its option, repair or relace the defective instrument free of charge. However, if we determine that the failure was caused by misuse, alteration, accident, or abnormal condition of operation, you will be billed for the repair. The repaired instrument will be returned, transportation prepaid.

ALPHA TECHNICS MAKES NO WARRANTY INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OTHER THAN THE WARRANTY STATED ABOVE. ALL WARRANTIES ARE LIMITED TO A PERIOD OF 1 YEAR. FROM THE DATE OF PURCHASE, ALPHA TECHNICS SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER IN CONTRACT, TORT, OR OTHERWISE.

Note (U.S.A. only): Some states do not allow limitations of implied warranties, or exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

4 6 0 0 S E R I E S T H E R M O M E T E R

- O P E R A T I N G I N S T R U C T I O N S -**6. AUTO SHUTOFF:**

The thermometer is factory set to automatically turn itself off 10 minutes after being turned on or 10 minutes after the last function key entry. You may turn the unit off at any time by pressing the ON/OFF switch.

When using the RS-232 interface or the optional external power supply, the auto shutoff feature is automatically disabled.

Optional PC software called **Thermal View** allows the user to vary the auto shutoff time period. The thermometer can be configured to shutoff from 3 to 998 minutes, or not auto shutoff. **Thermal View** is a Window's based data acquisition and manipulation package which allows information from the thermometer to be sent, via RS-232, to a standard Personal Computer. See the **Thermal View** manual for additional information and other configuration features.

4 6 0 0 S E R I E S T H E R M O M E T E R

- R S - 2 3 2 I N T E R F A C E -

The RS-232 interface allows temperature data from the 4600 Series thermometers to be sent to a standard Personal Computer. An optional software package known as ***Thermal View*** allows for easy data capture and manipulation in a Windows environment. Other data capture programs may be used.

When using non-***Thermal View*** data capture programs, the following information may be necessary:

The 4600 Series thermometers enter the HOST mode when the RTS line becomes active true. When the RTS line becomes FALSE, the 4600 returns to the normal mode of operation.

Baud Rate: 9600
Data Length: 8 Bits
Parity: None
Stop Bits: 1

The 4600 has a standard DB9 female connector with the following pins:

<u>PIN</u>	<u>DIRECTION</u>	<u>SIGNAL NAME</u>
1		No Connection
2	to Host	RX (Receive Data)
3	From Host	TX(Transmit Data)
4		No Connection
5		GND
6		No Connection
7	From Host	RTS (Request to Send)
8		No Connection
9		No Connection

4 6 0 0 S E R I E S T H E R M O M E T E R

- R E P A I R -

If the Thermometer fails, forward it, postage paid, to Alpha Technics. Include a description of the difficulty, place the Thermometer in its carrying case or box and pack the unit securely. Alpha Technics shall assume NO responsibility for damage in transit.

IN WARRANTY:

Instruments covered by the limited warranty will be promptly repaired or replaced, at Alpha Technic's option, and returned at no charge. SEE LIMITED WARRANTY, PAGE 17, FOR ITEMS COVERED AND COMPLETE WARRANTY TERMS. (Other manufacturers probes are not included under Alpha Technics' warranty unless otherwise stated.)

OUT OF WARRANTY:

The Thermometer will be repaired and returned for a fixed fee. (Repairs needed because of abuse or accidental damage will be quoted.) Contact Alpha Technics for current prices. Include a check, money order, or purchase order with the unit.

4 6 0 0 S E R I E S T H E R M O M E T E R

- RECALIBRATION -

The Thermometer should be recalibrated at least once a year to maintain its accuracy. (Some 4600 versions may require a 6 month recalibration cycle). Check the Report of Calibration, which came with the unit, or the recalibration label on the unit to determine the next recalibration date.) Recalibration should be performed at Alpha Technics. When the Thermometer requires recalibration, forward it, postage paid, to:

Alpha Technics
17151 Gillette Avenue
Irvine, CA 92614-5602
Phone (949) 250-6578
Fax: (949) 271-2300

Contact Alpha Technics for current prices and include with the unit a purchase order, a ship to/bill to address, a phone number, and a contact name. Ship the unit in its original carrying case or box enclosed in a suitable shipping container.

15

ALPHA TECHNICS PRECISION TEMPERATURE

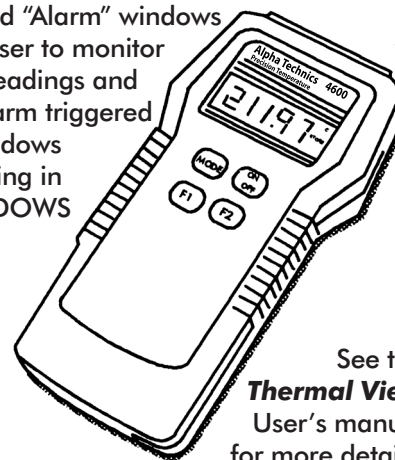
4 6 0 0 S E R I E S T H E R M O M E T E R

- THERMAL VIEW SOFTWARE -

Thermal View Basic is a WINDOWS based software package which allows the user to control the capture and presentation of temperature data from RS-232 equipped Alpha Technics thermometers. The information can be displayed or printed in **Thermal View** or exported to other programs.

Savable "Protocol" windows allow the user to select start/stop times and temperatures, set alarms, select units, set duration and other parameters. The capture protocol can be defined to start and stop data collection based on the time of day or on temperature.

"Status" and "Alarm" windows allow the user to monitor real-time readings and user-set alarm triggered pop up windows while working in other WINDOWS programs.



See the
Thermal View
 User's manual
 for more details.

12

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

- BATTERY REPLACEMENT -

The Model 4600 Series uses a standard 9 Volt alkaline battery. To replace the battery, turn the unit over, onto its face, and remove the battery door at the bottom of the case.

The old battery may be pried out from the mounting terminals by using your thumb or fore finger.

When putting in the new 9 Volt alkaline battery, be sure that the terminals line up and snap firmly into the terminal on the circuit board. (The unit will not be damaged if you accidentally try to put the battery in backwards.) Replace the battery door.

To increase battery life, a 9 Volt lithium battery can be used

13

ALPHA TECHNICS PRECISION TEMPERATURE

4 6 0 0 S E R I E S T H E R M O M E T E R

- CARE & CLEANING -

Extensive testing has proven this case to be rugged and reliable. It is splash resistant, but not waterproof. The case may not be submerged! Liquid will flow in and damage or ruin the thermometer!

DO NOT AUTOCLAVE THE UNIT! If it is necessary to decontaminate the thermometer, a weak chlorine solution may be gently wiped on to the case by a well rung out soft cloth. If your 4600 version has any open connector jacks, do not let any liquid go into the jacks. Your readings will be affected.

The clear plastic LCD lens can be easily scratched and/or fogged by inappropriate cleaning products. Use only plastic approved lens cleaners. Alcohol, acetone, lacquer thinners and other harsh chemicals will fog the lens and damage the case and rubber key pad.

If your 4600 version has a detachable probe with a plug termination, periodically wipe off and clean the probe plug contacts. Dirty contacts will cause reading errors.

14

ALPHA TECHNICS PRECISION TEMPERATURE
