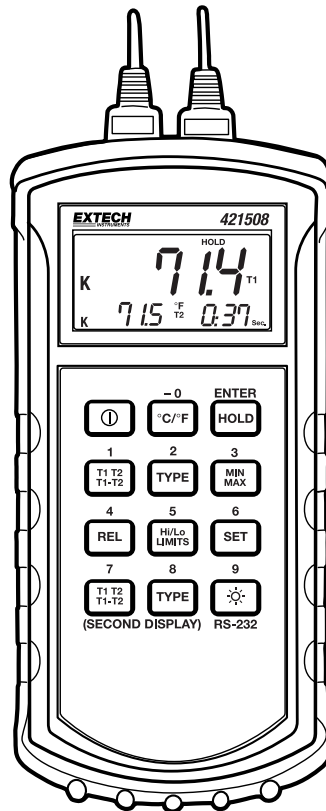


Model 421508**Dual Input, 3-Display Handheld Thermometer**

- Accepts J, K, T, E, R, S, & N thermocouples
- Backlit Electro-luminescent LCD Display
- T1 / T2 / T1 – T2 displays
- MIN / MAX / AVG Record/Recall
- Selectable temperature units (C/F)
- Data Hold, Relative Mode, Elapsed Timer
- Bi-directional RS-232 PC Interface

***Introduction***

Congratulations on your purchase of Extech's Dual Input, 3-Display, Hand-Held Digital Thermometer. This portable digital thermometer is designed to use external K / J / T / E / R / S / N type thermocouples (K-type supplied). Temperature indication follows Reference Temperature/Voltage Tables (N.I.S.T. Monograph 175 Revised to ITS-90). This professional meter, with proper care, will provide years of safe reliable service.

Specifications

General Specifications

Display	5-digit (9999.9), 3-Display, LCD with EL Backlighting
Water resistant housing	Gasket protected front panel
Input Protection	24VDC or 24VAC rms maximum input on any combination of inputs. Max voltage between T1 and T2 inputs is 1V
Reading rate	One reading per second
Input connectors	Accepts standard sub-miniature thermocouple connectors
Operating conditions	32 to 122°F (0 to 50°C); less than 80% RH
Storage conditions	-4 to 140°F (-20 to 60°C); less than 70% RH
Dimensions / Weight	7.5 x 3.6 x 2.1" (192 x 91 x 52.5mm); 11.7oz. (365g)
Power Supply	9V battery
Auto Power off	Meter automatically turns off after 30 minutes of inactivity
Battery life	100 hours typical

Range Specifications

Thermocouple	Range	Resolution
K type	-328 to 2501°F (-200 to 1372°C)	0.1°F (0.1°C) from 0 to 700°F, 0.2°F all other ranges
J type	-346 to 1922°F (-210 to 1050°C)	0.1°F (0.1°C) from 0 to 500°F, 0.2°F all other ranges
T type	-328 to 752°F (-200 to 400°C)	0.1°F (0.1°C) from 0 to 600°F, 0.2°F all other ranges
E type	-346 to 1454°F (-210 to 790°C)	0.1°F (0.1°C) from 0 to 450°F, 0.2°F all other ranges
R type	32 to 3212°F (0 to 1767°C)	1°F (1°C)
S type	32 to 3212°F (0 to 1767°C)	1°F (1°C)
N type	-58 to 2372°F (-50 to 1300°C)	0.2°F (0.1°C)

Accuracy Specifications

Thermocouple	Accuracy
K, J, T, E types	±(0.05% rdg + 0.6°F) -58°F to 2498°F ±(0.05% rdg + 1.4°F) -58°F to 346°F ±(0.05% rdg + 0.3°C) -50°C to 1370°C ±(0.05% rdg + 0.7°C) -50°F to -210°C
N type	±(0.05% rdg + 1.4°F) -58°F to 32°F ±(0.05% rdg + 0.6°F) 32°F to 2372°F ±(0.05% rdg + 0.7°C) -50°C to 0°C ±(0.05% rdg + 0.3°C) 0°F to 1300°C
R, S types	±(0.05% rdg + 0.6°F) -58°F to 2498°F ±(0.05% rdg + 1.4°F) -58°F to 346°F ±(0.05% rdg + 0.3°C) -50°C to 1370°C ±(0.05% rdg + 0.7°C) -50°F to -210°C
Temperature Coefficient	0.1 multiplied by the accuracy per °C from 0°C to 18°C and 28°C to 50°C (32°F to 64°F and 82°F to 122°F)
Supplied Thermocouples	4', type K (with teflon insulation) Max insulation temp: 500°F (260°C) Accuracy: ± 4°F (2.2°C) or ± 0.75% of rdg (whichever is greater) from 32 to 1472°F (0 to 800°C)

Safety Information

Please read the safety and operational instructions before using this device.

WARNING

To avoid electrical shock, do not use this instrument when working near voltages over 24V AC/DC.

WARNING

To avoid damage or burns, do not make temperature measurement in microwave ovens.

CAUTION

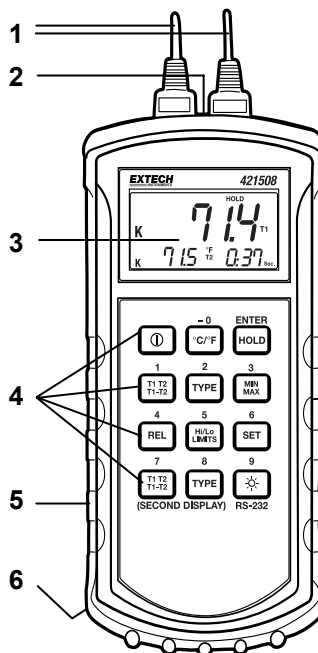
Repeated flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.



This symbol on the instrument indicates that the operator must refer to an explanation in this manual.

Meter Description

1. Thermocouple inputs
2. Optical PC Interface
3. LCD Display
4. Keypad
5. Rubber meter holster
6. Battery compartment and tilt stand on rear



Meter Operation

Power Key

The Power key (red key) turns the thermometer ON or OFF. Note that in the MIN/MAX record mode the thermometer cannot be powered off. Be sure to exit the MIN/MAX record mode before powering off.

°C/°F Key

Readings can be displayed in degrees Celsius (°C) or degrees Fahrenheit (°F). Note that the meter remembers the unit of measure when it is turned off. Press the °C/°F key to change the temperature units. The C/F key is also the zero (0) key and the minus (-) key for negative number entry (explained later in the 'SET Key' section).

HOLD Key (Main Display only)

Press the HOLD key to enter the Data Hold mode, the "HOLD" annunciator will display. When HOLD is selected, the thermometer freezes the reading on the main display (the main display is the center LCD line with the largest digits). Press the HOLD key again to return to the normal measurement mode. In the MIN/MAX recording mode, use the HOLD key as a pause/resume recording control. The HOLD key doubles as the ENTER key for programming purposes.

T1 T2/T1-T2 Key - Main Display Input Selection

Note that this key doubles as the numeric '1' key. Press this key to select which thermocouple input configuration is represented on the main display; 'T1' will display for thermocouple input 1, 'T2' for thermocouple 2, or 'T1-T2' for the difference between the two thermocouple measurements.

Type Key - Thermocouple Type for T1

Note that this key doubles as the numeric '2' key. Use the TYPE key to select the thermocouple type (K, J, T, E, R, S, or N) that is connected to the T1 input. The thermocouple type is indicated on the left side of the LCD. When the thermometer is turned on, it remembers the type used when the thermometer was last turned off.

MIN MAX Key

Note: Auto Power OFF and several keys (C/F, REL, SET, HI/LO, TYPE, and T1 T2 T1-T2) are defeated in this mode

Press MIN MAX to enter the MIN MAX recording mode; the meter will begin keeping track of the highest (MAX), lowest (MIN), and Average (AVG) readings. There are four displays (listed below) for this mode. Use the MIN MAX key to scroll through all four.

- When the RECORD icon is on the display (top), the meter is displaying measurements normally while it is recording.
- With the RECORD MAX icon on the display, the meter continues taking measurements but the main display shows only the highest (MAX) reading recorded. The Elapsed Time (in hours, minutes, and seconds) is shown in the lower right LCD field. The Timer shows when the MAX reading was taken.
- With the RECORD MIN icon on the display, the main display shows only the lowest reading recorded. The Time of the MIN reading is shown in the lower right LCD field.
- With the RECORD AVG icon on the display, the main display shows only the average of all the readings recorded. Note that the averaging limit is 22 hours. After 22 hours, the last average reading display is held on the LCD.

The meter emits a tone when a new minimum or maximum value is recorded. Use the HOLD key to pause recording (all values are then held). Press HOLD again to resume recording. To exit the MIN MAX mode press and hold the MIN MAX key until the RECORD icon switches off.

REL Relative key

Press the REL key to enter the Relative mode. The meter will now store the displayed reading (main display) as a reference value and display 'REL'. All subsequent readings will now display less the stored reference value. Press the REL key again to exit the relative mode. Note that the Relative reference value can also be entered manually (see the 'SET Key' paragraph below). The Relative mode is also a useful zeroing function. Note that the reference value cannot exceed ± 3000.0 counts.

Hi/Lo LIMITS key (Main display only)

Press the Hi/Lo LIMITS key to enter the Hi/Lo Limits comparative mode ("LIMIT" will be displayed on the LCD). When the measured temperature is higher than the High Limit (or lower than the Low Limit), the alarm beeper emits a tone and "Hi" or "Lo" is displayed. Note: The tones for High and Low Alarms are different; the High Alarm tone is continuous while the Low Alarm tone is pulsed. Use the SET key to program the temperature limits as explained in the next paragraph. Press the Hi/Lo LIMIT key again to exit the Hi/Lo LIMIT mode. In this mode the automatic power-off feature is disabled along with the following keys: REL, HOLD, & MIN MAX.

SET Key (Setting Relative Value, High / Low Alarm Limits, and the Timer)

Follow the steps a. through c. below for programming any or all of the SET parameters. Use the overlay second-function keys (- 0 through 9 and ENTER) when entering numbers. For negative numbers, press the (- 0) key after the number has been entered. The ENTER key is used to enter the programmed data and queue the next SET parameter.

a. Setting the Relative Mode reference value

Press the SET key to enter the Relative value setting mode. When in this mode, dashes are displayed on the main display. Manually program the desired value via the numeric keys. Press the ENTER key to store the relative value and move to the High / Low Limit setting mode.

b. Setting the High and Low Alarm Limits

In the High Limit setting mode all dashes are initially displayed on the main display. Use the numeric keys to program the desired High Limit value and then press ENTER to store the value. Perform the same steps for setting the Low Limit value. The Elapsed Timer SET mode is then queued.

c. Setting the Elapsed Timer

Use the numeric keys to enter the Hours, Minutes, and Seconds for the Timer. Press ENTER to store this value and exit the SET mode.

T1/T2 T1-T2 (Second Display Input Selection)

This key doubles as the numeric '7' key. Press this key to select which input is shown on the secondary display (lower left display); T1 for thermocouple 1, T2 for thermocouple 2, or T1-T2 to display the difference between the two thermocouples.

Type Key - Thermocouple Type for T2 input (Second Display)

This key doubles as the numeric '8' key. Use the TYPE key to select the thermocouple type (K, J, T, E, R, S, or N) for the T2 input. The input type is shown on the left side of the LCD in smaller digits than for the T1 input. When the thermometer is turned on, it remembers the type in use when the thermometer was last turned off.

Backlight Button

The backlight button (bottom right) doubles as the numeric '9' key. Press the backlight button to toggle the backlighting on and off. The backlight will switch-off automatically after 60 seconds to conserve battery life.

RS-232 PC Interface

The Model 421508 Thermometer is supplied with a sophisticated Windows™ software package on disk. A communications cable (meter to PC) is also supplied. The disk contains program files, software instructions, and communication protocol; refer to the disk for details.

The program allows the user to operate the meter remotely and view the readings from all three LCD fields on the PC monitor. The software also permits measurement data to be stored as text files on a PC. The data files can then be exported to spreadsheet or other programs for further manipulation (graphing, sorting, filing, etc.).

Battery Replacement

Replace the battery when the low battery indication symbol appears on the upper left corner of the display. To replace the battery, remove the two screws that secure the rear battery compartment cover. Remove the old battery, install a new one, and replace cover.

Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to ensure calibration integrity.

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com (click on 'Contact Extech' and go to 'Service Department' to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.



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