

Model 421502
Dual Input Type J/K Digital Thermometer

- Dual input T1 / T2 / T1 – T2 displays
- Maximum temperature record mode
- Selectable units
- Data Hold

**1. INTRODUCTION**

Congratulations on your purchase of Extech's Digital Thermometer. This professional meter, with proper care, will provide years of safe reliable service.

2. SPECIFICATIONS

Display	5 digit LCD multifunction display
Battery Power Supply	NEDA 1604, IEC 6F22, or 006P 9VDC battery.
Auto Power off	Meter shuts down after approx. 30 mins. of inactivity
Battery life	100 hours typical with carbon zinc battery
Dimensions / Weight	7.5 x 3.6 x 2.1" (192x91x52.5mm); 11.7oz. (365g)
J TC Range	-328 to 1922°F (-200 to 1050°C)
K TC Range	-328 to 2498°F (-200 to 1370°C)
Resolution	0.1°C or 0.2°F
Temperature units	Selectable C or F temperature units
Accuracy	$\pm(0.05\% \text{ rdg} + 0.3^{\circ}\text{C})$ -50°C to 1370°C
	$\pm(0.05\% \text{ rdg} + 0.7^{\circ}\text{C})$ -50°C to -200°C
	$\pm(0.05\% \text{ rdg} + 0.6^{\circ}\text{F})$ -58°F to 2498°F
	$\pm(0.05\% \text{ rdg} + 1.4^{\circ}\text{F})$ -58°F to -328°F
Temperature Coefficient	0.1 times the applicable accuracy specifications 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)
Water resistant housing	Gasket protected front panel
Input Protection	24VDC or 24VAC rms max. input on any combination of inputs. Max voltage between T1 and T2 inputs = 1V
Reading rate	One reading per second
Input connectors	Accepts standard miniature thermocouple connectors
Supplied thermocouple	4', type K, teflon insulation, Max insulation temp: 260°C (500°F) Accuracy: $\pm 2.2^{\circ}\text{C}$ or $\pm 0.75\%$ of rdg (whichever is greater) from 0°C to 800°C
Ambient Operating Range	32 to 122°F (0 to 50°C); less than 80% RH
Storage Temperature	-4 to 140°F (-20 to 60°C); less than 70% RH

3. FRONT PANEL DESCRIPTION



FIGURE 1

Note: The 12 keys on the meter keypad double as numeric keys (0-9), minus key, and ENTER key. The Display icons and key functions are explained in the meter operation instructions below.

4. OPERATION

4.1 Ensure that a fresh battery is installed by **powering the meter** (press the Power key) and observing the LCD display. If the LCD does not display characters, check the battery.

4.2 **Connect the thermocouples** to the meter's thermocouple input jacks (meter top).

NOTE If the SET, RELATIVE, or MIN/MAX/AVG MODE is engaged, the meter cannot be powered down. Exit these modes before attempting to power down.

4.3 **Temperature Units:** The meter's dual display (one for each thermocouple input) can read either in °C or °F. Press the "C/F" key to toggle between °C and °F temperature units. The meter recalls the selected units of measure the next time the meter is powered up.

4.4 Data Hold Mode : During measurements, pressing the "Hold" key "freezes" the MAIN DISPLAY temperature value and the "HOLD" indicator will appear on the LCD. Press "Hold" again to return to normal operation. In MIN/MAX Mode, pressing the "Hold" key cancels the data recording session (pressing "Hold" again resumes recording).

4.5 Main Display Input Selection "T1, T2, or T1 - T2"

Pressing the "T1 T2 / T1 - T2" key (the key with the number 4 overlay) permits the user to select the thermocouple input configuration which will be reflected on the meter's Main Display (largest LCD digits). Choose "T1 or T2" to show either thermocouple input 1 or 2 respectively. Select "T1 - T2" to display the difference between the two thermocouple input temperatures. In T1 - T2 mode, a reading of zero indicates that both thermocouples are reading the same temperature.

4.6 "K/J" Key (Selecting the Thermocouple Type for the T1 Main Display)

For the type of thermocouple that is plugged into the T1 terminal on the meter, select K or J to match it by toggling the "K/J" key. The meter remembers this selection upon power OFF.

4.7 MIN/MAX/AVG Temperature mode (for Main Display only)

To enter this mode, press the "MIN/MAX" key. Repeated key-presses cycle through Min, Max, and Avg modes each with its own LCD icon. Once this key is pressed, the meter begins recording peak, valley, and average temperatures. Each time a new peak is measured, the previous Max displayed value is replaced. The same applies to the Min function. An audible beep alerts the user that a new peak or valley has been recorded. To toggle between start/stop recording, press the HOLD key. When recording is stopped, the stored values are held in meter memory until Min/Max/Avg mode is canceled or resumed by pressing the "Hold" again.

The Avg mode keeps a true running average of temperatures recorded since the "MIN/MAX" key was first pressed (up to a maximum of 22 hours). If 22 hours elapse the average stored at this point is held on the display and is no longer updated (the MIN and MAX functions continue without interruption indefinitely). If an overload is recorded, the Avg function is halted and the Avg. display shows "-----".

NOTE: Keep in mind that the main displayed value is either the Min, Max, or Avg reading depending upon which icon appears on the LCD. Cycle through Min/Max/Avg with the "MIN/MAX" key.

The Min/Max/Avg mode cancels the Auto Power OFF feature, disables most of the meter keys, and will not allow a manual power OFF.

Note: Press and hold the MIN/MAX key for several seconds to return to normal operation.

4.8 Relative Mode (REL) for Main Display Only

The Relative Mode permits the user to store the current temperature value (or enter one manually - see Set Mode) and compare it to subsequent temperature readings. The display then shows: Actual temp. minus the Relative temp. = Displayed temperature). To enter this mode press the "REL" key and the REL icon will appear on the LCD. While in REL Mode the Main Display will show the difference between actual temperature and the relative temperature previously entered. Press the REL key again to exit the REL Mode. To display the difference between the actual temperature and a manually entered Relative value, press the REL key and then the SET key (see SET mode below).

4.9 Real-Time/Elapsed Timer Clock

The Timer (third display on bottom right of LCD) displays Clock or Elapsed Time and is a convenient way to see when Min and Max temperatures occurred. Each time new Min or Max temperature values are stored, the timer/clock value for the that Max or Min temperature is also stored for later recall. Real time can be entered by setting the meter's clock to the current time (set Hours:Mins display using the MIN/SEC key). To use the clock as an elapsed timer, first reset the clock to zero in Set Mode (see next section). The timer will begin counting as soon as it is set in SET mode.

4.10 SET Mode (for Relative Mode, HI/LO Alarm setpoints, and Clock/Timer settings)

4.10.1 Manually setting the Relative Values in SET Mode

Press the "SET" key once and the display will go to all dashes "===== ". Enter the relative value using the meter's keys which double as numeric keys. USE LEADING ZEROS SINCE DISPLAY IS 5-DIGITS. Once the Relative value is entered, press the ENTER key FOUR times to return to normal operation. Meter will now display Actual Temperature minus Relative Temperature

4.10.2 Setting the Timer/Clock in SET Mode

Press the "SET" key and then the "ENTER" key. Next key in the Hours, Minutes, and Seconds (HH:MM:SS) via the overlay numeric keys. When editing is complete, the clock will begin counting. Press the "ENTER" key three times to return to normal meter operation. Now use the SEC/MIN key to toggle between Hours/Minutes and Minutes/Seconds display.

4.10.3 Alarm HI/LO Limit Programming in SET Mode

Press the "SET" key once and then the "ENTER" key twice. Key in the desired HI Alarm value (high temperature at which the meter will audibly alert the user) via the overlay numeric keys. Now press the "ENTER" key once. Next, key in the LO Alarm Limit value (low temperature at which the meter audibly alerts the user). Press the ENTER key once to return to normal operation. After exiting the SET mode, press the "HI/LO Limits" key to activate the Alarm, the audio icon on the LCD tells you that the Alarm is now armed and will alert you if HI/LO limits are encountered.

4.11 Second Display Input Selection "T1, T2 or T1-T2"

Pressing the "T1 T2 / T1 - T2" key (the key with the minus sign printed over it) permits the user to select the thermocouple input configuration which will be reflected on the meter's Second Display (lower left LCD). Choose "T1 or T2" to show either thermocouple input 1 or 2 respectively. Select "T1 - T2" to display the difference between the two thermocouple input temperatures. In T1 - T2 mode, a reading of zero indicates that both thermocouples are reading the same temperature.

4.12 "K/J" Key (Selecting the Thermocouple Type for the T2 Main Display)

For the type of thermocouple that is plugged into the T2 terminal on the meter, select K or J (to match input) by toggling the "K/J" key. The meter remembers this selection upon power OFF.

4.13 HI/LO Alarm Limits Mode

Press the "HI/LO Limits" key to arm the HI/LO Alarms (the audio speaker icon will appear on the right side of the LCD). When the actual temperature meets or exceeds the user programmed temperature limits a continuous alert tone will be heard. To disarm or silence a tripped Alarm press the HI/LO Limit key again (the audio display icon will disappear).

5. 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

6. CALIBRATION / 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 insure calibration integrity.

7. 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. 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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