User Guide

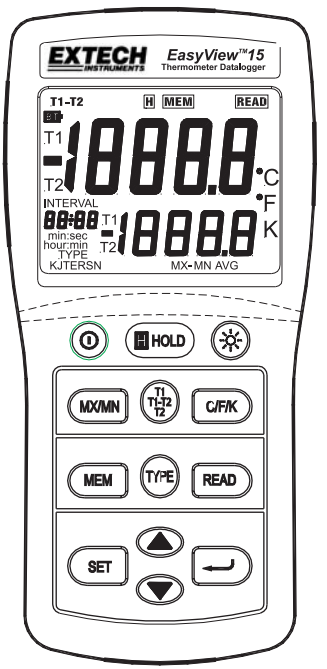
EXTECH INSTRUMENTS

Thermocouple Datalogging Thermometer

Seven (7) Thermocouple input types K, J, T, E, R, S, N

Dual thermocouple Input with PC Interface

Model EA15



Introduction

Congratulations on your purchase of the Extech Datalogging Thermometer. This device offers dual thermocouple inputs with manual and automatic datalogging capabilities. Careful use of this meter will provide years of reliable service.

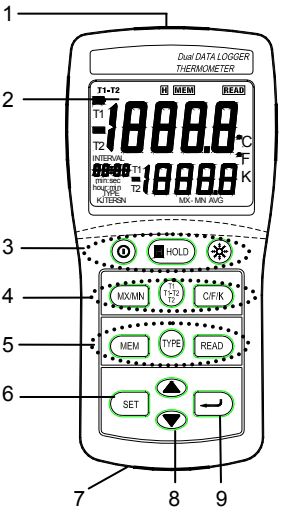
Specifications

Measurement Ranges	K - Type : -200.0°F to +1999.9°F (-150.0°C to +1370.0°C) J - Type : -200.0°F to +1994.0°F (-150.0°C to +1090.0°C) T - Type : -200.0°F to +752.0°F (-150.0°C to +400.0°C) E - Type : -200.0°F to +1598.0°F (-150.0°C to +870.0°C) R - Type : +32°F to +1999.9°F (0.0°C to +1767.0°C) S - Type : +32°F to +1999.9°F (0.0°C to +1767.0°C) N - Type : -200.0°F to +1999.9°F (-150.0°C to +1300.0°C)
Resolution	J, K, T, E, N Type: 0.1°F/°C/K R, S Type: 1.0°F/°C/K (0.1° for reference only)
Accuracy	J, K, T, E, N Type: ±(0.05% reading + 1.5°F (0.75°C) below -148°F (-100°C): add 0.15% of reading for J, K, E and N; 0.45% of reading for T; ±0.05 of reading +2°F(1°C) for R, S
Temperature Coefficient	0.01% of reading +0.06°F per °F (+0.03 °C) outside the specified +64°F to 82°F (+18°C to 28°C) range Below -148°F (-100°C): add 0.04% of reading for J, K, E and N type; and 0.08% of reading for T type
Note: Temperature accuracy does not include the accuracy of the probe. Note: The temperature scale is based on the international temperature scale of 1990 (ITS90).	

Display	Dual Display Multi-function LCD with Backlight
Input Protection	60VDC; 24VAC rms
Measurement Rate	1 time per 1.5 second
Over range indication	"OL" appears on the LCD
Open input indication	"OL" appears on the LCD
Low battery indication	“BT” appears on the LCD
Manual Memory Capacity	98 sets
Datalogging Memory Capacity	8800 sets
Power supply	6 ‘AAA’ Batteries
Battery life	Approximately 200 hours with alkaline batteries
Operating Temperature	32 to 122°F (0 to 50°C)
Operating Humidity	< 80% RH
Storage Temperature	14 to 140°F (-10 to 60°C)
Storage Humidity	10 to 80% RH
Dimensions	5.91 x 2.8 x 1.4" (150 x 72 x 35mm)
Weight	Approx. 8.29 oz. (235g) with batteries

Meter Description

1. RS-232 and thermocouple input jacks
2. LCD display
3. Power, Data Hold, and Backlight buttons
4. Max/Min, display select, and units buttons
5. MEM, input TYPE, and READ buttons
6. SET button
7. Battery compartment (rear)
8. Up/Down scroll button
9. Enter Button



Operation

Connecting thermocouples

1. This meter accepts two thermocouples with spade plugs (sub-miniature type with one spade wider than the other).
2. Plug the thermocouple(s) into the meter's T1 and/or T2 thermocouple input jack(s).
3. Always check LCD display for the proper thermocouple type selection..

Turn Power ON

Press the ⏻ button to turn power on. The meter will perform a short self-test. If a thermocouple is not plugged into the selected input or if the thermocouple is "open", the display will show "- - - - -". The default thermocouple type, units and display is determined from the parameters selected when the meter was last used.

Selecting thermocouple type

Press the **TYPE** button to select the type of thermocouple being used.

Selecting °C, °F or °K units of measure

Press the **C/F/K** button to select the unit of measure.

Selecting T1, T2, and T1-T2 Displays

Press the **T1 T2 T1-T2** button to step through and select from the following displays:

a. T1 (thermocouple 1) primary display and T2 (thermocouple 2) lower display.
b. T2 primary display and T1 lower display
c. (T1-T2) (difference between T1 and T2) primary display and T1 lower display
d. (T1-T2)primary display and T2 lower display

Notes:

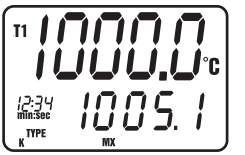
- To avoid electrical shock or personal injury, do not apply more than 20Vrms, between the thermocouples, or between any thermocouple and earth ground.
- If voltage on the measurement surface results in potentials of more than 1V, measurement errors may occur.
- If a potential exists between the thermocouples, use electrically insulated thermocouples.

Data Hold

Press the **HOLD** button to freeze the displayed reading. The 'H' hold icon will appear on the display. Press the HOLD button again to return to normal operation.

MIN, MAX, AVG Recording Function with Timer

Press the **MX/MN** button to begin capturing the Minimum (**MN**), Maximum (**MX**), and Average (**AVG**) temperature values. The Elapsed Time clock will appear on the lower left of the display. The primary display shows the current temperature. The lower display will indicate the **MX, MN** or **AVG** value (depending on which is selected) captured since the MX/MN button was pressed.



1. Press the **MX/MN** button to step through the **MX, MN** or **AVG** display Each reading will be accompanied by a Timer value indicating the time when each reading was recorded
2. Press and hold the '↵' button to change the elapsed time format from min:sec to hour:min
3. Press and Hold the **MX/MN** button to exit the MX/MN function.

Backlight

Press the ✳ backlight button to turn on the LCD display backlight. The backlight will automatically turn off after one minute (or press the button again to turn the light off manually).

Auto Power OFF

The meter will automatically turn off after 30 minutes if no keys are pressed during this period. AUTO POWER OFF is disabled in the max/min and datalogging modes.

To disable AUTO POWER OFF manually:

1. Hold the enter button '↵' while turning power on.
2. The AUTO POWER OFF function will be reactivated when the meter is manually turned off.

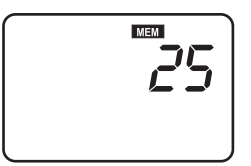
Turning Power OFF

Press the ⏻ button to turn power off.

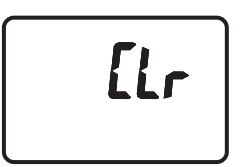
Manual Datalogging

Manual datalogging allows the user to store and recall up to 98 temperature readings with the press of a button.

1. Press the **MEM** button to manually store a single reading into memory. The '**MEM**' icon and location number of the reading will appear on display for two seconds and then the normal display will return.
2. To view stored readings, press the **READ** button. The memory location number will briefly appear and then the '**READ**' icon and the stored values will appear on the display



3. Press the ▲ and ▲ buttons to scroll through the memory locations and view the logged readings.
4. Press the '**READ**' button to exit the read mode
5. Press and hold the **MEM** button while turning the meter on to clear the memory. When the LCD indicates "CLr", the memory has been cleared.



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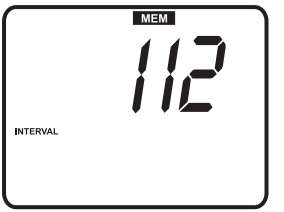
Automatic Datalogging

Automatic datalogging allows the user to store up to 8,800 temperature readings in memory for later downloading and viewing using the supplied software. The storage interval rate is programmable from 3 to 255 seconds.



1. Press and HOLD the **SET** button for two seconds to enter the interval programming screen. The 'MEM' and 'INTERVAL' icons and interval time will appear on the display. Use the ▲ and ▲ buttons to scroll through the available intervals (3 to 255 seconds). Press the '↵' button to select the desired logging interval
2. Make note of the start time (time of day) for your datalogging session as you will be prompted for this information when downloading the data.
3. Press and hold the **MEM** button for two seconds to enter the datalogging mode. The 'MEM' icon on the center of the display will flash each time a record is stored (at the interval selected above). When the memory is full, 'FULL' will appear on the display and the meter will stop logging data.
4. To stop and exit the datalogging mode, press the **MEM** button.
5. To download data, read the datalogging sections below.

Note: Max/Min and AVG functions can be used with the meter in datalogging mode

Clearing stored data

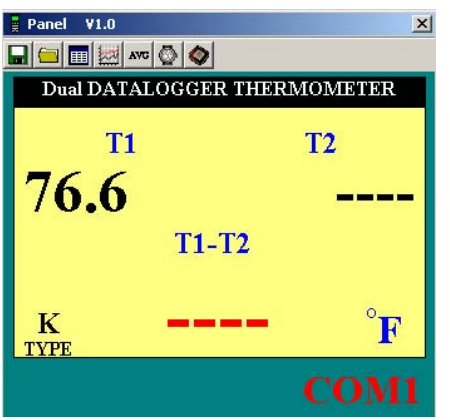
1. Press the "⏻ " button to turn the meter off.
2. Press and hold the **MEM** button, then press the " ⏻ " button to turn the meter on. When the LCD indicates "CLr", the entire memory has been erased.

Datalogging Software

The instructions on how to install the datalogging software are printed on the Software CD label. After reading the label's directions, load the software CD in the PC CD-ROM drive.

When the program is opened a COM PORT selection screen appears. Select either COM 1 or COM 2 depending on which computer port will be used to connect to the meter with the supplied cable (the cable connects to the top of the meter and to a DB9 9-pin COM PORT on the PC).

Once the COM PORT selection is correctly made, the meter and PC begin communicating. The main software screen, shown at right, appears. The menu icons at the top of the screen are explained below.

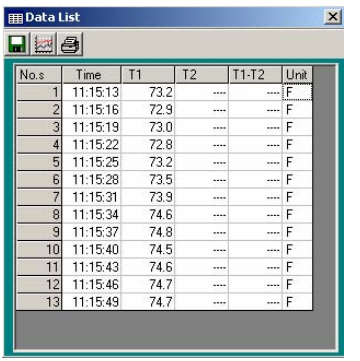


SAVE FILE ICON

The SAVE FILE icon is the first icon on the left (floppy disk symbol). Click on this icon to save recorded data to a text file. When clicked, the PC will prompt for a filename and location. Once saved, this file can be opened in other programs such as spreadsheets, word processors, and databases.

OPEN FILE ICON

The OPEN FILE icon is located second from left. Click to open a file that has already been saved.

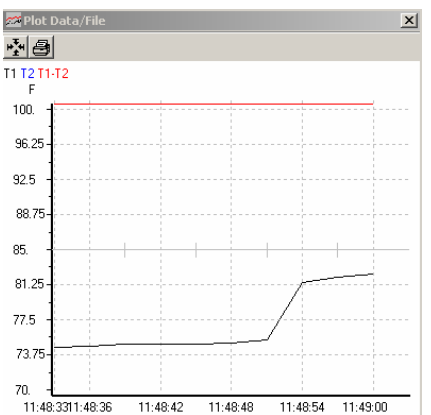


DATA LIST ICON

The LIST icon is located third from left on the main software screen. When clicked, data is shown on the screen in list format (shown at right). To save, graph, or print the list, click the SAVE, GRAPH, or PRINT icons in the Data List window.

DATA GRAPH ICON

The GRAPH icon is located fourth from left. When clicked, the data is shown on an x-y graph (see diagram below). The vertical axis represents the temperature units; the horizontal axis represents the time.



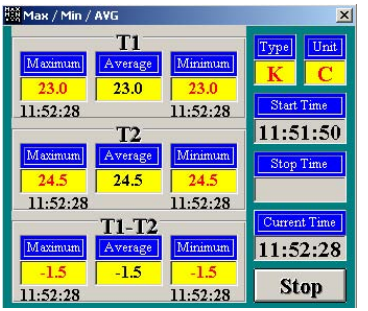
Click on the PRINT to get a hard copy of the graph. Press the four-arrow icon (next to the PRINT icon) to change the scale and to select data range to be viewed. See diagram below

SAMPLING INTERVAL

The INTERVAL icon (2nd icon from right) allows the user to change the number of seconds that the meter waits before logging a reading. If the interval is set to 5 seconds, the meter will record a reading every 5 seconds, for example. The range is 1 to 86,400 seconds.

MIN/MAX/AVG ICON

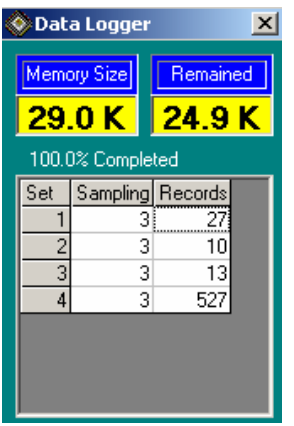
The AVG icon (3rd icon from right) allows the user to view maximum, minimum and average readings for T1 and T2 inputs in real time when the meter is connected to the RS232 Port via the optical cable.



Downloading Readings from the Meter to a PC

With the meter connected to the PC (as described earlier) and the software running, click on the datalogger download icon (first icon from the right) to begin downloading data from the meter to the PC.

When the screen shown at right appears, select a set to view by clicking on its number. A set is simply a datalog session. Data will be displayed in the data list format described earlier in DATA LIST ICON.



Once a data set has been selected the screen shown below will appear. Enter the time of day datalogging began as noted earlier (in HR:MN:SC format).