User's Guide

EXTECH INSTRUMENTS
A FLIR COMPANY

Thermocouple Datalogging Thermometer

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

Dual thermocouple Input with PC Interface

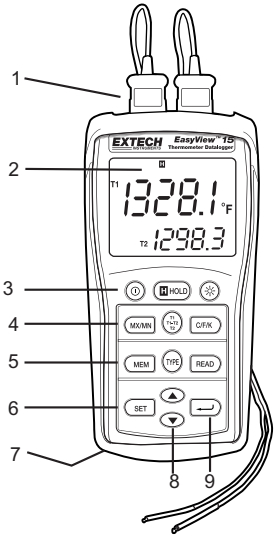
Model EA15

Introduction

Congratulations on your purchase of the Extech Datalogging Thermometer. The EA15 offers dual thermocouple inputs with manual and automatic datalogging capabilities. The EA15 includes a PC interface and Windows™ compatible software for real-time monitoring and storage of temperature data. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

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 the 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. When a thermocouple is not plugged into the selected input, or if a thermocouple is "open", the display will show "- - - - -". The default thermocouple type, units and display configuration are determined from the parameters selected when the meter was last used.

Selecting thermocouple type

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

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) is the primary display; T2 (thermocouple 2) is the lower display
b. T2 is the primary display and T1 is the lower display
c. T1-T2 (difference between T1 and T2) is the primary display and T1 the lower display
d. T1-T2 is the primary display and T2 is the lower display

Notes:

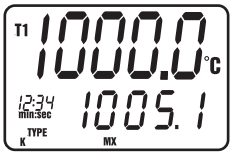
- To avoid electrical shock or personal injury, do not apply more than 20Vrms, between the thermocouples, or between any thermocouple and earth ground.
- If voltage on the measurement surface results in potentials of more than 1V, measurement errors may occur.
- If a potential exists between the thermocouples, 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 and 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 the 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 switch on the LCD display backlight. The backlight will automatically switch off after one minute (press button again to turn the light off manually).

Auto Power OFF

The meter will automatically switch off after 30 minutes of inactivity. 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.

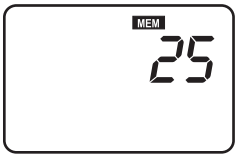
Turning Power OFF

Press the ⏻ button to turn power off.

Manual Datalogging

Manual datalogging allows the user to store and recall up to 98 temperature readings.

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

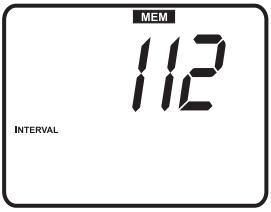


3. Use the up/down buttons to scroll through the memory locations and view the logged readings.
4. Press the '**READ**' button to exit the read mode
5. Press and hold the **MEM** button while turning the meter on to clear the memory. When the LCD indicates "CLr", the memory has been cleared.

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 up/down 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 the datalogging session as this information will be useful 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). 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/AVG functions can be used with the meter in datalogging mode

Clearing stored data

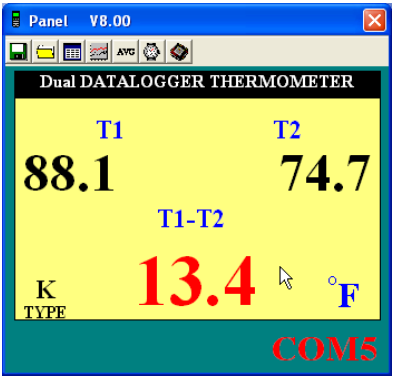
1. Press the "⏻ " button to turn the meter off.
2. Press and hold the **MEM** button, then press the " ⏻ " button to turn the meter on. When the LCD indicates "CLr", the entire memory has been erased.

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 prompt appears. Select the PC COM PORT that will be used to connect the meter to the PC with the supplied cable (the cable connects to the top of the meter and to the USB 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.



FILE 'SAVE AS' ICON

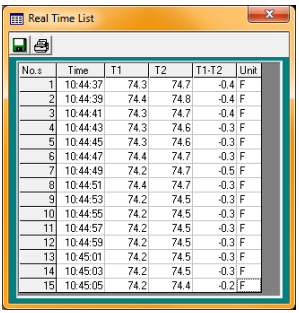
The SAVE FILE icon is the first icon on the left. Click on this icon to save recorded data to a text file. When clicked, the PC will prompt for a filename and location. Once saved, this file can be opened in other programs such as spreadsheets, word processors, and databases.

OPEN FILE ICON

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

REAL TIME DATA LIST ICON

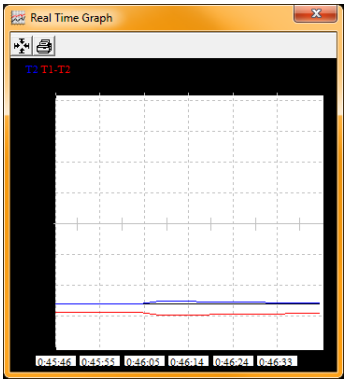
The LIST icon is located third from left on the main software screen. When clicked, data is shown on the screen in list format (shown at right). To save or print the list, click the SAVE or PRINT icons in the Real Time List window.



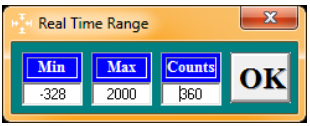
No.s	Time	T1	T2	T1-T2	Unit
1	10:44:37	74.3	74.7	-0.4	F
2	10:44:39	74.4	74.8	-0.4	F
3	10:44:41	74.3	74.7	-0.4	F
4	10:44:43	74.3	74.6	-0.3	F
5	10:44:45	74.3	74.6	-0.3	F
6	10:44:47	74.4	74.7	-0.3	F
7	10:44:49	74.2	74.7	-0.5	F
8	10:44:51	74.4	74.7	-0.3	F
9	10:44:53	74.2	74.5	-0.3	F
10	10:44:55	74.2	74.5	-0.3	F
11	10:44:57	74.2	74.5	-0.3	F
12	10:44:59	74.2	74.5	-0.3	F
13	10:45:01	74.2	74.5	-0.3	F
14	10:45:03	74.2	74.5	-0.3	F
15	10:45:05	74.2	74.4	-0.2	F

REAL TIME DATA GRAPH ICON

The REAL TIME 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.

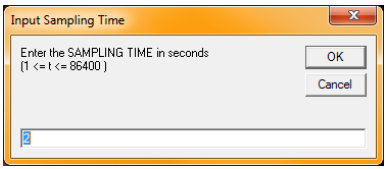


Click on PRINT to get a hard copy of the graph. Press the four-arrow icon (next to the PRINT icon) to select the data range to be viewed. See diagram below:



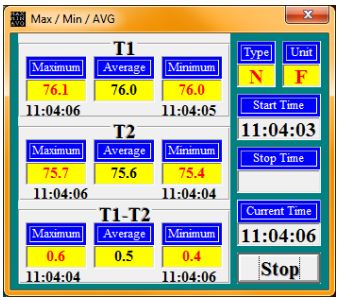
SAMPLING TIME (RECORDING INTERVAL) ICON

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. The range is 1 to 86,400 seconds.



MIN/MAX/AVG ICON

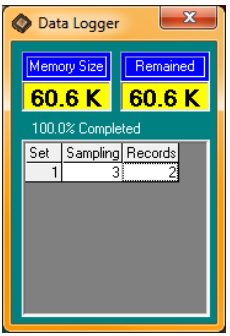
The AVG icon (3rd icon from right) allows the user to view maximum, minimum and average readings for T1 and T2 inputs in real time when the meter is connected to the COM PORT via the supplied cable. See screen capture below on left.



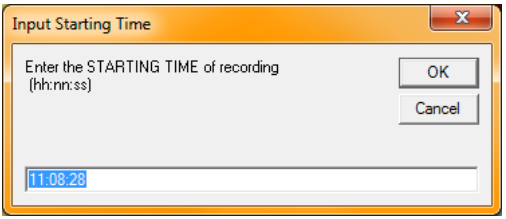
Downloading Readings from the Meter to a PC

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

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



Once a data set has been selected, the screen shown below will appear. Enter the time of day datalogging began in HH:MM:SS (hour/minute/second) format.



Maintenance

Cleaning

The meter can be cleaned with a damp cloth. A mild detergent may be used but avoid solvents, abrasives, and harsh chemicals.

Battery Installation / Replacement

The battery compartment is located on the back of the meter. The compartment is easily accessed by removing the 'flat head' screw on the back of the meter, and removing the compartment cover. Replace or install the six 'AAA' batteries observing polarity and re-assemble the battery compartment. Please dispose of batteries responsibly and in accordance with all regulations.

You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

Storing

When the meter is to be stored, please remove the battery and affix the sensor's protective cover. Avoid storing the meter in areas of extreme temperature and humidity.

Specifications

Measurement Ranges	K - Type : -150.0°C to +1370.0°C (-200.0°F to +1999.9°F) J - Type : -150.0°C to +1090.0°C(-200.0°F to +1994.0°F) T - Type : -150.0°C to +400.0°C (-200.0°F to +752.0°F) E - Type : -150.0°C to +870.0°C (-200.0°F to +1598.0°F) R - Type : 0.0°C to +1767.0°C (+32°F to +1999.9°F) S - Type : 0.0°C to +1767.0°C (+32°F to +1999.9°F) N - Type : -150.0°C to +1300.0°C (-200.0°F to +1999.9°F)
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 + 0.75°C (1.5°F) below --100°C (148°F): add 0.15% of reading for J, K, E and N; 0.45% of reading for T; ±0.05 of reading +1°C(2°F) for R, S
Temperature Coefficient	0.01% of reading +0.06°F per °F (+0.03 °C) outside the specified +18°C to 28°C (+64°F to 82°F) range Below --100°C (148°F): 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	0 to 50°C (32 to 122°F)
Operating Humidity	< 80% RH
Storage Temperature	-10 to 60°C (14 to 140°F)
Storage Humidity	10 to 80% RH
Dimensions	150 x 72 x 35mm (5.91 x 2.8 x 1.4")
Weight	Approx. 235g(8.29 oz) with batteries

Copyright © 2011 Extech Instruments Corporation (a FLIR company)
All rights reserved including the right of reproduction in whole or in part in any form.
www.extech.com