User's Manual

T-Logger View Software

Version 3.3.

Table of Contest

1. Overview

1.1. T-Logger Button

Is a temperature logger based on Dallas Semiconductor Thermochron iButton®, " The first single chip time and temperature logging device that is submersible, dirt and impact resistant in a 16 mm stainless steel iButton® form factor, self powered logger for economy, durability and compactness ". Some of the applications for T-Logger include: The monitoring of temperature on sensitive goods, frozen foods, chemical products, medical equipments, air conditioner and refrigeration maintenance, drying and battery powered systems and others processes where temperature logging is critical.

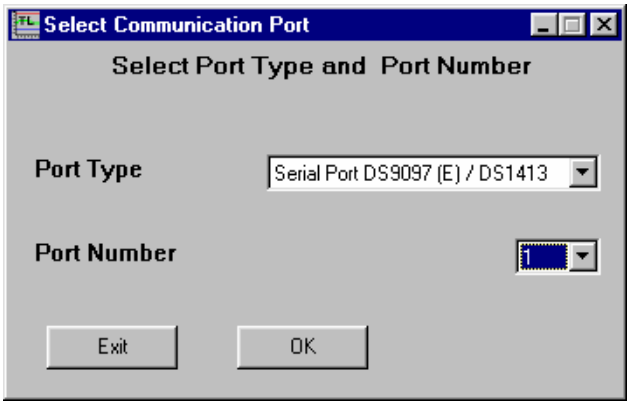
1.2. T-Logger Button (Most Important Features)

- DS1921G-F50, digital thermometer measures from -40 °C to +85 °C in 0.5 °C increments.
- DS1921H, digital thermometer measures from 15 °C to +46 °C in 0.125 °C increments.
- DS1921Z, digital thermometer measures from -5 °C to +26 °C in 0.125 °C increments.
- Real-time clock/calendar counts seconds, minutes, hours, date, month, day of the week, and year with leap year compensation; Y2K compliant.
- Real-time clock accuracy ± 2 minutes per month from 0 °C to 45°C.
- Programmable temperature-high and temperature-low alarm trip points.
- Automatically measures temperature at user-programmable intervals from 1 to 255 minutes.
- Logs up to 2048 consecutive temperature measurements in nonvolatile memory.
- Records a long-term temperature histogram with 2 °C resolution for the DS1921L, and 0.5 °C resolution for the DS1921H/Z. Both with (63 bins), 65.535 readings.
- Records time stamp and duration when temperature leaves the range specified by the trip points.
- 4096 bits of general-purpose read/write nonvolatile memory.
- Unique, factory lasered and tested 64-bit registration number, assures absolute traceability because no two parts are alike.
- Durable stainless steel case engraved with reg. number withstands harsh environments.
- Meets UL#913 (4th Edit.); Intrinsically Safe Apparatus: approved under Entity Concept for use in Class I, Division 1, Group A, B, C and D Locations (application pending).

*** Reference:** DS1921L-F5X Thermochron iButtom® Manual, DS1921H/Z Thermochron iButtom® Manual,.

2.1. Host Adapters

1-Wire® interface to RS232 COM port. The serial adapter enables an IBM type PC to directly read T-Logger data. Plugging a dot receptor into the serial adapter provides touch or dwell access for the T-Logger button. T-Logger View Software can be used with Serial port, Parallel port and USB port Adapters.



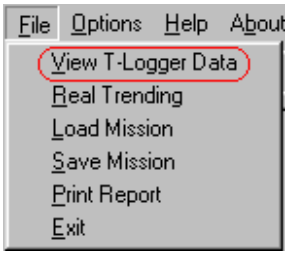
2.2. System Requirements

In Order to run T-Logger View Software, you must have a Pentium-based computer. In addition, your system must include the following:

- Microsoft Win 95®, 98®, Me®, NT 4.0® or Win 2000®, Win XP®.
- A hard drive with at least 10 megabytes of free space
- 32 megabytes of RAM
- A mouse (or other pointing device) supported by Windows®
- A 800x600 (256 color) display adapter and monitor. For better results use a (16 bits or 24 bit) color display adapter.
- Floppy 3 ½"disk drive and CD ROM Drive.

3. Menu (File)

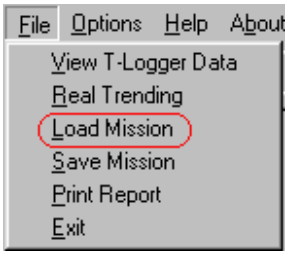
3.1. View T-Logger Data

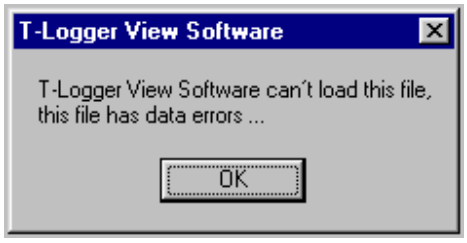


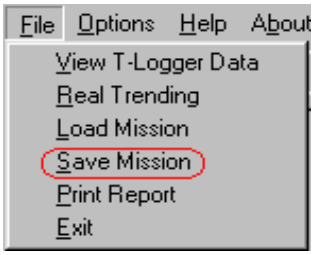
Allows user to set a Mission, read the information on the Mission, plot data or plot a histogram graph. T-Logger button must be inserted on dot receptor to obtain correct results. If the T-Logger is not on the dot receptor a warning message " **Please insert T-Logger on Dot Receptor**" will be displayed.

3.2. Load Mission

Allows user to display a previous mission results disk file. User can read information of the previous mission results, plot data or plot a histogram graph. Default directory of the previous mission results disk file is on current application directory. Previous mission disk files have (*.mis) extension. Please don't try to open (*.mis) file within T-Logger View Software because this error could be appear.





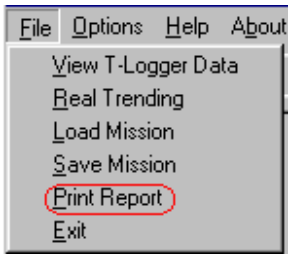


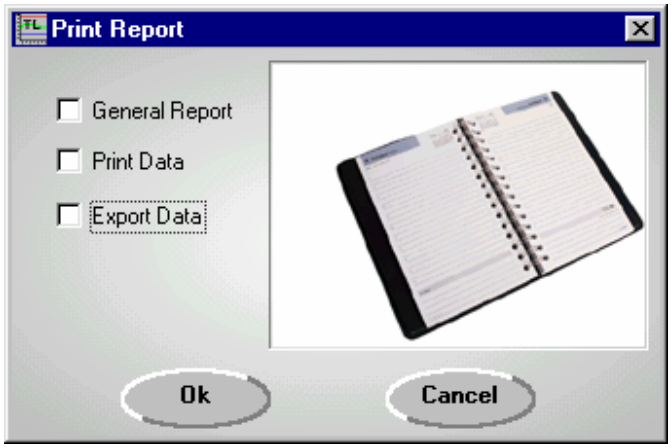
3.3. Save Mission

Allows user to save mission results values, plotting and histogram graph in disk files. Save default directory is on current application directory. Save files have (*.mis) extensions .

3.4. Print Report

Allows user to print a General Report , Print Data and /or Export Data to Excel™ (*.xls) format . General Report: Allows user to print a mission's general information. It report includes: mission's data, alarms temperatures, real time clock, general descriptions and information, graph, histogram and alarms. Print Data: Allows the user to print all temperature's data and time stamp stored in the T-Logger internal memory. It's so important to remember that report pages number varies according to the quantity of data stored in memory.

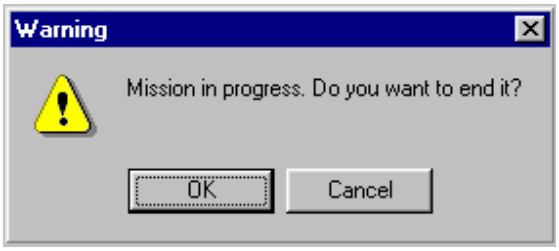




For a mission with 2048 data will be printed at 330 data points by page until completing a maximum of seven pages. **Export Data:** Allows the user to export mission data to a file disk. It will have the extension (*. xls) compatible with Microsoft Excel™. This file will be recorded on application directory/Reports.

3.5. Real Trending

Allows user to display real time temperature graphs. No mission settings are needed; however, the user is required to set the poll time and the alarm's threshold. Real trending graph is an excellent choice when quick actions over temperature process are required.



User must use a mission ended T-Logger Button; otherwise a message screen will appear leaving the user has two options: to end mission or to cancel Real Trending.

Poll Time: Allows user to set the T-Logger poll time. Polling time force a temperature reading each (2 ..60) seconds. Start trending check box, enables to begin polling process and plot the graph. If user stop trending a "**Save Real Trending ?",** message will be displayed, and user can now store the current real trending graph memory on disk file for future analysis.

Default directory of the previous real trending disk file is on current application directory. Previous real trending files have (*.rtd) extension and can be open with Excel® software. A temp.rdt disk file will be created when the user check the start trending checks box and the graph memory will be stored on temp.rtd disk file. If the computer hangled up or blue up, you will be able to recover the graph memory loading the Temp.rtd disk file. Temp.rtd disk file will be updated every 10 minutes.

 **Resume Button:** Resumes tracking on all axes. Re-Plot graph.

 **Axes Mode Buttons:** Change the mode axes to scroll or zoom mode.

 **Zoom In/Out Button:** For zooming axes.

 **Zoom Box Button:** Allows user to draw a "**Zoom Box**" on the data view area to zoom all axes.

 **Cursor Button:** Allows user to move a line in the data view area. Values for temperature and thresholds are displayed in legend.

 **Print Button:** Allows user to print real trending graph with T-Logger description labels, date and time. T-Logger user description will be printed on the same page too.

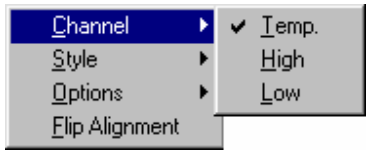
 **Alarm Sound Button:** Allows user on/off the sound alarms.

 **Load Previous Trending Button:** Allows user to display a previous real trending disk file. User can read information of the previous trending and plot data. Default directory of the previous real trending disk file is on current application directory. Previous real trending disk files have (*.rtd) extension.

Low / High Alarm Thresholds: Allows user to set the alarm thresholds values. Low threshold indicates the lower bound temperature range (in celsius : -40 °C .. +85 °C, in Fahrenheit: -40 °F ..+185 °F) that user can set. High threshold indicates the upper bound temperature range in Celsius (-40 °C .. +85 °C), Fahrenheit (-40 °F ..+185 °F) that user can set. If the temperature value is lower than the low alarm thresholds value a blue panel alarm will be displayed. If the temperature value is higher than the high alarm thresholds value a red panel alarm will be displayed.

Save Button: Allows user to save memory data to a disk file. Default directory of the previous real trending disk file is on current application directory. Previous real trending files have (*.rtd) extension and will be open with Excel® software. A temp.rdt disk file will be created when the user check the start trending check box and the graph memory will be stored on temp.rtd disk file.

Right Click Mouse Over Axes: Allows user to enable or disable tracking on all axes.



Right Click Mouse Over Cursor: Allows user to enable or disable cursor menu options.

3.5.1. Real Trending Memory Considerations

Since real trending graph are designed to handle synchronous data point in RAM memory, T-Logger View software allow to store as many 150,000 points of the graph in RAM memory afterwards a roll over memory function is enabled. By storing this amount of data point and using the tools (Scrolling, Zooming, and Cursor tools), real trending files is able to look for historical data.

$$\text{Real Trending (Days)} = \frac{150000 \times \text{Poll Time}}{(60 \times 60 \times 24)}$$

For example:

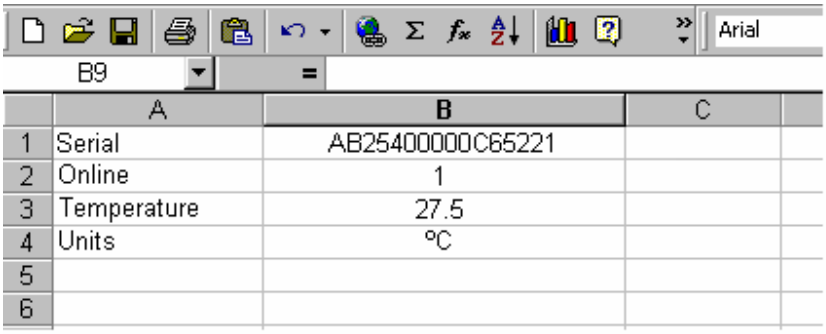
If poll time (seg) =	2	Max. real trending graph (**Days**) =	**3.47**
If poll time (seg) =	5	Max. real trending graph (**Days**) =	**8.68**
If poll time (seg) =	10	Max. real trending graph (**Days**) =	**17.36**
If poll time (seg) =	60	Max. real trending graph (**Days**) =	**104.17**

3.6. Exit

The exit menu option will close this T-Logger View software.

3.7. DDE Outputs Fields

Dynamic Data Exchange DDE is a technology for inter-application communication. It is a standard communication protocol built into the Microsoft® Windows® operating system and provide your application with the ability to establish a DDE conversation with other programs that support DDE to exchange data between themselves. To establish a DDE link between T-Logger View Software and Excel® , simply specifying an application, topic, and item on spreadsheet as following:

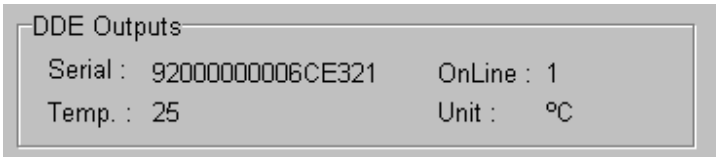


	A	B	C
1	Serial	AB25400000C65221	
2	Online	1	
3	Temperature	27.5	
4	Units	ºC	
5			
6			

=TLogger|Temp1!Serial
=TLogger|Temp1!Online
=TLogger|Temp1!Value
=TLogger|Temp1!Units

Application = TLogger
Topic = Temp1
Item = Serial, Online, Value, Units

Serial → T-Logger serial number.
Online → Indicates if the device is communicating (0, 1)
Value → T-Logger current temperature
Units → Engineering unit of the temperature value (ºC, ºF)



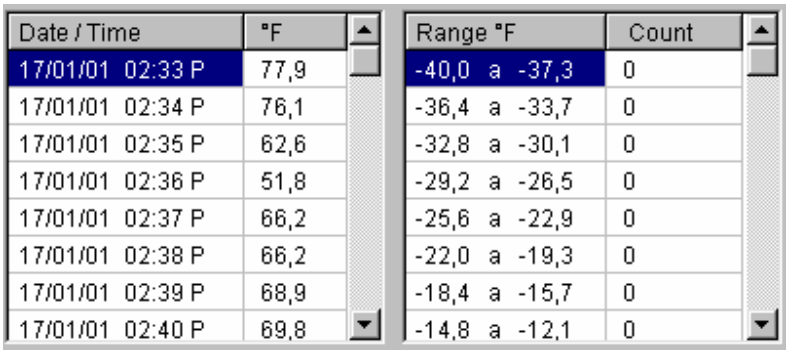
Real Trending Graph enable user to see DDE Output Fields in real time.

T-Logger Button must be always on Dot Receptor. If User place a T-Logger Button in other place during Real Trending, a communication error will appear and Real Trending graph will be finish.

4. Menu (Options)

4.1. Option Fahrenheit

Temperature mode options select whether all of the temperatures in this viewer are displayed as Fahrenheit.

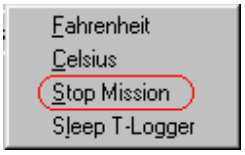


Date / Time	°F	Range °F	Count
17/01/01 02:33 P	77,9	-40,0 a -37,3	0
17/01/01 02:34 P	76,1	-36,4 a -33,7	0
17/01/01 02:35 P	62,6	-32,8 a -30,1	0
17/01/01 02:36 P	51,8	-29,2 a -26,5	0
17/01/01 02:37 P	66,2	-25,6 a -22,9	0
17/01/01 02:38 P	66,2	-22,0 a -19,3	0
17/01/01 02:39 P	68,9	-18,4 a -15,7	0
17/01/01 02:40 P	69,8	-14,8 a -12,1	0

4.2. Option Celsius

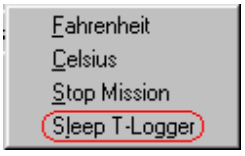
Temperature mode options select whether all of the temperatures in this viewer are displayed as Celsius

4.3. Stop Mission



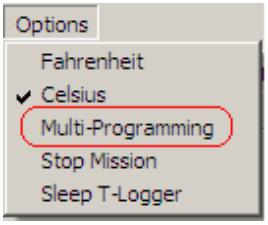
Stop mission menu option will end a mission if one is currently in progress. However, it does not stop the real-time clock.

4.4. Sleep T-Logger



The sleep T-Logger menu option controls the crystal oscillator of the T-Logger real time clock. When you check this option true, the oscillator will stop and the T-Logger will be in low power data retention mode. This option should not be selected for normal operation of the T-Logger. You must select this option true, for example, if you would like to store your T-Logger for a long time.

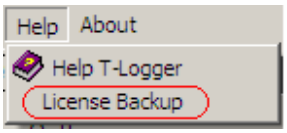
4.5. Multi-Programming



With this option, the user is able to program on different T-Logger, the same Date/Time mission start setting. With this option several T-Logger will be started and the same Date/Time. User descriptions and Page are holding when the T-Logger is changed.

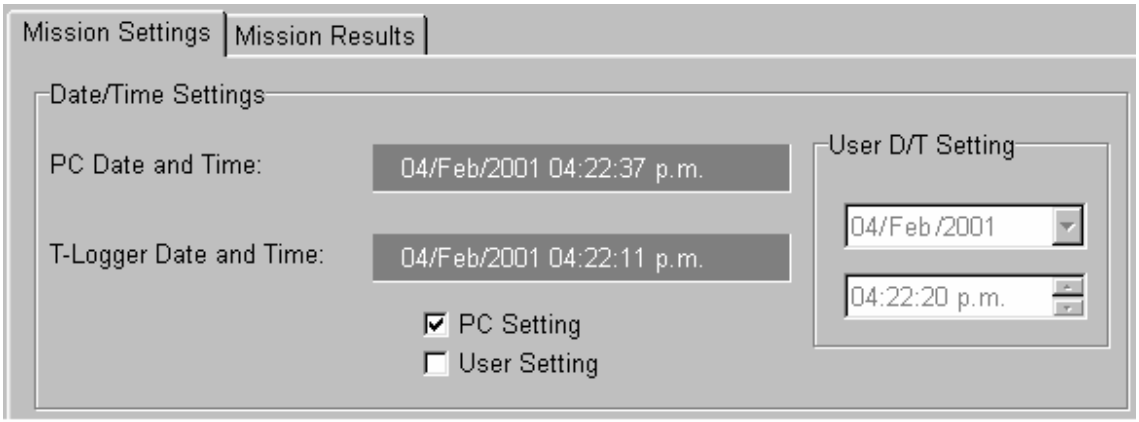
5. Menu (Help)

5.1. License Backup



With this option, the user is able to backup the software license to a 3.5" floppy disk. If the users format a computer hard drive, the Backup File T-Logger.vbr must be copied to the C:\Windows directory before install the T-Logger View Software again.

6. Mission Setting



6.1. Date/Time Setting

Both the PC and the T-Logger clocks date and time are displayed. User can synchronize T-Logger clock with PC clock if "Set Timer From PC" check box is checked .

6.2. User Setting Check Box

T-Logger is set to user's date and time values.

6.3. Time Alarm

The alarm mode indicates the period at which the time alarm can occur. The possible alarm modes are: "None", "Weekly", "Daily", "Hourly", "Minutely", and "Every Second". If no alarm mode is selected then the default mode is "None".

6.4. Mission Start Delay

Delays time in days (0..43), hours (0..23), minutes (0..59) to start a mission. The start delay is the current delay count down value show in the "Total Minutes label". When the start delay goes to 0, the mission sampling begins. If start delay was not selected, then the mission starts immediately after the "Record Mission" button is pressed.

6.5. Roll Over Enabled

Roll over enabled check box, enables or disable the roll over action. If the roll over check box is checked, the T-Logger has been set to overwrite early readings after the 2048 time stamped readings have been done. If roll over check box is not checked , roll over is not enabled.

6.6. Temperature Alarm Low Threshold

Low threshold indicates the lower bound temperature range in Celsius (-40 °C .. +85 °C) or Fahrenheit (-40 °F ..+185 °F) that can be set.

6.7. Temperature Alarm High Threshold

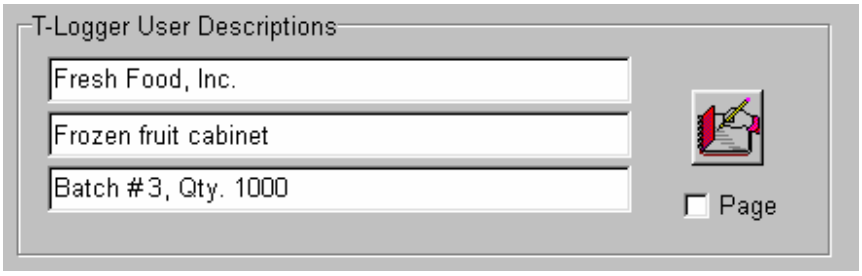
High threshold indicates the upper bound temperature range in Celsius (-40 °C .. +85 °C) or Fahrenheit (-40 °F ..+185 °F) that can be set.

6.8. Respond to Conditional Search On Alarm

This check box selects whether the T-Logger will respond to a conditional search when a time alarm has occurred. Since the time alarm cannot be disabled, selecting the alarm mode of "None" will set a "Weekly" alarm. The check box selects whether the device responds to a conditional search when a time alarm occurs only if T-Logger is 1-Wire® wired.

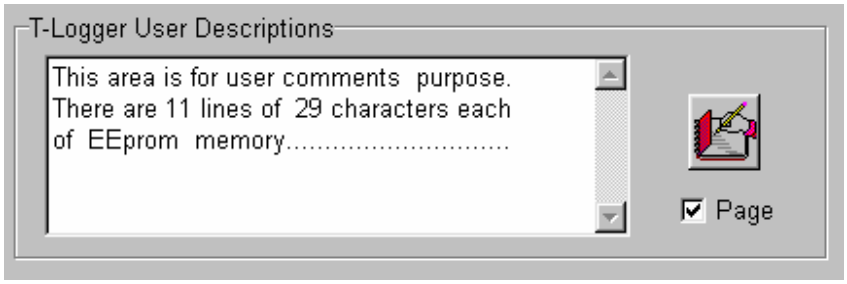
6.9. T-Logger User Description

Allows user to write his own descriptions for the T-Logger, for example: T-button location, uses, label description, container description. There are three input lines with 29 characters each for description purposes. The description lines will be printed over plotting and real trending graph.



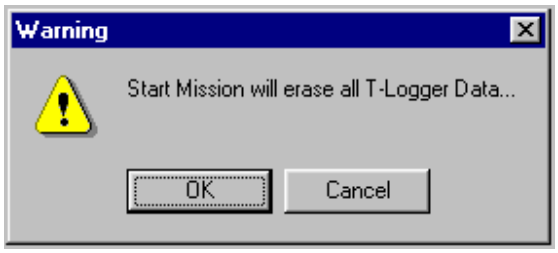
6.10. T-Logger User Description Page

Allows user to write his own comments. There are 11 lines of 29 characters each of non volatile memory.



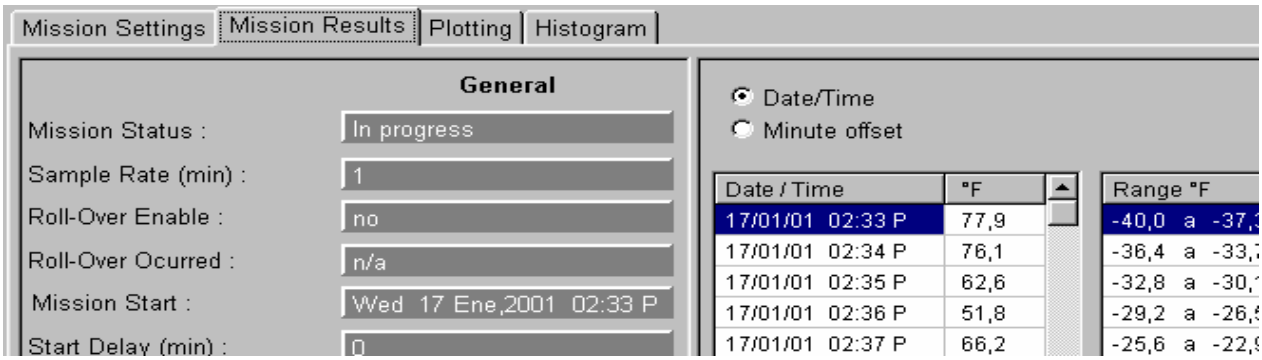
6.11. Record Mission

The mission settings will then be written to the T-Logger. To show the state of the new mission, the T-Logger View software will automatically switch to the "Mission Results" tab. Note: Record a mission will erase all previous memory data of the T-Logger Button.



7. Mission Results

Mission Results tab displays the temperature reading results from the current mission. The mission results are automatically downloaded when the **View T-Logger Data** menu option is started and if there is a mission running. If the mission has been ended, then results can still be downloaded using the "**Read Data"** button. The "**Read Data**" button can also be used to refresh the result contents if the device has been connected long enough for a mission reading to take place.



7.1. Mission Status

The mission status will indicate "In progress" if a mission is currently running. It will display "Ended" if there is no mission.

7.2. Sample Rate

The sample rate is the number of minutes between samples.

7.3. Roll Over Enabled

Roll over enabled will say "yes" if the device has been set to overwrite early readings after the 2048 time stamped readings have been done. It will say "no" if roll over is not enabled.

7.4. Roll Over Occurred

Roll over occurred would say “n/a“ for not applicable if roll over is not enabled. If roll over is enabled, then this label will display “yes” if more than 2048 readings have been made, or “no” if the number of readings is less than 2048.

7.5. Mission Start

The mission start is the date / time stamp of the beginning of temperature readings. Note that this is the start time after the start delay has expired and the first reading has been taken. While the start delay is counting down the mission start will be displayed as “not started yet”.

7.6. Start Delay

The start delay is the current delay count down value in minutes. When the start delay goes to 0, then the mission sampling will begin.

7.7. Mission Samples

The Mission Samples indicates the number of temperature samples that have been taken during the current mission.

7.8. Total Samples

Total Samples indicates the total number of temperature samples that have been taken on the T-Logger button.

7.9. Temperature Alarm Low Threshold

Set the low threshold temperature value. Celsius (-40 °C .. +85 °C) or Fahrenheit (-40 °F ..+185 °F).

7.10. Temperature Alarm High Threshold

Set the high threshold temperature value. Celsius (-40 °C .. +85 °C) or Fahrenheit (-40 °F ..+185 °F).

7.11. Real Time Clock (Time)

Time displays the current real time clock value from the T-Logger. This value is updated every seconds, except during the download of the mission results the update of the time can be more than every second.

7.12. Alarm Mode

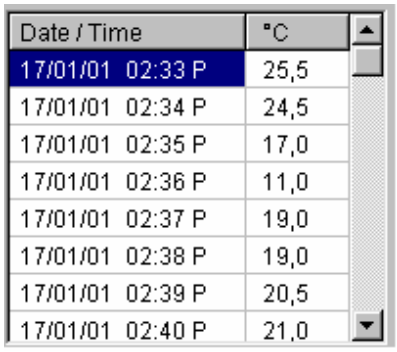
The alarm mode indicates the period at which the time alarm can occur. The possible alarm modes are: “Weekly”, “Daily”, “Hourly”, “Minutely”, and “Every Second”. If no alarm mode was selected then the default mode is “none”.

7.13. Alarm Time

The alarm time indicates the relevant time in the alarm mode when the time alarm occur. The format of this function will depend on the alarm mode.

7.14. Log Data Box

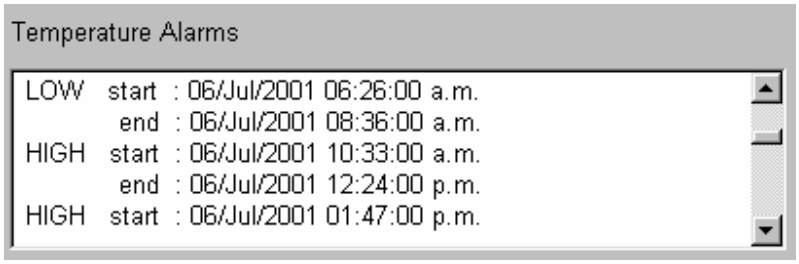
The data box displays the time stamped temperature readings. The format for the entries is selected thru “Date / Time” or “Minute Offset” radio buttons.



Date / Time	°C
17/01/01 02:33 P	25,5
17/01/01 02:34 P	24,5
17/01/01 02:35 P	17,0
17/01/01 02:36 P	11,0
17/01/01 02:37 P	19,0
17/01/01 02:38 P	19,0
17/01/01 02:39 P	20,5
17/01/01 02:40 P	21,0

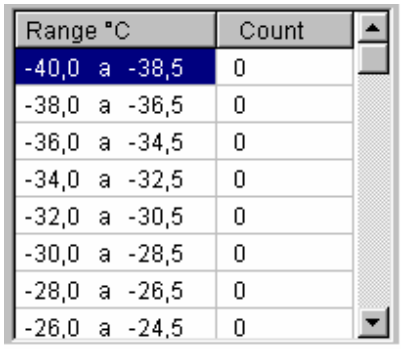
7.15. Temperature Alarms Box

The temperature alarms box will display the temperature alarm’s events. An alarm event is created when the temperature read during a mission goes outside the specified thresholds. There can be up to 12 high and 12 low alarm events. Each event lists the event type (High, Low) and the start and end time. The format for the entries is selected thru “Date/Time” or “Minute Offset” radio buttons.



7.16. Histogram Box

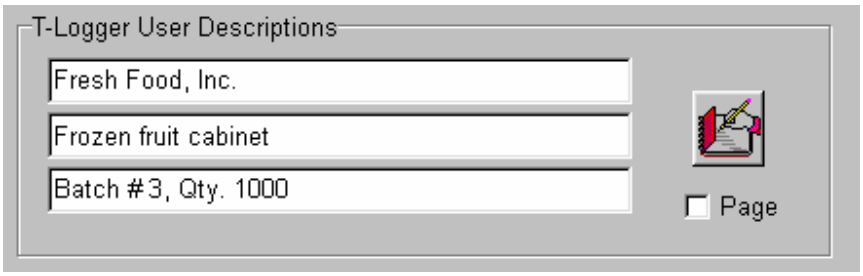
The histogram box displays the temperature history as defined by 63 data bins. Each bin represents a temperature range. When a temperature reading is made, the associated bin count is incremented. Each interval count can hold up to 65536 readings. The format for the entries is selected thru “Date/Time” or “Minute Offset” radio buttons.



Range °C	Count
-40,0 a -38,5	0
-38,0 a -36,5	0
-36,0 a -34,5	0
-34,0 a -32,5	0
-32,0 a -30,5	0
-30,0 a -28,5	0
-28,0 a -26,5	0
-26,0 a -24,5	0

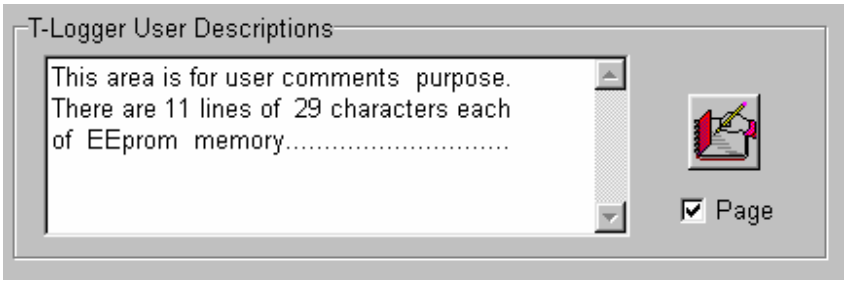
7.17. T-Logger User Description

Allows user to write his own descriptions for the T-Logger, for example: T-button location, uses, label description, container descriptions. There are three input lines with 29 characters each for description purposes. The description lines will be printed over plotting and real trending graph.



7.18. T-Logger User Description Page

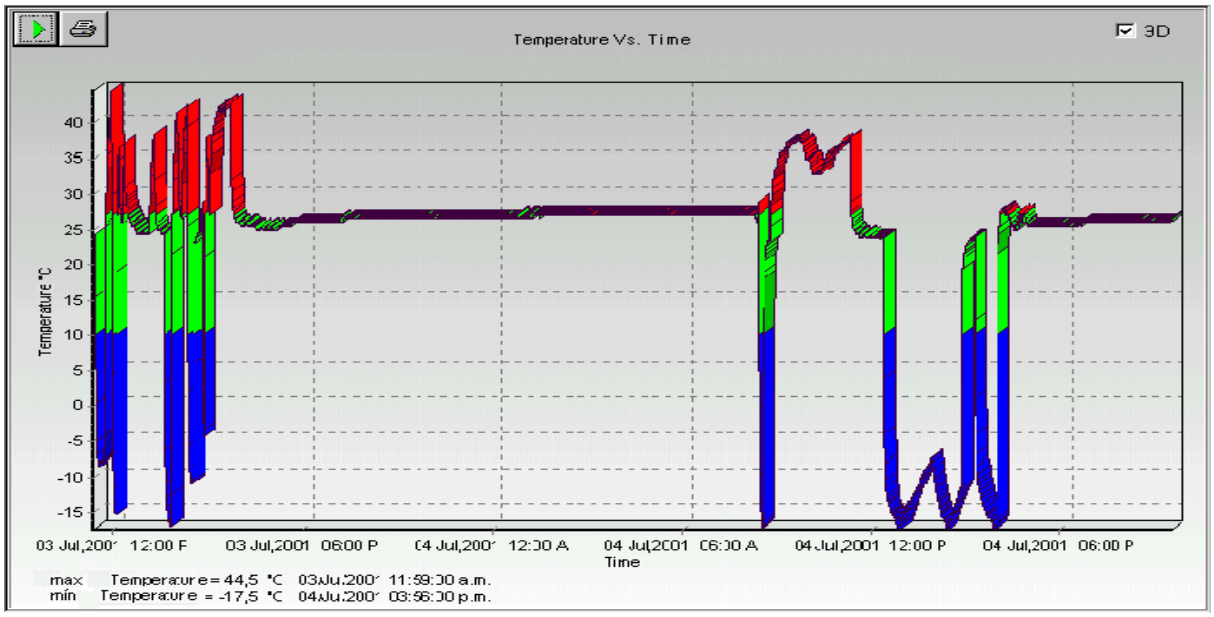
Allows user to write his own comments. There are 11 lines of 29 characters each of non volatile memory.



8. Plotting

8.1. Plotting

The Plot displays a line graph of the T-Logger data collected. Toolbar provides quick and easy control over the chart. Toolbar components are:



8.2. Resume Button

Resumes tracking on all axes. Re-Plot Graph.

8.3. Print Button

Allows user to print a screen image with T-Logger description labels, date, and time. The T-Logger user's description will be printed on the same page too.

8.4. Making Zoom over Graph

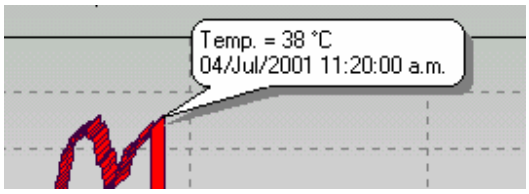
The user must to draw a rectangle with the mouse on the area that to wants to enlarge. Mouse left button must stay pressed while the user draws the rectangle on the graph.

8.5. Scrolling graph over screen

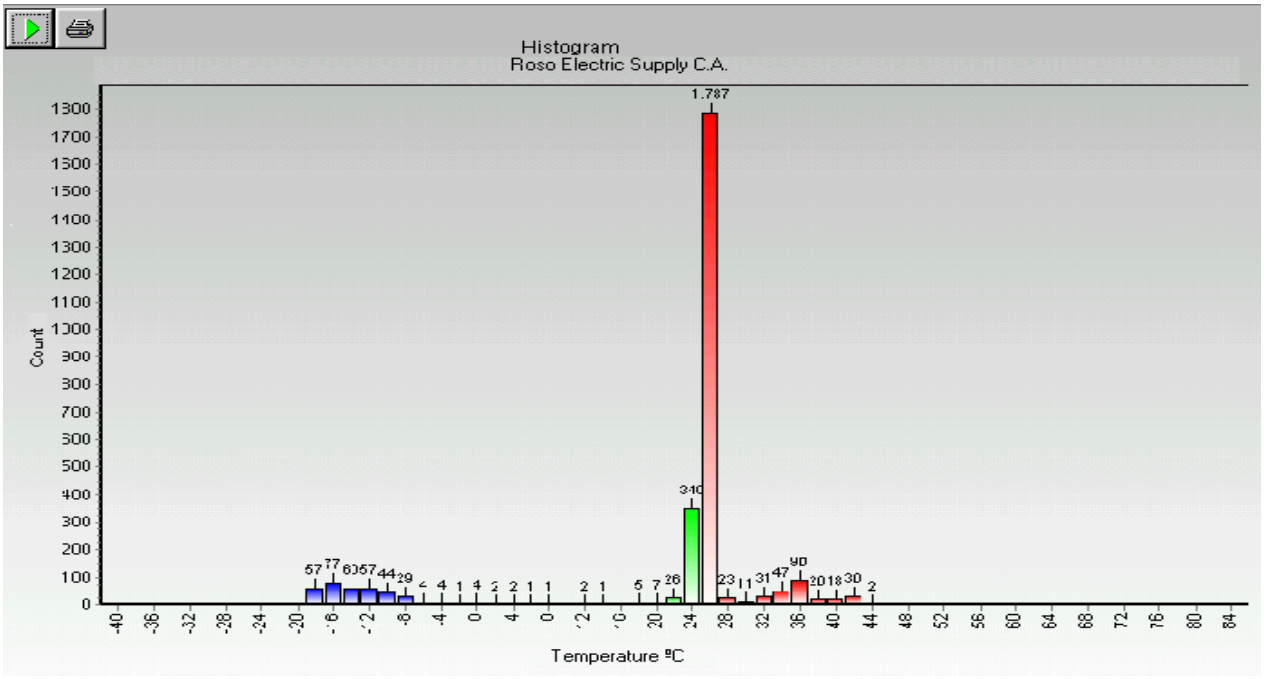
The user must maintain pressed the mouse right button while it moves the mouse to the required position.

8.6. Clicking Over graph line

Pressing the mouse left button or right over the graph lines: It allows to show a particular graph point information (Temperature, date and time).



9. Histogram



9.1. Histogram

The histogram graph displays the temperature history as defined by 63 data bins. Each bin represents a temperature range. When a temperature reading is made, the associated bin count is incremented. Each interval count can hold up to 65536 readings.

9.2. Resume Button

 Resumes tracking on all axes. Re-Plot histogram.

9.3. Histogram Print Button

 Allows user to print histogram graph area, legend, temperature and bin counts.

9.4. Making Zoom over Histogram

The user must to draw a rectangle with the mouse on the area that to wants to enlarge. Mouse left button must stay pressed while the user draws the rectangle on the graph.

9.5. Scrolling Histogram over screen

The user must maintain pressed the mouse right button while it moves the mouse to the required position.