KeyTag Manager User Guide.

Release 011 – 09/02/2017

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1. Presentation and Installation

1.1. Introduction to KeyTag Manager

KeyTag Manager is a multi-platform desktop application with smart interfaces, elegantly designed to work with the KeyTag series data loggers.
This software facilitates fast creation of reports in formats such as PDF, CSV, and Text files including graph, histogram, summary, data, and more. This software is fully inclusive of data loggers configuration, viewer, alarm manager, and MKT (Mean Kinetic Temperature) and report creator.

1.2. Highlights

- ✓Absolutely free
- ✓Configure, Viewer, Report all in one
- ✓Create mission template
- ✓Multi-platform: Windows, Mac Osx
- ✓Auto upgrade
- ✓Export data in various formats
- ✓Analyze data
- ✓Customizable reports
- ✓Upgrade data logger's firmware

1.3. Download

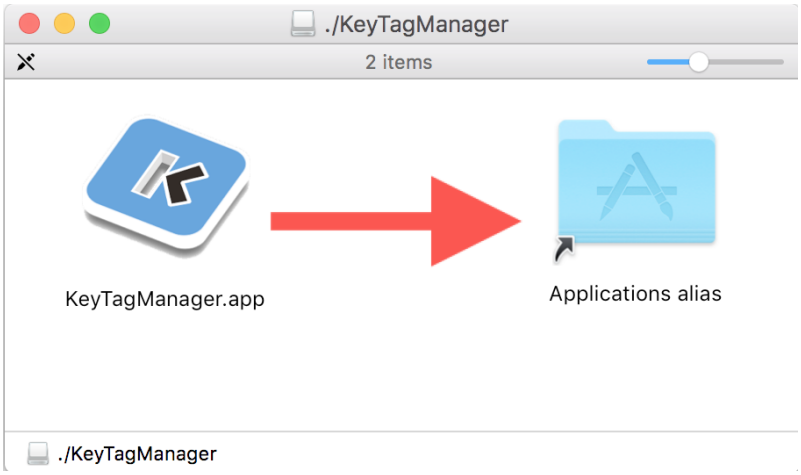
Click the link to download your copy of KeyTag Manager for free:
KeyTagManagerSetup.exe for Windows
KeyTagManager.dmg for OSX

1.4. Installation for Windows:

Extract your copy of KeytagManagerSetup (*.exe) launch the installation wizard and follow the steps.
This installation process will add a shortcut on the desktop.

1.5. Installation for Mac OSX:

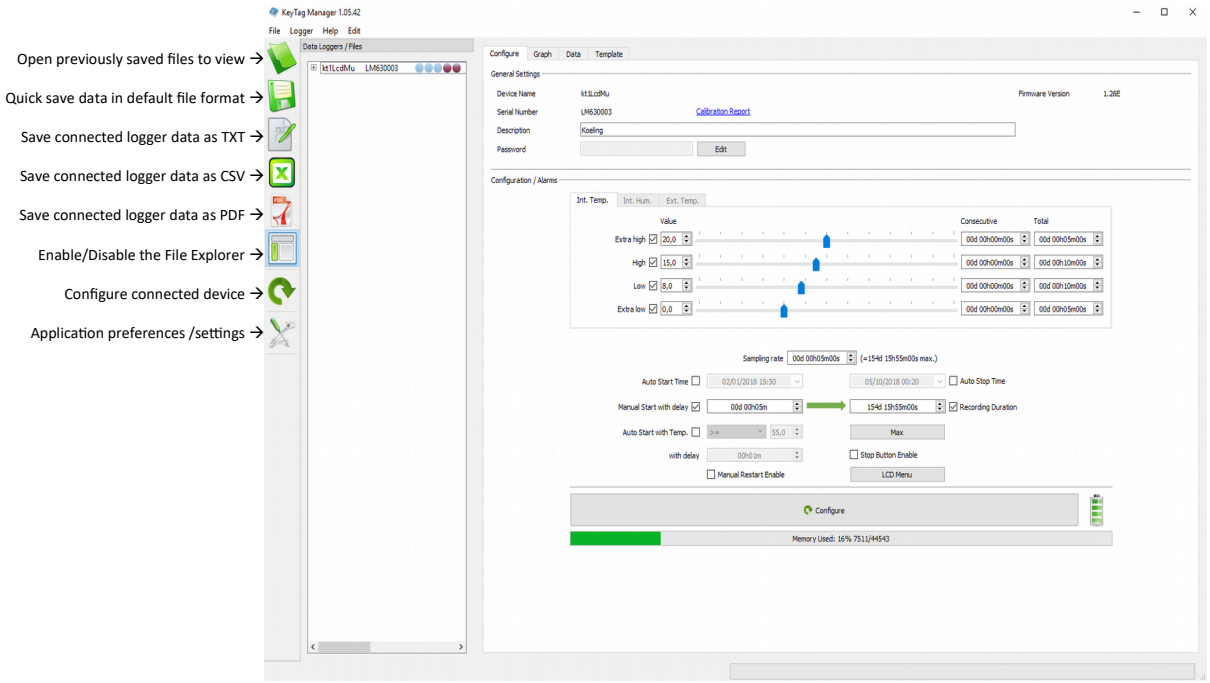
Double click on your copy of KeytagManager.dmg file. This will mount the file and open a window containing the KeyTag Manager application. Just move the application into the Application folder. The KeyTag Manager application can be launched directly from the Application folder.



2. Application View

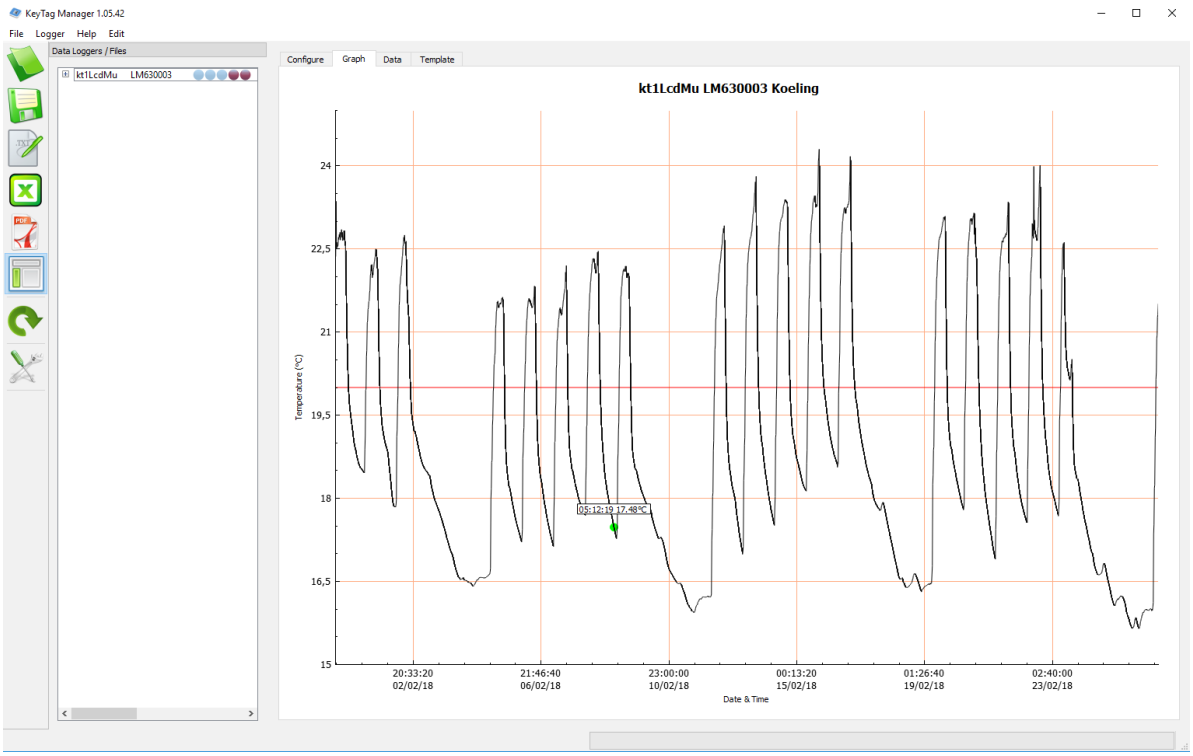
2.1. Quick Icons and Configuration View

To perform quick basic functions.



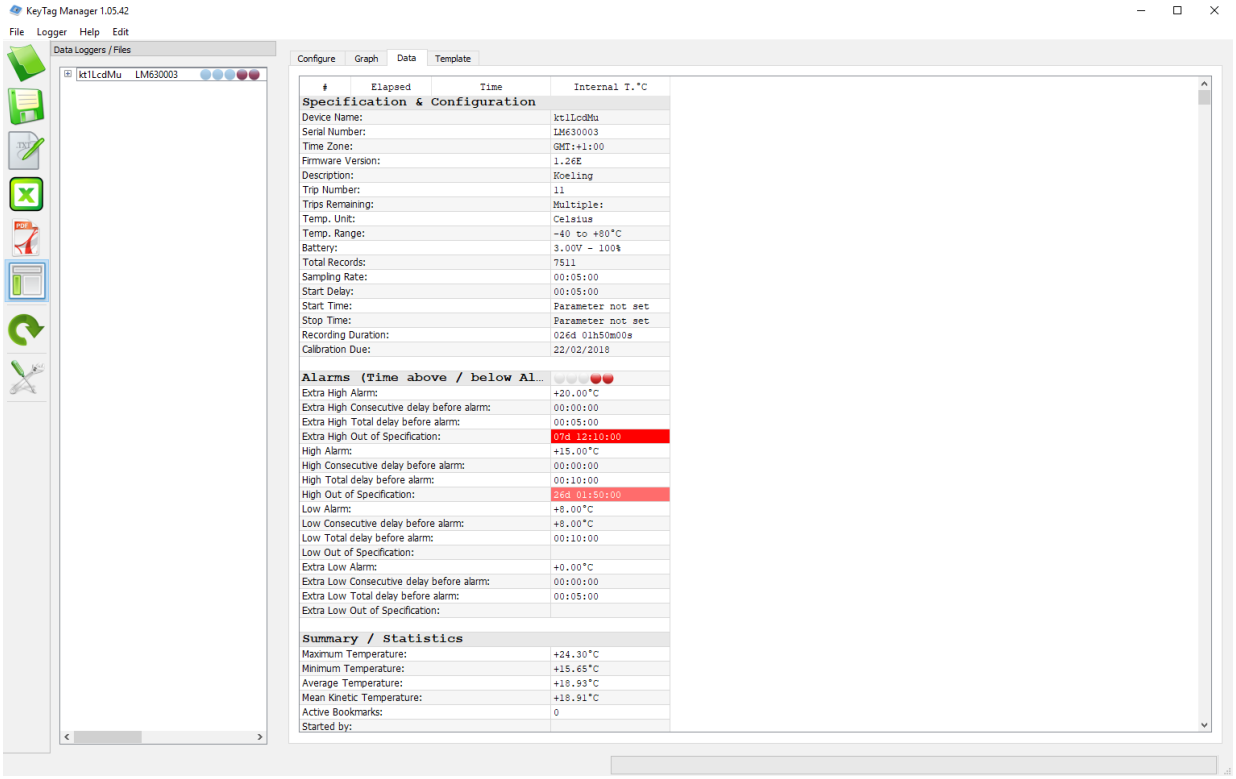
2.2. Graph View

Advanced graph viewer with zoom on both axes or each axes individually.

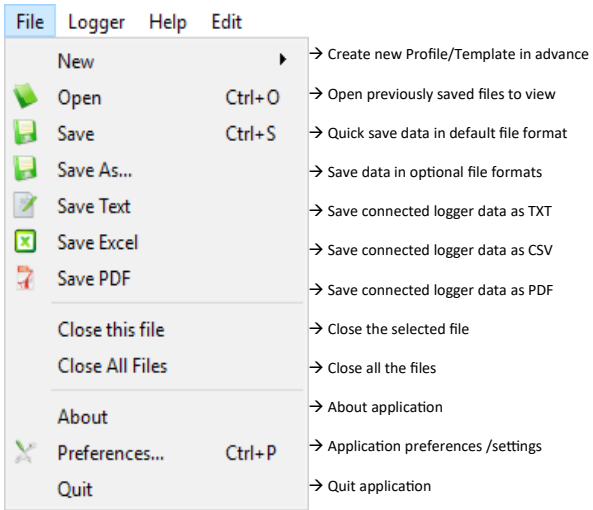


2.3. Data View

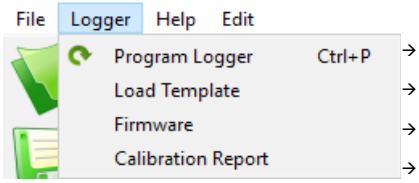
Fully customizable summary view of the data including the logger configuration, the alarms status, statistics and data.



2.4. Menu

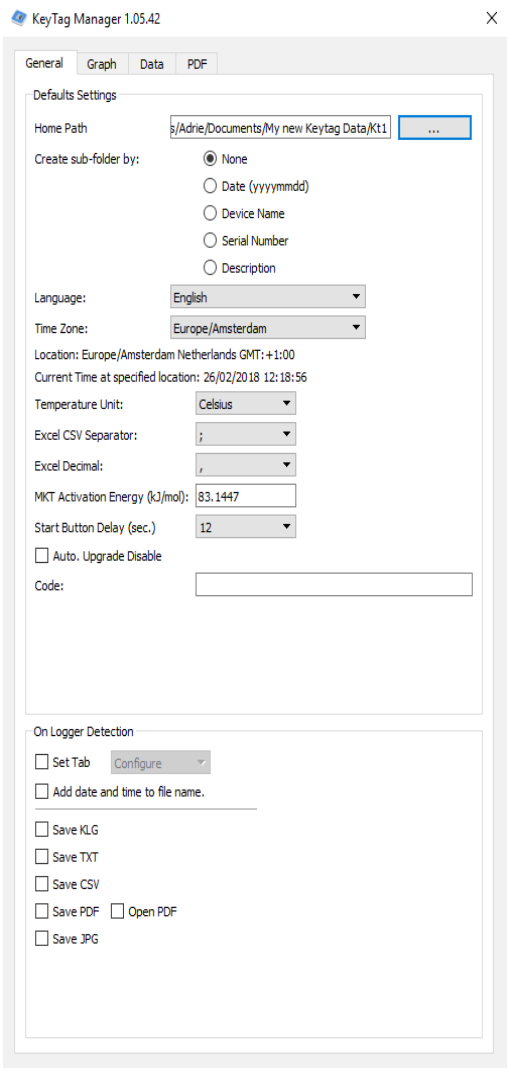


→ Create new Profile/Template in advance
→ Open previously saved files to view
→ Quick save data in default file format
→ Save data in optional file formats
→ Save connected logger data as TXT
→ Save connected logger data as CSV
→ Save connected logger data as PDF
→ Close the selected file
→ Close all the files
→ About application
→ Application preferences /settings
→ Quit application



→ Configure the connected logger
→ Fetch template to quick program
→ Upgrade Firmware of connected unit
→ Open the Calibration Report

2.5. Preferences General Tab



Home Path: Select the default directory where files will be saved.
Create sub-folder by: Files will be saved in the following folder:

- **None:** Home Path.
- **Date:** Named after the current date.
- **Device Name:** Named logger's name.
- **Serial Number:** Named after logger's serial.
- **Description:** Named after logger's description.

Language: Current language.
Time Zone: Selection based on country/city or UTC format.
Temperature Units: Selection Celsius/Fahrenheit.
Excel CSV Separator: Select the default separator character used in the CSV generation files.
Excel Decimal: Select the default decimal character.
MKT Activation Energy: Set the activation energy value.

MKT is expressed as:

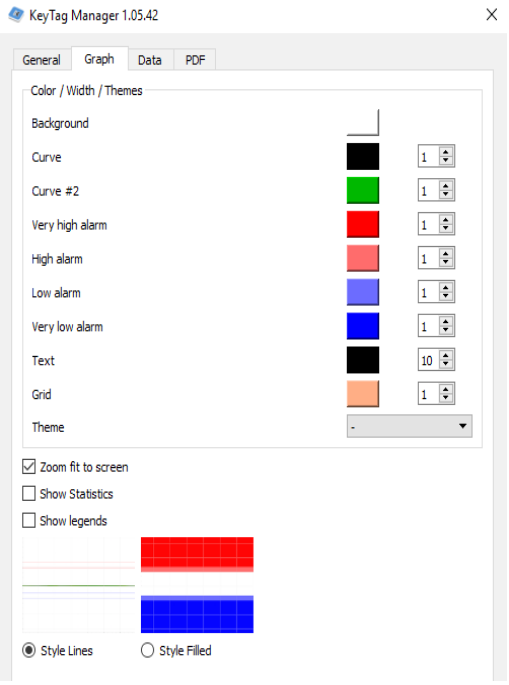
$$\frac{\Delta H/R}{-ln\left(\frac{e^{-\Delta H/RT1} + e^{-\Delta H/RT2} + \ldots + e^{-\Delta H/RTn}}{n}\right)}$$

Where.
ΔH = activation energy (typically from 60 to 100 kJ/mol for solids and liquids)
R = 8.314472 J/mol-K (universal gas constant)
T = temperature in degrees K
n = the number of sample periods over which data is collected

Note : ln is the natural log and e^x is the natural log base.

Start Button Delay (sec): This is the delay the Start button has to be pressed and held for the Kt1 series data loggers.
Auto. Upgrade Disable: Prevent the communicate with KeyTag's server to check the current version.
On Logger Detection: Auto generate and save the desired file format in the default folder, as soon as the logger is connected.

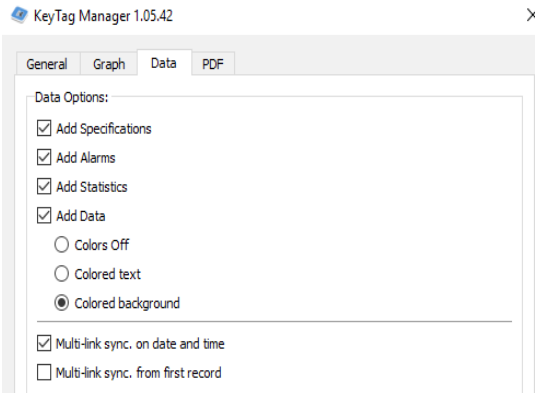
2.6. Preferences Graph Tab



Color/Width/Themes: Customize all aspects of the graph such as background/traces color and thickness.
Theme: Three preset themes to choose from. Options are: white, gray and black.
Zoom fit to screen: Default zoom for the graph to fit all data onto one screen.
Show Statistics: Show the basic statistics (max, average, min..) on the graph.
Show legends: Show the name of each sensors in a legend at the top right of the graph.
Style Lines: Select the alarm thresholds shown as lines or areas.

2.7. Preferences Data Tab

Select the information needed to be viewed in the data window.

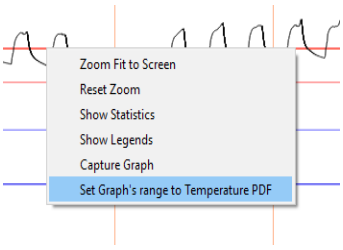


Add Specifications: Add the device and configurations information.
Add Alarms: Add the alarms settings such as thresholds, delays.
Add Statistics: Add the basic statistics information such as min, average, max, MKT.
Add Data: Add the recorded data using the following colors:
Colors Off: not colored.
Colored text: foreground used the alarm's color.
Colored background: background used the alarm's color.
Multi-link sync. on date and time: When multiple files are opened, the data are synchronized according the recording date and time.
Multi-link sync. from first record: When multiple files are opened, the data are synchronized with their first record.

2.8. Preferences PDF Tab

Customize PDF generated by data logger and by KeyTag Manager according to requirement.
Chose graph colors for alarms, curve and alarm lines thickness.

PDF Color/Width: Customize the curve and alarm's thresholds color and thickness.
PDF X & Y ranges: In this section, it is possible to set the PDF's graph limits by adjusting Start / Stop and Min / Max.
The data can be entered manually or by a simple click on the button "Get Range from Graph" that will calculate the limits from the current graph's view.
A right click from the graph will open a popup menu with: "Set Graph's range to Temperature PDF" that will also calculate the limites from the current graph's view.



PDF Options: Select which data you would like to be added in the PDF generated by the application.

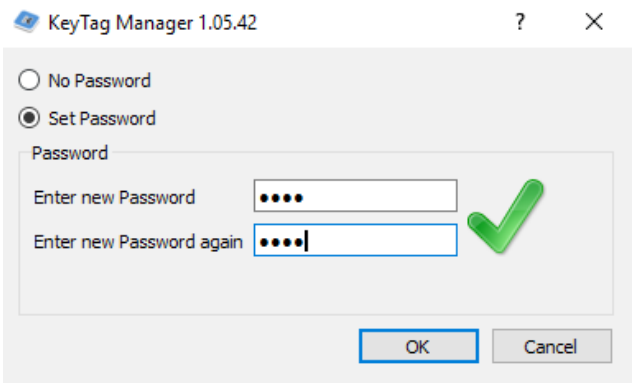
3. Configuration

3.1. General Settings

Device Name: Data Logger's model.
Firmware Version: Data Logger's firmware version.
Serial Number: Data Logger's unique serial number.
Calibration Report: If exist, it opens the online Calibration Certificate directly from the default web browser.
Description: User description. The length of this field is related to the connected device specifications.
Password: User's Password.

3.2. Password

This password protection, if activated, prevent the connected logger to be configured.
To set a password protection on the connected logger:
Click on the "Edit" button:
Set the radio button: "Set Password".
Enter the new password twice, until the green check indicating that the new password is set.

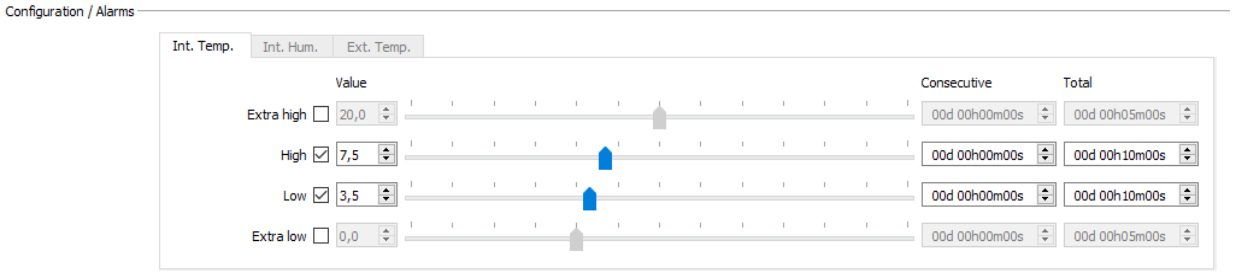


The new password is now set. The logger can be configured. This password will be written into the logger.
When this logger with a password is reconnected, all the configuration controls are disabled including the configure button. Until the right password is entered.
To remove the password protection, click the "Edit" button and set the radio button: "No Password", then configure the logger.

3.3. Alarms

Up to four alarm thresholds with smart delay management.
Each alarm threshold has a consecutive and/or a total delay before alarm.
The resolution of the alarms thresholds is 0.1°C in the whole range of the connected data logger.
Alarms can be enabled or disabled using the checkbox button. Therefore it is possible to configure a data logger without any alarm, or with 1, 2, 3 or up to 4 alarms thresholds.

The alarm thresholds are inclusive:
ex: High Alarm Temperature >= 7.5°C is out of specification.
ex: Low Alarm Temperature <= 3.5°C is out of specification.



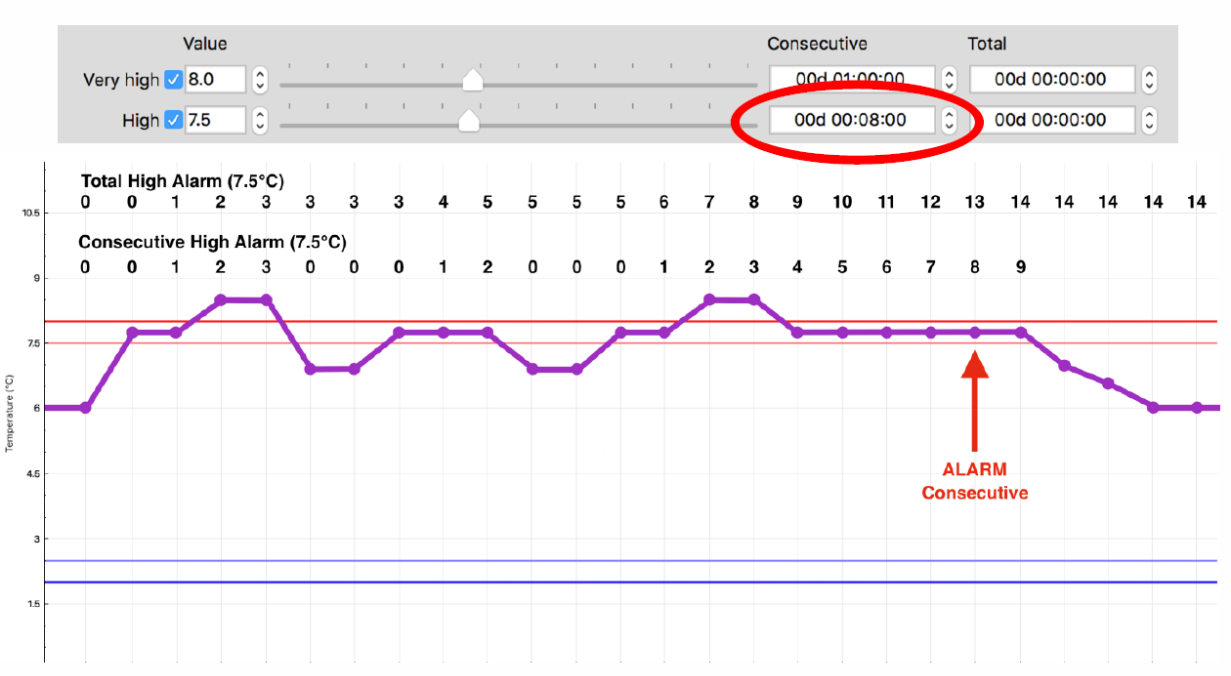
3.4. Delay before alarm

The delay before alarm is the mechanism that triggers the alarm according to the preset sensor value, the duration of "out of specification," and the type of delay.

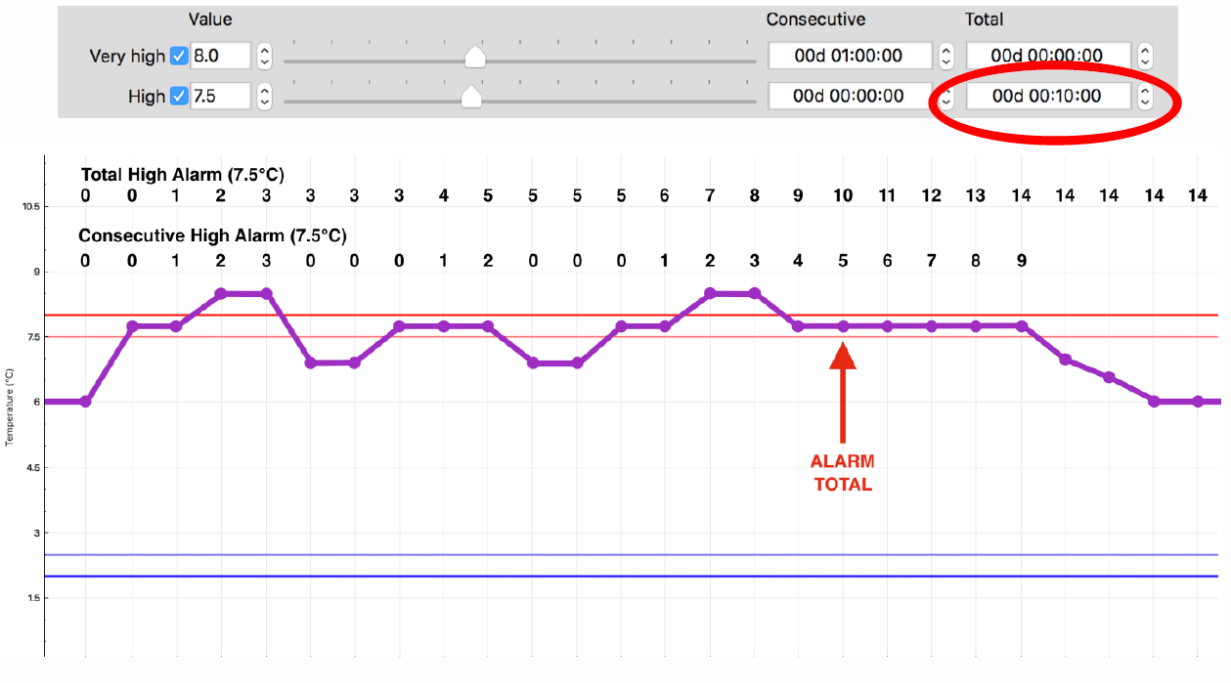
The consecutive alarm delay is a counter that tracks the duration between when the sensor value is above or below the alarm threshold (above for high and extra high alarm, and below for low and extra low). If the sensor value comes back to normal before it has reached the consecutive delay, this counter is reset to zero. This consecutive alarm delay will trigger an alarm if this one is out of specification for the set duration without going back to normal. If set to zero, this delay is disabled.

The total alarm delay is a counter that counts the duration of when the sensor value is above or below the alarm threshold (above for high and extra high alarm, and below for low and extra low).
If the sensor value comes back to normal before it has reached the consecutive delay, this counter is not reset to zero. It will maintain the out of specification duration and restart counting when the sensor value will go again out of specification. This total alarm delay will trigger an alarm as soon as the expired time of all added violations has reached the set duration. If set to zero, this delay is disabled.

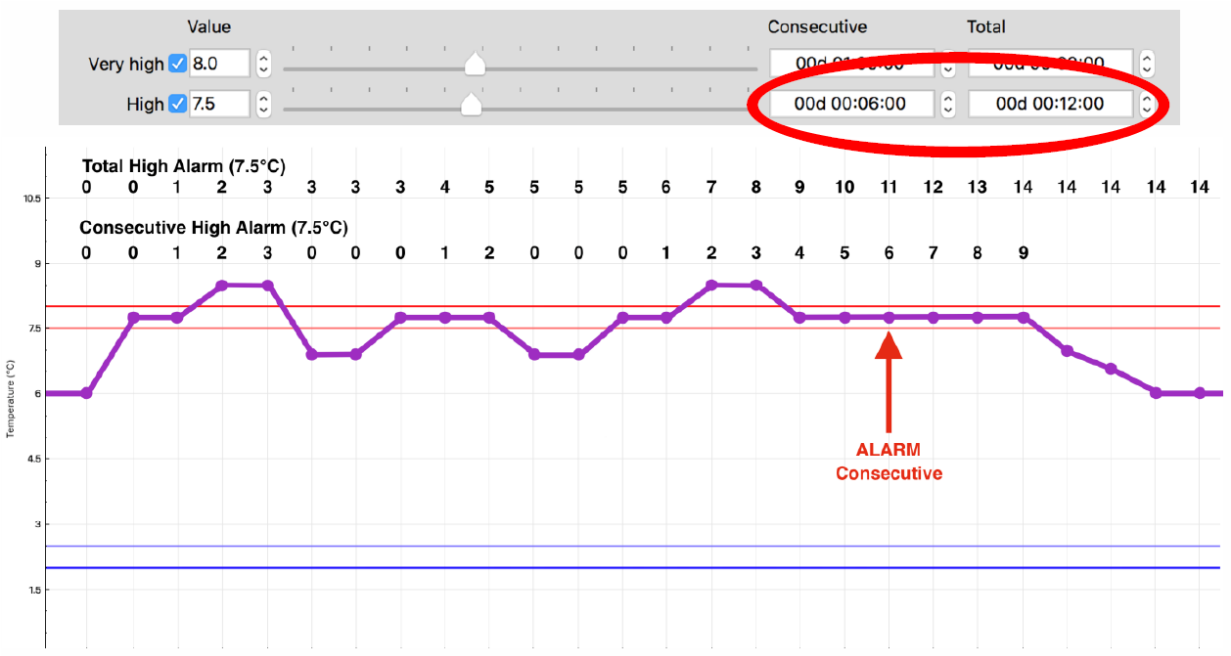
Example: High alarm threshold set to 7.5°C with a consecutive delay of 8 minutes and no total alarm. The sampling rate is 1 minute. The alarm is triggered when the consecutive delay reaches 8 minutes. As we can see in this example, the counter is reset to zero twice when the temperature goes below 7.5°C.



Example: High alarm threshold set to 7.5°C with a total delay of 10 minutes and no consecutive delay. The sampling rate is 1 minute. The alarm is triggered when the total delay reaches 10 minutes. As we can see in this example, the counter stopped counting when the temperature goes back below 7.5°C and continues when above 7.5°C.



Example: High alarm threshold set to 7.5°C with a consecutive delay of 6 minutes and a total delay of 12 minutes. The sampling rate is 1 minute. In this scenario we have both, the consecutive, and the total delay set respectively to 6 and 12 minutes. In that example, the alarm is triggered when the consecutive delay reaches 6 minutes.



3.5. Start, Stop and Sampling rate

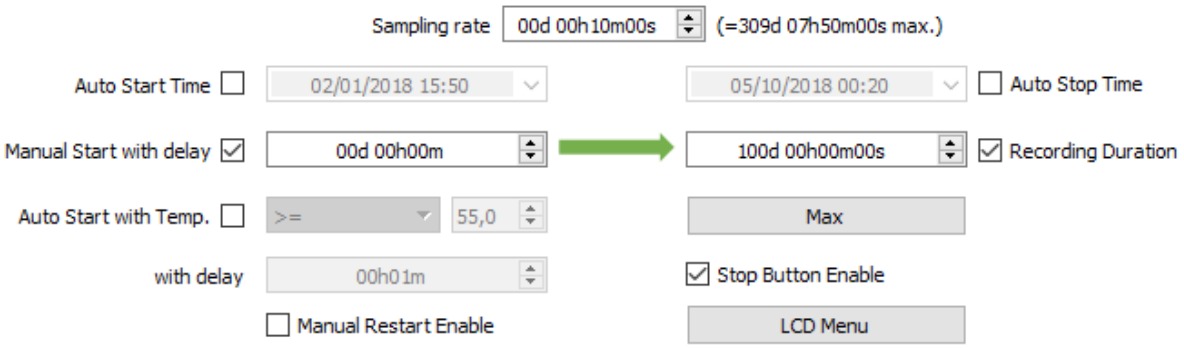
The sampling rate is the record period. The delay between when each record is stored in memory.
A KeyTag logger can start and stop in different ways:

- Manual start pressing the Start button; with or without delay.
- Automatic start at a preset date and time.
- Automatic start when a preset temperature threshold is achieved with a consecutive delay.
- Automatic stop after a record duration.
- Automatic stop at a desired time and date.

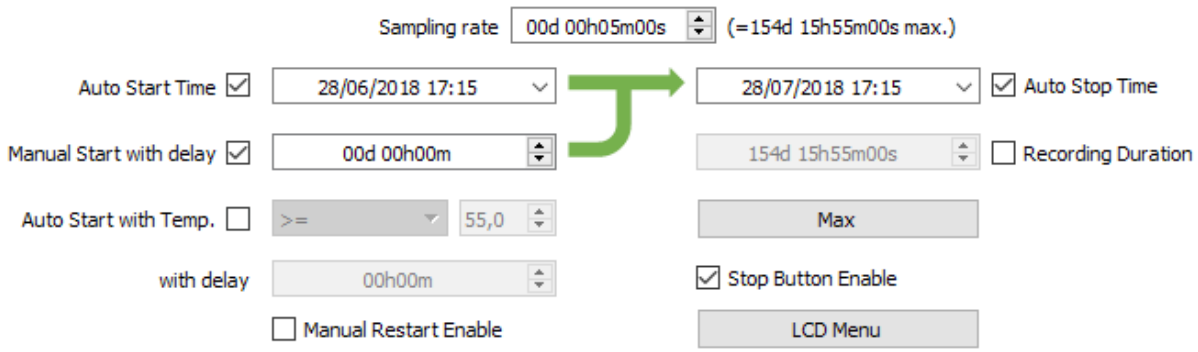
Manual and automatic start can be enabled at the same time. In this particular case the logger will start automatically at the desired time and date, but user can override this by pressing the start button manually.

Sampling rate:	from 5 seconds to 24H.
Manual Start with delay:	enable/disable the manual start by pressing the start button with/without delay up to 99 days. The delay is a period of time where the logger is not yet recording, but waiting. This delay is commonly used when the device is placed in a cooler and it needs a certain time to cool down to the product's temperature. This will avoid false alarms.
Auto Start Time:	enable/disable the automatic start at a preset date and time.
Auto Stop Time:	enable/disable the automatic stop at a preset date and time.
Auto Start Temp. with delay:	enable/disable the automatic start with a temperature threshold with/without consecutive delay.
Record Duration:	enable/disable the stop after a total record duration. From 5 seconds to 1 year.
Max button:	Automatically set the record duration to its maximum according to the connected device's memory capacity.

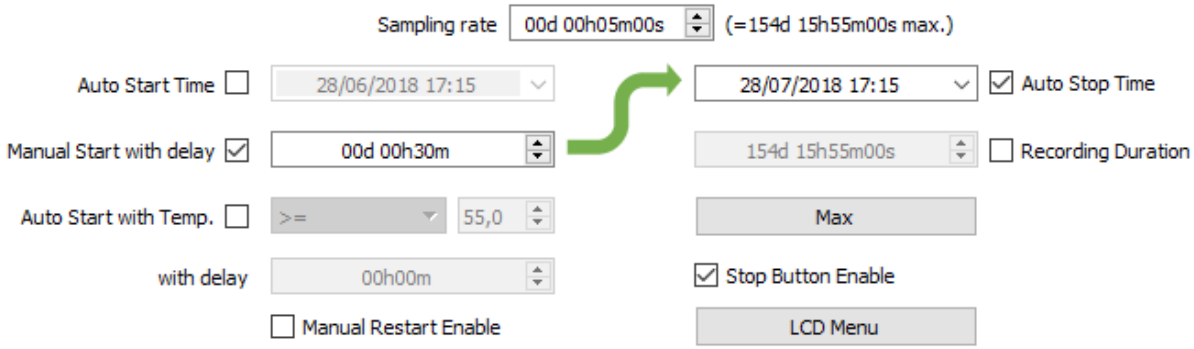
In this example, the logger will start manually by pressing the start button without any delay.
The sampling rate is 10 minutes and the logger will stop automatically after 100 days.



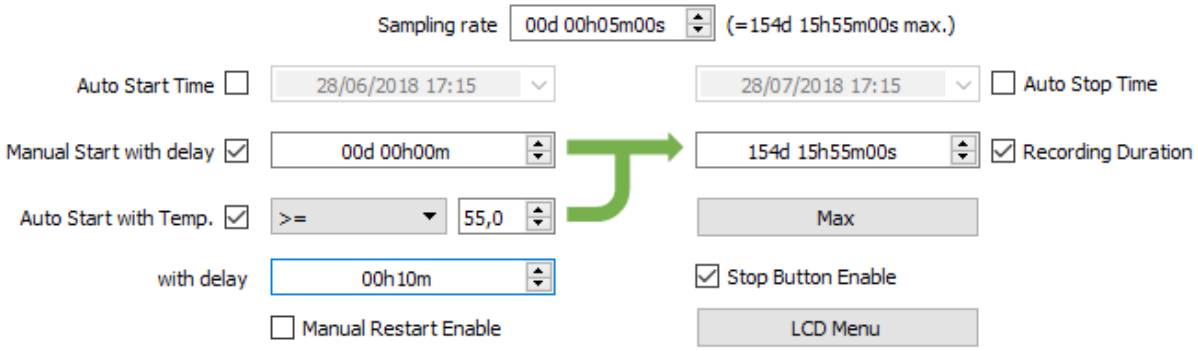
In this example, the logger will start automatically at 17H15 on June 28th 2018.
It can also be started manually by pressing the start button without any delay.
The sampling rate is 5 minutes and the logger will stop automatically at 17H15 on July 28, 2018.



In this example, the logger will start manually by pressing the start button with a delay of 30 minutes. The sampling rate is 5 minutes and the logger will stop automatically at 17H15 on June 28, 2018.



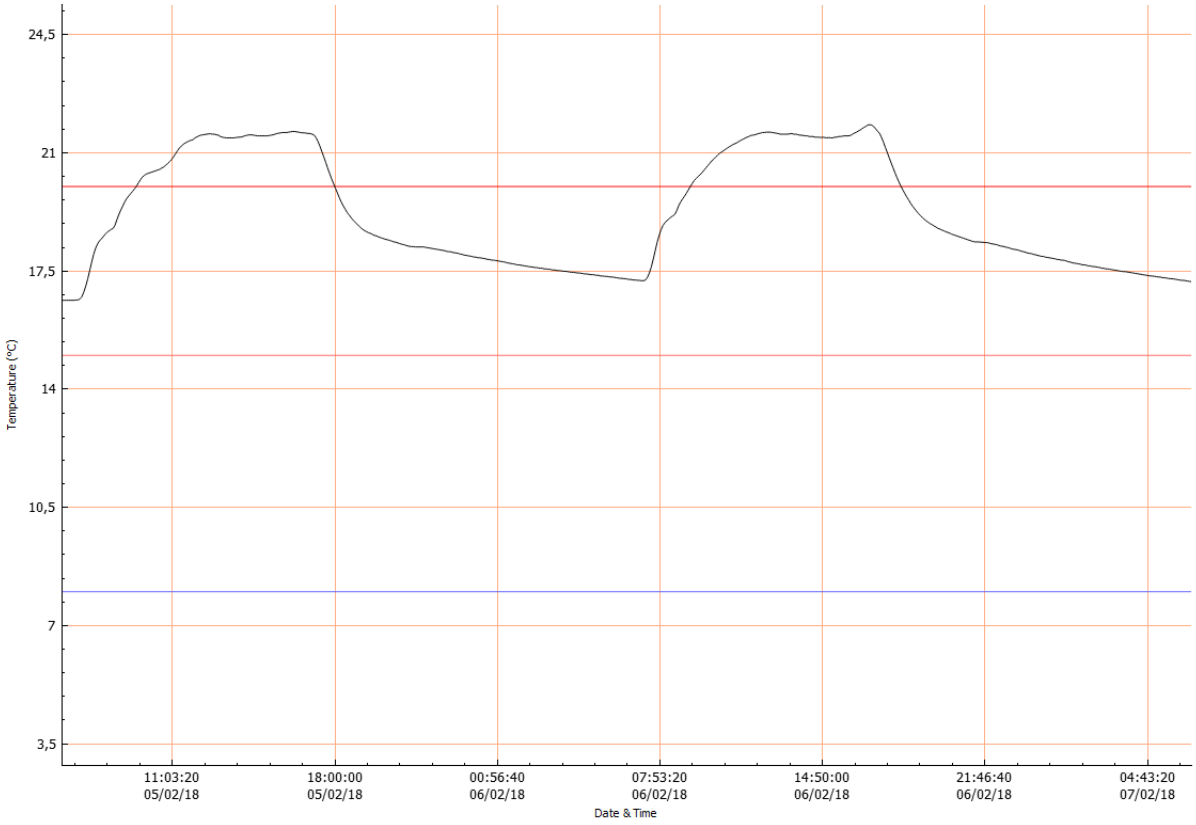
In this example, the logger will start manually by pressing the start button without any delay,
or will start automatically if the temperature is greater or equal to 55°C for 10 minutes consecutive. The sampling rate is 5 minutes and the logger will stop automatically after 154 days, 15 hours and 55 minutes.



4. Graph

4.1. Presentation

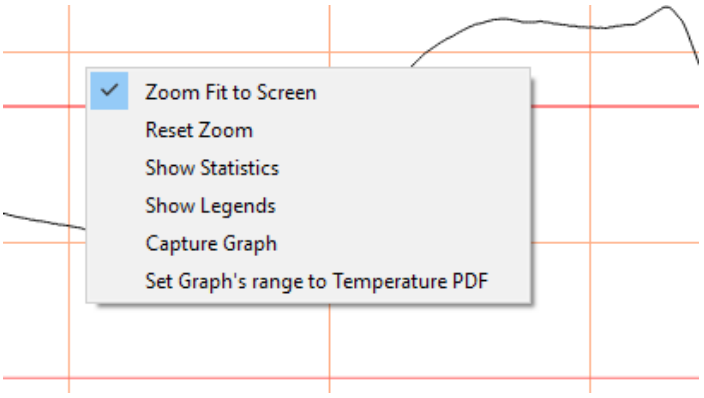
The graph tool is a smart, fast, and smooth graphic interface to navigate, isolate, and view all the relevant information in the records. The appearance is also customizable from the Settings/Graph section.



4.2. Navigation

- Mouse left click and hold to move the graph.
- Mouse scroll wheel or two fingers slide for Mac users to zoom in and out.
- Select the X or Y axis to zoom vertically or horizontally.
- Mouse right click to open a quick pop-up menu.

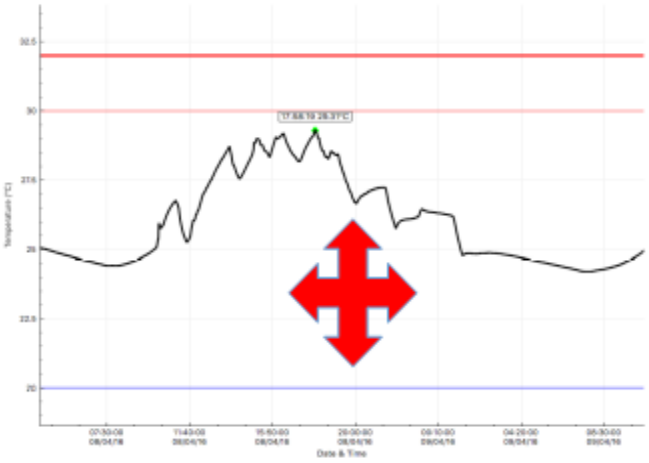
  Zoom Fit to Screen: Adjust the vertical axis to fit the graph or keep the full sensor range.
  Reset Zoom: Go back to the initial zoom.
  Show Statistics: Show the minimum, average, and maximum value pointed with arrows.
  Capture Graph: Copy the graph into the clipboard.



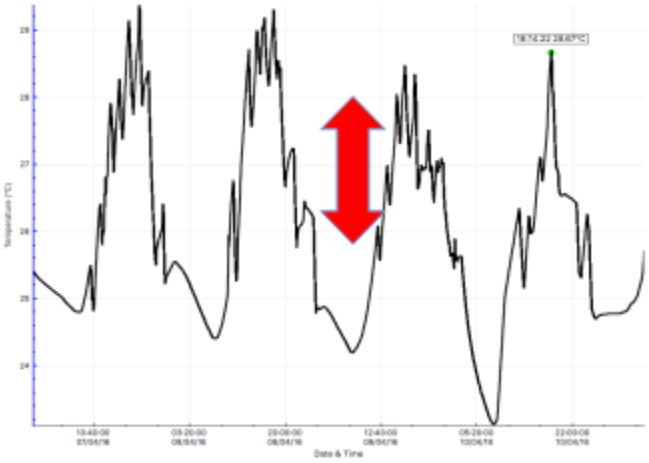
4.3. Zoom

This powerful zoom function allows zooming in and out on both X and Y axes, and also to select the desired axis for zooming only on one axis, X or Y.

The default zoom works on X & Y axes.

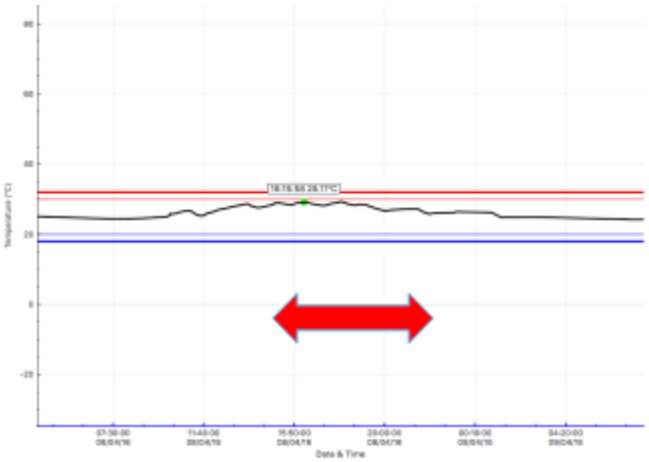


Select the Y axis to set the zoom mode only on the Y axis.



Click anywhere inside the graph to deselect the X or Y zoom mode.

Select the X axis to set the zoom mode only on the X axis.



5. Data

5.1. Presentation

The data section is a customizable summary containing all the configuration, statistics, alarm status and recorded data. This summary is composed of four sections that can be enabled or disabled from the Settings/Data section:

1. Specification and Configuration.
2. Alarms.
3. Summary and Statistics.
4. Data.

#	Elapsed	Time	Internal T.°C
Specification & Configuration			
Device Name:			ktlLcdMu
Serial Number:			LM630003
Time Zone:			GMT:+1:00
Firmware Version:			1.26E
Description:			Koeling
Trip Number:			11
Trips Remaining:			Multiple:
Temp. Unit:			Celsius
Temp. Range:			-40 to +80°C
Battery:			3.00V - 100%
Total Records:			7823
Sampling Rate:			00:05:00
Start Delay:			00:05:00
Start Time:			Parameter not set
Stop Time:			Parameter not set
Recording Duration:			027d 03h50m00s
Calibration Due:			22/02/2018
Alarms (Time above / below Al...			
Extra High Alarm:			+20.00°C
Extra High Consecutive delay before alarm:			00:00:00
Extra High Total delay before alarm:			00:05:00
Extra High Out of Specification:			07d 23:35:00
High Alarm:			+15.00°C
High Consecutive delay before alarm:			00:00:00
High Total delay before alarm:			00:10:00
High Out of Specification:			27d 03:50:00
Low Alarm:			+8.00°C
Low Consecutive delay before alarm:			+8.00°C
Low Total delay before alarm:			00:10:00
Low Out of Specification:			
Extra Low Alarm:			+0.00°C
Extra Low Consecutive delay before alarm:			00:00:00
Extra Low Total delay before alarm:			00:05:00
Extra Low Out of Specification:			

Summary / Statistics			
Maximum Temperature:			+24.30°C
Minimum Temperature:			+15.65°C
Average Temperature:			+18.95°C
Mean Kinetic Temperature:			+18.94°C
Active Bookmarks:			0
Started by:			
Stopped by:			
Status:			Recording
Trip Duration:			27d 03:50:00
Time within Specifications:			00:00:00
Started Time:			31/01/18 09:26:22
Stopped Time:			
Memory Used:			17% 7823/44543
Downloaded at:			27/02/18 13:22:16
Data			
1	000 00:00:00	31/01/2018 09:26:22	23.36
2	000 00:05:00	31/01/2018 09:31:22	22.83
3	000 00:10:00	31/01/2018 09:36:22	22.56
4	000 00:15:00	31/01/2018 09:41:22	22.42
5	000 00:20:00	31/01/2018 09:46:22	22.38

5.2. Specification and Configuration

Full summary including device information and configuration.

#	Elapsed	Time	Internal T.°C
Specification & Configuration			
Device Name:			ktlLcdMu
Serial Number:			LM630003
Time Zone:			GMT:+1:00
Firmware Version:			1.26E
Description:			Koeling
Trip Number:			11
Trips Remaining:			Multiple:
Temp. Unit:			Celsius
Temp. Range:			-40 to +80°C
Battery:			3.00V - 100%
Total Records:			7823
Sampling Rate:			00:05:00
Start Delay:			00:05:00
Start Time:			Parameter not set
Stop Time:			Parameter not set
Recording Duration:			027d 03h50m00s
Calibration Due:			22/02/2018

Device Name: Data Logger's model. Read only.
Serial Number: Data Logger's unique serial number.
Time Zone: Selected time zone during the configuration + DST (Daylight Saving Time).
Firmware Version: Current logger's firmware version.
Description: Data Logger's description.
Trip Number: This is the trip counter. Counted at each logger's Start. Read only.
Trips Remaining: Indicates the remaining number of trips available or Multiple for multi-use loggers.
Temp. Unit: Selected unit of measure for temperature (Celsius or Fahrenheit) during the configuration.
Temp. Range: This is the logger's sensor range. In this example this is a temperature sensor with a range from -40°C to +80°C.
Battery: Current battery voltage and power level indication in percentage.
Total Records: Current number of records stored in the logger's memory.
Sampling Rate: Configured time period between each record sampling.
Start Delay: Configured manual start delay.
Start Time: Automatic configuration start time and date.
Stop Time: Automatic configuration stop time and date.
Record Duration: Total configuration record duration.

5.3. Alarms

Full summary including alarms information and configuration.

Alarms (Time above / below Al...	
Extra High Alarm:	+20.00°C
Extra High Consecutive delay before alarm:	00:00:00
Extra High Total delay before alarm:	00:05:00
Extra High Out of Specification:	07d 23:35:00
High Alarm:	+15.00°C
High Consecutive delay before alarm:	00:00:00
High Total delay before alarm:	00:10:00
High Out of Specification:	27d 03:50:00
Low Alarm:	+8.00°C
Low Consecutive delay before alarm:	+8.00°C
Low Total delay before alarm:	00:10:00
Low Out of Specification:	
Extra Low Alarm:	+0.00°C
Extra Low Consecutive delay before alarm:	00:00:00
Extra Low Total delay before alarm:	00:05:00
Extra Low Out of Specification:	

Extra High Alarm: Configuration threshold for the extra high alarm.

Extra High Consecutive delay before alarm: Consecutive delay above the extra high threshold before the extra high alarm is triggered.

Extra High Total delay before alarm: Cumulative delay above the extra high threshold before the extra high alarm is triggered.

Extra High Out of Specification: Total duration above the extra high threshold.

High Alarm: Configuration threshold for the high alarm.

High Consecutive delay before alarm: Consecutive delay above the high threshold before the high alarm is triggered.

High Total delay before alarm: Cumulative delay above the high threshold before the high alarm is triggered.

High Out of Specification: Total duration above the high threshold.

Low Alarm: Configuration threshold for the low alarm.

Low Consecutive delay before alarm: Consecutive delay below the low threshold before the low alarm is triggered.

Low Total delay before alarm: Cumulative delay below the low threshold before the low alarm is triggered.

Low Out of Specification: Total duration below the low threshold.

Extra Low Alarm: Configuration threshold for the extra low alarm.

Extra Low Consecutive delay before alarm: Consecutive delay below the extra low threshold before the extra low alarm is triggered.

Extra Low Total delay before alarm: Cumulative delay below the extra low threshold before the very low alarm is triggered.

Extra Low Out of Specification: Total duration below the extra low threshold.

5.4. Summary and Statistics

Summary regarding the trip statistics, duration and times.

Summary / Statistics	
Maximum Temperature:	+24.30°C
Minimum Temperature:	+15.65°C
Average Temperature:	+18.95°C
Mean Kinetic Temperature:	+18.94°C
Active Bookmarks:	0
Started by:	
Stopped by:	
Status:	Recording
Trip Duration:	27d 03:50:00
Time within Specifications:	00:00:00
Started Time:	31/01/18 09:26:22
Stopped Time:	
Memory Used:	17% 7823/44543
Downloaded at:	27/02/18 13:22:16

Maximum Temperature: Maximum temperature during the whole trip.

Minimum Temperature: Minimum temperature during the whole trip.

Average Temperature: Average temperature during the whole trip.

Mean Kinetic Temperature: MKT of the whole trip using the activation energy set during the configuration.

Active Bookmarks: Number of marker, manually activated by the users.

Started by: How the logger has been started:

- Manual: by pressing the Start button.
- Start Timer: by automatic start with time and date.
- Temperature: by automatic start on temperature threshold.

Stopped by: How the logger has been stopped:

- Manual: by pressing the Stop button.
- Memory full: the logger reached it maximum memory capacity.
- Reset: the logger went to reset.
- Stop Timer: by automatic stop with time and date.

Status: Current status of the logger:

- Ready: Logger is configured and ready to be started.
- In Start Delay: Logger has been started and actually in started delay countdown.
- Recording: Logger is started in recording.
- Stopped: Logger is not recording anymore. This is end of the trip.

Trip Duration: Current trip duration from the first to the last record.

Time within Specifications: Total duration within the alarm thresholds. (No alarms).

Started Time: Date and Time of the first record.

Stopped Time: Date and Time of the last record when the trip is finished.

Memory Used: Indicate the memory usage in % and the number of record in memory/memory size.

Downloaded at: Date and Time of the logger's download.

5.5. Data

The data table contains the records with time stamps.

#	Elapsed	Time	Internal T.°C
Data			
1	000 00:00:00	31/01/2018 09:26:22	23.36
2	000 00:05:00	31/01/2018 09:31:22	22.83
3	000 00:10:00	31/01/2018 09:36:22	22.56
4	000 00:15:00	31/01/2018 09:41:22	22.42
5	000 00:20:00	31/01/2018 09:46:22	22.38
6	000 00:25:00	31/01/2018 09:51:22	22.37
7	000 00:30:00	31/01/2018 09:56:22	22.40
8	000 00:35:00	31/01/2018 10:01:22	22.45
9	000 00:40:00	31/01/2018 10:06:22	22.50
10	000 00:45:00	31/01/2018 10:11:22	22.53
11	000 00:50:00	31/01/2018 10:16:22	22.55

#: Record number starting from #1.

Elapsed: Elapsed time from the first record ddd HH:MM:SS.

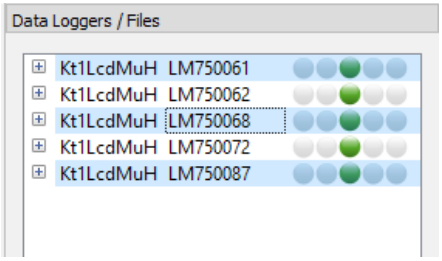
- ddd: days
- HH: hours
- MM: minutes
- SS: seconds

Time: Record's date and time based on the configuration's time zone.

Internal T.°C Sensor identification in preset temperature unit. (ex: Internal Temperature in degree Celsius).

5.6. Multi-link

When multiple files are selected simultaneously, the DATA Tab contains each selected loggers in columns next to each other's.
To select multiple file keep "Control" button pressed while the files are selected. Or the "Command" button for MAC.
Data are synchronized accordingly to the Multi-ling sync. in the Data Tab of the Settings: (See: ¶3.7).



#	Elapsed	Time	LM750061	LM750068	LM750087
Specification & Configuration					
Device Name:			Kt1LcdMuH	Kt1LcdMuH	Kt1LcdMuH
Serial Number:			LM750061	LM750068	LM750087
Time Zone:			GMT:+1:00	GMT:+1:00	GMT:+1:00
Firmware Version:			1.26E	1.26E	1.26E
Description:					
Trip Number:			1	1	1
Trips Remaining:			Multiple:	Multiple:	Multiple:
Temp. Unit: / Hum. Unit:			Celsius	Celsius	Celsius
Temp. Range: / Hum. Range:			-40 to +80°C	-40 to +80°C	-40 to +80°C
Battery:			3.00V - 100%	3.00V - 100%	3.00V - 100%
Total Records:			3841	3842	3841
Sampling Rate:			30 sec	30 sec	30 sec
Start Delay:			0 sec	0 sec	0 sec
Start Time:			Parameter not set	Parameter not set	Parameter not set
Stop Time:			Parameter not set	Parameter not set	Parameter not set
Recording Duration:			001d 08h00m00s	001d 08h00m30s	001d 08h00m00s
Calibration Due:			02/01/2018	02/01/2018	02/01/2018
Alarms (Time above / below Al...					
Extra High Alarm:			not set	not set	not set
Extra High Consecutive delay before alarm:			not set	not set	not set
Extra High Total delay before alarm:			not set	not set	not set
Extra High Out of Specification:					
High Alarm:			not set	not set	not set
High Consecutive delay before alarm:			not set	not set	not set
High Total delay before alarm:			not set	not set	not set
High Out of Specification:					
Low Alarm:			not set	not set	not set
Low Consecutive delay before alarm:			not set	not set	not set
Low Total delay before alarm:			not set	not set	not set
Low Out of Specification:					
Extra Low Alarm:			not set	not set	not set
Extra Low Consecutive delay before alarm:			not set	not set	not set
Extra Low Total delay before alarm:			not set	not set	not set
Extra Low Out of Specification:					
Summary / Statistics					
Maximum Temperature:			+60.75°C	+60.96°C	+60.15°C
Minimum Temperature:			-39.94°C	-40.56°C	-40.07°C
Average Temperature:			+16.93°C	+12.83°C	+16.83°C
Mean Kinetic Temperature:			+15.40°C	+9.94°C	+15.31°C
Active Bookmarks:			0	0	0

6. Reports Generation

6.1. KLG Files

KLG is Keylog's proprietary file format, which contains:

- The data logger information such as type, serial, firmware version.
- The configuration menus including the start and stop conditions, alarms settings.
- All the records.

This file can be saved manually or automatically when the logger is connected.
The data can be accessed after multiple generations/uses of the logger. All data is maintained until the maximum capacity is reached. This allows the generation of reports without having the logger connected.

6.2. TXT Files

The generated TXT file is basic text file coded with standard ASCII characters and use a TAB character as a separator.

Contains in columns:

- **#:** Record number starting from #1.
- **Elapsed:** Elapsed time from the first record ddd HH:MM:SS.
  - ddd: days
  - HH: hours
  - MM: minutes
  - SS: seconds
- **Time:** Records date and time based on the configuration's time zone.
- **Internal T.°C** Sensor identification and temperature unit. (ex: Internal Temperature in degree Celsius).

Bestand Bewerken Opmaak Beeld Help

#	Elapsed	Date	Time	Internal T.°C
1	000 00:00:00	31/01/2018	09:26:22	23.36
2	000 00:05:00	31/01/2018	09:31:22	22.83
3	000 00:10:00	31/01/2018	09:36:22	22.56
4	000 00:15:00	31/01/2018	09:41:22	22.42
5	000 00:20:00	31/01/2018	09:46:22	22.38
6	000 00:25:00	31/01/2018	09:51:22	22.37
7	000 00:30:00	31/01/2018	09:56:22	22.40
8	000 00:35:00	31/01/2018	10:01:22	22.45
9	000 00:40:00	31/01/2018	10:06:22	22.50
10	000 00:45:00	31/01/2018	10:11:22	22.53
11	000 00:50:00	31/01/2018	10:16:22	22.55

6.3. CSV Files

The generated CSV file is a standard Excel format coded with ASCII characters and using a specific character for the column separation. This separator character in accessible from the Settings/General. This is also the default separator if different in some countries.
Ex. Europe uses";"semicolon while USA uses "," comma.

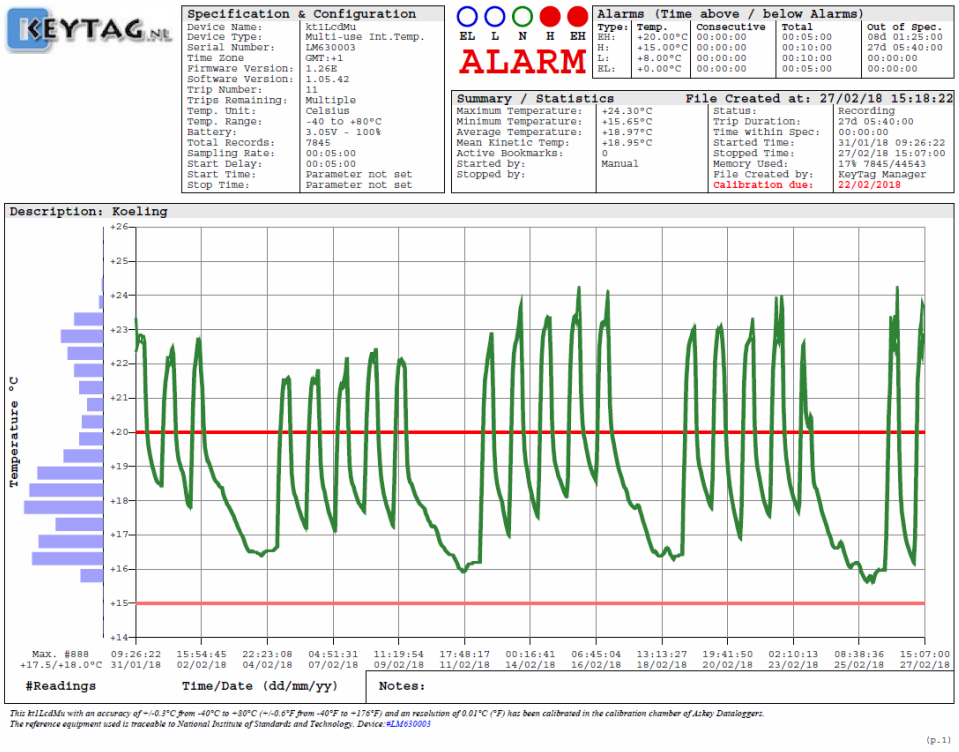
Contains in columns:

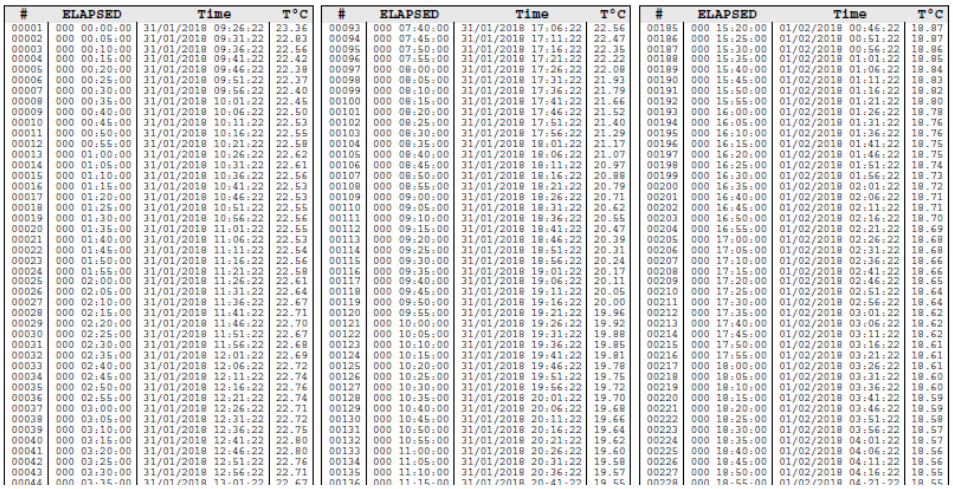
- **#:** Record number starting from #1.
- **Elapsed:** Elapsed time from the first record ddd HH:MM:SS.
  - ddd: days
  - HH: hours
  - MM: minutes
  - SS: seconds
- **Time:** Records date and time based on the configuration's time zone.
- **Internal T.°C** Sensor identification and temperature unit. (ex: Internal Temperature in degree Celsius).

	A	B	C	D	E
1	#	Elapsed	Date	Time	Internal T,°C
2	1	000 00:00:00	31/01/2018	09:26:22	23,36
3	2	000 00:05:00	31/01/2018	09:31:22	22,83
4	3	000 00:10:00	31/01/2018	09:36:22	22,56
5	4	000 00:15:00	31/01/2018	09:41:22	22,42
6	5	000 00:20:00	31/01/2018	09:46:22	22,38
7	6	000 00:25:00	31/01/2018	09:51:22	22,37
8	7	000 00:30:00	31/01/2018	09:56:22	22,40
9	8	000 00:35:00	31/01/2018	10:01:22	22,45
10	9	000 00:40:00	31/01/2018	10:06:22	22,50
11	10	000 00:45:00	31/01/2018	10:11:22	22,53
12	11	000 00:50:00	31/01/2018	10:16:22	22,55

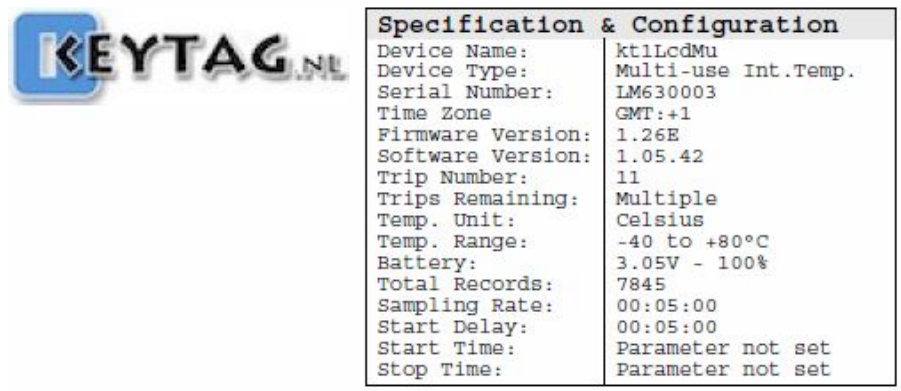
6.4. PDF Files

The generated PDF file contains all the relevant information in regards to the configuration, alarms, statistics, graph, and histogram. This PDF can be customized from the Settings/PDF section, with one page PDF to multiple pages including the data.





#	ELAPSED	Time	T°C
00001	000 00:00:00	31/01/2018 09:26:22	23.36
00002	000 00:05:00	31/01/2018 09:31:22	22.83
00003	000 00:10:00	31/01/2018 09:36:22	22.56
00004	000 00:15:00	31/01/2018 09:41:22	22.42
00005	000 00:20:00	31/01/2018 09:46:22	22.38
00006	000 00:25:00	31/01/2018 09:51:22	22.37
00007	000 00:30:00	31/01/2018 09:56:22	22.40
00008	000 00:35:00	31/01/2018 10:01:22	22.45
00009	000 00:40:00	31/01/2018 10:06:22	22.50
00010	000 00:45:00	31/01/2018 10:11:22	22.53
00011	000 00:50:00	31/01/2018 10:16:22	22.55
00012	000 00:55:00	31/01/2018 10:21:22	22.58
00013	000 01:00:00	31/01/2018 10:26:22	22.62
00014	000 01:05:00	31/01/2018 10:31:22	22.61
00015	000 01:10:00	31/01/2018 10:36:22	22.56
00016	000 01:15:00	31/01/2018 10:41:22	22.53
00017	000 01:20:00	31/01/2018 10:46:22	22.53
00018	000 01:25:00	31/01/2018 10:51:22	22.55
00019	000 01:30:00	31/01/2018 10:56:22	22.56
00020	000 01:35:00	31/01/2018 11:01:22	22.55
00021	000 01:40:00	31/01/2018 11:06:22	22.53
00022	000 01:45:00	31/01/2018 11:11:22	22.54
00023	000 01:50:00	31/01/2018 11:16:22	22.56
00024	000 01:55:00	31/01/2018 11:21:22	22.58
00025	000 02:00:00	31/01/2018 11:26:22	22.61
00026	000 02:05:00	31/01/2018 11:31:22	22.64
00027	000 02:10:00	31/01/2018 11:36:22	22.67
00028	000 02:15:00	31/01/2018 11:41:22	22.71
00029	000 02:20:00	31/01/2018 11:46:22	22.70
00030	000 02:25:00	31/01/2018 11:51:22	22.67
00031	000 02:30:00	31/01/2018 11:56:22	22.68
00032	000 02:35:00	31/01/2018 12:01:22	22.69
00033	000 02:40:00	31/01/2018 12:06:22	22.72
00034	000 02:45:00	31/01/2018 12:11:22	22.74
00035	000 02:50:00	31/01/2018 12:16:22	22.76
00036	000 02:55:00	31/01/2018 12:21:22	22.74
00037	000 03:00:00	31/01/2018 12:26:22	22.71
00038	000 03:05:00	31/01/2018 12:31:22	22.72
00039	000 03:10:00	31/01/2018 12:36:22	22.75
00040	000 03:15:00	31/01/2018 12:41:22	22.80
00041	000 03:20:00	31/01/2018 12:46:22	22.80
00042	000 03:25:00	31/01/2018 12:51:22	22.76
00043	000 03:30:00	31/01/2018 12:56:22	22.71
00044	000 03:35:00	31/01/2018 13:01:22	22.67
00093	000 07:40:00	31/01/2018 17:06:22	22.56
00094	000 07:45:00	31/01/2018 17:11:22	22.47
00095	000 07:50:00	31/01/2018 17:16:22	22.35
00096	000 07:55:00	31/01/2018 17:21:22	22.22
00097	000 08:00:00	31/01/2018 17:26:22	22.08
00098	000 08:05:00	31/01/2018 17:31:22	21.93
00099	000 08:10:00	31/01/2018 17:36:22	21.79
00100	000 08:15:00	31/01/2018 17:41:22	21.66
00101	000 08:20:00	31/01/2018 17:46:22	21.52
00102	000 08:25:00	31/01/2018 17:51:22	21.40
00103	000 08:30:00	31/01/2018 17:56:22	21.29
00104	000 08:35:00	31/01/2018 18:01:22	21.17
00105	000 08:40:00	31/01/2018 18:06:22	21.07
00106	000 08:45:00	31/01/2018 18:11:22	20.97
00107	000 08:50:00	31/01/2018 18:16:22	20.88
00108	000 08:55:00	31/01/2018 18:21:22	20.79
00109	000 09:00:00	31/01/2018 18:26:22	20.71
00110	000 09:05:00	31/01/2018 18:31:22	20.62
00111	000 09:10:00	31/01/2018 18:36:22	20.55
00112	000 09:15:00	31/01/2018 18:41:22	20.47
00113	000 09:20:00	31/01/2018 18:46:22	20.39
00114	000 09:25:00	31/01/2018 18:51:22	20.31
00115	000 09:30:00	31/01/2018 18:56:22	20.24
00116	000 09:35:00	31/01/2018 19:01:22	20.17
00117	000 09:40:00	31/01/2018 19:06:22	20.11
00118	000 09:45:00	31/01/2018 19:11:22	20.05
00119	000 09:50:00	31/01/2018 19:16:22	20.00
00120	000 09:55:00	31/01/2018 19:21:22	19.96
00121	000 10:00:00	31/01/2018 19:26:22	19.92
00122	000 10:05:00	31/01/2018 19:31:22	19.88
00123	000 10:10:00	31/01/2018 19:36:22	19.85
00124	000 10:15:00	31/01/2018 19:41:22	19.81
00125	000 10:20:00	31/01/2018 19:46:22	19.78
00126	000 10:25:00	31/01/2018 19:51:22	19.75
00127	000 10:30:00	31/01/2018 19:56:22	19.72
00128	000 10:35:00	31/01/2018 20:01:22	19.70
00129	000 10:40:00	31/01/2018 20:06:22	19.68
00130	000 10:45:00	31/01/2018 20:11:22	19.66
00131	000 10:50:00	31/01/2018 20:16:22	19.64
00132	000 10:55:00	31/01/2018 20:21:22	19.62
00133	000 11:00:00	31/01/2018 20:26:22	19.60
00134	000 11:05:00	31/01/2018 20:31:22	19.58
00135	000 11:10:00	31/01/2018 20:36:22	19.57
00136	000 11:15:00	31/01/2018 20:41:22	19.55
00185	000 15:20:00	01/02/2018 00:46:22	18.87
00186	000 15:25:00	01/02/2018 00:51:22	18.87
00187	000 15:30:00	01/02/2018 00:56:22	18.86
00188	000 15:35:00	01/02/2018 01:01:22	18.85
00189	000 15:40:00	01/02/2018 01:06:22	18.84
00190	000 15:45:00	01/02/2018 01:11:22	18.83
00191	000 15:50:00	01/02/2018 01:16:22	18.82
00192	000 15:55:00	01/02/2018 01:21:22	18.80
00193	000 16:00:00	01/02/2018 01:26:22	18.78
00194	000 16:05:00	01/02/2018 01:31:22	18.76
00195	000 16:10:00	01/02/2018 01:36:22	18.76
00196	000 16:15:00	01/02/2018 01:41:22	18.75
00197	000 16:20:00	01/02/2018 01:46:22	18.75
00198	000 16:25:00	01/02/2018 01:51:22	18.74
00199	000 16:30:00	01/02/2018 01:56:22	18.73
00200	000 16:35:00	01/02/2018 02:01:22	18.72
00201	000 16:40:00	01/02/2018 02:06:22	18.71
00202	000 16:45:00	01/02/2018 02:11:22	18.71
00203	000 16:50:00	01/02/2018 02:16:22	18.70
00204	000 16:55:00	01/02/2018 02:21:22	18.69
00205	000 17:00:00	01/02/2018 02:26:22	18.68
00206	000 17:05:00	01/02/2018 02:31:22	18.68
00207	000 17:10:00	01/02/2018 02:36:22	18.66
00208	000 17:15:00	01/02/2018 02:41:22	18.66
00209	000 17:20:00	01/02/2018 02:46:22	18.65
00210	000 17:25:00	01/02/2018 02:51:22	18.64
00211	000 17:30:00	01/02/2018 02:56:22	18.64
00212	000 17:35:00	01/02/2018 03:01:22	18.62
00213	000 17:40:00	01/02/2018 03:06:22	18.62
00214	000 17:45:00	01/02/2018 03:11:22	18.62
00215	000 17:50:00	01/02/2018 03:16:22	18.61
00216	000 17:55:00	01/02/2018 03:21:22	18.61
00217	000 18:00:00	01/02/2018 03:26:22	18.61
00218	000 18:05:00	01/02/2018 03:31:22	18.60
00219	000 18:10:00	01/02/2018 03:36:22	18.60
00220	000 18:15:00	01/02/2018 03:41:22	18.59
00221	000 18:20:00	01/02/2018 03:46:22	18.59
00222	000 18:25:00	01/02/2018 03:51:22	18.58
00223	000 18:30:00	01/02/2018 03:56:22	18.57
00224	000 18:35:00	01/02/2018 04:01:22	18.57
00225	000 18:40:00	01/02/2018 04:06:22	18.56
00226	000 18:45:00	01/02/2018 04:11:22	18.56
00227	000 18:50:00	01/02/2018 04:16:22	18.55
00228	000 18:55:00	01/02/2018 04:21:22	18.55



Specification & Configuration	
Device Name:	ktlLcdMu
Device Type:	Multi-use Int.Temp.
Serial Number:	LM630003
Time Zone	GMT:+1
Firmware Version:	1.26E
Software Version:	1.05.42
Trip Number:	11
Trips Remaining:	Multiple
Temp. Unit:	Celsius
Temp. Range:	-40 to +80°C
Battery:	3.05V - 100%
Total Records:	7845
Sampling Rate:	00:05:00
Start Delay:	00:05:00
Start Time:	Parameter not set
Stop Time:	Parameter not set

Device Name: Data Logger's model. Read only.
Serial Number: Data Logger's unique serial number.
Time Zone: Selected time zone during the configuration + DST (Daylight Saving Time).
Firmware Version: Current logger's firmware version.
Trip Number: This is the trip counter. Counted at each logger's Start. Read only.
Trips Remaining: Indicates the remaining number of trips available or Multiple for multi-use loggers.
Temp. Unit: Selected temperature unit of measure (Celsius or Fahrenheit) during the configuration.
Temp. Range: This is the logger's sensor range. In this example this is a temperature sensor with a range from -40°C to +80°C.
Battery: Current battery voltage and power level indication in %.
Total Records: Current number of records stored in the logger's memory.
Sampling Rate: Configured period between each record sampled.
Start Delay: Configured manual start delay.
Start Time: Automatic configuration start time and date.
Stop Time: Automatic configuration stop time and date.

Alarms (Time above / below Alarms)				
Type:	Temp.	Consecutive	Total	Out of Spec.
EH:	+20.00°C	00:00:00	00:05:00	08d 01:25:00
H:	+15.00°C	00:00:00	00:10:00	27d 05:40:00
L:	+8.00°C	00:00:00	00:10:00	00:00:00
EL:	+0.00°C	00:00:00	00:05:00	00:00:00

Type: Extra High, High, Low and Extra Low.
Temp: Alarm threshold.
Consecutive: Consecutive delay (see detail in ¶5.3).
Total: Cumulative delay (see detail in ¶5.3).
Out of Specification: Total duration out of the alarm threshold.

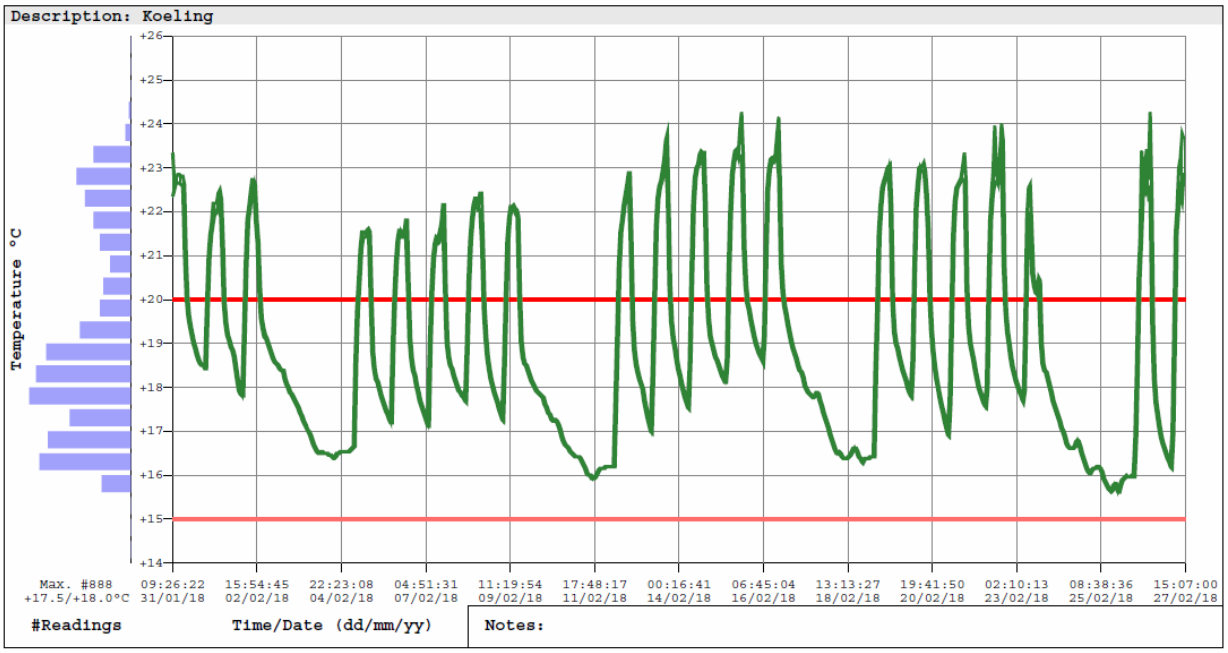
Summary / Statistics			File Created at: 27/02/18 15:18:22
Maximum Temperature:	+24.30°C	Status:	Recording
Minimum Temperature:	+15.65°C	Trip Duration:	27d 05:40:00
Average Temperature:	+18.97°C	Time within Spec:	00:00:00
Mean Kinetic Temp:	+18.95°C	Started Time:	31/01/18 09:26:22
Active Bookmarks:	0	Stopped Time:	27/02/18 15:07:00
Started by:	Manual	Memory Used:	17% 7845/44543
Stopped by:		File Created by:	KeyTag Manager
		Calibration due:	22/02/2018

Maximum Temperature: Maximum temperature during the whole trip.
Minimum Temperature: Minimum temperature during the whole trip.
Average Temperature: Average temperature during the whole trip.
Mean Kinetic Temperature: MKT of the whole trip using the activation energy set during the configuration.
Active Bookmarks: Number of marker, manually activated by the users.
Started by: How the logger has been started:
- Manual: by pressing the Start button.
- Start Timer: by automatic start with time and date.
- Temperature: by automatic start on temperature threshold.

Stopped by: How the logger has been stopped:
- Manual: by pressing the Stop button.
- Memory full: the logger reached it maximum memory capacity.
- Reset: the logger went to reset.
- Stop Timer: by automatic stop with time and date.

Status: Current status of the logger:
- Ready: Logger is configured and ready to be started.
- In Start Delay: Logger has been started and actually in started delay countdown.
- Recording: Logger is started in recording.
- Stopped: Logger is not recording anymore. This is end of the trip.

Trip Duration: Current trip duration from the first to the last record.
Time within Specifications: Total duration within the alarm thresholds. No alarms.
Started Time: Date and Time of the first record.
Stopped Time: Date and Time of the last record if the trip is finished.
Memory Used: Indicate the memory usage in percentage and the number of record in memory/ memory size.
File Created at: Document creation Date and Time.



This ktlLcdMu with an accuracy of +/-0.3°C from -40°C to +80°C (+/-0.6°F from -40°F to +176°F) and an resolution of 0.01°C (°F) has been calibrated in the calibration chamber of Askey Dataloggers.
The reference equipment used is traceable to National Institute of Standards and Technology. Device:#LM630003

(p.1)

#	ELAPSED	Time	T°C
00001	000 00:00:00	31/01/2018 09:26:22	23.36
00002	000 00:05:00	31/01/2018 09:31:22	22.83
00003	000 00:10:00	31/01/2018 09:36:22	22.56
00004	000 00:15:00	31/01/2018 09:41:22	22.42
00005	000 00:20:00	31/01/2018 09:46:22	22.38
00006	000 00:25:00	31/01/2018 09:51:22	22.37
00007	000 00:30:00	31/01/2018 09:56:22	22.40
00008	000 00:35:00	31/01/2018 10:01:22	22.45
00009	000 00:40:00	31/01/2018 10:06:22	22.50
00010	000 00:45:00	31/01/2018 10:11:22	22.53
00011	000 00:50:00	31/01/2018 10:16:22	22.55
00012	000 00:55:00	31/01/2018 10:21:22	22.58
00013	000 01:00:00	31/01/2018 10:26:22	22.62
00014	000 01:05:00	31/01/2018 10:31:22	22.61
00015	000 01:10:00	31/01/2018 10:36:22	22.56
00016	000 01:15:00	31/01/2018 10:41:22	22.53
00017	000 01:20:00	31/01/2018 10:46:22	22.53
00018	000 01:25:00	31/01/2018 10:51:22	22.55
00019	000 01:30:00	31/01/2018 10:56:22	22.56
00020	000 01:35:00	31/01/2018 11:01:22	22.55
00021	000 01:40:00	31/01/2018 11:06:22	22.53
00022	000 01:45:00	31/01/2018 11:11:22	22.54
00023	000 01:50:00	31/01/2018 11:16:22	22.56
00024	000 01:55:00	31/01/2018 11:21:22	22.58
00025	000 02:00:00	31/01/2018 11:26:22	22.61
00026	000 02:05:00	31/01/2018 11:31:22	22.64
00027	000 02:10:00	31/01/2018 11:36:22	22.67
00028	000 02:15:00	31/01/2018 11:41:22	22.71
00029	000 02:20:00	31/01/2018 11:46:22	22.70
00030	000 02:25:00	31/01/2018 11:51:22	22.67
00031	000 02:30:00	31/01/2018 11:56:22	22.68
00032	000 02:35:00	31/01/2018 12:01:22	22.69
00033	000 02:40:00	31/01/2018 12:06:22	22.72
00034	000 02:45:00	31/01/2018 12:11:22	22.74
00035	000 02:50:00	31/01/2018 12:16:22	22.76
00036	000 02:55:00	31/01/2018 12:21:22	22.74
00037	000 03:00:00	31/01/2018 12:26:22	22.71
00038	000 03:05:00	31/01/2018 12:31:22	22.72
00039	000 03:10:00	31/01/2018 12:36:22	22.75
00040	000 03:15:00	31/01/2018 12:41:22	22.80
00041	000 03:20:00	31/01/2018 12:46:22	22.80
00042	000 03:25:00	31/01/2018 12:51:22	22.76
00043	000 03:30:00	31/01/2018 12:56:22	22.71
00044	000 03:35:00	31/01/2018 13:01:22	22.67

#	ELAPSED	Time	T°C
00093	000 07:40:00	31/01/2018 17:06:22	22.56
00094	000 07:45:00	31/01/2018 17:11:22	22.47
00095	000 07:50:00	31/01/2018 17:16:22	22.35
00096	000 07:55:00	31/01/2018 17:21:22	22.22
00097	000 08:00:00	31/01/2018 17:26:22	22.08
00098	000 08:05:00	31/01/2018 17:31:22	21.93
00099	000 08:10:00	31/01/2018 17:36:22	21.79
00100	000 08:15:00	31/01/2018 17:41:22	21.66
00101	000 08:20:00	31/01/2018 17:46:22	21.52
00102	000 08:25:00	31/01/2018 17:51:22	21.40
00103	000 08:30:00	31/01/2018 17:56:22	21.29
00104	000 08:35:00	31/01/2018 18:01:22	21.17
00105	000 08:40:00	31/01/2018 18:06:22	21.07
00106	000 08:45:00	31/01/2018 18:11:22	20.97
00107	000 08:50:00	31/01/2018 18:16:22	20.88
00108	000 08:55:00	31/01/2018 18:21:22	20.79
00109	000 09:00:00	31/01/2018 18:26:22	20.71
00110	000 09:05:00	31/01/2018 18:31:22	20.62
00111	000 09:10:00	31/01/2018 18:36:22	20.55
00112	000 09:15:00	31/01/2018 18:41:22	20.47
00113	000 09:20:00	31/01/2018 18:46:22	20.39
00114	000 09:25:00	31/01/2018 18:51:22	20.31
00115	000 09:30:00	31/01/2018 18:56:22	20.24
00116	000 09:35:00	31/01/2018 19:01:22	20.17
00117	000 09:40:00	31/01/2018 19:06:22	20.11
00118	000 09:45:00	31/01/2018 19:11:22	20.05
00119	000 09:50:00	31/01/2018 19:16:22	20.00
00120	000 09:55:00	31/01/2018 19:21:22	19.96
00121	000 10:00:00	31/01/2018 19:26:22	19.92
00122	000 10:05:00	31/01/2018 19:31:22	19.88
00123	000 10:10:00	31/01/2018 19:36:22	19.85
00124	000 10:15:00	31/01/2018 19:41:22	19.81
00125	000 10:20:00	31/01/2018 19:46:22	19.78
00126	000 10:25:00	31/01/2018 19:51:22	19.75
00127	000 10:30:00	31/01/2018 19:56:22	19.72
00128	000 10:35:00	31/01/2018 20:01:22	19.70
00129	000 10:40:00	31/01/2018 20:06:22	19.68
00130	000 10:45:00	31/01/2018 20:11:22	19.66
00131	000 10:50:00	31/01/2018 20:16:22	19.64
00132	000 10:55:00	31/01/2018 20:21:22	19.62
00133	000 11:00:00	31/01/2018 20:26:22	19.60
00134	000 11:05:00	31/01/2018 20:31:22	19.58
00135	000 11:10:00	31/01/2018 20:36:22	19.57
00136	000 11:15:00	31/01/2018 20:41:22	19.55

#	ELAPSED	Time	T°C
00185	000 15:20:00	01/02/2018 00:46:22	18.87
00186	000 15:25:00	01/02/2018 00:51:22	18.87
00187	000 15:30:00	01/02/2018 00:56:22	18.86
00188	000 15:35:00	01/02/2018 01:01:22	18.85
00189	000 15:40:00	01/02/2018 01:06:22	18.84
00190	000 15:45:00	01/02/2018 01:11:22	18.83
00191	000 15:50:00	01/02/2018 01:16:22	18.82
00192	000 15:55:00	01/02/2018 01:21:22	18.80
00193	000 16:00:00	01/02/2018 01:26:22	18.78
00194	000 16:05:00	01/02/2018 01:31:22	18.76
00195	000 16:10:00	01/02/2018 01:36:22	18.76
00196	000 16:15:00	01/02/2018 01:41:22	18.75
00197	000 16:20:00	01/02/2018 01:46:22	18.75
00198	000 16:25:00	01/02/2018 01:51:22	18.74
00199	000 16:30:00	01/02/2018 01:56:22	18.73
00200	000 16:35:00	01/02/2018 02:01:22	18.72
00201	000 16:40:00	01/02/2018 02:06:22	18.71
00202	000 16:45:00	01/02/2018 02:11:22	18.71
00203	000 16:50:00	01/02/2018 02:16:22	18.70
00204	000 16:55:00	01/02/2018 02:21:22	18.69
00205	000 17:00:00	01/02/2018 02:26:22	18.68
00206	000 17:05:00	01/02/2018 02:31:22	18.68
00207	000 17:10:00	01/02/2018 02:36:22	18.66
00208	000 17:15:00	01/02/2018 02:41:22	18.66
00209	000 17:20:00	01/02/2018 02:46:22	18.65
00210	000 17:25:00	01/02/2018 02:51:22	18.64
00211	000 17:30:00	01/02/2018 02:56:22	18.64
00212	000 17:35:00	01/02/2018 03:01:22	18.62
00213	000 17:40:00	01/02/2018 03:06:22	18.62
00214	000 17:45:00	01/02/2018 03:11:22	18.62
00215	000 17:50:00	01/02/2018 03:16:22	18.61
00216	000 17:55:00	01/02/2018 03:21:22	18.61
00217	000 18:00:00	01/02/2018 03:26:22	18.61
00218	000 18:05:00	01/02/2018 03:31:22	18.60
00219	000 18:10:00	01/02/2018 03:36:22	18.60
00220	000 18:15:00	01/02/2018 03:41:22	18.59
00221	000 18:20:00	01/02/2018 03:46:22	18.59
00222	000 18:25:00	01/02/2018 03:51:22	18.58
00223	000 18:30:00	01/02/2018 03:56:22	18.57
00224	000 18:35:00	01/02/2018 04:01:22	18.57
00225	000 18:40:00	01/02/2018 04:06:22	18.56
00226	000 18:45:00	01/02/2018 04:11:22	18.56
00227	000 18:50:00	01/02/2018 04:16:22	18.55
00228	000 18:55:00	01/02/2018 04:21:22	18.55

#: Record number starting from #1.

Elapsed: Elapsed time from the first record ddd HH:MM:SS.

- ddd: days
- HH: hours
- MM: minutes
- SS: seconds

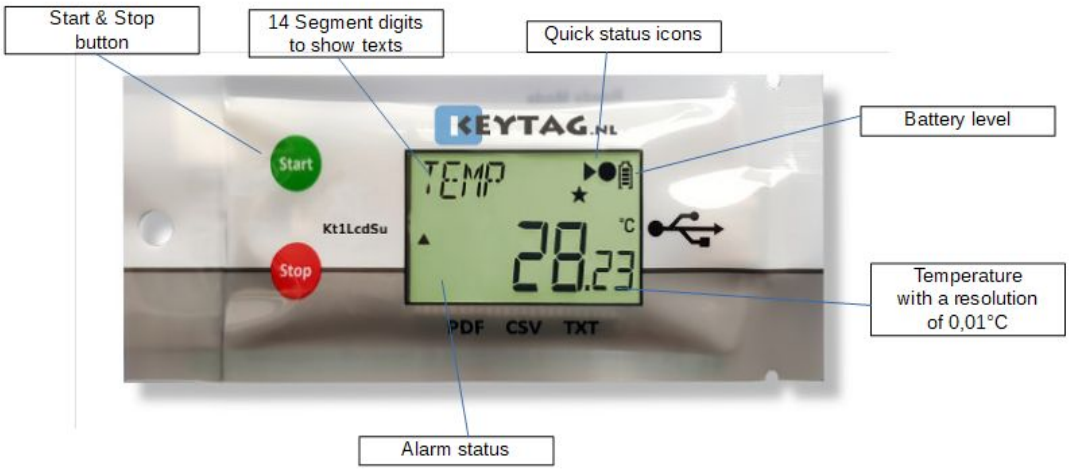
Time: Record's date and time based on the configuration's time zone.

T.°C Sensor identification a& temperature unit. (ex: Temperature in degrees Celsius).

7. Kt1LcdSu

7.1. Presentation

Kt1LcdSu is a single use temperature data logger with a rich LCD.
This data logger has all the smart features seen above in the KeyTag Manager sections.
Manual and Automatic Start and Stop on Date/Time/Temperature threshold.



USB ON-BOARD	USB on-board (No wires attached!): Tear the sleeve and slide to expose the USB port, plug and view the data.
PDF AUTO GENERATED	Built in PDF (Auto-generated): When connected to computer, Kt1Lcd auto - generates detailed pdf report.
CUSTOMIZE PDF REPORT	Customize PDF report (tailored contents): Control, manage & customize generated pdf report, enable / disable fields, contents.
CSV TXT AUTO GENERATED	CSV and TXT reports (auto-generated): Easiest way to view data, in the event if PDF reader software is not available.
MULTI FUNCTIONAL LCD	Multi-functional LCD (1 click information): Smart display designed to view most of the mission info. With just a press of the button.
LARGE MEMORY	Extra large memory: Able to take over 20,000 records.
IP 67	Protected (waterproof): With the IP rating of IP67, packed & sealed in durable plastic. Completely food safe.
LONG BATTERY LIFE 100%	Extended battery life: Ultra low current consumption to last more than 2 years on shelf and monitoring.

	Bookmark: Easily mark multiple records and review them when downloaded.
	Multi-alarms (visual): Four alarms configurations, two for high thresholds and two for low thresholds.
	Firmware Upgrade: Continuously improving & adding the features.
	Multi operating systems support: Kt1Lcd is supported by Windows (XP, Vista, 7, 8 & 10), Mac OS, Linux and Android devices.

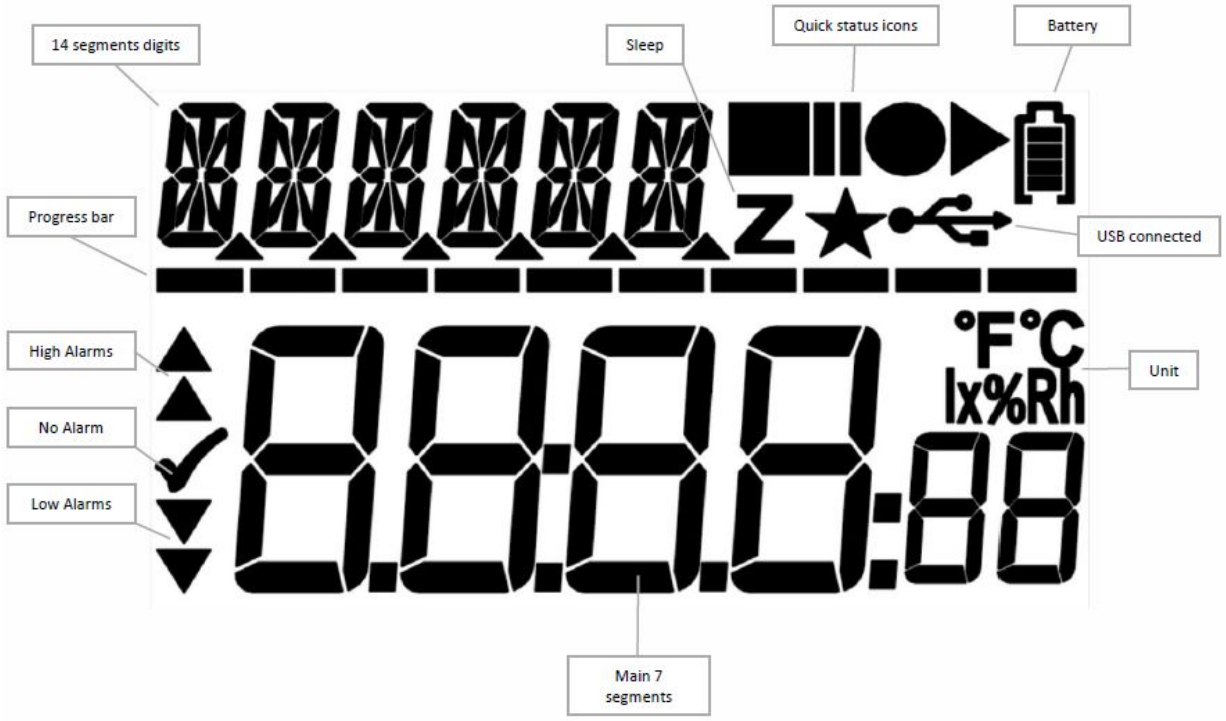
7.2. Specifications

Logger Type	Single Use Temperature Data Logger
Sensor	Thermistor (Internal)
Memory Capacity	>20,000 records
Measurement Range	-40°C to +80°C
Accuracy	±0.3°C from -40°C to +80°C
Resolution	0.01°C
Time Accuracy	±15 minutes / year
Button	2
Start Option	Manual Start, Start with/without delay, Start with Time & Date, Start @ a Temp. threshold with delay
Stop Option	Manual Stop, Stop after a delay, Stop with Time & Date
Marked Readings	X8 Markers
Log Intervals	From 5 Sec to 24 Hours
Total Alarms	4
Alarm Type	Consecutive and/or Total Alarm
Sensor Response Time	< 7 minutes
Battery	3V, CR2032
Display	LCD reflective 30x17mm with 14 digits segments
Connection/Interface	USB Mass Storage Device Direct Plug in to PC
Auto Generated File Types	KLG, TXT, CSV, PDF
Export File Types	KLG, TXT, CSV, PDF
Software Support	KeyTag Manager
Compatibility	Windows, Mac OSX, Linux
Calibration	Yes

Certificates	RoHS
Dimensions	44x107x7mm
Weight	17g
Packaging/Material	Poly-carbonate, FDA 21 CFR 177.1520
Protection Class	IP 67, Waterproof

7.3. LCD Display

Kt1Lcd series data logger uses a reflective LCD display with high contrast and wide angle view.
The 14 digits segment allows the flexibility to display dynamic words using up to six characters.



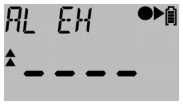
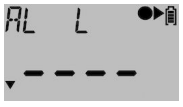
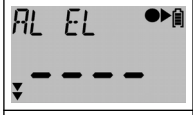
7.4. LCD Quick Status Icons

Kt1Lcd LCD contains icons to quickly inform about the current state.

	**READY:**	Configured and ready to start. Press Start button.
	**RECORD:**	Started, in record mode.
	**STOPPED:**	End of the mission. Doesn't record anymore.

7.5. LCD Display Modes

Kt1Lcd series data logger offers various menu on the LCD display with Start and Stop button to navigate up and down into the different screen.

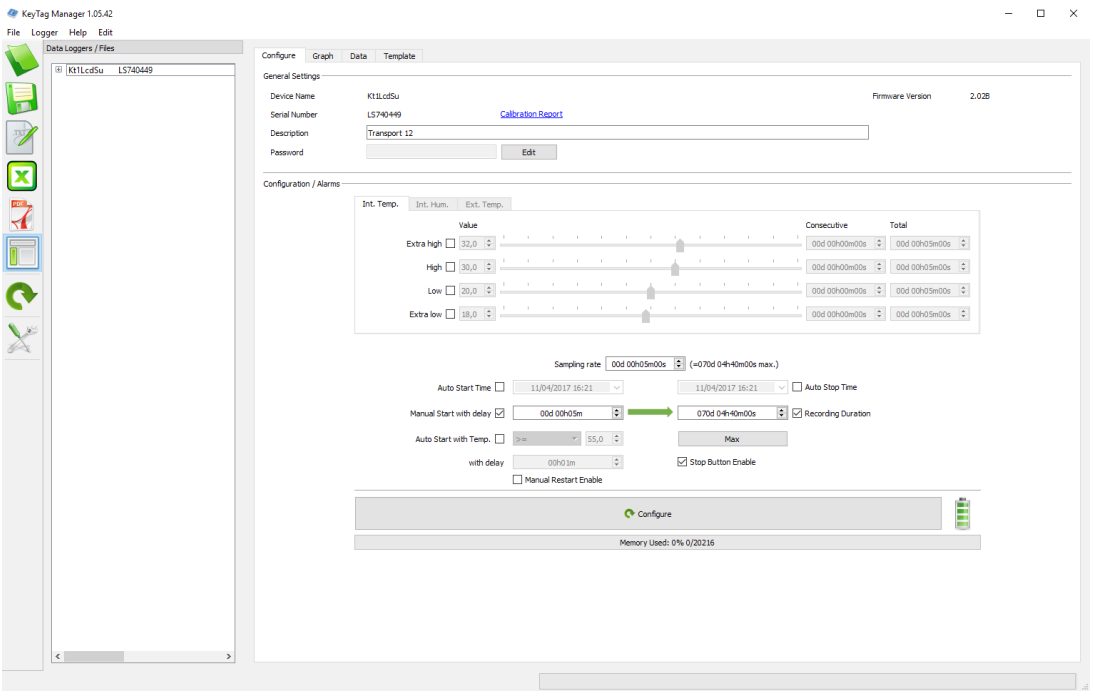
	Standard display when recording. Temperature at 2 decimal places, record, battery status and alarm status.
	Displaying maximum temperature.
	Displaying minimum temperature.
	Displaying average temperature.
	Displaying MKT (Mean Kinetic Temperature).
	Extremely HIGH Alarm status. There is no EH alarm so information is blank. Indicate the EH alarm threshold when the logger is in READY mode.
	High Alarm status. Total duration above the high threshold is 2h34m50s. Indicate the H alarm threshold when the logger is in READY mode.
	LOW Alarm status. There is no L alarm so information is blank. Indicate the L alarm threshold when the logger is in READY mode.
	Extremely LOW Alarm status. There is no VL alarm so information is blank. Indicate the EL alarm threshold when the logger is in READY mode.
	Number of records. Total number records stored in memory. Ex: 20000.
	Current Date. With the format: dd/mm/yy.
	Current Time. With the 24H format: HH:MM:SS.
	Battery Voltage Status. Displaying real-time battery voltage: Low batt.<2.50V.
	Serial Number. This is a unique serial number.
	Firmware Version (Ex: 1.14a). Press and hold the STOP button to reset the logger.

	Sampling Rate. HH:MM:SS (Ex: 00 hours, 5 minutes, 0 seconds).
	Stop Conditions Header. The enabled stop conditions will be scrolling every 2 seconds.
	Auto Stop Date. dd:mm:yy.
	Auto Stop Time. HH:MM:SS.
	Recording Duration. The logger will Stop after this duration. (Ex: 1 day, 4 hours).
	Stat Conditions Header. The enabled start conditions will be scrolling every 2 seconds.
	Auto Start Date. dd:mm:yy.
	uto Start Time. HH:MM:SS.
	Manual Start with Delay. HH:MM:SS (or ex: 001d23, 1 day and 23 hours) .
	Auto Start with Temperature and delay. Ex: The logger will start if the temperature is >= 55°C.
	Auto Start with Temperature and delay. HH:MM:SS. Ex: The logger will start if the temperature is >= 55°C for 10 minutes.

7.6. How to configure the Kt1LcdSu

Step by step process to configure the Kt1LcdSu Data Logger.

- On the computer: Launch the KeyTag Manager application.
- Make sure that the default settings (from the Settings section) are correct.
  Language.
  Time zone.
  Temperature Units.
  Excel CSV separator.
  MKT Activation Energy (default: 83kJ/mol).
- Connect the Kt1LcdSu to the computer using the USB connection.
- The logger is detected and visible in the Data Loggers/Files section.
- Select the configuration Tab.
- Enter the description.
- Enable the alarm check boxes required in the mission.
  Set the alarm threshold.
  Set the consecutive alarm delay if needed or set to zero to disable.
  Set the total alarm delay if needed or set to zero to disable.
- Set the sampling rate.
- Set the Start condition(s):
  Auto Start Time.
  Manual Start + Delay.
  Auto Start with Temperature + Delay.
- Set the Stop condition.
  Auto Stop Time.
  Recording Duration (Press the Max button to auto set the maximum duration).
- Click on the Configuration button.
  The following Configuration message will appear on the logger's LCD.
- The logger is configured and ready to be started.
  You can now disconnect the logger.



7.7. How to Start the Kt1LcdSu

Step by step process to start the Kt1LcdSu Data Logger.

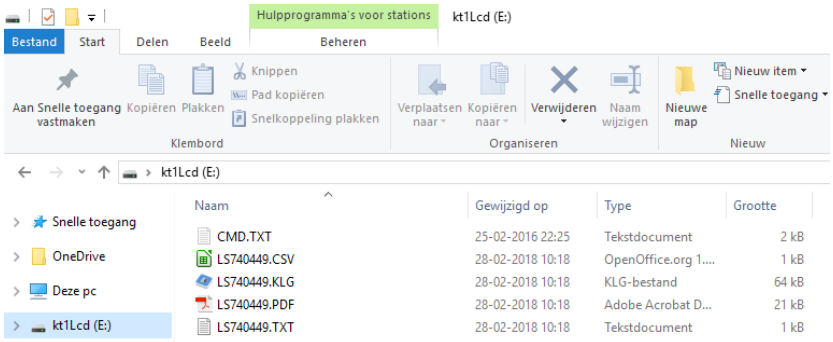
	Make sure the logger has been configured and in Ready mode.
	If the logger has been configured with the Auto Start Time, the LCD display will show TIMER instead of READY.
	Press and hold the Start button for 8 seconds until the loggers switches to Record mode. A progress bar will appear during this process.
	If the logger has been configured with a start delay. This count down will run until the end and then the logger will start.
	The logger is now in record mode.

7.8. How to Read the Kt1LcdSu

Relevant information is always available on the LCD display in real time.
Use the Start and Stop button to navigate in the menu. (see ¶7.5).

To download the report on the computer, just connect the logger and check for an external mass storage device in the explorer (for Windows) or directly mounted and visible on the desktop (for Mac). The following files are available:

- *.KLG: Keylog format, needs KeyTag Manager. (See: ¶6.1).
- *.TXT: Text File. (See: ¶6.2).
- *.CSV: Excel CSV file. (See: ¶6.3).
- *.PDF: PDF File. (See: ¶6.4).



The alternative way is to use KeyTag Manager. (see ¶4, ¶5 and ¶6).

7.9. How to Stop the kt1LcdSu

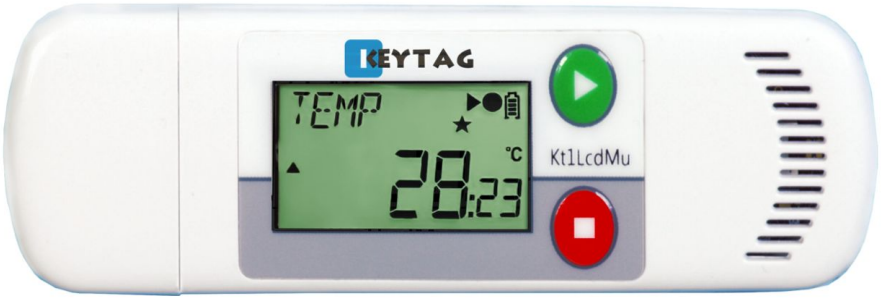
Step by step process to stop the kt1LcdSu Data Logger.

	The logger is in record mode.
	Press and hold the Stop button for 8 seconds until the loggers switch to the Stop mode. A progress bar will appear during this process.
	The logger is now in stopped mode and doesn't record anymore.

8. Kt1LcdMu, Kt1LcdMuH, Kt1LcdMuE

8.1. Presentation

The KeyTag Kt1LcdMu/H/E is an extremely accurate multi-use data logger for internal and external temperature and humidity, with a detailed, multi-screen display. In addition to things like current date and time, serial number, firmware version, battery power, etc. The display also shows you information on logging interval, how it starts (manual, time, temperature) and stops (period, time or manual), start delay, running or stopped state, various alarm levels and alarm states, minimum, maximum, average and Mean Kinetic Temperature, etc, all by a simple click of the button.
Once plugged into the USB port, the logger works like a USB stick that holds the automatically generated KLG, TXT, CSV and PDF files. No KeyTag software needed.
Where other suppliers choose to accompany their loggers with a basic manufacturers certificate, mentioning specifications based on theoretical calculations and prefabrication tests, every KeyTag Kt1 will be individually calibrated before it leaves our lab. Its unique, traceable calibration certificate can be found 'in the cloud' by clicking a link on the PDF generated by the logger.



USB ON-BOARD	USB on-board (No strings attached!): Direct connection to USB port, plug and view the data.
PDF AUTO GENERATED	Built in PDF (Auto-generated): When connected to computer, Kt1LcdMu auto generates a detailed PDF report.
CUSTOMIZE PDF REPORT	Customize PDF report (tailored contents): Control, manage & customize generated PDF report, enable / disable fields, contents.
CSV AUTO GENERATED TXT	CSV and TXT reports (auto-generated): Easiest way to view data, in the event if PDF reader software is not available.
MULTI FUNCTIONAL LCD	Multi-functional LCD (1 click information: Smart display designed to view most of the mission info. With just press of a button.
LARGE MEMORY	Extra large memory: Able to take over 44,000 records.
LONG BATTERY LIFE 100%	Replaceable standard battery CR2032: Ultra low current consumption to last more than 2 years on shelf and monitoring.
MARKED!	Bookmark: Easily mark multiple records and review them when downloaded.
VISUAL MULTI ALARM	Multi-alarms (visual): Four alarms configurations, two for high thresholds and two for low thresholds.

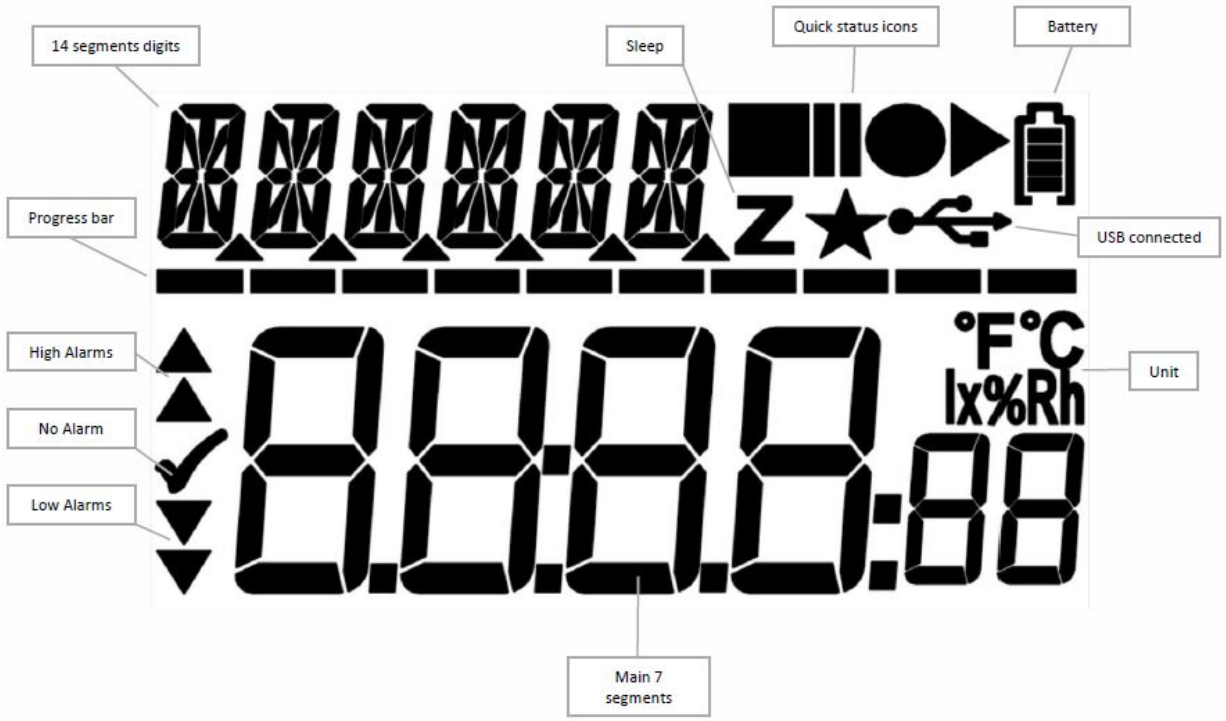
REMOTE FW UPGRADE	Firmware Upgrade: Continuously improving & adding the features.
WINDOWS MAC ANDROID LINUX supported	Multi operating systems support: Kt1LcdMu is supported by Windows (XP, Vista, 7, 8 & 10), Mac OS, Linux and Android devices.

8.2. Specifications

Logger Type	Multi-use Temperature Data Logger
Sensor	Temperature / Humidity / External temperature
Memory Capacity	>44,000 records
Measurement Range	-40°C to +80°C / 0 to 100% RH
Accuracy	±0.3°C from -40°C to +80°C ±3% from 0% to 100%RH
Resolution	0.01°C
Time Accuracy	±15 minutes / year
Button	2
Start Option	Manual Start with / without delay Start with Time & Date Start at temperature threshold with/without delay
Stop Option	Stop after a period Stop with date and time Manual stop
Marked Readings	Yes, 8x Markers
Log Interval	From 5 Sec to 24 Hours
Total Alarms	4
Alarm Type	Consecutive and / or Total Alarm
Sensor Response Time	< 7 minutes, external sensor < 1 minute
Battery	Replaceable 3V, CR2032
Display	LCD reflective 30x17mm with 14 digits segments
Connection / Interface	USB Mass Storage Device Direct Plug in to PC
Auto Generated File Types	KLG, TXT, CSV, PDF
Export File Types	KLG, TXT, CSV, PDF
Software Support	KeyTag Manager
Compatibility	Windows, Mac OSX, Linux
Calibration	Yes
Certificates	RoHS
Dimensions	35x103x11mm
Weight	28g
Packaging / Material	Poly-carbonate
Protection Class	IP 65

8.3. LCD Display

Kt1Lcd series data logger uses a reflective LCD display with high contrast and wide view angle.
The 14 digit segment allows the flexibility to display dynamic words using up to six characters.



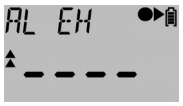
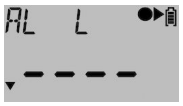
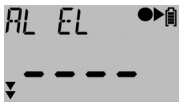
8.4. LCD Quick Status Icons

Kt1Lcd LCD contains icons to quickly inform about the current state.

	**READY:**	Configured and ready to start. Press Start button.
	**RECORD:**	Started, in record mode.
	**STOPPED:**	End of the mission. Doesn't record anymore.

8.5. LCD Display Modes

Kt1Lcd series data logger offers various menus on the LCD display with start and stop button to navigate up and down into the different screens.

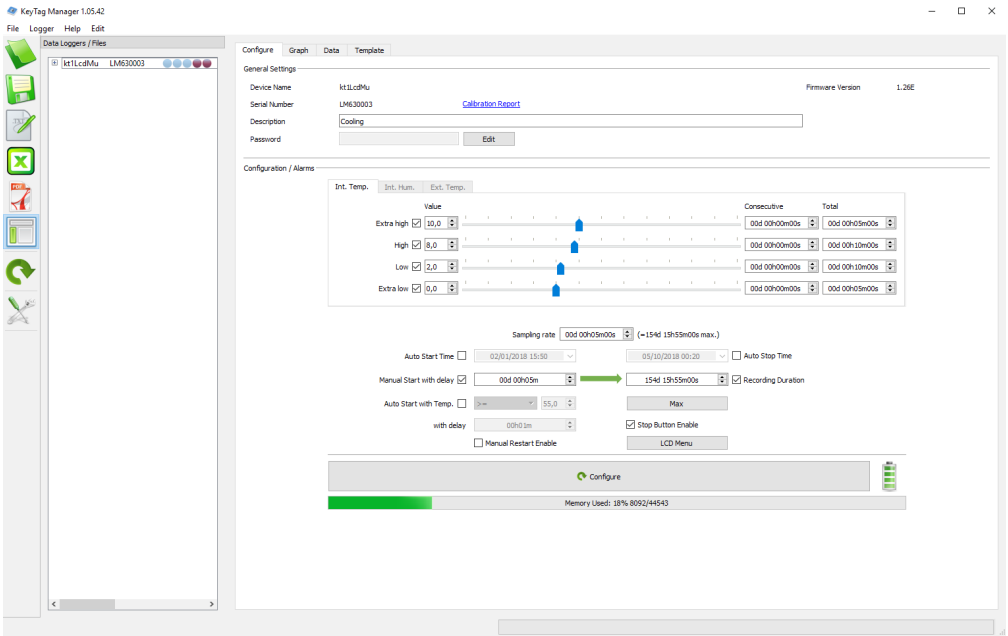
	Standard display when recording. Temperature at 2 decimal places, record, battery status and alarm status.
	Displaying maximum temperature.
	Displaying minimum temperature.
	Displaying average temperature.
	Displaying MKT (Mean Kinetic Temperature).
	Extremely HIGH Alarm status. There is no EH alarm so information is blank. Indicate the EH alarm threshold when the logger is in READY mode.
	High Alarm status. Total duration above the high threshold is 2h34m50s. Indicate the H alarm threshold when the logger is in READY mode.
	LOW Alarm status. There is no L alarm so information is blank. Indicate the L alarm threshold when the logger is in READY mode.
	Extremely LOW Alarm status. There is no VL alarm so information is blank. Indicate the EL alarm threshold when the logger is in READY mode.
	Number of records. Total number records stored in memory. Ex: 20000.
	Current Date. With the format: dd/mm/yy.
	Current Time. With the 24H format: HH:MM:SS.
	Battery Voltage Status. Displaying real-time battery voltage: Low batt.<2.50V.
	Serial Number. This is a unique serial number.
	Firmware Version (Ex: 1.14a). Press and hold the STOP button to reset the logger.

	Sampling Rate. HH:MM:SS (Ex: 00 hours, 5 minutes, 0 seconds).
	Stop Conditions Header. The enabled stop conditions will be scrolling every 2 seconds.
	Auto Stop Date. dd:mm:yy.
	Auto Stop Time. HH:MM:SS.
	Recording Duration. The logger will Stop after this duration. (Ex: 1 day, 4 hours).
	Stat Conditions Header. The enabled start conditions will be scrolling every 2 seconds.
	Auto Start Date. dd:mm:yy.
	uto Start Time. HH:MM:SS.
	Manual Start with Delay. HH:MM:SS (or ex: 001d23, 1 day and 23 hours) .
	Auto Start with Temperature and delay. Ex: The logger will start if the temperature is >= 55°C.
	Auto Start with Temperature and delay. HH:MM:SS. Ex: The logger will start if the temperature is >= 55°C for 10 minutes.

8.6. How to configure the Kt1LcdMu/H/E

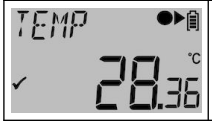
Step by step process to configure the Kt1LcdMu/H/E Data Logger.

- On the computer: Launch the KeyTag Manager application.
- Make sure that the default settings (from the Settings section) are correct.
  Language.
  Time zone.
  Temperature Units.
  Excel CSV separator.
  MKT Activation Energy (default: 83kJ/mol).
- Connect the Kt1LcdMu/H/E to the computer using the USB connection.
- The logger is detected and visible in the Data Loggers/Files section.
- Select the configuration Tab.
- Enter the description.
- Enable the alarm check boxes required in the mission.
  Set the alarm threshold.
  Set the consecutive alarm delay if needed or set to zero to disable.
  Set the total alarm delay if needed or set to zero to disable.
- Set the sampling rate.
- Set the Start condition(s):
  Auto Start Time.
  Manual Start + Delay.
  Auto Start with Temperature + Delay.
- Set the Stop condition.
  Auto Stop Time.
  Recording Duration (Press the Max button to auto set the maximum duration).
- Click on the Configuration button.
  The following Configuration message will appear on the logger's LCD.
- The logger is configured and ready to be started.
  You can now disconnect the logger.



8.7. How to Start the Kt1LcdMu/H/E

Step by step process to start the Kt1LcdMu/H/E Data Logger.

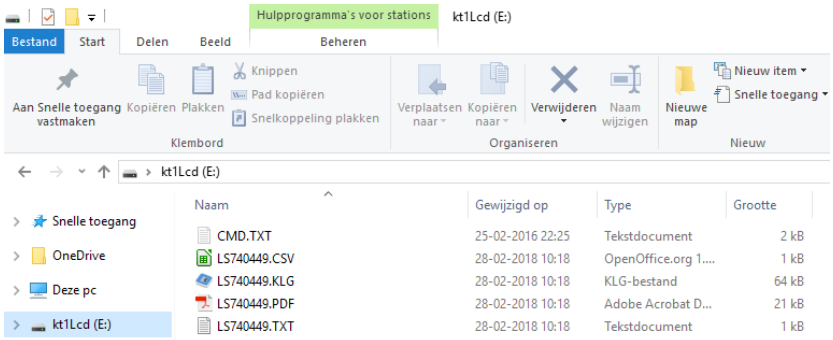
	Make sure the logger has been configured and in Ready mode.
	If the logger has been configured with the Auto Start Time, the LCD display will show TIMER instead of READY.
	Press and hold the Start button for 8 seconds until the loggers switches to Record mode. A progress bar will appear during this process.
	If the logger has been configured with a start delay. This count down will run until the end and then the logger will start.
	The logger is now in record mode.

8.8. How to Read the Kt1LcdMu/H/E

Relevant information is always available on the LCD display in real time.
Use the Start and Stop button to navigate in the menu. (see ¶7.5).

To download the report on the computer, just connect the logger and check for an external mass storage device in the explorer (for Windows) or directly mounted and visible on the desktop (for Mac). The following files are available:

- *.KLG: Keylog format, needs KeyTag Manager. (See: ¶6.1).
- *.TXT: Text File. (See: ¶6.2).
- *.CSV: Excel CSV file. (See: ¶6.3).
- *.PDF: PDF File. (See: ¶6.4).



The alternative way is to use KeyTag Manager. (see ¶4, ¶5 and ¶6).

8.9. How to Stop the Kt1LcdMu/H/E

Step by step process to stop the Kt1LcdMu/H/E Data Logger.

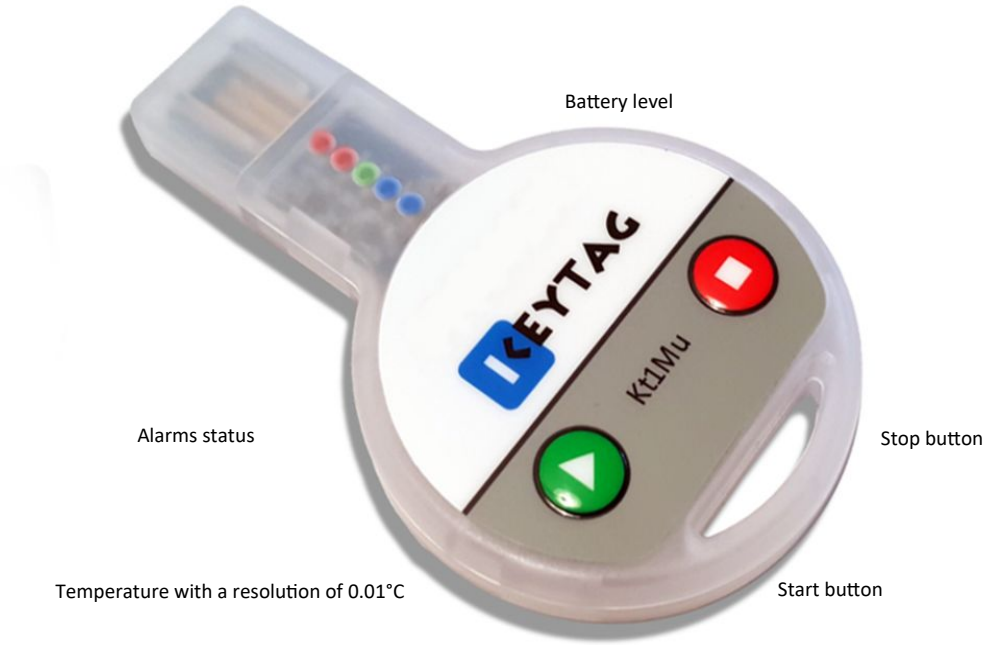
	The logger is in record mode.
	Press and hold the Stop button for 8 seconds until the loggers switch to the Stop mode. A progress bar will appear during this process.
	The logger is now in stopped mode and doesn't record anymore.

9. Kt1Mu, Kt1MuH

9.1. Presentation

Kt1Mu/H is an extremely accurate and low cost multi-use data logger for temperature and humidity, with 5X LED's — blue for low alarms, green for no alarm and red for high alarms, visual indication of the current status (recording, stopped, battery level). The battery (non-replaceable) has a shelf life of 1 to 2 years for regular usage. When not in use, the logger is automatically placed in sleep mode to save the battery.

Once plugged into the USB port, the logger works like a USB stick that holds the automatically generated KLG, TXT, CSV and PDF files. No KeyTag software needed.
Where other suppliers choose to accompany their loggers with a basic manufacturers certificate, mentioning specifications based on theoretical calculations and prefabrication tests, every KeyTag Kt1 will be individually calibrated before it leaves our lab. Its unique, traceable calibration certificate can be found 'in the cloud' by clicking a link on the PDF generated by the logger.



9.2. Specifications

Logger Type	Multi-use Temperature Data Logger
Sensor	Temperature and Humidity
Memory Capacity	>12,000 records
Measurement Range	-40°C to +80°C and 0% to 100% RH
Accuracy	±0.3°C from -40°C to +80°C and ±3% from 0% to 100%RH
Resolution	0.01°C
Time Accuracy	±15 minutes / year
Button	2
Start Option	Manual Start with / without delay Start with Time & Date Start at temperature threshold with/without delay
Stop Option	Stop after a period Stop with date and time Manual stop
Marked Readings	Yes, 8x Markers
Log Interval	From 5 Sec to 24 Hours
Total Alarms	4
Alarm Type	Consecutive and / or Total Alarm
Sensor Response Time	< 7 minutes
Battery	Not replaceable
Battery life	1 to 2 years for a normal usage
Display	5X LED's — blue, green, red
Connection / Interface	USB Mass Storage Device Direct Plug in to PC
Auto Generated File Types	KLG, TXT, CSV, PDF
Export File Types	KLG, TXT, CSV, PDF
Software Support	KeyTag Manager
Compatibility	Windows, Mac OSX, Linux
Calibration	Yes
Certificates	RoHS
Dimensions	78 x 48 x 9 mm
Weight	16g
Packaging / Material	ABS
Protection Class	IP 30

9.3. LED Display

Kt1Mu series data logger uses 5 x LED's to indicate:

- Alarms.
- Current state.
- Battery level.

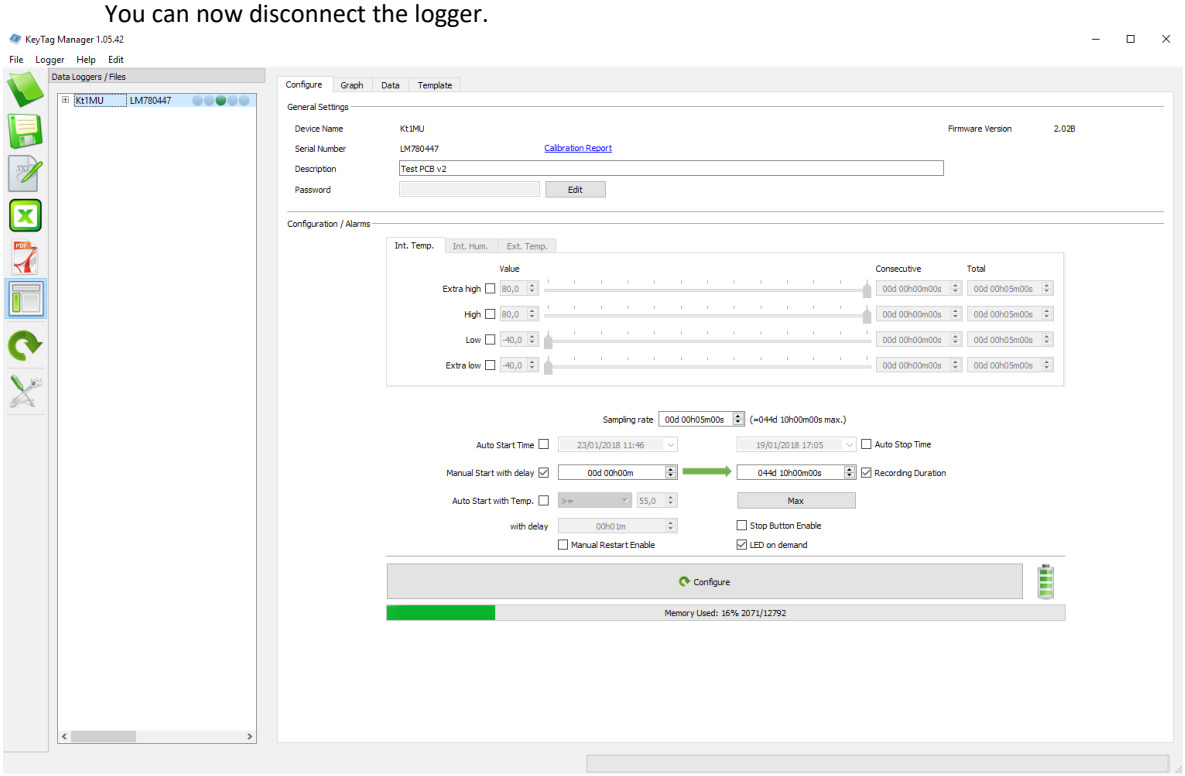
	Alarms.	**Battery Level.** **Press and hold the two buttons.**
	Extra high alarm.	Low.
	High alarm.	
	No alarm.	High.
	Low alarm.	
	Extra low alarm.	Medium.

LED's	**State.**
No blink.	Press any button to awake the LED's. After a period of 2 minutes, the LED's goes back to sleep mode.
1 flash / 10 sec.	The LED's indicate the alarm status. Logger is Ready or Stopped.
2 flashes / 5 sec.	The LED's indicate the alarm status. Logger is in Record mode.

9.4. How to configure the Kt1Mu/H

Step by step process to configure the Kt1Mu/H Data Logger.

- On the computer: Launch the KeyTag Manager application.
- Make sure that the default settings (from the Settings section) are correct.
  Language.
  Time zone.
  Temperature Units.
  Excel CSV separator.
  MKT Activation Energy (default: 83kJ/mol).
- Connect the Kt1Mu/H to the computer using the USB connection.
- The logger is detected and visible in the Data Loggers/Files section.
- Select the configuration Tab.
- Enter the description.
- Enable the alarm check boxes required in the mission.
  Set the alarm threshold.
  Set the consecutive alarm delay if needed or set to zero to disable.
  Set the total alarm delay if needed or set to zero to disable.
- Set the sampling rate.
- Set the Start condition(s):
  Auto Start Time.
  Manual Start + Delay.
  Auto Start with Temperature + Delay.
- Set the Stop condition.
  Auto Stop Time.
  Recording Duration (Press the Max button to auto set the maximum duration).
- Click on the Configuration button.
  The LED's flashes to indicate configuration is received.
- The logger is configured and ready to be started.
  You can now disconnect the logger.



9.5. How to Start the Kt1Mu/H

Step by step process to start the Kt1Mu/H Data Logger.

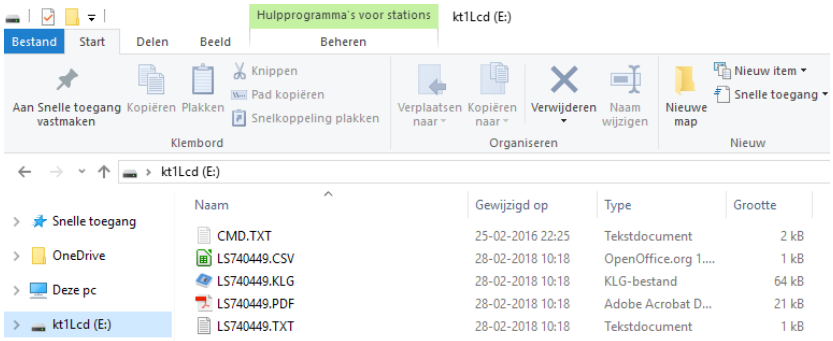
Green LED: 1 flash/8 sec.	Quickly press any button to awake the logger if necessary. Make sure the logger has been configured and in “Ready Mode”.
LED’s scroll up from blue to red.	Press and hold the Start button for 8 seconds until the loggers switch to the Record mode. A visual progress will appear during this process.
2 flashes/5 sec.	The logger is now in “Record Mode”.

9.6. How to Read the Kt1Mu/H

Quick press any button to awake the logger if necessary.
LED's indicate the current state. (see ¶9.3).

To download the report on the computer, just connect the logger and check for an external mass storage device in the explorer (for Windows) or directly mounted and visible on the desktop (for Mac). The following files are available:

- *.KLG: Keylog format, needs KeyTag Manager. (See: ¶6.1).
- *.TXT: Text File. (See: ¶6.2).
- *.CSV: Excel CSV file. (See: ¶6.3).
- *.PDF: PDF File. (See: ¶6.4).



The alternative way is to use KeyTag Manager. (see ¶4, ¶5 and ¶6).

9.7. How to Stop the Kt1Mu/H

Step by step process to stop the Kt1Mu/H Data Logger.

2 flashes/5 sec.	Quickly press any button to awake the logger if necessary.
LED’s scroll down from red to blue.	Press and hold the Stop button for 8 seconds until the loggers switch to the “Stop Mode”. A visual progress will appear during this process.
1 flash/8 sec.	The logger is now in “Stop Mode”.