First Edition **Termologger USB & OSAKA MicroLab Lite User guide**

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Introduction

The Termologger USB is a compact 16-bit USB data logger designed for accurate temperature monitoring for a wide range of applications. Due to its low cost, the Termologger USB can be used as a One Trip Logger, for monitoring temperature of perishable goods during transportation, for example. Other typical applications include warehousing of food, monitoring of controlled environments i.e. in the pharmaceutical industry, and many more.

Chapter 1 of this user guide details the operational procedures for Termologger USB as a standalone device.

Chapter 2 provides instruction on how to work with the Termologger USB software, OSAKA OSAKA MicroLab Lite.

CONTENTS

CHAPTER 1. USING THE TERMOLOGGER USB

1.1. Overview

The Termologger USB can be used as a standalone device to monitor temperature levels. The Termologger USB LCD screen continuously displays the current temperature recordings and the maximum and minimum temperature readings. You can also define minimum and maximum alarm levels for a specific data logging session, and the LCD screen will also show any alarm levels that may have been breached as well as the duration of the alarm.

The data stored by Termologger USB can be easily downloaded to any computer for further viewing and analysis using the OSAKA OSAKA MicroLab Lite software, and can also be exported to an Excel spreadsheet.

1.2. Getting Started

The Termologger USB data logger you have purchased is shipped in a plastic box with a Quick Start Guide printed on the rear of the box.

The box contains one Termologger USB data logger and one small magnet accessory (located in the Termologger USB cap which protects the USB connector). Read more about the purpose of this magnet in section 1.7.3 on page 6.

In order to save battery life, Termologger USB is shipped in Stop Mode. This means that before you can start recording, you must first connect Termologger USB to the PC and set it up with the OSAKA MicroLab Lite software in CD.

To set up Termologger USB with the OSAKA OSAKA MicroLab Lite software, refer to section 2.3.1: Setting up the Termologger USB on page 8.Once Termologger USB receives the Setup command, it begins logging the temperature data immediately or waits for a predefined time to start logging.

1.3. Reading the Termologger USB Display

The Termologger USB has a 3-digit (with one decimal place) 7-segment LCD screen, which is able to display the following information:
- The temperature reading currently recorded
- The lowest and highest temperature recorded to that point
- Low and/or high alarm level breach
- Duration of low and/or high alarm level breach
- Low battery warning

1.3.1. Data Displays

The LCD displays the data in a continuous cycle, alternating in duration according to the order shown in the table below:

Time on Screen (seconds)	Data Reading	Example of Reading on Screen
4	Temperature (in Celsius or Fahrenheit)	25.5 ˚C
2	Low alarm duration *	AL-L 1.55H
2	High alarm duration *	AL-H 1.05H
2	Minimum temperature reading	MIN 23.2 ˚C
2	Maximum temperature reading	MAX 30.1 ˚C
2	Low battery warning *	BATT LO

* If relevant (only displayed in event of alarm/low battery)

1.3.2. Current Temperature Reading

This is the last temperature reading recorded by the Termologger USB. If the sampling interval is once per second, then the reading will be updated for each of the four seconds it displayed on the LCD. Therefore you will be looking at the actual temperature recorded at that very moment.

1.3.3. Termologger USB Alarm

Termologger USB displays an alarm notification whenever any alarm level is exceeded.

AL-L – The temperature reading is lower than its low alarm level (as defined in the logger Setup).

AL-H – The temperature reading is higher than its high alarm level (as defined in the logger Setup).

The alarm notification remains until the next time you download data to a PC.

To learn how to set alarm levels, refer to page 8.

The alarm duration on the logger's LCD is calculated in hours. For example, the shortest possible duration of 0.01 hours means the logger has been in alarm for between 0 and 36 seconds.

A duration of 1.55 hours means the logger has been in alarm for 93 minutes.

If the Termologger USB is in a Low and High alarm simultaneously, then it will show the duration for both alarms.

Note: When the Termologger USB is in Cyclic mode, the Low or High alarm level displayed represents the lowest or highest readings recorded since the Termologger USB starting logging data, irrelevant of how many cycles the logger has recorded.

1.3.4. Minimum and Maximum Temperature Readings

The logger display automatically scrolls through the Min/Max temperature readings while sampling.

These readings are simply the minimum and maximum temperature values recorded by the Termologger USB up until that point. If your logger has breached an alarm level, look at the MIN and MAX readings to see the extent of the low or high alarm level breach. These readings are constantly updated.

1.4. Termologger USB Working Modes

Termologger USB is always set in one of five possible modes. These modes are all activated via the OSAKA OSAKA MicroLab Lite software (see 0 for more details).

1.4.1. Stop

Termologger USB is idle and is not recording. When pressing Stop in the OSAKA OSAKA MicroLab Lite software, the logger LCD immediately ceases to record data, instead displaying STOP and scrolling through the alarm durations (if alarms were previously recorded).

1.4.2. Run

Termologger USB is recording data. It will stop recording automatically when its memory has reached full capacity (8,000 or 16,000 samples depending on the model).

1.4.3.   Cyclic Run

Similar to Run mode, but Termologger USB will continuously sample data, recording over old data when the memory reaches its capacity, beginning with the earliest data recording.

1.4.4.   Timer Run

Termologger USB can be configured to start recording at a predetermined time. When Termologger USB is set for such a run, its status is set to Timer Run. The logger LCD displays tRUN.

1.4.5.   Push to Run

Termologger USB will only begin logging data when the user operates the logger's reed switch with the Termologger USB magnet. The logger LCD displays PUSH. See section 1.7.3 on page 6 for more details.

1.5. USB Port Connection

The Termologger USB interfaces with the computer via any of its USB Host ports. In order to be detected by the computer and by the OSAKA MicroLab Lite software, the USB driver must first be installed. USB driver installation is part of the software installation (see section 2.2: Software Installation on page 7).

1.5.1. Termologger USB LCD Status when Connected to USB

The USB connection status is always displayed on the Termologger USB LCD when connected or disconnected from a USB port.

The LCD flashes USB ON once when connected and flashes USB OFF once when disconnected from the USB port. The logger LED (located adjacent to the logger's USB connector) also lights up when connected to the USB port.

If the Termologger USB is in Run mode when connected to the USB port, the LCD will only display the current temperature reading and will not scroll through the other readings.

If the Termologger USB is in Stop mode when connected to the USB port, the LCD will display STOP. If the logger had recorded an alarm during the previous data logging session, then the LCD will also scroll through the alarm durations.

1.6. The Termologger USB Battery

The Termologger USB runs on a standard 3V CR2032 lithium battery. The battery maintains the Termologger's Real-Time Clock (RTC). The logger's time/date settings are synchronized with the PC when you perform a Setup. Removing the battery will revert the logger's time/date settings to the default of 01 Jan 2004.

1.6.1. Battery Level

The Termologger USB battery level indication is provided in the OSAKA MicroLab Lite software's Setup dialog (see page 8). The Termologger USB battery's maximum lifespan is approximately two years. This long battery life is achieved by the Termologger USB putting itself to sleep between data recordings. While in sleep mode, the data logger consumes a minimal amount of power.

Termologger USB wakes up for a few micro-seconds whenever it has to record a data sample or display new data on the LCD screen.

1.6.2. Replacing the Battery

Internal battery compartment

Figure 1: Termologger USB battery compartment

As shown in the figure above, the Termologger USB internal lithium battery is located under a removable rubber protector. To replace the battery, simply remove the rubber protector and pull out the battery.

Note: Be sure to place the rubber protector properly back in its place, to maintain the Termologger's dust and waterproof IP68 compliancy. As stated previously, replacing the battery will lose the Termologger's time/date settings. These can be restored the next time you Setup the logger using OSAKA MicroLab Lite.

After replacing the battery, the Termologger USB LCD will display PUSH, indicating it is in Push to Run mode. Once you connect the logger to the PC's USB port, you will be able to run the logger without the need for the magnet.

In addition, you will still be able to download the data previously recorded onto the Termologger USB, before you removed the battery. This data is not lost.

1.6.3. Using the Termologger USB Magnet

The Termologger USB includes the magnet accessory (stored in the logger's cap during shipment). This magnet is used to activate the logger when in Push to Run mode. There is a reed relay on the Termologger's circuit board which is closed using the magnet, thereby activating the logger.
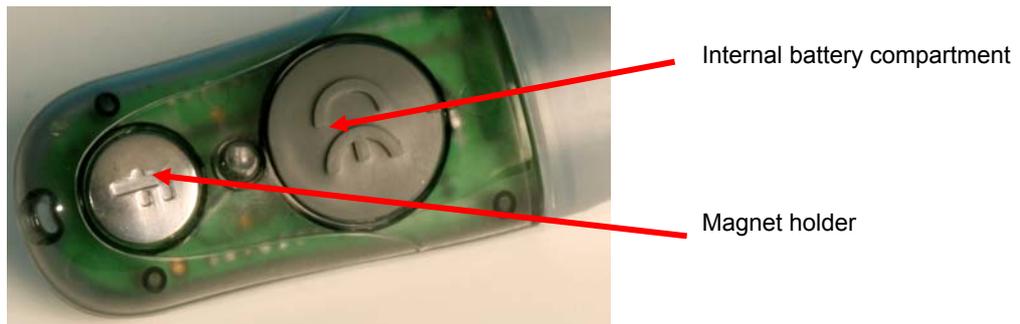

Internal battery compartment

Magnet holder

Figure 2: Termologger USB magnet holder

To activate the Termologger USB when in Push to Run mode, place the magnet inside the small holder next to the battery compartment for two seconds, and then remove the magnet. The Termologger USB LCD will immediately move to Run mode and live temperature data will be displayed.

2.1. OSAKA MicroLab Lite Software Overview

The OSAKA MicroLab Lite software was designed to allow for the programming of the desired data recording specifications for Termologger USB, to enable the downloading of recorded data to a PC, and to store, view and analyze the data. The Logger menu handles all communication between the PC and Termologger USB, such as programming the desired recording mode, starting or stopping data recording, as well as downloading the data.

The View menu controls the various data display options. Data can be viewed in graph format, in table format, or in both. The Data Map is a separate pane that displays a list of the open data sets. It can also be used to quickly navigate through the data sets. The Graph menu contains all the commands needed to format and edit the graph. The most common tasks and commands are available as buttons on the main toolbar and on the graph toolbar.

2.2. Software Installation

2.2.1. System Requirements
To work with OSAKA MicroLab Lite your system should be configured with the following: Software Windows 98, Windows 2000, Windows ME, Windows XP, Vista

Hardware
Pentium 200 MHz or higher
32 MB RAM (64 MB recommended)
5 MB available disk space for the OSAKA MicroLab Lite application

2.2.2. Installation Procedure
This installation procedure is written for computers running Windows 2000, Windows ME, Windows XP and Vista. Note: Do not connect the Termologger USB to the computer until installation of software and USB driver is complete.

Click Run to install the software directly from CD. The OSAKA MicroLab Lite software will first be installed. Follow the on-screen instructions to continue the installation process.

Once the OSAKA MicroLab Lite software has been installed the Silicon Laboratories USB driver installation will begin automatically. The driver is required in order for the computer to detect the Termologger USB logger.

Follow the on-screen instructions to continue the installation process. The default installation location is C:\SiLabs.
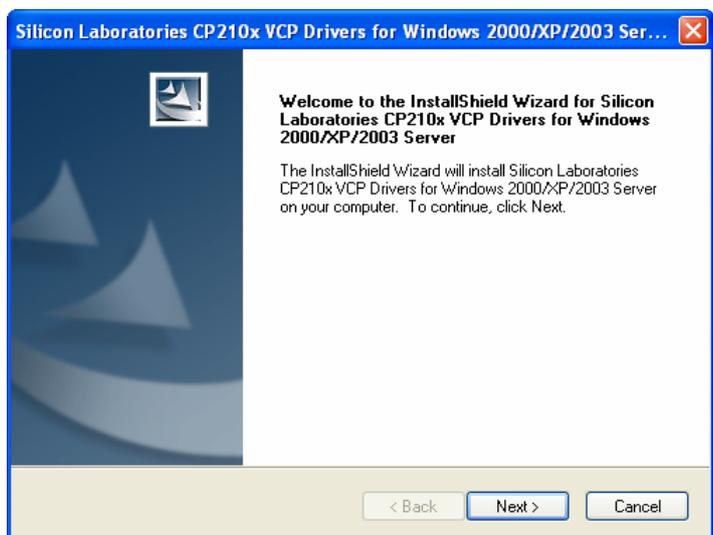
When the following dialog pops up, click Install.
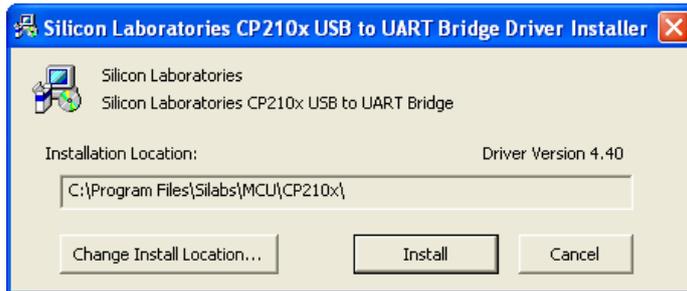
The installation of the driver could take up to one minute or more, depending on the system.
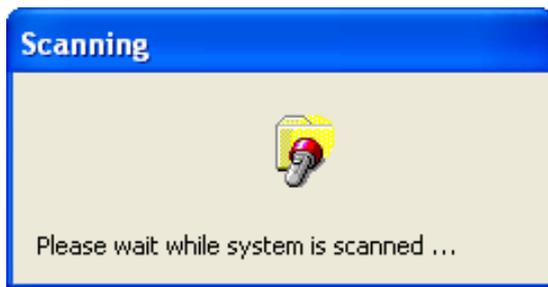
Once installed, click Finish to close the USB driver Install Wizard dialog.

The main OSAKA MicroLab Lite InstallShield Wizard now resumes.
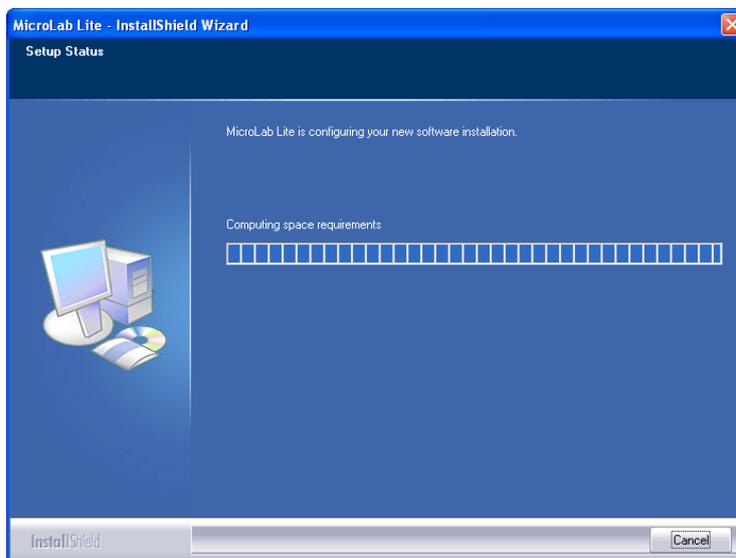
After a few more seconds, the installation process is completed. Click Finish.

Connect the Termologger USB to a USB port on your PC. The PC will automatically detect the Termologger USB as new hardware. After a few seconds you will see a message stating that the device is ready for use.

Double click the OSAKA MicroLab Lite shortcut on your desktop to launch the software. If the Termologger USB is connected to the PC the software will automatically detect it.

2.3. Getting Started

2.3.1.   Setting up the Termologger USB.

Use the Setup dialog box to view or change the Termologger USB settings. Connect Termologger USB to the PC.

Click Setup [SETUP icon] to open the Setup dialog box.
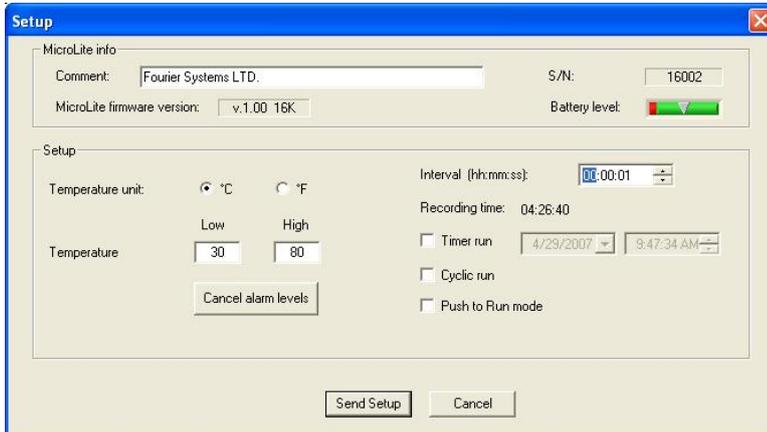
Figure 3: Setup dialog box

The dialog box consists of two main sections:

A. Termologger USB info

Comment
> Click the text box and type a name that will serve to identify the specific Thermologger USB (e.g. its location).

S/N
> Displays the Thermologger's serial number.

Battery Level
> Shows the current status of the Thermologger USB battery. If the indicator is in the red zone the battery should be replaced.

Termologger USB firmware version
> Displays the firmware version and the memory capacity, either 8K (8,000) or 16K (16,000) samples.

B. Setup

Temperature unit

> To set the temperature unit in the Thermologger USB display, select the option you want (Celsius or Fahrenheit).

Temperature alarm

> Type in the desired Low and High alarm levels. If the Thermologger USB records a reading that exceeds either of these levels, the Thermologger´s LCD will display an alarm notification.
> The default alarm levels are the lower and upper ends of the temperature sensor range. Click **Cancel Alarm** to restore the default levels.

Interval

> This determines the logging interval, or the time interval between successive data recordings.
> The time format is hh:mm:ss. Set the time setting to select a recording time interval from **1 second to 2 hours**. For example, to set a time interval of one hour, five minutes and thirty seconds, click the hours (hh) and type 1 or use the arrows to select 01. Click the minutes (mm) and type 5 or use the arrows, and finally, click the seconds (ss) and type 30 or select 30 using the arrows.

Recording Time

> Displays the total recording time according to the logging interval selected.

Timer run

> Select the **Timer run** check box if you want Thermologger USB to start recording at a predetermined time. This option is convenient if you are using several Thermologger USB at once and want them to all begin logging at the same time.
> Use the time and date selectors to set the start time.

Cyclic run

> In **Cyclic run** mode, the Thermologger USB overwrites the old measurements (starting with the oldest recorded data) once the Thermologger's memory is full. Click the **Cyclic run** check box to operate in this mode.
> If the check box is unselected, Thermologger USB will operate in **Normal run** mode and will stop recording when the memory is full.

Push to run

> In **Push to run** mode, the Thermologger USB will only start recording data when you use the Thermologger USB magnet to close the reed relay on the Thermologger's circuit board, thereby causing the logger to start recording data. This is convenient for when you wish to start recording data soon (but not immediately) following setup, or at an unspecified time.

Temperature unit

> To set the temperature unit in the Termologger USB display, select the option you want (Celsius or Fahrenheit).

Temperature alarm

> Type in the desired Low and High alarm levels. If the Termologger USB records a reading that exceeds either of these levels, the Termologger´s LCD will display an alarm notification.
> The default alarm levels are the lower and upper ends of the temperature sensor range. Click Cancel Alarm to restore the default levels.

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> The time format is hh:mm:ss. Set the time setting to select a recording time interval from 1 second to 2 hours. For example, to set a time interval of one hour, five minutes and thirty seconds, click the hours (hh) and type 1 or use the arrows to select 01. Click the minutes (mm) and type 5 or use the arrows, and finally, click the seconds (ss) and type 30 or select 30 using the arrows.

Recording Time

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Use the time and date selectors to set the start time.

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If the check box is unselected, Termologger USB will operate in Normal run mode and will stop recording when the memory is full.

Push to run

In Push to run mode, the Termologger USB will only start recording data when you use the Termologger USB magnet to close the reed relay on the Termologger's circuit board, thereby causing the logger to start recording data. This is convenient for when you wish to start recording data soon (but not immediately) following setup, or at an unspecified time.

2.3.2. Completing the Setup

Click Send Setup to send the new settings to the Termologger USB and begin recording. This will complete the setup. Click Cancel if you do not wish to change the setup at this stage.

Note: The Send Setup command erases all existing data in the Termologger USB.

If you select Timer run mode, Termologger USB will wait in standby mode, displaying tRUN. It will begin recording at the specified time.

If you select Push to Run mode, Termologger USB will also wait in standby mode, displaying PUSH until the magnet is used to start the logger.

2.3.3. Starting Data Recording

Click Run every time you want to start a new recording. The Run command erases all previous data in the Termologger USB memory and begins recording.

Note: If you setup the Termologger USB using the Setup command, it will automatically begin recording, and you don't have to click Run.

2.3.4. Stopping Data Recording

Click Stop to stop recording. In Stop mode, Termologger USB keeps all recorded data but does not record new data. Use this mode to save battery power.

2.3.5. Temperature Sensor Calibration

A new Termologger USB comes fully calibrated. After a long period of use however, you may want to recalibrate the Temperature sensor.

The calibration is made directly to the Termologger USB firmware i.e. the calibrated data is displayed on the logger LCD, not just in the software following data download.

Calibration must be carried out while Termologger USB is connected to the PC.

Calibration Password

- To prevent accidental change of the calibration, the calibration procedure is protected by a password.
- The default password is: 1234.

To change the password:

- Click Logger on the main menu, and then click Calibration.
- Click Change Password to open the Change Password dialog box.
- Enter the current password in the Current Password field.
- Enter the new password in the New Password field.
- Enter the new password a second time in the Confirm New Password field to confirm your new password.
- Click OK.

Note: The password must include at least 4 characters and is case sensitive.

Temperature Calibration

- Connect the Termologger USB to the PC.
- Click Logger on the main menu, and then click Calibration.
- Enter the calibration password, and then click OK.
- The Calibration dialog will open.
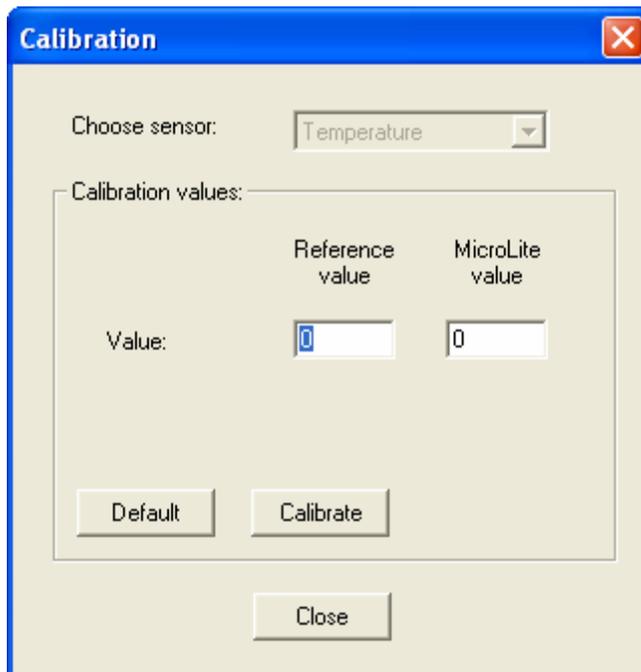
- Enter the Reference value: this is the temperature value you expect the logger to display.
- Enter the Termologger USB value: this is the temperature value the logger is currently displaying, when compared with the reference value.
- Click Calibrate.
- To restore default calibration, click Default. This will remove any calibration applied to the Termologger USB.

2.3.6.   Communication Setup

Communication between the PC and the Termologger USB unit takes place automatically whenever you send a command to the Termologger USB. However, the Communication Setup dialog box can be used for more advanced communication options.

Click Logger on the main menu and select Com setup to open the Communication Setup dialog box:
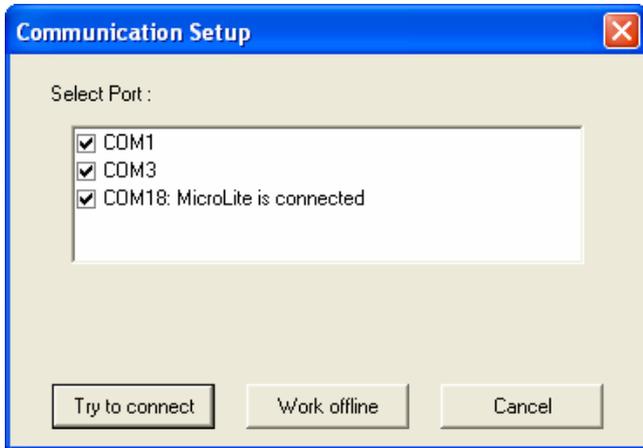

Figure 4: Communication Setup dialog box

The selected COM ports are available for communication.
- Click Try to connect to establish communication.
- Click Work offline to work with saved files and no logger detection is required.

Note: You can speed up the Termologger USB detection process by only selecting the COM which is being used by the Termologger USB.

2.3.7.   Downloading Data
- Connect Termologger USB to the PC.
- Open the OSAKA MicroLab Lite software.
- Click Download on the main toolbar.

The Termologger USB will first be detected and then the download will begin. Once the data has been downloaded, it will be displayed both in the graph and in the table, and a new data icon will be added to the Data Map:
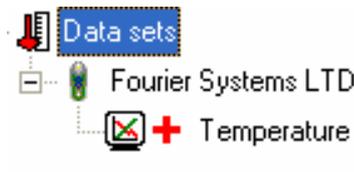
You can now connect a different Termologger USB to the PC and download its data as well. The number of downloads is limited only by the memory available on the computer.

Use the Data Map (refer to page 14) to navigate between the different data sets.

2.3.8.   Saving Data

To save the displayed data, click Save ![icon] on the main toolbar. The data currently displayed by the graph will be saved in the Termologger USB Data folder:

C:\Program Files\Fourier Systems\MicroLab Lite\MicrpLite

The data file name consists of the Termologger USB name (Comment, refer to page 9) and of the time and date at which it was saved.

To save data in a different location or under a different name, use the Save as… command from the File menu: Select Save as… from the File menu.

- Enter a new name in the File name box.
- To save the data in a different folder, select a drive and/or folder from the Save in dialog box.
- Click Save.
- If you've downloaded data from more than one Termologger USB and you want to save all the data sets, select Save all from the File menu.

Note: If you want to remove unwanted data before saving, apply the Crop tool (refer to page 16).

2.4. OSAKA MicroLab Lite Basics

2.4.1.   Opening Files

Click Open ![icon] on the main toolbar.
To open a file that was saved in a different folder, select a drive and/or folder in the Look in dialog box.
Double-click the file you want to open.

2.4.2.   Displaying Properties

You can change the way numbers and dates will be displayed on screen. Click File on the main menu, and then click Display properties. Under Decimal place settings, enter the number of decimal places you want to display (enter a number between 0 and 4) for each sensor. Under the Date format settings, select the desired format option. Click OK.

2.4.3.   Printing a Graph

- Click Print ![icon] on the main toolbar to open the Print Options dialog box.
- Click the Graph option.
- Click Print to open the Print dialog box.
- Click OK.

2.4.4.   Printing a Table

The displayed data can also be printed as a table. The printed table will include data from all Termologger's that are currently represented on the graph (to learn how to add or remove data sets from the graph, refer to page 14) as well as the Termologger USB name, serial number and the alarm level setup. Data that exceeds any of the alarm levels will be highlighted by arrows.

Click Print ![icon] on the main toolbar to open the Print Options dialog box.

- Click the Table option. If you want to print only part of the data, uncheck the check box and select the desired time and date in the From and To boxes.
- Click Print to open the Print dialog box and click OK.

2.5. Viewing the Data

2.5.1. Display Options

OSAKA MicroLab Lite's main window consists of three parts: the graph, the table and the Data Map. You can display all three parts simultaneously (the default view) or any combination of them.

Graph

Click Graph to display or remove the graph. The graph displays the data sets plotted vs. time.

In order to keep the graph clear and simple, only two Y-axes can be shown on the graph simultaneously. If there are three curves in the graph, one of the Y-axes will be hidden. To make this axis visible, select the corresponding plot with the cursor (refer to page 14). You can identify the Y-axis by its color, which matches the plot color.

Table

Click Table to display or remove the table. The data in the table always matches the data that is currently displayed on the graph.

Data Map

Click Data Map to display or remove the Data Map.

The Data Map is a separate window that displays the list of data sets that were downloaded or opened in the current session. Use the Data Map to navigate through the available plots and to keep track of the data that is displayed in the graph and/or table windows.

When you double-click on a Termologger USB icon in the Data Map, OSAKA MicroLab Lite jumps to the corresponding data and displays it in the graph and table windows. It also expands the Data Map to show the Temperature sensor data set.

- A graph icon indicates that the data set is currently being displayed. Double-click on the icon to clear the data set from the display.

- An empty icon indicates that the data set is not being displayed. Double-click on the icon to add the data set to the display.

- To collapse the sensor list under an individual Termologger USB, click the minus sign (-) next to the Termologger USB icon.

- To expand the sensor list under an individual Termologger USB, click the plus sign (+) next to the Termologger USB icon.

- To remove an individual Termologger USB from the Data Map, right-click on its icon, then click Remove data.

- To remove all data sets from the Data Map, right-click the Data Sets icon , then click Remove all data.

2.5.2. The Cursor

Use the cursor to view individual data recording values, or to reveal a hidden Y-axis. OSAKA MicroLab Lite enables you to display up to two cursors simultaneously.

To display the first cursor, double-click on an individual data point or click Cursor on the graph toolbar. You can drag the cursor with the mouse to any other point on the plot, or to another plot altogether. The point coordinates of the selected data recording will appear in the status bar at the bottom of the graph window.

To display a second cursor, double-click anywhere on the graph or click Second cursor on the graph toolbar.

2.5.3. Graph Features

Zooming

Click Zoom in on the graph toolbar and drag the cursor diagonally to select the area you want to magnify. Release the mouse button to zoom in to the selected area.
Click on the Zoom in button a second time to turn off the Zoom tool.

Autoscale

Click Autoscale on the graph toolbar for the full data display. Double-click on an individual axis to auto scale it separately.

Manual scaling

Click Graph properties on the graph toolbar to open the Graph Properties dialog box.
Select the Scale tab, and choose the axis you want to scale in the Select axis drop-down menu.
Unselect the Auto scale check box and enter the new values in the value fields.
In the time axis, you can either enter the time and date manually, or select it with the up and down arrow buttons. Click OK. To restore auto scaling, click Autoscale .

Default zooming

If you usually need to view a specific time frame (i.e. workday hours), use the Default zooming tool. You can set the start and end time of the time span and then use it whenever you open a file or download data from the Termologger USB.
To set the default zoom:
- Click Graph Properties on the graph toolbar, then click Set Default Zoom.
- Enter the start and end times, then click Set.
To zoom to the default zoom:
- Click Graph Properties on the graph toolbar.
- Check the Use default zoom check box and click OK.

Every file and every data recording you download will automatically open in the default zoom as long as the Use

default zoom check box remains selected. To restore auto scaling, click Autoscale [🔍] .

The Stretch/Compress Axis Tool

Move the cursor onto one of graph axes. The cursor icon changes to a double arrow symbol (↔), indicating that you can stretch or compress the axis scale. Drag the symbol to the desired location. Repeat the procedure for the other axis, if necessary.

Panning

Use the pan tool after zooming any part of the graph that is outside the zoomed area.

To do so, click Pan   on the graph toolbar, then click anywhere on the graph and drag the graph to view another area. Click Pan a second time to turn off the Pan tool.

2.5.4.   Cropping the Data

Cropping enables you to trim the edges of a data set. Use it to remove unwanted data. Zoom to the data range you want to keep. Click Graph on the menu bar, and then click Crop. All data outside the zoomed area will be permanently removed.

2.5.5.   Formatting the Graph

You can change a data line's color, style or width. You can also add markers that represent the data points on the graph and format their style and color.

The Y-axis color matches the corresponding plot's color and will change accordingly. The Time axis color can be changed separately:

- Click Graph properties [icon] on the graph toolbar to open the Graph Properties dialog box.
- Select the Lines tab, and then select the plot or axis you want to format in the Select plot drop-down menu.
- From here, you can format the line's color, style and width, as well as the markers' color and style.

To remove the line or the marker, uncheck the corresponding visible check box.

To restore the default formatting, click Restore default, and click OK.

2.5.6.   Displaying Alarm Levels

Click the Display Alarm Level icon on the main toolbar [🔔 Temperature ▼] to enable the Temperature alarm levels to be displayed on the graph.

2.5.7.   Changing the Temperature Units

Click Toggle °C/°F button [°C/°F] to change the temperature scale from Fahrenheit to Celsius and vice versa.

Note: To change the units in the Termologger USB display, use the Setup dialog box (refer to page ¡Error! Marcador no definido.).

2.5.8.   Adding Annotations to the Graph

OSAKA MicroLab Lite allows you to add annotations to the graph. An annotation is always attached to a specific data point.

To add an annotation:
- Place the cursor on the point to which you want to add the annotation.
- Click Add new annotation [TEXT] on the graph toolbar
- Type the annotation in the New annotation caption text box.
- Click OK.

To move an annotation:
- Click Move annotation [TEXT] on the graph toolbar
- Drag the annotation to any location on the graph you choose.
- Click Move annotation a second time.

To edit an annotation:
- Place the cursor on the point to which the annotation is attached.
- Click Graph on the menu bar.
- Click Edit annotation.
- Edit the annotation in the text box.
- Click OK.

To delete an annotation:
- Place the cursor on the point to which the annotation is attached.
- Click Graph on the menu bar.
- Click Delete annotation.

To hide all annotations:
- Click Graph on the menu bar.
- Click Show annotations to uncheck it.

2.5.9.   Exporting Data to Excel

Click Export to Excel [X] to export the currently displayed data to an Excel spreadsheet. OSAKA MicroLab Lite will open a new Excel workbook displaying the data along with the Termologger USB info, including the Termologger USB name, serial number and alarm levels setup.
If Excel is not installed on the PC then the data will be exported to a CSV text file.

2.5.10. Export File Settings

If OSAKA MicroLab Lite fails to export the data properly i.e. all of the data is displayed in one row of the worksheet, you can change the export file settings. This ensures that the data is exported using comma separated values (CSV).
- Click File on the main menu, then click Export file settings,

- Select the Ignore regional settings check box.
- Click OK.

2.5.11. Copying the Graph as a Picture

You can copy the graph to the clipboard as a picture and then paste it into other Windows programs, such as Word and PowerPoint:

- On the Graph menu, click Copy graph.
- Open the destination file.
- In the destination file, right-click and select Paste.
- Viewing more than one Data Set on the Graph

MicroLab Lite lets you view more than one data set in Graph and Table view at the same time, allowing you to compare the data from several data sets side by side.

Note: To use this feature the data sets must have been recorded using the same sampling rate e.g. every 1 minute

There are two modes when using the Multi-graph feature:

A. Standard mode

The time scale of all data on the graph is the same. The time and date of data recorded in the first data set included on the graph is used.

For example, if you have a graph whose data was recorded starting 10:00AM on August 11, then all additional data added to the graph will be displayed with the same recording date.

The OSAKA MicroLab Lite data table below shows all data in the graph having the same time scale:

	Time (Date)	Fourier Systems LTD. Temperature (°C)	Fourier Systems LTD. 2 Temperature (°C)
0	28-Apr-07 14:03:42	26.33	25.00
1	28-Apr-07 14:03:43	26.33	25.00
2	28-Apr-07 14:03:44	26.33	25.00
3	28-Apr-07 14:03:45	26.44	25.10
4	28-Apr-07 14:03:46	26.44	25.00
5	28-Apr-07 14:03:47	26.44	25.10
6	28-Apr-07 14:03:48	26.44	25.10
7	28-Apr-07 14:03:49	26.44	25.00
8	28-Apr-07 14:03:50	26.44	25.10
9	28-Apr-07 14:03:51	26.33	25.10
10	28-Apr-07 14:03:52	26.33	25.10

Figure 5:Termologger USB data table

B. Plot sync mode

To display data on the graph using the data's actual time scale i.e. the time and date when the data was actually recorded, use the Plot sync feature. This will also shift all data in the data table accordingly.

Once you've added the data to the graph, on the Graph menu, select Plot sync to enable the feature. To return to Standard mode, unselect Plot sync.

Note: The time scale of all data is rounded to the same resolution as the time scale of the original data on the graph.

2.6. Analysis Tools

2.6.1. Setting the Analysis Tools Parameters

Click Analysis on the menu bar, then click Set Functions' Parameters to open a dialog box:
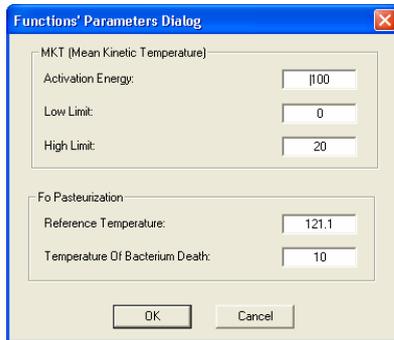
Figure 6: Functions Parameters

Type in the desired parameters, and then click OK.

2.6.2. Histogram

Use this tool to create a frequency distribution of the selected data set.

To create a histogram:

- Use the cursor to select a plot on the graph.
- Click Analysis on the main menu bar, then click Histogram.

OSAKA MicroLab Lite displays a histogram of the selected data and creates a new entry in the Data Map.

Use the Data Map (refer to page 14) to hide the histogram or to return to the original data sets.

You can modify the histogram to your needs. You can set the upper limits of the first bin and the lower limit of the last bins, and refine the histogram by increasing the number of bins.

To modify the histogram:

Click Analysis on the main menu, then click Histogram a second time to open a dialog:
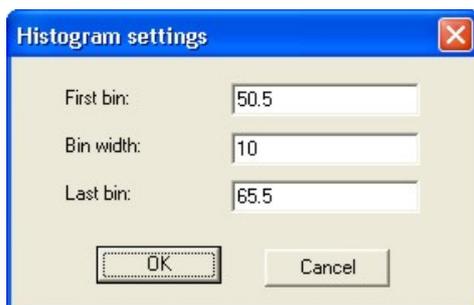
Figure 7: Histogram settings

Enter the desired values for the first bin, the bin width and last bin, and then click OK. You can repeat the process for further modification.

2.6.3. Pasteurization

Use this tool to create and display an FO Pasteurization curve: Click Analysis on the menu bar, then click FO pasteurization.

2.6.4. Statistics

Use the statistics tool to display statistics of each data set in the graph.

The statistics include:

- Minimum – The smallest value in the data set.
- Maximum – The largest value in the data set.
- Average – The average of all the numbers in the data set.
- MKT – The Mean Kinetic Temperature.

To display statistics:

Click Statistics Σ on the main toolbar. OSAKA MicroLab Lite will display the statistics in the information bar at the bottom of the graph window.

To hide the statistics, click Statistics Σ a second time.

2.7. Toolbar Buttons

2.7.1. Main (Upper) Toolbar

	Open	Opens saved files
	Save	Saves the data that is currently displayed
	Print…	Opens the Print Option dialog box
	Export	Exports the displayed data to an Excel spreadsheet
	Run	Begins recording data
	Stop	Stops recording data
	Setup	Opens the Setup dialog box
	Download	Downloads data from the Thermologger USB onto the PC
	Data Map	Displays or removes the Data Map
	Graph	Displays or removes the graph
	Table	Displays or removes the table
	Statistics	Displays or removes the data's statistics
	°C/°F	Displays the desired unit of temperature
	Alarm	Displays or removes temperature alarm levels from the graph

2.7.2. Graph (Lower) Toolbar

	Add annotation	Adds new annotation to the graph
	Move annotation	Relocates the annotation on the graph
	Zoom in	Activates the zoom tool
	Pan	Activates the pan tool
	Autoscale	Returns the graph to full view
	Graph properties	Opens the Graph Properties dialog box
	Cursor	Toggles the first cursor
	Second cursor	Toggles the second cursor

Specifications

Termologger USB
Models:
LITE5008 - Temperature sensor; 8,000 sample memory
LITE5016 - Temperature sensor; 16,000 sample memory

Internal Temperature sensor:
Range: -40 ˚C to 80 ˚C
Resolution: A/D resolution: 16-bit, 0.1°C
Accuracy (all ranges): 0.3 ˚C
Response time: ~ 20 minutes
(Thermal conductor enabling fast response time)
Software calibration is possible
Outputs:
3-digit 7-segment LCD with decimal point
USB 2.0 interface
Memory Capacity:
8,000 samples or 16,000 samples, depending on Termologger USB model
LCD Unit Icons:
˚C, ˚F, AL-H, AL-L, MIN, MAX
Power Supply:
Internal Lithium Battery: 3V, CR2032
Battery Life: Approximately two years
Sampling Rate:
User defined: From once every second to once every 2 hours

Dimensions:

11 x 3.9 x 2.6 cm

Weight:

45.5 g

Standards:

Water and dust proof IP68 standard compliance

CE and FCC standard compliance

Software

OSAKA MicroLab Lite Software Features

Runs on Windows 98/2000/ME/XP/VISTA

Fast data download from the Termologger USB

Graphic visualization of the Termologger USB data

Data displayed in graphs and tables

Data export to EXCEL

Graphic analysis tools such as Markers, Zoom

Setup windows, for setting the Termologger USB unit name, sampling rate and alarm level

Sampling rate: Once every second to one every 2 hours

Termologger USB sensor calibration

Display of Termologger USB battery level

Visual alarm levels on the graph and table

OSAKA MicroLab Lite System Requirements

Software

Windows 98 or later

Internet Explorer 4.0 or later

Hardware

Pentium 200 MHz or higher

32 MB RAM (64 MB recommended)

5 MB available disk space for the OSAKA MicroLab Lite application

Appendix: Figures