EL-USB-2-LCD
Product Overview

EL-USB-2-LCD is a data logger that measures and stores up to 16,379 relative humidity and 16,379 temperature readings over 0 to 100%RH and -35 to +80°C (-31 to +176°F) measurement ranges.

The user can easily set up the logger and view downloaded data by plugging the data logger into a PC's USB port and using the supplied software. Relative humidity, temperature and dewpoint (the temperature at which water vapour present in the air begins to condense) data can then be graphed, printed and exported to other applications.

The high contrast LCD can show a variety of temperature and humidity information. At the touch of a button, the user can cycle between the current temprature and humidity, along with the maximum and minimum stored values for temperature and humidity.

The data logger is supplied complete with a long-life lithium battery, which can typically allow logging for three months.

Help File Contents

Quick Start Guide

Remove the transparent cap from the EL-USB-2-LCD.

Install the battery in the EL-USB-2-LCD.

Insert the EL-USB-2-LCD into a free USB port on your computer. The computer will automatically detect the presence of the EL-USB-2-LCD and start the hardware installation process. Refer to the Installation guide.

Double-click the EasyLog USB icon on your desktop to launch the control software. You will be presented with three options on the Main Screen.

Click on the green button to set up and start the EL-USB-2-LCD Data Logger and follow the setup procedure:-

USB Data Logger Name, Temperature Scale and Sample Rate:
- enter the Logger Name,
- select the Temperature Scale,
- select the Sample Rate,
- then click Next.

Note: If you are using this Data Logger for the first time, then it may contain some sample data, in which case you will receive a warning message. Click OK to continue.

Setting alarm levels for the USB Data Logger:
- select the Alarms, if required,
- select the Alarm Trigger Levels for any selected alarms,
- select Hold for any selected alarms,
- then click Next.

Logger Options:
- select how the LCD should operate from the available options,
- select whether the logger should stop saving data when full or begin overwriting the oldest data.

Setting the start time and date:
- either click Finish if you want to start logging immediately or
- select the Start Time and Start Date for logging to commence, then click Finish.

The summary screen will appear.

Remove the EL-USB-2-LCD from the computer and place it in the location where you want to measure temperature.

Notes: If you leave the EL-USB-2-LCD connected to your PC, the Data Logger will operate at an elevated temperature, due to a self heating effect. This will cause the Data Logger to record erroneous temperature readings. If the Data Logger is connected to the USB port for a long time (e.g. 15 minutes), then you should allow time for the Data Logger to cool down after disconnecting it from the USB port.

When the EL-USB-2-LCD is connected to the USB port, the battery inside the Data Logger is discharged at a higher rate than normal. To conserve battery life, do not leave the EL-USB-2-LCD connected to the USB port for a prolonged period of time.

Help File Contents

The Software Interface
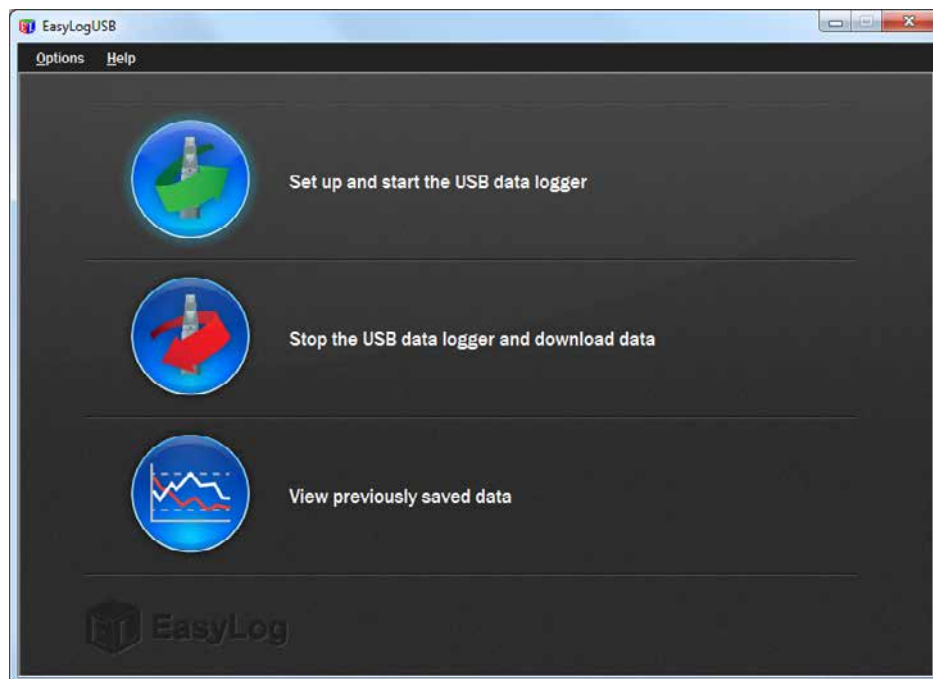
Click on the green button to set up and start the data logger.

If the data logger is logging when you click on the green button, or if the data logger is set up for a delayed start, then you will be prompted to stop the logging process.

- · If you select No, then the data logger will continue logging.

- · If you select Yes, then the data logger will stop taking readings. Any stored data will be permanently erased when Setup is Finished. To enable you to save this data before it is lost, click cancel in the Setup window and then click on the red button to download any stored data.
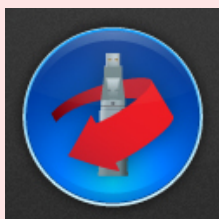
Click on the red button to stop the EL-USB-2-LCD data logger and download any stored data.

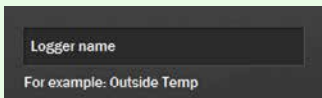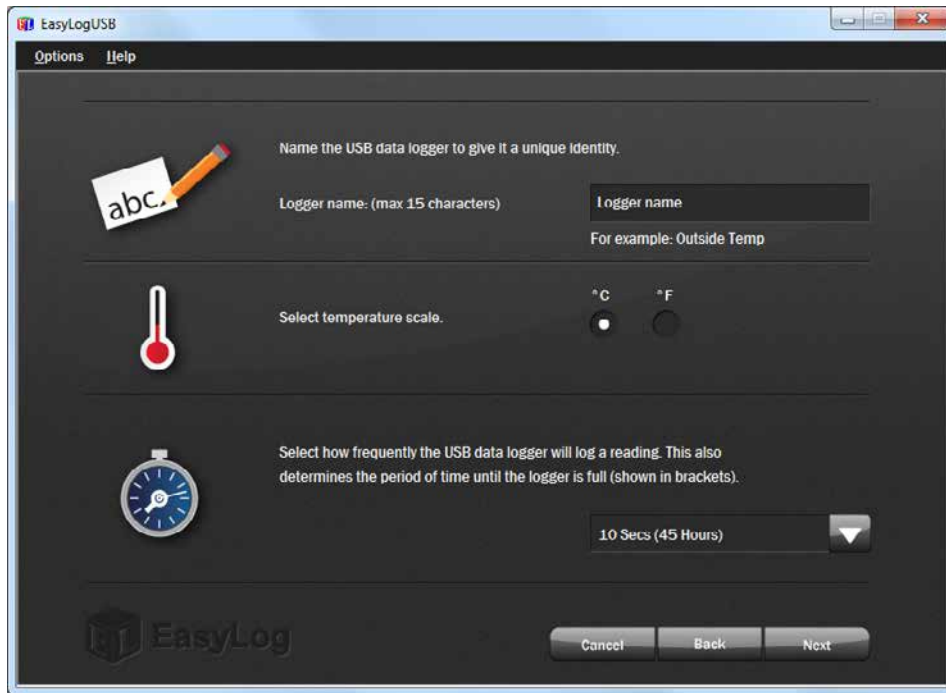To avoid inadvertently interrupting a logging exercise, you will be asked to confirm that you would like to halt the logging process.
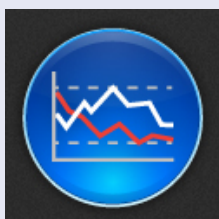
Click on the blue button to graph previously saved data.

This opens the File Open dialog box which prompts you to select the data file you wish to graph.

USB Data Logger Name, Temperature Scale and Sample Rate

In order to distinguish between several EL-USB-2-LCD data loggers, give each EL-USB-2-LCD a unique name, up to 15 characters long. The name can contain letters (upper and lower case), numbers, and all special characters except any of the following: " % & * , . / : < > ? \ ( ) |

Check the appropriate box to store the readings in degrees Celsius or degrees Fahrenheit.
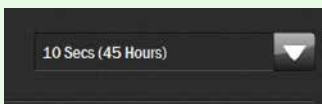
Select the sample rate for the EL-USB-2-LCD. The sample rate shows the time interval between stored readings.

Selecting a short sample rate results in the EL-USB-2-LCD memory being full faster than when a longer sample rate is selected.

If in doubt, we recommend that you always install a fresh battery before logging critical data.

Available sample rates and memory capacities are as follows:-

Sample Rate	Memory Capacity
10 seconds	45 hours
1 minute	11 days
5 minutes	56 days
30 minutes	11 months
1 hour	1.8 years
6 hours	> 2 years*
12 hours	> 2 years*

* Although you can log at this sample rate, the battery will in all likelihood run out before you have filled the EL-USB-2-LCD's memory.

Always ensure that the remaining charge in the battery is sufficient to last the complete duration of your logging exercise.

Note: Changing the battery whilst logging is in progress will halt the logging operation.

Display and logging options

Select the most suitable LCD setting for your application:

Selecting 'LCD Off' will give the longest battery life but you will not be able to see the data until it is downloaded.

Selecting 'LCD Always On' will give the shortest battery life but you are always able to see the data shown on the display.

Selecting 'On for 30 seconds' allows the EL-USB-2-LCD to stay in a low power state most of the time, but will show the data at the touch of the button.

There are 2 available options for how the logger will respond once the memory is full:

Selecting 'Logger stops' will cease the logging session once memory capacity has been reached. All data will be saved until it has been downloaded.

Selecting 'Logger continues to log' means once the memory is full it will begin overwriting the oldest data to produce a rolling data set. Any data that is overwritten cannot be recovered.

Setting Alarm Levels
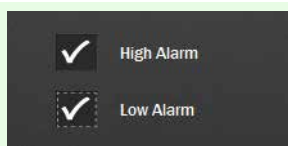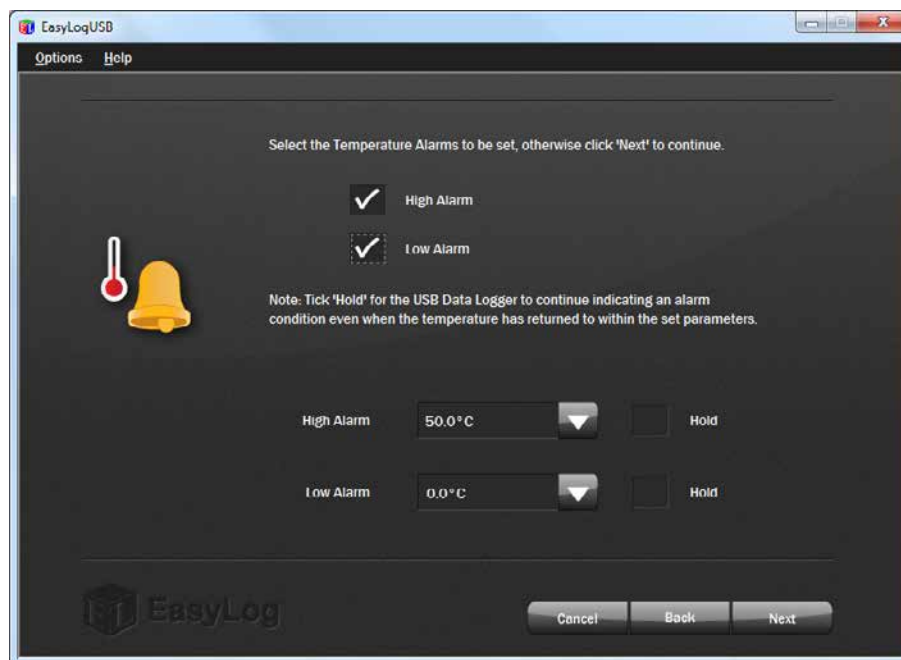
You have the option to set no, one or both alarms.

If no alarms are set, then the EL-USB—LCD flashes its green LED once every 10 seconds.

If one or both alarms have been set, then the EL-USB-2-LCD flashes its red LED once, twice or three times every 10 seconds, every time a reading is stored and an alarm level has been breached. The number of flashes is determined by which alarm has been breached, once for the Low Alarm, twice for the High Alarm and three times for an alarm breach with full memory. If no alarm level has been breached, then the EL-USB-2-LCD flashes its green LED once every 10 seconds.

Note: When the battery is approaching depletion, the interval between each flashing sequence changes to every 20 seconds.
When the battery is fully depleted, the logger will stop and LEDs will not flash.
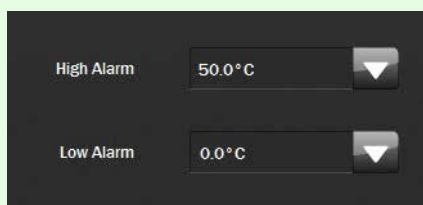
For each alarm that you have set, you must set the alarm trigger level (the level at which the alarm is activated) by using the drop-down list box.

Note: The High Alarm cannot be set lower than the Low Alarm.

You also have the option to set Hold for each alarm. By selecting this option, the LED status for the channel will continue to show the alarm level even if the value being measured is no longer in an alarm condition. This ensures that you always know whether the Alarm trigger level has been breached.

Note: If both alarms have been set to Hold, then Hold will only apply to the alarm trigger level that was breached first.
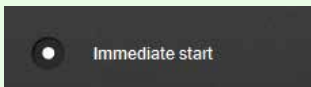
The colour and flashing rate of the LED only relates to the stored measurements. It does not relate to any temperature or humidity fluctuations which may occur between stored measurements, or after the last stored measurement.

Setting Start Time and Date
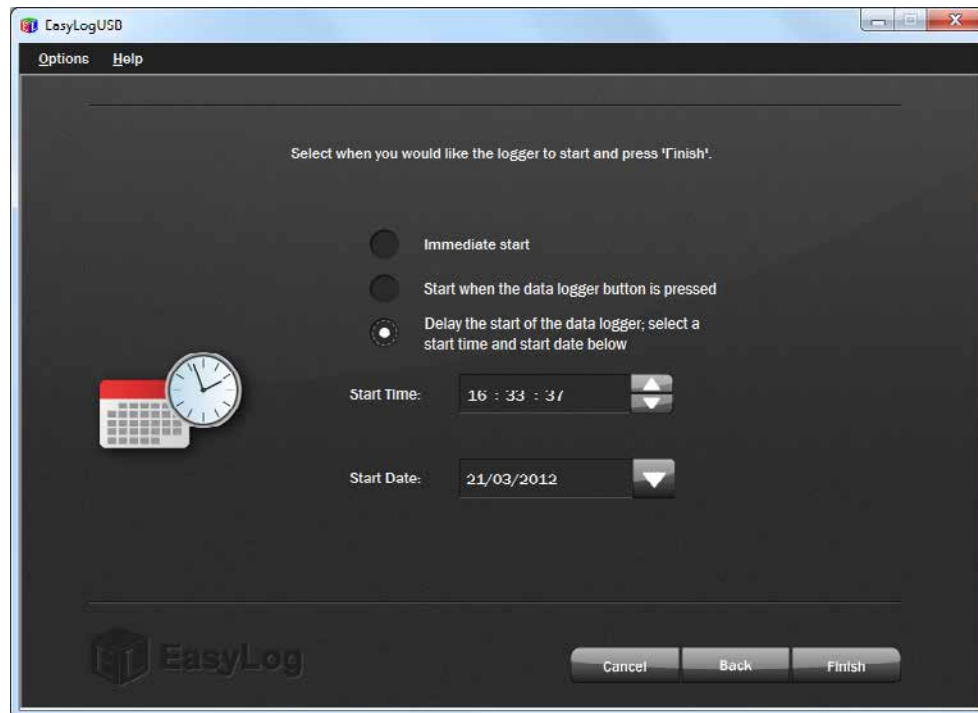
The data logger can be setup to start in three different ways:

Immediate start:

Select the appropriate radio button and click 'Finish'. The data logger will take its first reading immediately thereafter.

Start when the data logger button is pressed:

Select the appropriate radio button and click 'Finish'. The data logger screen will display 'dS' to indicate a delayed start. When the button is pressed the data logger will take its first reading immediately thereafter.

To start logging at a later time and date:

First select the appropriate radio button. The current time and date will be shown.

To change the start time:

Select the part of the time (hh, mm or ss) that you want to modify. Then use the up/down arrows to the right of the text box or type over to select the desired start time.

To change the start date:

Select the part of the date (dd, mm or yyyy) that you want to modify. Then use the down arrow next to the date to open up a calendar from which the and either type over to select the desired date, or click the down arrow next to the date to open up a calendar from which the desired start date can be selected.

Help File Contents

Setup Summary

After the computer has configured the Data Logger with your chosen parameters, the following confirmation screen is displayed.
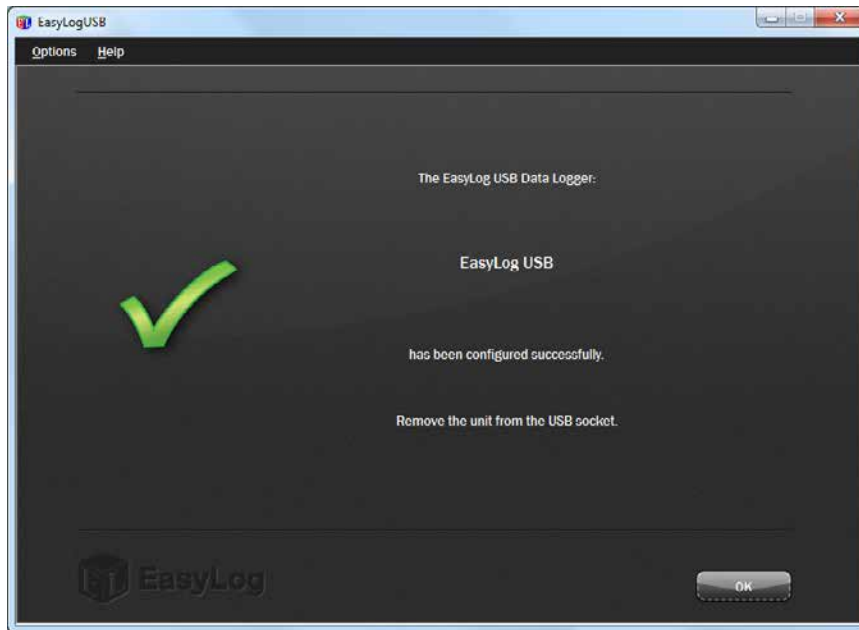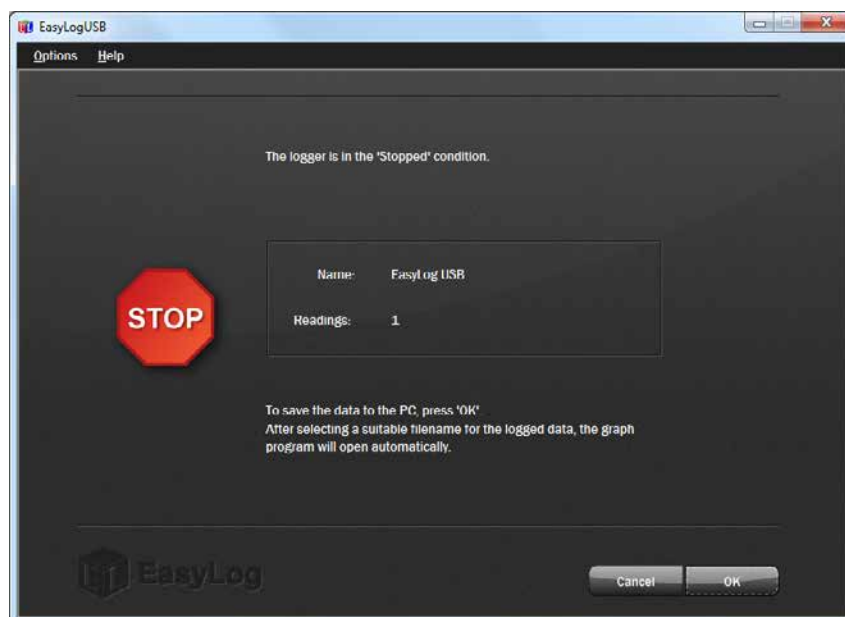

Remove the Data Logger from the computer and place it in the location where you want to measure temperature and relative humidity.
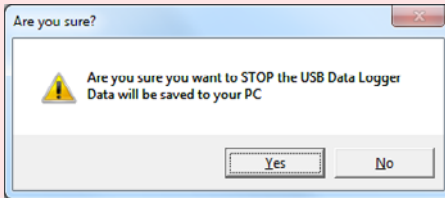
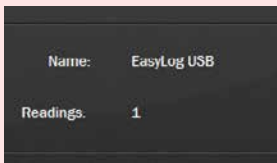---

Stop Logging and Download Data

Click on the red button to stop the data logger and download any stored data.
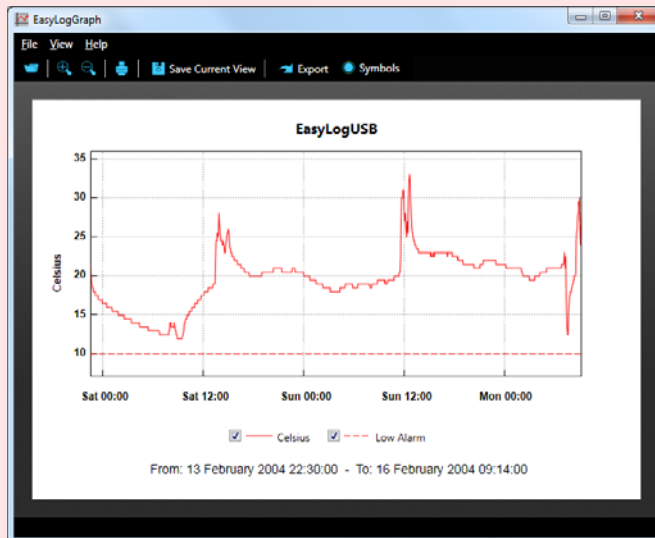

To avoid inadvertently interrupting a logging exercise, you will be asked to confirm that you would like to halt the logging process.

Click Yes to stop the logging exercise.

A window pops up to show that the Data Logger is in the Stopped condition, it also displays the Data Logger's Name and the number of Readings stored inside its memory.

To save the data to the PC and graph it, click OK. After selecting a suitable filename for the logged data*, the graph program will open automatically and display the readings as a graph.

The data that has just been downloaded will remain in the logger's memory until it has been set up again.

* If you do not choose a file name, then the EL-WIN-USB software will attempt to save the data to a file with the same name as the logger name.

Note: Before downloading critical data from the data logger, ensure that there are no other programs running on the PC.

Graphing

There are two ways to open the graphing program:-

- Clicking the red button on the main program screen stops the logging process, prompts you for a file name to save to and then opens up the graphing program to show the logged data as a graph.
- Clicking the blue button on the main program screen, which prompts you for a file name to open and then opens up the graphing program to show the previously saved data as a graph.
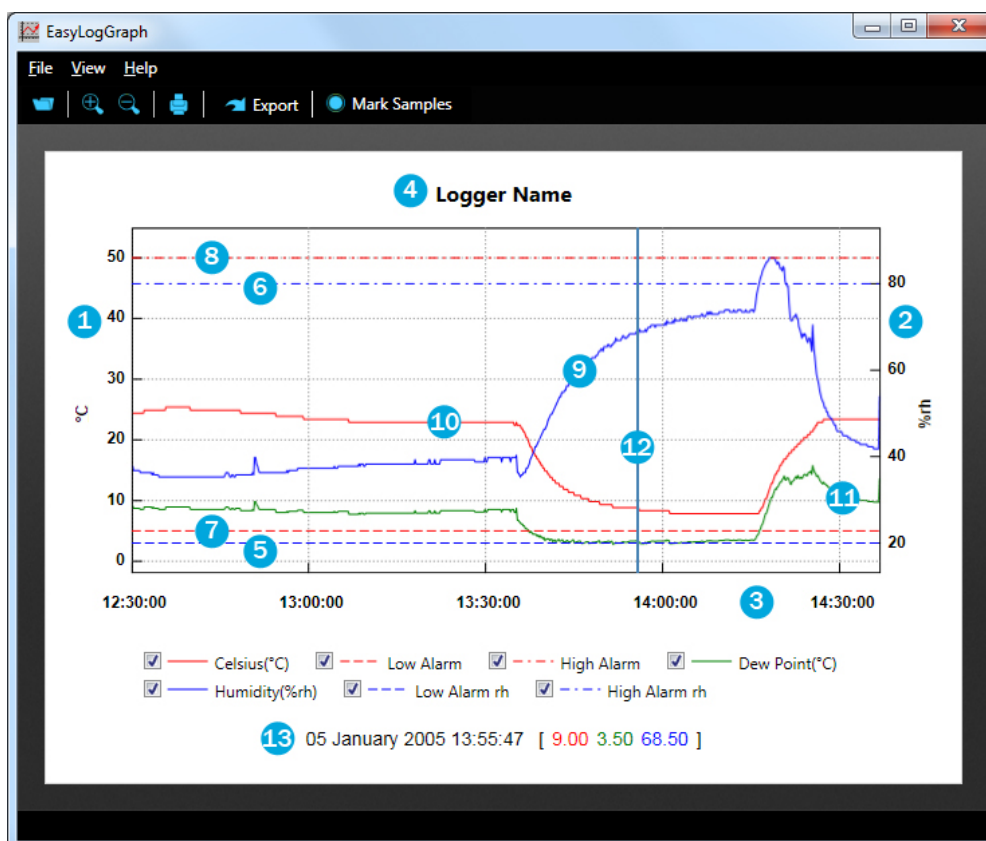
The graph shows the following information:-

1. The left hand vertical axis, including temperature scale and unit.
2. The right hand vertical axis, including humidity scale and unit.
3. The horizontal axis including time related information.
4. The data logger name.
5. The low humidity alarm trigger level, shown as a blue horizontal dashed line.
6. The high humidity alarm trigger level, shown as a blue horizontal dashed line.
7. The low temperature alarm trigger level, shown as a red horizontal dashed line.
8. The high temperature alarm trigger level, shown as a red horizontal dashed line.
9. Plotted humidity data, shown as a blue line.
10. Plotted temperature data, shown as a red line.
11. Plotted dew point data, shown as a green line.
12. Marker line, shown as a blue vertical line that follows the mouse pointer.
13. Marker line data, showing the data relevant to the current marker line position, or the logging period, if no marker line is shown.

Traces:-

When graphing data, the image can get cluttered with multiple traces. Up to 7 traces can be displayed with data from an EL-USB-2-LCD (relative humidity, temperature, each with up to 2 alarms, and dew point). In order to reduce the clutter, individual traces can be turned off by clicking on *View - Show traces* and clicking on the listed trace name that you wish to switch off. Similarly, the trace can later be switched back on again by clicking on the same menu option. It is also possible to toggle traces on and off using the tick box at the bottom of the graph.

Grid lines:-

When graphing data, the image will by default automatically include horizontal (y-axis) and vertical (x-axis) grid lines to facilitate interpretation of the data. These lines can be turned off by clicking on *View - Grid Lines* and clicking on the horizontal or vertical grid line that you wish to switch off. Similarly, the grid lines can later be switched back on again by clicking on the same menu option.

Notes:
- The horizontal grid line will be aligned to specific values on the temperature axis, while any alignment with specific values on the relative humidity axis is merely coincidental.
- When plotting another graph, the graphing software will remember your grid line preferences. When exiting the graphing software, your grid line preferences are lost.

The toolbar shows the following buttons:-

 Open - Clicking this button opens the Open dialogue box, prompts you to select the data file that you want to graph, and then displays the data as a graph.

 Zoom in - Click this button. Then select the zoom area by holding the left mouse button down and dragging a box over that part of the graph that you wish to inspect more closely.

You can zoom in several times before the maximum zoom level is reached and no further zooming in is achieved.

 Zoom out - Every time you click this button, the zoom level is decreased to the previous zoom level until, eventually, the minimum zoom level is reached and no further zooming out is achieved.
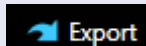
 Export – Automatically exports, formats and graphs the data into Microsoft Excel.

 Print - Click this button to open the Print dialogue box.
Note: Selecting Landscape orientation for your printer allows you to print larger graphs, showing more detail.

Importing the Measurements into Other Applications

The graphing software includes an automatic export button for Microsoft Excel. Other spreadsheet programs are currently unsupported. Users of these other programs have to perform a manual import of the data. Data is stored in the .txt file in a 'comma separated variable' format, sometimes called 'comma delimited format'.

Copying the Graph into Other Applications

1)

Capturing the Image

Open the EasyLog data file that you wish to graph and copy into your report. There are two ways of doing this: -

- If you want to plot data that is still in your data logger, then connect your data logger to the PC and click the red button on the main EasyLog USB program screen to stop the logging process. This prompts you for a file name to save to and then opens up the graphing program to show you the saved data as a graph.

- If you want to plot data that has already been saved, then click the blue button on the main program screen. This prompts you for a file name to open and then runs the graphing program to show the previously saved data as a graph.

You now need to prepare the graph prior to capturing it: -

- Maximise the image on your screen.

- If the mouse pointer is located over the graph, then this will result in a vertical pink marker line on the graph and the legend below the graph will show the values for the date, time, temperature and humidity that coincide with that pink marker line. If this pink marker line is not required, then move the mouse pointer away from the graph. The legend below the graph will then show the start and end dates and times of the graph.

Now press ALT+PRINT SCREEN on the keyboard. This will copy an image of the screen to the clipboard.

You are now ready to paste this image from the clipboard into your target application. The examples below show you how to paste and manipulate the captured image in Word 2000 and Paint, the latter enabling the image to be saved as a BMP and used in any other application.

2)

- Using the Captured Image in Word 2000

Position the cursor (mouse pointer) at desired location in your document and left-click once.

Paste the captured image from the clipboard into your document by selecting Edit / Paste or pressing Ctrl+V on the keyboard.

Save your document.

Left-click on the image to select it and then drag its corners in or out to reduce or increase the size of the image.

To remove borders from the image, double-click on the image. This opens up the Format Picture dialog box. Click on the Picture tab. Here, you can crop left, right, top and bottom parts of the image that are not required. Typically, this could be (5mm) left, (5mm) right, (20mm) top, (10mm) bottom. These values depend on the measurement unit used and the screen resolution at which the image was captured.

Centre justify the image, if required, and add a suitable caption, if required.

- Using the Captured Image in Paint

Click 'File > New' to create a new picture.

Select Edit / Paste (or press Ctrl+V on the keyboard.

Use the select tool to select the area of the graph you wish to use. Select Edit / Copy, then File / New (do not save the file when prompted). A new blank picture will open. Now select Edit / Paste, the screen should now show the selected part of your graph. Finally click File / Save to save the picture as a .BMP file which can be used in a variety of applications.

View the Data Logger Status
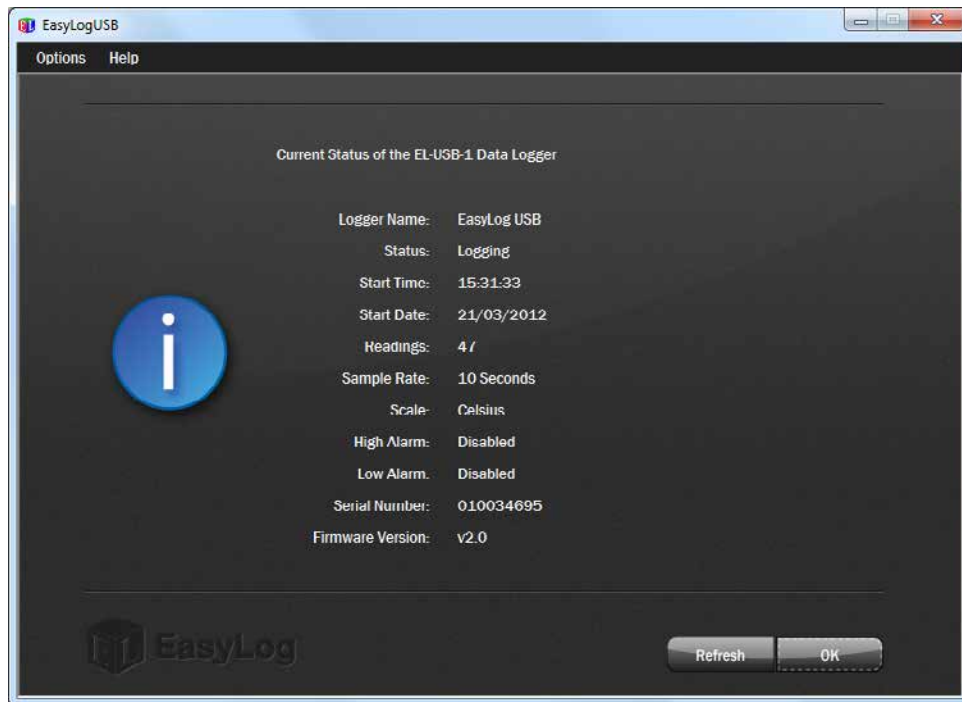
Click on 'Options', then 'Current Status...' to display the current status of the Data Logger.

Installing/Replacing the battery

We recommend that a suitable, new battery is used if any low battery state is detected.

When the LEDs indicate that the battery inside the data logger is nearly empty, the battery should be replaced immediately. If a battery is completely discharged, all previously logged readings are stored securely inside the data logger, but no new readings are being taken.
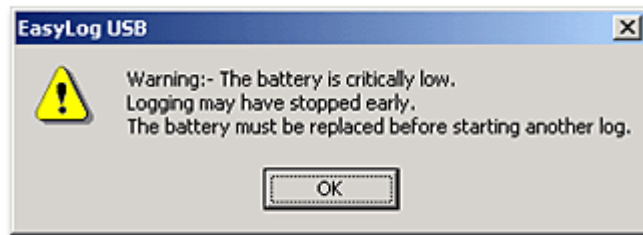
When communicating with the data logger, the PC will detect if the battery is in need of replacing.

1. The first state is a 'BATTERY LOW' warning.

The data logger will still work in this state but the battery has a very limited life.

2. The final state is a 'BATTERY CRITICAL' warning.

The data logger has stored any readings taken and safely shut itself down. No more readings will be logged and the battery MUST be replaced.

- Do not open, puncture, or mutilate the batteries
- Do not heat batteries or attempt to recharge them
- Do not use a fire to dispose of batteries
- Keep batteries out of reach of children
- Always remove old, weak, or worn-out batteries promptly and recycle or dispose of them in accordance with local regulations
- Remove the batteries if your device is to be stored for longer than a month without being used

To replace the battery, proceed as follows:

Use a small flat blade screwdriver to gently push down the tab, by moving the screwdriver in the direction of the arrow. Take care not to push the tab down too far, as this may damage the tab.

While the tab is pushed down, gently pull apart the two parts of the data logger enclosure.

Remove the old battery and dispose of it in accordance with local regulations. Observe warnings on the battery casing.

Fit a new 1/2AA battery of the same type, making sure it is fitted the correct way round and noting the polarity symbols moulded into the battery bay. Only use 3.6V 1/2AA lithium batteries. Before replacing the battery, remove the data logger from the PC. We recommend the following part:-

MANUFACTURER	BATTERY PART NUMBER
Tekcell	SB-AA02P

Slide the two parts of the data logger enclosure back together again, until a click is heard. This confirms that the two parts are snapped together correctly.

After the battery has been replaced, connect the data logger to your PC to download any data that may be stored from a previous exercise.

The data logger is now ready to be set up to start a new logging exercise.

Help File Contents

LED Status Indication

The EL-USB-2-LCD features two high intensity LEDs, located in the main body of the logger. During operation, the LEDs flash to indicate the logger and alarm status, as per below:

Green Single Flash:- The channel is logging, no alarm levels (if set) have been exceeded.

Green Double Flash:- The EL-USB-2-LCD is configured for a delayed start.

Green Triple Flash:- The EL-USB-2-LCD is full, no alarm levels (if set) have been exceeded.

Red Single: Flash:- The channel is logging, the low alarm level has been exceeded. If Hold has been enabled during setup, then the alarm event may have occurred a while ago.

Red Double: Flash:- The channel is logging, the high alarm level has been exceeded. If Hold has been enabled during setup, then the alarm event may have occurred a while ago.

Red Triple: Flash:- The EL-USB-2-LCD is full, the low alarm or high alarm level has been exceeded. If Hold has been enabled during setup, then the alarm event may have occurred a while ago.

If both LEDs flash red every 60 seconds, the logger is indicating a low battery status and you should replace the battery immediately. No alarms are shown when the logger is in this condition.

Note:- If both alarms have been set to Hold, then Hold will only apply to the alarm trigger level that was breached first.

The LCD

The LCD on the EL-USB-2-LCD provides information on the logging status of the unit at the touch of a button. The table below shows the various displays possible.
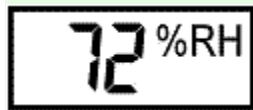
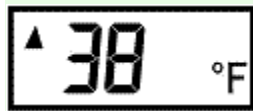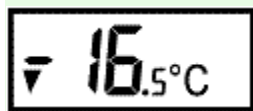|	
d5	The logger is in 'Delayed Start' mode and will begin logging at the time specified during setup.
P5	When the LCD has been disabled (see Display and Logging Options), pressing the button will momentarily show 'log' to indicate that the unit is functioning correctly.
lo9	When the LCD has been disabled (see Display and Logging Options), pressing the button will momentarily show 'log' to indicate that the unit is functioning correctly.
72 %RH	A reading with no 'triangle' annunciator before it indicates the latest logged reading for either temperature or humidity.
▲ 38 °F	A upwards pointing triangle before a reading indicates this is the Maximum recorded reading
▼ 16.5°C	A downwards pointing triangle before a reading indicates this is the Minimum recorded reading
- - -	The logger is in a 'stopped' condition

Help File Contents