EL-GFX-DTC

Product Overview

The EL-GFX-DTC standalone USB data logger measures and stores up to 252,928 temperature readings from two J, K, or T-type thermocouple inputs at a resolution of 0.1°C. Using the Windows control software users can quickly set up the data logger and view downloaded data by connecting the device to the PC's USB port using the supplied cable.

The data logger features a high-contrast graphic LCD and three-input buttons which allows users to start, stop and restart the data logger using on-screen menus. This menu also provides real-time analysis of data either as a data summary (showing highest & lowest readings and alarm conditions) or as a graph that updates as new data is added. The Max and Min readings and also the Time and Date these are valid from, can be displayed on the LCD (info button). If desired, the user can then reset the Max/Min shown on this screen of the LCD. Each time these maxima and minima are reset whilst logging, an "Event Marker" is created in the data. When the data has been downloaded to a PC these Events can be viewed on the graph (Mark Events), they also appear in the data file - associated with the corresponding log when the reset took place. For certain applications where procedures mandate that a regular physical check of the logger/stats have taken place – this can be useful as an audit / validation tool. Multiple data logging sessions can be stored on the device ready for upload to a PC at a later date.

The two replaceable ½AA batteries typically allow logging for up to one year.

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Quick Start Guide

The EL-GFX-DTC is supplied with the batteries installed and with a plastic tab which must be removed to provide power to the unit.

Using the micro USB cable supplied, connect the EL-GFX-DTC to a free USB port on your PC. If the software has been correctly installed the PC will automatically detect the presence of the EL-GFX-DTC.

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-GFX-DTC data logger and follow the setup procedure:-

GFX Data Logger Name, Temperature Scale, Thermocouple Settings and Sample Rate:
- enter the Logger Name,
- select the Temperature Scale,
- select the Channel Options including Thermocouple Type
- 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.

Adjust Offset Calibration

Display functionality and security settings
- choose how you would like the display to function,
- select the security setting for the data logger,
- then click Next.

Setting alarm levels for the GFX 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.

Delayed Alarm Settings:
- select number of consecutive readings in an alarm condition before it is indicated by the LED's

Setting the start mode:
- choose how you would like the data logger to start,
- set any variables as required by your chosen start mode,
- then click Finish.

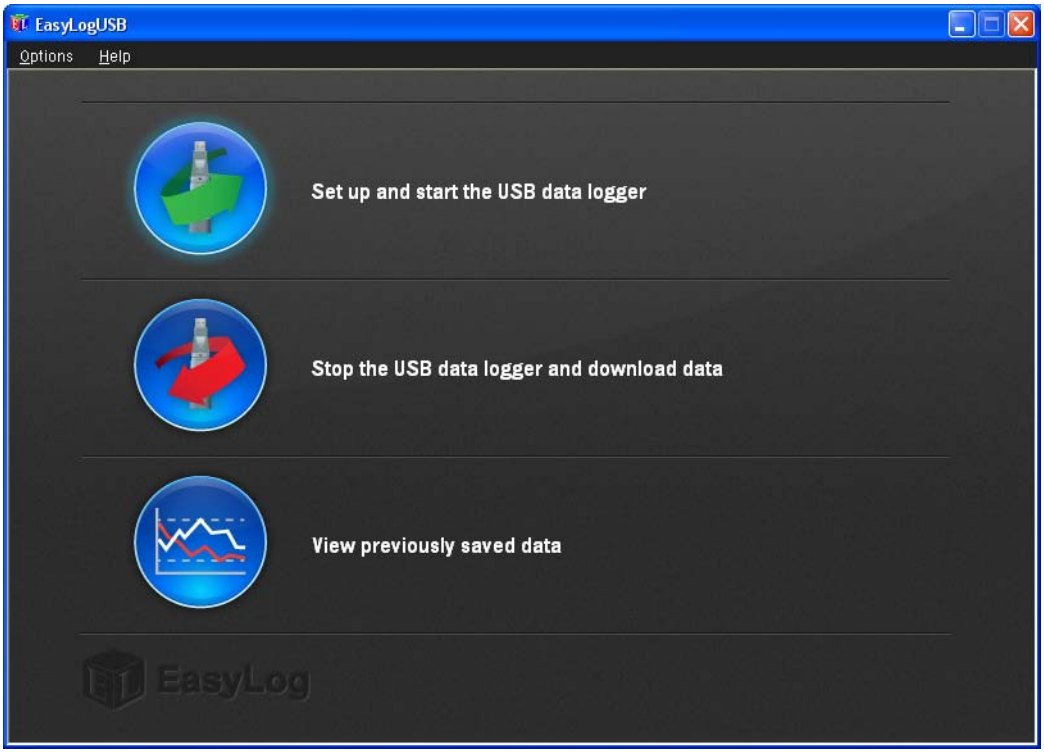
The summary screen will appear.

Remove the EL-GFX-DTC from the computer and place it in the location where you want to measure temperature.

When the EL-GFX-DTc 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-GFX-DTC connected to the USB port for a prolonged period of time.

Help File Contents

The Software Interface



Click on the “set up button” (the top button) to set up and start the data logger.

If the data logger is logging when you click on the “set up 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 “stop button” to download any stored data.

Click on the “stop button” (second button down) to stop the EL-GFX-DTC data logger and download any stored data.

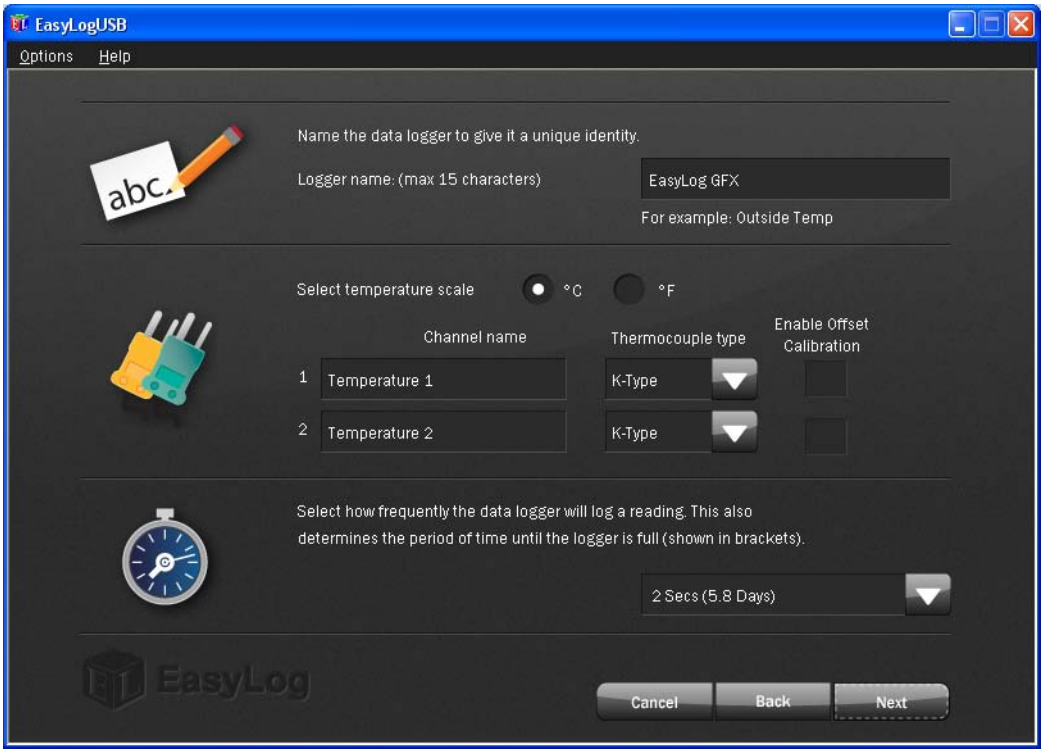
To avoid inadvertently interrupting a logging exercise, you will be asked to confirm that you would like to halt the logging process.

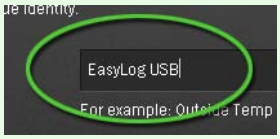
Click on the “download button” (bottom button) to graph previously saved data.

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

Help File Contents

USB Data Logger Name, Temperature Scale, Thermocouple Settings and Sample Rate





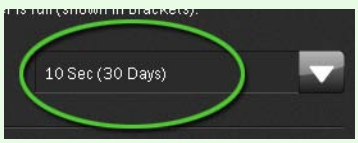
In order to distinguish between several EL-GFX-DTC data loggers, give each data logger a unique name, up to 15 characters long. The name can contain letters (upper and lower case), numbers, and all special characters except any of the following:

" % & * , . / : < > ? \ ( ) |

Check the appropriate box to store the readings in degrees Celsius or degrees Fahrenheit.

Select the channel name and thermocouple type for each channel. The drop-down also includes options to select internal temperature, or to disable the channel completely.

To the right there is a tick box to enable offset calibration. This should only be checked by advanced users.



Select the sample rate for the EL-GFX-DTC. The sample rate shows the time interval between stored readings.

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

Available sample rates and memory capacities are as follows:-

Sample Rate	Memory Capacity
2 seconds	5.8 days
10 seconds	29 days
15 seconds	43 days
20 seconds	58 days
30 seconds	87 days
1 minute	174 days
2 minutes	349 days
5 minutes *	> 2 years
10 minutes *	> 2 years
30 minutes *	> 2 years
1 hour *	> 2 years

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

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

If in doubt, we recommend that you install fresh batteries before logging critical data.

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

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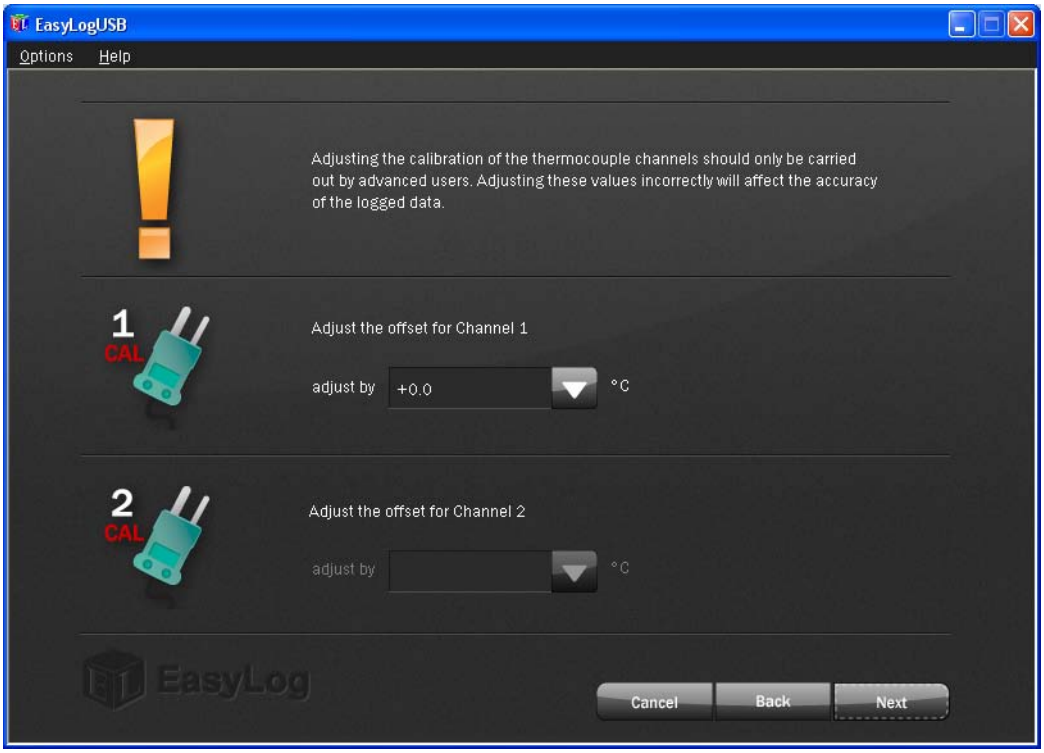
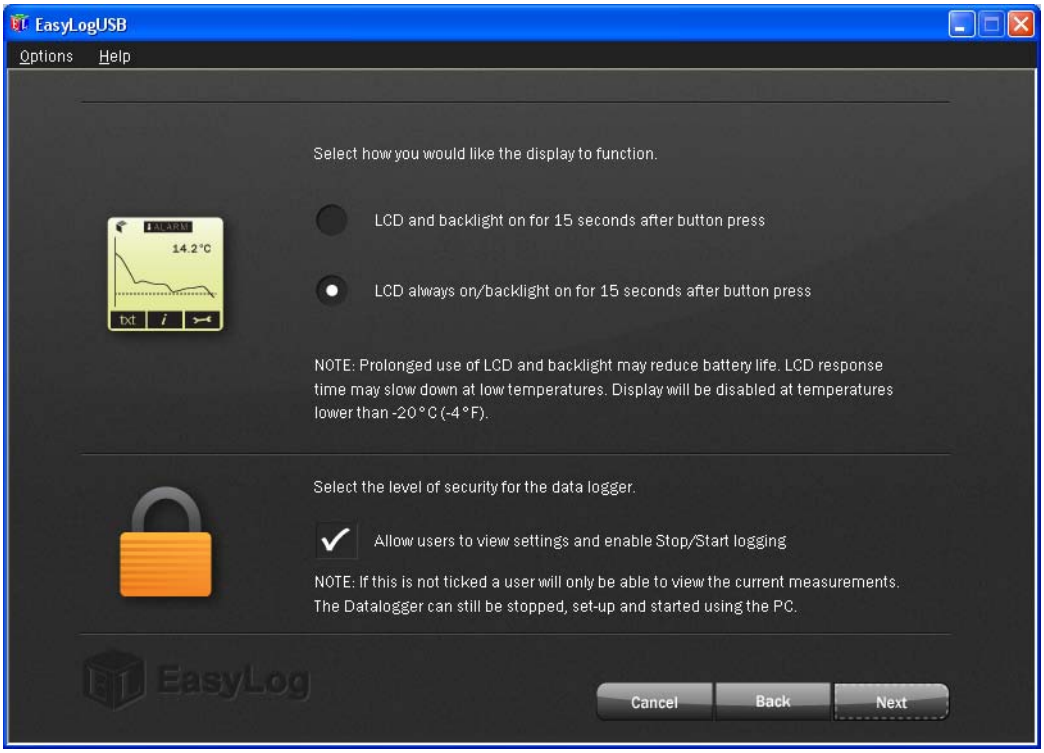
Adjust Offset Calibration



Select the temperature offset to be applied to each channel.

It is important that any adjustments made during this stage of setup are carefully considered and based on empirical evidence. Used incorrectly this functionality could introduce errors into the recorded data.

Display and security options



Select the most suitable LCD setting for your application:

Selecting 'LCD and backlight on for 15 seconds after button press' will give the longest battery life but the display will remain blank between uses.

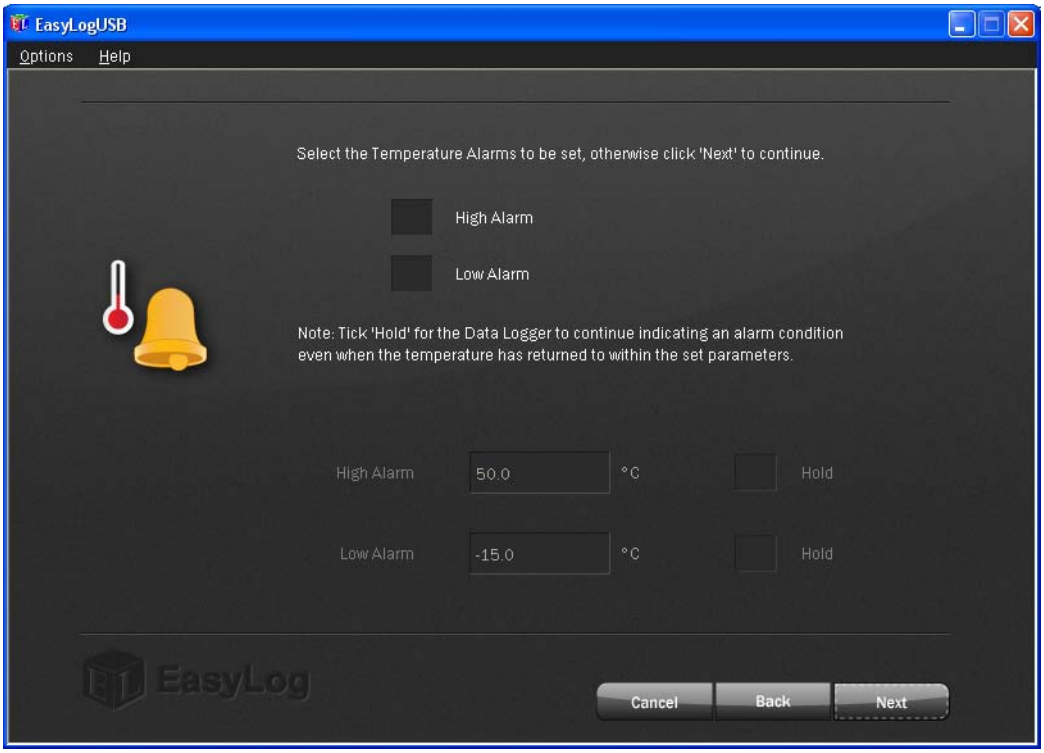
Selecting 'LCD always on/backlight on for 15 seconds after button press' will enable you to always see the display, but with the backlight only turning on after a button press.

Select the level of security for the data logger:

By leaving the tick box checked users will be able to view settings as well as start/stop logging using the on-screen menus. By removing this tick these options will not be accessible via the on-screen menus of the EL-GFX-DTC.

Help File Contents

Setting Alarm Levels



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

If one or both alarms have been set and an alarm condition is breached then the EL-GFX-DTC will display an Alarm message on the LCD, flash the red LED and activate the alarm sounder once every ten seconds.

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 display, status LED and sounder will continue to indicate an alarm condition 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.

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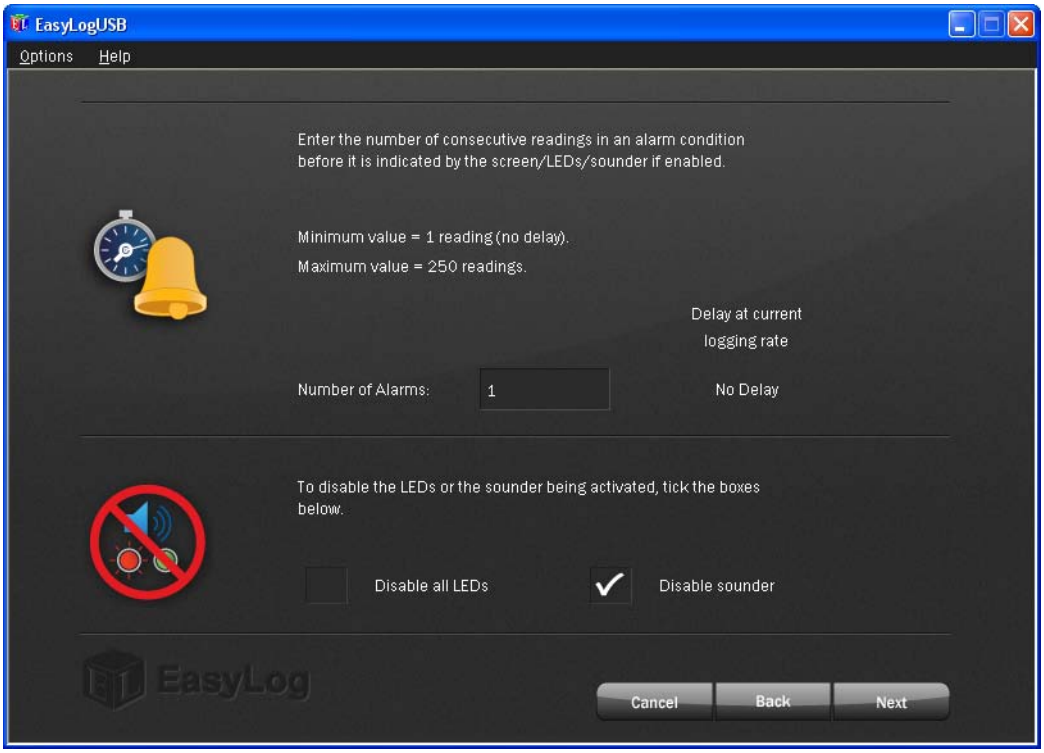
Delayed Alarm Settings



In some instances, it might not be necessary to indicate an alarm situation until several consecutive alarm readings have been gathered. Perhaps a single reading in an alarm condition doesn't warrant any corrective action but several consecutive readings in alarm condition might. In these instances, it is possible to delay the indication of an alarm by a user-selectable number of readings in alarm mode.

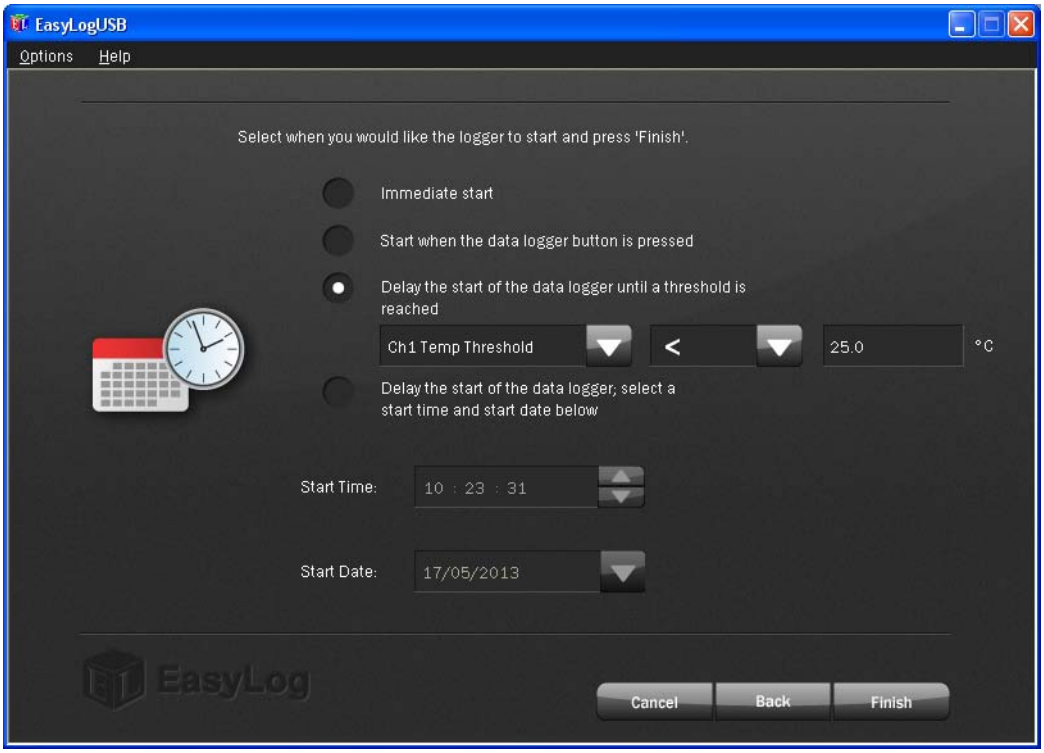
Input the number of consecutive alarm readings that can be registered before an alarm is indicated up to a maximum of 250. Note, if no delay is required, the user should type the number '1'.

The delay at the current logging rate is displayed on the page to assist in calculating the number of consecutive alarm readings which must occur before an alarm is indicated.

Example: A user wishes to setup a data logger to measure temperature at five minute intervals in a refrigerator used for vaccine storage. By opening the refrigerator door for a period of time, a user may inadvertently push the data logger into high alarm mode. In this example, the user knows that until the logger has been exposed to higher temperatures for a period of at least 30 minutes, then no alarm should be indicated. As the data logger is sampling in 5 minute intervals the user would type '6' in the Number of High Alarms section to provide a half-hour window before an alarm condition is indicated (6x5 samples = 30 minutes).

It is possible to disable the alarm LEDs and/or sounder by adding a tick to the respective check-box. Note, that with both boxes checked an alarm condition will display on the EL-GFX-DTC display alone.

Setting Start Mode



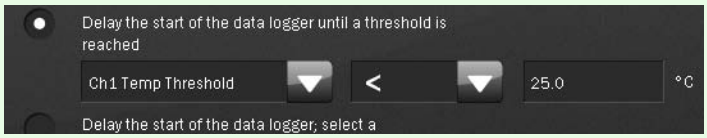
The data logger can be setup to start in four different ways:

Immediate start:

In this mode the data logger will take its first reading immediately thereafter. Check the appropriate radio button and click 'Finish'.

Start when the data logger button is pressed:

The data logger screen will show "ARMED – Press button to start logging" to indicate a delayed start. When the button is pressed the data logger will take its first reading immediately thereafter. Select the appropriate radio button and click 'Finish'.



Start when a temperature threshold is breached

In this mode you can define a temperature condition which will trigger the data logger to start logging. First select the appropriate radio button, then choose which channel(s) you wish to apply the trigger to. Next choose whether the you wish the data logger to start when the temperature is lower ('<') or higher ('>') than your threshold, finally select the temperature threshold. Click 'Finish' to arm the data logger.

The data logger screen will show "DELAYED START – Starts logging when temperature ....." The data logging will take its first reading immediately after the temperature condition is met.

In the example shown above, the data logger will start logging when the temperature exceeds 20.0°C.

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:

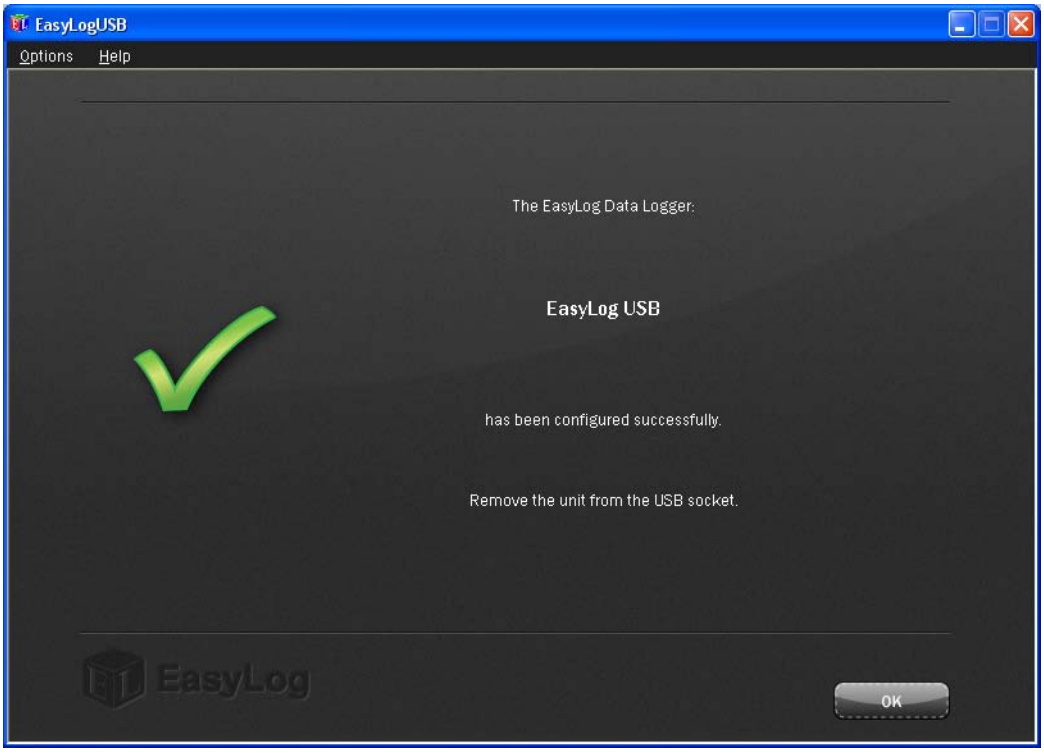
Select the part of the date (dd, mm or yyyy) that you want to modify. Then use the down arrow next to the date to open up a calendar from which desired date can be selected. Click 'Finish' to arm the data logger.

The data logger screen will show "DELAYED START – Starts logging at .....". The data logger will take its first reading at the time and date entered.

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.

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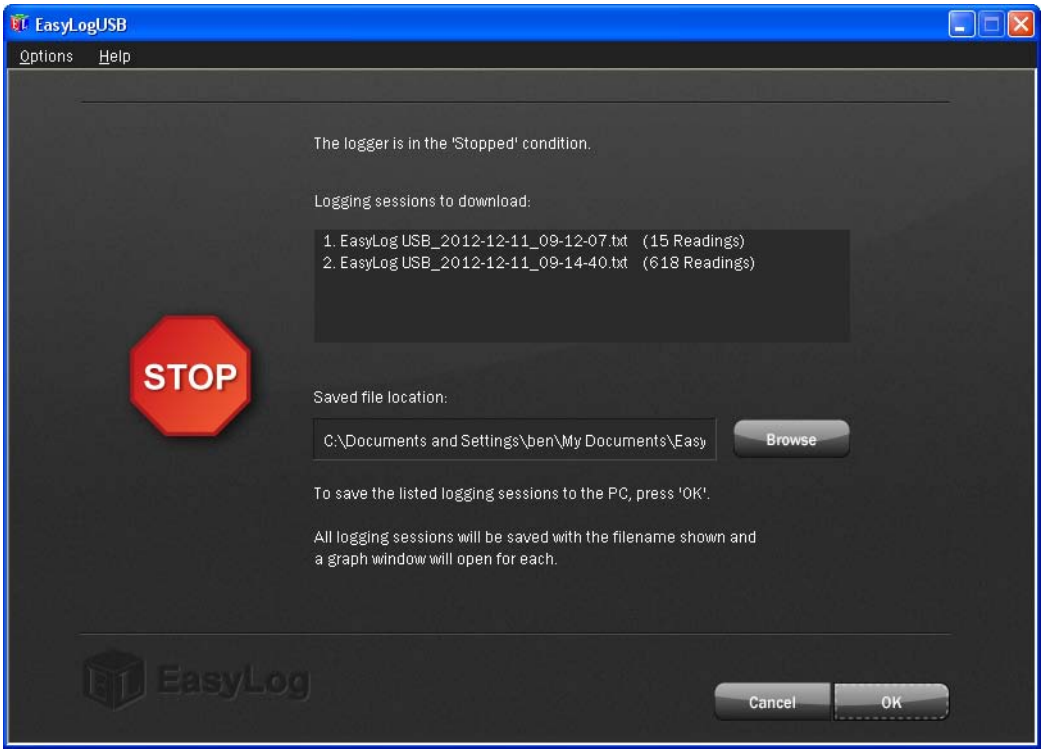
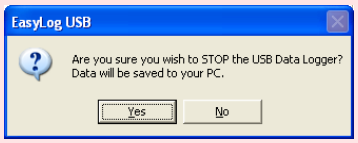
Stop Logging and Download Data

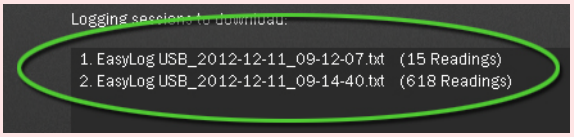


Click on the “download button” to stop the data logger and download any stored data.



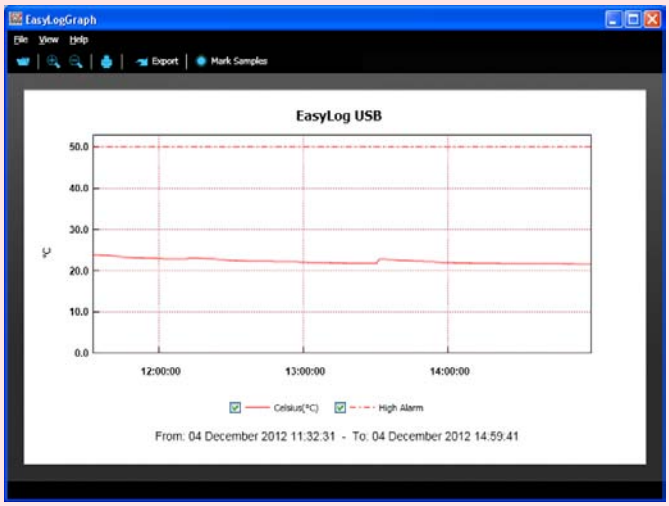
To avoid inadvertently interrupting a logging exercise, you will be asked to confirm that you would like to halt the logging process.

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.

You also have the opportunity to specify where the files will be saved. Click on the ‘Browse’ button if you wish to change this location.



To save the data to the PC and graph it, click OK after downloading the 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.

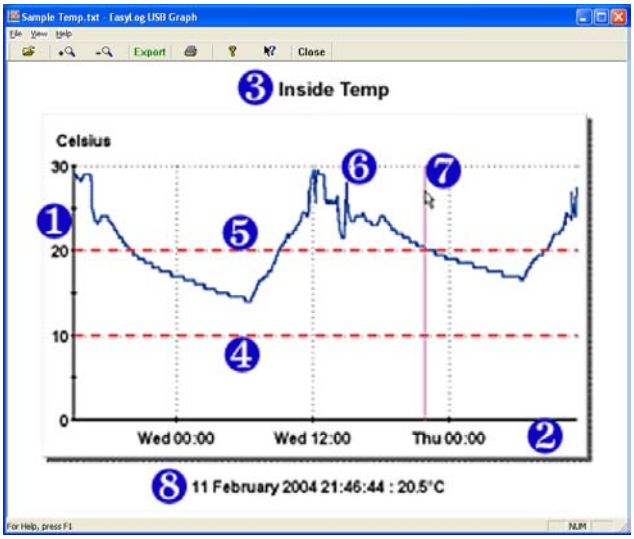
Note: Before downloading critical data from the data logger, ensure that there are no other programs running on the PC.

Help File Contents

Graphing

There are two ways to open the graphing program:-

- Clicking the “download 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 “graph 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 vertical axis, including scale and unit.
2. The horizontal axis including time related information.
3. The data logger name.
4. The low alarm trigger level, shown as a red horizontal dashed line.
5. The high alarm trigger level, shown as a red horizontal dashed line.
6. Plotted data, shown as a blue line.
7. Marker line, shown as a pink vertical line that follows the mouse pointer.
8. Marker line data, showing the data relevant to the current marker line position, or the logging period, if no marker line is shown.

Traces:-

In order to reduce any clutter in the graph window, 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.

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.

Note - 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.

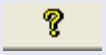
Zoom in - Click this button. Then select the zoom area by holding the left mouse button down and dragging a box over that part of the graph that you wish to inspect more closely.

You can zoom in several times before the maximum zoom level is reached.

Zoom out - Every time you click this button, the zoom level is decreased to the previous zoom level until the minimum zoom level is reached.

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.



About - Click this button to open a window that displays program information, version number and copyright.

Help - Click this button to open the help file.

Close - Click this button to close the graphing application

Help File Contents

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'.

Help File Contents

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 Microsoft Word 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 Microsoft Word**

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 Microsoft 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.

Help File Contents

View the Data Logger Status

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

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Installing/Replacing the batteries

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

When the LEDs indicate that the batteries inside the data logger are nearly empty, the batteries should be replaced immediately. If the batteries are 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 batteries are in need of replacing.

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

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

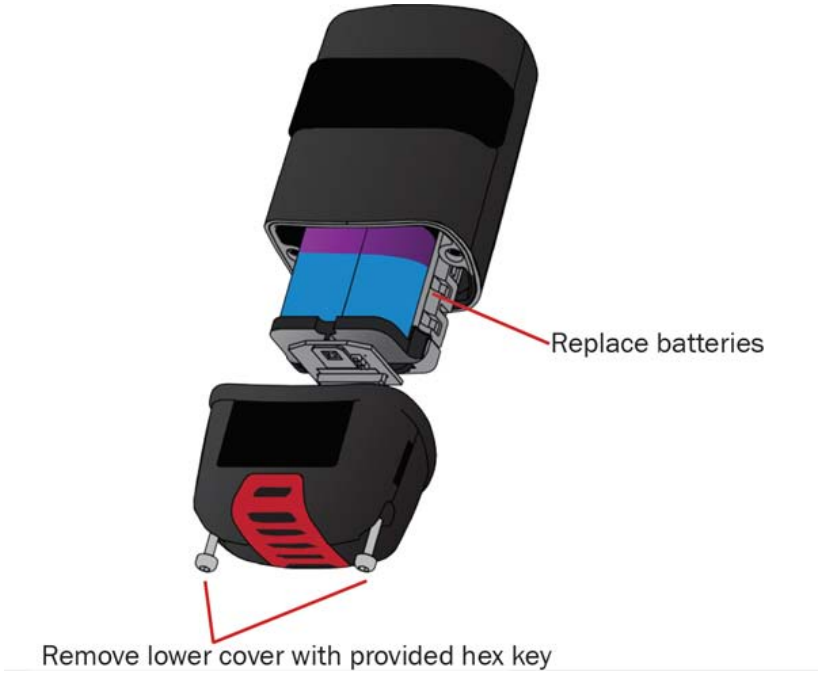
2. The final state is a 'BATTERY CRITICAL' warning.

The data logger has stored any readings taken and safely shut itself down. No more readings will be logged and the batteries 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 batteries, proceed as follows:

Use a suitable screwdriver to unscrew the two bolts positioned on the side of the EL-GFX-DTC. Then remove the lower cover to access the battery bay.



Before replacing the batteries, disconnect the data logger from the PC. Fit two new 1/2AA batteries of the same type, making sure they are fitted the correct way round. Only use 3.6V 1/2AA lithium batteries. We recommend the following part:-

MANUFACTURER	BATTERY PART NUMBER
Tekcell	SB-AA02P

Slide the two parts of the data logger enclosure back together again and use the hex key to re-secure the bolts.

After the batteries have 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 and Sounder Status Indication

The EL-GFX-DTC features two high intensity LEDs and an alarm sounder, located in the main body of the logger. During operation, the LEDs and sounder will indicate the logger's status as per below:

Green single flash (10 seconds):- The data logger is currently logging. No alarm.

Red single flash and audible alarm (10 seconds):- The data logger is currently logging. Alarm.

Users can disable the LEDs and/or the sounder on the 'Delayed Alarm Settings' screen.

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

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