

# ALIAN ELECTRONICS – LASCAR

## AC MAINS DATA LOGGER SYSTEM MANUAL v2

### Model SM303

This system allows recordings to be made from AC mains voltage over many days. After collecting this information graphs may be stored, viewed and printed.



### A Brief Description

The technology is a hybrid system based largely on the Lascar USB temperature data logger unit using modifications by Alian Electronics. The Lascar system is a clever portable data logger that can collect temperature information for days, weeks or months, then later transfer this information to a PC using a special Lascar program.

Alian Electronics has created a special safe interface that allows the logger to connect to the AC mains where it collects AC voltage readings instead of temperature readings. Once the record has been downloaded and saved in its original 'temperature reading', a special program has been created that will convert the file to an AC volts format that may be viewed with the Lascar program like the one shown above.

### Setting up a Data Logging Session

First remove the end-cap from the logger unit and slide out the USB log module within.

(This must never be done while the logger is still connected to AC mains)

Ensure that the 3.6V lithium battery is in place within the data logger battery bracket. This half-AA battery can operate the logger continuously for about 1 year.

Plug the module into a PC USB port and run the Easy Log program.





Click on:

**Set up and start the USB Data Logger.**

Enter a 15 character name to represent the location or client where the test is to be conducted.

Select a **Sample Rate**. One-minute sample rate is recommended as this will last for 11 days. Then click **NEXT** which will show an Alarms page. Ignore this page and click **NEXT** again.

Enter the **Start Date & Time**.

The default shows the present date and time, so if you wish to record immediately, just click **FINISH**. If the logger is to be posted to another location, set the start of the log cycle for say two days hence. Then press **FINISH** and **OK**.

The logger unit is now primed. To confirm this, you should see the green LED on the logger briefly pulse every 10 seconds.

Now return the logger to the plastic sleeve and replace the end cap. Simply plug the logger into a power outlet, turn it on and leave it for at least a week.

It is not powered by the outlet, it just measures its voltage as a meter would and stores the result.



It does not matter if the logger stays too long in the power outlet, as it will simply halt at the end of its 11 day recording cycle. Old data will not be over-written with new data. However be sure the battery is not removed before the log has been saved, or all data will be lost. (A rubber band around the battery is a good policy to ensure it does not leave the holder while the logger is in transit)

The logger can record up to **16,381** voltage samples in a single session.

### Downloading the logged information

As before, plug the logger unit into the USB port of the pc and run the Easy Log program. This time select **Stop the Data Logger and Download Data**. After confirming that it is ok to proceed a screen will show how many readings had been taken.

A **Save As** data path and filename window is shown. It is recommended to save the files into the **C:\SM303 Log Files** folder. Chose a filename that identifies the recording site, with a version number, such as "**Joos Manufacturing 01**". A file will be created with an extension of **.txt** then a graph will be shown of the collected information.

This graph will be incorrectly calibrated, as the legend is still in Degrees C. There is a final step to convert the downloaded file into an AC Voltage format.

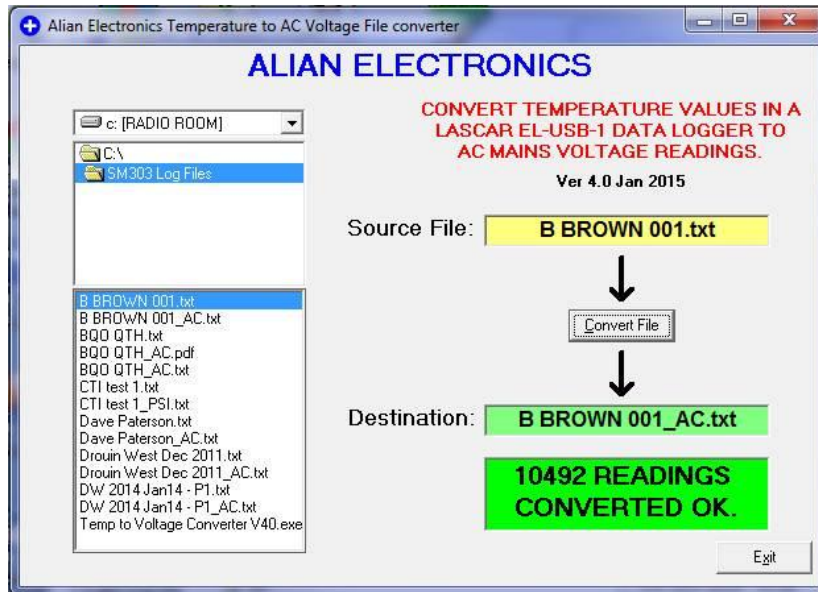
## Converting the download into Voltage values

A special utility program has been developed called **Temp to Voltage Converter.exe**.

If the installation procedure was completed successfully, a copy of this program should also be in the **C:\SM303 Log Files** folder

Run this program and a path should be shown to this folder and various files, including the recently downloaded **.txt** files should be evident.

Click on the recently collected file (say **BBROWN 001.txt**) and this file should appear in the **Source File** window.



Note that the Destination file name has automatically been generated from this with the text **\_AC** added to the end. Click on the Convert button and all readings will be converted to the modified format within the new file. (the source file remains unchanged)

## Displaying the converted log file

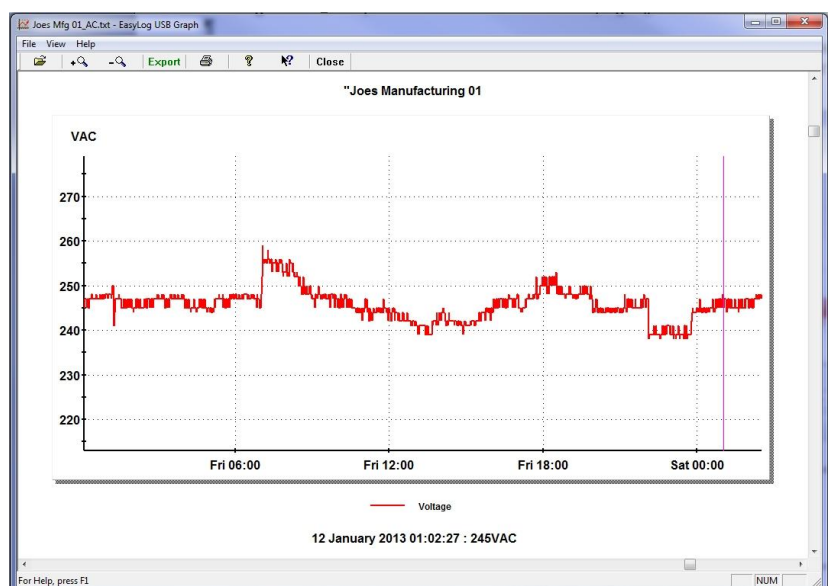
Re-run the EasyLog program, but this time select the third option: **View Previously Saved Data**. Select a log file with **\_AC.txt** at the end and click **OPEN**. A graph should appear calibrated in AC voltage. When the mouse pointer is moved over the graph, a line appears showing exact readings at the line position at the bottom of the page.

It is possible to Click and Drag a box around a particular area of interest within the graph and zoom in for a closer look.

Any graph can be printed to a connected printer or printed as a pdf file if a pdf creation program is installed on the PC.

Date ranges at the base of the graph identify when specific events took place.

Brief dips in voltage are usually the result of some heavy equipment or heating elements being activated somewhere on the same circuit. Australian voltage ranges should be **230V +10%, -6%**, which is an effective voltage range of **216V to 253V**. Persistent voltage readings outside of that range should be reported to the electrical supplier as a fault.



## INSTALLING THE EASY LOG SOFTWARE

The SM303 Data Logger unit should come with a CD which contains the original Lascar setup program, plus an additional program which is the Temperature to Voltage converter file.

Place the small **Easy Log** disk into your CD player and wait for the setup program to Auto-run. (If this does not auto-run, use windows 'Explorer' program to locate Setup.exe and activate it manually)

License agreement confirmation is needed to proceed. Select Accept and click on **NEXT** followed by **INSTALL**.

Note your PC may pop-up a window asking if you wish to allow this program to be installed. Click **YES** to continue.

Files should now be installed and the action box labelled **FINISH** should appear. Click on this button.

A new screen will appear for installation of the USB device driver. Click **INSTALL** again and the screen should "Installation completed successfully"

This will insert the Lascar program into a folder called **C:\Program files\ EasyLog USB**  
A shortcut for the program should have appeared on the PC desktop.

(Don't attempt to move this folder to another location or disk drive, or the **Temp to Volts converter** program will not be able to find files and run correctly)

Also on the CD there should be a folder called **SM303 Log Files**. Use windows Explorer to drag this folder into the **C:\** root directory of your PC. **This folder should be the destination of all downloaded log files.**

It is also the location of the converter program **Temp to Voltage Converter V40.exe**, which is the file conversion utility to convert the original Lascar log files into calibrated AC Voltage files. Right-click on this utility program and select the **Create a Shortcut** option. This shortcut may then be dragged onto the desktop to allow for easy execution of the program.

## Calibrating the Data Logger

The maximum recording voltage of the unit is approximately 300VAC. When measuring AC voltages, the resolution should provide accuracy to within 1.2 Volts of static recordings by a digital volt meter.

Where the readings are deemed suspect, or need confirmation after a particularly strange reading event, it is reassuring to check the accuracy of the logger. First measure the AC mains with a digital multimeter at a power outlet. Some multimeters have been known to vary by plus or minus 5V, so it is important perform this calibration test with a meter of known quality.

Prime the data logger in a PC in the usual way, but select logging intervals of 10 seconds. Leave the logger in a power outlet for about one minute, then download and display the graph. Readings on the screen should be within about one volt of the multimeter readings.

If the readings appear too high or too low, remove the logger from the power outlet, then slide the module from the plastic tube. The small pcb on the rear of the logger labelled SM303 converts the 240V AC signal into a low voltage D.C. signal. This output may be adjusted by turning the screw head on the small blue trimpot device with a fine flat-blade screwdriver or alignment tool. Settings are touchy, with one quarter of a turn resulting in a reading shift of about 2 Volts AC on a final graph.

Repeat the sequence of a 1-minute test download and re-check the results until a suitable level of accuracy has been achieved.

---