EM2030 Sound Level Monitor

Periodic Calibration - Guide

1   Operation

Once powered on, the unit will automatically begin logging sound levels. Results are calculated and logged at user defined intervals, synchronised to the internal clock.

The green LED light on the front of the EM2030 serves as a simple indicator of the boot sequence progress. Upon powering up, the following sequence should be observed:

1.   When power is connected the light will come on for 3 seconds.
2.   The light switches off while the software is initialised.
3.   The light stays off until the next measurement epoch e.g. 5 minutes.
4.   The light begins flashing indicating that data is being processed.

Once the unit is powered up and the green light is on or flashing it is possible to connect to the unit using the Wi-Fi interface.

1.1   Connecting to the Unit

The EM2030 has standard Wi-Fi communications capability and can communicate with any laptop or mobile device which has a Wi-Fi connection and a web browser.

Each EM2030 is labelled with a serial number. This serial number is the unique identifier of the unit, used for communication over the Wi-Fi link.

The EM2030 acts as an access point, generating a unique Wi-Fi network. The network name is linked to the device serial number. For example, if the serial number of the device is 00323 the unique Wi-Fi network will be named "Sonitus-Systems-EM2030-00323." To connect to the EM2030 simply join the Wi-Fi network and the appropriate settings will automatically be applied.

The password to the Wi-Fi network is *noiselevels.*

2   User Interface

Communications to the sound level monitor are handled through a standard web browser.

Note: It is recommended that you download the latest version of your web browser before logging in to the sound level monitor.

To log into the sound level monitor enter the IP address of the unit into the address bar of the web browser, as shown below:

http://10.1.1.2

Note: There should be no *www* preceding the number in the address bar.

Once you have correctly entered these details you will be logged into the EM2030 user interface and you will see the home page, as displayed below.
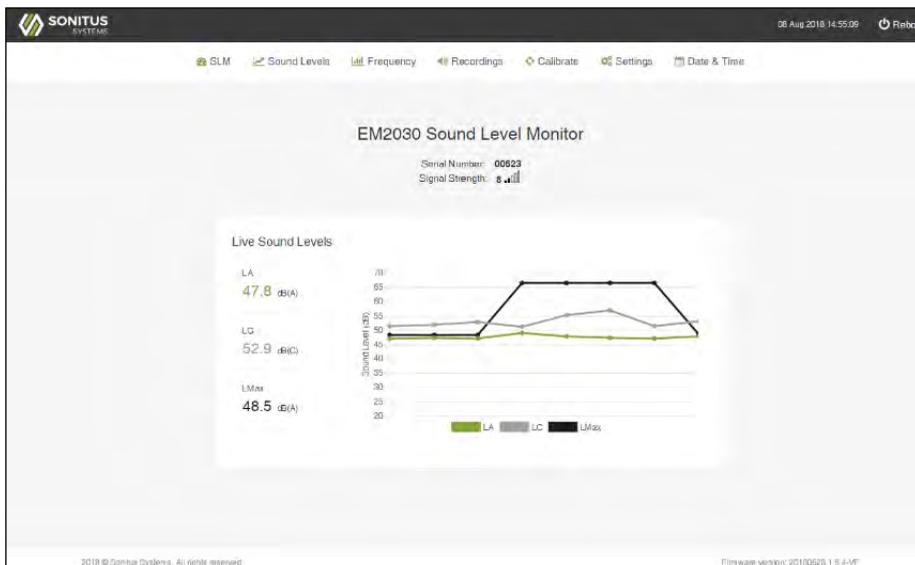
Figure 1: EM2030 User Interface Home Page

The home page displays some basic information about the unit such as the serial number, signal strength and the software version. Also displayed on the home page are links to pages which access some of the main features. These pages and their associated functionality are detailed below.

The home page also shows a live readout of the measured sound level. This allows you to remotely view the current sound level at the microphone.

At the bottom of the home page is the **Reboot** button. This button performs a manual reset of the monitoring unit. This should be used after making a change to the calibration or system settings, or during a troubleshooting process as outlined in the troubleshooting section of this manual.

2.1   Calibration Page

The calibration page allows the user to set the calibration constant of the microphone being used with the sound level monitor. This is done by applying a known calibration signal to the microphone for a period of time.

Note: Microphone diaphragms are extremely fragile and precise pieces of equipment. Calibration procedures should only be calibrated in a controlled, clean environment. Any damage caused to microphones through misuse or mishandling will not be covered by normal maintenance agreements and warranty.

To run a calibration procedure, remove the weather protection kit and place an acoustic calibrator securely over the microphone. Set the time for the calibration procedure and the level of the calibration signal. Default values are 20 seconds and 94dB respectively. Click "Start Calibration" **once only**. Make sure that the calibrator remains in place and the calibration signal is applied constantly for the duration of the calibration run. Starting the calibration will stop the sound level analysis program. The system must be rebooted before the analysis program will resume. The browser will not advance until the calibration program has finished.
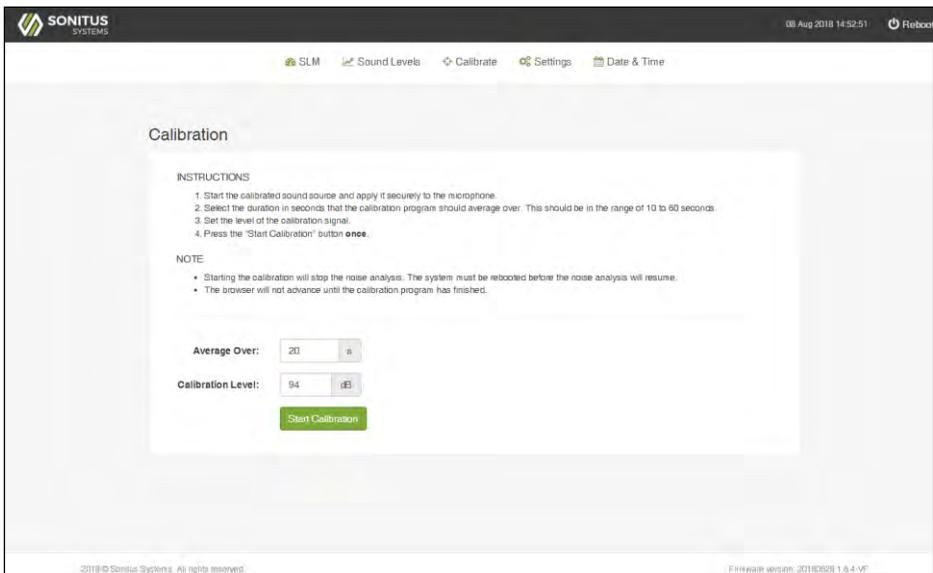
Figure 2: Calibration Page

2.2 Set Up Page

The set up page allows you to change the basic settings of the monitor. The settings which can be changed include the location coordinates, the microphone sensitivity setting and the time at which the EM2030 will reboot each day.

2.2.1 Microphone Sensitivity

The microphone sensitivity should not be changed manually unless required.

2.2.2 Windscreen Correction

This setting should be on if the windscreen is being used (default). The monitor will automatically apply a filter to correct for windscreen effects.

2.2.3 Measurement Parameters

The measurement options determine which parameters are logged to file during the automatic measurement sessions. The A-weighted L$_{EQ}$ is logged by default. Additional measurement parameters can be added by selecting the relevant options. Available options include:

- C-weighting (applied to all selected parameters)
- L95, L90, L50, L10, L05, LMAX
- Measurement logging intervals of 1, 5, 10, 15 or 30 minutes
- Fast or slow time weighting (for LMAX sound pressure level calculations)

2.2.4 Low Power Mode

This setting can be used when the EM2030 is being powered by batteries. When low power mode is enabled, the Wi-Fi connection will switch off after a user selected time. Switching off the Wi-Fi can result in approximately 20% reduction in power usage.

2.2.5 Reboot Time

The system reboot time is the time each day when the system resets and starts a new noise data file. Changing this value means the monitor will log one file each day beginning at this time. There is a gap of one measurement interval (e.g. 5 minutes) between each measurement run when the monitor is rebooting.

2.2.6 Audio Capture Trigger

The audio capture trigger settings allow you to control the audio recording functions of the EM2030. When the measured sound level meets the user-defined criteria then an audio sample is automatically captured and uploaded to your online account. The following parameters control the audio capture function:

Trigger Level: The sound pressure level that must be exceeded to start a recording.
Pre-record Time: The number of seconds before a trigger event that are captured to the recording.
Post-record Time: The number of seconds after a trigger event that are captured to the recording.
Trigger Length: The length of time in seconds that the Trigger Level must be exceeded in order to activate the recording (default is 1s).

An audio event containing 10s pre-event recording and 10s post-event recording takes approximately 2MB of disk space.

Once the changes are selected click "Submit Changes". The system must be rebooted for changes to take effect.

To abandon your changes and start again click "Reset Form".

To restore the original settings click "Restore Factory Defaults".

To return to the home page at any time click the logo at the top of the page.
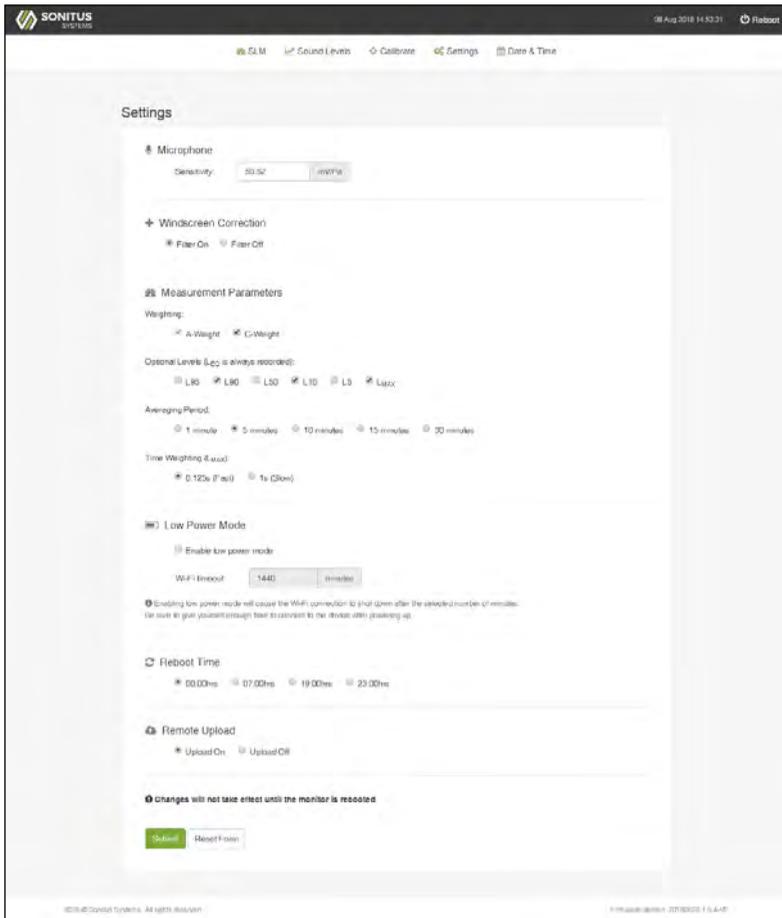

Figure 3: Set Up Page

2.3 Set Date and Time Page

The set date and time page allows you to manually set the system clock and date. Click on the "Enter New Date" box to display a calendar. Select the desired date and then enter the new time. The time format is a 24 hour clock in hh:mm:ss. Once this information is entered click the "Set" button. This will set the date and time to the new values and return you to the homepage.
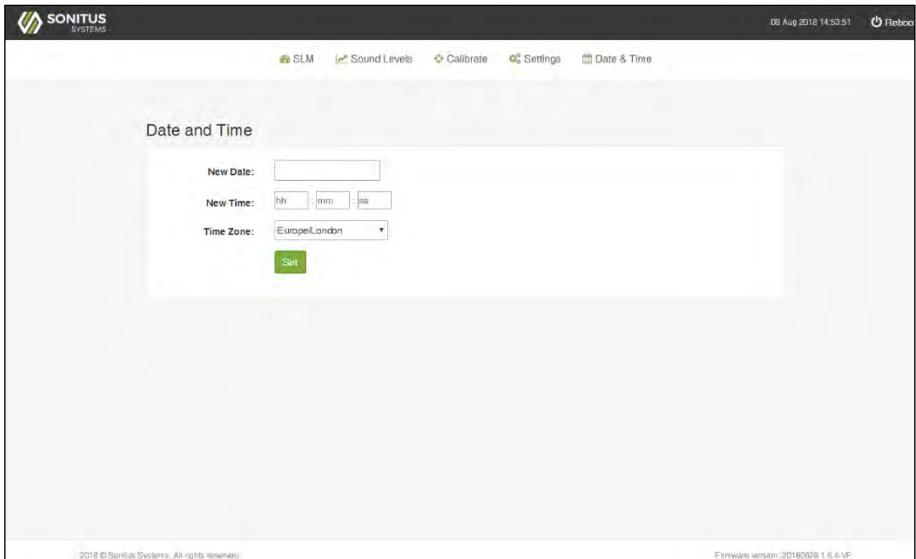
Figure 4: Set Date and Time Page

3   Laboratory Calibration – Periodic Testing

The EM2030 provides a dedicated view for testing laboratories to perform periodic testing in line with IEC 61672-3.

To access the calibration view and measurement controls the user must first connect to the Wi-Fi network as detailed in section 1.1.

Once connected the calibration technician should enter the following URL in a web browser:

http://10.1.1.2/cgi-bin/slm_test.cgi

This page will provide access to a detailed real time display showing all parameters needed to assess compliance with periodic tests.

The stop/start control buttons allow the technician to easily start and stop a measurement session.

Reference Settings
Reference sound level: 94dB
Reference frequency: 1000Hz

4   Contact Details

For technical queries please contact us using the information below.

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5 Technical Details

EM2030 Sound Level Monitor Specifications

Microphone	Class 1 tolerances to IEC 61672
Sensitivity	50mV/Pa
Frequency weighting	Digital A-weighting and C-weighting
Frequency range	20Hz to 20kHz
Dynamic Range	16 to 121 dB(A)
Linear Measurement Range	30 to 120 dB(A)
Sampling Frequency	96kHz
Measurement parameters	L_{EQ}, L_{05}, L_{10}, L_{50}, L_{90}, L_{95}, L_{max} at user selected intervals
Measurement procedure	Measurement is automatic at power up
Data storage	5 years (5 minute logging)
Enclosure	IP65 die-cast aluminium
Operating temperature range	-10°C to +50°C
Humidity levels	0 to 95%
Microphone power supply	Constant current ICP supply, 18V 4mA
Microphone connection	BNC male to BNC male
EM2030 power supply	9V DC, 500mA
Communications	802.11 b/g (Wi-Fi) and HSPA/UMTS (3G)
Dimensions	110 x 140 x 60mm (W x L x H)
Weight	< 800g
Mounting holes	4 x 5mm