

Note

Thank you for purchasing your SE3EAR or SE3IND Advanced Noise Warning Sign. The units, whilst different, have major similarities and therefore for the purposes of this manual we will just refer to either of the advanced noise warning signs as the SoundEar3.

Please see images of the respective signs below.



SoundEar3 Key Features

- The **SOUNDEAR3** is an attractive noise measurement instrument that also stores up to 600 days of measurement data. The SoundEar3 is normally wall mounted.
- The SOUNDEAR3 **visualises** noise by lighting up the distinctive ear symbol in different colours instantly raising awareness and alerting people to potentially harmful or annoying noise levels whilst giving a numerical display of decibel levels.
- Each colour (Green, Amber and Red) can be set to a predetermined trigger level and you can choose how long a noise level occurs before the sign lights up.
- The flexible and intelligent configuration by SoundEar3 software gives visual impact in an appropriate manner. Choose how long the sign will light up once triggered and whether it just lights up or flashes for higher impact. Day and night time threshold levels and display can also be independently configured.
- The download facility and SoundEar3 software enable historical data to be analysed and ongoing improvements quantified. This data provides a comprehensive overview of the noise climate making the SoundEar3 an ideal tool to help monitor and manage ongoing noise levels.
- Rather than just being a simple sign based on instantaneous sound levels the SoundEar3 is Integrating / averaging along with a Cpeak facility. A wide range of noise management issues can be evaluated and managed effectively as key parameters are measured.
- The SoundEar3 has a measurement range from 30dB(A) to 120dB(A). The Low noise floor allows is particularly useful for certain Hospital applications and at night time whilst the higher levels are ideal for industrial applications.
- Calibrate the SoundEar3 with a standard ½” acoustic calibrator with a 94dB output (not supplied)
- Systems integration using 4-20mA current loop or 0-10V DC outputs.

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1 SoundEar3 Overview

This page gives a quick overview of how to get the most out of your SoundEar3 and how to navigate this Manual.

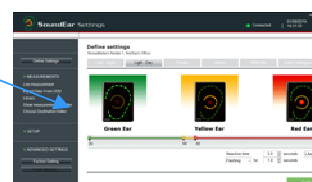
There are a number of tasks you will need to carry out initially, others that will be done regularly and some for ongoing maintenance. **For this reason the manual will be split into 3 main sections, “Getting Started”, “Using the Sign and Managing the Noise Data” and “Maintenance Tasks”. They are colour coded Blue, Turquoise and Orange respectively** for ease of use. There is also an **Appendix** section at the back of the manual that includes an acoustic terms glossary.

As this the most advanced version of the SoundEar range we will assume that most people will be using the SoundEar3 software to download their measurement results. The exception to this will be those using the specialist system integration features that are covered in APPENDIX 3

Getting Started

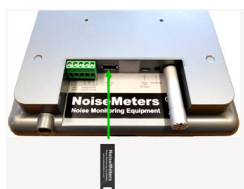
Tasks that just need to be carried out initially - some of these are optional

- 1 Install the SoundEar3 software from the link provided or the USB stick.
- 2 Unpack the box and check and familiarise yourself with the contents.
- 3 Plug into a computer running the SoundEar3 software and set time / date.
- 4 Assign the SoundEar3 a Name the assign it a location (stored in the internal memory)
- 5 Configure the SoundEar3 for use using the software provided.
- 6 Physically install the SoundEar3 and power up.



Using the Sign and managing the Noise Data

- 1 Download noise measurement data from the SoundEar to a USB memory device.
- 2 Import this data from the USB memory device using the ‘Import Data from USB’ function within the SoundEar3 software. It will then be saved within the SoundEar3 software database.
- 3 Use the ‘LIBRARY’ function within the SoundEar3 software to view your noise measurement data
- 4 Export noise measurement data as a spreadsheet or create PDF reports
- 5 Fine tune configuration of SoundEar3 to suit your application and ongoing requirements.



Maintenance tasks

- 1 Clean the SoundEar3
- 2 Field Verification Check / Calibration (optional)
- 3 Check for Software and Firmware Updates



Setting up your **SOUNDEAR3**

Install Software

Unpack and familiarise

Set the clock and date

Name the sign and assign it a location

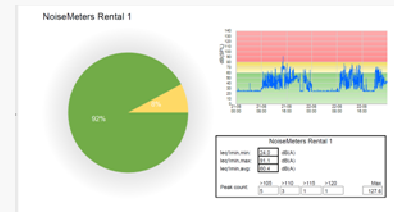
Configure the SoundEar3 by defining the Threshold
Trigger Level, LED display, Day / Night options etc

Physical installation of the SoundEar3

2 SoundEar3 Software

Install the SoundEar3 software first as the SoundEar3 software allows you to:

- Configure the noise sign
 - i) Set the time and date
 - j) Give the sign a unique name and location
 - II) Program threshold trigger levels (options for different day and night settings)
 - III) Choose whether the sign illuminates or flashes
 - IV) Select the output displayed on the digital LED display
- Import and measurement data and use the 'Library' function to view data.
- Create a range of attractive and informative reports from downloaded data
- Calibrate the SoundEar3 using the 0.5m microphone extension cable (item 4) from contents) and an acoustic calibrator (not supplied as standard).



2.1 Important: Network / IT dept permissions

It is often worth planning ahead especially in larger establishments. I

Software installation may need booking in advance if an IT administrator / manager is required to facilitate this.

3.1.1 The SoundEar3 software **must** be installed with full admin rights.

3.1.2 Network permissions / constraints **must** allow a USB memory device to be plugged into the users computer.

3.1.3 During installation set 'User access rights' for the 'Program data folder' and the 'Data and Reports folder'

3.1.4 **Important Note:**

Use a 'standalone computer' if any of the above are not possible. A standalone computer is a computer that is not required to be connected to a network and is not subject to strict IT department constraints.

2.2 SoundEar3 Software minimum requirements

Operating System:	Windows 7, 8, or 10
Hard Drive:	100Mbytes free
RAM:	minimum 512MB
USB Port:	1 x USB 2.0 port
CPU:	1.5GHz AMD / Intel processor
Screen resolution:	1366 x 768

2.3 How to install the SoundEar3 Software

The SoundEar3 software does not require a licence so it can be installed on multiple computers at no additional cost.

2.3.1 The software is supplied on a small NoiseMeters USB memory device



Save a copy of the USB memory device contents onto a computer and then delete the files.

(Going forward this USB stick will be used for downloading data from the SOUNDEAR3 although any suitable USB memory device could be used)

2.3.2 Alternatively upload from the following link: <https://support.noisemeters.com/downloads/soundear3/>

2.4 SoundEar3 Software installation 'Walkthrough'

The installation should prove straightforward. However, the next 2 pages will walk you through the installation process. It will also explain what to do if you get a 'Windows unknown publisher' or have 'Windows Defender Firewall' issues.

2.4 SoundEar3 Software installation walkthrough

2.4.1 Windows Defender Firewall issues

Note: The latest versions of the SoundEar3 software are designed to be used with a variety of systems. Some of these systems have a remote communication option. For this reason occasionally the SoundEar3 software can cause an issue with 'Windows Defender Firewall' and the following message window may appear.



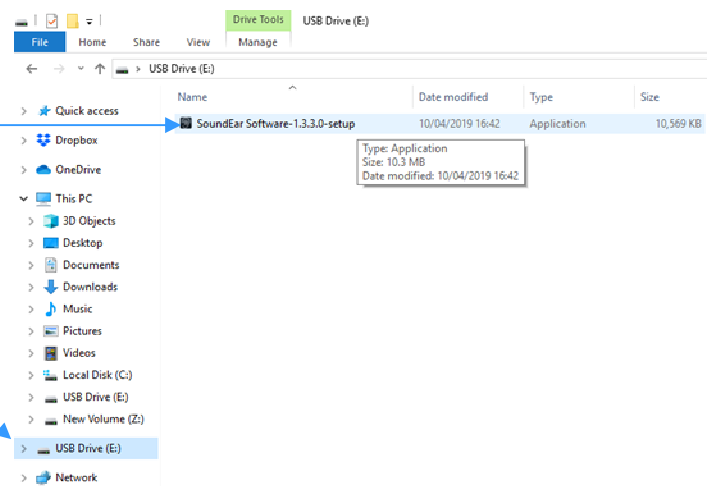
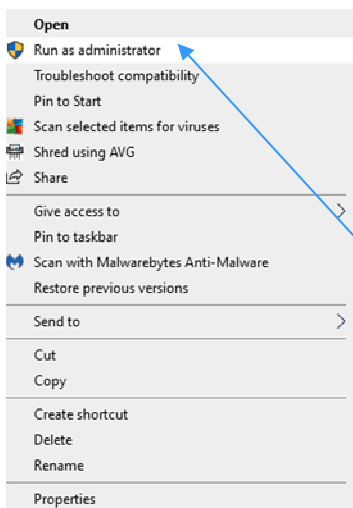
Note

If this message appears:

- 1 Check the 'Private networks' box
- 2 Click the 'Allow access' button.

2.4.2 SoundEar 3 Software Installation STEP 1

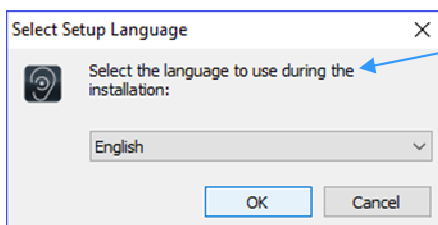
Insert the memory stick into your computer and use 'file explorer' to navigate the relevant USB drive. You should then be able to see the 'SoundEar Software' setup file.



Right click with your mouse to get the option to 'Open' or if network permissions are required your IT department will 'Run as administrator'

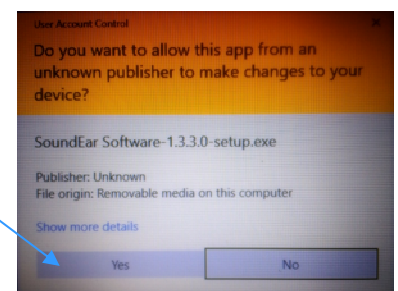
STEP 2

If the generic Windows message appears asking 'do you want to allow this app from an unknown publisher', click the 'Yes' button.



STEP 3

A 'Select Setup Language' window will appear, select the appropriate language from the drop menu and then click 'OK'.

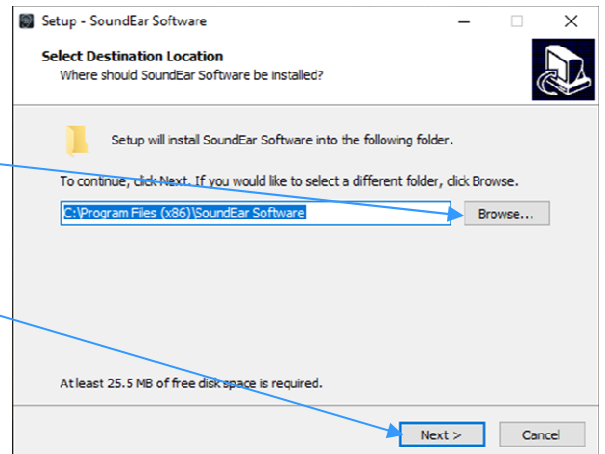


2.4 SoundEar3 Software installation walkthrough (cont)

STEP 4

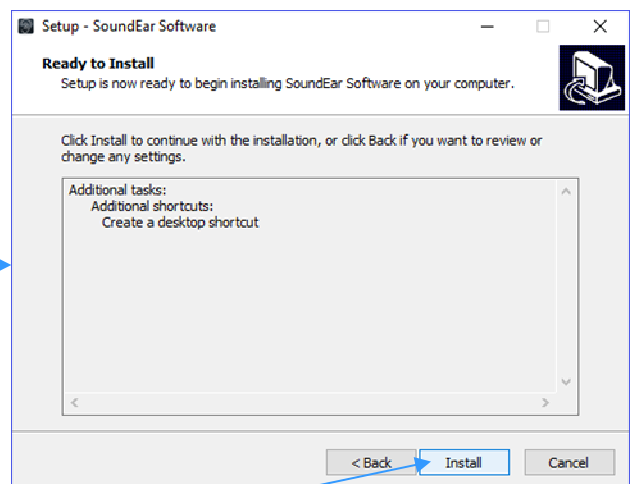
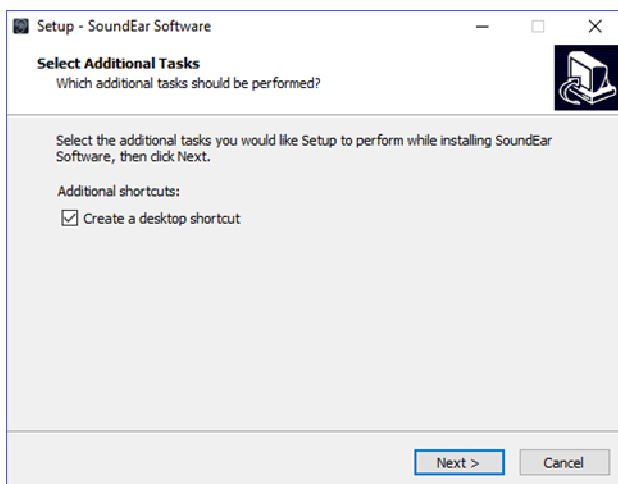
You will then see a window showing the folder the software will be stored in. You can use the 'Browse' button if you need to alter this from the default offered.

Click the Next button



STEP 5

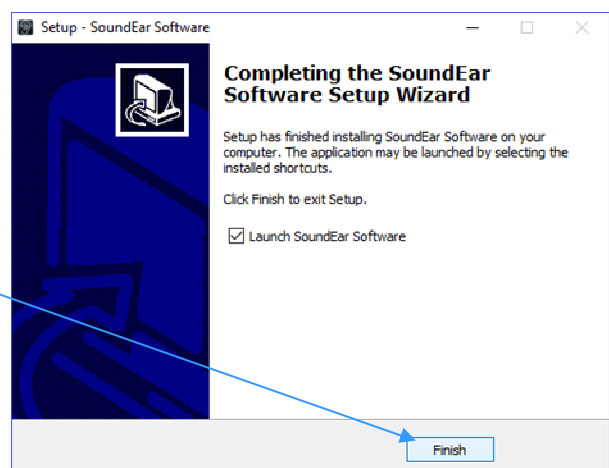
The next window will appear where you can choose to 'Create a desktop shortcut' by checking or un-checking the tick box. Then click the 'Next' button.



Another Window will appear, click the 'Install' button.

The program will then install and when finished the following window will appear.

Click the 'Finish' button to complete the process and launch the software



2.5 Overview of SoundEar3 software menu

2.5.1 SoundEar3 Software Menu system

The use of the SoundEar3 software will be covered through the manual but here is a very quick guide to the main menu structure / functionality of the software. The main menu is always shown on the left hand side of the screen.

There are a number of sections to the menu. Three of these can be expanded.

'The 'Sign in' and 'Cloud devices....' parts of the menu are for another system so you should ignore them.

1 Define Settings

This section allows you to configure the SoundEar3 (Display, Threshold Level, LED display etc)

2 MEASUREMENTS

This section allows you to import data into the SoundEar3 software (Import Data from USB) and view measurements using the Library function.

3 SETUP

Use 'Device Info' check the version, name and location allocated to your SoundEar3 memory. You can also edit or change the name and location. Use 'About SoundEar3' to check for and perform Software updates. The 'Reporting', 'Cloud' and 'Email configuration' sections are not compatible with this hardware so please ignore.

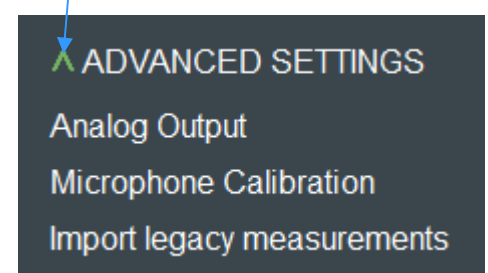
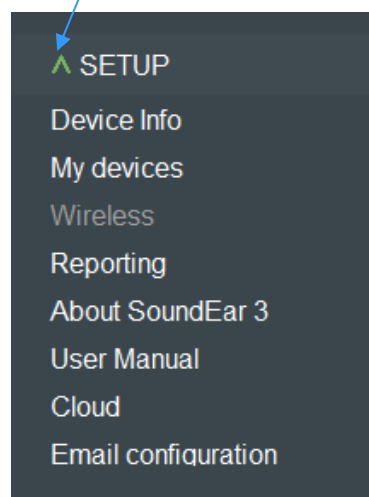
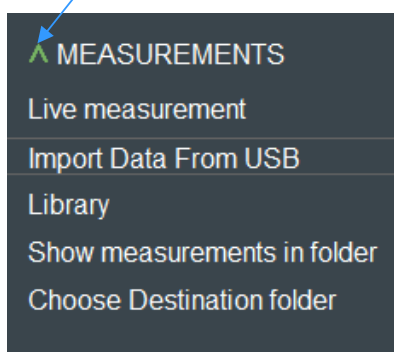
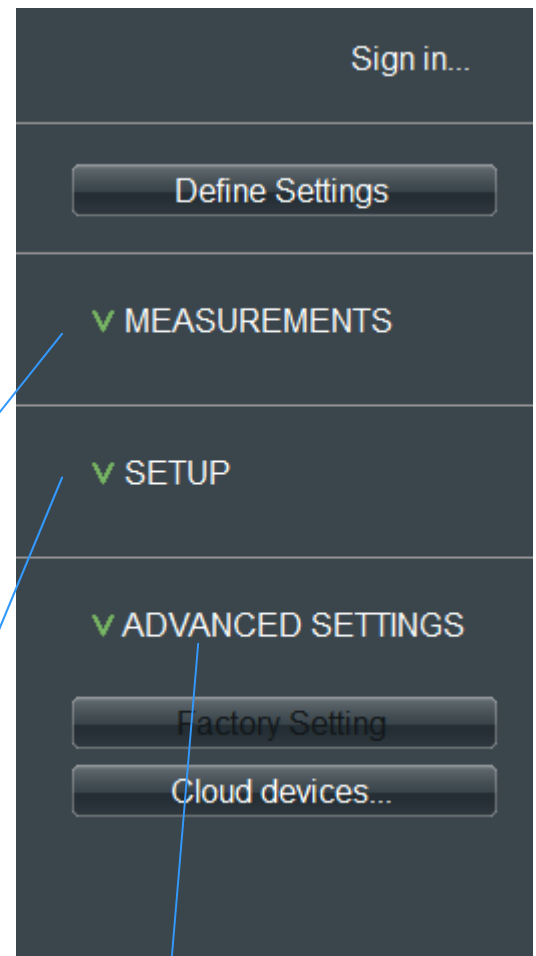
4 ADVANCED SETTINGS

This section allows you to carry out a 'Field Verification Check' / calibration. For specialist users it allows the configuration of the analog outputs (0-10V DC or 4-20mA current loop) for systems integration. There is also an option for importing Legacy measurements. This is a feature of the latest software where older file measurements can be imported into the database.

5 Factory Setting

This allows you to reset your SoundEar3 to factory default settings. This is also used if you ever need to perform a 'hard reset' for the device.

Cloud devices Please ignore



3 Unpack, familiarise and check you have the following contents

- 1 SOUNDEAR3 Noise Warning Sign
- 2 USB memory device
- 3 Microphone and preamplifier - please take care with this part. The microphone is normally plugged directly into the SOUNDEAR3
- 4 Short 0.5m microphone extension cable. Generally only used for calibration with an acoustic calibrator (calibrator not supplied as standard). See 'Maintenance Section' for calibration instructions.
- 5 110 -240V Power adaptor (with choice of 'plug pins' to suit your country).
- 6 Mini USB to Standard USB Cable This cable connects to 'Power adaptor' (item 5) to power the SOUNDEAR3. It is also used for connecting the SOUNDEAR3 to the USB port of a computer (to configure the SOUNDEAR3)

Parts supplied with SoundEar3 showing rear view of the SOUNDEAR3

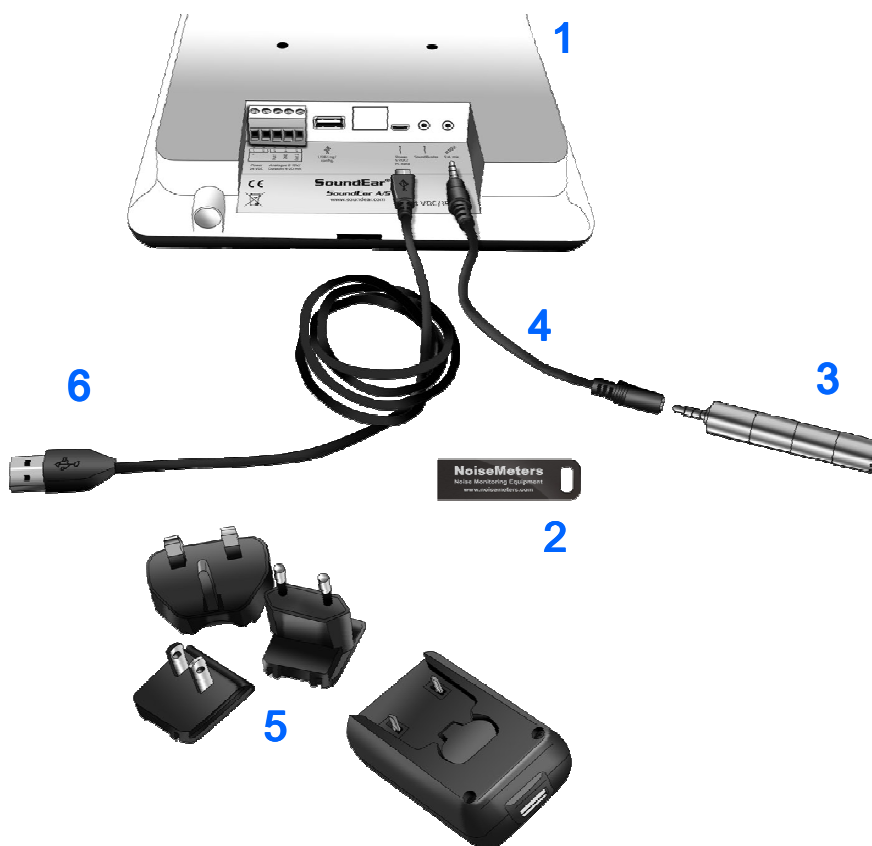


Fig 2: Front View of SOUNDEAR3

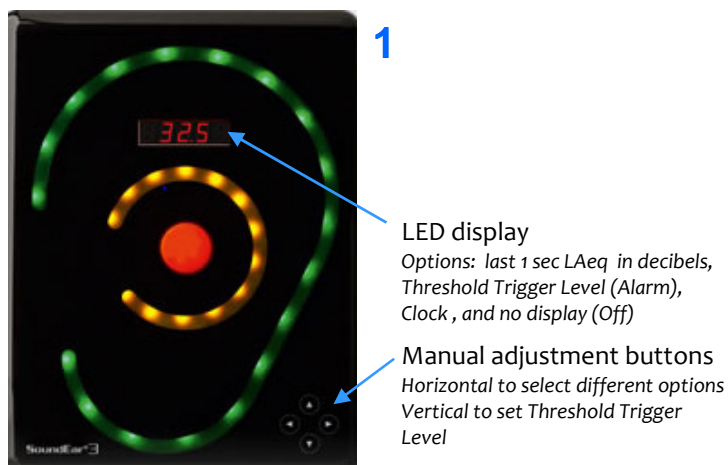
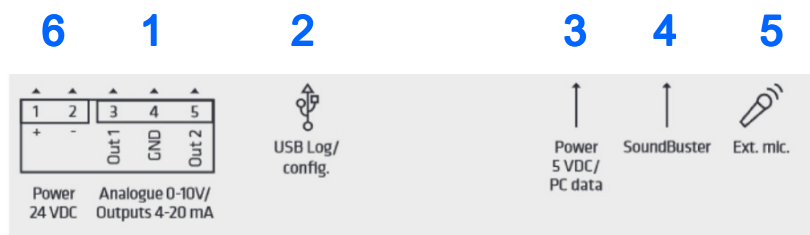
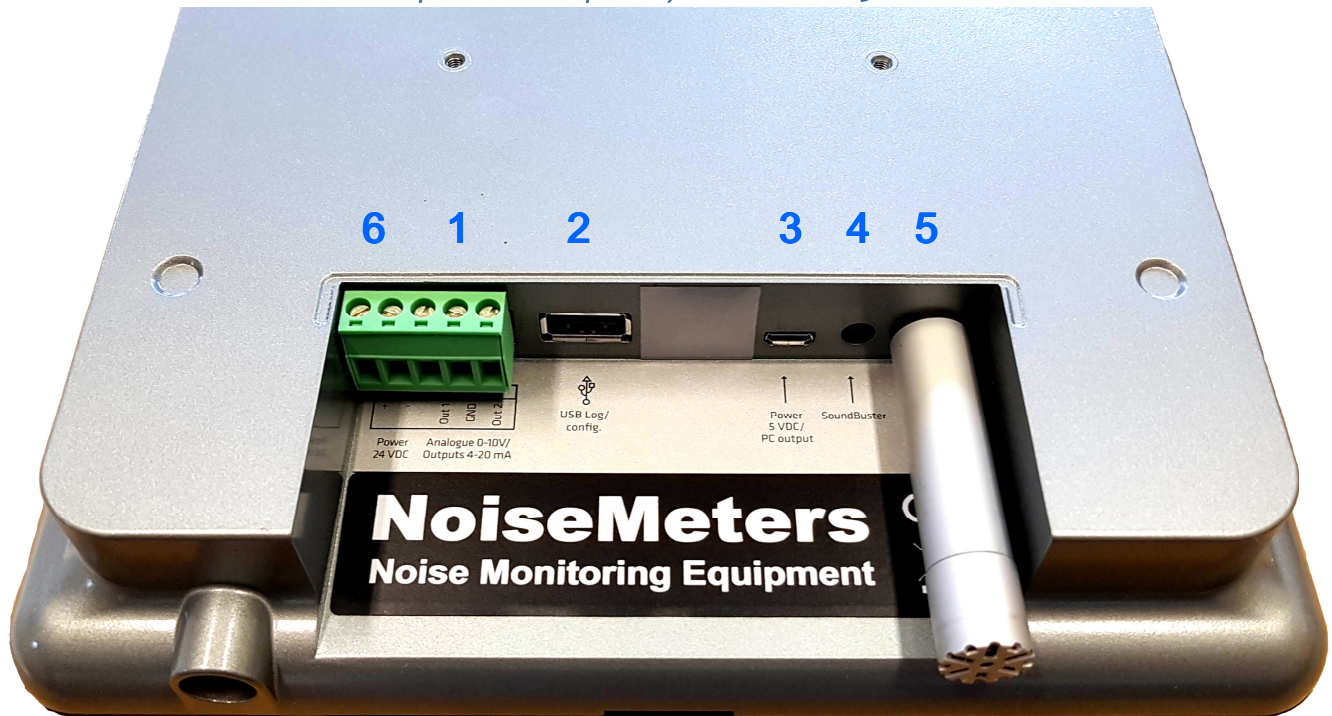


Fig 3: Rear view of the SOUNDEAR3 with power cable and microphone inserted



3 Unpack, familiarise (cont)

Inputs and outputs of the SoundEar3



- 1** Specialist applications only: The analog ‘screw terminal’ output which is generally used for System Integration purposes. The two outputs can be either 4-20mA outputs or 0-10V DC outputs. ** (See note below)
- 2** USB Port. Insert the USB memory device (supplied) into this port to download noise measurement data.
- 3** Power supply. Insert the USB power supply adaptor here.
- 4** Negative logic output. (can be used for triggering an external beacon)
- 5** Input for the microphone unit.
- 6** Alternative power ‘screw terminal’ input. Using the optional extra NoiseMeters items PSU24DC ‘Power Adaptor’ and ‘POWEX10 ‘10m Power Extension Cable’ the device can be powered via this input.

**** Please note:** The alternative power input in conjunction with the PSU24DC and POWEX10 must be used if an analog output is required. Most users will not require this specialist facility.

4 Simple Manual configuration of the SoundEar3

4.1 There are two ways to configure the SoundEar3

- Recommended:** The first is to set up the unit using the SoundEar3 software. During this stage lock the 'Touch Display Arrow Buttons' and set the clock and date. The reason for locking the 'Touch Display' is to prevent people manually altering the Threshold Trigger Level once installed. This provides a much more comprehensive and flexible approach allowing 'fine tuning' of the SoundEar3 to suit your specific application.
- The second method is to manually create a simple setup using the 'Touch Display Arrow Buttons' and setting a simple threshold trigger Level. Most users will opt for setting up their SoundEar3 using the software provided. However, this section covers the simple Manual configuration options.

4.2 Simple configuration using 'Touch Display Arrow Buttons'

LED display and Touch Display Arrow Buttons on the SE3IND

Some users may prefer to use the simple manual setup approach and the option to continually adjust the unit 'in situ'. There are 4 buttons having 'up', 'down' and 'left', 'right' arrow heads. This method is very quick and allows the SoundEar3 to be manually configured and altered without having to use the software. *However the setup options are limited.*

Use the horizontal arrow heads to navigate between different options.

Use the vertical arrow heads to set the threshold limit level

The manual setup allows the following:

- Setting threshold levels
- Choosing what to display in the LED display (decibel level, threshold level, parameter, time etc)
- Switch off the LED display



4.3 Simple manual configuration of the 'Threshold Trigger Level'

5.3.1 Cycle through the manual configuration options using the horizontal keys

The configuration options are shown below:

CLOCK --> AL --> LE9.15 --> OFF



5.3.2 Toggle to the 'AL' option using the Horizontal 'Touch Display Arrow Buttons'

5.3.3 Leave in this position if you want to adjust or display the Threshold Trigger level.

AL

5.3.4 Use the **Vertical** keys to increase or decrease this value in single decibel increments.

If Threshold Trigger Level were set to 65dBA the display would show the following.

In this example the sign would trigger: 'Red' at 65dB or above
'Amber' at 60dB(A) to below 65dB(A)
'Green' below 60dB(A)

A 65.0

When an alarm level is set manually this **overrides any settings made in the software** and resets the unit to a simple trigger system based on 1 second A weighted LAeq and 5dB increments for the Amber and Green settings respectively.

Important Note: Changing the alarm level (Threshold Trigger Level) will overwrite any specific settings you previously made in the 'Light Settings' within the SoundEar3 software.

4 Simple Manual configuration of the SoundEar3 (cont)



4.4 Display the current time in the LED display

- Cycle through the configuration options using the horizontal keys until 'Clock' is displayed
- Stay in this position if you want the current time to be displayed.

Please note: The time and date settings will be synchronized automatically when connecting the SoundEar3 to a computer (running the SoundEar3 software) for the first time.

Please see the following example of the clock display (2:25 pm) . There is a dot on the right hand side that flashes once a second to show the sign is measuring noise.

CLOCK

14.25.

4.5 Display the current live noise level in the LED display (LAeq, 1s)

Continuously display the latest sound levels in decibels in the LED display.

Cycle through the configuration option until the Leq,1s option is displayed and then leave in this position if you want the live noise levels to be displayed.

LE9.15

34.8.

4.7 Choosing to switch off the LED display

In certain situations it may be preferable to have nothing displayed.

Cycle through the configuration options until 'OFF' is displayed

Left in this position nothing will be displayed in the LED display except a pulsing red dot at the right hand side to show the SoundEar3 is measuring noise.

OFF

.

5 Full configuration of the SoundEar3 using the SoundEar3 software

5.1 Connecting the SoundEar3 to your computer for the first time

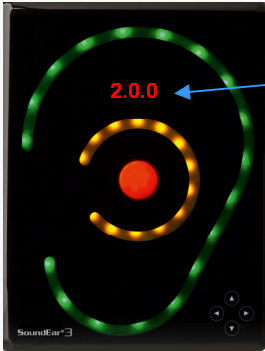
- Ensure the SoundEar3 software has been installed and you have the correct administration permissions.
- Check the latest version of the software is running. If you are using mains power unplug from the mains
- Connect the sign to your computer using the USB cable provided, this will also power up the sign



Windows should then make a noise to recognise a device is being plugged into your computer.

When you first plug the sign into your PC the current firmware version will be shown in the SoundEar3 LED display (at the time of writing this was 2.0.0).

A few moments later the LED display will show following.



The first time the SoundEar3 is plugged into the SoundEar3 software a pop-up window will appear.

- Select the 'Laptop icon' - the other two icons are not supported with your of the hardware.

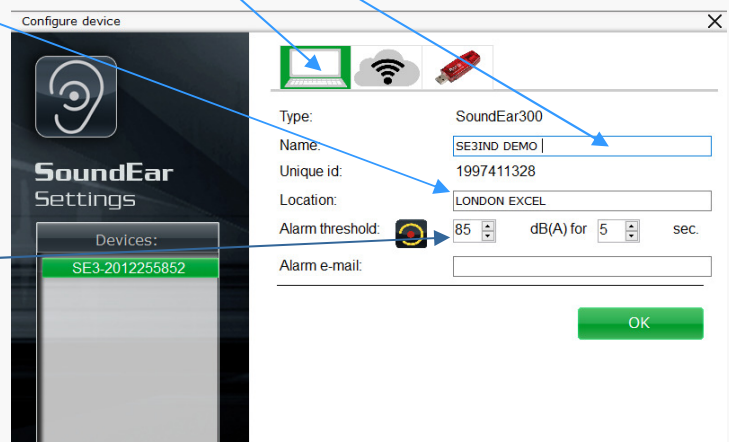
From this screen you can:

- Name the device (if not changed the software will use the device's unique ID code)
- Create a location name if the sign is going to stay in one location or area.

The field name 'Alarm e-mail' is only available if you choose to leave the sign directly connected to your computer. Therefore don't enter an alarm email or Alarm threshold level.

Please note: This screen appears the first time you plug your SoundEar3 into the SoundEar3 software. Don't worry if you don't choose a name or location as you can do this from the 'Define Settings' option within the SoundEar3 software at any time in the future.

- Click the 'OK' button to save your initial configuration.



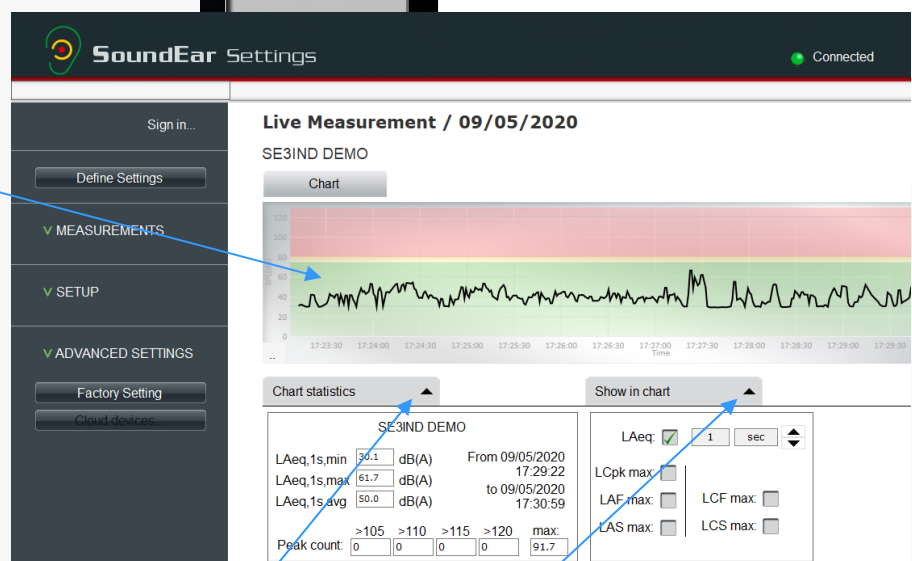
The 'Configure device' window shows the following fields:

- Type: SoundEar300
- Name: SE3IND DEMO
- Unique id: 1997411328
- Location: LONDON EXCEL
- Alarm threshold: 85 dB(A) for 5 sec.
- Alarm e-mail: (empty)

There is an 'OK' button at the bottom right.

A screen showing the live data accumulating will then be shown.

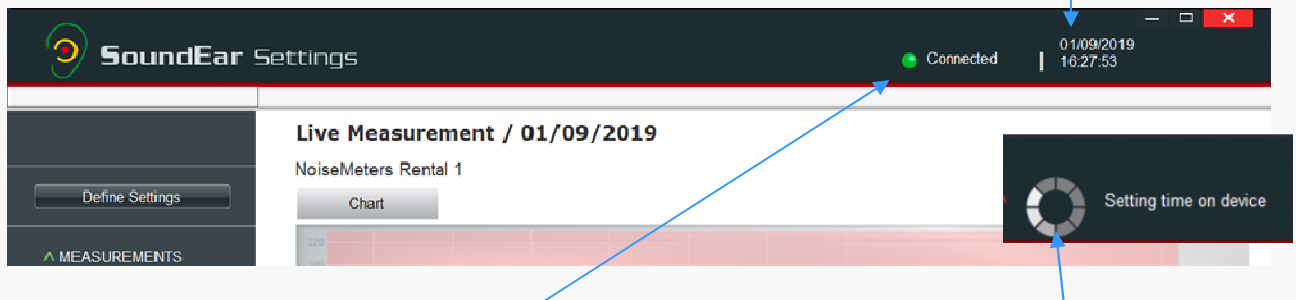
Live data is only shown when the SoundEar3 is plugged directly into a computer running the SoundEar3 software.



A larger clearer graph can be shown by minimising the 'Chart statistics' and 'Show in Chart' boxes. However these boxes do allow you view key statistics and select which parameter to show in the chart.

5.2 Setting the time and date

By connecting and configuring your SoundEar3 to the SoundEar3 software the time and date should be automatically set to be the same as your computer. Please check to make sure they are correct.

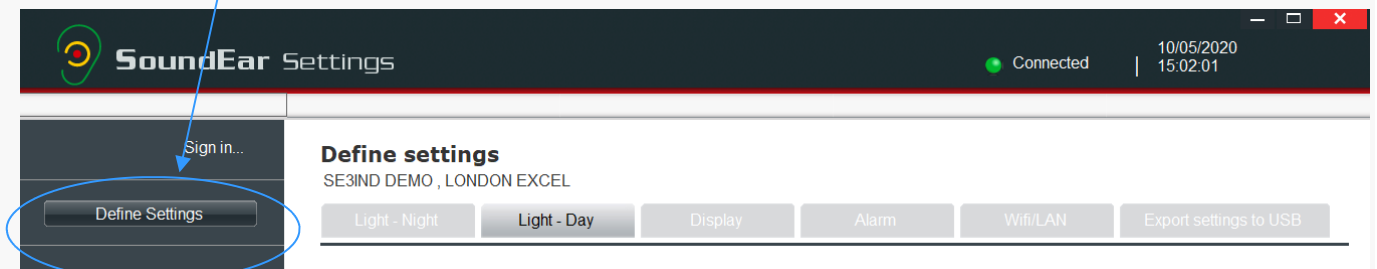


You can also double left click on the time / date setting to force the time to update (a loading icon will appear at the top centre of the screen)

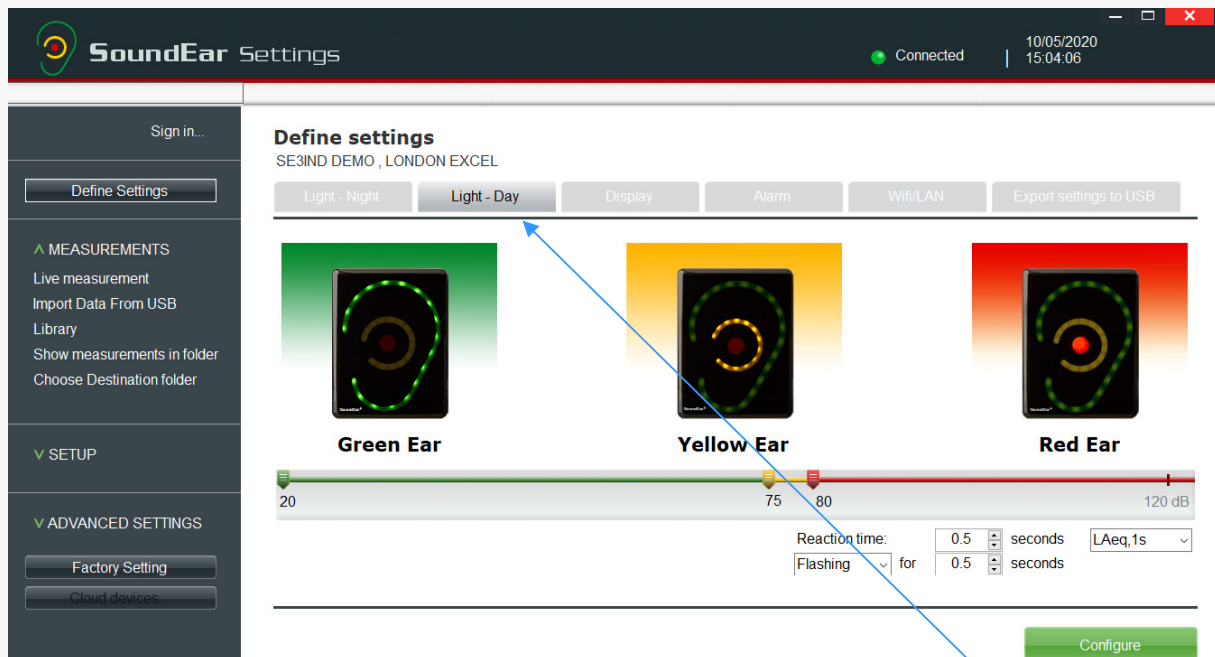
Notice the green Connected icon to show the SoundEar3 is connected to the software.

5.3 'Define Settings' section in the SoundEar3 software

5.3.1 The 'Define Settings' button on the left hand menu is where you can create your individual set up for the SoundEar3.



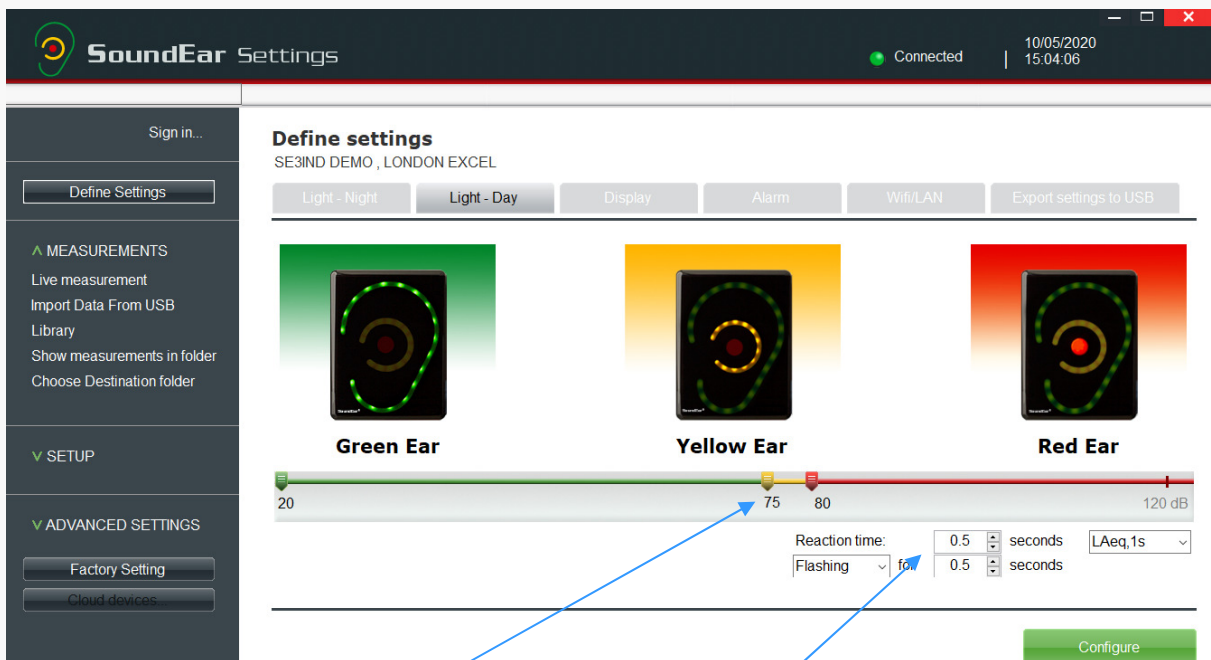
The following screen will then be shown. From this 'key' screen we can set up the visual aspects of the sign and advanced Threshold trigger levels for the Red, Amber and Green parts of the SoundEar3.



From the Define Settings screen we have a choice of TABs and the default TAB to arrive on is Light-Day. This allows you to create you own settings for the day time which will initially be for both day and night. If you want to create different settings for the Night time go to the Light-Night TAB. From here you can define the time period for night time settings. The other TAB you will use will be 'Display'. From here you can program what is displayed in the LED display.

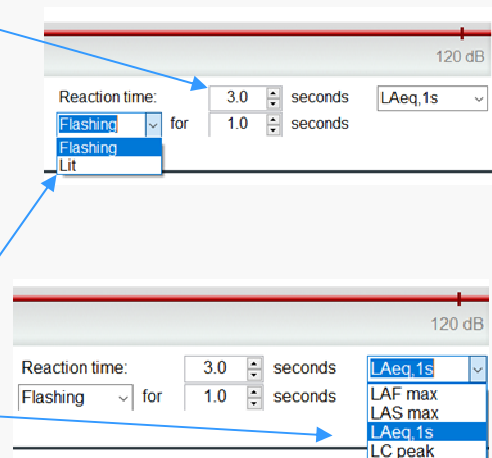
Important: Please ignore the 'Alarm' and 'Wifi/LAN' TABs as they are not supported with the Hardware supplied.

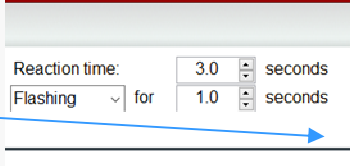
5.3.2 Define Settings during the daytime (Light - Day)



- Use the simple slider system to set up the threshold levels for the Green, Yellow and Red parts of the ear.
- Adjust the 'Reaction time' (how long the noise should be exceeded before the Red / Amber or Green part of the SoundEar3 turns on. In this example we have selected 0.5 seconds.

This is a very useful feature. You can select from 0.5 seconds to 100 seconds. This allows you to 'damp' the unit to avoid the sign flashing on every time there is a sudden noise.

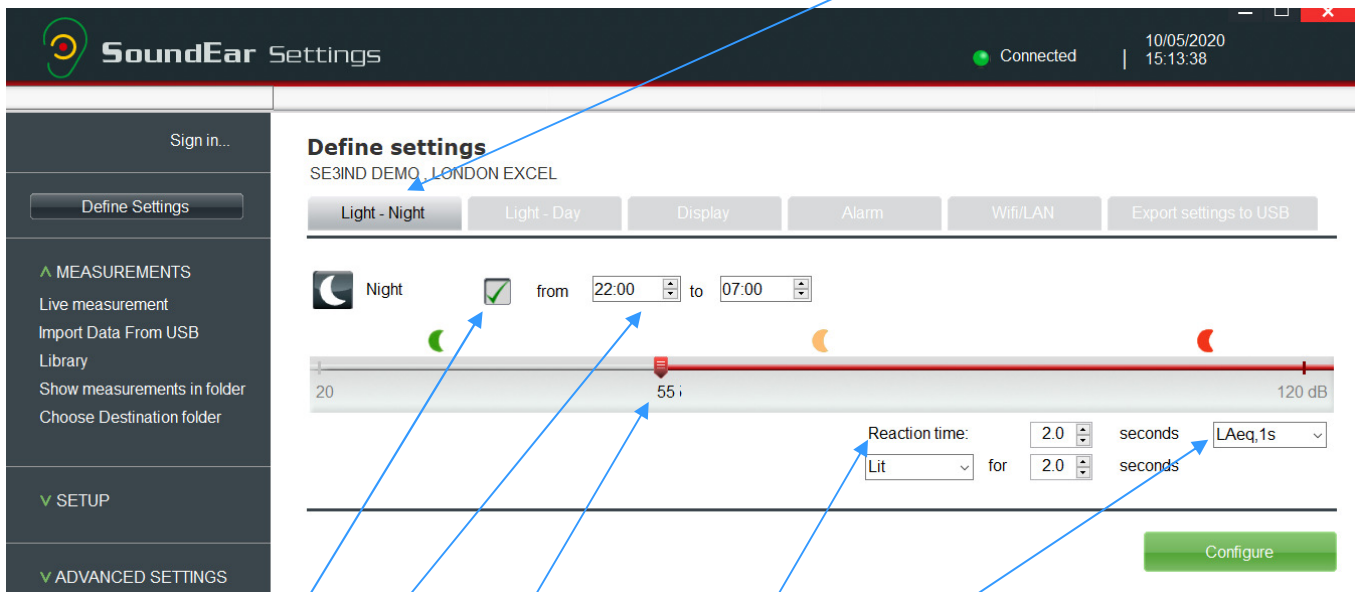


- c) Select whether you require the sign to be lit up or flashing and for how long it is illuminated for that threshold using the drop-down menu.
- 
- d) The default parameter that the threshold triggers work to is the 1 second LAeq (A weighted average). There is however the option to select LAFmax, LASmax or CPeak.
- e) Click the 'Configure' button to save your configuration to the SoundEar3

5.3 Define Settings (cont)

5.3.2 OPTIONAL - Define Settings during the night-time (Light-Night)

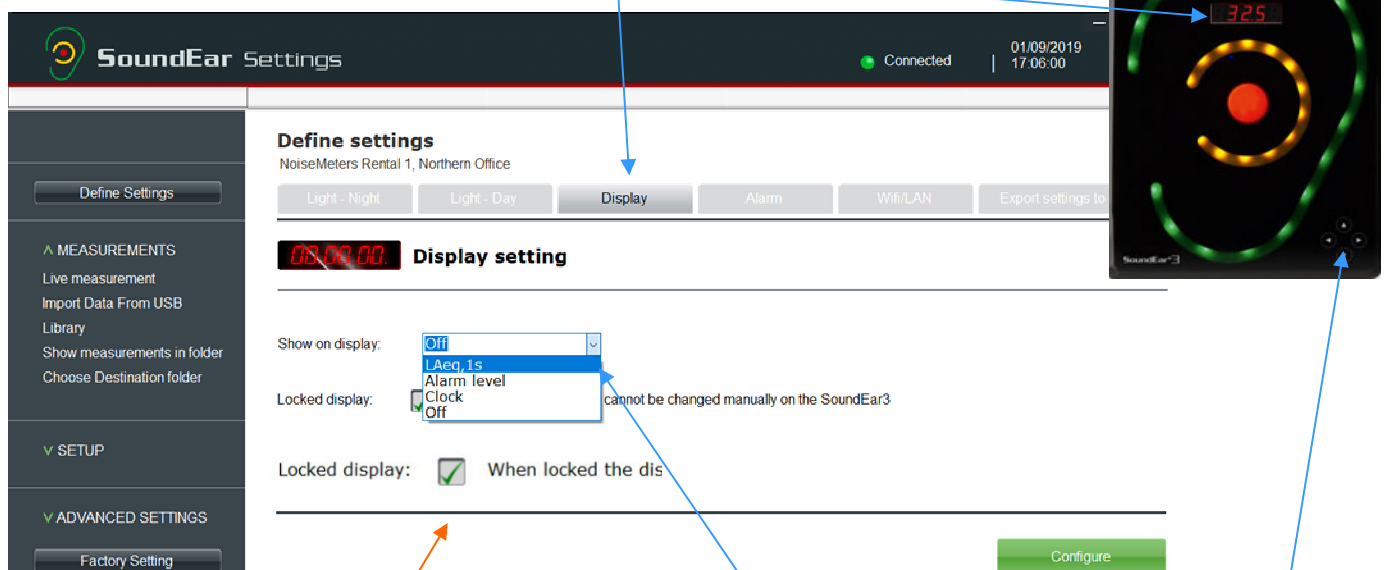
There is the added function of being able to define a night-time period and different settings to the Day time. This



can be particularly useful for Hospitals and other applications. Select the 'Light-Night' TAB to make these settings.

- To activate the Night time option check the box
- Select a suitable start and end time for the Night time period. This example shows night time starting at 22.00 hours (10.00 pm) and running until 07.00 am in the morning.
- Select suitable threshold trigger levels for the night time period. These would normally be lower than daytime in hospitals etc.
- Select the Reaction time and Parameters required.
- Left click the green 'Configure' button to write these changes to your SoundEar3

5.3.3 Define LED display settings



The LED display can be configured from the 'Display' TAB. Choose what will be displayed using the drop-down menu. The choice being:

- Nothing (Off), 1 second 'A' weighted average value (LAeq,1s), the selected 'Threshold trigger level' (Alarm level) or the time (Clock).
- IMPORTANT** - Lock the display by checking the 'Locked display' box. If you do not lock the display changes to settings could be made by anyone using the Touch Display Arrow Buttons.
- Left click the green 'Configure' button to write these changes to your SoundEar3

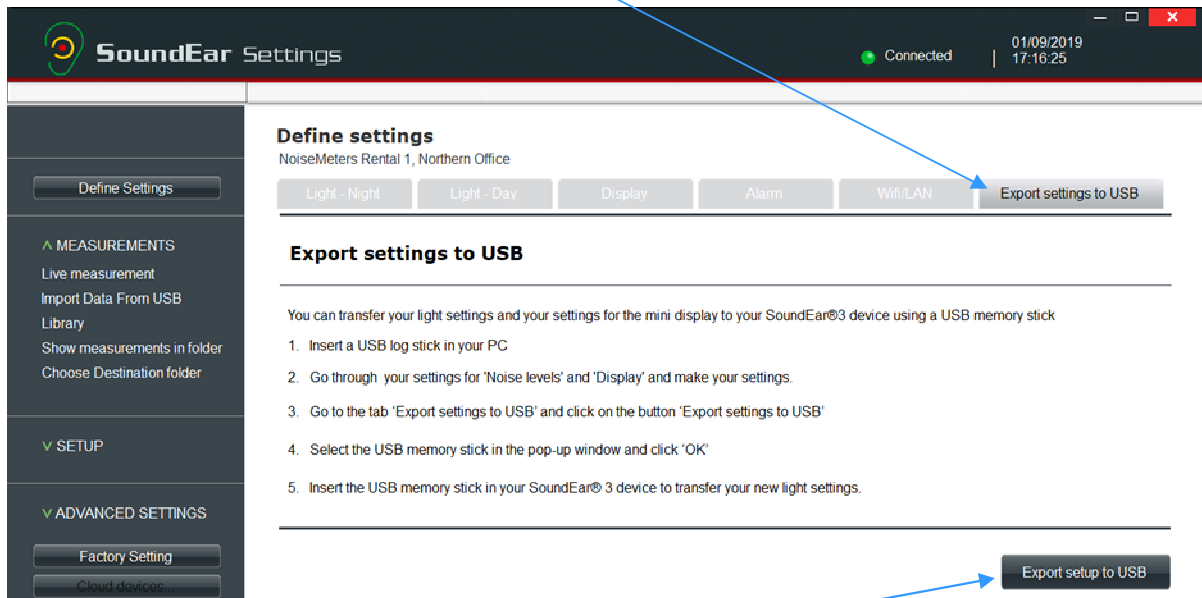
5.3 Define Settings (cont)

5.3.3 OPTIONAL - Export Settings to USB

If your organization has many SoundEar3 units you may prefer to create a single 'global setup'. You can do this by creating a special setup USB memory device.

- Go through the TABs 'Light-Day' (Light-Night if required) and 'Display' without clicking the green configure button.
- Go to the 'Export settings to USB' TAB
- Insert a formatted USB memory device (See APPENDIX 2)

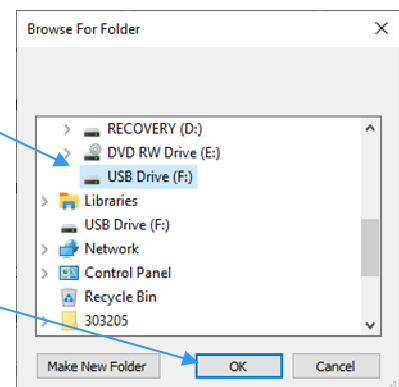
USB memory device



- Left click on the 'Export setup to USB' Button
- A pop up window will appear allowing you to navigate to the USB memory device.
- Left click the 'OK' button.

The USB will now contain a config.bin file

- Insert the USB memory device into a SoundEar3 that is powered. The display on the SoundEar3 will show 'USB' and the '100' when the process is finished.
- Remove the USB and the SoundEar3 will return to its normal display.
- The last two steps can be repeated to setup further signs.



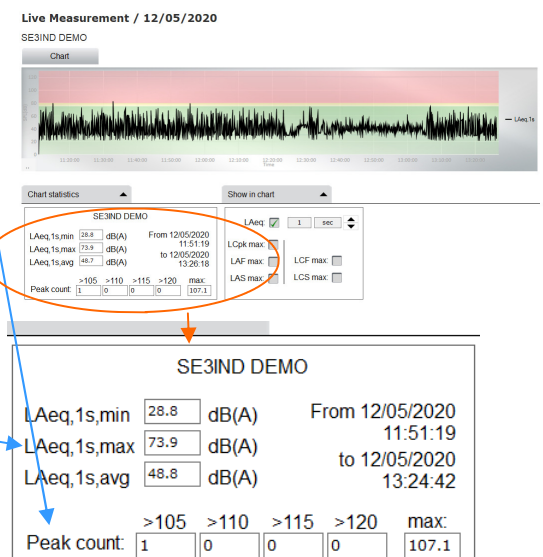
5.4 Chart statistics explanation

When viewing live measurement data The 'Chart statistics box allows you to look the 'Peak' count (this is the amount of 'C' peak instances above 105, 110, 115, 120 and also shows the highest Peak value (max).

The highest Peak max is particularly useful for Noise at Work applications although some of the lower Peak values (>105 / >110) may be of interest in Hospital wards / units.

There are also statistics for the minimum 1 minute LAeq in this measurement along with the highest 1minute LAeq and also the overall average LAeq for the whole measurement.

Please note: The 1 second values are only available for live measurement data and not from measurements imported from the SoundEar3 memory.



6 Physical installation of the SoundEar3

There are two main options for installing the SoundEar3:

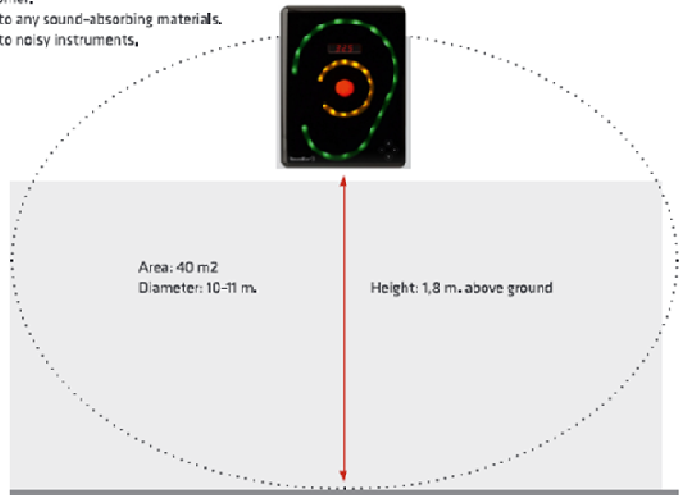
- Directly to a wall
- With a VESA mount. (This is an optional extra not supplied as standard). The VESA mount allows the SoundEar3 to be angled and a small distance from the wall.

NoiseMeters Part No: SE2VESA 'Wall and corner mount for the SoundEar II and SoundEar3'

6.1 Considerations for installation

- Check for available power socket nearby or make necessary electrical arrangements.
- Don't cover the microphone at the base of the SOUNDEAR3 and avoid placing close to noise absorbing materials.
- Find a 'visible' position at approx 1.8m above floor level on the opposite side of the room from the door and not in a corner.

On the opposite side of the room from the door,
Not in a corner.
Not close to any sound-absorbing materials.
Not close to noisy instruments,



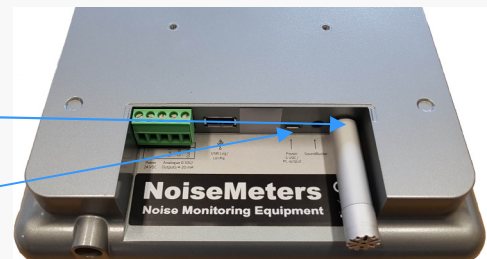
6.2 Direct mounting on the wall



6.2.1 Fasten a screw of 8 - 9 mm diameter (not supplied) securely to the wall using a method suitable for the wall type (i.e. Rawl plug etc)

6.2.2 Hook the SOUNDEAR3 over this screw. Ensure the microphone should be plugged into socket

6.2.3 Power using the mains adaptor / USB into socket 3



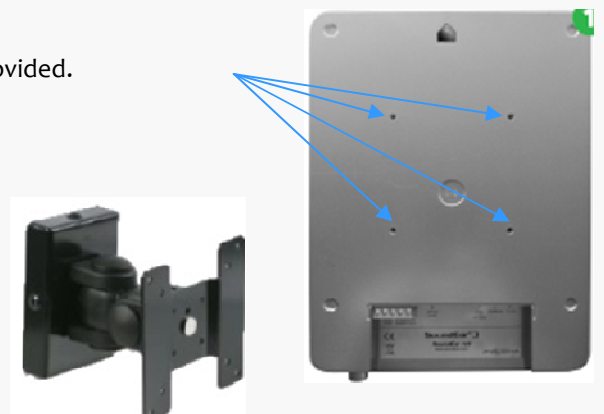
6.3 Mounting using a VESA mount

6.3.1 Fix the VESA mount to the SoundEar3 using the screws provided.

6.3.2 Fix the VESA mounting bracket to the wall.

Instructions will be supplied with the VESA mount unit.

The VESA mount allows you to angle the sign for the optimum viewing position and provides a more 'permanent' installation than the single screw option (where the sign can be removed by just lifting from the screw mount).



Managing ongoing noise measurement data

Download data to USB memory device

Import this data into the SoundEar3 software database

View data

Export as simple spreadsheet

Create a variety of PDF reports

7 Downloading Data from the SoundEar3

7.1 Downloading via USB memory device

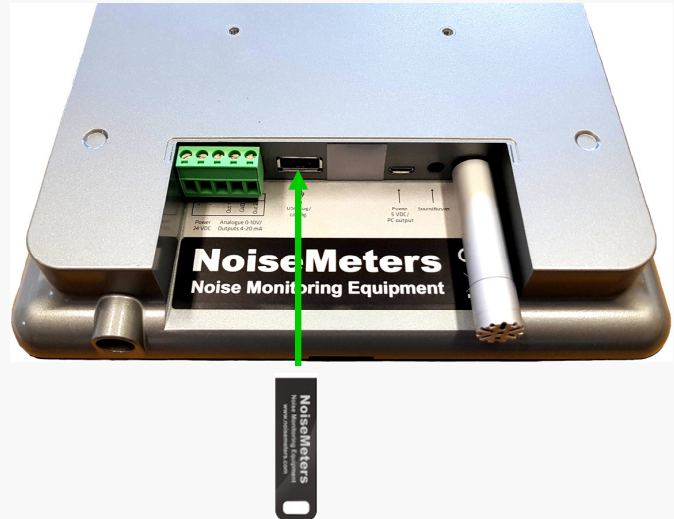
The SoundEar3 can store up to 600 days worth of time / date stamped noise measurement data in it's internal memory. **However, good practice dictates that you should download the noise data regularly, especially when you first start using the SoundEar3.**

Download to USB memory device and then plug the USB device into a computer running the SoundEar3 Software

7.1 Downloading via USB memory device

- a) Plug a correctly formatted USB memory device (supplied - see APPENDIX 2) into the USB socket at the base of the SoundEar3. This is done whilst the SoundEar3 is still running.

A simple sequence will then be shown in the LED display to show that the data is being downloaded to the USB drive. Once the copy has started it will count from 0 to 100 until complete. This may take from a few seconds up to a couple of minutes depending on the amount of data stored.



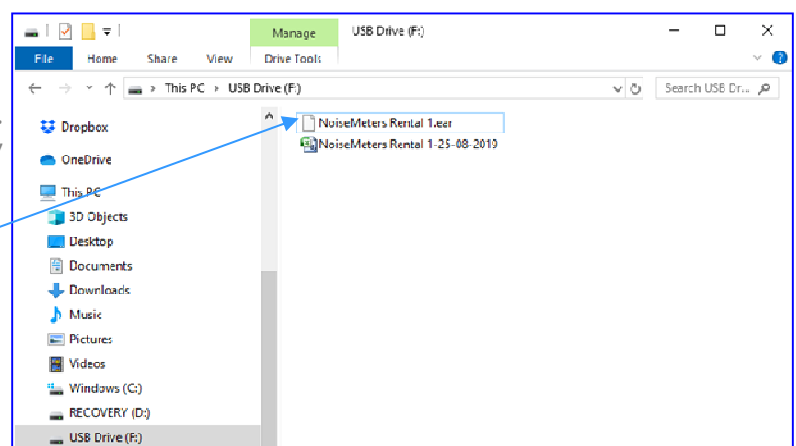
- i) 0---0
- ii) USB
- iii) ---
- iv) Copy
- v) 00.1
- vi) 100.0

Finally this display will return to it's normal mode.

- b) Remove the USB memory device from the SoundEar3 and can be used to download from other monitors or subsequently be plugged into your computer to import the noise data into the SoundEar3 software.

NOTE: If you experience issues importing noise data into the SoundEar3 software check the USB memory device using 'File explorer'. There should be a number of files on the USB memory device.

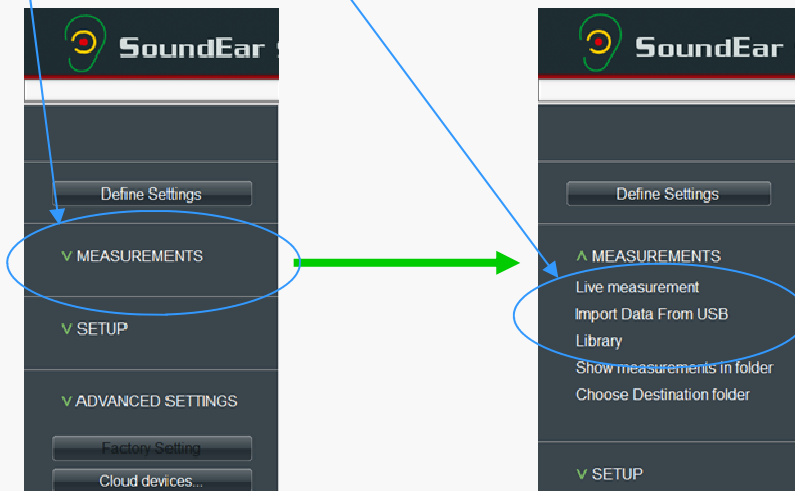
There should be a .csv file (spreadsheet format) But importantly another should be a '.ear file'. The .ear file is the one that will be imported into the SoundEar3 software. The .ear file is a special format that can be read by the SoundEar3 software.



8.1 Importing noise data into the SoundEar3 software

8.1 Transferring data from the USB memory device

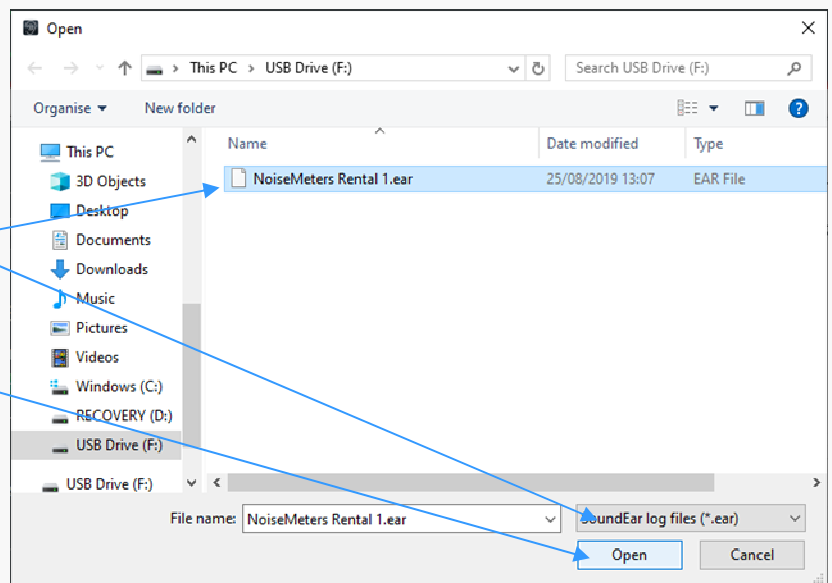
- Make sure the SoundEar3 software is running on your computer and that you have the necessary admin rights to plug a USB device into your computer.
- Plug the USB memory device into your computer
- Left click on the 'green downward arrow' to expand the 'Measurements' section of the SoundEar3 software.
- Select the 'Import Data from USB' option.



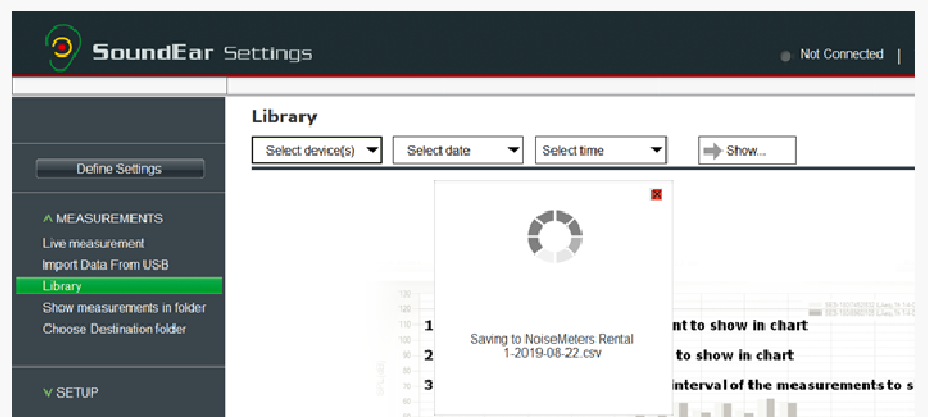
A pop up

window will appear.

- Navigate to the USB drive port that you plugged your USB memory device into [in this particular example it is the (F:) drive].
- Highlight the .ear file you want to open
- Click Open



Another window will appear to indicate that the download is taking place. There will be a count through the days until finally the import is completed.



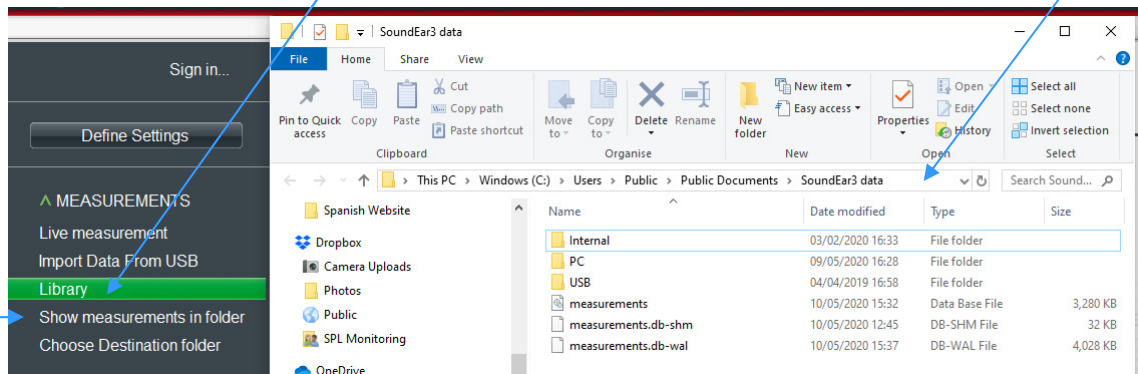
8.3 Importing noise data into the SoundEar3 software

8.3 Show where measurements are stored on you computer.

Measurements are stored in a Folder. You get the option to accept the default location or alter this during software installation. To find out where the measurements are stored there is a 'Show measurements in folder' option. A pop up window will then appear showing where the files are stored.

Please note: the menu system changes to 'Library'

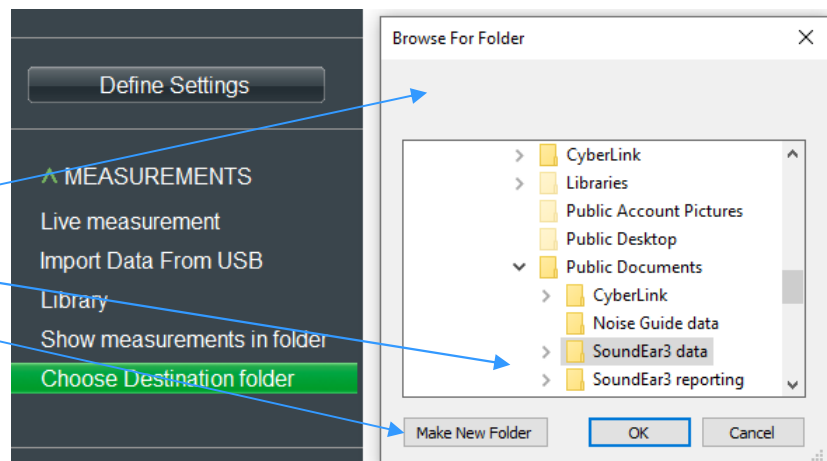
- 1 Expand the 'MEASUREMENTS' menu and select 'Show measurements in folder'. A window will then appear showing where the measurements are stored. Please note the menu will switch to 'Library'/'



8.3 Choose where Noise Measurement Data is stored on your computer.

You have the option to alter where the noise measurement data files are stored.

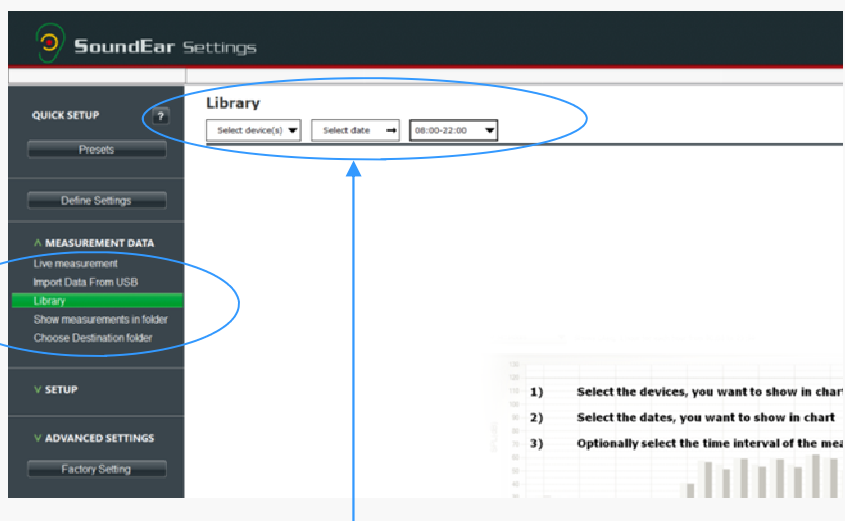
- 1 Expand the 'MEASUREMENTS' menu and select 'Choose Destination folder'
- 2 The pop up window will then show where the files are currently stored.
- 3 Navigate to the folder where you would like the files to be stored or use the 'Make New Folder' option'.
- 4 Click the OK Button to save your choice.



9.1 The Library Function - Viewing measurement Data

9.1 The Library Function

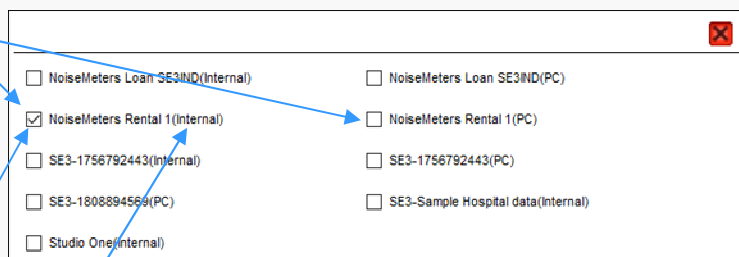
The selected menu in the SoundEar3 software is highlighted green. Once you have completed the import noise data process this highlight will automatically switch to 'Library'



The next task is to select the 'Device' (the specific SoundEar you want to display the data from) along with the Date and Time of the data you wish to display.

- a) Use the drop-down menu from the Library section to select the device (SoundEar3).

Please note there are two suffixes for each SoundEar3 (assuming that specific SoundEar3 has been plugged directly into your computer running the SoundEar3 Software at some point i.e. for configuration). Please see the example shown.

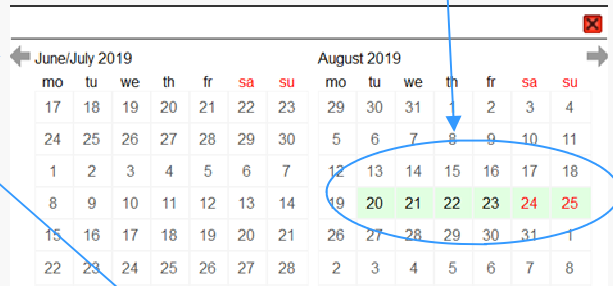


- b) Select the 'Devices' you wish to view data from by ticking the box. You would normally need to choose a sign with the (Internal) suffix. This refers to the data stored within the internal memory of the SoundEar3. The (PC) suffix refers to a 'Live' measurement made whilst the SoundEar3 was plugged directly into your computer with the SoundEar3 software running.

- c) Select the Date required from the drop-down menu 'Select Date'. A calendar will be displayed where days with data available will be highlighted.

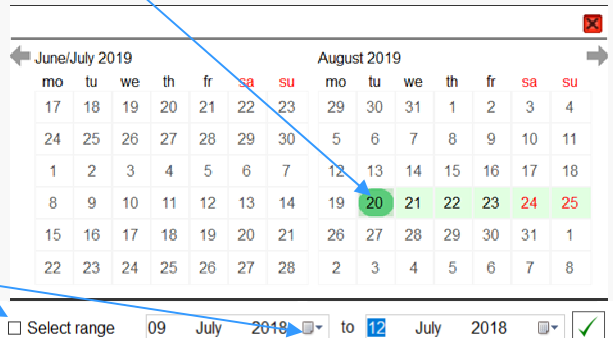
In this example data is available from 20th to 25th of August 2019. Use the arrow keys to go backwards or forwards by month.

Once a day is selected it will show as a darker green colour.



Please note: On the latest software release there is the option to select a date range as an alternative to selecting each day individually. This is useful for longer measurement periods.

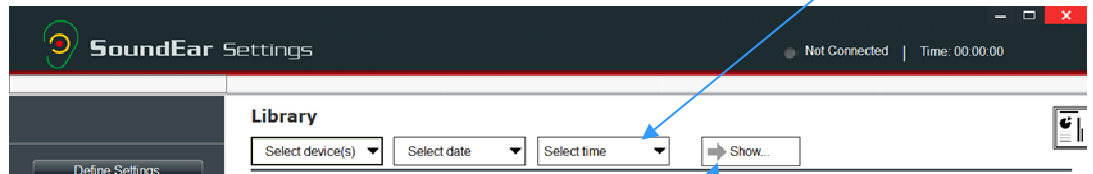
- i) Check the 'Select range' box
ii) Select start and finish dates from the drop-down calendars.



9.1 The Library Function - Viewing measurement Data (cont)

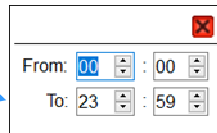
9.1 The Library Function (cont)

d) Select the time 'window' or working day you wish to display for each day selected from the 'Select Time' drop-down menu.



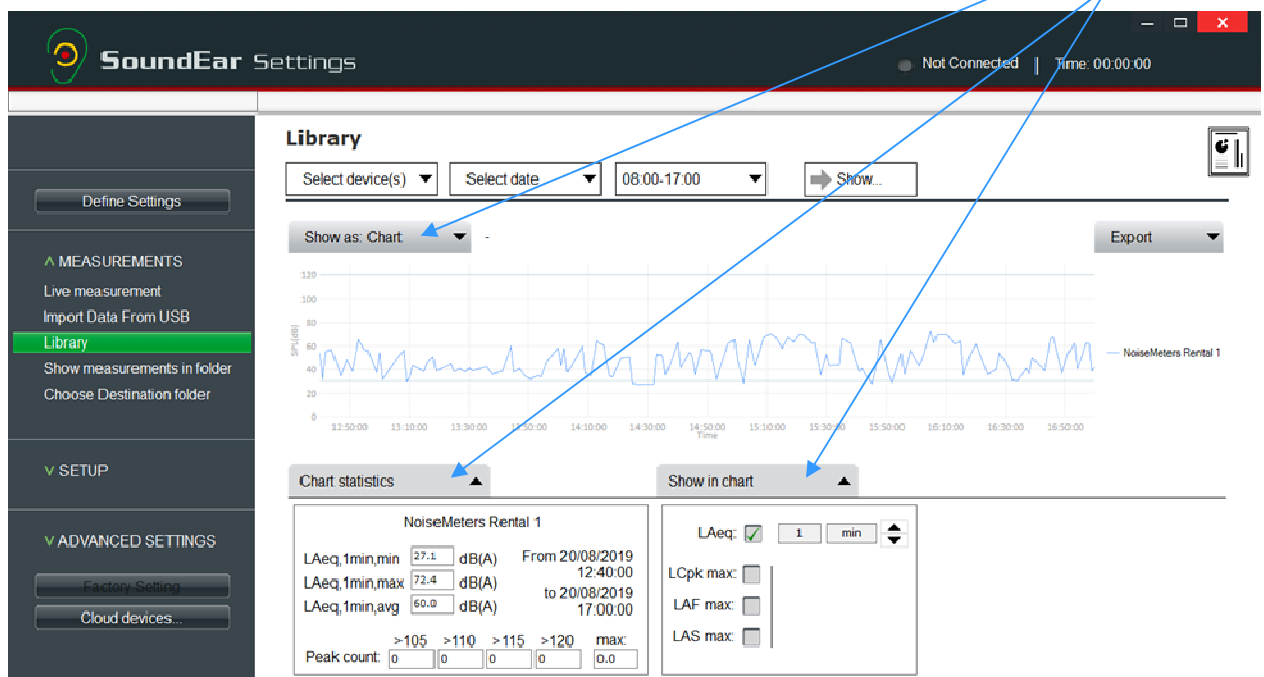
The following window will then appear.

By default the whole day will be selected as per the example shown.

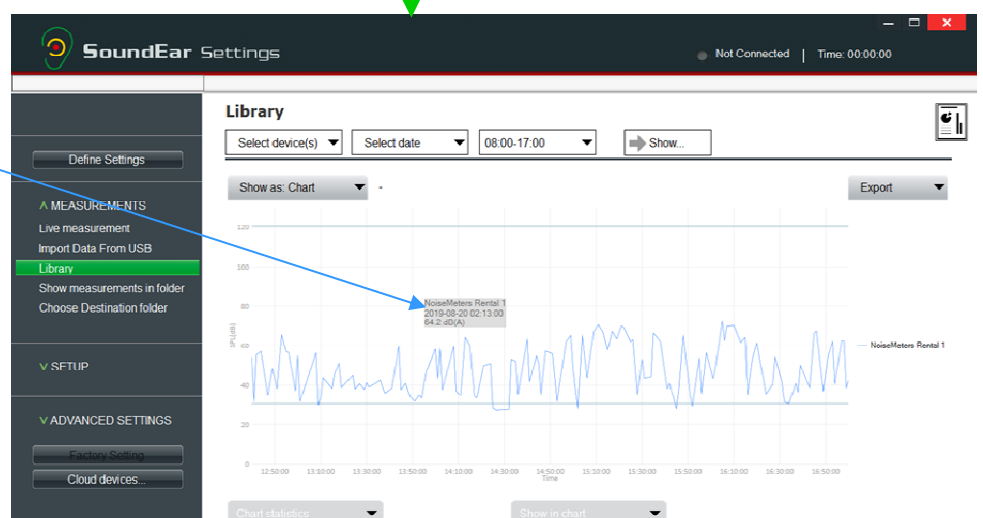


e) Finally left click on the '->Show' button to view your measurement data.

The measurement data will then be displayed. The SoundEar3 software initially defaults to the 'Show as Chart' view. The bottom two boxes can be minimised using the arrows to give a larger Time History Graph area.



Once the two menu's are minimized you view see a better sized graph. Time and measurement levels will be shown by hovering over with your mouse.



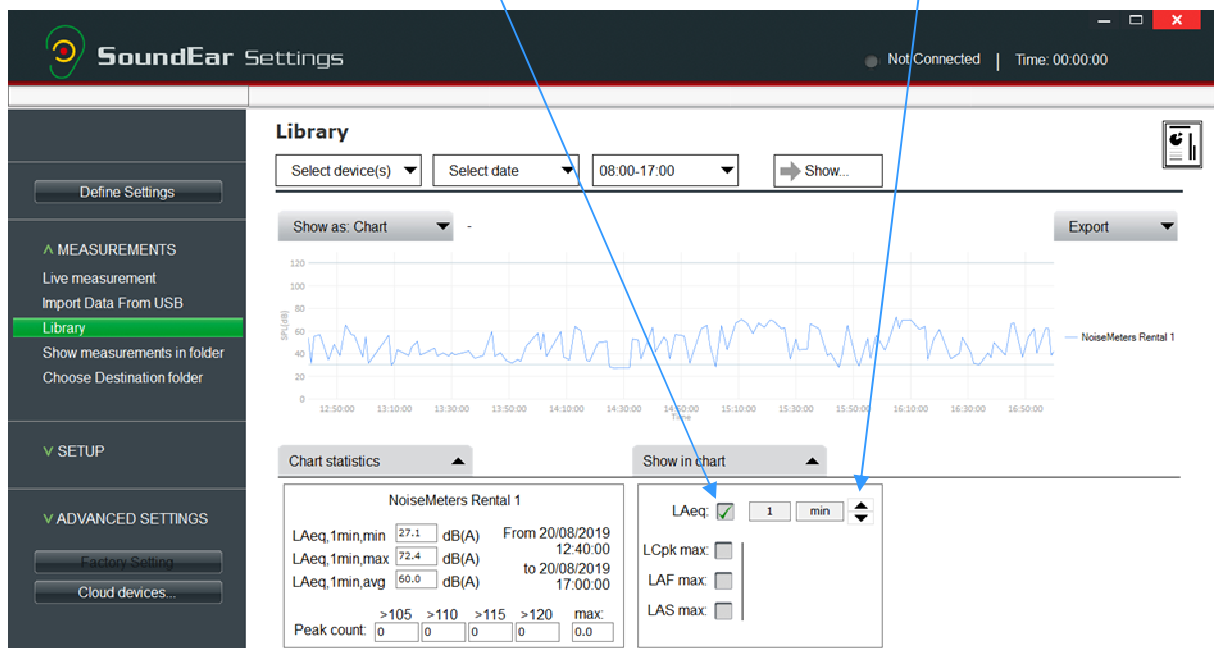
9.2 The Library Function - Viewing measurement Data (cont)

9.2.1 Selecting different 'view formats'

There are 3 different viewing options that can be accessed from the 'Show as' drop-down menu.

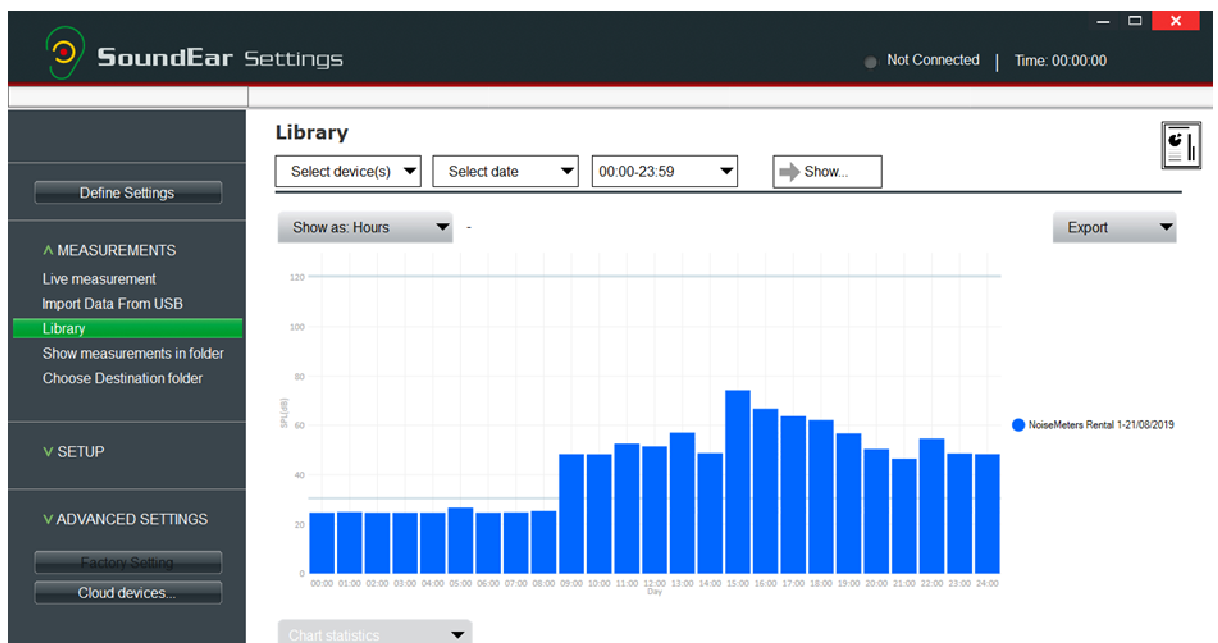
9.2.2 Chart view

- The 'Chart' setting shows a Time History Graph. Tick the suitable box in the 'Use the 'Show in chart' section to select which parameter to display. Choose from LAeq, LCpkmax (LCPeak), LAFmax, LASmax. See Appendix 5 for a glossary of terms.
- Use the up / down arrows to select the time interval for the LAeq values. Select from 1 minute, 15 minutes and 60 minute intervals. A 1 second interval is also available but can only be selected for 'Live Measurements' where the SoundEar3 is plugged directly into your computer running the SoundEar3 software. Please note the time interval option is only available for the LAeq (not the Peak or max values).



9.2.3 Hours View

This view provides a bar chart that represents the average noise level for each hour within your selected period. This can be useful to compare hourly average noise levels throughout the day.

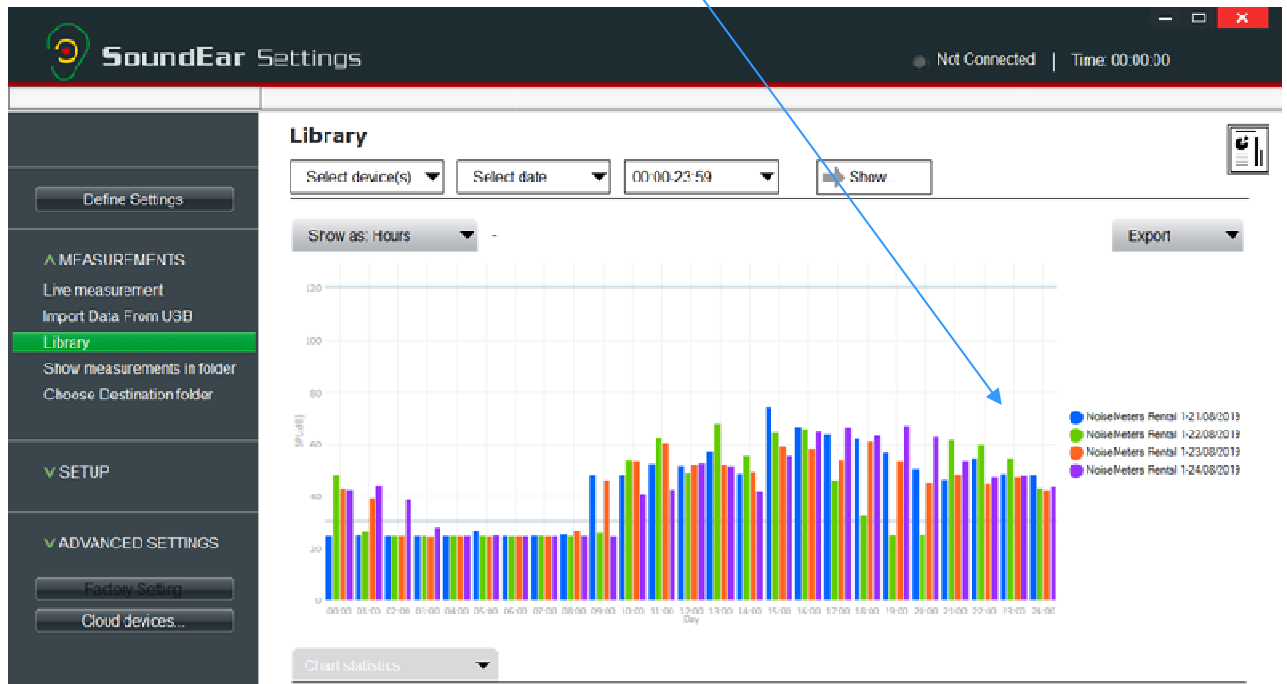
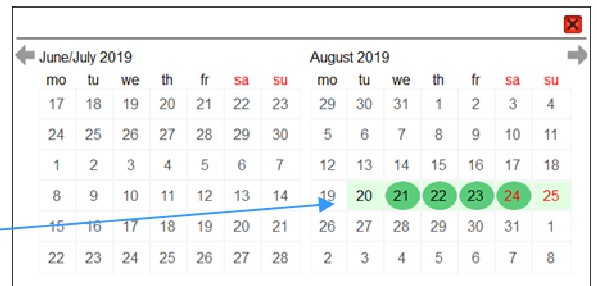


9.2 The Library Function - Viewing measurement Data (cont)

9.2.3 Hours View (cont)

By selecting more than one day from the 'Select Date' menu you can also run comparisons for different days at different hourly values throughout the day.

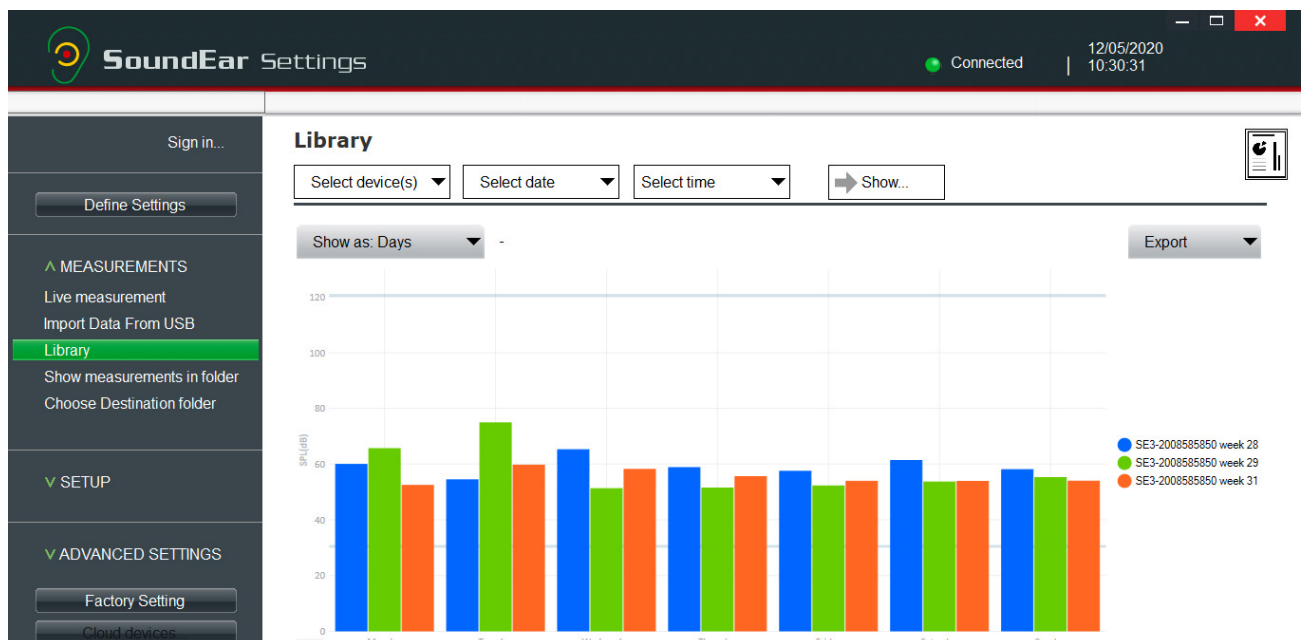
- a) Left click on each day you want to select or deselect. (in this example 4 days have been selected).



Comparison of hourly values over a number of days

Please note – this can't be viewed as a report but you can use 'Print Screen' from your keyboard and then paste into a Word document to store this graph.

9.2.4 Days view



10 Creating Reports and exporting Data

10.1 Exporting data a simple .csv report

One very simple but useful function is to export data from 1 or more SoundEar3 units into one spreadsheet.

- 1 Selected the devices, dates and times required
- 2 **Important:** Select the parameter required from the 'Show in Chart' section
- 3 Click the 'Show' button
- 4 Finally click on the Export button where a drop-down menu will show Csv (spreadsheet format).

The screenshot shows the 'Library' section of the SoundEar3 software. It features three dropdown menus for 'Select device(s)', 'Select date', and 'Select time', followed by a 'Show...' button. Below these is a line chart displaying SPL (dB) over time from July 9th to 21st. The chart is labeled 'SE3-2008585850'. At the bottom, there is a 'Show in chart' section with checkboxes for 'LAeq', 'LCpk max', 'LAF max', 'LAS max', 'LCF max', and 'LCS max'. The 'LAeq' checkbox is checked, and a value of '60 min' is selected. To the right of the chart, there is an 'Export' button with a dropdown menu showing 'Csv' as the selected option.

Useful tip: When selecting data to export to .csv think about the time interval to select. Try selecting either the 60 min LAeq (average) or 15 minute average if you want to get a good feel for general noise levels.

Please note that .csv files can't be edited unless they are saved into another format (such as Microsoft Excel). When you first open the file you may need to widen the first field (A) to create the width required to show the date data .

Other parameters can be selected such as LAFmax or LCpk max or LASmax . For these parameters you can't select a time interval, it will be 1 second so you will get a very large spreadsheet (3600 seconds per hour which means 3600 spreadsheet rows per hour!). Therefore for most reporting applications select the LAeq value and longer time intervals such as 15 minutes or 1 hour.

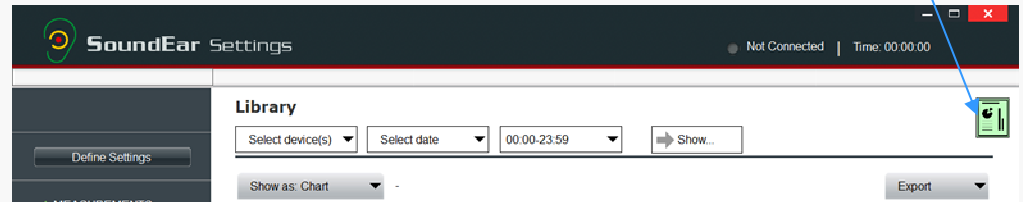
	A	B
1	Date	Time
2	#####	00:00:00
3	#####	00:01:00
4	#####	00:02:00
5	#####	00:03:00
6	#####	00:04:00

	A	B	C
1	Date	Time	Mike Demo[LAeq
2	09/07/2018	00:00:00	66.3
3	09/07/2018	00:01:00	66.4
4	09/07/2018	00:02:00	66.9
5	09/07/2018	00:03:00	66.4
6	09/07/2018	00:04:00	68.9
7	09/07/2018	00:05:00	71
8	09/07/2018	00:06:00	69.8
9	09/07/2018	00:07:00	65.7
10	09/07/2018	00:08:00	66.7
11	09/07/2018	00:09:00	69.6
12	09/07/2018	00:10:00	65
13	09/07/2018	00:11:00	66.4

10.2 Creating PDF reports

10.2 Creating PDF reports

Once you have selected a Device along with a date(s) and times you can view the results but also have the added option of creating a PDF report using some of the simple reporting options. These can be accessed by the special report button.



Useful tip: The key to creating clear reports using the SoundEar3 software is just to select the information that you need rather than just ticking all of the boxes. This will give you a clear and focused report.

- a) Left click on the 'Report' icon.

Another window will open allowing you to select which information you wish to include in your report.

- b) Name the report.
c) Include a Footer image if required.
d) Tick the options you want including in your report.
e) Select dates

Generate report

Report name: Hospital Noise - Entrance B Reception area

Footer image (optional):

Show in report:

- ☐ Devices summaries
- ☒ Line chart
- ☒ Hours column chart
- ☐ Days average column chart
- ☐ Daily charts
- ☐ Lden of period

From: 21 August 2019

To: 21 August 2019

Cancel OK

10.2.1 Device summaries

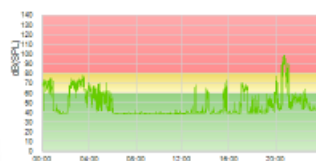
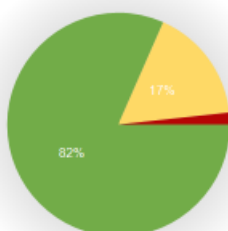
This first 'Device summaries' option may be excluded if you want to focus on other reporting options as this takes 2 pages per device. A lot of this information will be included in other report options. The pie chart is unique to this report though.

The Device Summary will create:

- 1st page: a daily average along with highest and lowest noise levels etc
2nd page a simple Pie Chart and colour coded 'time history chart' along with Chart Statistics Box.

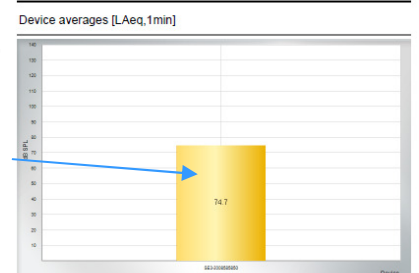
Noise Report		Date: 17/07/2018
Location:	Sample Device Summaries report	
Report period:	00:00 17 July 2018 - 23:59 17 July 2018	

SE3-2008585850



SE3-2008585850				
L _{Aeq,1min,min}	38.4	dB(A)		
L _{Aeq,1min,max}	98.4	dB(A)		
L _{Aeq,1min,avg}	74.7	dB(A)		
Peak count:	>105	>110	>115	>120
	0	0	0	0
				Max
				0.0

Noise Report		Date: 17/07/2018
Location:	Sample Device Summaries report	
Report period:	00:00 17 July 2018 - 23:59 17 July 2018	



Lowest noise level:	Device SE3-2008585850 at 17/07/2018 08:25:00, 38.4
Highest noise level:	Device SE3-2008585850 at 17/07/2018 20:43:00, 98.4
Critical noise levels:	25 times at device SE3-2008585850

'Critical noise level' indicates that noise levels set for the red indicator for this report has been exceeded

10.2 Creating PDF reports (cont)

10.2.2 Line Chart

By ticking the 'Line Chart' box a colour coded time history graph will be included.

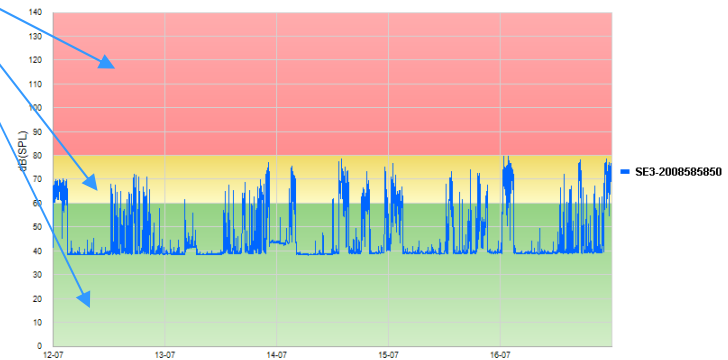
The colour coding (Red, Yellow and Green) will be based on the limit values you have set for the device.

Noise Report

Date: 12/07/2018

Location:	Soundear Line Chart
Report period:	00:00 12 July 2018 - 23:59 16 July 2018

Chart [LAeq,1min]



10.2.3 'Hours column chart'

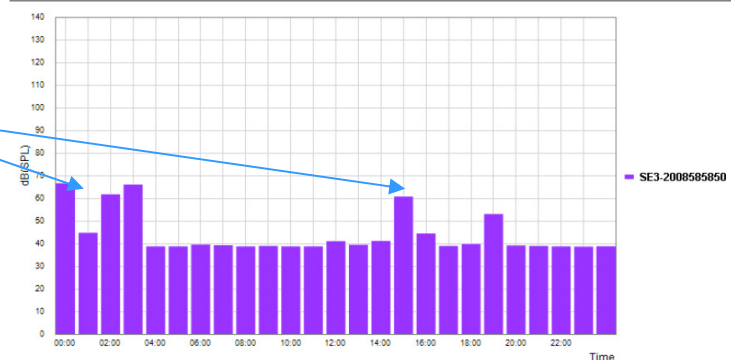
Check this box to include a bar chart showing the hourly average values. This type of report is generally useful to show hourly noise levels over one day rather than multiple days.

Noise Report

Date: 09/07/2018

Location:	Soundear Hours Column Chart 1 day
Report period:	00:00 09 July 2018 - 23:59 09 July 2018

Hours



10.2.4 'Days average Chart'

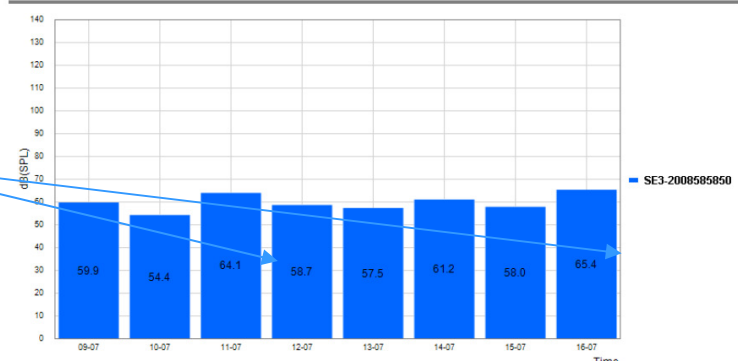
This allows you to display a Bar chart showing the overall average values for each day. The daily average is shown to one decimal place for each day.

Noise Report

Date: 09/07/2018

Location:	Sample Days average column chart
Report period:	00:00 09 July 2018 - 23:59 16 July 2018

Days



10 Creating PDF reports (cont)

10.2.5 Daily Charts

Check the 'Daily Charts' box and the window shown below will pop up. This allows you to define the Day / Evening / Night start times and define a limit for each.

A time history graph will be included in your report with the limit values shown as red lines for the Day, Evening and Night.

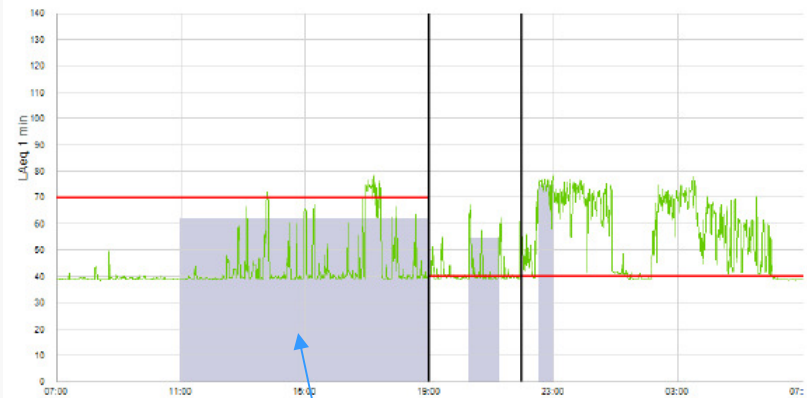
A box at the bottom of the graph a small table will show the typical higher average value areas which are shaded in the graph as grey. It will also state when these periods started and stopped.

Noise Report

Date: 16/07/2018

Location:	Soundear report 12/05/2020 12:07:39
Report period:	00:00 16 July 2018 - 23:59 17 July 2018

Daily noise: SE3-2008585850, 16 July 2018



Highest Averages

Interval	Time	Average
Day:	10:59 - 18:59	62.0 dB
Evening:	20:18 - 21:18	54.2 dB
Night:	22:32 - 23:02	74.8 dB

10.2.6 Lden of period

The Lden, also known as a 'Community Noise Equivalent Level', is a noise calculation often used for Environmental Noise on construction projects but it can be useful for other scenarios.

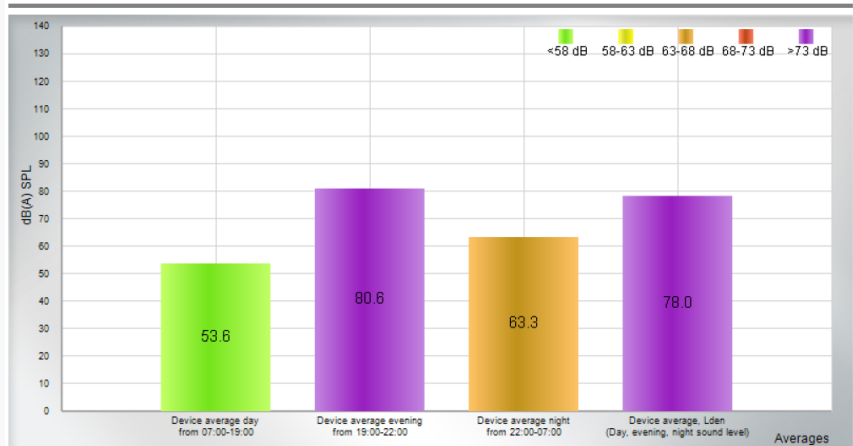
It aims to calculate a daily average noise level but adds a penalty of 5dB for the evening hours and 10dB for the night time hours to reflect the typical expectancy of reduced noise levels during the evening and night time.

Noise Report

Date: 17/07/2018

Location:	Sample Lden report 17th July 2018
Report period:	00:00 17 July 2018 - 23:59 17 July 2018

SE3-2008585850: Average from 17/07/2018 to 18/07/2018



10.3 ***SoundEar3 Software Legacy data import ***

10.3 Legacy data import

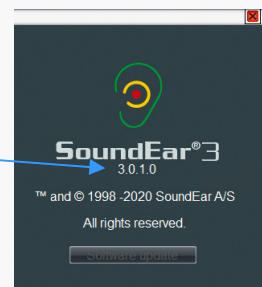
Up until May 2020 the SoundEar3 software stored data in a Folder as separate '.ear files'. The software has recently changed to import this into a Database.

For existing users of the software version before 3.0.1.0 they may suddenly see their data 'disappear'.

The data is still available but will need to be imported into the database manually.

10.3.1 Checking SoundEar3 software version

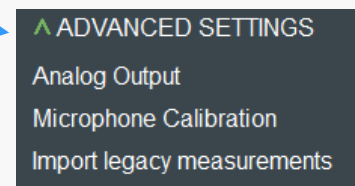
(you can check by expanding the SETUP menu and selecting 'About SoundEar3' a window will then appear giving the software version).



10.3.2 Importing Legacy Data

- Expand the ADVANCED SETTINGS menu
- Select 'Import legacy measurements'
- The following window will appear. There will be a list of your devices (SoundEar3's). Check the import box for each unit you wish to import

HOWEVER, PLEASE BE AWARE THE IMPORT PROCESS CAN TAKE A WHILE SO IF YOU HAVE A NUMBER OF SOUNDEAR3'S TRY ONE UNIT FIRST TO DETERMINE HOW LONG THE IMPORT WILL TAKE.



Import	Name	Uniqueld	Progress
☒	SE3-Sample Hospital data	934749475	64%
☐	Studio One	68335682	0%
☐	london	1997411328	0%
☒	Mike Demo	2001081458	0%
☒	NoiseMeters Hire	138961943	0%
☒	NoiseMeters Loan SE3IND	1591012593	0%
☒	NoiseMeters Rental 1	213826499	0%
☐	SE3-1756792443	1038726542	0%
☐	SE3-1808894569	1881581287	0%
☐	SE3-2008585850	1432458170	0%
☐	SE3IND DEMO	422102707	0%

Select none Select all

Select devices to import



The SoundEar Software now stores measurements from all devices in a local database. Old measurements are not visible in the software, unless you import them from this dialog box.

Importing measurements takes a while, so please select which devices to import measurements from.

Import	Name	Uniqueld	Progress
☒	303570	1010932280	0%
☐	NoiseMeters Loan SE3IND	1687698673	0%
☐	NoiseMeters Rental 1	1021352796	0%
☐	SE3-1754367077	2043390042	0%
☐	SE3-1756792443	1693530012	0%
☐	SE3-Sample Hospital data	934749475	0%
☐	Studio One	68335682	0%
☐	london	1997411328	0%
☐	Mike Demo	2001081458	0%
☐	NoiseMeters Hire	138961943	0%
☐	NoiseMeters Loan SE3IND	1591012593	0%

Select none Select all

Cancel Import...

Close

- Click the Import button.
- Another Window will appear to show the progress of the import.
- Eventually the process will finish and a little window will appear to say 'Import complete'.
- You will now be able to go to the Library and view your data, export data and create reports as before.

Maintenance

Cleaning the SoundEar3

Calibration of the SoundEar3

Firmware and Software updates

11 Maintenance

11.1 Repairs

In the unlikely event of there being any issues, to ensure the correct performance of the SoundEar3, repairs and service should be carried out by a trained technician.

11.2 Disinfection / Cleaning

The SoundEar3 partly consists of materials that do not tolerate certain substances used in surface disinfectants.

To Disinfect via wiping firstly remove any dirt or grime from the surface using a damp disposable cloth. Then disinfect the surface with alcohol wipes, then buff with a dry cloth.

11.3 Field Verification / Calibration using an acoustic calibrator

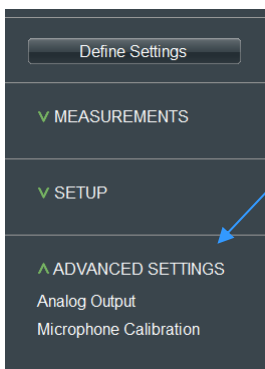
To carry out a 'Field Verification Check' of the SoundEar3 you will need an acoustic calibrator.

The calibrator will need to:

- Have a 1/2" aperture
- Meet IEC 60942:2003 Class 2 or ANSI S1.40: 2006 Type 2



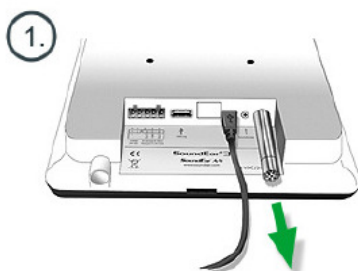
Typical acoustic calibrator



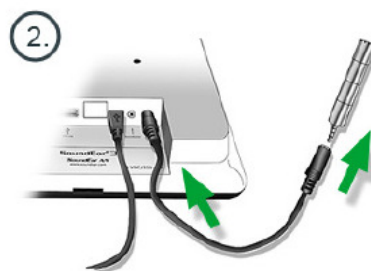
11.3.1 Field Verification / Calibration Process

Select 'Microphone Calibration' from the 'Advanced Settings' in the SoundEar3 software menu.

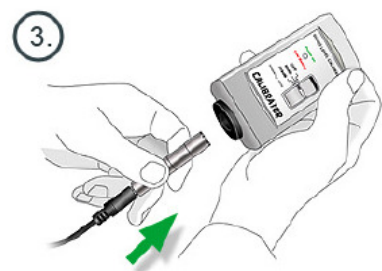
- 1 Disconnect the external microphone.
- 2 Plug the 4 pole 0.5m microphone extension cable provided with the SoundEar3 into the SoundEar3 - the other end will plug into the microphone.
- 3 Carefully insert the microphone into the acoustic calibrator and make sure the calibrator is switched on.



1. Connect your SoundEar 3 to your laptop, and disconnect the external microphone.

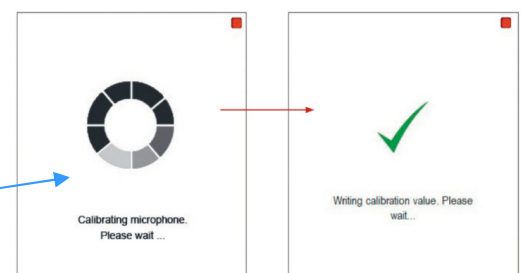
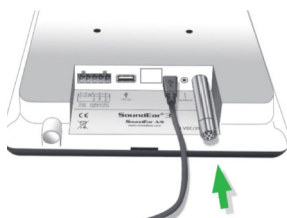


2. Connect the external microphone to the extension cable.



3. Set the calibrator to 94 dB.

- 4 Wait for a few seconds until the the noise level shown as LASmax is stable.
- 5 Click 'Perform Calibration' The calibration process takes a number of seconds. A pop up window lets you know the calibration is taking place and when when it has finished.
- 6 Finally plug the microphone back directly into the SoundEar3 (unless you are using a microphone extension cable). The SoundEar3 is now ready to be used again.



11.4 Software and Firmware Updates

11.4.1 Software and Firmware Updates

As part of a process of continual improvement there will be regular updates to both the SoundEar3 software and the Firmware within the SoundEar3.

Both of the checks and updates are carried out using the SoundEar3 software.

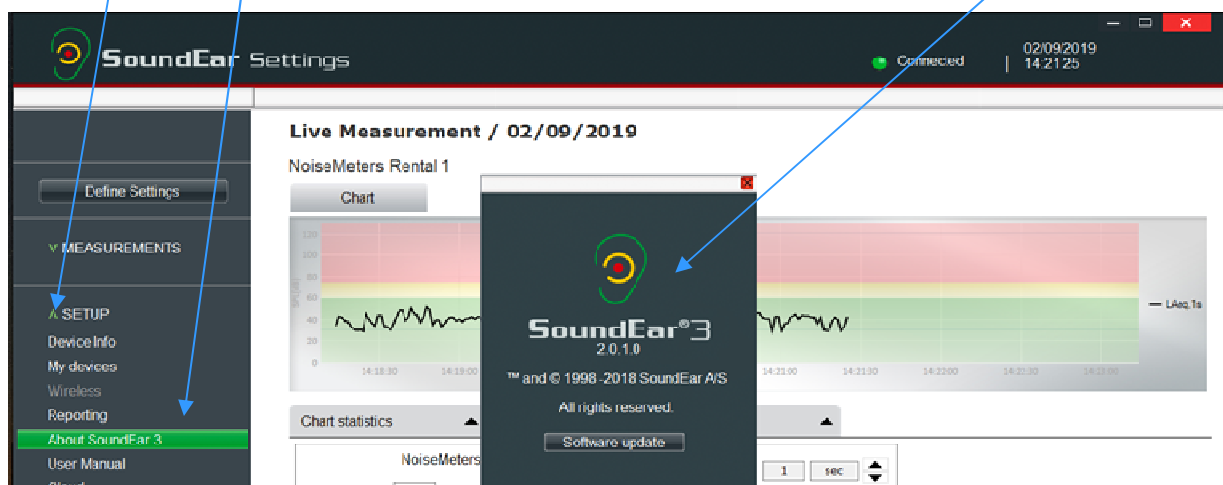
11.4.2 Software updates

Periodically new updates will be available for the SoundEar3 software.

STEP 1 Expand the SETUP menu

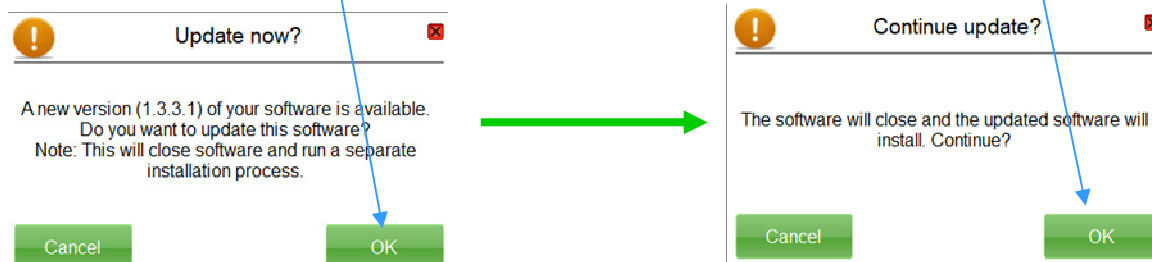
STEP 2 Select 'About SoundEar3' by left clicking with you mouse

A window will then appear detailing the version of software being used (In this example 2.0.2.0)



STEP 3 Select 'Software update' button to run a check to see if there is a later version available.

STEP 4 Left click the 'OK' button to proceed and then another window will open. Once again left click the OK button.



11.5 Firmware Updates

11.5 Firmware

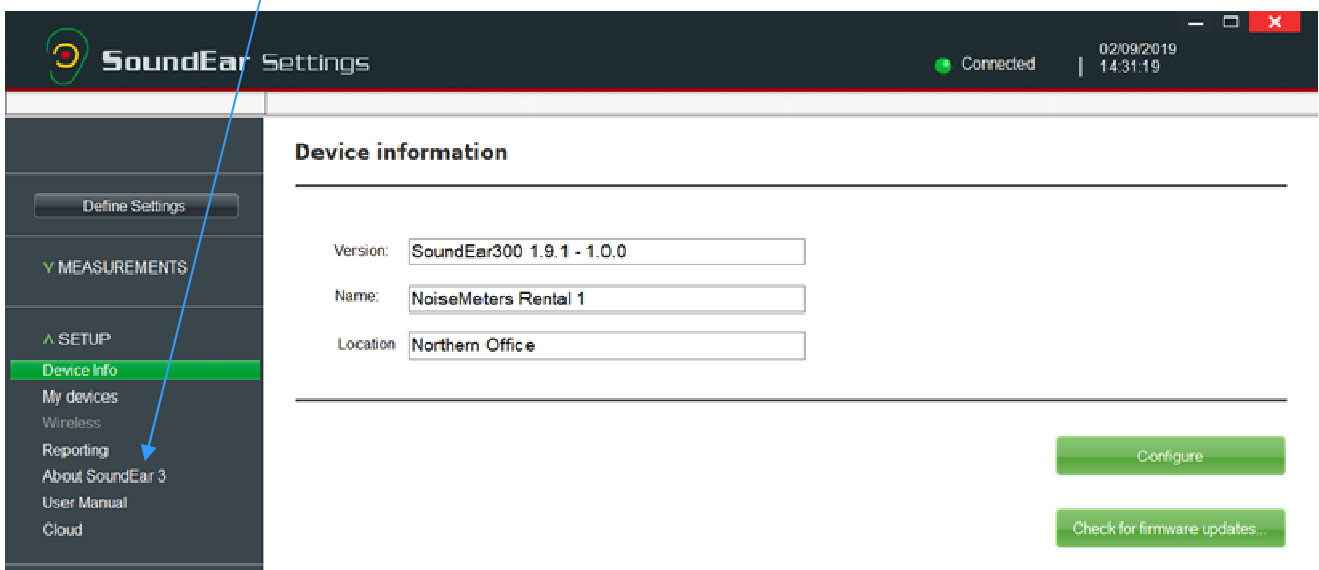
The SoundEar3 has its own internal software (code) which provides the necessary instructions for the device to function and communicate effectively. This is known as firmware. When the SoundEar3 is connected to a computer or powered up the Firmware version will show up in the LED display on the sign.

Firmware updates

Periodically there will be updates to ensure the SoundEar3 runs correctly. Please see note at bottom of this page.

11.5.1 Checking for Firmware updates

It is recommended that you check for Firmware updates at least twice a year. To do this make sure your SoundEar3 is plugged into a computer running the SoundEar3 software.

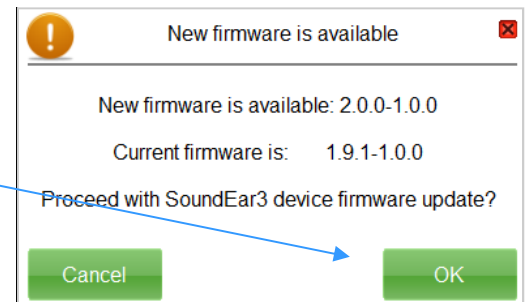


a) Expand the 'SETUP' menu (click green arrow to left of menu) and select 'Device info'.

b) Left click on the 'Device Info' button.

If the firmware is up to date a small window will appear to let you know. Alternatively you will be given the option to update your firmware.

c) If a firmware update has taken place ensure you perform a **factory reset** of your SoundEar3. Go to the 'Advanced Setting' menu and click on the Factory Setting option.



11.6 Actions prior to updating the firmware

After a firmware update you need to perform a factory reset. This will return all of your settings / configurations to the factory default settings (see Appendix 1 for factory default settings).

During the reset all of the measurements from the Internal memory of the SoundEar3 will be deleted.

IMPORTANT : Before performing a firmware update ensure you have transferred all of the internal measurement data from the SoundEar3 to USB memory device and the measurement Library within the SoundEar3 software.

12 Accessories and further options

12.1 5m Microphone extension cable

The microphone is normally plugged straight into the SoundEar3.

A short 0.5m microphone extension is provided for use with calibration.

There is the option for a 5m microphone extension cable allowing the microphone to be sited away from the SoundEar3. It is possible to use two of these to achieve a distance of up to 10m. The diagram opposite shows one example where a SoundEar3 could be outside a manufacturing area to warn those entering of high noise levels and to wear PPE.

The part number is SE3EXT



12.2 Medical Power Supply for SoundEar3

There is the option for a special power supply adaptor and cable that reduces Power-Supply noise to a minimum. This is particularly useful for applications where there is the need to measure accurately down to 30dB(A).

The part number is P-SE-MED



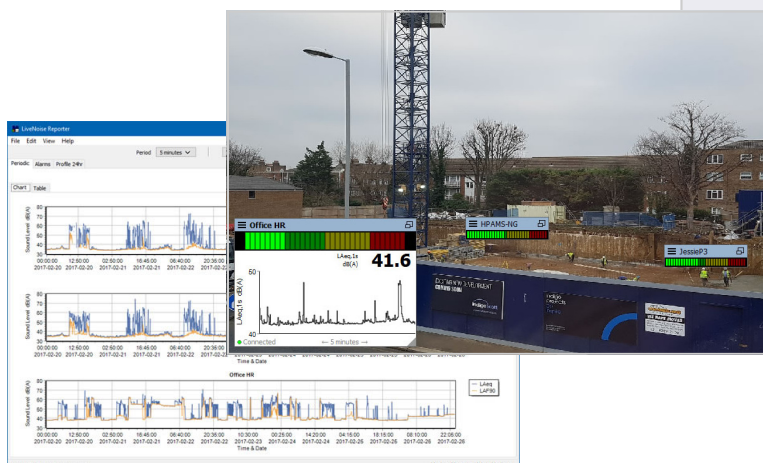
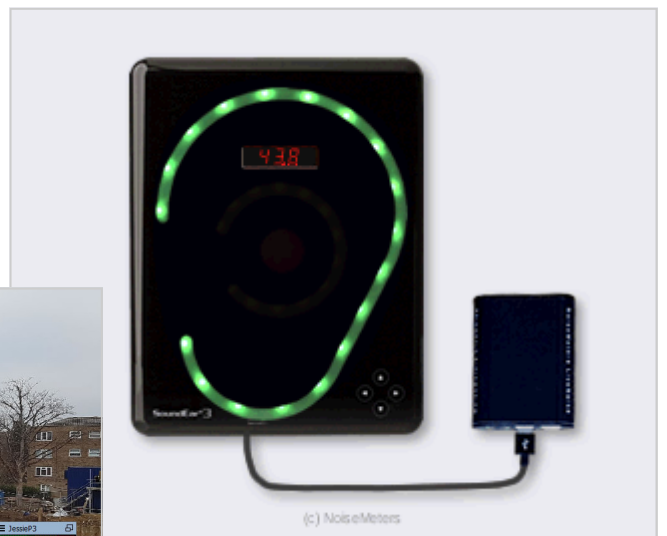
12.3 24V power supply with 10m power extension

For systems integrators needing the analog outputs the alternative power supply system must be used.

PSU24DC - 'Power supply with 24V DC output', POWEX10 'DC power extension cable 10m (32ft) for 24V power supply'. See APPENDIX 3 for more details.

12.4 'LiveNoise' module

NoiseMeters has developed an interface module that can be connected to the SE3EAR or SE3IND. This module gives live data, storing it to make information available to the NoiseMeters Supervisor and Reporter software packages. For more information please contact noise meters.



APPENDIX 1

Factory Default Settings

When you receive the SoundEar3 it will be set to Factory Default settings. This will also happen if you do a firmware update or choose to do a factory reset.

Sound Ear3 Factory Settings

Default Threshold Trigger Level settings

Green	30dB-120dB
Yellow	75-120dB
Red	80-120dB

All measurements are shown as dB(A) Slow

Night time settings

Yellow	60-120dB
Red	60-120dB

Night settings are not activated as default.
To active check the 'Night Settings' option in
'Define Settings'

Analog Output Settings (System integration)

Output 1	dB(A) Slow
Output 2	dB(C) Fast
Output Type	0-10V
Min output	30dB
Max output	120dB

APPENDIX 2

Formatting the USB memory device

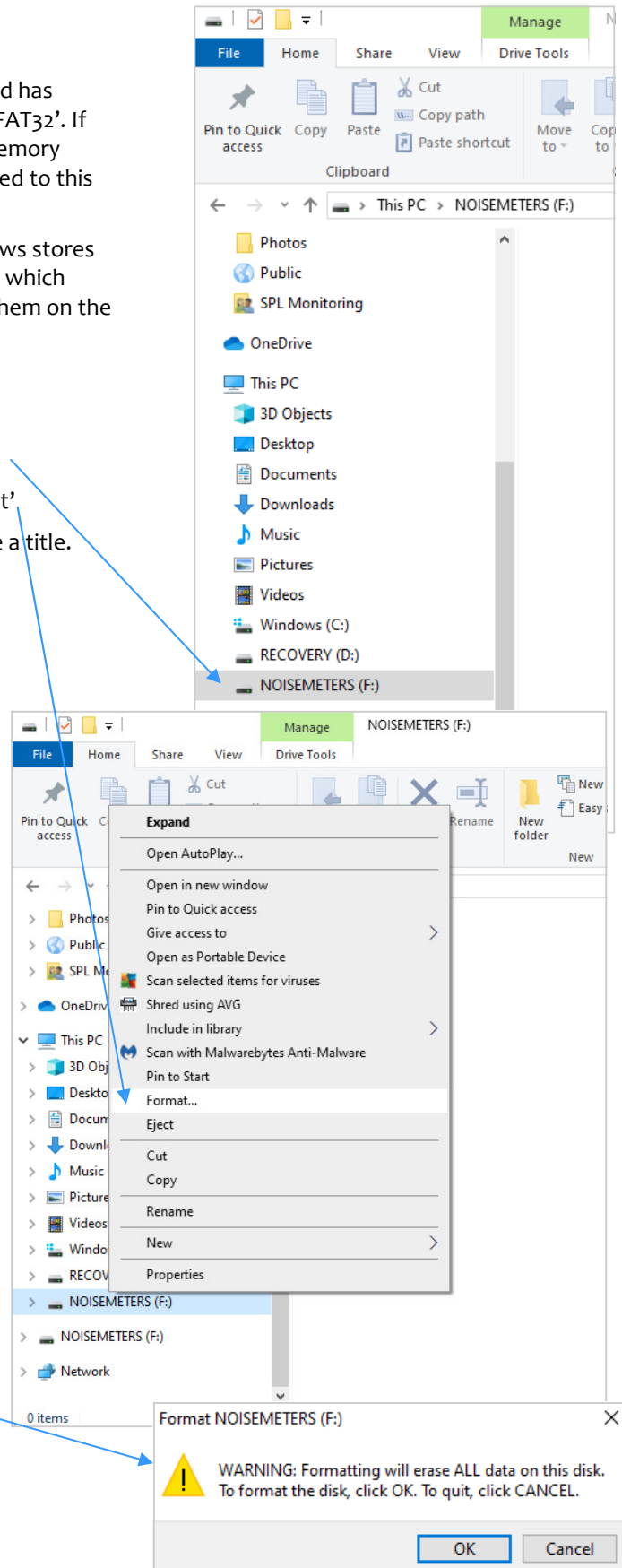
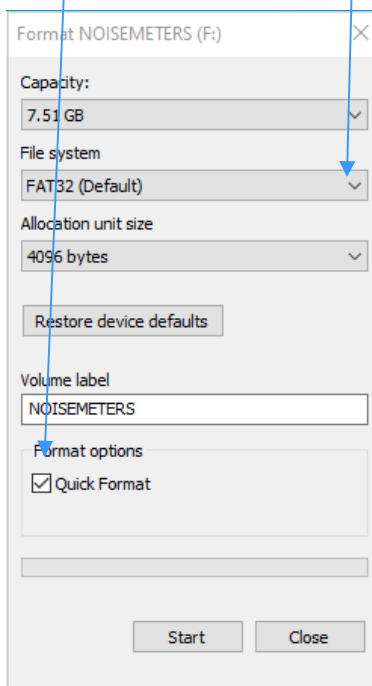
Formatting the USB memory device



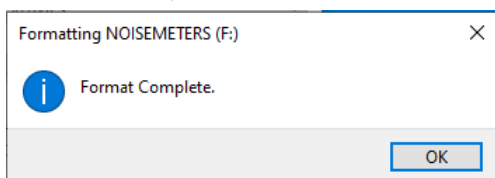
The USB memory device supplied has already been formatted to the 'FAT32'. If you need to use another USB memory device it will need to be formatted to this style of file system.

'FAT32' refers to the way Windows stores data on this drive. The FAT stands for 'File Allocation Table' which keeps track of all your files and helps the computer locate them on the disk.

- 1 Connect the USB memory device to your computer
- 2 Use 'File Explorer' to locate this device
- 3 A pop up menu will appear. From here select 'Format'
- 4 A pop up window will appear. You can give the Drive a title. Make sure FAT32 is selected.
- 5 Check the 'Quick Format' box
- 6 Click the 'Start' button



- 7 A pop up window will appear warning that you will loose all data on the disk. Click 'OK'. Finally a window will appear to confirm the format is complete.



APPENDIX 3

Analog outputs

Interfacing and System Integration

The **analog outputs** from the SoundEar3 are available to specialist users for system integration. These outputs allow you to develop an interface to integrate with your own recording or monitoring system. The outputs are either a choice of 2 parameters for 4-20mA output or 2 parameters for 0-10V DC output. The two analog outputs share a ground connection.

Important Note:

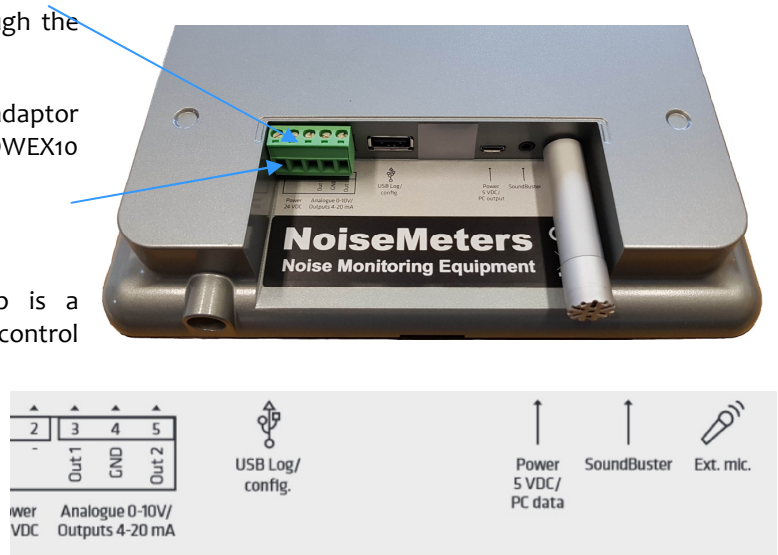
The SoundEar3 must be provided with 24V DC through the screw terminal for the analog outputs to work.

The NoiseMeters codes for a suitable power supply adaptor and 10m extension cable are the PSU24DC and POWEX10 respectively.

4-20mA Current Loop 4-20mA current loop is a common method used by industrial process control systems (SCADA, PLC, etc) to monitor analog signals. The main advantage of current loop over a DC output is that the signal is not affected by voltage drops due to resistance in the cabling.

The SoundEar3 has two standard 4-20mA current loop outputs that maps to the measured sound level (Fast, Slow, Max or Leq).

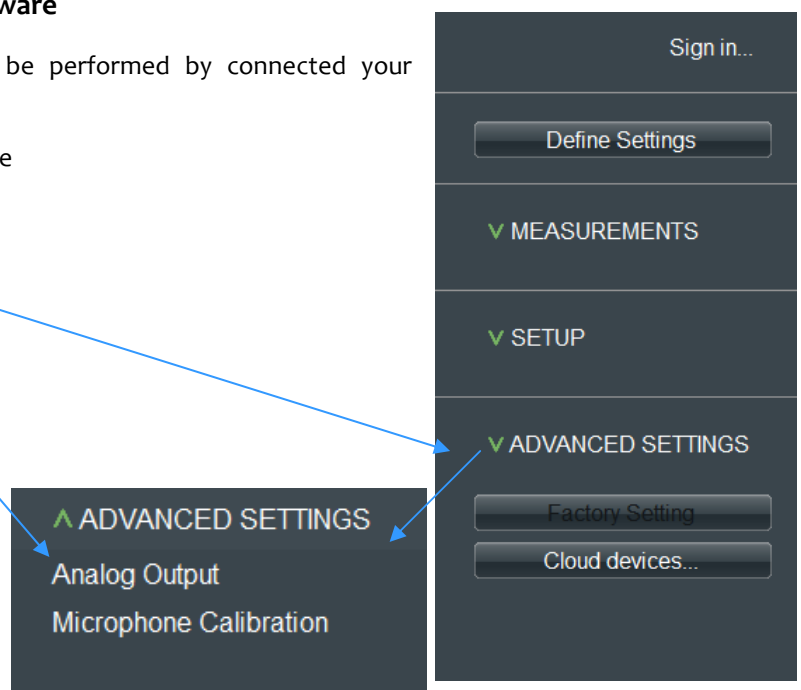
0-10V DC The DC outputs provide a voltage that is proportional to the measured sound level (Fast, Slow, Max or Leq). Being a simple DC voltage that varies linearly with decibels it can be connected to a monitoring system (using an A.D convertor) or used to control a relay or switch.



Configuring the outputs from the SoundEar3 software

The configuration of the analog outputs needs to be performed by connecting your SoundEar3 to the SoundEar3 software.

- 1 Connect SoundEar3 to SoundEar3 software
- 2 Expand the 'ADVANCED SETTINGS' menu
- 3 Select the 'Analog Output' option



APPENDIX 3

Analog outputs (cont)

Interfacing and System Integration

The **analog outputs** from the SoundEar3 are available to specialist users for system integration. These outputs allow you to develop an interface to integrate with your own recording or monitoring system. The outputs are either a choice of 2 parameters for 4-20mA output or 2 parameters for 0-10V DC output. The two analog outputs share a ground connection.

Important Note:

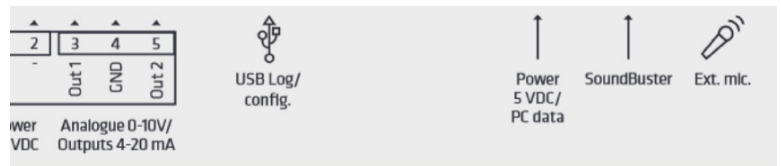
The SoundEar3 must be powered with 24V DC through the screw terminal for the analog outputs to work.

The NoiseMeters codes for a suitable power supply adaptor and 10m extension cable are the PSU24DC and POWEX10 respectively.



4-20mA Current Loop 4-20mA current loop is a common method used by industrial process control systems (SCADA, PLC, etc) to monitor analog signals. The main advantage of current loop over a DC output is that the signal is not affected by voltage drops due to resistance in the cabling.

The SoundEar3 has two standard 4-20mA current loop outputs that map to the measured sound level (Fast, Slow, Max or Leq).



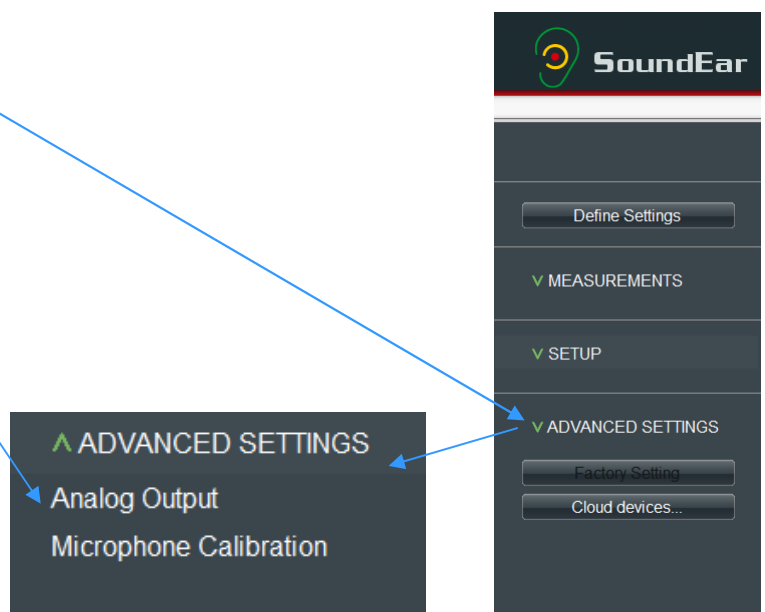
0-10V DC The DC outputs provide a voltage that is proportional to the measured sound level (Fast, Slow, Max or Leq)

Being a simple DC voltage that varies linearly with decibels it can be connected to a monitoring system (using an A/D convertor) or used to control a relay or switch.

Configuring the outputs from the SoundEar3 software

The configuration of the analog outputs needs to be performed by connecting your SoundEar3 to the SoundEar3 software.

- 1 Connect SoundEar3 to SoundEar3 software
- 2 Expand the 'ADVANCED SETTINGS' menu
- 3 Select the 'Analog Output' option



APPENDIX 3

Analog outputs (cont)

Analog Output

Once we have opened the menu we get the following display. From this window we can setup the two outputs Measurement Option 1 and Measurement Option 2.

Analog Output

Measurement output 1:	LAeq,1s	Minimum output (dB):	30
Measurement output 2:	LC peak	Maximum output (dB):	120
Output type:	0-10V		

Configure

- 1 Select the Output type which will be the same for both outputs.

Analog Output

Measurement output 1:	LAeq,1s	Minimum output (dB):	30
Measurement output 2:	LC peak	Maximum output (dB):	120
Output type:	0-10V		

- 2 Select the output parameter required for each of the two outputs

Analog Output

Measurement output 1:	LAeq,1s	Minimum output (dB):	30
Measurement output 2:	LAeq,1s	Maximum output (dB):	120
Output type:	0-10V		

The options are:

LAFmax

maximum Fast Sound Level

LASmax

maximum Slow Sound Level

LAeq,1s

average sound level every second

LCpeak

'C' weighted Peak

LAeq, 1/4h

average sound level over 15 minutes

LAeq, 1/2h

average sound level over 30 minutes

LAeq, 1 h

average sound level over 60 minutes

- 3 Set the dynamic range required. This is set to a Minimum of 30dB and a maximum of 120dB by default.

- 4 Save your settings to the SoundEar3 by clicking the 'Configure' button.

APPENDIX 4

Technical Specifications

Frequency Range	20Hz to 20kHz
Measuring Range	30 to 120 dB
Deviation	± 0.5 dB
Frequency Weighting	'A' (C weighted Peak)
Time Weighting	Fast and Slow
LED Digital Display	dB(Slow, LAeq15, Alarm setting and Clock
Analog Outputs (Advanced)	'A' weighted SPL Fast / Slow, 15 / 30 / 60 min LAeq, 'C' Peak: 0-10V or 4-20mA
USB Ports	1 Micro USB (Power and PC connection) 2 USB Controller (for USB memory device connection).
Internal Memory	16MB (128MBit) 600 days time history data.

Physical

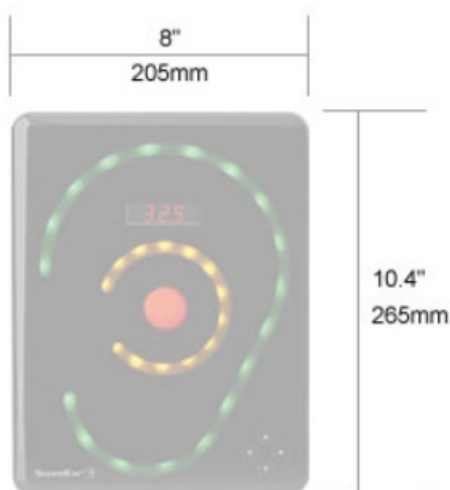
Cabinet	Shockproof acrylic
Dimensions	265 x 205 x 46 mm, 10.4" x 8" x 1.8"
Weight	1.5kg, 3.3 lb

Power

Power Supply	5 VDC (micro USB) or 24 VDC (screw terminal) Max 2.5W
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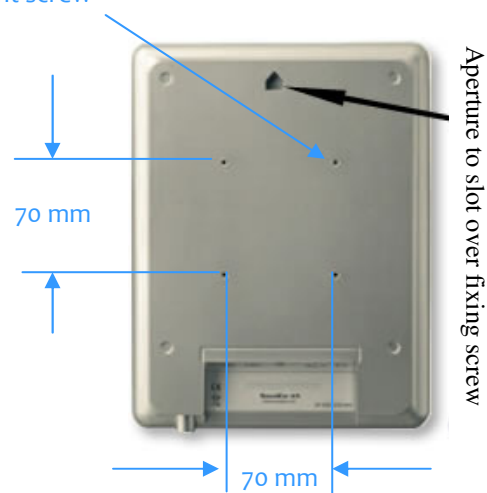
Standards

Acoustic Standards	IEC61672-2-2002 Class 2, ANSI S1.4 Type 2
Medical Standards (in conjunction with P-SE3-MED power supply adaptor)	60601-1: Medical electrical equipment Part 1: General requirements for basic safety and essential performance. 60601-1-2: Medical electrical equipment Part 1-2: General requirements for basic safety and essential performance.



(c) NoiseMeters

4 x VESA mount screw apertures



SoundEar 3 Dimensions

APPENDIX 5

Short Glossary of Key Acoustic Terms

The **L_{Aeq}** is best described as the **Average Sound Level** over the period of the measurement with the 'A' frequency filter applied. The L_{Aeq} (defined as the Equivalent Continuous Sound Level) is an average and a good indicator of potential hearing damage or the likelihood that the noise will generate issues.

A Weighting The most common weighting that is used in noise measurement. The 'A' weighting is an attempt to replicate the response of the human ear. This weighting effectively cuts off the lower and higher frequencies that a typical person cannot hear.

Maximum and Minimum - The L_{max} and L_{min} parameters are quite easy to understand. They are simply the highest and lowest values measured by a sound level meter over a given period of time. They are based on the time-weighted sound pressure level expressed in dB, using either the Fast or Slow time constant.

The L_{max} and L_{min} terms used should indicate the frequency weighting and time constant used:

L_AF_{max} The maximum level with A-weighted frequency response and Fast time constant

L_AF_{min} The minimum level with A-weighted frequency response and Fast time constant

L_AS_{max} The maximum level with A-weighted frequency response and Slow time constant

L_AS_{min} The maximum level with A-weighted frequency response and Slow time constant

Peak Sound Pressure The Peak is not the same as the Maximum Sound Level. The Peak, referred to as the L_{peak} or sometimes L_{pk}, is the maximum value reached by the sound pressure. There is no time-constant applied and the signal has not passed through an RMS circuit or calculator. This is the true Peak of the sound pressure wave.

For a pure tone, the Peak will be 3 dB above the Maximum Sound Level. For varying signals there can be a huge difference and there is no way to calculate the Peak from the Max or any other measurement.

Unlike the Sound Level and the L_{eq}, the Peak measurement is usually C-Weighted rather than A-Weighted. Some older meters used Linear, but C-weighting has replaced that in most standards, including the European Noise Directive (Noise in the Workplace). The C-weighted Peak measurement is usually expressed as L_{Cpeak} in dB(C).

NOTES for SE₃EAR

The SoundEar₃ is predominantly used in Hospitals, Schools, Music rehearsal rooms, Libraries etc. It is ideal for:

- Raising awareness regarding noise issues.
- Warn when noise levels may cause a nuisance.
- To measure the ongoing effectiveness of any noise control initiatives.



Notes for SE3IND

The SE3IND is designed as an accurate visual 'High noise level' warning and long term monitoring in Industrial / manufacturing areas. It is especially useful:

- in areas where there average daily noise exposures are potentially close to, or exceeding action levels.
- in areas where there is intermittent noise that could potentially cause a risk of noise induced hearing loss.
- to warn people entering an area that noise levels are high
- to raise awareness regarding which processes / machines or combinations of these cause high noise levels.
- to measure the ongoing effectiveness of noise reduction initiatives (engineering or process management)



Things to consider

- In any manufacturing / industrial / construction area noise levels may vary considerably in different zones. The best way to check this out is to do a quick 'walk around' survey with an accurate sound level meter. This will then determine if one SE3IND is sufficient or perhaps more are required. It will also assist in determining the 'optimal' Threshold levels for the Amber and Red visual warning.
- Using a meter will also help you determine the better positions to mount the sign.
- The SE3IND will often be mounted flush to a wall which isn't ideal acoustically (there may be some 'acoustic reflection' which may increase noise levels slightly). Once again, checking with a sound level meter will ensure suitable threshold levels are set for an area. Try to avoid mounting the SE3IND in a corner of a room as this will further increase acoustic reflection. A 5m microphone extension cable is available if you prefer to mount the microphone away from the wall. The part number is SE3EXT.
- Be mindful that the action / legal threshold levels given by European and International Laws are normally related to noise 'exposure' levels and NOT instantaneous sound pressure levels. (For example in Europe the upper action level is considered to be an exposure of 85dB(A). This is expressed as $L_{EP,d}$ or L_{EX8h} and can be thought of as the average amount of noise energy received during a working day normalized to an 8 hour period.
To give an example based on European Regulations: If someone was exposed to noise at a machine for 2 hours at 85dB(A) and the rest of the day was quiet their daily noise exposure would be 79dB(A) i.e. below the action levels.
- The SE3IND gives you the option to have a noise level exceeded for a certain number of seconds (1 to 100) before the display lights up. This can be really useful to ensure the SE3IND doesn't keep lighting up every time there is a sudden noise. Having the sign light up excessively will diminish its impact.
- The SE3IND is a noise warning sign and **not** a sound level meter. In other words it does not replace the need to carry out a formal risk assessment at least once every 2 years with a calibrated sound level meter and / or noise dosimeters. The role of the SE3IND would normally be as a tool to help manage noise issues.
- The SE3IND is data logging and can store up to 600 days of noise data so it can be very useful to:
 - a) better understand the noise climate in an area and help identify processes that are very noisy etc.
 - b) determine the effectiveness of any improvement measures.



Sound Level Meter



Noise Dosimeter