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A Guide to Environmental Noise Measurement Terminology

A summary of parameters and functions shown by the Optimus® Sound Level Meters and Trojan Noise Nuisance Recorder

Cirrus Research plc
dedicated to noise measurement

Environmental Noise Terminology
An Introduction

Most noise measurement equipment is capable of measuring, recording and storing a wide range of parameters.

Some of our more advanced instruments can measure and store over 100 different noise parameters at the same time!

There are different versions of all of these instruments and some may not show all of the parameters listed in this booklet.

This eBook covers essential noise terminology, as well as listing all of the parameters that you may see displayed by the Optimus Sound Level Meters and the Trojan Noise Nuisance Recorders, with an emphasis on the parameters applicable to environmental noise measurements.

A brief explanation of each parameter is provided along with additional information where appropriate.

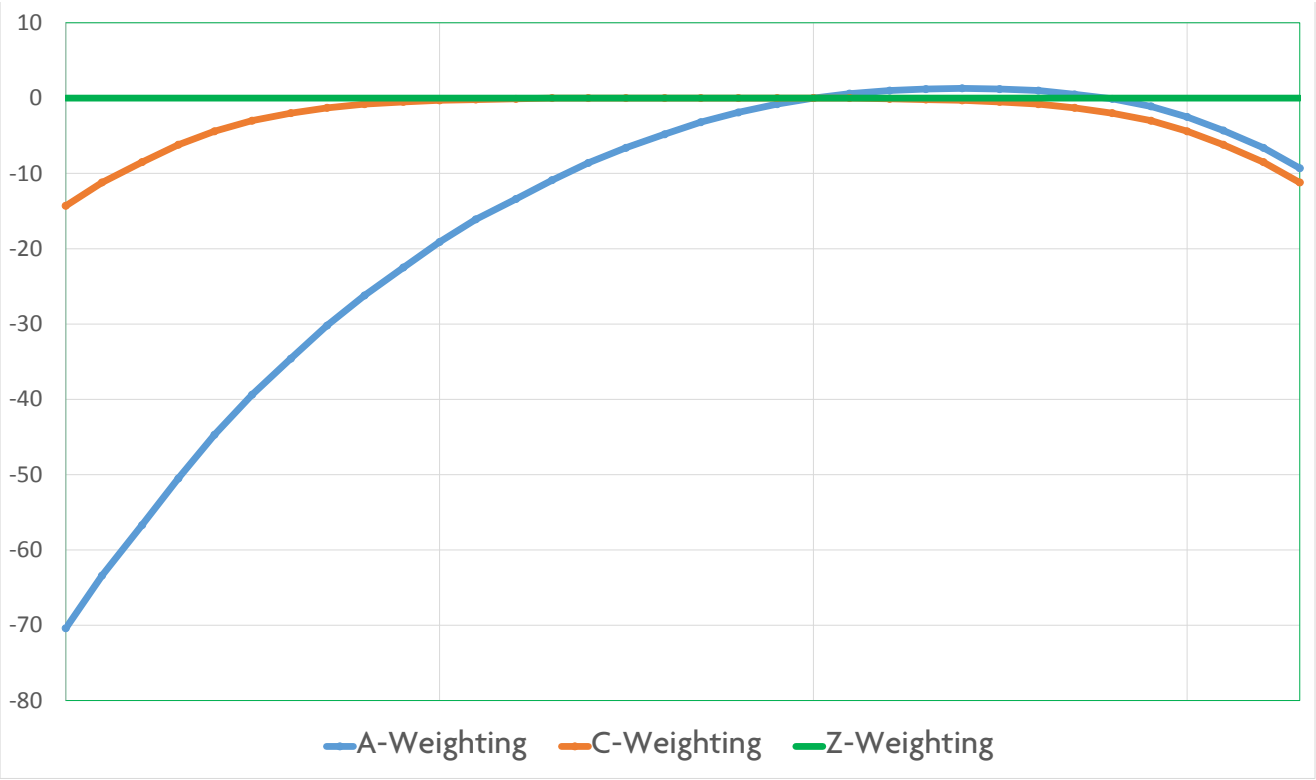
If you need a more detailed description of any parameter or you have any questions, please ask us and we will be happy to help.

You can contact us through our website at www.cirrusresearch.co.uk/support or email us at support@cirrusresearch.com.

For Cirrus Customers, The Details View on the Optimus and Trojan instruments will show the capabilities fitted to that instrument so you can see what features are available.

Key Noise Parameters

Term	Description
'A' Weighting	'A' Weighting is a standard weighting of the audible frequencies designed to reflect the response of the human ear to noise. The 'A' Frequency Weighting network is the most widely used, and is used to represent the response of the human ear to loudness. Measurements made with this frequency weighting will be displayed as dB(A) or dBA. For example, as LAeq, LAFmax, LAE etc where the A shows the use of 'A' Weighting.
'C' Weighting	'C' weighting gives much more emphasis to low frequency sounds than the 'A' weighting response and is essentially flat or linear between 31,5Hz and 8kHz, the two -3dB or 'half power' points. In addition, Peak Sound Pressure measurements are made using the 'C' Frequency Weighting. Measurements made with this frequency weighting will be displayed as dB(C) or dBC. For example, as LCeq, LCPeak, LCE etc where the C shows the use of 'C' Weighting.
'Z' Weighting	This has replaced Linear or Flat, and is defined as being a flat frequency response of 8Hz to 20kHz ±1.5dB. Measurements made with this frequency weighting will be displayed as dB(Z) or dBZ. For example, as LZeq, LZFmax, LZE etc where the Z shows the use of 'Z' Weighting.



Term	Description
Fast, Slow and Impulse Time Weightings	The Time Weightings of Fast, Slow and Impulse are defined by the standards to which the instrument are designed, such as IEC 61672, and they determine the "speed" at which the instrument responds to changing noise levels. For example, an instrument set to Fast will respond quickly to changes in the noise level, whereas an instrument set to Slow will respond more slowly. If the noise level is constant, both instruments will display the same level. An instrument set to Impulse will respond very quickly to an increase in the noise level, but will take much longer to fall when the noise level decreases. Time weighting is only applied to Sound Level, Maximum Sound Level and Minimum Sound Level. Also, the Ln Percentile Levels are calculated from Sound Level, and therefore are also affected by the selected Time Weighting. Measurements parameters that use these time weightings will show this, for example, as LAFmax which shows that the values are the maximum A-Weighted Fast Time Weighted sound levels.
Equivalent Continuous Sound Level (Leq)	Leq is the equivalent continuous sound level, and represents the total sound exposure for the period of interest or an energy average noise level for the period of interest. Leq is often described as the "average" noise level during a noise measurement which although not technically correct, is often the easiest way to think of Leq. If the noise is varying quickly, the average energy over a period of time is a useful measurement parameter and it is for this reason Leq is often called the Equivalent continuous level. Leq values should be written with a Frequency Weighting, such as dB(A) and also the measurement duration. For example, LAeq, 5min = 90dB

Term	Description
Peak Sound Pressure	This function is often confused with the maximum Sound Level. Whereas the maximum is the highest sound level, the Peak level is the actual peak level of the pressure wave. The reason for this is that the maximum sound level is the RMS level with a time constant (F,S or I) applied, whereas the Peak is the highest point of the pressure wave before any time constant is applied. The measurement of Peak sound pressure levels is required by the UK Noise at Work regulations where it is C-weighted. In this case, the value would be written as LCPeak = 134dB.
1:1 &1:3 Octave Band Filters	When detailed information about a complex sound is needed, the frequency range can be split into sections, or frequency bands. A sound level meter may provide 1:1 (or single) octave band filters or 1:3 (or third) octave band filters. An Octave is a frequency band where the highest frequency is twice the lowest frequency. For example, an octave filter with a centre frequency of 1kHz has a lower frequency of 707Hz and an upper frequency of 1.414kHz. A Third Octave Band is 1/3 the width of an Octave Band. An instrument with 1:1 octave band filters, such as the Optimus CR:162C, would typically provide 10 bands from 31.5Hz to 16kHz. An instrument with 1:3 octave band filters, such as the Optimus CR:171B, would typically provide 33 bands from 12.5Hz to 20kHz although some additional bands such as 6.3Hz, 8Hz and 10Hz may also be available.

Instrument Views

The Optimus Sound Level Leters and Trojan Noise Nuisance Recorders provide a range of Views or Screens that show the measurement information. This section describes what each of these screens shows.

Some screens, such as the 1:3 octave band view and the Ln view, are only available on certain instruments such as the Optimus Green instruments. The General View on the Optimus instruments shows the capabilities of that specific instrument.

Term	Description
General View	The information view pages on the Optimus Sound Level Meters. These screens show information about the instrument such as the serial number, calibration information and measurement storage space.
Sound Level View	The Sound Level View provided by the Optimus Sound Level Meters. These screens provide a display of the Sound Level and include values such as LAF, LAS, LAFmax and LAFmin.
Leq View	The view of the integrated sound level shown as Leq. When the instrument is not measuring, this view will show the 1 second Leq samples and can show this with A, C or Z frequency weighting. When the instrument is measuring, the primary number is the cumulative Leq (A, C or Z weighted) with the LCPeak and C-A values shown. LAPeak, LAE, LCeq and LCE values are also available. A graph of the 1 second LAeq and LCPeak values is also shown.
1:1 Octave Band View	The view in the Optimus Sound Level Leters that displays the 1:1 Octave Band Filters
1:3 Octave Band View	The view in the Optimus Sound Level Meters that displays the 1:3 Octave Band Filters
Ln View	The view in the Optimus Sound Level Meters that shows the calculated Statistical or Ln values. Data is only shown when the instrument is measuring. Up to 28 values may be displayed depending upon the instrument type. The data being used to calculate the Ln values is shown at the top of the screen. The default is to use the LAF at a data rate of 1/16 second.

Term	Description
Dose View	The view in the Optimus Sound Level Leters that shows a range of occupational noise exposure values. The values shown in this view are determined by the Quick Settings options chosen.
Environmental View	A summary view combining a range of measurement parameters relevant to environmental noise (Available in firmware version v2.9 or later)
Noise Nuisance View	A summary view the presents the overall noise measurement parameters for Noise Nuisance applications (Trojan & Trojan^2 instruments only)

Measurement Parameters

This section shows the measurement parameters that are available in the Optimus Sound Level Meters, the Trojan and Trojan^2 Noise Nuisance Recorders and the doseBadge Noise Dosimeter.

The parameters are listed in alphabetical order.

Term	Description
A-weighted Octave Band Leq,1s	The 1:1 Octave Band Filters shown numerically with A-weighting applied.

Term	Description
A-weighted Octave Band Leq,t	The 1:1 Octave Band Filters shown graphically when the instrument is measuring. The cumulative LAeq in each band is shown.
A-Weighted Octave Band Leq,t	The 1:1 Octave Band Filters shown numerically with the cumulative LAeq in each band shown.
A-weighted Octave Band LF	The 1:1 Octave Band Filters shown graphically with A-weighting applied.
A-weighted Third Octave Band Leq,1s	The 1:1 Octave Band Filters shown numerically with A-weighting applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal. The highest band is highlighted in a lighter green colour.
A-weighted Third Octave Band Leq,t	The 1:3 Octave Band Filters shown graphically when the instrument is measuring. The cumulative LAeq in each band is shown. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal.
A-weighted Third Octave Band Leq,t	The 1:3 Octave Band Filters shown numerically with the cumulative LAeq in each band shown. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal. The highest band is highlighted in a lighter green colour.
A-weighted Third Octave Band LF	The 1:3 Octave Band Filters shown graphically with A-weighting applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal.
dB(A)	Decibels 'A' Weighted The most commonly used standard frequency weighting designed to reflect the response of the human ear to noise. Also written as 'A' weighting or dB(A)
dB(C)	Decibels 'C' Weighted A standard frequency weighting commonly used for the measurement of Peak Sound Pressure level. Also written as dB(C) or dBC.

Term	Description
dB(Z)	Decibels 'Z' weighted Z weighting is a flat frequency response between 10 Hz and 20 kHz ±1.5 dB excluding microphone response. Replaces Flat and Linear. Also written as dB(Z) and dBZ
Exchange Rate (Q)	The increase in noise level that corresponds to a doubling of the noise level. LAeq is always based on an Exchange Rate, or Q, of 3. In the US, the exchange rate defined in the OSHA standard is 5 dB. Using the 5 dB exchange rate, the 8 hour average level is known as TWA or the Time Weighted Average. For other exchange rates the average level for the measurement duration is known as Lavg
Exposure	The measured noise exposure expressed in Pa2h (Pascal Squared Hours)
Exposure Time	The actual time that a person is exposed to noise during a workday - used for calculation of LEP,d
L10	The noise level exceeded for 10% of the measurement, calculated by statistical analysis
L90	The noise level exceeded for 90% of the measurement, calculated by statistical analysis
LA10	The noise level exceeded for 10% of the measurement period with 'A' frequency weighting, calculated by statistical analysis
LA90	The noise level exceeded for 90% of the measurement period with 'A' frequency weighting, calculated by statistical analysis
LAE	Sound Exposure Level (SEL) with 'A' frequency weighting. See LE
LAeq	See Leq
LAeq,1s	An 'A' Weighted 1 second Leq value
LAeq,t	See Leq
LAF	The Sound Level with 'A' Frequency weighting and Fast Time weighting
LAF10	The noise level exceeded for 10% of the measurement period with 'A' frequency weighting calculated by statistical analysis from samples of the Fast time weighted sound level.

Term	Description
LAF90	The noise level exceeded for 90% of the measurement period with 'A' frequency weighting calculated by statistical analysis from samples of the Fast time weighted sound level.
LAFmax	The maximum Sound Level with 'A' Frequency weighting and Fast Time weighting during the measurement period.
LAFmin	The minimum Sound Level measured with 'A' frequency weighting and Fast Time weighting during the measurement period.
LAFTeq	Takt maximal sound level as defined by DIN 45641
LAI	The Sound Level with 'A' Frequency weighting and Impulse Time.
LAImax	The maximum Sound Level with 'A' Frequency weighting and Impulse Time weighting
LAImin	The minimum Sound Level measured with 'A' frequency weighting and Impulse Time weighting during the measurement period.
LAS	The Sound Level with 'A' Frequency weighting and Slow Time weighting
LASmax	The maximum Sound Level with 'A' Frequency weighting and Slow Time weighting during the measurement period.
LASmin	The minimum Sound Level measured with 'A' frequency weighting and Slow Time weighting during the measurement period.
LAT	See Leq
LAVG	The Time Averaged Sound Level with an exchange rate other than 3dB.
LCE	Sound Exposure Level (SEL) with 'C' frequency weighting
LCeq,1s	'C' Weighted 1 second Leq value
LCeq,t	An Leq value measured with 'C' frequency weighting
LCF	The Sound level with 'C' Frequency weighting and Fast Time weighting
LCFmax	The maximum Sound level with 'C' Frequency weighting and Fast Time weighting during the measurement period.
LCFmin	The minimum Sound Level measured with 'C' Frequency weighting and Fast Time weighting during the measurement period
LCI	The Sound Level with 'C' Frequency weighting and Impulse Time weighting

Term	Description
LCImax	The maximum Sound level with 'C' Frequency weighting and Impulse Time weighting during the measurement period
LCImin	The minimum Sound Level measured with 'C' Frequency weighting and Impulse Time weighting during the measurement period
LCPeak	The Peak Sound pressure level with 'C' frequency weighting
LCS	The Sound level with 'C' Frequency weighting and Slow Time weighting
LCSmax	The maximum Sound level with 'C' Frequency weighting and Slow Time weighting during the measurement period
LCSmin	The minimum Sound Level measured with 'C' Frequency weighting and Slow Time weighting during the measurement period
LE (SEL)	This is an Leq normalised to 1 second. It can be used to compare the energy of noise events which have different time durations. For example if a noise level of 90 dB last for 1 second then the LE = 90 dB. If the same noise event lasted 10 seconds the LE would be 100 dBA. If it lasted 20 seconds the LE would be 103 dBA and so on. The LE is the Sound Exposure expressed as a logarithm and basically Leq is the LE divided by time. This will usually be displayed as LAE, LCE or LZE
Leq	Equivalent Continuous Sound Level This is the most commonly used value used to describe sound levels that vary over time. An Leq is the level that would produce the same sound energy over a stated period of time when using a 3 dB exchange rate. It is defined as the sound pressure level of a noise fluctuating over a period of time T, expressed as the amount of average energy. Commonly written as Leq, LAeq, LAeq,t or LAT
Leq,t	See Leq
LEX,8h	See LEP,d
LIeqT	Impulse weighted Leq,t as defined by DIN 45641
Lmax	Maximum Sound Level

Term	Description
Lmin	Minimum Sound Level
Ln	Statistical analysis of noise levels. The n denotes the percentage exceedence, for example the value of L90 shows the noise level that was exceeded for 90% of the measurement duration. Percentile level where 'n' is between 0.01 and 99.9% calculated by Statistical Analysis. Ln values usually include a descriptor that shows the frequency weighting ie A-weighting and the time weighting ie Fast. The most common Ln values are LAF10 and LAF90..
Lp	Sound Pressure Level
Lw	Sound Power Level
LZE	Sound Exposure Level (SEL) with 'Z' frequency weighting
LZeq,1s	A 1 second Leq value with 'Z' Frequency Weighting
LZeq,t	A Leq measured with 'Z' Frequency weighting.
LZF	The Sound level with 'Z' Frequency weighting and Fast Time weighting
LZFmax	The maximum Sound level with 'Z' Frequency weighting and Fast Time weighting during the measurement period
LZFmin	The minimum Sound Level measured with 'Z' Frequency weighting and Fast Time weighting during the measurement period
LZI	The Sound level with 'Z' Frequency weighting and Impulse Time weighting
LZImax	The maximum Sound level with 'Z' Frequency weighting and Impulse Time weighting during the measurement period
LZImin	The minimum Sound Level measured with 'Z' Frequency weighting and Impulse Time weighting during the measurement period
LZPeak	Peak Sound pressure level with 'Z' Frequency weighting
LZS	The Sound level with 'Z' Frequency weighting and Slow Time weighting
LZSmax	The maximum Sound level with 'Z' Frequency weighting and Slow Time weighting during the measurement period
LZSmin	The minimum Sound Level measured with 'Z' Frequency weighting and Slow Time weighting during the measurement period

Term	Description
Maximum Sound Level (Lmax)	Maximum Sound Level. The maximum noise level during a measurement period or a noise event.
Minimum sound level (Lmin)	Minimum Sound Level. The minimum noise level during a measurement period or a noise event.
NC	Noise Criteria A single number for rating the sound quality of a room, used extensively by the air conditioning industry, for example, to test the background levels on offices etc. The measured octave bands are compared with the NC Curves which are based on equal loudness curves. The NC rating is the value of the highest NC curve touched by the measured octave bands. The NC Decisive Band is the frequency band touching the NC Curve.
NR	Noise Rating A method for rating the acceptability of indoor environments for the purposes of hearing preservation, speech communication and annoyance Sound Pressure Levels measured in octave bands are compared with curves from which a noise rating (NR) is obtained. The NR rating is the highest NR Curve touched by the measured octave band spectrum. The NR Decisive Band is the frequency band touching the NR Curve.
Octave Band Leq,1s	The 1:1 Octave Band Filters shown numerically. No frequency weighting is applied.
Octave Band Leq,t (Graph)	The 1:1 Octave Band Filters shown graphically when the instrument is measuring. The cumulative Leq in each band is shown. No frequency weighting is applied.
Octave Band Leq,t (Numbers)	The 1:1 Octave Band Filters shown numerically with the cumulative Leq in each band shown. No frequency weighting is applied.
Octave Band LF	The 1:1 Octave Band Filters shown graphically. No frequency weighting is applied.
Pa2h (Pa^2h)	Noise Exposure in Pascal Squared Hours
Peak	The maximum value reached by the sound pressure at any instant during a measurement period (in dB usually with C frequency weighting)

Term	Description
Percentile Levels (Ln)	Percentage exceeded levels where 'n' is between 0.1 and 99.9% calculated by statistical analysis The most commonly used Ln values are L10 and L90 levels
Projected Exposure	The measured LAeq projected over a range of durations to give the equivalent daily exposure values.
Q	Exchange Rate This is the increase in noise level that corresponds to a doubling of the noise energy. LAeq is always based on an Exchange Rate of 3dB. Using the 3 dB exchange rate, the 8 hour average level is known LEP,d or LEX,8h. In the US, the exchange rate defined in the OSHA standard is 5 dB. Using the 5 dB exchange rate, the 8 hour average level is known as TWA or time weighted average
Sound exposure level (SEL)	See LE
Third Octave Band Leq,1s	The 1:3 Octave Band Filters shown numerically. No frequency weighting is applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal. The highest band is highlighted in a lighter green colour.
Third Octave Band Leq,t (Graph)	The 1:3 Octave Band Filters shown graphically when the instrument is measuring. The cumulative Leq in each band is shown. No frequency weighting is applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal.
Third Octave Band Leq,t (Numbers)	The 1:3 Octave Band Filters shown numerically with the cumulative Leq in each band shown. No frequency weighting is applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal. The highest band is highlighted in a lighter green colour.
Third Octave Band LF	The 1:3 Octave Band Filters shown graphically. No frequency weighting is applied. Where Tonal Noise Detection is available, bands are highlighted in blue where the bands are tonal.
Third Octave Functions	Additional measurement functions that are calculated from the 1:3 octave band measurement data.

Term	Description
TW	The time weighting used by the doseBadge Noise Dosimeter.

Sound Level Meter Standards & Terms

The table shows the current standards for Sound Level Meters, Integrating Averaging Sound Level Meters (i.e. those that measure Leq), Noise Dosemeters and Acoustic Calibrators which apply in the UK.

Instrument Type	Current Standards	Superseded Standards
Sound Level Meters	BS EN 61672-1:2003 Also published as IEC 61672-1:2002	BS EN 60651 BS 5569:1981 IEC 60651:1979 (previously known as IEC 651)
Integrating Sound Level Meters	BS EN 61672-1:2003 Also published as IEC 61672-1:2002	BS EN 60804:2001 BS 6698:1986 IEC 804:1985
Noise Dosemeters	BS EN 61252:1997 Also published as IEC 61252:1993	BS 6402:1994 (Previously numbered as IEC 1252:1993 and BS 6402:1994)
Acoustic Calibrators	BS EN 60942:2003 Also published as IEC 60942:2003	BS EN 60942:1998 IEC 60942:1997

Term	Description
Class 1	Precision grade meters for laboratory and field use as defined in IEC 61672. This may also be referred to as Type 1 although the IEC 61672 standard uses the term Class rather than Type.
Class 2	General grade meters for field use as defined in IEC 61672. This may also be referred to as Type 2 although the IEC 61672 standard uses the term Class rather than Type.
Type 1	Laboratory & Field Grade for Sound Level Meters defined in standards such as IEC 60651 and IEC 60804. These standards have been superseded by IEC 61672 which uses Class 1 rather than Type 1.

Term	Description
Type 2	General Field Grade for Sound Level Meters defined in standards such as IEC 60651 and IEC 60804. These standards have been superseded by IEC 61672 which uses Class 2 rather than Type 2.
IEC	International Electrotechnical Commission The international standards body responsible for issuing technical standards for instrumentation such as the IEC 61672 standard for sound level meters.
IEC 60651	A standard for Sound Level Meters, now superseded by IEC 61672 In the UK this was known as BS EN 60651
IEC 60804	A Standard for Integrating & Integrating-Averaging Sound Level Meters, now superseded by IEC 61672 In the UK this was known as BS EN 60804 and previously BS 6698
IEC 61252	The international standard for personal sound exposure meters or noise dosemeters. In the UK this is known as BS EN 61252 The standard for noise dosemeters has no Class or Type levels.
IEC 61260	The International Standard for 1:1 Octave & 1:3 Octave Band Filters
IEC 61672	The International standard for Sound Level Meter and Integrating Averaging Sound Level Meters has superseded both IEC 60651 and IEC 60804
IEC 651	An international standard for sound level meters, replaced by IEC 60651 and now superseded by IEC 61672
IEC 804	An international standard for integrating averaging sound level meters, replaced by IEC 60651 and now superseded by IEC 61672
IEC 60942	The international standard for sound calibrators (acoustic calibrators)
IEC 942	An international standard for acoustic calibrators. Replaced by IEC 60942
DIN 45641	German Standard which defines the additional measurements LAFTeq & LIeqT
ISO	International Standards Organization. An international standards body that issues measurement standards such as ISO 1996 for environmental noise and ISO 20906 for aircraft noise.

Other Noise Terminology

There are a number of other terms that are used when we are discussing sound level meter and noise dosimeters and this section covers some of the more common of these.

Term	Description
Acoustic Calibrator	An instrument that provides a reference noise source that is used to calibrate and check the performance of a Sound Level Meter.
Acoustic Fingerprint	An advanced system that allows triggers to be set up to start and stop audio recordings and markers in the Optimus Green and Trojan instruments. The triggers can be made up of a number of rules which can be level, rate of change or tonal noise based and can use any parameter that is available in the instrument.
Audio Quality	The audio recording quality in the Optimus Green Sound Level Meters can be set to be either Standard (16bit/16kHz) or Studio (32bit/96kHz)
Audio Recording	The Optimus Green Sound Level Meters and the Trojan Noise Nuisance Recorders can record and store the actual sounds during the measurement in the form of an audio recording. This can be downloaded and listened to in the NoiseTools software.
Audio Triggers	The audio recording in the Optimus Green and Trojan instruments can be set to trigger automatically under specified conditions such as when the noise level exceeds a preset level. This is part of the Acoustic Fingerprint system.
Broadband	Noise Measurements using parameters which include all the audible noise, such as dB(A) and dB(C)
Calibrated to	The level to which the instrument sound level meter has been calibrated. This will usually be 93.7dB in the case of the Optimus Sound Level Meters and 114dB in the case of the doseBadge.
Calibration	The process of measuring to determine the accuracy of your measurement chain.
Calibration offset	The difference between the expected calibration level set in the instrument and the level measured by the instrument during calibration.

Term	Description
CE Marking	A label used to show that the Sound Level Meter conforms to the specification of a European Directive
Decibel (dB)	The Decibel is a unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale. In the case of noise measurement, the measured sound pressure, p (in Pascals) is compared to a reference value p_0 of $2x10^{-5}$ Pa using the equation: $dB = 20\ x\ log_{10}\left(\frac{p}{p_0}\right)$
Data Logging	The storage of measurement information into a sound level meter or noise dosimeter that can be downloaded into software on a PC such as NoiseTools.
Display	The screen on the sound level meter or noise measurement instrument that shows the noise levels and measurement information.
Dynamic Range	All noise instruments are limited in the range of levels that they can accurately measure by inherent noise at low levels and by overload at high levels. The usable region between these two is the dynamic range of the instrument. Expressed in dB.
Free Field Microphone	At frequencies above 1 kHz the wavelength of sound is small enough for a standard half-inch microphone to 'disturb' or affect the sound field being to measured. Free field microphones are designed to compensate for this effect.
Integrating Averaging Sound Level Meter	A Sound Level Meter which accumulates the total sound energy over a measurement period and calculates an equivalent average value, usually displayed as an Leq.
Microphone Capsule	The microphone capsule is the part of the noise measurement instrument that converts the acoustic pressure, or noise, into an electrical signal that can be measured and displayed by the instrument. This is often the most sensitive and fragile part of a noise measurement instrument as it has to deal with both very small and very large changes in pressure with great accuracy and precision.

Term	Description
Noise Floor	The lower limit of measurement of an instrument calculated from the addition of all noise sources and unwanted signals within a measurement system. Signals beneath the noise floor cannot be measured.
Overload	The input to the Sound Level Meter is too high for the current measurement range.
Pa	Pascal. This is the SI derived unit of pressure.
Preamplifier	The preamplifier is an electronic circuit which takes the electrical signal from the microphone capsule and converts it into a signal that can be used in the sound level meter.
Quick Settings	A set of quick configuration options for the Dose View in the Optimus sound level meters.
Repeat Timer	The Optimus Green Sound Level Meters and Trojan Noise Nuisance Recorders can be programmed to make repeating measurements of a specified duration. The measurements will continue to repeat until the Stop buttons is pressed.
Single Timer	The duration of a measurement in the Optimus Sound Level Meters. If this is set, the measurement will stop after the specified time. If this is switched off, the measurement will continue until the Stop key is pressed.
Sound Level Meter	An instrument for measuring various noise parameters
Sound Power Level	This is a logarithmic measurement of the sound power as a relation to the threshold of hearing, and makes the values more manageable i.e. 0 to 160 dB and the symbol is Lw.
Sound Pressure Level	SPL, or sound level Lp, is a logarithmic measurement of the RMS sound pressure of a sound relative to a reference value. It is measured in decibels (dB).
Statistical Analysis	A calculation performed by a Sound Level Meter on the noise levels measured during the measurement period to describe the statistical spread of the noise. The resulting statistical levels, of Ln values, are displayed in dB.

Term	Description
Third octave band	A frequency band whose cut-off frequencies have a ratio of 21/3, which is approximately 1.26. The cut-off frequencies of 891 Hz and 1112 Hz define the 1000 Hz third-octave band in common use. In modern sound level meters, 1:3 or 1/3 octave band filters are usually available from around 12.5Hz to 20kHz although some instruments may also provide lower bands.
Time constant	A standardized time constant used in exponential time weighting for acoustical analysis. The standard time constants for sound level meters are Slow (100ms), Fast (125ms) and Impulse (35 ms while the signal level is increasing or 1,500 ms while the signal level is decreasing).
Time History Rate	The speed, or rate, at which the noise levels are sampled and stored in the instrument. These samples, or time history, can be downloaded to the NoiseTools software and displayed on a graph.
Tonal Noise Detection	A feature available in certain versions of the Optimus Sound Level Meters that allow tonal noise according to ISO 1996-2:2007 Simplified method (Annex D) or the Cirrus Improved Method.
Under Range	The input to the Sound Level Meter is too low for the current measurement range.
USB Socket	The standard USB socket on the Optimus, Trojan and doseBadge Reader units that allows the measurements to be transferred to the NoiseTools software.
VoiceTag	The data logging versions of the Optimus Sound Level Meters allow a short voice recording to be made before the measurement starts. This can be downloaded and listened to in the NoiseTools software.
3.5mm Socket	An additional socket on the Optimus Sound Level Meters that is used for some specialised applications.
18 Way Socket	The large, wide connector on the bottom of the Optimus and Trojan sound level meters that is used to connect accessories and ancillary equipment.

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