

# optimus

sound level meters

## Sound Level Meters for Environmental and Occupational Noise Measurements



## NoiseMeters

### Applications

- Environmental noise impact assessments
- Short or long duration surveys
- Occupational & Industrial Noise evaluation
- Tonal analysis with 1/3 Octave Band Filters
- Audio recording
- Noise Ordinance & Community Noise
- Hearing Protector Selection
- General Noise Measurements

### Key Features

- Simple operation
- Simultaneous measurement & data logging of all available parameters
- Simultaneous A, C & Z Frequency Weightings
- Simultaneous F, S & I Time Weightings
- Real-Time 1/1 and 1/3 Octave Band Filters
- 14 Statistical Ln % values
- Single 120dB measurement range
- Audio recording during measurement for replay or further analysis
- VoiceTag audio recording of notes
- Automatic repeating measurements
- High resolution OLED display
- Backlit keypad for night-time use
- 4GB memory for over 10,000 measurements
- Compatible with Weatherproof Outdoor Kit

## Simple operation with advanced technology

The **optimus** sound level meters have been designed with ease of use as the most important feature, so you can get on with measuring the noise.

The instruments use the latest in digital technology and design techniques to make everything as clear as possible.

Featuring a high resolution colour OLED screen and a keypad that illuminates automatically in low light, the **optimus** instruments are ideal for any noise application.

The measurement data is displayed in a

clear and simple format along with a real-time noise chart so you can see how the noise varies with time.

All the functions of the meter are measured simultaneously, and with a wide 120dB measurement span you don't need to worry about choosing the right range.

A standard **optimus** can measure up to 140dB(A) and 143 dB(C) Peak, and up to 170dB using the optional MK200EH High Level Noise Microphone System.

Switch on, calibrate, measure.

## The ideal solution for environmental noise

The **optimus green** sound level meters are ideal for both environmental and occupation noise, and will give you all the information you need, right at your fingertips.

Every measurement contains all of the available parameters, so there is no risk of selecting the wrong parameter or function.

### Environmental Noise Measurements

#### Comprehensive Measurement Capability

The overall Leq, Lmax and statistical Ln% values (14 in total) are measured along with a range of noise profiles, providing a complete picture of the noise under investigation.

#### Real-time 1/3 Octave Bands

The B versions (CR171B and CR172B) will measure and store the Real-Time 1/3 octave bands from 6.3Hz to 20kHz throughout each and every measurement. The overall value and a time history are stored automatically.

#### Audio Recording

As well as the VoiceTag feature (for recording notes), the **optimus green** has the ability to record the audio during a measurement.

This can be either started manually during the measurement or triggered using a sophisticated set of threshold parameters.

Audio recordings can be stored either in high quality, which can be used for later analysis, or as standard quality, which is adequate for playback and source identification.

#### Repeating Measurements

Measurements can be either started manually or by using the measurement control functions.

This allows the meter to make repeating measurements over long periods of time, ideal when the meter is used with an outdoor noise measurement kit.

### Occupational Noise Measurements

As well as the environmental noise functions, the **optimus green** meter also provides a complete range of occupational noise functions.

#### UK & EU Noise at Work Regulations

If you are working to the UK Control of Noise at Work Regulations or the EU Physical Agents (Noise) Directive, the LAeq and LCPeak values are measured at the same time, allowing compliance with the LEP,d (LEX,8h) and the Peak Action Levels to be determined.



The L<sub>Ceq</sub>-L<sub>Aeq</sub> (C-A) value is also measured. This can be used to select hearing protection using the HML method.

#### OSHA, MSHA & Other Regulations

If you need to meet regulations such as OSHA HC & NC, MSHA HC or ACGIH, the two "virtual" noise meters in the Dose view can be quickly configured to provide this.

#### Octave Band Filters for Noise Control & Selecting Hearing Protection

The **optimus green** meters also feature real-time 1/1 octave band filters, which can be used to aid in the selection of hearing protectors and for noise control applications.

## NoiseTools Software

For many users, the most challenging part of a noise survey is the reporting and analysis of the results. Having a simple way to view, analyse and print the information is essential.

The new NoiseTools software gives you a quick and simple way to download, analyse and report your noise measurement information.

### Intuitive and Simple to Use

The initial summary screen shows you the most commonly used information and, through simple icons, gives you access to the detailed measurement data. You can simply print the summary screen to get a quick measurement report.

For advanced users, each and every function measured by the instrument is available for review and analysis, and the data can be exported for further use.

VoiceTag audio recordings can be played back for reference and are automatically stored with the measurement data.

Audio recordings can be played back to identify the noise source and analysis performed on the recordings

Where Octave band data is available, this can be used by the program to calculate the level of protection from a range of hearing defenders.

### Helping You Keep Your Data Organised

Over time, you may find that you have a large number of measurements, information and notes.

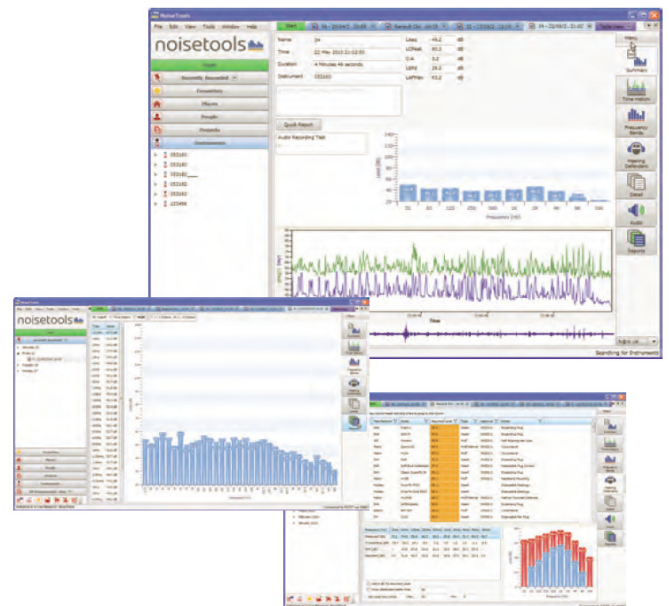
To help keep your noise measurement data organised and easy to find,

NoiseTools allows each measurement to be tagged to people, places and projects.

Measurements can be sorted or grouped by any parameters or tag and measurement reports created quickly and easily.

NoiseTools is fully compatible with the latest versions of Microsoft Windows and updates are available free of charge from the web site.

NoiseTools is supplied free from any licensing restrictions or limits, allowing you to install the program on as many PCs as needed at no additional cost.



## Instrument Range & Kits

The **optimus green** sound level meters can be used for a wide range of environmental and occupational noise applications, and you can choose from two options to get the meter that meets your needs.

Choose from Class 1 or Class 2 performance, and then choose whether you want 1/3 Octave Band Filters.

All of the meters measure the Sound Level functions with all frequency and time weightings, as well as real-time 1/1 Octave Band Filters,  $L_{Aeq,t}$  and  $L_{AE}$ , C-A, Peak Sound Pressure and the virtual noise meters for OSHA/MSHA/ACGIH.

14 independent  $L_n$  values are included along with many other measurement functions.

Complete measurement kits are available for the **optimus** meters containing the instrument, and acoustic calibrator, windshield, cables, batteries and accessories. The measurement kits contain all the accessories needed to carry out a noise survey.



# Specifications



## Applicable Standards

IEC 61672-1:2002 Class 1 or Class 2 Group X  
IEC 60651:2001 Type 1 or Type 2  
IEC 60804:2000 Type 1 or Type 2  
IEC 61252:1993 Personal Sound Exposure Meters  
ANSI S1.4-1983 (R2006), ANSI S1.43-1992 (R2007)  
ANSI S1.25:1991  
1/1 & 1/3 Octave Filters to IEC 61260 & ANSI S1.11

## Microphone

Class 1 Instruments MK224 pre-polarized  
Class 2 Instruments MK216 pre-polarized

## Microphone Preamplifier

MV200E Removable Preamplifier

## Total Measurement Range

20 dB to 140 dB RMS Single Range  
Noise Floor: <18dB(A) Class 1, <21dB(A) Class 2

## Frequency Weightings

RMS: A, C & Z Measured Simultaneously  
Octaves: 16Hz to 16kHz  
1/3 Octaves: 6.3Hz to 20kHz (B version of meter)

## Time Weightings

Fast, Slow & Impulse Measured Simultaneously

## Display

High resolution OLED display with ambient light sensor & illuminated keypad

## Memory

4GB with up to 10,000 measurements stored

## Time History Data Rates (Global Settings)

10ms, 62.5ms, 125ms, 250ms, 1/2 sec, 1 sec, 2 sec (user selectable)

## Voice Tag Audio Recording

30 seconds of audio recording with each measurement

## Audio Recording

Manual, Threshold Triggered or Advanced Trigger  
Standard (16kHz, 16-bit) or High (96kHz, 32-bit)

## Ln Statistical Values

7 preset to L1, L5, L10, L50, L90, L95 & L99  
7 user defined Ln values

## Measurement Control

User selectable duration of: Manual, 1 min, 5 min, 10 min, 15 min, 30 min, 1 hour, Lden. Auto repeat & sync.

## Integrators

Three simultaneous "virtual" noise meters.  
Integrator 1 is preset to Q3 for Leq functions.  
Integrators 2 & 3 can be configured with the following:  
Q3, 4 or 5. Time Weighting: None or Slow.  
Threshold 70 to 120 dB (1dB steps)  
Criterion Level: 70 to 120 dB (1dB steps)  
Criterion Time: 1 to 12 hours (1 hour steps)

## Integrator Quick Settings

EU, OSHA HC & OSHA NC, OSHA HC & ACGIH  
MSHA HC & MSHA EC, Custom 1 & Custom 2

## Dimensions

Size: 283mm x 65mm x 30mm  
Weight: 300gms/10oz

## Batteries

4 x AA Alkaline, life typically 12 hours

## External Power

5V via USB Socket from PC or Power Supply  
5V-15V via Multi-IO socket

## Tripod Mount

1/4" Whitworth socket

## Connections

USB Type B to PC

## Case

Material: High Impact ABS-PC with soft touch back

## Environmental

Temperature Operating -10°C to +50°C  
Storage -20°C to +60°C  
Humidity Up to 95% RH Non Condensing

## Electromagnetic Performance

IEC 61672-1:2002 & IEC 61672-2:2003  
Except where modified by EN 61000-6-1:2007 & EN 61000-6-1:2007

## Language Options

English, French, German, Spanish as standard  
Other language options may be available

## Software Support

NoiseTools Download, Configuration & Analysis  
software supplied as standard. Compatible with MS  
Windows XP, Vista and 7 (32bit & 64 bit)

## Measurement Functions

### CR172A & CR171A

#### Displayed Functions

$L_{XY}$ ,  $L_{XYMax}$ ,  $L_{XYmin}$   
 $L_{Aeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$ ,  $L_{Ceq}$ ,  $L_{Aeq}$ ,  $L_{XE}$   
Graph of Short  $L_{Aeq}$ ,  $L_{CPeak}$   
Integrators 2 & 3: TWA, Dose %, Est Dose %  
Real-Time Octave Bands (graphical & numerical)  
Statistical Ln% values  
Measurement Run Time

#### Stored Functions

$L_{XYMax}$  & Time History of  $L_{XYMax}$   
 $L_{Aeq}$ ,  $L_{Ceq}$ ,  $L_{Zeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$   
Time History of  $L_{Aeq}$ ,  $L_{Ceq}$ ,  $L_{Zeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$   
Integrators 2 & 3:  $L_{AVG}$ , TWA, Dose %  
Time History of  $L_{AVG}$   
Octave Bands: Overall Leq & Time History each band  
Ln Values: 14 independent statistical values  
Audio Recording During Measurement  
Measurement Run Time  
Time & Date of Measurement Start

### CR172B & CR171B

#### Displayed Functions

$L_{XY}$ ,  $L_{XYMax}$ ,  $L_{XYmin}$   
 $L_{Aeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$ ,  $L_{Ceq}$ ,  $L_{Aeq}$ ,  $L_{XE}$   
Graph of Short  $L_{Aeq}$ ,  $L_{CPeak}$   
Integrators 2 & 3: TWA, Dose %, Est Dose %  
Real-Time Octave Bands (graphical & numerical)  
Real-Time 1/3 Octave Bands (graphical & numerical)  
Measurement Run Time  
Leq Lf (20Hz to 200Hz)  
14 Statistical Ln% Values

#### Stored Functions

$L_{XYMax}$  & Time History of  $L_{XYMax}$   
 $L_{Aeq}$ ,  $L_{Ceq}$ ,  $L_{Zeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$   
Time History of  $L_{Aeq}$ ,  $L_{Ceq}$ ,  $L_{Zeq}$ ,  $L_{CPeak}$ ,  $L_{ZPeak}$   
Integrators 2 & 3:  $L_{AVG}$ , TWA, Dose %  
Time History of  $L_{AVG}$   
Octave Bands: Overall Leq & Time History each band  
1/3 Octaves: Overall Leq & Time History each band  
Measurement Run Time  
Time & Date of Measurement Start

where x=A, C, Z; y=F,S,I

All specifications, features and values are typical and are subject to change without notice.

# Instrument Selection

Function	Class	Sound Level Functions	Integrating Functions	Data Logging	Audio & VoiceTag	1/1 Octave Band Filters	1/3 Octave Band Filters	Ln Values Auto Timer	Software Support	Measurement Kit
Instrument										
CR172A	Class 2	Yes	Yes	Yes	Yes	Yes		Yes	Yes	CK172A
CR171A	Class 1	Yes	Yes	Yes	Yes	Yes		Yes	Yes	CK171A
CR172B	Class 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	CK172B
CR171B	Class 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	CK171B

## Standard Accessories

The **optimus** sound level meters are supplied as standard with the following accessories:  
User Manual  
Certificate of Calibration  
USB Data/Power Cable  
Windshield  
NoiseTools Software CD

## Measurement Kits

The **optimus** sound level meters are available as a complete measurement kit with the following accessories:  
Optimus Sound Level Meter  
CR514 Class 2 or CR515 Class 1 Acoustic Calibrator  
UA237 90mm Windshield  
CK280 Carrying Case  
User Manual & Certificates of Calibration  
USB Data/Power Cable & NoiseTools Software CD

NoiseMeters Limited  
West End  
Muston  
YO14 0ES  
England

Tel: 0845 680 0312  
Fax: 0845 680 0316

Email: [info@noisemeters.co.uk](mailto:info@noisemeters.co.uk)  
Web: [www.noisemeters.co.uk](http://www.noisemeters.co.uk)

NoiseMeters Inc  
14781 Memorial Drive, Suite 2174  
Houston  
TX 77079  
USA

Tel: 888 206 4377  
Fax: 888 584 2230

Email: [info@noisemeters.com](mailto:info@noisemeters.com)  
Web: [www.noisemeters.com](http://www.noisemeters.com)