optimus
sound level meters

# Sound Level Meters for Noise at Work Measurements


**NoiseMeters**

The **optimus red** sound level meters use the very latest digital technology and industrial design to give you the ideal instrument for Occupational noise measurements.

**Applications**

- Occupational Noise Evaluations
- Noise at Work Surveys
- Noise Exposure Calculations
- Hearing Protector Selection
- Machinery Noise Tests
- General Noise Measurements

**Key Features**

- Simple Operation, ergonomic design
- Simultaneous measurement of all workplace noise parameters
- VoiceTag audio recording
- Latest digital technology
- Colour OLED display and backlit keypad
- Single 120 dB Measurement range
- Real-time Octave Band Filters
- Large 4GB memory
- Stores over 10,000 measurements
- Long Battery Life

For Occupational Noise, measuring the noise exposure of employees quickly and reliably is essential. The **optimus red** sound level meters are the ideal instrument for these applications with a clear, high resolution OLED colour screen, a wide 120dB measurement range and simultaneous measurement of all available parameters.

There is no setup or complicated configuration needed. Just switch on, calibrate and press start. It is that simple.

**VoiceTag Audio Recording**

Before each measurement is made, you can record a VoiceTag by simply speaking into the microphone.

You can record notes about the measurement location, describe what is being measured or simply store information that may be useful at a later date.

**The Ideal Instrument For Any Application**

With three “virtual” noise meters running at the same time, you can meet any noise regulation, guideline or standard.

Whether you need to meet the UK and EU regulations, measure to OSHA HC & PEL, MSHA, ACGIH or any other regulation, an **optimus red** is the ideal meter.

# Simple operation with advanced technology

When you are making a noise measurement, the instrument you are using should not get in the way of getting reliable and useful information.

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.

We've used a high resolution OLED screen that can be seen in any conditions and the keypad will illuminate automatically in low light. The case is robust and covered with a tactile finish so it can be used even if you are wearing gloves.

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.


# The ideal solution for occupational noise

The **optimus red** sound level meters are ideal for occupation noise, as well as for basic noise surveys, and will give you all the information you need, right at your fingertips.

**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 Leq View gives you the information that you need.

The $L_{Aeq}$ and $L_{CPeak}$ values are measured at the same time, allowing compliance with the $L_{EP,d}$ ($L_{EX,8h}$) and the Peak Action Levels to be determined.

The $L_{Ceq}$-$L_{Aeq}$ (C-A) value is also measured. This can be used to select hearing protection using the HML method. $L_{AE}$ (sound exposure) is also measured along with the $L_{ZPeak}$, required by some regulations.

**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.

The Quick Setup gives access to a number of preset functions, including OSHA HC & NC, OSHA HC & ACGIH and MSHA HC & EC.

Custom settings can be used to choose any other setup or configuration that you may need.

Once you have chose the setup needed it will be stored so each time you use the meter you will have the information you need.

For the two "virtual" noise meters, the $L_{AVG}$, TWA, % Dose and Estimated % Dose are displayed.

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

The CR162C and CR161C instruments have real-time octave band filters, which measure the noise in 10 standard frequency bands.

The octave band measurement is made at the same time as other measurements, and includes the overall level in each band along with a time history of the bands throughout the measurement period.

**Basic Noise Level Measurements**

The **optimus red** meters can also be used for basic noise measurements where the Sound Level is required, such as community and noise ordinance enforcement and testing of fire and emergency alarms.

Where precision measurements are needed, Class 1 / Type 1 meters are available as well as the general purpose Class 2 / Type 2 meters.

**Data Logging & PC Download**

If there is need to record and download measurements to the PC, data logging is available with the B & C version meters.

These units are supplied with the NoiseTools software and a USB data cable to allow the measurements to be downloaded.

# 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 package supplier with the B & C versions 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.

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.

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# Instrument Range & Kits

The **optimus red** range comprises Class 1 and Class 2 versions of the A, B and C instruments.

All if the meters can measure Sound Level functions plus Lmax and Lmin with all frequency and time weightings.

The A versions measurement the Integrated noise levels such as Leq and LAE, C-A, Peak Sound Pressure and have the virtual noise meters for OSHA, MSHA, ACGIH, etc.

The B versions provide the same functions as above but with the addition of data logging. The VoiceTag audio recording is included.

The C versions add real-time octave band filters to these functions.

Specifications and a selection charge are on the following page.

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
Octave Band Filters to IEC 61260 & ANSI S1.11-2004

**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
Freq. Bands: 10 Octave Bands (31.5Hz to 16kHz)

**Time Weightings**
Fast, Slow & Impulse Measured Simultaneously

**Display**
High resolution OLED display with ambient light sensor & illuminated keypad

**Memory**
4GB Expandable with up to 10,000 measurements stored (B & C Versions)

**Time History Data Rates (Global Settings)**
10ms, 62.5ms, 125ms, 250ms, 1/2 sec, 1 sec, 2 sec (user selectable)

**Voice Tag Audio Recording (B Versions)**
30 seconds of audio recording with each measurement

**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

**Size**
283mm x 65mm x 30mm

**Weight**
300gms/10oz

**Batteries**
4 x AA Alkaline

**Battery Life**
Typically 16 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
Multi-pin IO for external power

**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 Microsoft Windows XP, Vista & 7 (32bit & 64bit)

**Measurement Functions**

**CR162A & CR161A**
**Displayed Functions**
$L_{XY}$, $L_{XYMax}$, $L_{XYmin}$
$L_{xeq}$, $L_{CPeak}$, $L_{ZPeak}$, $L_{Ceq}$-$L_{Aeq}$, $L_{XE}$
Graph of Short $L_{Aeq}$, $L_{CPeak}$
Integrators 2 & 3: TWA, Dose %, Est Dose %
Measurement Run Time

**CR162B & CR161B**
**Displayed Functions**
$L_{XY}$, $L_{XYMax}$, $L_{XYmin}$
$L_{xeq}$, $L_{CPeak}$, $L_{ZPeak}$, $L_{Ceq}$-$L_{Aeq}$, $L_{XE}$
Graph of Short $L_{Aeq}$, $L_{CPeak}$
Integrators 2 & 3: TWA, Dose %, Est Dose %
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 $L_{AVG}$

**CR162C & CR161C**
**Displayed Functions**
$L_{XY}$, $L_{XYMax}$, $L_{XYmin}$
$L_{xeq}$, $L_{CPeak}$, $L_{ZPeak}$, $L_{Ceq}$-$L_{Aeq}$, $L_{XE}$
Graph of Short $L_{Aeq}$, $L_{CPeak}$
Integrators 2 & 3: TWA, Dose %, Est Dose %
Measurement Run Time
Real-Time Octave Band Filters

**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
Measurement Run Time
Time & Date of Measurement Start

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

All values, figures and performance statements are typical and are subject to change without notice.

# Instrument Selection

| Function | Class 1 | Class 2 | Sound Level Functions | Leq/Peak Functions | TWA/Dose Functions | Data Logging | VoiceTag Recording | Octave Band Filters | Software Support | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Instrument** | | | | | | | | | | **Measurement Kit** |
| **CR162A** | | **Yes** | **Yes** | **Yes** | **Yes** | | | | | **CK162A** |
| **CR161A** | **Yes** | | **Yes** | **Yes** | **Yes** | | | | | **CK161A** |
| **CR162B** | | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | | **Yes** | **CK162B** |
| **CR161B** | **Yes** | | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | | **Yes** | **CK161B** |
| **CR162C** | | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **CK162C** |
| **CR161C** | **Yes** | | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **CK161C** |

**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 (Requires B or C Version to download measurements)

**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 Caliration
USB Data/Power Cable & NoiseTools Software CD
(Requres B or C version to download measurements)

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