![Cirrus Research plc logo]

![optimus+ sound level meters logo]

Optimus+ Environmental

Handheld Sound Level Meter

The comprehensive solution for environmental and occupational noise measurements

VoiceTag™
Audio note recording

AuditStore™
Data verification for your noise measurements

Acoustic Fingerprint™
Audio triggering, recording & alerts

❈ Bluetooth®

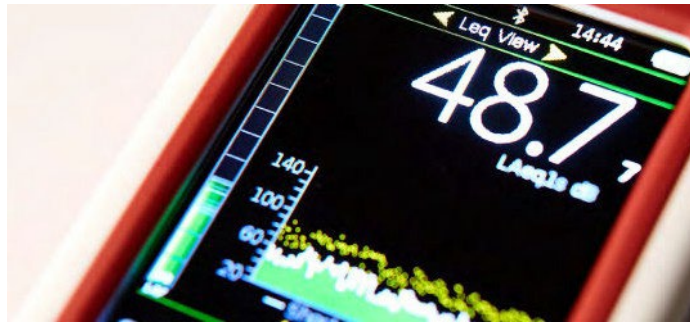**Key features:**

- Measures all noise level parameters simultaneously, including L_{Xeq} and L_{XMax}
- Optional 1:1 and 1:3 octave band filters
- Integrating functionality, providing average noise level data (Leq)
- Compliance with international environmental noise regulations, such as BS4142, and noise at work regulations
- Optional audio recording with Acoustic Fingerprint technology

Optimus+ Handheld Sound Level Meter

What is the Optimus+ Green?

The Optimus+ Environmental is an advanced handheld sound level meter, designed for the accurate and effective measurement of both environmental noise and noise at work. Having noise measurement data you can rely on to be accurate and compliant is essential. The Optimus+ Environmental ticks all the boxes when it comes to environmental and occupational noise measurement. You can also use add-on accessories such as the Outdoor Measurement Kit and the GPS module, to increase its functionality.

Applications

- Environmental noise impact assessments over short or long periods
- Environmental noise monitoring with remote data download over mobile data, as well as GPS location technology
- Boundary noise measurements and impact assessments
- Occupational noise surveys and assessments
- Hearing protection selection using HML or 1:1 octave band methods
- Measurements to international standards and guidelines
- Detailed noise level analysis with audio recordings

Measure everything, forget nothing

We've designed the Optimus+ Environmental sound level meter with ease-of-use as its most important feature, to enable you to get on with measuring and controlling noise in the environment.

The instrument uses the very latest in digital technology and industrial design techniques to make everything as clear and simple as possible.

All noise parameters are measured by the instrument at the same time, so there's never any risk of choosing the wrong setting and missing something crucial. With a wide 120dB measurement span, you won't need to worry about choosing the right range either.

Featuring a high-resolution colour screen and a keypad that illuminates automatically in low light, the Optimus+ Environmental is ideal for any noise measurement application. The measurement data is displayed in a clear and simple format along with a real-time noise chart, so that you can see how the noise levels vary with time.

Key features

- IEC 61672-1:2013 Class 1 & Class 2
- Simultaneous measurement and data logging of all available parameters
- Real-time 1:1 & 1:3 octave band filters
- NR & NC values and curves on screen
- Tonal noise analysis
- Up to 28 statistical Ln % values
- Single 120dB measurement range
- Acoustic Fingerprint™ audio triggering, recording and alerts during measurements for replay and analysis
- VoiceTag™ audio note recording and AuditStore™ measurement verification
- Repeating measurements with manual or automatic control
- Pause and back-erase functions
- High-resolution colour display and back-lit keypad for nighttime measurements
- 8GB memory capable of storing over 10,000 measurements (expandable up to 32GB)
- Compatible with CK:675 & CK:685 outdoor noise measurement kits
- Measure up to 170dB with the optional MV:200EH microphone system
- Bluetooth® connectivity, compatible with Android and iOS devices

Comprehensive measurement capability

The overall Leq, L_{Max} and statistical Ln% values are measured along with a range of noise profiles, providing a complete picture of the noise under investigation.

Remote operation with Bluetooth connectivity

With Bluetooth connectivity, the Optimus+ Environmental can be operated remotely from a compatible smartphone through the dedicated mobile app.

Comprehensive noise data analysis and audio playback with NoiseTools

Reviewing noise data and audio recordings is an essential part of any noise monitoring operation, which is why we provide this functionality, and more, as standard with every Optimus+ Environmental:

- Get access to all the functionality you need, as NoiseTools is supplied free of any licence restrictions.
- Enjoy a better and more comprehensive understanding of the noise with high-quality audio playback.
- Always have access to the latest features with free lifetime updates.

The Optimus+ Environmental sound level meters are ideal instruments for both environmental and occupational noise, and will give you all of the information you need, right at your finger tips.

Every measurement contains all of the available functions on the device, so there's no risk of selecting the wrong parameter or function and missing something important.

Real-time 1:1 and 1:3 octave bands

The Optimus+ Environmental will measure and store real-time 1:3 octave bands from 6.3Hz to 20kHz throughout each and every measurement, with the overall value along with a time history, stored automatically.

Acoustic fingerprint triggers and audio recording

As well as the VoiceTag recording, the Optimus Environmental instruments provide audio recording during measurements using our Acoustic Fingerprint technology.

You can start recordings manually, or automatically when user-defined triggers are activated.

The instrument can store audio recordings as either studio 96kHz/32bit quality, which you can use for later analysis; high 48kHz/24bit quality; or as standard 16kHz/16bit quality, which can be used for replay and source identification.

Tonal noise detection

Optimus+ Environmental can use either the ISO 1996-2:2007 Simplified Method or the Cirrus Improved Method to highlight tonal noise in 1:3 octave bands.

Repeating measurements

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

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

Automatic audio measurements

An automatic audio measurement can be set up to record up to two minutes of audio at the start of each measurement.

Included with your Optimus+ Environmental noise measurement kit

You'll get everything you need to ensure you can instantly start measuring noise easily and effectively:

- Class 1 or Class 2 sound level meter
- Class 1 or Class 2 acoustic calibrator
- Microphone windshield
- Heavy duty carrying case
- Data transfer cable
- Software USB
- Batteries

Technical Specifications

Applicable standards[1]
IEC 61672-1:2013 Class 1 or Class 2
IEC 61672-1:2002 Class 1 or Class 2
IEC 60651:2001 Type 1 I or Type 2 I
IEC 60804:2000 Type 1 or Type 2
IEC 61252:1993 Personal sound exposure meters
ANSI S1.4 -1983 (R2006), ANSI S1.43 - 1997 (R2007)
ANSI S1.25:1991
IEC 61260:1996 & ANSI S1.11-2004
DIN 45657:2005-03

Microphone
Class 1 Instruments MK:224 pre-polarized
Class 2 Instruments MK:216 pre-polarized
Microphone preamplifier
MV:200F removable preamplifier (All Versions)

Total measurement range:
20dB to 140dB RMS single range

24dB to 139dB linear range
Noise floor: <18dB(A) Class 1, <21dB(A) Class 2

Frequency weightings
RMS & peak : A, C, & Z measured simultaneously
1:1 octave bands: 31.5Hz to 16kHz
1:3 octave bands: 6.3Hz to 20kHz (bands from 12.5Hz displayed, 6.3Hz, 8Hz & 10Hz stored & downloaded)
Additional metrics: LAeq LF (20Hz to 200Hz) & Leq LF (20Hz to 200Hz)

Time weightings
Fast, Slow & Impulse measured simultaneously

Display
High-resolution display
Ambient light sensor and illuminated keypad

Memory
8GB (32GB factory fit option)

AuditStore
Measurement verification data stored in secure memory

Time history data rates (global settings)
10ms, 62.5ms, 100ms, 125ms, 250ms, 1/2 sec, 1 sec, 2 sec (user-selectable)

VoiceTag audio recording
Up to 30 seconds of audio notes with each measurement

Acoustic fingerprint audio recording
Off, manual, threshold triggered, advanced trigger
User options:
Studio quality - 96kHz/32bit WAV format High quality - 48kHz/24bit WAV format Standard quality - 16kHz/16bit WAV format Pre-Trigger & Post-Trigger

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

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

Ln statistical values
14 independent statistical Ln values calculated from 1/16th LAF
7 preset to L1.0, L5.0, L10.0, L50.0, L90.0, L95.0 & L99.0
7 user defined Ln values
CR:172C & CR:171C allow for an additional 14 Ln values with independent time and frequency weighting.

Measurement control
Single or repeat measurement control with user selectable duration of manual, 1 min, 5 min, 10 min, 15 min, 30 mins, 1 hour, Lden
Automatic synchronisation and repeat
Pause
Back-erase with user selectable duration

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

Batteries
4 x AA alkaline

Battery life
Typically 12 hours with alkaline AA
Typically 20 hours with lithium AA non-rechargeable

Battery life is dependent upon the battery type and quality, and screen brightness

Connections
USB Type B to PC
AC & DC output via ZL:174 (2 x Phono, 1m)
Multi-pin IO for external power via ZL:171 cable (2.1mm socket)
External power: 5v-15v via MultiIO socket via ZL:171 cable (2.1mm socket)

Tripod Mount
1/4" Whitworth socket

Case
Material: high-impact ABS-PC with soft touch back and keypad

Environmental conditions
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 and analysis software supplied as standard. Compatible with Microsoft Windows 7, 8, 10 & 11 (32bit & 64bit)

Bluetooth
BLE compatible with Anrdoid and iOS devices
Cirrus mobile applications available from Google Play and the App Store

Measurement functions[2]
CR:1720 & CR:1710
Displayed functions
LXY, LXYMax, LXYMin
LXeq, LCPeak, LZPeak, LAPeak LCeq-LAeq, LXE, LAIeq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose %, est dose %14 statistical Ln% values

Stored functions
LXYMax and time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Integrators 2 & 3: LAVG , TWA. % dose
Time history of LAVG
Ln Values: 14 independent statistical values
Audio recording during measurement
Time, date and duration of measurement

CR:172A & CR:171A
Displayed functions
LXY, LXYMax, LXYMin
LXeq, LCPeak, LZPeak, LAPeak LCeq-LAeq, LXE, LAIeq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose %, est dose %
Real-time 1:1 octave bands (graphical and numerical)
NR & NC values and curves
14 statistical Ln% values

Stored functions
LXYMax and time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Integrators 2 & 3: LAVG , TWA. % dose
Time history of LAVG
1:1 octave bands: overall Leq & Leq time history for each band, NR & NC values and curves
Ln values: 14 independent statistical values
Audio recording during measurement
Time, date and duration of measurement

CR:172C & CR:171C
Displayed functions
LXY, LXYMax, LXYMin
LXeq, LCPeak, LZPeak, LAPeak LCeq-LAeq, LXE, LAIeq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose %, est dose %
Real-time 1:1 octave bands (graphical and numerical)
Real-time 1:3 octave bands (graphical and numerical)
Tonal noise detection in 1:3 octave bands NR & NC values and curves
Leq LF (20Hz to 200Hz)
Up to 28 statistical Ln% values

Stored functions
LXYMax & time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAIeq
Integrators 2 & 3: LAVG , TWA. % dose
Time history of LAVG
1:1 & 1:3 octave bands: overall Leq & Leq time history for each band
Tonal noise detection in 1:3 octave bands NR & NC values and curves
Ln values: 28 independent statistical values
Audio recording during measurement
Time, date and duration of measurement

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

Other functions may be calculated by the NoiseTools softwarse and displayed on download.

Notes
1. Please contact Cirrus Research plc for details of the standards and approvals that are available on specific instrument types.
2. For details of the displayed and stored parameters, please refer to the Optimus user manual for full specifications.
All specifications, features and values are typical and are subject to change without notice.

Which Optimus+ is right for you?

Key Features													
	Class 1	Class 2	Sound pressure level	Average noise level (Leq)	Peak	%Dose	1:1 octave bands	1:3 octave bands	Audio recording	On-screen NR/ NC curves	Single measurement timers	Repeat measurement timers	Bluetooth
Optimus+ Environmental	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓
Optimus+ Environmental with Octave Bands	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Optimus+ Environmental with Tonal Noise Detection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓