Cirrus Research plc

optimus+ GPS sound level meters

Optimus+ GPS

Handheld GPS-Enabled 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}
- Pinpoint-accurate GPS location data saved alongside every measurement
- 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
- Audio recording with Acoustic Fingerprint technology

Optimus+ GPS Handheld GPS-enabled Sound Level Meter

What is the Optimus+ GPS?

The Optimus+ GPS is Cirrus Research's first fully integrated handheld GPS-enabled sound level meter, designed for the measurement of environmental noise alongside pinpoint-accurate GPS location data. Having noise measurement data you can rely on to be accurate and compliant is essential and the Optimus+ GPS ticks all the boxes when it comes to environmental and occupational noise measurement.

Applications

- Environmental noise impact assessments over short or long periods
- Boundary noise measurements and impact assessments
- Outdoor 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
- Location-specific noise level monitoring and analysis

Measure everything, forget nothing

We've designed the Optimus+ GPS 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.

All noise parameters are measured by the instrument simultaneously, 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+ Green 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.

The Optimus+ GPS features an industry-leading time to first fix (TTFF), which means it can acquire and lock on to a steady GPS signal in seconds, saving you time and allowing you to complete your noise surveys in less time.

Choose the meter that's right for you

When choosing an Optimus+ GPS, you have the option of which features and functions you need based on the type of noise you need to measure. We'll make sure you only get exactly what you need: no more, no less.

For occupational noise: Optimus+ Red GPS.

For environmental noise: Optimus+ Green GPS.

Key features

- IEC 61672-1:2013 Class 1 & Class 2
- Simultaneous measurement and data logging of all available parameters
- GPS location data stored alongside every measurement that's taken
- 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
- 4GB memory capable of storing over 10,000 measurements (expandable up to 32GB)
- 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, which when analysed alongside GPS location data, provides a comprehensive understanding of the noise under investigation.

Complete noise data analysis, audio playback and location data review with NoiseTools

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

- 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 and accurate geo-location data
- Always have access to the latest features with free lifetime updates.

The Optimus+ GPS sound level meters are ideal instruments for both environmental and outdoor 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+ GPS 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 GPS 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+ Green 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.

Included with your Optimus+ Green 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

*Only available on the Optimus+ Green GPS

Cirrus Research plc

Technical Specifications[1]

Applicable standards[2]
IEC 61672-1:2013 Class 1 or Class 2
IEC 61672-1:2002 Class 1 or Class 2 Group X
IEC 60651:2001 Type 1 l or Type 2 l
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/MK:229 pre-polarized
Class 2 Instruments MK:216 pre-polarized

Microphone preamplifier
MV:200 removable preamplifier (All Versions)

Total measurement range:
20dB to 140dB RMS single 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
4GB (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 (32bit & 64bit)

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

Measurement functions[3]

CR:162A & CR:161A
Displayed functions
LXY, LXYMax, LXYMin, LXeq, LCPeak, LZPeak, LCeq-LAeq, LXE
Graph of short LAeq, LCPeak
Integrators 2 & 3: TWA, dose%, est dose%
Measurement run time

CR:162B & CR:161B
Displayed functions
LXY, LXYMax, LXYMin,,LXeq, LCPeak, LZPeak, LCeq-LAeq, LXE, LAleq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose%, est dose%

Stored functions
LXYMax & time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
Integrators 2 & 3: LAVG , TWA. %dose
Time history of LAVG

CR:162C & CR:161C
Displayed functions
LXY, LXYMax, LXYMin, LXeq, LCPeak, LZPeak, LCeq-LAeq, LXE, LAleq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose%, est dose%
Real-time octave band filters

Stored functions
LXYMax & time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
Integrators 2 & 3: LAVG , TWA. %dose
Time history of LAVG
Octave bands: overall Leq & Leq time history for each band
Measurement run time
Time & date of measurement start

CR:162D & CR:161D
Displayed functions
LXY, LXYMax, LXYMin, LXeq, LCPeak, LZPeak, LCeq-LAeq, LXE, LAleq
Graph of short LAeq, LCPeak
Measurement run time
Integrators 2 & 3: TWA, dose%, est dose%
Real-time octave band filters
NR & NC values & curves

Stored functions
LXYMax & time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
Integrators 2 & 3: LAVG , TWA. %dose
Time history of LAVG
Octave Bands: Overall Leq & Leq Time History for each band
NR & NC values & curves
Measurement run time
Time & date of measurement start

CR:1720 & CR:1710
Displayed functions
LXY, LXYMax, LXYMin
LXeq, LCPeak, LZPeak, LAPeak LCeq-LAeq, LXE, LAleq
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, LAleq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
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, LAleq
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, LAleq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
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:172B & CR:171B
Displayed functions
LXY, LXYMax, LXYMin
LXeq, LCPeak, LZPeak, LAPeak LCeq-LAeq, LXE, LAleq
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)
NR & NC values and curves
Leq LF (20Hz to 200Hz)
14 statistical Ln% values

Stored functions
LXYMax and time history of LXYMax
LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
Integrators 2 & 3: LAVG , TWA. % dose
Time history of LAVG
1:1 & 1:3 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, LAleq
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, LAleq
Time history of LAeq, LCeq, LZeq, LCPeak, LZPeak, LAPeak, LAleq
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 software and displayed on download.

Notes
1. Specifications are typical and may differ between Optimus+ Red GPS and Optimus+ Green GPS instruments.
2. Please contact Cirrus Research plc for details of the standards and approvals that are available on specific instrument types.
3. 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+ GPS 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	GPS
Optimus+ Red GPS	✓	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓
Optimus+ Green GPS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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