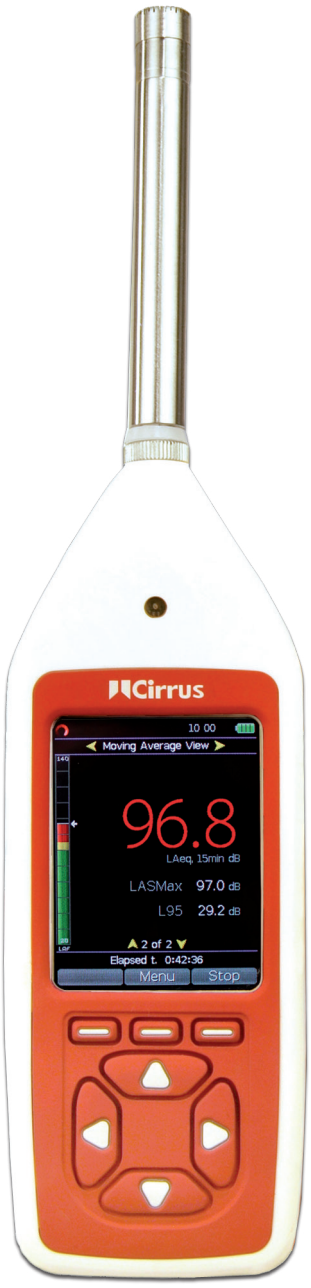
Cirrus optimus® sound level meters

CR:19xBE Data Logging Sound Level Meter with Moving Average



The CR:19xBE optimus sound level meters have been designed to meet the needs of entertainment venues where there is a requirement to measure 15 minute and 60 minute moving average values.

The high resolution screen shows the LAeq, LASmax and LA95 with simple, highly visible colour changes showing when the preset threshold levels are exceeded.

As well as the moving average function the optimus sound level meters also provide a range of standard noise parameters which allow the instruments to be used for other applications such as environmental impact assessments and occupational noise risk assessments.

Applications

- Noise control at live concerts
- Noise control in nightclubs
- External noise impact assessments
- Environmental noise measurements
- Occupational noise risk assessments

Features

- Moving Average L_{Aeq} over 15 minutes & 60 minutes
- Simple, clear colour changes show when preset thresholds are exceeded
- Multi-use Class 1 or Class 2 sound level meter
- Maximum Sound Level (Lmax)
- Minimum Sound Level (Lmin)
- Equivalent Continuous Sound Pressure Level (Leq)
- Peak Sound Pressure
- 14 Statistical Ln values
- Audio Recording (CR:193BE & CR:194BE versions)
- Real time 1:1 & 1:3 Octave Band filters (CR:193BE & CR:194BE versions)
- Simultaneous dB(A), dB(C) and dB(Z)
- Simultaneous Fast, Slow & Impulse
- VoiceTag audio note recording

Specifications

Applicable Standards
IEC 61672-1:2002 Class 1 or Class 2 Group X
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
1:1 & 1:3 Octave Band Filters to IEC 61260 & ANSI S1.11-2004

Microphone
Class 1 Instruments MK:224 pre-polarized
Class 2 Instruments MK:216 pre-polarized

Microphone Preamplifier
MV:200 Removable Preamplifier

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: L_{Aeq} L_F (20Hz to 200Hz) & L_{eq} L_F (20Hz to 200Hz)

Time Weightings
Fast, Slow & Impulse Measured Simultaneously

Display
High resolution OLED display.
Ambient light sensor & illuminated keypad
Moving Average display colour change:

15 L_{Aeq} minute: <85dB	White
15 L_{Aeq} minute: >85dB, <95dB	Yellow
15 L_{Aeq} minute: >95dB	Red
60 L_{Aeq} minute: <100dB	White
60 L_{Aeq} minute: >100dB	Red

Memory
4GB (32GB factory fit option)

AuditStore
Measurement verification data stored in secure memory

Time History Data Rates (Global settings)
10ms, 62.5ms, 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
Standard quality - 16kHz/16bit WAV format
Pre-Trigger function

Ln Statistical Values
14 independent statistical Ln values calculated from 1/16th L_{AF}
7 preset to L1.0, L5.0, L10.0, L50.0, L90.0, L95.0 & L99.0
7 user defined Ln values

Measurement Control
Measurement control with user selectable duration of manual, 1 min, 5 min, 10 min, 15 min, 30 mins, 1 hour, Lden
Automatic Synchronisation & 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 & 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 & keypad

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[1]

CR:191BE & CR:192BE
L_{XY}, L_{XYMax}, L_{XYMin}
L_{Xeq}, L_{CPeak}, L_{ZPeak}, L_{APeak} L_{Ceq}-L_{Aeq}, L_{XE}, L_{Aleq}
Graph of Short L_{Aeq}, L_{CPeak}
Moving Average View: $L_{Aeq15min}$, L_{ASmax}, L_{95}, $L_{Aeq60min}$, L_{ASmax}, L_{95}
Measurement Run Time
14 Statistical Ln% Values

Stored Functions
L_{XYMax} & Time History of L_{XYMax}
L_{Aeq}, L_{Ceq}, L_{Zeq}, L_{CPeak}, L_{ZPeak}, L_{APeak}, L_{Aleq} , $L_{A,15min}$, $L_{A,60min}$
Time History of L_{Aeq}, L_{Ceq}, L_{Zeq}, L_{CPeak}, L_{ZPeak}, L_{APeak}, L_{Aleq}
Ln Values: 14 independent statistical values
Time, date & duration of measurement

CR:193BE & CR:194BE
L_{XY}, L_{XYMax}, L_{XYMin}
L_{Xeq}, L_{CPeak}, L_{ZPeak}, L_{APeak} L_{Ceq}-L_{Aeq}, L_{XE}, L_{Aleq}
Graph of Short L_{Aeq}, L_{CPeak}
Moving Average View: $L_{Aeq15min}$, L_{ASmax}, L_{95}, $L_{Aeq60min}$, L_{ASmax}, L_{95}
Measurement Run Time
Real-Time 1:1 Octave Bands (Graphical & Numeric)
Real-Time 1:3 Octave Bands (Graphical & Numeric)
L_{eq} L_F (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}, L_{APeak}, L_{Aleq}
Time History of L_{Aeq}, L_{Ceq}, L_{Zeq}, L_{CPeak}, L_{ZPeak}, L_{APeak}, L_{Aleq} , $L_{A,15min}$, $L_{A,60min}$
1:1 & 1:3 Octave Bands: Overall L_{eq} & L_{eq} Time History for each band
NR & NC values & curves
Ln Values: 14 independent statistical values
Audio recording during measurement
Time, date & duration of measurement

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

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

Notes
1. For details of the displayed and stored parameters, please refer to the optimus user manual. All specifications, features and values are typical and are subject to change without notice.

Instrument Selection

Function/ Instrument	Class 1	Class 2	Sound Level Functions	Leq/Peak Functions	Moving Average 15min & 60min	Data Logging	Pause & Back Erase	VoiceTag Note Recording	Audio Recording	1:1 & 1:3 Octave Band Filters	Software Support	Measurement Kit
CR:192BE		✓	✓	✓	✓	✓	✓	✓			✓	CK:192BE
CR:191BE	✓		✓	✓	✓	✓	✓	✓			✓	CK:191BE
CR:194BE		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	CK:194BE
CR:193BE	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	CK:193BE

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, C or D 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
CR:514 Class 2 or CR:515 Class 1 Acoustic Calibrator
UA:237 90mm Windshield
CK:300 Carrying Case
User Manual & Certificates of Calibration
USB Data/Power Cable & NoiseTools Software CD

Cirrus Research plc
dedicated to noise measurement

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BGI

ISO 14001:2004
EMS 552104

ISO 9001:2008
FM 531001

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BSIF Registered Safety Supplier Confidence through Compliance

Institute of Acoustics sponsoring organisation