PRODUCT DATA

2250 Light – with Sound Level Meter Software BZ-7130 Optional Software: 1/1-oct. Frequency Analysis BZ-7131, 1/3-oct. Frequency Analysis BZ-7132 and Logging BZ-7133

2250 Light has been developed specifically for measuring occupational, environmental and product noise, while complying fully with all the relevant national and international standards.

Extensive user studies have been paired with state-of-the-art technology to make this analyzer a robust, effective and elegant tool for those applications.

Using the large, high contrast, touch screen interface, the analyzer can easily be set up to display and measure just what is needed from the extensive list of parameters provided by the analyzer.

2250 Light comes with Sound Level Meter Software installed, measuring all parameters simultaneously within its wide 120 dB dynamic range. For frequency analysis, add the 1/1- and/or 1/3-octave software module. For time profile investigation, add the Logging software module. The optional software modules install easily and work seamlessly with the Sound Level Meter Software.

Back in the office, USB connectivity lets you use your PC to archive, manage, view or even control 2250 Light, as well as export your results to software packages such as Microsoft® Excel and Brüel & Kjær Types 7815, 7820 or 7825 for post-processing and reporting.

Uses and Features

USES

- Environmental noise assessment, monitoring and complaints
- Occupational noise evaluation
- Selection of hearing protection
- Noise reduction
- Product quality control
- General purpose Class 1 sound measurements
- Real-time analysis of sound in 1/1- and 1/3-octave bands
- Analysis of time histories for broadband parameters and spectra (Logging)

FEATURES

- Large, high-resolution, touch-sensitive screen
- 'Traffic Light' status indicator
- Plug-in rechargeable Li-ion battery
- Data storage on plug-in memory cards
- 120 dB dynamic range – up to 140 dB
- Real-time frequency analysis in 1/1-octave bands
- Real-time frequency analysis in 1/3-octave bands
- Broadband and spectrum logging
- Logging profile display with markers
- Back-erase to delete unwanted noise events
- PC software included for archiving, export and reporting
- Robust and environmentally protected (IP 44)
- Upgrade to Type 2250 on exchange basis

Brüel & Kjær

Introduction

2250 Light combines renowned Brüel & Kjær measurement excellence and the Type 2250 platform's ease of use, in an efficient and versatile sound measurement instrument. Whether you are addressing workplace noise compliance, environmental noise assessment, or product noise certification, 2250 Light offers the functionality to meet your requirements. A unique user-interface makes your measurements easier to perform with results that are easier to analyze and report.

This data sheet describes the suite of software applications available for 2250 Light. All instruments come with the Sound Level Meter Software for 2250 Light (BZ-7130) included.

Note: 2250 Light can be upgraded to a Type 2250 Hand-held Analyzer, to include more features and applications such as advanced logging, sound recording or reverberation time software. Please refer to Type 2250 Product Data BP 2025 for more information. The upgrade is on an exchange basis, please contact you local Brüel & Kjær representative for details.

Applications

Workplace and Industrial Hygiene Noise Measurement Applications

2250 Light was developed with special interest for the measurement of workplace noise. The comfortable and secure design feels safe in your hand. With the display located relatively close to you, the buttons fall precisely where they need to be for a one thumb operated Start, Stop and Save. The 'Traffic Light' indicator surrounding the Start/Pause pushbutton gives you an immediate visual indication of measurement status – even in the brightest sunshine. The large, high contrast, touch screen/display, lets you select parameters on the display, and 2250 Light can memorise those setups for your next measurement.

As for occupational health noise parameters, nothing was left out. 2250 Light can measure Fast and Slow, A-weighted and C-Weighted SPLs simultaneously, along with a separately weighted peak detector, so that the values you need to specify hearing protection are immediately on the display. Parallel analysis allows you to compare a 3 dB exchange rate average measurement with a selectable alternate 4, 5 or 6 dB exchange rate, including separate dose, expected dose and exposure values.

2250 Light also offers three independent threshold peak event counters, along with simultaneous Fast, Slow and Impulse RMS detectors, to assess impulsive noise.

When you add the optional 1/1-octave frequency analysis software option, you are ready to instantly assess noise control and detailed hearing protection requirements for a surveyed location. With 2250 Light there is no filter switching, or range changing, all the octaves are measured at the same instant, along with the broadband A- and C-weighted values. For even more detail, add the 1/3-octave frequency analysis option. Instantly see the maximum and average levels across 31 frequency bands spanning three decades from 12.5 Hz to 16 kHz.

Sometimes noise levels in the workplace vary dramatically, and perhaps irregularly. To assess this kind of noise it is helpful to measure and analyse a noise profile – a measurement that shows how the sound varies with time.

The Logging option for 2250 Light provides this capability in a naturally intuitive way, using simultaneous views of the complete profile and a 'zoomed-in' 100-second 'window'. Set up to five different user-defined markers anywhere in the profile, to identify noise sources or events. If you have installed either the 1/1- or 1/3-octave real-time frequency analysis options, 2250 Light seamlessly integrates the spectrum information into the noise profile.

Back at your desk after a survey, or even a single measurement, archive the measurements using the included utility program, where you can view all the results of your measurement on a Windows® compatible PC. Use the same utility program to transfer measurement results to Excel to easily produce reports, or export the results directly to Brüel & Kjær's Protector Type 7825, where you can organise and analyze the company's noise and hearing conservation program. Type 7825 calculates noise exposure according to ISO 9612.2.

So, whether you are making a simple noise survey, or supplementing noise dose measurements for noise control or hearing protection selection, 2250 Light is an easy, yet powerful tool to make you more productive, and more confident in analysing hearing conservation programs.

Environmental Noise Measurement Applications

The tasks for environmental noise measurements are varied, so the instrument you pick for your measurements needs to be flexible, easy to configure, powerful and accurate. 2250 Light is all that, and more, making it ideal for a simple noise enforcement measurement one moment, then a complex environmental impact survey the next. 2250 Light is built on the core platform of the award winning design of Type 2250. It borrows the robust construction, intuitive touch screen interface, and legendary Brüel & Kjær measurement accuracy.

2250 Light with the standard Sound Level Meter software (BZ-7130) is ideal for a spot noise enforcement check. Use the large numeric display, press the conveniently located Start pushbutton, and when ready, press the same button to stop the measurement. Press the Save pushbutton, and you will not only be saving the results, but also the actual time of the measurement, its duration, and even the date and time for the last calibration of the instrument.

2250 Light can measure all the parameters needed for environmental noise, including dual frequency weightings, Fast, Slow, and Impulse Time Averaging, L_{eq}'s and a full range of statistical distributions. But just as important, you can set 2250 Light to display just the parameters you need, then save that display so 2250 Light powers-up, tailor-made for your use, every time.

For more involved environmental applications, you'll need to add the Logging option. Now you can set the instrument to record all, or up to ten selected measurement results at intervals from one second to one day, for a duration only limited by the size of the CF or SD memory card used in the external memory slots. The display offers two simultaneous views, one of

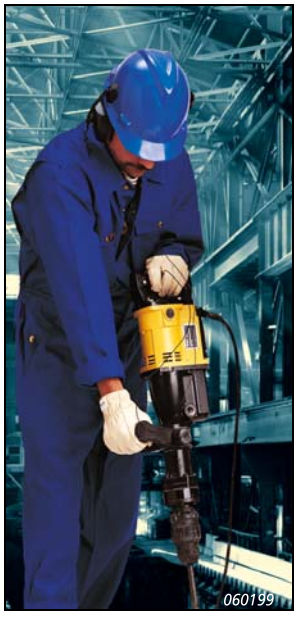
the complete profile and a ‘zoomed-in’ 100-sample ‘window’, that are intuitively linked by the cursor.

For the precise timing of noise events, an alternative ‘Fast Log’ view gives you either or both of the L_{AF} and L_{Aeq} results for 100 ms intervals. In either the fast log, or profile view, you can define up to five different markers anywhere in the profile, to identify noise sources or events. When you use the real-time frequency analysis options, 1/1-octave or 1/3-octave, the frequency spectrum average, maximum and minimum values can be logged along with the overall values. Save and view the noise profiles on your Windows® PC with the included utility program, or for easy analysis of the noise profile, export the whole measurement to Brüel & Kjær Environmental Noise Software (Type 7820 Evaluator or Type 7821 Evaluator Light) which have built-in calculation algorithms that allow you to produce compound sound level figures from several contributions. Some may have impulse or pure tone penalties, depending on which measurement standard you choose, for example, ISO 1996, DIN 45 645, TA Lärm, NF S 31-010, or BS 4142. (See Product Data BP 1752.)

You’ll take these measurements with the incredible 120 dB dynamic range of 2250 Light, allowing measurements from the low noise floor of the instrument to over 140 dB. Without a range switch to consider, you can now make measurements without fear of overload, and still capture the nuances of a silent night. 2250 Light is an ideal entry point to safe, easy and precise environmental noise measurements.

Product Noise Measurement

Brüel & Kjær long ago set the standard for product noise measurements. Now, whether you have a simple A-weighted sound limit requirement, or need to evaluate a 1/3-octave reverberation chamber sound power test, 2250 Light is scalable to your requirements.



2250 Light can be used as a hand-held device for easy portability, or it can be operated using your Windows® PC as an on-line USB controlled device in your laboratory. The user-defined templates make switching between applications easy.

The wide 120 dB dynamic range of 2250 Light eliminates concern for overloads, and you can set a preset measurement time to add consistency to your measurements. Use the built-in headphone style (3.5 mm) output jack to send the signal out to other measurement instrumentation. The included utility program makes it easy to keep track of results in an organised, archive structure. And, of course, there’s the Class 1 precision and reputation of Brüel & Kjær, giving you and your customers’ complete confidence in your measurements, while adding value to your products.

For comprehensive data management and post-process reporting, consider using 2250 Light data together with Type 7815 Noise Explorer, which supports a wide range of user-definable graphic and tabular displays.

Graphs and tables can be imported into standard Windows® applications such as word processors and spreadsheets.

Fig. 1 *Key features of 2250 Light*

Sound Level Meter Software for 2250 Light – BZ-7130

SLM Module

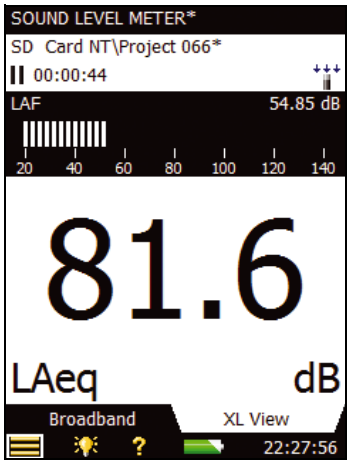


Fig. 2
The large numeric display - ideal for a spot noise enforcement check

2250 Light comes with the Sound Level Meter Software for 2250 Light included. This makes 2250 Light into a versatile broadband sound level meter; it complies with the latest international standard (IEC 61672–1) as well as previous international and national standards.

All quantities are measured at the same time. For example, A and C frequency weighted levels are measured simultaneously, and at the same time F, S and I time weightings are applied in parallel. In addition, Peak levels are measured. Full statistics are also computed on-the-fly. Combine this with the dynamic range exceeding 120 dB and you will never miss a beat! You get all the parameters in one attempt, under-range is non-existent and you will have difficulties provoking an overload. A full compliment of occupational health sound parameters are provided simultaneously, complying with national and international standards. The detailed list of available parameters can be found in the specifications section. You choose what you want on the display, but, at any time – during or after the measurement – all other parameters can be inspected and reported.

1/1- and 1/3-octave Frequency Analysis Software for 2250 Light – BZ-7131 and BZ-7132

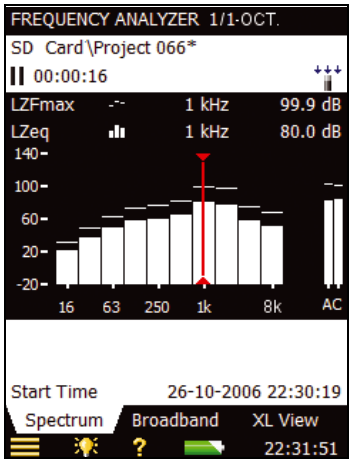


Fig. 3
Example of 1/1-octave frequency analysis. Note that two spectra are displayed simultaneously

1/1-octave Frequency Analysis Software for 2250 Light BZ-7131, and 1/3-octave Frequency Analysis Software for 2250 Light BZ-7132 are optional software modules. They allow you to make real-time measurements in 1/1- or 1/3-octave bands over a wide frequency range. This makes it a simple matter to obtain spectra in order to, for example, select hearing protection, qualify heat and ventilation systems, and assess tonality.

The following frequency ranges are available:

- 1/1-octave spectra (centre frequencies 16 Hz to 8 kHz)
- 1/3-octave spectra (centre frequencies 12.5 Hz to 16 kHz)

In each band you have a full and unrivalled dynamic range from the noise floor in that particular band to 140 dB. That is, a dynamic range generally in excess of 135 dB.

Spectra can be A-, B-, C- or Z-weighted. Five spectra are measured and stored and, in addition, two instantaneous spectra are available for display. Two spectra, for example, a minimum and maximum spectrum, can be superimposed on the display. All the broadband quantities measured by Sound Level Meter Software BZ-7130 are computed in parallel with the frequency analysis.

Logging Software for 2250 Light – BZ-7133

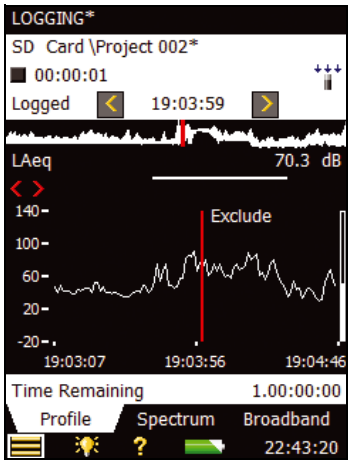


Fig. 4
Display showing part of a logging profile and an exclude marker

With the optional Logging Software enabled, 2250 Light becomes a versatile instrument for obtaining time histories. The Logging Software allows you to select freely among the broadband parameters and log them at intervals from 1 s to 24 h. At the same time L_{Aeq} and/or L_{AF} can be logged at 100 ms intervals.

If Frequency Analysis Software BZ-7131 or BZ-7132 is enabled, the Logging Software additionally lets you log spectra at the same 1 s to 24 h intervals.

Logging Software BZ-7133 incorporates a number of features designed to make difficult field work as manageable as possible.

Among the most salient of these features are the following:

- Five user-definable markers can be set on-the-fly in the profile. Use these, for example, to clearly indicate specific noise sources or events
- Markers can be set directly on the profile display using the stylus and the touch screen. Simply ‘tap and drag’ on the part of the profile you want to mark and select a marker from the drop-down list
- Three of the markers can also be set using the three marker pushbuttons
- Markers can even be set ‘after the fact’. The display covers the latest 100 samples (that is, 100 s of profile when logging at 1 s intervals, otherwise more) meaning that in most cases you can wait for the event (or disturbance) to stop before placing your marker. Alternatively, scroll back in the profile and set your marker
- Lets you browse easily between markers
- The profile display can be ‘frozen’ at any time (this happens automatically when you tap the screen), allowing you to work at ease

All markers are saved with the measurement, see Fig. 4. No further bookkeeping is required. When exporting data to, for example, 7821 Evaluator Light software for further analyses, markers are directly accessible on the profile.

Data is stored directly on SD or CF cards; for availability, please refer to the Ordering Information. Data can be directly read from the memory card by the included PC software BZ-5503 (see following section). This means that even large amounts of data can be quickly transferred to a PC.

In order to give an indication of the amount of memory required, some examples have been listed below. Values should be compared to the standard size of the SD cards used, which start at 128 Mbyte.

For convenience, values for 1 s logging periods during 24 h are given. Other values easily compute from these:

- Five broadband parameters, no statistics: 1 Mbyte
- All broadband parameters, one 100 ms parameter: 3 Mbyte
- All broadband parameters, no statistics: 4 Mbyte
- All broadband parameters, one 100 ms parameter, all 1/3-octave spectra: 30 Mbyte
- All broadband parameters with full statistics: 58 Mbyte
- All broadband parameters, one 100 ms parameter, all 1/3-octave spectra, full statistics: 86 Mbyte

Type 2250 PC Software – Utility Software for Hand-held Analyzers BZ-5503

Utility Software for Hand-held Analyzers BZ-5503 is an archiving tool for 2250 Light data and setups, and functions as the link between 2250 Light and post-processing or reporting software on a PC. It enables you to do the following:

- Control 2250 Light from a PC
- Manage and archive data on a PC
- Keep your 2250 Light software up to date

Overview of 2250 Light Software Features

The table that follows presents a summary of the features of each of the software modules available with 2250 Light. See Specifications for details.

Feature	SLM Software (Included)	1/1-octave Frequency Analysis Software	1/3-octave Frequency Analysis Software	Logging Software
120+ dB Dynamic Range – no need for range switching	●	●	●	●
Sound levels up to 140 dB with supplied Microphone Type 4950	●	●	●	●
IEC/ANSI SLM standards Type/Class 1	●	●	●	●
Frequency weightings A, B, C, Z (linear) and time weightings F, S, I	●	●	●	●
Free-field/diffuse-field correction	●	●	●	●
Pre-set time start/stop	●	●	●	●
Back-erase – last 5 seconds of measurement data	●	●	●	
Multi-language user interface	●	●	●	●
Context-sensitive help	●	●	●	●
Broadband statistics based on L_{Aeq}, L_{AF} or L_{AS}	●	●	●	●
Broadband frequency range: 5 Hz – 18 kHz	●	●	●	●
Remote control using Analogue or GSM modem	●	●	●	●
Transfer of data files while measuring (USB or modem)	●	●	●	●
1/1-octave spectra (centre frequencies 16 Hz to 8 kHz)		●		●[a]
1/3-octave spectra (centre frequencies 12.5 Hz to 16 kHz)			●	●[a]
Logging of all or selected broadband parameters and spectra				●
Logging period 1 s to 24 h				●
L_{Aeq} and/or L_{AF} logged every 100 ms				●
Profile display				●
Profile overview of entire measurement				●
Markers on profile display				●

a. If 1/1- or 1/3-octave Frequency Analysis Software is enabled

Compliance with Standards

CE, C-Tick	CE-mark indicates compliance with the EMC Directive and Low Voltage Directive. C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand.
Safety	EN/IEC 61010–1: Safety requirements for electrical equipment for measurement, control and laboratory use. UL 61010B–1: Standard for Safety – Electrical measuring and test equipment.
EMC Emission	EN/IEC 61000–6–3: Generic emission standard for residential, commercial and light industrial environments. CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits. FCC Rules, Part 15: Complies with the limits for a Class B digital device. IEC 61672–1, IEC 61260, IEC 60651 and IEC 60804: Instrumentation standards
EMC Immunity	EN/IEC 61000–6–2: Generic standard – Immunity for industrial environments. EN/IEC 61326: Electrical equipment for measurement, control and laboratory use – EMC requirements. IEC 61672–1, IEC 61260, IEC 60651 and IEC 60804: Instrumentation standards

Specifications – 2250 Light Platform

Specifications apply to 2250 Light fitted with Microphone Type 4950 and Microphone Preamplifier ZC-0032

SUPPLIED MICROPHONE
Type 4950: Prepolarized Free-field ½″ Microphone
Nominal Open-circuit Sensitivity: 50 mV/Pa (corresponding to –26 dB re 1 V/Pa) ± 2 dB
Capacitance: 12.5 pF (at 250 Hz)

MICROPHONE PREAMPLIFIER ZC-0032
Nominal Preamplifier Attenuation: 0.3 dB
Connector: 10-pin LEMO
Extension Cables: Up to 100 m in length between the microphone preamplifier and 2250 Light, without degradation of the specifications

SELF-GENERATED NOISE LEVEL
Typical values at 23°C for nominal microphone open-circuit sensitivity:

Weighting	Microphone	Electrical	Total
"A"	14.0 dB	12.9 dB	16.4 dB
"B"	12.9 dB	11.8 dB	15.4 dB
"C"	13.0 dB	13.4 dB	16.2 dB
"Z" 5 Hz–20 kHz	14.4 dB	19.2 dB	20.4 dB

KEYBOARD
Pushbuttons: 11 keys with backlight, optimised for measurement control and screen navigation

ON-OFF BUTTON
Function: Press 1 s to turn on; press 1 s to enter standby; press for more than 5 s to switch off

STATUS INDICATORS
LEDs: Red, amber and green

DISPLAY
Type: Transflective back-lit touch screen 240 × 320 dot matrix
Black and White Scheme
Backlight: Adjustable level and on-time

USER INTERFACE
Measurement Control: Using pushbuttons on keyboard
Setup and Display of Results: Using stylus on touch screen or pushbuttons on keyboard
Lock: Keyboard and touch screen can be locked and unlocked

USB INTERFACE
USB 1.1 OTG Mini B socket

MODEM INTERFACE
Hayes compatible GSM or standard analogue modems connected through the Compact Flash slot

HEADPHONE SOCKET
Connector: 3.5 mm Minijack stereo socket
Max. Peak Output Level: ± 1.4 V
Output Impedance: 32 Ω in each channel

EXTERNAL DC POWER SUPPLY REQUIREMENTS
Used to charge the battery pack in the instrument
Voltage: 8 – 24 V DC, ripple voltage < 20 mV
Current Requirement: min. 1.5 A
Power Consumption: < 2.5 W, without battery charging, < 10 W when charging
Cable Connector: LEMO Type FFA.00, positive at centre pin

BATTERY PACK
Type: Li-Ion rechargeable
Typical Operating Time: > 8 hours

STORAGE SYSTEM
Internal Flash-RAM (non-volatile): 20 Mbyte for user setups and measurement data
External Secure Digital Memory Card (SD-card): For store/recall of measurement data
External Compact Flash Memory Card (CF-card): For store/recall of measurement data

CLOCK
Back-up battery powered clock. Drift < 0.45 s per 24 hour period

WARM-UP TIME
From Power Off: < 2 minutes
From Standby: < 10 seconds

TEMPERATURE
IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat
Operating Temperature: –10 to + 50°C (14 to 122°F), < 0.1 dB
Storage Temperature: –25 to +70°C (–13 to +158°F)

HUMIDITY
IEC 60068–2–78: Damp Heat: 90% RH (non-condensing at 40°C (104°F)).
Effect of Humidity: < 0.1 dB for 0% < RH < 90% (at 40°C (104°F) and 1 kHz)

MECHANICAL
Environmental Protection: IP 44
Non-operating:
IEC 60068–2–6: Vibration: 0.3 mm, 20 m/s^2, 10 – 500 Hz
IEC 60068–2–27: Shock: 1000 m/s^2
IEC 60068–2–29: Bump: 4000 bumps at 400 m/s^2

WEIGHT AND DIMENSIONS
650 g (23 oz.) including rechargeable battery
300 × 93 × 50 mm (11.8 × 3.7 × 1.9″) including preamplifier and microphone

LANGUAGE
User Interface in Catalan, Croatian, Czech, Danish, English, Flemish, French, German, Hungarian, Japanese, Italian, Polish, Portuguese, Romanian, Serbian, Slovenian, Spanish, Swedish and Turkish

HELP
Concise context-sensitive help in Catalan, English, French, German, Italian, Japanese, Polish, Portuguese, Romanian, Serbian, Slovenian and Spanish

Software Specifications – Sound Level Meter Software for 2250 Light BZ-7130

Conforms with the following National and International Standards:
- IEC 61672–1 (2002–05) Class 1
- IEC 60651 (1979) plus Amendment 1 (1993–02) and Amendment 2 (2000–10), Type 1
- IEC 60804 (2000–10), Type 1
- IEC 61252, Electroacoustics – Specifications for Personal Sound Exposure Meters
- DIN 45657 (1997–07)
- ANSI S1.4–1983 plus ANSI S1.4A–1985 Amendment, Type 1
- ANSI S1.43–1997, Type 1

Note: The International IEC Standards are adopted as European standards by CENELEC. When this happens, the letters IEC are replaced with EN and the number is retained. 2250 Light also conforms to these EN Standards

CORRECTION FILTERS

For Microphone Type 4950:
Correct the frequency response to compensate for sound field and accessories:
Sound Field: Free-field or Diffuse-field
Accessories: None, Windscreen UA-0237

DETECTORS

Parallel Detectors on every measurement:
A- or B-weighted (switchable) broadband detector channel with three exponential time weightings (Fast, Slow, Impulse), one linearly averaging detector and one peak detector
C- or Z-weighted (switchable) as for A- or B-weighted
Overload Detector: Monitors the overload outputs of all the frequency weighted channels

MEASUREMENTS

X = frequency weightings A or B
Y = frequency weightings C or Z
V = frequency weightings A, B, C or Z
U = time weightings F or S
Q = exchange rate 4, 5 or 6 dB
N = number between 0.1 and 99.9

For Storage
Full statistics

For Display and Storage

Start Time	Stop Time	Overload %
Elapsed Time	L_{Xeq}	L_{Yeq}
L_{XE}	L_{YE}	L_{Ceq}-L_{Aeq}
L_{XSmax}	L_{XFmax}	L_{XImax}
L_{YSmax}	L_{YFmax}	L_{YImax}
L_{XSmin}	L_{XFmin}	L_{XImin}
L_{YSmin}	L_{YFmin}	L_{YImin}
L_{XIeq}	L_{YIeq}	L_{AIeq}-L_{Aeq}
L_{AFTeq}	L_{AFTeq}-L_{Aeq}	Time Remaining
$L_{ep,d}$	$L_{ep,d,v}$	E
Dose%	Proj. Dose%	#VPeaks (>NNNdB)
#VPeaks (>137dB)	#VPeaks (>135dB)	L_{Vpeak}
T_{Vpeak}	L_{avUQ}	TWA
TWA_V	DoseUQ%	Proj. DoseUQ%

Only for Display as Numbers or Quasi-analogue Bars

L_{XS}	L_{XF}	L_{XI}
L_{YS}	L_{YF}	L_{YI}
$L_{XS(SPL)}$	$L_{XF(SPL)}$	$L_{XI(SPL)}$
$L_{YS(SPL)}$	$L_{YF(SPL)}$	$L_{YI(SPL)}$
$L_{Vpeak,1s}$	L_{AN1} or L_{AUN1}	L_{AN2} or L_{AUN2}
L_{AN3} or L_{AUN3}	L_{AN4} or L_{AUN4}	L_{AN5} or L_{AUN5}
L_{AN6} or L_{AUN6}	L_{AN7} or L_{AUN7}	

MEASURING RANGES

Dynamic Range: From typical noise floor to max. level for a 1 kHz pure tone signal, A-weighted: 16.4 to 140 dB
Primary Indicator Range: In accordance with IEC 60651, A-weighted: 23.9 dB to 123 dB
Linearity Range: In accordance with IEC 60804, A-weighted: 21.8 dB to 140 dB
Linear Operating Range: In accordance with IEC 61672, A-weighted: 1 kHz: 25.0 dB to 140 dB
Peak C Range: In accordance with IEC 61672: 43.0 dB to 143 dB

SAMPLING FOR BROADBAND STATISTICS

The Statistics can be based on either L_{AF}, L_{AS} or L_{Aeq}:
- Statistics L_{AFN1-7} or L_{ASN1-7} are based on sampling L_{AF} or L_{AS}, resp., every 10 ms into 0.2 dB wide classes over 130 dB
- Statistics L_{AN1-7} are based on sampling L_{Aeq} every second into 0.2 dB wide classes over 130 dB

Full distribution saved with measurement

MEASUREMENT DISPLAYS

SLM: Measurement data displayed as numbers of various sizes and one quasi-analogue bar
Measured data are displayed as dB values, housekeeping data as numbers in relevant format.
Instantaneous measurement L_{XF} is displayed as a quasi-analogue bar

MEASUREMENT CONTROL

Manual: Manually controlled single measurement
Automatic: Pre-set measurement time from 1 s to 24 hours in 1 s steps
Manual Controls: Reset, Start, Pause, Back-erase, Continue and Store the measurement manually

BACK-ERASE

The last 5 s of data can be erased without resetting the measurement

MEASUREMENT STATUS

On Screen: Information such as overload and running/paused are displayed on screen as icons
Traffic Lights: Red, yellow and green LEDs show measurement status and instantaneous overload as follows:
- Yellow LED flash every 5 s = stopped, ready to measure
- Green LED flashing slowly = awaiting calibration signal
- Green LED on constantly = measuring
- Yellow LED flashing slowly = paused, measurement not stored
- Red LED flashing quickly = intermittent overload, calibration failed

CALIBRATION

Initial calibration is stored for comparison with later calibrations
Acoustic: Using Sound Calibrator Type 4231 or custom calibrator. The calibration process automatically detects the calibration level when Sound Calibrator Type 4231 is used
Electrical: Uses internally generated electrical signal combined with a typed-in value of microphone sensitivity
Calibration History: Up to 20 of the last calibrations made are listed and can be viewed on the instrument

SIGNAL MONITORING

The input signal can be monitored using an earphone/headphones connected to the headphone socket
Headphone Signal: Input signal can be monitored using this socket with headphones/earphones
Gain Adjustment: –60 dB to 60 dB

DATA MANAGEMENT

Project Template: Defines the display and measurement setups
Project: Measurement data stored with the Project Template
Job: Projects are organised in Jobs
Explorer facilities for easy management of data (copy, cut, paste, delete, rename, view data, open project, create job, set default project name)

PREFERENCES

Date, Time and Number formats can be specified

Software Specifications – 1/1-octave Frequency Analysis Software for 2250 Light BZ-7131 and 1/3-octave Frequency Analysis Software for 2250 Light BZ-7132

The specifications for BZ-7131 and BZ-7132 include the specifications for Sound Level Meter Software for Light BZ-7130. BZ-7131 and BZ-7132 add:

STANDARDS

Conforms with the following National and International Standards:
- IEC 61260 (1995–07) plus Amendment 1 (2001–09), 1/1-octave Bands, Class 0
- ANSI S1.11–1986, 1/1-octave Bands and 1/3-octave Bands, Order 3, Type 0–C
- ANSI S1.11–2004, 1/1-octave Bands, Class 0

CENTRE FREQUENCIES

1/1-octave Band Centre Frequencies (BZ-7131 only):
16 Hz to 8 kHz
1/3-octave Band Centre Frequencies (BZ-7132 only):
12.5 Hz to 16 kHz

MEASUREMENTS

X = frequency weightings A, B, C or Z

Spectra for Display and Storage

L_{Xeq} L_{XSmax} L_{XFmax}
L_{XSmin} L_{XFmin}

Spectra for Display Only

L_{XS} L_{XF}

Single Values

SIL PSIL SIL3
$L_{Aeq\ (20\text{-}200\ Hz)}$ (BZ-7132 only)

MEASURING RANGES

Dynamic Range: From typical noise floor to max. level for a pure tone signal at 1 kHz 1/3-octave: 1.5 to 140 dB
Linear Operating Range: In accordance with IEC 61260: ≤ 20.5 dB to 140 dB

MEASUREMENT DISPLAYS

Spectrum: One or two spectra superimposed + A/B and C/Z broadband bars
Table: One or two spectra in tabular form
Y-axis: Range: 5, 10, 20, 40, 60, 80, 100, 120, 140 or 160 dB. Auto zoom or auto scale available
Cursor: Readout of selected band

Software Specifications – Logging Software for 2250 Light BZ-7133

The specifications for BZ-7133 include the specifications for Sound Level Meter Software for 2250 Light BZ-7130. BZ-7133 adds:

MEASUREMENTS

Logging: Measurement data logged at pre-set periods into files on external SD- or CF-cards
Logging Period: From 1 s to 24 hours with 1 s resolution
Fast Logging: L_{AF} and L_{Aeq} can be logged every 100 ms, irrespective of logging period
Broadband Data Stored at each Logging Interval: All, or up to 10 selectable broadband data
Broadband Statistics Stored at each Logging Interval: Full distribution, or none
Spectrum Data Stored at each Logging Interval: All, or up to 3 selectable spectra (license for BZ-7131 or BZ-7132 required)
Logging Time: From 1 second to 31 days with 1 s resolution
Measurement Total: For the logging time, in parallel with logging: All broadband data, statistics and spectra (license for BZ-7131 or BZ-7132 required)
Automatic reboot and resume of operation in case of power failure

MARKERS

Five user-definable markers for on-line marking of noise sources or events anywhere in the profile.
Markers are set using the stylus on the touch screen, or the three marker pushbuttons

MEASUREMENT DISPLAYS

Profile: Graphical display of selectable measurement data versus time. Fast display of next or previous marker, Profile Overview of entire measurement
Y-axis: Range: 5, 10, 20, 40, 60, 80, 100, 120, 140 or 160 dB. Auto zoom or auto scale available
X-axis: Scroll facilities
Cursor: Readout of measurement data at selected time

STORAGE

Measurement data is stored on an external SD or CF memory card. For availability, please refer to the Ordering Information

Software Specifications – Utility Software for Hand-held Analyzers BZ-5503

BZ-5503 is included with 2250 Light for easy synchronisation of data between PC and 2250 Light. BZ-5503 is supplied on CD-ROM BZ-5298

ON-LINE DISPLAY OF 2250 LIGHT DATA

Measurements on 2250 Light can be controlled from the PC and displayed on-line with the PC, using the same user interface on the PC as on 2250 Light

DATA MANAGEMENT

Explorer: Facilities for easy management of Instruments, Jobs and Projects (copy, cut, paste, delete, rename, create)
Data Viewer: View measurement data (content of projects)
Synchronisation: Projects can be synchronised between PC and 2250 Light

EXPORT FACILITIES

Excel: Projects (or user specified parts) can be exported to Microsoft® Excel

Type 7810/12/15/16/20/25: Projects can be exported to Predictor Type 7810, Lima Type 7812, Noise Explorer Type 7815, Acoustic Determinator Type 7816, Evaluator Type 7820 or Protector Type 7825

2250 LIGHT SOFTWARE UPGRADES AND LICENSES

The utility software controls 2250 Light software upgrades and licensing of the 2250 Light applications

INTERFACE TO 2250 LIGHT

USB ver. 1.1 or Hayes compatible GSM or standard analogue modem

PC REQUIREMENT

Operating System: Windows® 2000/Windows® XP, Microsoft®.NET
Recommended PC: Pentium® III (or equivalent) processor, 128 Mbyte RAM, SVGA graphics display/adaptor, sound card, CD ROM drive, mouse, USB, Windows® XP

Ordering Information

2250 LIGHT PACKAGES

Type 2250-L-100	Hand-held Analyzer with Sound Level Meter Software BZ-7130
Type 2250-L-200	Hand-held Analyzer with Sound Level Meter Software BZ-7130 and 1/1-octave Frequency Analysis Software BZ-7131
Type 2250-L-300	Hand-held Analyzer with Sound Level Meter Software BZ-7130, 1/1-octave Frequency Analysis Software BZ-7131 and 1/3-octave Frequency Analysis Software BZ-7132
Type 2250-L-400	Hand-held Analyzer with Sound Level Meter Software BZ-7130 and Logging Software BZ-7133
Type 2250-L-500	Hand-held Analyzer with Sound Level Meter Software BZ-7130, 1/1-octave Frequency Analysis Software BZ-7131, 1/3-octave Frequency Analysis Software BZ-7132 and Logging Software BZ-7133

SOFTWARE MODULES AVAILABLE SEPARATELY

BZ-7131	1/1-octave Frequency Analysis Software for 2250 Light
BZ-7132	1/3-octave Frequency Analysis Software for 2250 Light
BZ-7133	Logging Software for 2250 Light

COMPONENTS INCLUDED WITH TYPE 2250-L

Type 4950	Prepolarized Free-field 1/2″ Microphone
ZC-0032	Microphone Preamplifier
AO-1476	USB Standard A to USB Mini B Interface Cable, 1.8 m (6 ft)
BZ-5298	Environmental Software, including BZ-5503 Utility Software for Hand-held Analyzers
ZG-0426	Mains Power Supply
QB-0061	Battery Pack
	Stylus

BASIC KIT FOR 2250 LIGHT (UA-1703)

FB-0691	Hinged Cover for Hand-held Analyzer
UA-0237	90 mm dia. Windscreen
DH-0696	Wrist Strap
KE-0441	Protective Cover for 2250 Light
UA-1654	5 Extra Styli

PLUS KIT FOR 2250 LIGHT (UA-1704)

FB-0691	Hinged Cover for Hand-held Analyzer
UA-0254	90 mm dia. Windscreens (6 pack of UA-0237)
UA-1673	Adaptor for Standard Tripod Mount
DH-0696	Wrist Strap
KE-0441	Protective Cover for 2250 Light
HT-0015	Earphones
UA-1654	5 Extra Styli
Type 4231	Sound Calibrator
UA-1251	Lightweight Tripod
UL-1009	SD Memory Card

ADVANCED KIT FOR 2250 LIGHT (UA-1705)

FB-0691	Hinged Cover for Hand-held Analyzer
UA-0254	90 mm dia. Windscreens (6 pack of UA-0237)
UA-1673	Adaptor for Standard Tripod Mount
DH-0696	Wrist Strap
KE-0441	Protective Cover for 2250 Light
HT-0015	Earphones
UA-1654	5 Extra Styli
Type 4231	Sound Calibrator
UA-1251	Lightweight Tripod
UL-1009	SD Memory Card
Type 7821	Evaluator Light

OCCUPATIONAL HEALTH KIT FOR 2250 LIGHT (UA-1706)

FB-0691	Hinged Cover for Hand-held Analyzer
UA-0254	90 mm dia. Windscreens (6 pack of UA-0237)
UA-1673	Adaptor for Standard Tripod Mount
DH-0696	Wrist Strap
KE-0441	Protective Cover for 2250 Light
HT-0015	Earphones
UA-1654	5 Extra Styli
Type 4231	Sound Calibrator
UA-1251	Lightweight Tripod
UL-1009	SD Memory Card
Type 7825	Protector

ACCESSORIES AND COMPONENTS AVAILABLE SEPARATELY

ANALYZER

ZG-0444	Charger for QB-0061 Battery Pack

CALIBRATION

Type 4231	Sound Calibrator (fits in KE-0440)
2250-CAI	Accredited Initial Calibration of Type 2250
2250-CAF	Accredited Calibration of Type 2250
2250-CTF	Traceable Calibration of Type 2250
2250-TCF	Conformance Test of Type 2250, with certificate

MEASURING

Type 3592	Outdoor Measuring Gear (see Product Data BP 1744)
AO-0441-D-030	Microphone Extension Cable, 10-pin LEMO, 3 m (10 ft)
AO-0441-D-100	Microphone Extension Cable, 10-pin LEMO, 10 m (33 ft)
KE-0440	Travel Bag
UA-0587	Tripod
UA-0801	Small Tripod
UA-1317	Microphone Holder
UA-1651	Tripod Extension for Hand-held Analyzer
UL-1009	SD Memory Card for Hand-held Analyzers
UL-1013	CF Memory Card for Hand-held Analyzers
UA-1654	5 Extra Styli

INTERFACING

Type 7815	Noise Explorer – data viewing software
Type 7821	Evaluator Light – data viewing and calculation software
Type 7825	Protector – software for calculation of Personal Noise Exposure

SERVICE PRODUCTS

2250-L-EW1	Extended Warranty, one year extension
2250-L-MU1	Upgrade of 2250 Light to Type 2250, performed at headquarters

HEADQUARTERS: Brüel & Kjær Sound & Vibration Measurement A/S · DK-2850 Nærum · Denmark
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Local representatives and service organisations worldwide

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Brüel & Kjær