

PRODUCT DATA

2238 Mediator with Enhanced SLM Software BZ 7125



Enhanced SLM Software BZ 7125 boosts the measurement capabilities of the 2238 Mediator dramatically. In addition to measuring RMS and Peak, the enhanced package simultaneously measures two RMS signals with independent frequency and time weightings. As a result, it is possible to measure all broad-band parameters, and most of them are available simultaneously.

The enhanced package also generates complete statistics and provides a back-erase function for on-the-spot editing. Other supported features include external DC input and input/output triggering, allowing a variety of sophisticated measurement set-ups.

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2238 Mediator

Uses and Features

USES

- Measuring environmental noise
- Making noise measurements in work areas
- Evaluating noise immission

FEATURES

- Two independently frequency weighted detectors measure RMS/RMS or RMS/Peak
- F, S and I weightings are simultaneously available for RMS signals
- Statistics include level distribution and seven user-selected L_N values.
- Back-erase function allows instant deletion of unwanted data
- The Mediator's two input/output sockets can be used for any combination of functions including external DC input (up to two), trigger input, trigger output, AC output and DC output

Multiple Parameters

The enhanced software package leaves nothing to be desired when it comes to broad-band parameters. By supporting a range of RMS/Peak or RMS/RMS weighting combinations on the Mediator's two independent detectors, the software adds a multitude of parameters to those provided by the basic Mediator package, forming a comprehensive set.

A Free Choice of RMS or Peak

While the one detector measures RMS values, the other can measure RMS or Peak, thus allowing simultaneous measurement of A- and C-weighted RMS, for example. With this set-up, it is possible to measure and display L_{Ceq} - L_{Aeq} directly instead of during post-processing.

Frequency and Time Weightings

The enhanced software supports A-, C- and Lin weightings for both detectors. In addition, F, S and I time weightings are available simultaneously in both RMS detectors, making it possible to measure six combinations at the same time.

Instant Statistics

The enhanced Mediator package also provides level and cumulative distributions, displaying your choice of L_N values (up to seven) during measurement. All statistics are saved with the measurement.

Friendly Interface

Despite the large number of parameters and measurement options available in the enhanced software, the program is entirely straightforward. With the Mediator's large screen and intuitively natural user interface, the process of setting up and making measurements is simple.

Impressive Connections

The enhanced software package puts the Mediator in good touch with its surroundings by supporting external DC input (one or two signals) and input/output triggering. With an external DC input, you can measure wind speed or any other DC signal while measuring noise parameters. The triggers are useful for synchronising measurements with external events — for example, starting a measurement when a compressor

switches on, or starting an external device when the measurement starts.

Easy Operation

Enhanced SLM Software BZ 7125 provides a variety of features that help you get your measurements right the first time, with minimal effort. Here are some of the highlights:

- **Back-erase:** When a disrupting noise occurs during a measurement, the back-erase function lets you delete it right away with a few quick keystrokes. You just pause the measurement and activate the back-erase function to delete the last 5, 10 or 15 s of data (user-selectable during measurement).
- **Pre-set Measurements:** The Mediator can be programmed with specific start and measurement times. In addition, automatic measurement sequencing facilitates easy generation of periodic reports.
- **Data Storage:** In addition to storing all standard measurement data (such as instrument set-up, start time and calibration data) the enhanced software records all non-instantaneous parameters and distributions. Through an efficient file management facility, stored data can be recalled to the display and printed or transferred to a PC for further processing.
- **Optional post-processing software:** The Protector™ Type 7825 and Evaluator™ Type 7820/7821 software packages turn your Enhanced SLM data into valuable analyses relevant to occupational and environmental noise measurements.

Specifications 2238 with BZ 7125

Specifications apply to the 2238 Mediator fitted with the supplied microphone and preamplifier and running Basic SLM Software (supplied as standard with each 2238 Mediator) and Enhanced SLM Software BZ 7125

STANDARDS:

Conforms with the following:

- IEC 651 – 1979 Type 1 I, EN 60651 Type 1 I
- IEC 804 – 1985 Type 1, EN 60804 Type 1
- Draft IEC 1672 / EN 61672 – April 1997 Class 1
- ANSI S1.43 – 1983 Type S1

SUPPLIED MICROPHONE:

Type 4188 Pre-polarized Free-field 1/2" Condenser Microphone

Nominal Sensitivity: – 30 dB

Frequency Range: 8 Hz – 16 kHz ± 2 dB

Capacitance: 12 pF

MICROPHONE PREAMPLIFIER:

ZC0030

Extension Cables: available in lengths of 3 m and 10 m

MEASURING RANGES:

Linear Operation Range: 80 dB, adjustable to give full-scale readings from 100 to 140 dB in 10 dB steps

Max. Peak Level: 3 dB above full scale reading

Upper Limit (RMS) for Crest Factor = 10: 17 dB below full scale reading

DETECTORS:

Simultaneous detection of RMS and Peak with independent frequency weightings

RMS: Three simultaneous exponential time weightings (Fast, Slow, Impulse) and a linear averaging detector. Selectable frequency weighting A, C or Lin

Peak: Selectable frequency weighting C or Lin

Overload Detector: Monitors all the frequency weighted channels

Exchange Rate: 3 dB. In addition, 4 or 5 dB can be selected

Criterion Level: Can be set to OFF or in the range 70 – 140 dB

Threshold Level: Can be set in the range 0 – 120 dB

INHERENT NOISE LEVEL:

This is due to the combination of electrical noise and microphone thermal noise at 20° C (68° F). Typical values with supplied microphone of nominal sensitivity (in dB):

Weighting	Electrical noise (2238)	Thermal noise (4188)	Combined Noise
"A"	14	14.5	17.4
"C"	17	13.2	18.5
Lin. 5 Hz – 20 kHz	22	14.2	23

DISPLAY:

128 × 64 dot matrix display with backlight

Measurement Display: Range and quasi-analogue bar, plus four measurement parameters that can be freely selected from all available parameters during measurements

Specifications (cont.)

MEASUREMENT CONTROL:

Manual control, or pre-set measurement time in the range 1 s – 24 h with automatic storage of measurement

Measurement Sequences:

The Mediator can be set up to make a sequence of individual measurements (up to 99) in immediate succession

Timers

The Mediator supports a total of four timers which allow set-up of measurement start times up to a month in advance

MEASUREMENTS:

The available measurement parameters are listed below. RMS and Peak measurements run in parallel with individual frequency weightings

Symbol Key:

- V: Frequency weighting C or L
- X: Frequency weighting A, C or L
- Y: Time weighting F, S and I
- Z: Time weighting F and S
- Q: Exchange rate = 4 or 5 dB

Detector 1	Detector 2
RMS	RMS
Stored	
L _{Xeq}	L _{Xeq}
L _{Xleq}	L _{Xleq}
L _{XYmax}	L _{XYmax}
L _{XYmin}	L _{XYmin}
L _{T5}	
L _{Tm5}	
L _{Aep,d}	
L _{AE}	
E _A	
L _{XZavQ}	
L _{XYN}	
Level distribution	
Dose% _X	
Dose% _{XZQ}	
L _{Aleq} - L _{Aeq}	
L _{Tm5} - L _{Aeq}	
L _{Ceq} - L _{Aeq}	
Overload%	
Underrange%	
Elapsed Time	
Instantaneous (display only)	
L _{XYInst}	L _{XYInst}
L _{XYp}	L _{XYp}

(continued)	
Detector 1	Detector 2
RMS	Peak
Stored	
L _{Xeq}	L _{Vpkmax}
L _{Xleq}	Number of peaks
L _{XYmax}	
L _{XYmin}	
L _{T5}	
L _{Tm5}	
L _{Aep,d}	
L _{AE}	
E _A	
L _{XZavQ}	
L _{XYN}	
Level distribution	
Dose% _X	
Dose% _{XZQ}	
L _{Aleq} - L _{Aeq}	
L _{Tm5} - L _{Aeq}	
Overload%	
Underrange%	
Elapsed Time	
Instantaneous (display only)	
L _{XYInst}	L _{Vpk}
L _{XYp}	
<p>Note 1: When both detectors are set to RMS, it is not possible to select the same frequency weighting for the two detectors.</p> <p>Note 2: Time weightings F, S and I are available simultaneously.</p> <p>Note 3: If the Aux 1 or Aux 2 socket is used for input, the signal(s) can be displayed and stored.</p> <p>Note 4: Values for statistics are sampled 40 times a second and are derived from the signal on Detector 1 with a preselected time weighting (F, S or I). The class width is 0.5 dB. Seven percentiles (L_{XYN,T}) are available during measurement at user-selectable levels (1% – 99%). A complete level distribution is stored.</p>	

CALIBRATION:

Can be performed using Sound Level Calibrator Type 4231 or Multifunction Acoustic Calibrator Type 4226. Initial calibration is stored for comparison with later calibrations

Calibration History: 20 latest calibrations

Specifications (cont.)

MEMORY:

2 Mbytes. Up to 500 measurements can be stored, including time stamp, complete set-up and calibration data

SERIAL PRINTER:

Measurement data can be printed on Portable Printer Type 2322 or on an IBM Proprinter-compatible printer

Aux 1 SOCKET:

Connector: 2 pin LEMO. Can be used as an AC output or a DC input for an external signal

AC Output Signal:

Range-adjusted AC output, unweighted or with the frequency weighting selected on RMS detector 1. Short-circuit protected

Output: 1 VRMS corresponding to full-scale indication

Max. Load: 10 kΩ || 1 nF

Output Impedance: Typically 100 Ω

DC Input:

Voltage Range: 0 to 4 V (max. -1 to 6 V)

Resolution: 5 mV (800 steps)

Aux 2 SOCKET:

Connector: 2 pin LEMO. Can be used as a DC output, a DC input for an external signal, a trigger input or a trigger output

DC Output Signal:

DC version of the signal on RMS detector 1 (Fast, Inst). Short-circuit protected

Output: 0 to 4.0 V DC (50 mV/dB)

Update Rate: 160 times per second

Max. Load: 10 kΩ || 1 nF

Output Impedance: Typically 100 Ω

DC Input:

Voltage Range: 0 to 4 V (max. -1 to 6 V)

Resolution: 5 mV (800 steps)

Trigger Input:

Voltage Range: 0 to 4 V (max. -1 to 6 V)

Trigger Level: ± 2 V

Trigger Output:

Level: 4 V

Duration: Throughout measurement

CLOCK:

Real-time (calendar)

SERIAL INPUT/OUTPUT:

Conforms to EIA/TIA 574 (RS232), coupled as Data Terminal Equipment (DTE). Cable is supplied with the 2238 Mediator

Connector: 9-pin D-type male

Baud Rates: 4800, 9600 and 19200. (38400 and 115200 for file transfer)

Word Length: 8 bits, no parity, 1 stop bit

Handshake: XON/XOFF, hardwired, modem

SETTLING TIME:

From Power On: < 10 s

BATTERIES:

Four 1.5 V LR6/AA alkaline cells

Lifetime (at room temperature): Typically > 8 hours

EXTERNAL DC POWER SUPPLY:

Voltage: regulated 7 to 14 V

Power: approximately 120 mA at 7 V

WEIGHT AND DIMENSIONS:

460 g (with batteries), 257 × 97 × 41 mm

LANGUAGE:

Each instrument is loaded with English, German, French, Italian and Spanish text. You can select any of these languages at any time

ENVIRONMENTAL EFFECTS:

Storage Temperature: -25 to +60°C (-13 to +140°F)

Operating Temperature: -10 to +50°C (14 to 122°F)

Effect of Temperature: < 0.5 dB (-10 to +50°C)

Effect of Humidity: < 0.5 dB for 30% < RH < 90% (at 40°C, 1 kHz)

CE	CE-mark indicates compliance with: EMC Directive and Low Voltage Directive.
EMC Emission	<p>EN 50081-1: Generic emission standard. Part 1: Residential, commercial and light industry.</p> <p>EN 50081-2: Generic emission standard. Part 2: Industrial environment.</p> <p>CISPR 22: Radio disturbance characteristics of information technology equipment. Class B Limits.</p> <p>FCC Rules, Part 15: Complies with the limits for a Class B digital device.</p>
EMC Immunity	<p>EN 50082-1: Generic immunity standard. Part 1: Residential, commercial and light industry. RF immunity implies that sound level indications of 45 dB or greater will be affected by no more than 0.5 dB.</p> <p>EN 50082-2: Generic immunity standard. Part 2: Industrial environment. RF immunity implies that sound level indications of 60 dB or greater will be affected by no more than 0.5 dB.</p>
<p>Note: The above conformance is guaranteed only when using accessories listed in this Product Data sheet.</p>	

Additional Specifications for 2238-B-002 (version with filter set installed)

With the filter set installed, $1/1$ -octave bands and $1/3$ -octave bands can be selected as frequency weightings for the RMS detectors

STANDARDS:

Conforms with the following:

- EN 61260/IEC 1260 (1995) Octave and $1/3$ -octave Bands Class 1
- ANSI S1.11-1986 Octave and $1/3$ -octave Bands, Order 3, Type 1D

MEASURING RANGES:

Two Additional Ranges: Full-scale readings of 80 and 90 dB

OCTAVE AND $1/3$ -OCTAVE BAND FILTERS:

Nominal Octave Band Centre Frequencies: 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz and 8 kHz

Nominal $1/3$ -octave Band Centre Frequencies: 20 Hz, 25 Hz, 31.5 Hz, 40 Hz, 50 Hz, 63 Hz, 80 Hz, 100 Hz, 125 Hz, 160 Hz, 200 Hz, 250 Hz, 315 Hz, 400 Hz, 500 Hz, 630 Hz, 800 Hz, 1 kHz, 1.25 kHz, 1.6 kHz, 2 kHz, 2.5 kHz, 3.15 kHz, 4 kHz, 5 kHz, 6.3 kHz, 8 kHz, 10 kHz and 12.5 kHz

BATTERIES:

Lifetime (at room temperature):

With filter selected: Typically > 6 hours

Ordering Information

Type 2238-B-001:

2238 Mediator sound level meter with Basic SLM Software and Enhanced SLM Software BZ 7125

Type 2238-B-002:

2238 Mediator sound level meter with Basic SLM Software and Enhanced SLM Software BZ 7125, plus $1/1$ -octave and $1/3$ -octave filter set

Accessories Included:

Type 4188: Prepolarized Free-field $1/2$ " Condenser Microphone
ZC0030: Microphone Preamplifier
AO 1386: 9-pole Cable with 25-pole Adaptor (for computer and serial printer)
KE0323: Shoulder Bag
UA 1236: Protective Cover
QB0013: 4 Alkaline Batteries

Optional Accessories

Type 7815: Noise Explorer™ Software
Type 7825: Protector™ Software
Type 7820/21: Evaluator™ Software
Type 4231: Sound Level Calibrator
Type 4226: Multifunction Acoustic Calibrator
Type 2322A: Portable Printer (European version)

Type 2322B: Portable Printer (UK version)

Type 2322C: Portable Printer (US version)

UA 1251: Tripod

UA 0237: Windscreen (90 mm)

AO 0560/0409: Microphone Extension Cable (10 m)

AO 0561/0408: Microphone Extension Cable (3 m)

UA 1254: Microphone Cable Holder (for tripod)

UL 0064: Interface Module (serial to parallel converter)

AO 0403: LEMO to BNC Cable (output/input cable)

ZG 0386: Power Supply (European version)

ZG 0387: Power Supply (UK version)

ZG 0388: Power Supply (US version)

KE 0325: Carrying Case (with insert for sound level meter, Calibrator Type 4231, Portable Printer Type 2322 and Tripod UA 1251)

Upgrades:

2238 MUF: $1/1$ -octave/ $1/3$ -octave Filter Set

BZ 7124: Logging SLM Software

BZ 7123: Frequency Analysis Software (requires 2238 MUF filter set)

Services Available with Delivery:

2238 CAF: Accredited Calibration

2238 CAI: Accredited Initial Calibration

2238 CAP: Accredited Calibration with Precalibration

Brüel & Kjær reserves the right to change specifications and accessories without notice