

Linewidth Analyzer

LWA-1k



HighFinesse
Laser and Electronic Systems

Wavelength range

1530 – 1565 nm

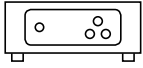
Required input power¹⁾

0.5 – 5 mW

Input power stability

5 %

1) Best performance with maximum input power. Noise sensitivity scales inversly with input power.



Analyzer Unit

Laser type	CW and single-mode
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Input type	FC/APC fiber
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Spectral and frequency noise specifications

Optical frequency resolution	2 kHz
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Frequency noise bandwidth	10 Hz – 10 MHz
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Frequency noise sensitivity	< 10 Hz/ $\sqrt{\text{Hz}}$ – 100 kHz/ $\sqrt{\text{Hz}}$
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Intrinsic linewidth range ³⁾	< 350 Hz – 1 MHz
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Effective linewidth ²⁾ range (β -separation)	2 kHz – 4 MHz
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Relative intensity noise limit	-150 dB/Hz
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Lineshape specifications

Effective linewidth ²⁾ range (FWHM)	2 kHz – 4 MHz
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Optical frequency resolution	2 kHz
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Dynamic range	50 dB
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Miscellaneous

Interface	USB 2.0 Type B
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Analog Output / error signal ⁴⁾	BNC ± 7.5 (50 Ω) ± 15 (high impedance) V, single ended
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Cutoff (highpass filter)	10 Hz, 1 kHz, 10 kHz, 100 kHz
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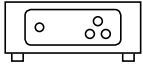
Dimensions	220 mm \times 334 mm \times 96 mm
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Weight	8 kg
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2) Effective linewidth: Combination of intrinsic linewidth and additional broadening mechanisms (thermal, electrical and acoustic noise). Determination by β -separation method (noise density spectrum) or curvefitting procedure (lineshape spectrum).

3) Intrinsic linewidth: Limited by fundamental quantum processes and laser design. Determined by the noise floor (white noise) of the frequency noise spectrum and calculated by: noise density (in Hz²/Hz) times π (rule of thumb). This value is most commonly denoted as “laser linewidth” by laser manufacturer.

4) Linewidth reduction/control: Analog output as error signal for use in combination with PID controller (not included) for frequency noise or RIN reduction.



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Digitizer Unit

Sample rate	62.5 (max.) Sa/s
Resolution	16 bits
Acquisition time	0.1 (typ.) s
Evaluation time	< 1 (typ.) s

Miscellaneous

Communication	USB 2.0 type B
Dimensions	210 mm × 200 mm × 74 mm
Weight	2 kg

Software

Operating system	Microsoft® Windows® (7 – 10), 64 Bit
CPU (minimum)	Intel® Core™ i5 or equivalent
Memory (minimum)	8 GB
Ports	USB 2.0 or higher
Graphical Evaluation options	Frequency noise density graph, lineshape graph, frequency deviation distribution (histogram)

Further Information

For further technical information, application examples, diagrams and for customisation of linewidth analyzers please contact:

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