

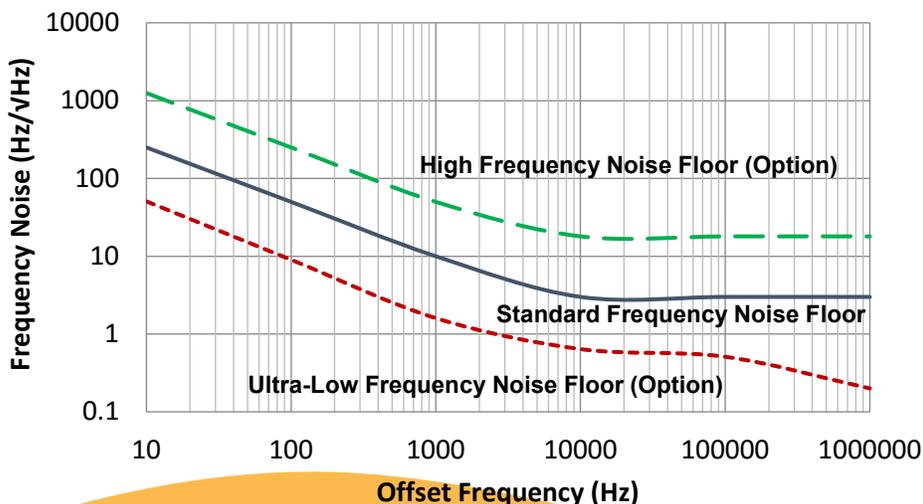
Using a homodyne methodology, HI-Q[®] Laser Linewidth / Phase Noise / RIN Analyzer offers a fully automated measurement of ultra-low phase noise CW laser sources.



*Factory PC option shown

HI-Q[®] Laser Linewidth / Phase Noise / RIN Analyzer is capable of rapidly measuring laser phase noise and estimating its Lorentzian linewidth down to < 1 Hz without complex setup or reference lasers normally required to make such a narrow linewidth measurement.

This homodyne-based system is unique in wideband measurement without requiring another low noise reference laser source. The complete system operates with ease, speed, and precision via a simple PC-based graphic user interface and API. No additional test equipment required. The unmatched ultra-low phase/frequency noise analyzer is scalable to multiple wavelength bands and is available with low relative intensity noise (RIN) measurement option.



FEATURES

- Ultra-Low Phase/Frequency Noise Measurement
- Fast Real-Time Measurement
- Intrinsic and Effective FWHM Linewidth Analysis
- No Low Noise Reference Source Required
- User Friendly Interface
- Remote Command API
- 3U x 19" Rack System
- Customizable Configurations, Future Upgrades, and Options

OPTIONAL CONFIGURATION

- Multiple Input Wavelength Bands from 400 nm to 2150 nm
- Ultra-Low or Dual Noise Floor
- RIN/Excess RIN Measurements
- Extended Offset Frequency Range up to 9 GHz
- Extended Input Power Range
- Frequency Monitoring
- Linewidth Narrowing
- Lorentzian Linewidth Monitoring
- Flexible Options and Upgrades

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RIDE THE WAVE OF INNOVATION

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PDS-0006_M

HI-Q[®] LASER LINEWIDTH/PHASE NOISE ANALYZER

OE4000



SPECIFICATIONS

1530 to 1565 nm

Frequency Noise Offset	10 Hz	100 Hz	1 kHz	1 MHz
▪ Ultra Low Noise Floor Option*	50 Hz/√Hz	10 Hz/√Hz	2 Hz/√Hz	0.2 Hz/√Hz
▪ Standard Noise Floor**	250 Hz/√Hz	50 Hz/√Hz	10 Hz/√Hz	3 Hz/√Hz
▪ High Noise Floor Option**	1250 Hz/√Hz	250 Hz/√Hz	50 Hz/√Hz	18 Hz/√Hz
* To measure laser under test (LUT) near the frequency noise floor requires LUT RIN < -100 dBc/Hz @ 10Hz, -130 dBc/Hz @ 1 kHz and -150 dBc/Hz @ 1 MHz				
** To measure laser under test (LUT) near the frequency noise floor requires LUT RIN < -100 dBc/Hz @ 10Hz, -130 dBc/Hz @ 1 kHz and -140 dBc/Hz @ 1 MHz				
Lorentzian/Instantaneous/Intrinsic Linewidth Sensitivity (<10 μs)	Ultra Low Noise Floor:		< 0.5 Hz	
	Standard Noise Floor:		< 30 Hz	
	High Noise Floor:		< 1 kHz	
FWHM Extended/Effective Linewidth Estimation Range (<10 ms)	Ultra Low Noise Floor:		3 Hz to 30 kHz	
	Standard Noise Floor:		1 kHz to 10 MHz	
	High Noise Floor:		10 kHz to > 100 MHz	
Dynamic Range	60 dB			
White Phase Noise Floor	-160 ± 2 dBc/Hz			
Optical Input Power Range	0 to +10 dBm (PM-FC/APC; SM & other type optional & wavelength dependent)			
Offset Frequency Range	10 Hz – 1 MHz; 1 Hz and up to 9 GHz Available (Option)			
Measurement Types	Frequency/Phase Noise, Spurious, Excess/RIN (Option), Cross-Correlation (Option)			
Resolution Bandwidth	0.1 Hz – 200 kHz; Frequency decade dependent			
Operating Interface	Monitor/Keyboard/Mouse (User supplied) via HDMI/USB from Internal Controller; OR via LAN/VPN using Command API or PC (User supplied WIN11 PRO+) Remote Desktop; OR Factory supplied PC Laptop w/pre-installed drivers/app (Option)			
Operating Temperature Range	15 °C to 35 °C			
Power	110 / 120 or 220 / 240 V _{ac} ; 50 / 60Hz			
Size	3U x 19" ; Rack Mount (Larger for high frequency options)			

OPTIONS

Input Power Range ¹	Up to 15 dB range no less than -10 dBm AND no higher than +15 dBm
Wavelength Ranges Available ²	400 – 535 / 535 – 740 / 740 – 935 / 965 – 1065 / 1000 – 1200 / 1260 – 1360 / 1360 – 1460 / 1460 – 1530 / 1530 – 1565 / 1565 – 1625 / 1647 – 1655 / 1655 – 1900 / 1900 – 1950 / 1950 – 2150 nm (Consult factory for custom or multi-band options)
Extended Offset Frequency Range	1 Hz – 10 MHz, 1Hz – 100 MHz, 100 Hz – 500 MHz, 100 MHz – 9 GHz
Relative Intensity Noise (RIN)/Excess RIN	-158/-168 ± 2 dB/Hz > 1 MHz (SM-FC/APC; Offset frequency matches system specification; Excess RIN excludes thermal and shot noises; see OE4001 Datasheet for higher frequencies)
Optical Frequency Monitoring	Refresh Rate > 10 Hz
Lorentzian Linewidth Monitoring	Rate > 0.1 Hz (LUT polarization deviation ≤ ±10 %, LUT optical power deviation ≤ ±1 dB)
Linewidth Narrowing	Frequency Noise >0.2 Hz/√Hz @ 1 MHz (User supplied external PID controller required)
Cross-Correlation Configuration	Lower System Noise Floor by >10 dB (AVG setting, Offset frequency, and LUT shot noise dependent)

Note: These specifications are subject to change without notice due to OEwaves commitment to continuous product improvement. Patents Pending. Unless otherwise noted, all system noise floors are optimum at maximum specified input power range and increases by 2 dB per 1 dB decrease in optical input power.

¹Standard input power range may be band dependent.

²Phase/Frequency Noise and RIN Floors are wavelength band dependent.



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