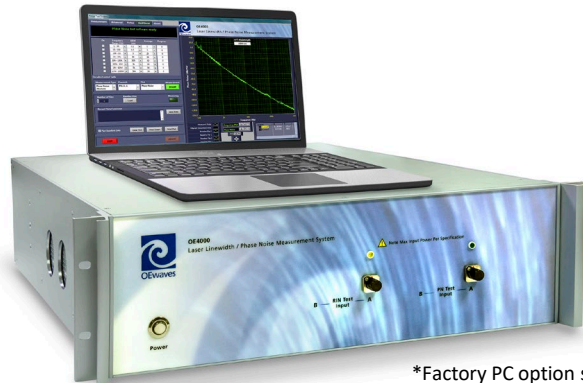


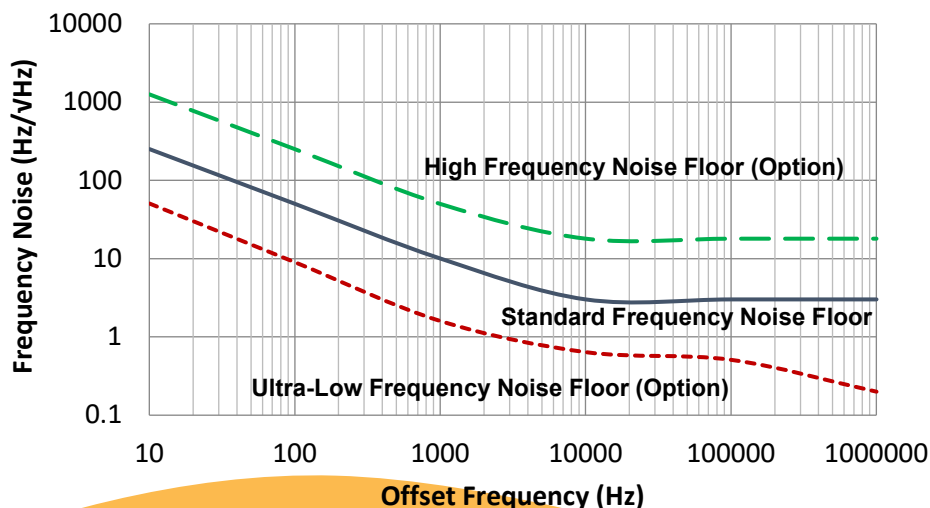
Using a homodyne methodology, HI-Q<sup>®</sup> Laser Linewidth / Phase Noise Analyzer offers a fully automated measurement of ultra-low phase noise CW laser sources.



\*Factory PC option shown

HI-Q<sup>®</sup> Laser Linewidth / Phase Noise Analyzer is capable of rapidly measuring laser phase noise and estimating its FWHM linewidth down to < 3 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. No additional test equipment required. The unmatched ultra-low phase/frequency noise analyzer is scalable to various input wavelength bands and is available with low relative intensity noise (RIN) measurement option.



## FEATURES

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

## OPTIONAL CONFIGURATION

- Multiple Input Wavelength Bands within 575 nm – 2100 nm
- Ultra-Low or Dual Noise Floor
- RIN Measurements
- Extended Offset Frequency Range up to 500 MHz
- Extended Input Power Range
- Frequency Monitoring
- Linewidth Narrowing
- Flexible Options and Upgrades

# HI-Q<sup>®</sup> LASER LINEWIDTH/PHASE NOISE ANALYZER

# OE4000



## SPECIFICATIONS

1530 – 1565 nm

Frequency Noise Offset	10 Hz	100 Hz	1 kHz	1MHz
▪ 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 Linewidth Sensitivity (<10 μs)	Ultra Low Noise Floor:	< 0.5 Hz		
	Standard Noise Floor:	< 30 Hz		
	High Noise Floor:	< 1 kHz		
FWHM Extended Linewidth Estimation Range (<10 ms)	Ultra Low Noise Floor:	3 Hz – 30 kHz		
	Standard Noise Floor:	1 kHz – 10 MHz		
	High Noise Floor:	10 kHz - > 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)			
Offset Frequency Range	10 Hz – 1 MHz			
Measurement Types	Frequency/Phase Noise, Spurious, RIN (Option)			
Resolution Bandwidth	0.1 Hz – 200 kHz			
Operating Interface	PC (WIN7 PRO+; User supplied) via LAN ; OR Monitor/Keyboard/Mouse (User supplied) via HDMI/USB ; OR Factory supplied PC Laptop (Option)			
Operating Temperature Range	15°C to 35°C			
Power	110 / 120 or 220 / 240 V <sub>ac</sub> ; 50 / 60Hz			
Size	3U x 19: Rack Mount			

## OPTIONS

Input Power Range <sup>1</sup>	Up to 15 dB range no less than -10 dBm AND no higher than +15 dBm
Wavelength Ranges Available <sup>2</sup>	575 – 710 / 740 – 935 / 965 – 1065 / 1000 – 1100 / 1260 – 1360 1360 – 1460 / 1460 – 1530 / 1530 – 1565 / 1565 – 1625 / 1647 – 1655 1900 – 1950 / 1950 – 2100 (Consult factory for custom or multi-wavelength range options)
Extended Offset Frequency Range	1Hz – 10MHz, 1Hz-100MHz, or 100Hz-500MHz
Relative Intensity Noise (RIN) Floor	-158 ± 2 dB/Hz > 1 MHz (SM-FC/APC; Offset frequency matches system specification; see OE4001 Datasheet for higher frequencies)
Optical Frequency Monitoring	Refresh Rate > 10 Hz
Linewidth Narrowing	Frequency Noise >0.2 Hz/√Hz @ 1MHz (User supplied external PID controller required)

**Note:** These specifications are subject to change without notice due to OEwaves ongoing development cycle. Patents Pending.

**Note:** 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.

<sup>1</sup>System noise floors are higher with low power range options. Consult OEwaves Sales for custom low power options and/or performance. Standard input power range may be band dependent.

<sup>2</sup>Phase Noise and RIN Noise Floors for systems with E, S and L telecom bands are 2 dB (typ.) higher than C-band specifications (3 dB with O-band configurations, 5 dB for 1647 – 1655 nm band); 8-12 dB higher for Visible region, 6-7 dB for 735nm-1.1μm, and 3-4 dB for 2 μm Input Wavelength Bands. Consult OEwaves Sales for other details.



+1.626.351.4200  
sales@oewaves.com  
www.oewaves.com

RIDE THE WAVE OF INNOVATION

465 N. Halstead Street, Suite 140 Pasadena, CA 91107

PDS-0006\_J