

# A0040A Optical Noise Analyzer

SYCATUS Corporation

Optical frequency noise captured as power spectrum density

White noise linewidth analysis functions

Analysis of lasers for digital coherent transmission and sensing systems

Novel fast sweep mode for real-time tuning of laser conditions

Delayed self-heterodyne interferometer mode for linewidth measurements

SYCATUS provides a new solution of A0040A Optical noise analyzer for optical frequency noise measurement. A0040A enables to investigate the optical frequency noise as power spectrum density.

The spectral purity of laser sources became the most critical concern along with the evolution of digital coherent transmission method. On the other hand, highly functional laser sources such as ITLA are facing the issue of optical frequency fluctuations arising from EMI by integration with electronics or complicated control scheme.

Laser linewidth measurement is the traditional method for the evaluation of the spectral purity of laser sources. However, the laser linewidth is insufficient for the analysis of the constituent of optical frequency noise. The spectrum analysis is mandatory instead of laser linewidth measurement as DSP in digital coherent transmission systems has limited bandwidth for frequency offset compensation.

A0040A Optical Noise Analyzer enables to capture optical frequency noise characteristics as power spectrum density by the combination of SYCATUS's unique method and Keysight X-series signal analyzer.

## SYCATUS A0040A Optical Noise Analyzer

A0040A Optical Noise Analyzer is a powerful tool for investigating the cause of optical frequency fluctuation with the ability of precise analysis of optical frequency noise characteristics of laser sources. A0040A separates white noise portion from  $1/f$  noise portion, which enables to derive white noise linewidth composed of only white noise.

A0040A Optical Noise Analyzer includes conventional laser linewidth measurement function. A0040A can share same Keysight X-series signal analyzer with A0010A RIN Measurement System. A0040A improves measurement convenience and investment efficiency as a totally integrated noise analysis solution for laser sources.

A0070A Optical Frequency Analyzer can be optionally added to A0040A Optical Noise Analyzer to provide an oscilloscope-like solution for real-time analysis of optical frequency modulation characteristics in FMCW LiDAR.

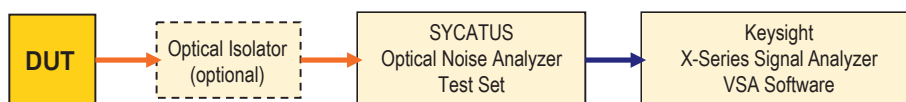
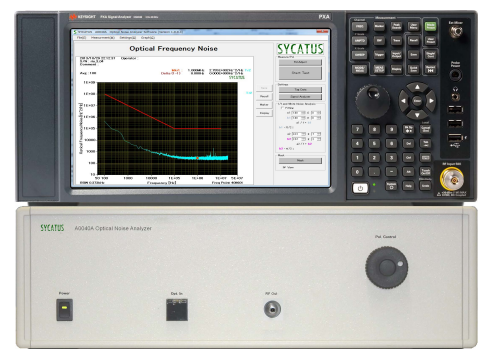


Fig. 1 A0040A System Configuration

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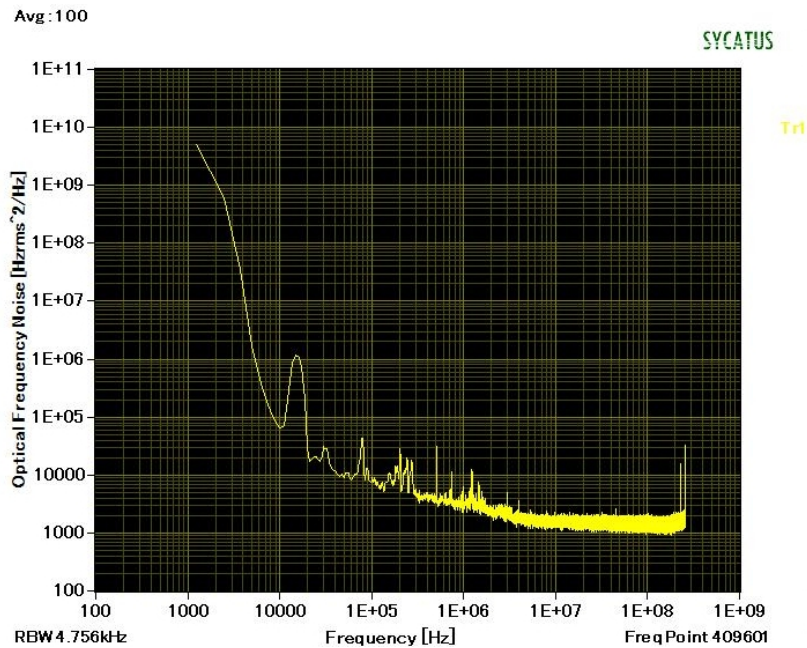


Fig. 2 Optical Frequency Noise Measurement Example



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## Specifications

Item	Specification
Optical Wavelength Range	1520 - 1620 nm, 1260 - 1360 nm or 1260 - 1620 nm
Optical Frequency Noise Analysis Bandwidth	Min.: 5 Hz Max.: 12.5 MHz, 20 MHz, 80 MHz, 127.5 MHz or 255 MHz (depending on signal analyzer's specification)
Optical Frequency Noise Noise Floor	6 mHz-rms <sup>2</sup> /Hz (@1 MHz, Standard Mode) 0.6 mHz-rms <sup>2</sup> /Hz (@1 MHz, High-Sensitivity Mode)
Input Optical Power Range	-7 dBm to +3 dBm
Measurement Time	< 20 s (Standard Mode, 50 averages) < 0.5 s (High-Speed Scan Mode, 50 averages)
Functions	Optical Frequency Noise Spectrum Analysis White Noise Linewidth Analysis Delayed Self-Heterodyne Linewidth Measurement Delayed Self-Heterodyne Linewidth Simulation A0070A Optical Frequency Analyzer (option)

## Ordering Information

### SYCATUS

Optical Noise Analyzer	A0040A
Optical Test Set	
System Software (Installed in Signal Analyzer)	
Remote Control Software (Available in Windows PC)	

### Keysight Technologies

X-Series Signal Analyzer	N9010B EXA, N9020B MXA or N9030B PXA
Vector Signal Analysis Software	89601200C

For more information on SYCATUS Corporation's products, applications or services, please send E-mail to:

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