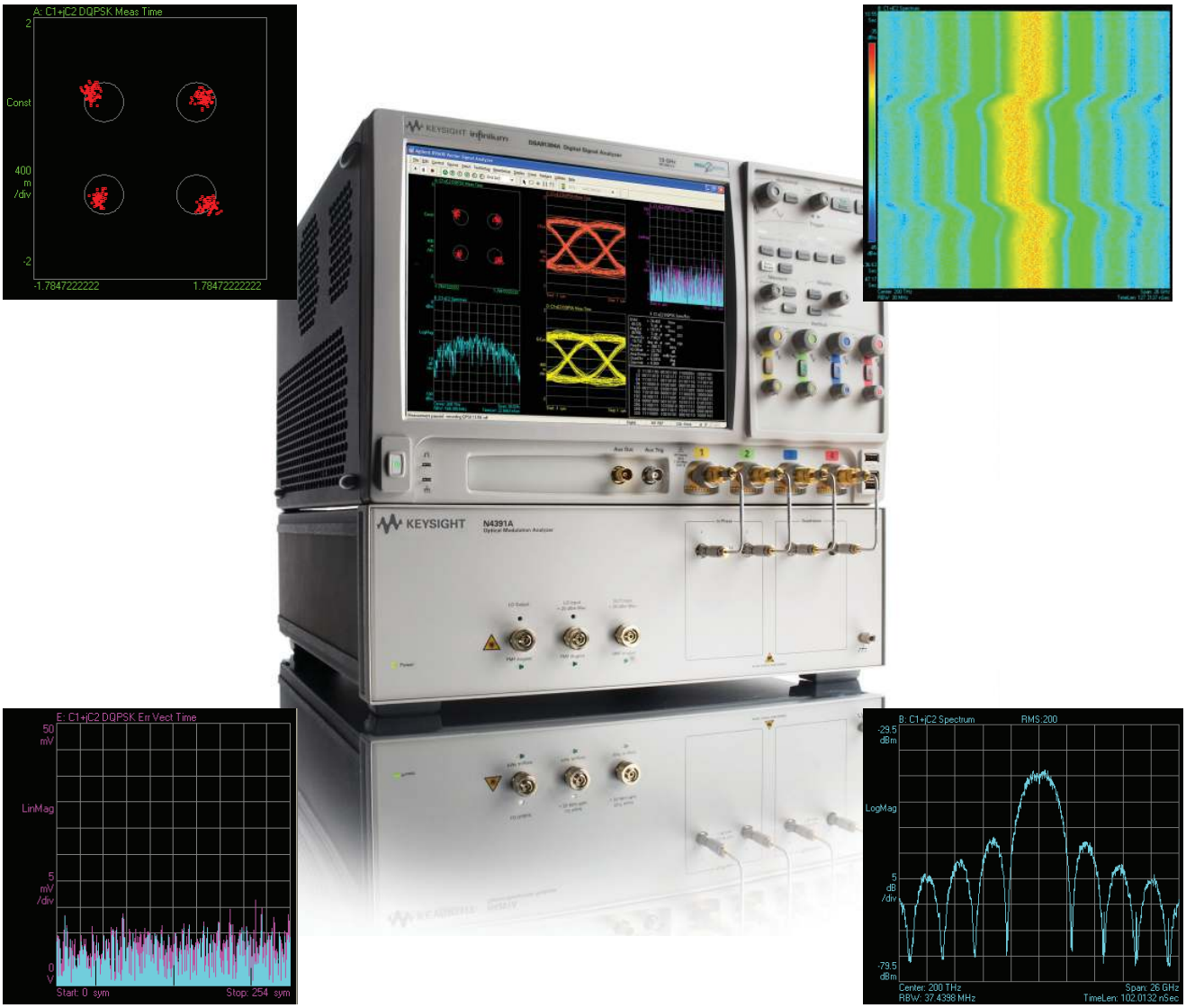
Keysight Technologies
N4391A Optical Modulation Analyzer

Get ready to characterize 40/100 Gbit/s optical transmitters operating with advanced modulation schemes using time-domain polarization-diverse coherent detection



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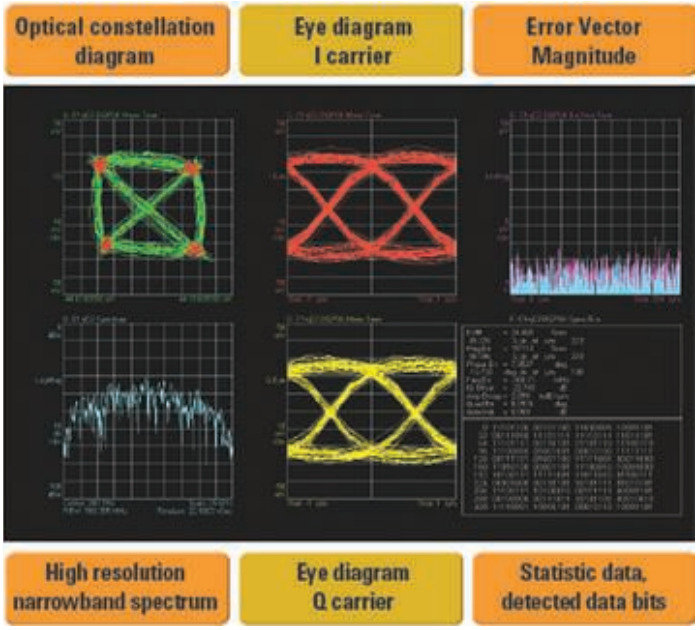
Get deep insight into modern 40/100 Gbit/s optical transmitter with new tools like constellation diagram and error vector analysis



The N4391A optical modulation analyzer opens tools well known in the RF world to the optic world. It is based on an timedomain coherent detection architecture with a 90000 Infiniium oscilloscope as data acquisition unit and the 89600 vector signal analysis software. In addition polarization multiplexed signals are supported with additional signal preprocessing.

Technical data	
Optical receiver	
Optical input wavelength range	1528 nm to 1630 nm
Average optical power signal input range	- 15 dBm to 0 dBm
Electrical bandwidth	> 37 GHz
Optical I-Q bandwidth	> 74 GHz
Local oscillator (internal)	
Optical input wavelength range	1528 nm to 1630 nm
Absolute wavelength accuracy	10 pm
Laser line width	100 kHz
System	
Maximum baud rate	25 Gbaud
Data aquisition real band width	13 GHz
Real-time sample rate	40 GSa/s on each channel
Excerp of supported modulation formats	
BPSK, 8BPSK, VSB -8, -16,	APSK 16/32 (12/4 QAM)
Offset QPSK, QPSK, Pi/4 QPSK	DQPSK, D8PSK
QAM 16-, 32- ,64-, 128-, 256-, 512-, 1028-	FSK 2-,4-,8,16 level

Features

- Wide-bandwidth time-domain based polarization-diverse coherent optical receiver, for state-of-the-art advanced modulation format analysis.
- Highest flexibility, through selection of numerous modulation formats, analysis tools and instrument configuration.
- In-depth analysis of optical transmitter and links with new analysis tools, such as constellation diagram with masks and error vector analysis.
- Optical constellation diagram with quantitative description of constellation errors offers precise description of the transmitter, making test results comparable.
- High sensitivity through coherent detection.
- Full support of DQPSK/DPSK with polarization multiplex.
- No clock input or hardware clock recovery necessary.
- Long pattern analysis available with up to 1 G/S data storage.
- Narrow-band high resolution spectral analysis.
- Modular hardware and software concept ensures flexible adoption to new requirements and protects investment.
- Open for future test capabilities like
  - -- BER test
  - -- Broad band high resolution spectrum analyzer

Related Literature	
5990-3509EN	Technical data sheet
5990-3748EN	Metrology of Optical Advanced Modulation Formats, White Paper
5989-1679EN	89600 Series Vector Signal Analysis Software, Technical Overview
5989-1121EN	Vector Signal Analysis Basics, Application Note
5965-7160E	Digital Modulation in Communication Systems - An introduction

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