QUANTIFI PHOTONICS®
A Teradyne Company



VISIQ™

COHERENT SIGNAL ANALYSIS SOFTWARE

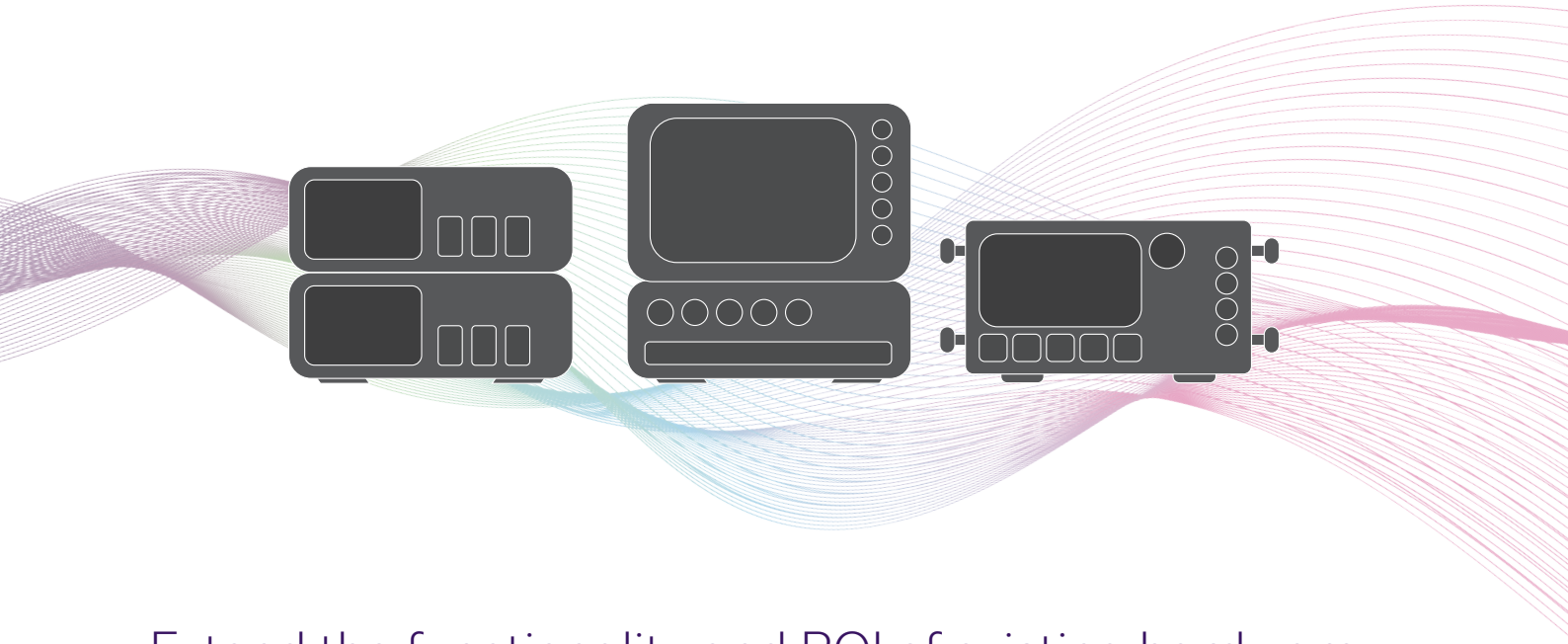
SPECIFICATION SHEET

quantifiphotonics.com

Introducing **VISIQ™**, the brand new coherent optical signal analysis software designed for today's pioneering optical engineers.

VISIQ is designed to make coherent signal analysis and DSP optimization as simple as possible. It features an intuitive user-interface that reduces the learning curve for new users, while still providing the ability for advanced users to fully customize the signal processing algorithms.

VISIQ is the first software platform to enable coherent signal analysis on high-performance real-time oscilloscopes from the three leading oscilloscope manufacturers.



Extend the functionality and ROI of existing hardware

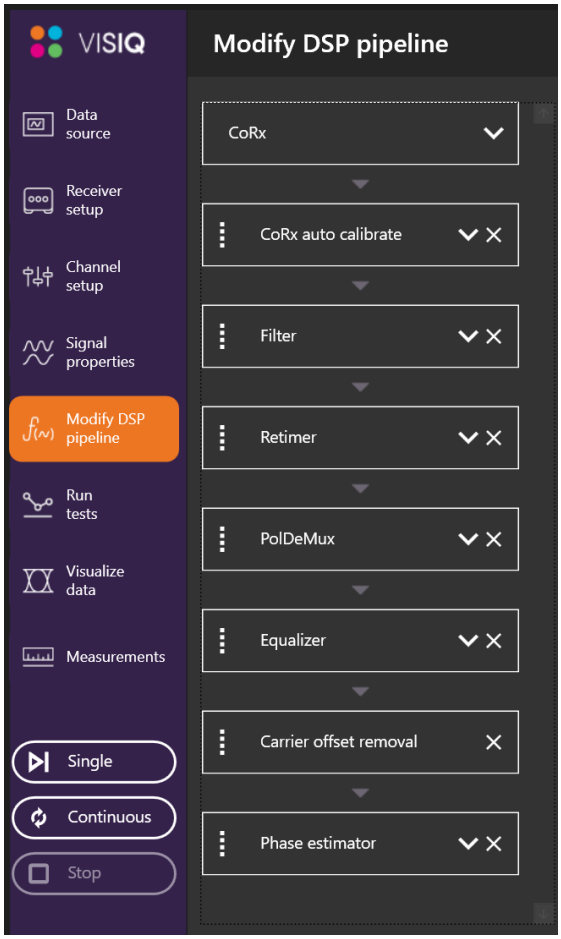
VISIQ is scope agnostic and can be used with popular real-time oscilloscopes providing a cost-effective upgrade for existing test hardware.

Compatible oscilloscopes include:

- Keysight Infiniium UXR-Series real-time oscilloscopes
- Keysight Infiniium V-Series real-time oscilloscopes
- Tektronix SX series real-time oscilloscopes
- Tektronix DX series real-time oscilloscopes
- TeledyneLeCroy LabMaster 10Zi real-time oscilloscopes
- TeledyneLeCroy LabMaster 9Zi real-time oscilloscopes

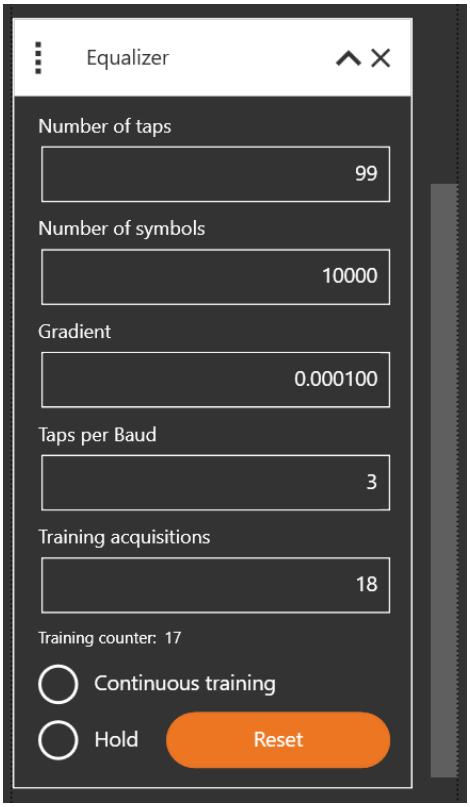
Easy-to-use, intuitive GUI

The modern user interface provides an intuitive presentation of the configuration and analysis workflow to make the coherent DSP simple to understand and use.



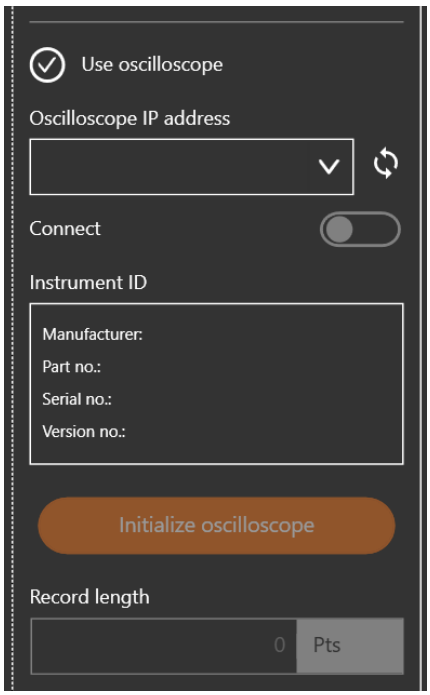
Powerful adaptive equalizers

The advanced equalizer algorithm can be set to train over multiple iterations to test the boundaries of DSP signal optimization and boost test efficiency.



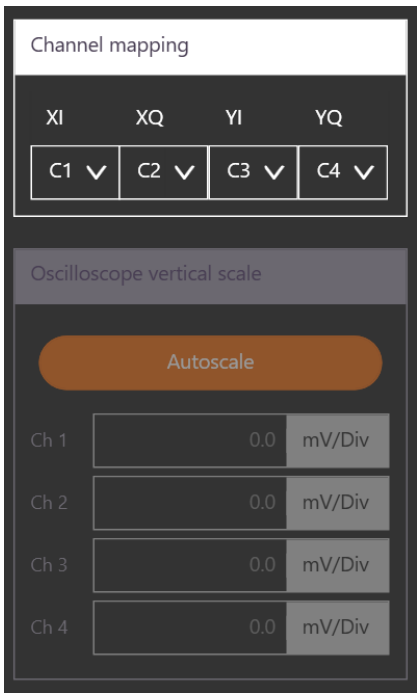
Auto-discovery of hardware

VISIQ automatically discovers compatible coherent receiver and oscilloscope hardware on the USB or ethernet network for a hassle-free setup.



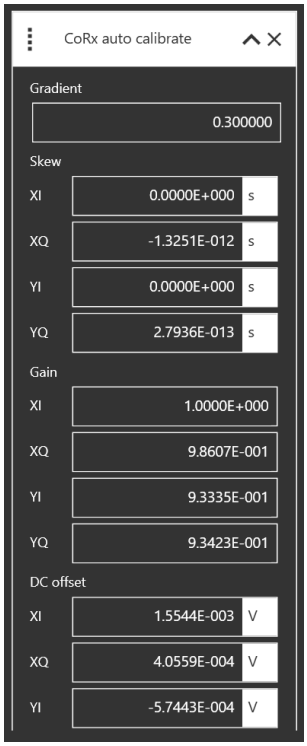
Integrated hardware control

Control oscilloscope, coherent receiver and the internal laser within VISIQ software interface, so you do not need to switch between software.



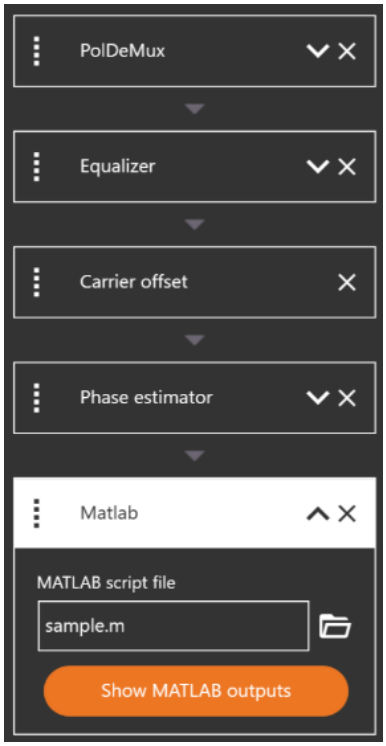
Dynamic CoRx auto-calibration

Automatic receiver calibration algorithm detects receiver IQ skew, gain imbalance and DC offset from the measured signal to remove them on-the-fly.



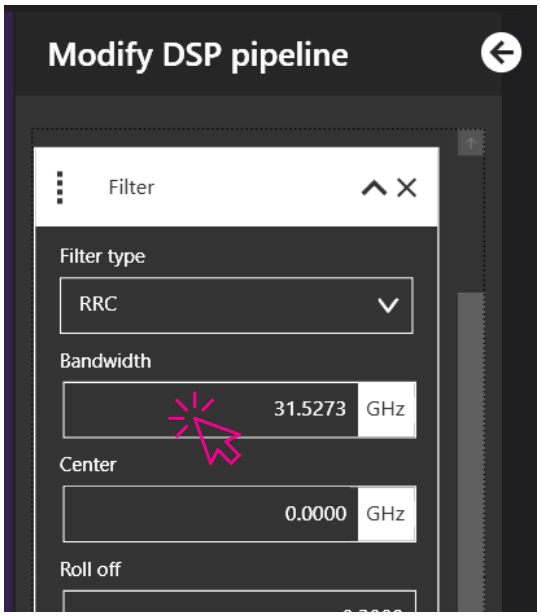
Modular MATLAB integration

Import your own MATLAB algorithm into the reconfigurable nodal DSP pipeline, giving you the freedom to place your code anywhere within the DSP chain.



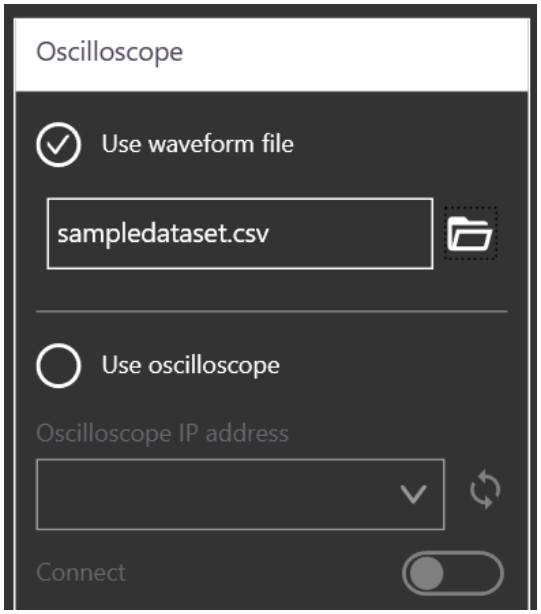
On-the-fly adjustment of DSP parameters

Modify DSP parameters while running in continuous acquisition mode for instant feedback.



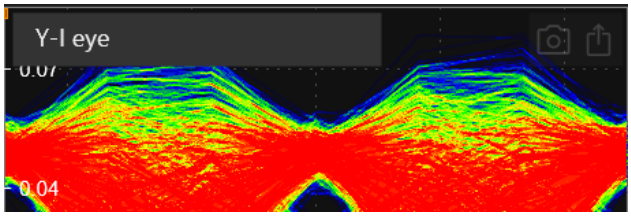
Save, recall and replay measurements

Conveniently save projects, graphs or series of raw waveforms and play them back for offline processing.



Save graphs as CSV or image file format

Save the graph you want to keep as a CSV file, so you can plot it again in a different software tool.



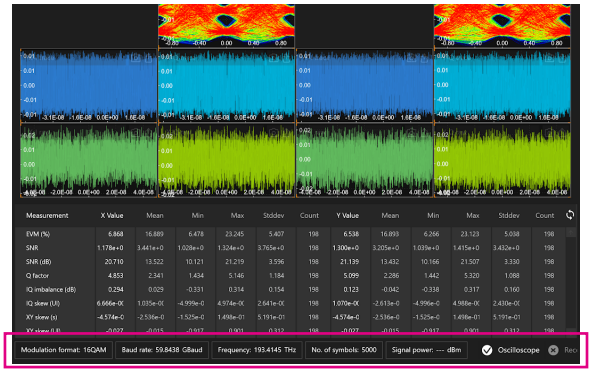
Supports SCPI and gRPC remote control

In addition to the intuitive GUI, VISIQ supports test automation via SCPI and GRPC command support.

gRPC
SCPI

Screenshot-friendly signal summary

The signal summary bar enables effective documentation by recording key signal information in every screen capture.



C-band and L-band coherent modulation analysis

Supports C- and L-band signal measurement when paired with Quantifi Photonics' IQRX coherent receiver hardware.



Intuitive layout

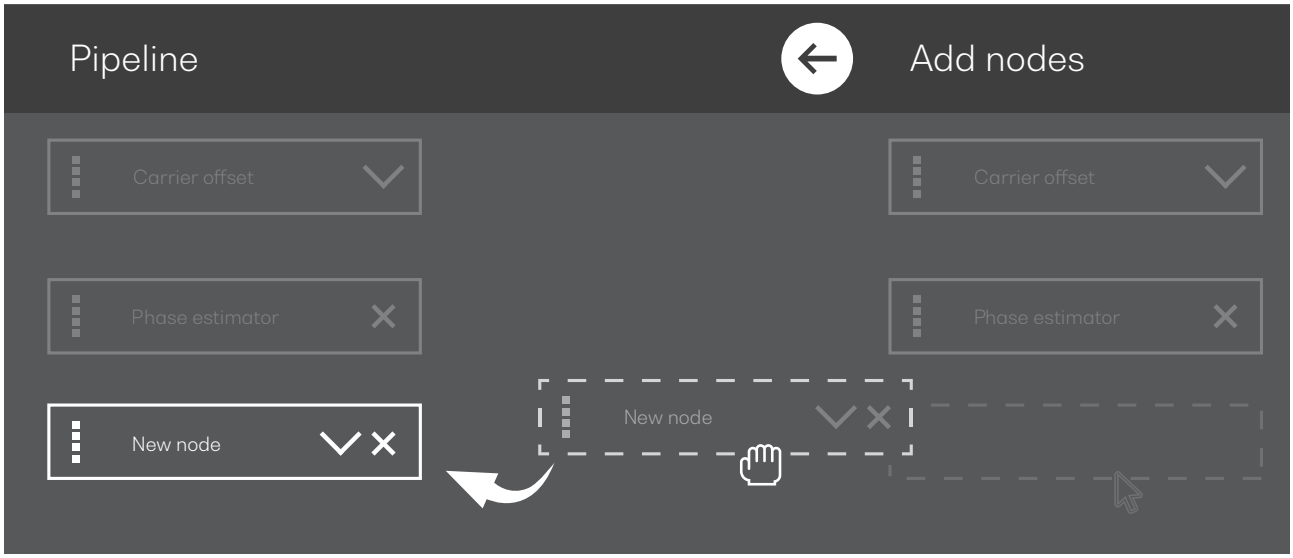
VISIQ's user interface has been carefully designed to offer an intuitive and user-friendly layout that empowers users to focus on their work & maximize productivity. No more struggling to navigate complex menus or searching for hidden functions; every action is easily accessible, saving time and reducing frustration. New users can quickly become proficient with the software, eliminating the need for extensive training sessions or drilling down into cumbersome user manuals.



1. Show/hide system menu
2. Configuration menu
3. Configuration control panel
4. Data acquisition control
5. Visualization area
6. Analysis measurements table
7. Signal summary panel
8. Connection status

Drag-and-drop DSP nodes

VISIQ is designed for ease-of-use. A convenient drag-and-drop interface for the built-in functional DSP nodes allows you to view and configure the full DSP chain in one place, minimizing configuration errors.

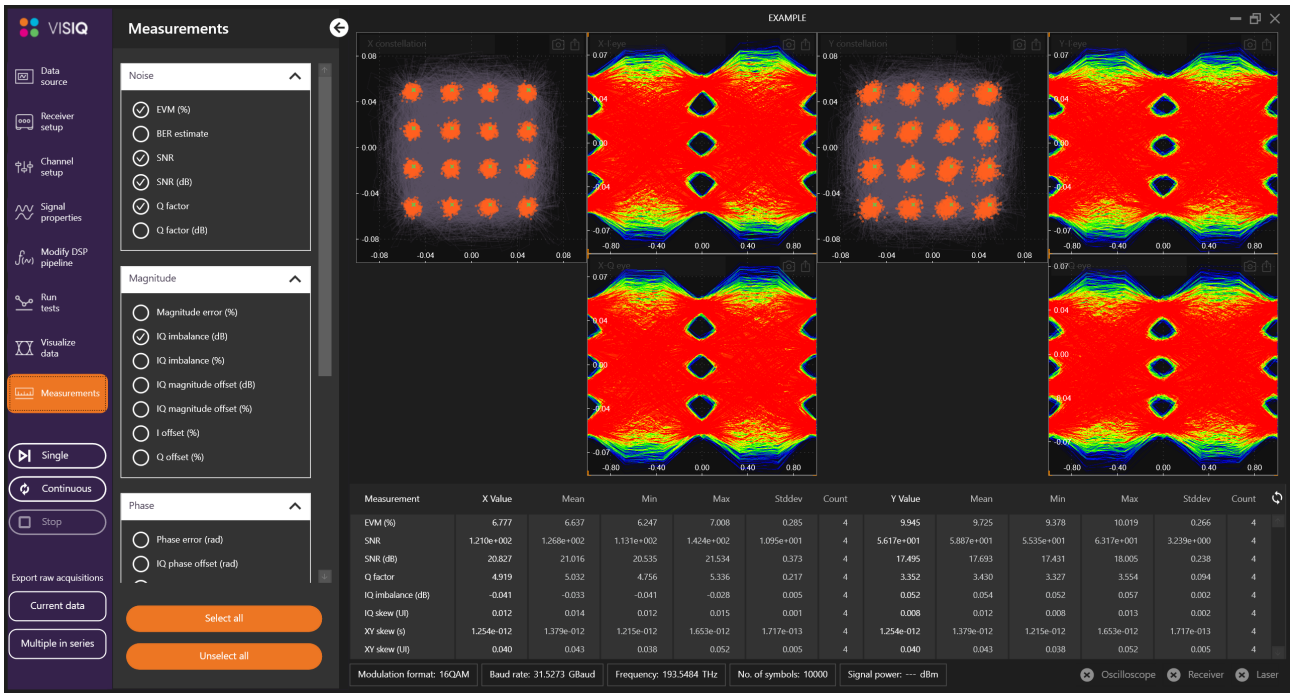


NODE	DESCRIPTION
Carrier offset	Estimates and compensates the residual frequency offset between the carrier and the local oscillator that may be present in your signal.
Chromatic dispersion	Compensates for fiber chromatic dispersion.
CoRx	Compensates coherent receiver imperfections such as skew, frequency response, and IQ phase error.
CoRx auto calibrate	Manages automatic calibration of the coherent receiver.
Equalizer	Calculates the complex Finite Impulse Response (FIR) taps. It attempts to correct the frequency response of the signal by training over a defined number over symbols.
Filter	This node works as a digital filter that modifies the frequency components present in the signal.
Find Baud rate	Detects the Baud rate of the signal and replaces the Baud rate setting in the Stream properties with the discovered Baud rate.
IQ offset removal	Corrects IQ offsets that may be present on the signal.
MATLAB	Enables the user to add a MATLAB script to the pipeline*
Nonlinear correction	Corrects gain imbalances, IQ offsets as well as non-linear distortion present on the signal.
Phase estimator	Calculates and removes the phase errors over time that may be present in the signal.
PolDeMux	Demultiplexes the two polarizations of the carrier.
Retimer	Retimes the input to a particular sample per Baud. Interpolation is used to create traces of samples per Baud higher than the input. The algorithm also calculates the skew between x pol and y pol that may be present.

*Requires the user to have an existing MATLAB license and MATLAB version 2014a or newer installed on their PC.

Measurements

VISIQ can perform a comprehensive range of measurements for full characterization of coherent signals, which can be displayed or hidden from the measurements table.



Noise

- EVM
- BER estimate
- SNR
- SNR (dB)
- Q factor
- Q factor (dB)

Magnitude

- Magnitude error (%)
- IQ imbalance (dB)
- IQ imbalance (%)
- IQ magnitude offset (dB)
- IQ magnitude offset (%)
- I offset (%)
- Q offset (%)

Phase

- Phase error (rad)
- IQ phase offset (rad)
- IQ phase error (deg)

Time

- IQ skew (s)
- IQ skew (UI)
- XY skew (s)
- XY skew (UI)
- PMD (s)

Frequency

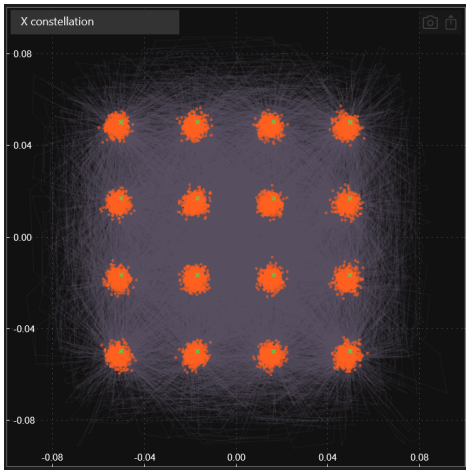
- Frequency offset (Hz)
- Line width (Hz)
- Baudrate (Hz)

Visualizations

VISIQ offers many of the visualization tools that the user will be familiar with. The visualization window can be customized to display different visualizations including:

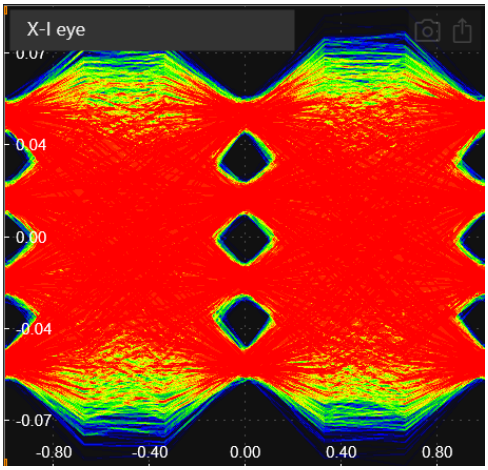
Constellations

Processed signal displayed as an I-Q plot. Show or hide symbols, reference symbols and trajectories.



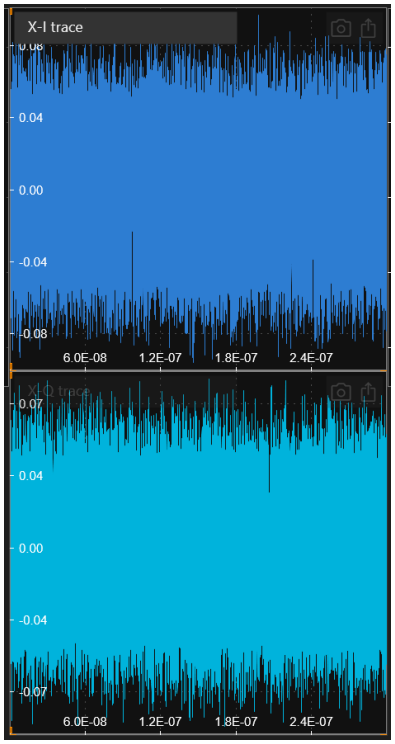
Eye diagrams

Processed signal separated out to I and Q components and displayed as eye diagrams.



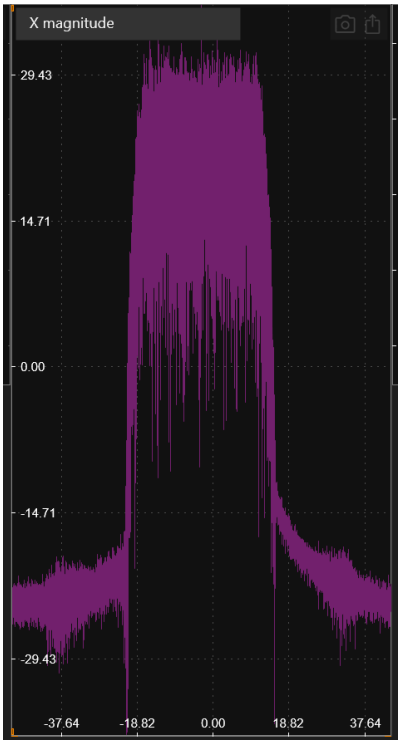
Trace diagrams

Processed signal separated out to I and Q components and displayed as time series plots.



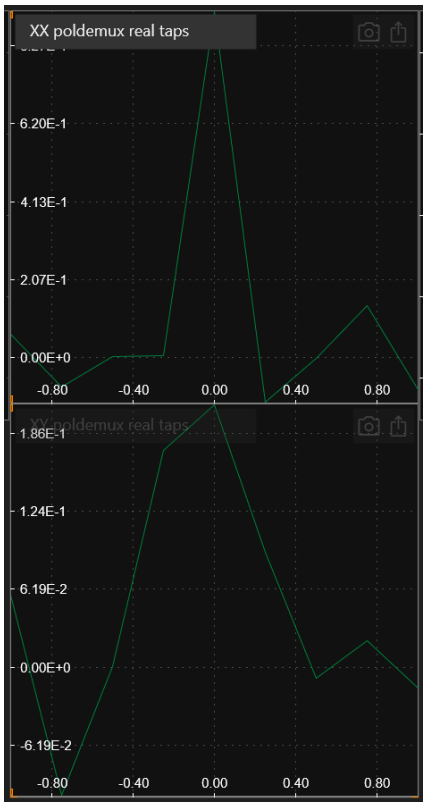
Spectral diagrams

Spectral plots of raw and processed base-band signal, displayed as magnitude, phase and total spectra.



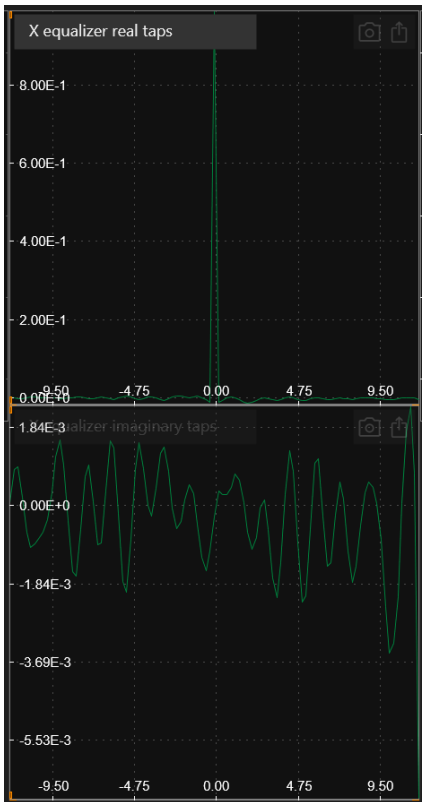
PolDeMux taps

Displays the optimized tap weights from the Polarization demultiplexer node.



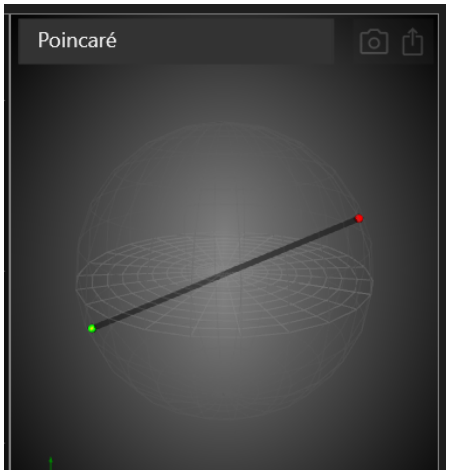
Equalizer taps

Displays the optimized tap weights from the Equalizer node.

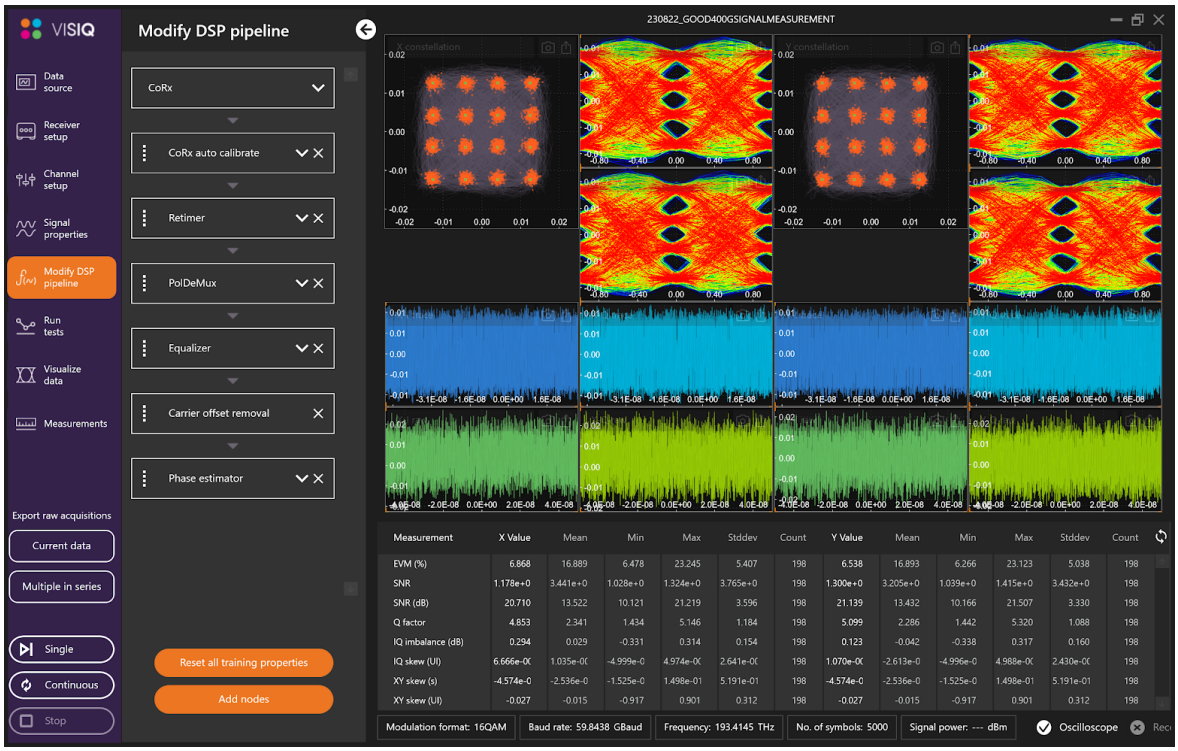


Polarization diagrams

The state of polarization of the signal is visually represented on the Poincare sphere, where the three Stokes parameters are plotted in Cartesian coordinates.



Analysis example



400ZR DP-16QAM running at 59.8 GBaud

MINIMUM PC REQUIREMENTS

- Operating system: Microsoft Windows® 10 (64-bit)
- Processor: Intel® CoreTM i5 or faster CPU
- Memory: 8 GB or greater

ORDERING INFORMATION

VISIQ - 1001 - P

License type
P = Perpetual license, single user

Versatile test modules for a wide range of requirements and applications.

Tunable Laser Source



Versatile telecom laser sources with full tunability across C or L bands. Narrow 100 kHz linewidth, up to 16.5 dBm of power, optional whisper mode to disable frequency dither.

Fixed Wavelength Laser Source



DFB laser sources available in a range of wavelengths and powers up to 24 dBm. Supports SMF, MMF and PMF.

Swept, Tunable Continuous Wave Laser



Swept, tunable continuous wave (CW) laser source with 0.01 dB power stability and 400 nm/s high-speed scan rate for R&D and production testing.

Superluminescent Diode Broadband Light Source



Super-luminescent LED light source with high output power, large bandwidth and low spectral ripple and various wavelengths.

ELSFP-Compliant External Laser Source



Uses ELSFP-compliant pluggable modules to provide 8 channels of CW optical power at 1310 nm up to 24 dBm.

Variable Optical Attenuator (VOA)



Fast attenuation speed with low insertion loss and built-in power monitoring. Operates in fixed attenuation or constant output power modes. Support SMF, MMF and PMF.

Polarization Controller & Scrambler



High-speed automated polarization control with broad wavelength coverage from 1260 to 1650 nm, low insertion loss and back reflection. Full remote control via intuitive GUI, LabVIEW or SCPI.

Optical Power Meter



Fast terminating or inline monitoring of optical signal power from -60 to +10 dBm across 750 to 1700 nm wavelengths. Model with logarithmic analog output for applications such as silicon photonics fiber alignment.

Optical Spectrum Analyzer (OSA)



Cost-effective, spectral measurement in a compact module with built-in analysis for: SMSR, OSNR & spectral width. Targeted wavelengths for specific applications in O band, C band & L band.

Optical-to-Electrical Converter



High bandwidth, broadband O-to-E converter. Choose from 1 or 2 channels, AC or DC coupling and various conversion gain and operating wavelength ranges.

Optical Switch



Proven reliability and fast switching time. Wide variety of switch configurations and models support SMF, MMF and PMF.

Photonic Doppler Velocimeter (PDV)



Purpose-built module for Photonic Doppler Velocimetry (PDV). A circulator, two VOAs and a passive coupler all built into one compact module.

Passive Component Integration



Integrate passive optical components of your choice such as WDM couplers, splitters, band-pass filters, PM beamsplitters and circulators. SMF, MMF and PMF.

Digital Sampling Oscilloscope (DSO)



Digital equivalent-time sampling oscilloscope (DSO) with high-quality precision timebase and low jitter mode, available in 1 or 2 channels in a compact benchtop instrument.

Clock Recovery Instrument (CDR)



Clock recovery instrument for the QCA Series. Low jitter design and precise phase-locking provide a reliable, scalable solution for high-speed communication testing.

Coherent Transmitter



Generate high-quality coherent optical signals for transmitter development, testing and advanced modulation research.

Coherent Receiver



High-performance coherent optical receiver for accurate measurement and characterization of coherent modulation formats.

VISIQ Analysis Software

VISIQ

Coherent signal analysis software for intuitive DSP configuration, signal analysis and optimization.

Test. Measure. Solve.™

Quantifi Photonics provides test solutions to help customers unlock scalable and cost-effective high-volume manufacturing of photonic integrated circuits (PICs), co-packaged optics and pluggable optics. The company's portfolio includes a wide range of photonic test instruments, and digital sampling oscilloscopes, available as benchtop or the industry-standard PXI format to support cost-effective, high-throughput design verification testing and high-volume manufacturing.

To find out more, get in touch with us today.

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