QUANTIFI PHOTONICS®

VISIQ™

COHERENT SIGNAL ANALYSIS SOFTWARE

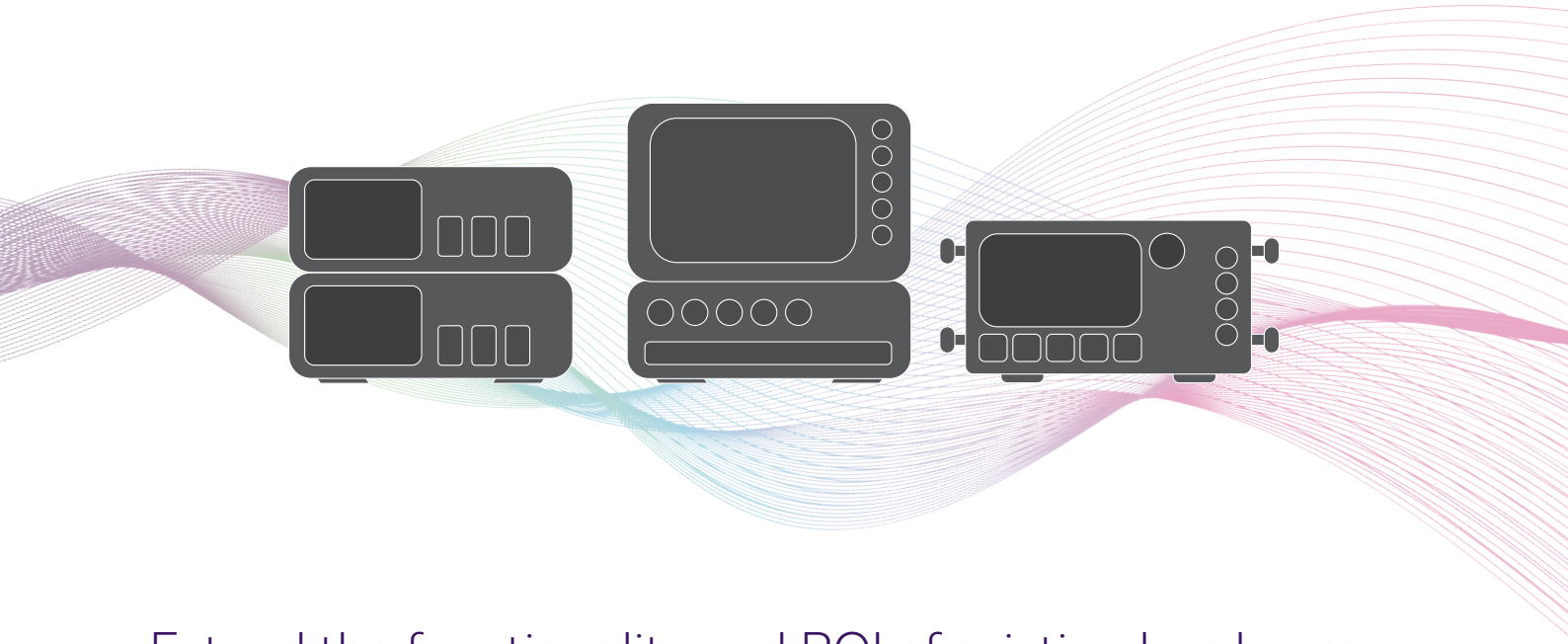
SPECIFICATION SHEET

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

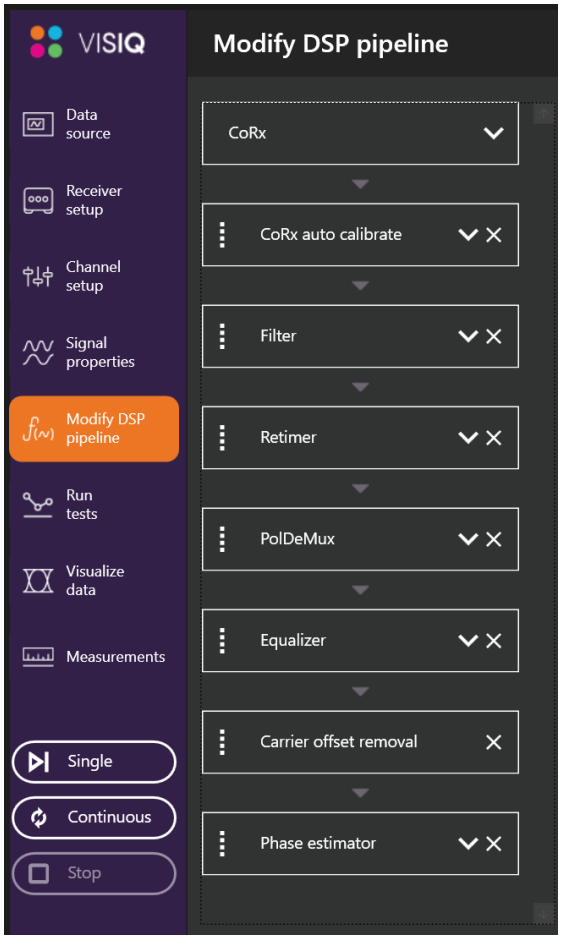
VISIQ is scope agnostic and can be used with popular real-time oscilloscopes providing a cost-effective upgrade for existing test hardware.

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

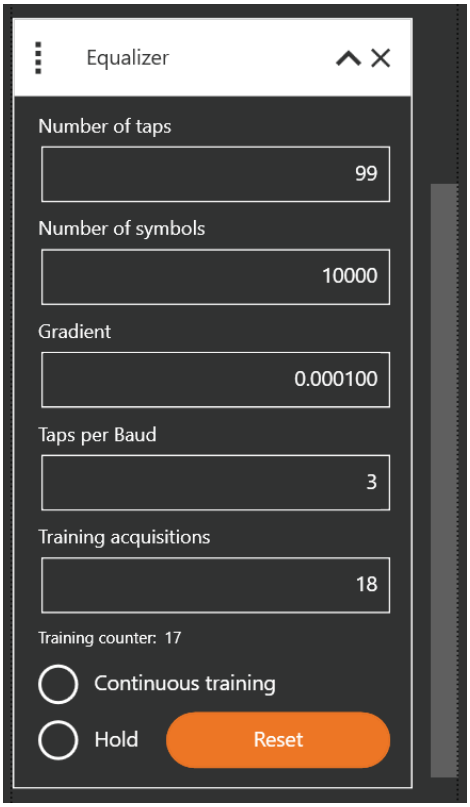
Easy-to-use, intuitive GUI

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



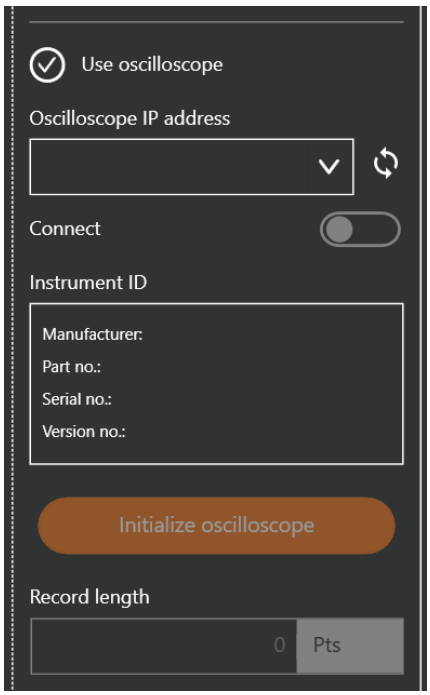
Powerful adaptive equalizers

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



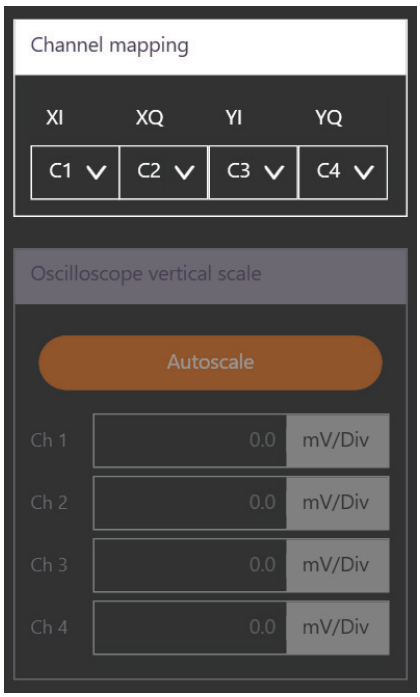
Auto-discovery of hardware

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



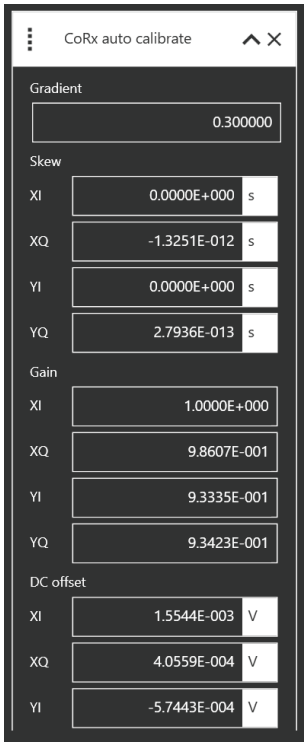
Integrated hardware control

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



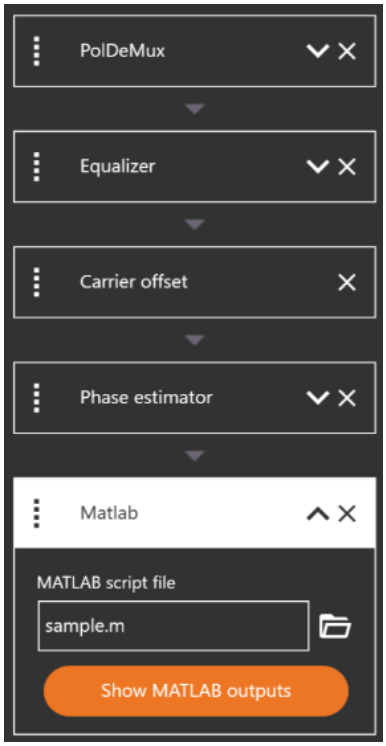
Dynamic CoRx auto-calibration

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



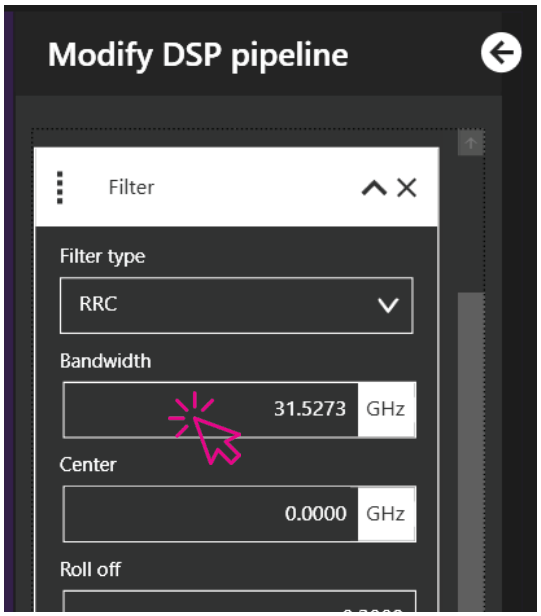
Modular MATLAB integration

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



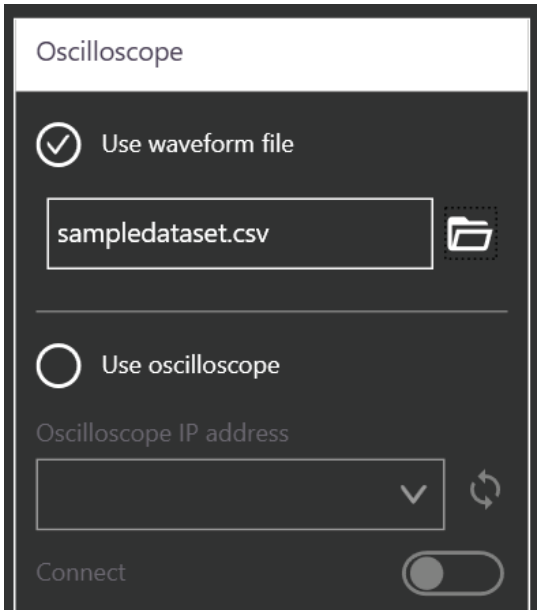
On-the-fly adjustment of DSP parameters

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



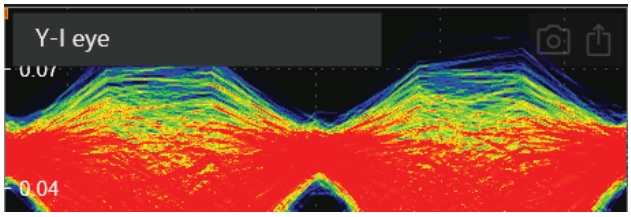
Save, recall and replay measurements

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.



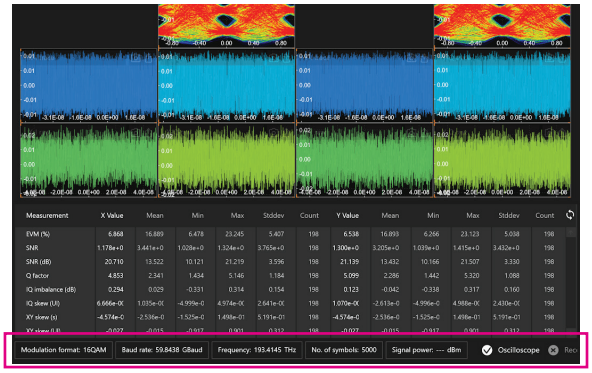
Supports SCPI and gRPC remote control

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-, L- and O-band coherent modulation analysis

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

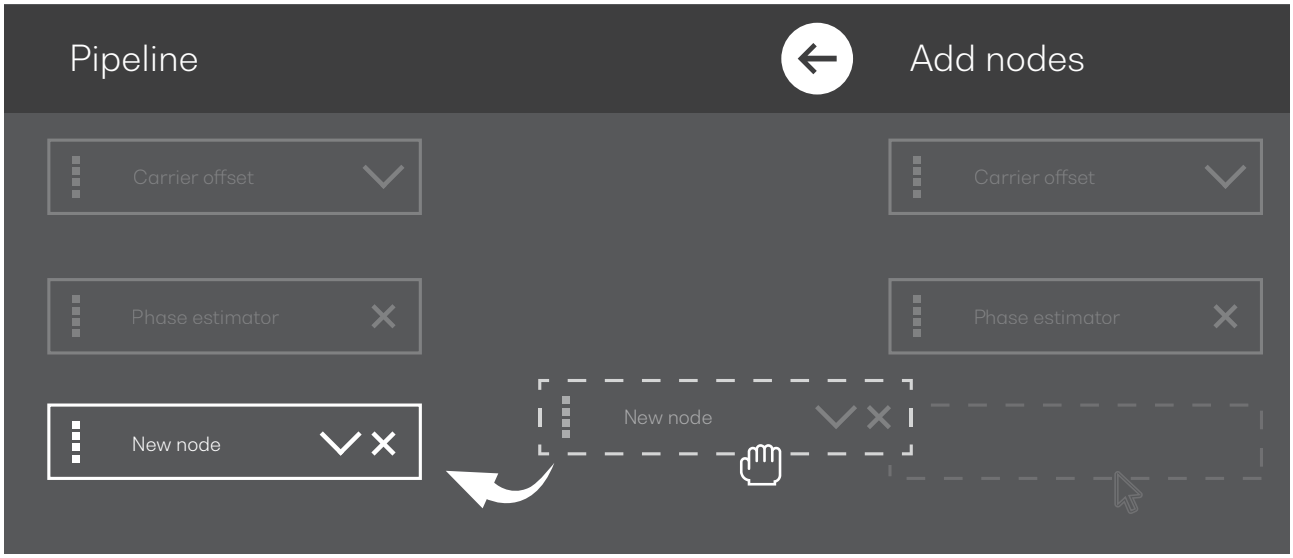
Intuitive layout

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.

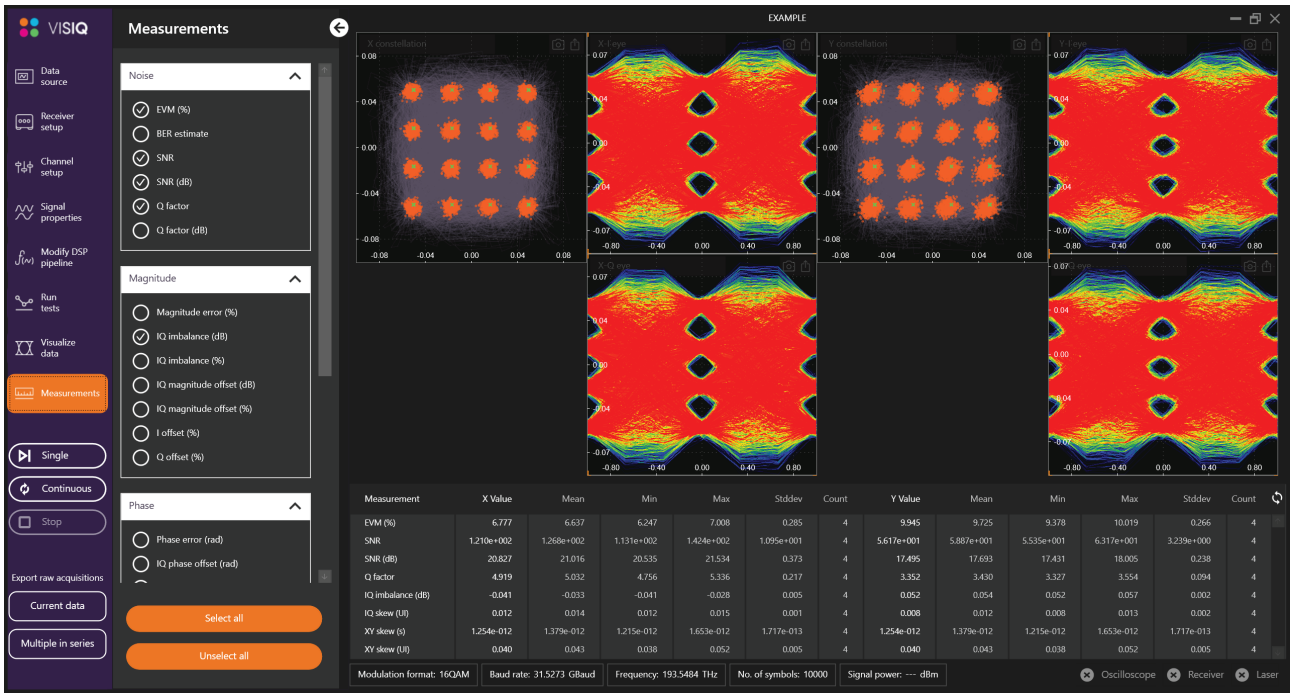


NODE	DESCRIPTION
Carrier offset	Estimates and compensates the residual frequency offset between the carrier and the local oscillator that may be present in your signal.
Chromatic dispersion	Compensates for fiber chromatic dispersion.
CoRx	Compensates coherent receiver imperfections such as skew, frequency 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

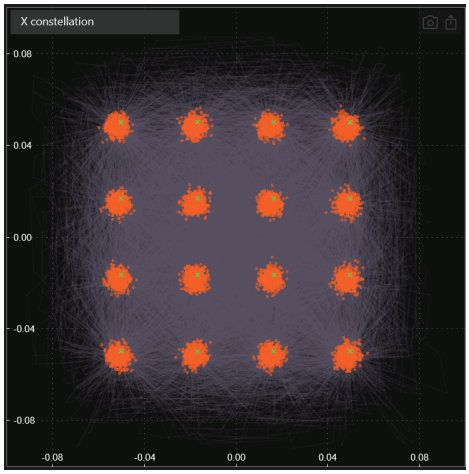
- Frequency offset (Hz)
- Line width (Hz)
- Baudrate (Hz)

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:

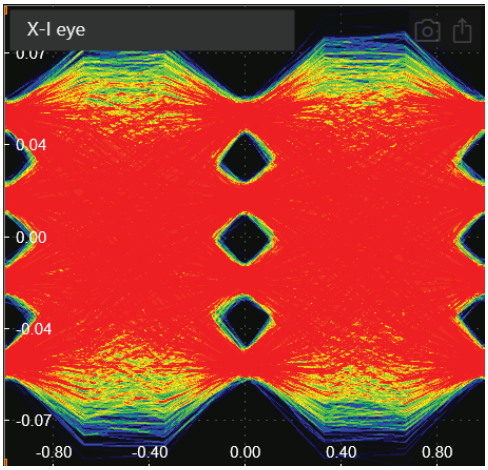
Constellations

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



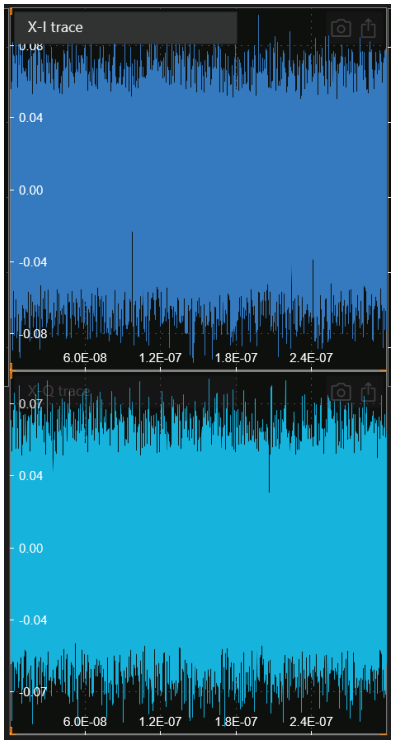
Eye diagrams

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



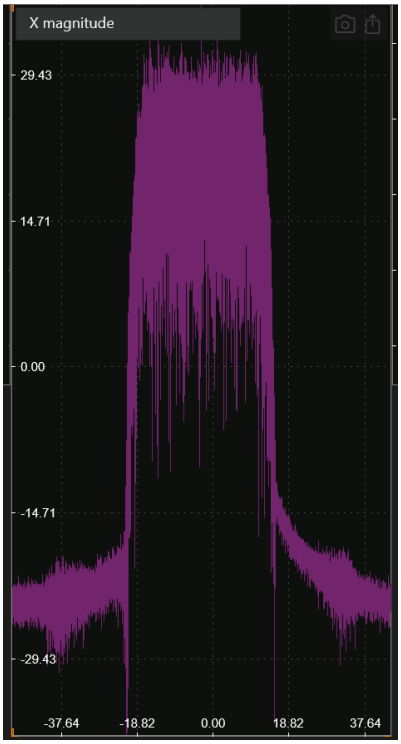
Trace diagrams

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



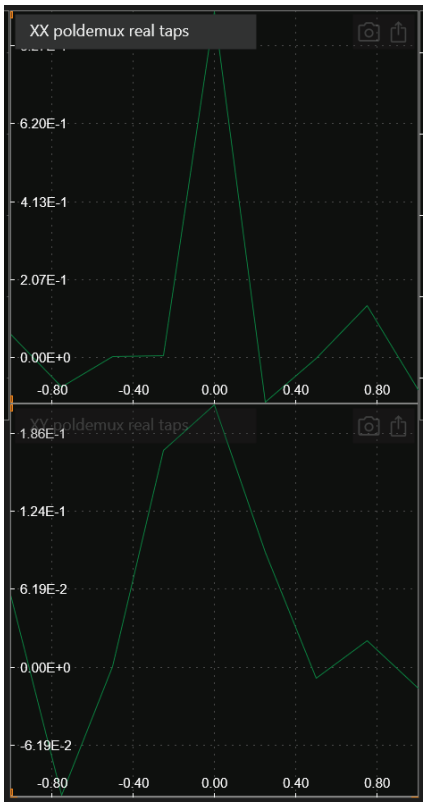
Spectral diagrams

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



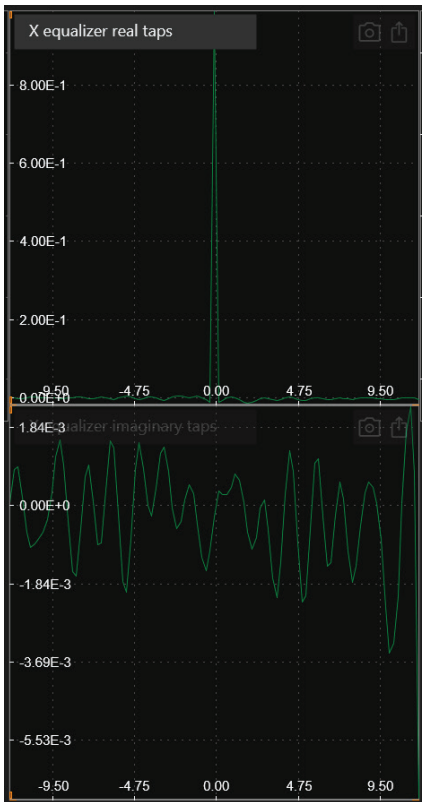
PolDeMux taps

Displays the optimized tap weights from the Polarization demultiplexer node.



Equalizer taps

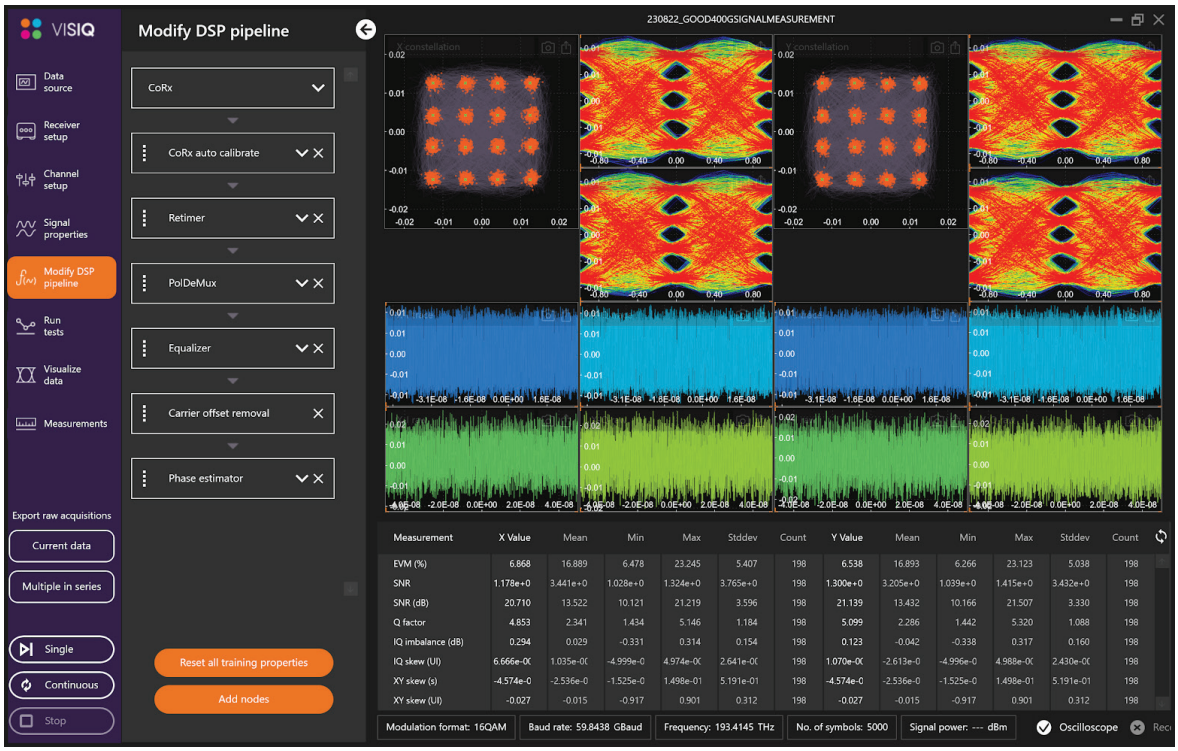
Displays the optimized tap weights from the Equalizer node.



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



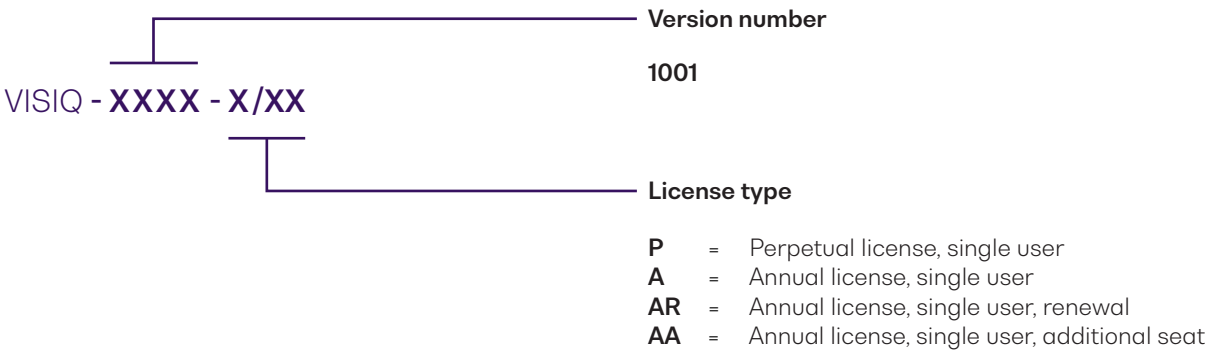
400ZR DP-16QAM running at 59.8 GBaud

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 can be purchased as a perpetual license or annual license. Licenses to use VISIQ software on additional seats are also available.



Generate high-bandwidth, complex modulation format optical signals with our high-performance coherent optical communications solutions.

IQTX

Coherent Optical Modulation Transmitter

Generate and control phase-modulated optical signals at 11 GHz, 20 GHz, 23 GHz or 40 GHz of bandwidth. Supports M-QAM, M-PSK and custom modulation formats & Baud rates beyond 64 GBaud.

IQRX

Coherent Optical Receiver

Gold standard coherent receiver for the measurement of coherent modulation formats such as QPSK, 64QAM and OFDM. The world's only commercially-available O-Band coherent receiver, also available in C/L-Band.

OMA

Optical Modulation Analyzer

High-performance reference coherent signal analyzer with powerful software for full characterization of 600G, 800G signals & more.

IQABC

Automatic Bias Controller

Modulation format independent Automatic Bias Controller for IQ-modulators. Accurately and reliably control and optimize modulator bias points regardless of the modulation format or pattern.

Co-Rx

Automated Coherent Receiver Tester

Automated sequential measurement of coherent receiver hardware performance to save test time and generate accurate and reliable results.

Test. Measure. Solve.™

Quantifi Photonics is transforming the world of photonics test and measurement. Our portfolio of optical and electrical test instruments is rapidly expanding to meet the needs of engineers and scientists around the globe. From enabling ground-breaking experiments to driving highly efficient production testing, you'll find us working with customers to solve complex problems with experience and innovation.

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

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