QUANTIFI PHOTONICS®
A Teradyne Company

QCR SERIES

CLOCK RECOVERY INSTRUMENT

SPECIFICATION SHEET

quantifiphotonics.com

INTRODUCING THE QCR SERIES

The **QCR Series Clock Recovery Instrument** is a high-performance instrument designed to extract clean, stable clock signals from high-speed data streams.

With its low-jitter architecture and precision phase-lock capabilities, it offers a reliable and scalable platform for validating and characterizing next-generation communication systems in combination with the QCA Series High-Speed Communication Analyzer.

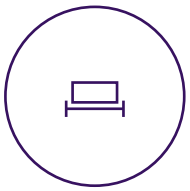
FEATURES

Ultra-low jitter

High quality precision timebase with low jitter mode provides ultra-low jitter noise floor and PLL-based low frequency clock phase tracking.

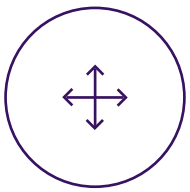
VISEYE™ software

With a modern, intuitive design, VISEYE makes it easy to control the QCR clock recovery instrument and QCA digital sampling oscilloscope from one software interface.



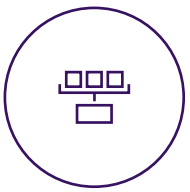
Compact design

Compact design enables high-density, high-channel count, test solutions in a relatively small footprint.



Scalable

Designed to meet the requirements for high channel count validation and high-volume manufacturing and testing.

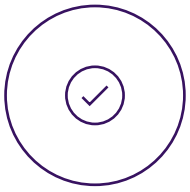


Ease of integration

Small footprint, remote control and API enable easy integration into probing and assembly equipment.

Lower cost-of-test

Improved test efficiency and test throughput can reduce the cost-of test and accelerate time-to-market.



Accurate performance

Comparable feature set and predictive value (correlation) as the prohibitively expensive R&D set-ups.

APPLICATIONS

- Optical communication testing
- High-speed electrical interconnects
- Electrical high-speed IO characterization
- High-volume test of high-speed ICs
- Validation testing

USE CASE

Recovering clock signal for the QCA Series High-Speed Communication Analyzer:

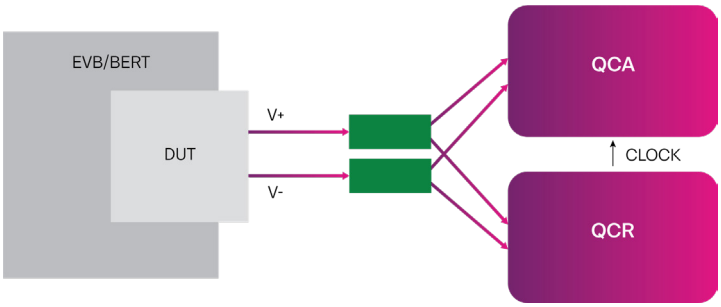
Requires clock recovery pick-off kit.

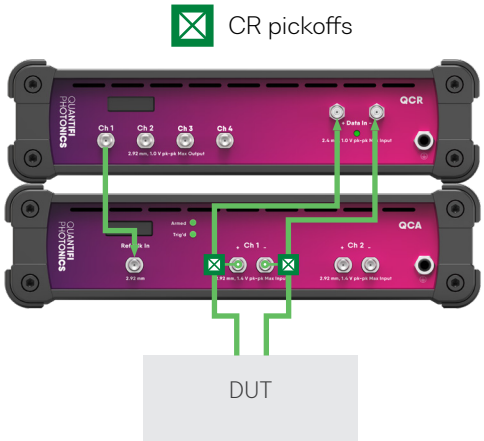
Typical use case:

- 53.125 GBd PAM4
- 26.56 GBd PAM4
- 25 - 32 G NRZ

Used for:

- Jitter and eye diagram measurements
- Retimed transmitter with local PLL

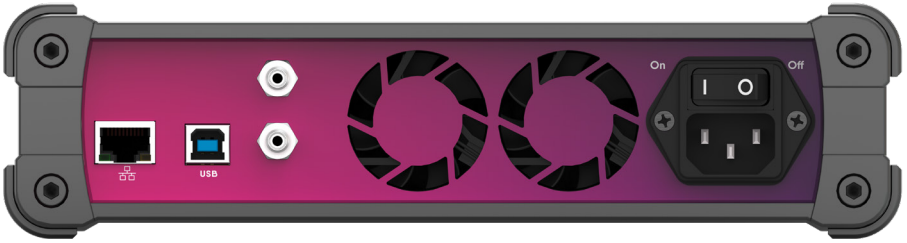




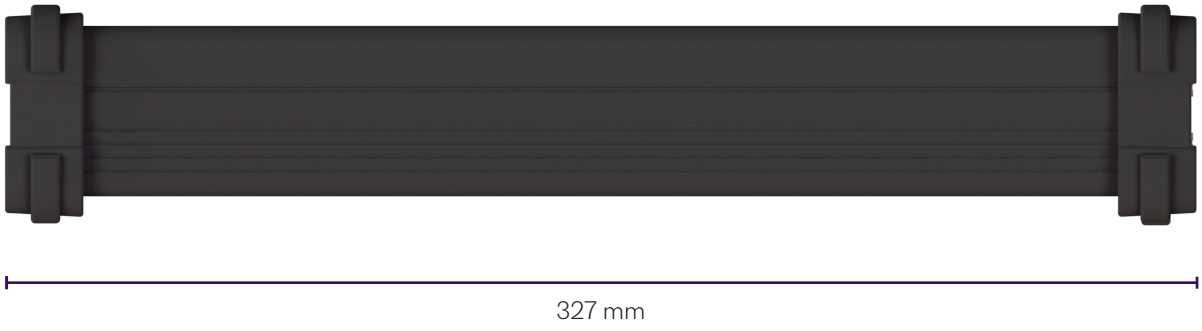
Other use cases with and without clock recovery are also possible, please consult with your Quantifi Photonics support team.

Front view

Rear view



Side view



QCR SERIES TECHNICAL SPECIFICATIONS

General Specifications	1002
Dimensions (HxWxD)	60 x 244 x 327 mm | 2.36 x 9.6 x 12.9 inches
Weight	2.71 kg
Bus connection	USB (instrument control), Ethernet (data transfer)
Number of channels	1 (1 input, 4 synchronous outputs to trigger up to 4 oscilloscopes)
Operating temperature range	5 °C to 45 °C | 41 °F to 113 °F
Storage temperature range	-40 °C to 70 °C | -40 °F to 158 °F

Power Specifications	1002
AC input voltage range	100 to 240 V
AC input current	1.3 A (115 V), 0.9 A (230 V)
AC frequency range	47 to 63 Hz

Clock recovery	1002
Coupling	2.92 mm single-ended or differential AC-coupled
RF termination	50 Ω (single-ended), 100 Ω (differential)
Supported data formats	NRZ, PAM4 pattern length ≥ PRBS31
Supported symbol rate ranges	25 - 32 Gbd, 50 - 58 Gbd
Max input differential	750 mV_{pp}
Max system input (QCA+QCR with external pick-off kit)	1400 mV_{pp}
Sensitivity	65 - 750 mV_{pp} (differential)
Phase lock loop bandwidth (can be set at these 4 levels)	2.6, 4, 10, 20 MHz

Recovered clock out	1002
RF termination	50 Ω
RF connector	2.92 mm
Output channels	4, single-ended AC-coupled
Clock output	50 - 1200 mV_{pp} (adjustable)
Recovered clock frequency range	12.5 - 16 GHz
Recovered clock divide ratios	1, 2, 4
RMS jitter	180 fs (Typical) | ≤200 fs (Max)

Notes
1. Advanced specs as of May 2025 and subject to change.

MINIMUM PC REQUIREMENTS

- Operating system: Microsoft Windows® 10 (64-bit)
- Processor: Intel® CoreTM i9 or faster CPU
- Memory: 32 GB or greater of RAM

ORDERING INFORMATION

QCR - 1002-1

Model number
1002 = 53 GBd PAM4/NRZ clock recovery instrument

ACCESSORIES

QCR - 9002

Model number
9002 = 53 GBd Pick-off kit (splitters & cables) + calibration (s-parameters)

WARRANTY INFORMATION

This product comes with a standard 1 year warranty.

EXTENDED WARRANTIES AND CALIBRATION PLANS

With an **extended warranty and calibration plan** you'll spend more time focused on your priorities and less time worrying about maintenance.

Add a **3 or 5 year extended warranty** when you purchase your Quantifi Photonics instruments.

Guarantee performance

Ensure your equipment is operating at the best it can be for reliable and accurate results.

Lower cost of ownership

Lock in savings and maximise your testing budget with a lower base cost of ownership.

Peace of mind

Spend less time worrying about maintenance and more on generating results.

CALIBRATION PLANS FOR ADDITIONAL DISCOUNTS

Order a **calibration plan** when purchasing your Quantifi Photonics instruments and get additional discounts.

10% Discount — On calibrations ordered at the time of purchase.

25% Discount — Add on an extended warranty and receive a 25% discount on calibrations.

Over time and with regular use, all optical parts and connectors require re-calibration and maintenance to guarantee accurate and reliable performance. We recommend Quantifi Photonics optical instruments are re-calibrated every 12 months. With an instrument calibration performed by Quantifi Photonics technicians you receive:

- Comprehensive calibration to factory specifications
- End-to-end inspection to ensure all instrument functions are working and connectors are clean
- Firmware, software and documentation updates
- Certificate of calibration which includes detailed test results

How to do I **secure my extended warranty or calibration plan**?

Contact your Quantifi Photonics sales representative or email **sales@quantifiphotonics.com**

Extended warranties and calibration plans must be ordered at the time of purchase and are available only for Quantifi Photonics' products. The 25% calibration discount only applies to calibrations while the product is covered by the extended warranty period.

Our portfolio of optical & electro-optical test modules is rapidly expanding to meet a wide range of customer requirements and applications.

For more details visit **quantifiphotonics.com/products**

Tunable Laser Sources

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 Sources

Highly-customizable DFB or FP laser sources available in a wide 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.

Erbium-Doped Fibre Amplifier (EDFA)

High power Erbium-Doped Fiber Amplifier for signal power amplification in C and L bands with various control modes, including automatic gain control.

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 1260nm to 1650nm, low insertion loss and back reflection. Full remote control via intuitive GUI, LabVIEW or SCPI.

Optical Power Meters

Fast terminating or inline monitoring of optical signal power from -60 to +10 dBm across 750 – 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. Available in a range of configurations; choose from 1 or 2 channels, AC or DC coupling and various conversion gain and operating wavelength ranges.

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.

Bit Error Rate Tester (BERT)

4 or 8-channel Pulse Pattern Generator and Error Detector at rates up to 29 Gbps for the design, characterization and production of optical transceivers and opto-electrical components.

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.

Optical Switch

Proven reliability and fast switching time. Wide variety of switch onfigurations: 1x4, 1x16, 16x16 and more. Models support SMF, MMF and PMF.

Photocurrent Amplifier

Versatile photodiode amplifier to measure photocurrent in photonic integrated circuit (PIC) applications. Digital and analog measurement.

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.

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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