QUANTIFI PHOTONICS®
A Teradyne Company

BERT

BIT ERROR RATE TESTER

SPECIFICATION SHEET

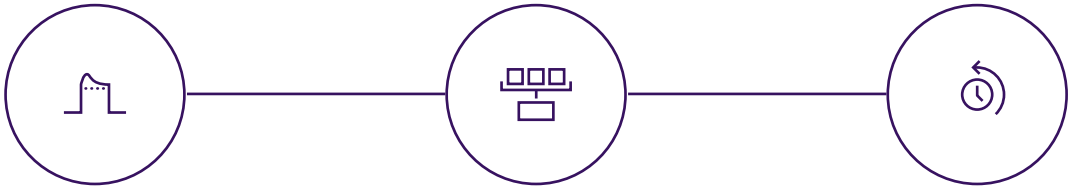
AVAILABLE IN PXI

AVAILABLE IN MATRIQ

quantifiphotonics.com

Quantifi Photonics' BERT is a 4-channel PPG and Error Detector for the design, characterization and production of optical transceivers and opto-electrical components at data rates up to 14.5 Gb/s.

With scalability and exceptional signal fidelity, it is a cost-effective test solution for 400 Gb/s communication eco-systems.



Programmable de-emphasis and CTLE processor.

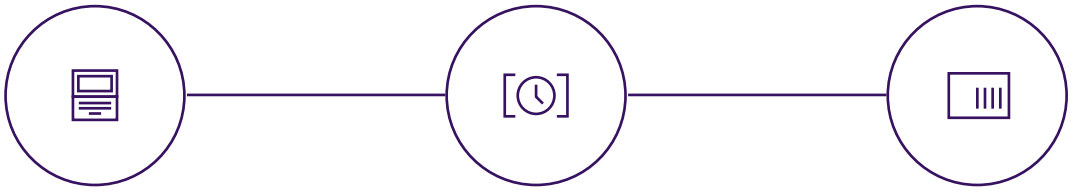
Programmable PPG Tx de-emphasis and error detector receiver continuous-time linear equalizer (CTLE) allow the user to compensate for finite coaxial cable interconnect loss.

Single platform testing.

Conduct all your DUT characterization on one platform and spend less time switching cables and patchcords between instruments.

Built-in clock recovery.

4-channel simultaneous testing in a Integrated CDR makes the BERT a versatile and easy-to-use instrument. No need for additional clock recovery hardware.



Simple control with intuitive GUI.

Save time and reduce complexity with the easy-to-use GUI. Control all channels and functions from its single panel interface.

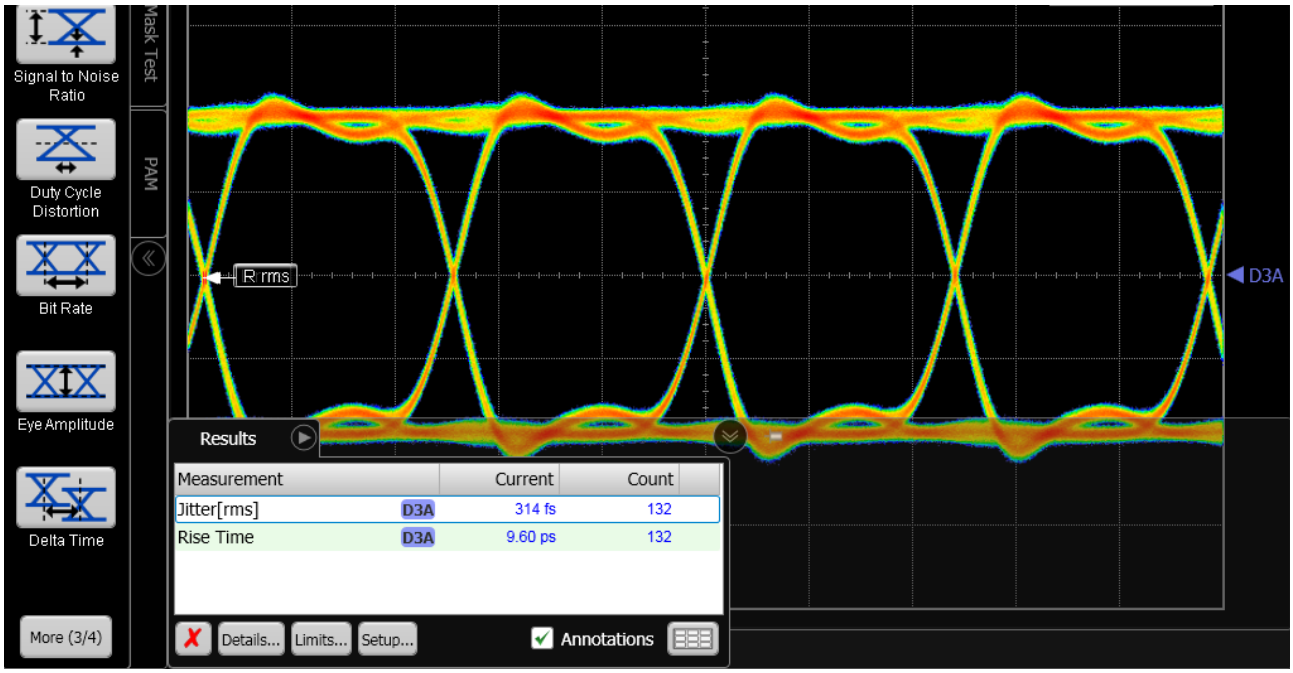
Internal clock synthesizer.

An integrated clock synthesizer for additional convenience and hassle-free operation.

Extremely high channel density in PXI.

With up to 4-channels per single-slot PXIe module, fit up to 68 synchronized channels per single PXIe mainframe.

EXAMPLE DATA SIGNAL



TARGET APPLICATIONS

- Multi-channel BER Tester for 14.5 Gbps per channel
- Active optical cable testing
- High speed SerDes characterization

CHOOSE YOUR FORM FACTOR

PXIe – MODULAR

Our expanding range of PXIe optical test solutions are used by customers in mixed-signal test and measurement systems, reducing complexity, lowering the cost of test and accelerating time to market.

- Multi vendor, open standard with over 2500 PXI modules available
- Advanced timing and synchronization capabilities across instruments
- Low latency, high performance processing and fast data throughput
- Design and build scalable, high channel count systems
- Small footprint and lower power consumption

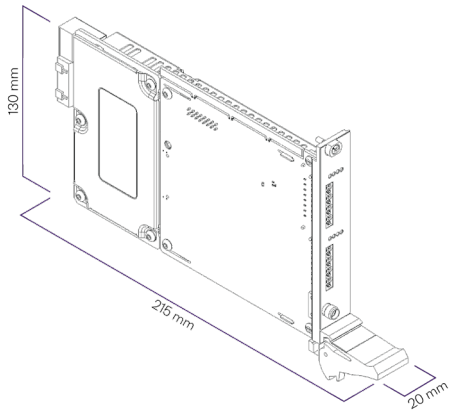
MATRIQ – COMPACT & PORTABLE

The MATRIQ series provides the same high-performance test capabilities of our PXIe modules in an compact benchtop design. MATRIQ instruments are simple to setup and easy to operate, making them the perfect choice for your optical lab or test bench.

- Same performance and control as our PXIe modules
- Plug and play with USB or Ethernet connectivity
- Control via the web-based GUI, COHESIONUI or SCPI commands
- Compact and portable design saves benchtop space

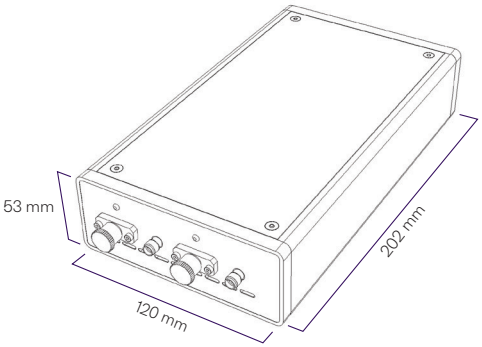
PXI – MODULAR

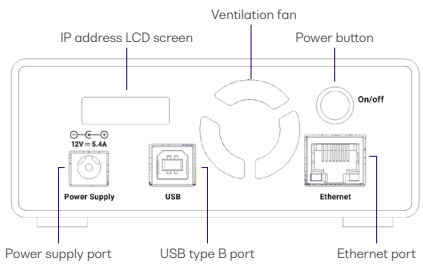
BERT-1005-4-PXIE



MATRIQ – COMPACT & PORTABLE

BERT-1005-4-MTRQ





BERT TECHNICAL SPECIFICATIONS

General Specifications	PXI	MATRIQ
Bus connection	PXIe	USB and Ethernet
Slot count	1	-
Dimensions (H x W x D)	130 x 20 x 215 mm | 5.1 x 0.8 x 8.5 inches	53 x 120 x 202 mm | 2.1 x 4.7 x 8.0 inches
Weight	~ 250 grams | ~ 0.55 lbs	~ 1.1 kg | ~ 2.4 lbs
Operating temperature range	5°C to 45°C | 41°F to 113°F	5°C to 45°C | 41°F to 113°F
Storage temperature range	-40°C to 70°C | -40°F to 158°F	-40°C to 70°C | -40°F to 158°F

Power Specifications	PXI	MATRIQ
AC input voltage range	Please refer to the latest PXI Express Hardware Specifications published by the PXI Systems Alliance.	100 to 240 VAC
AC input current		1.3 A (115 VAC), 0.9 A (230VAC)
AC frequency range		47 to 63 Hz
DC output voltage		12 V
DC output current max		5.41 A
Dimensions (LxWxH)		4.58 x 2.06 x 1.23" (116.3 x 52.4 x 31.3 mm)

Model Number	1005	1005
Number of channels	4	4
RF output	Differential	Differential
RF connector	2 x breakout cables with 8 x SMA connectors	2 x breakout cables with 8 x SMA connectors
Impedance	100 ohms between differential outputs	100 ohms between differential outputs
Data coding	NRZ	NRZ
Data rate	1.25 to 14.50 Gbps	1.25 to 14.50 Gbps
Data rate step size	2 kbps	2 kbps
PRBS patterns	2n-1, n = 9, 15 or 31	2n-1, n = 9, 15 or 31
Output amplitude (mV differential)	Adjustable 250 to 1100	Adjustable 250 to 1100
Output amplitude steps (mV differential)	5	5
Rise/fall time (20% to 80%)	< 18 ps	< 18 ps
Intrinsic jitter	< 850 fs rms (typical)	< 850 fs rms (typical)
Crossing point adjustment	40% to 60%	40% to 60%
Programmable de-emphasis	2 pre taps, 1 post tap	2 pre taps, 1 post tap
Polarity inversion	Yes	Yes

BERT TECHNICAL SPECIFICATIONS

Divided Clock Output	1005	1005
Rf output	Single-ended SMA	Single-ended SMA
Impedance	50 ohms	50 ohms
Frequency	100 - 156.25 MHz Programmable Synthesizer Reference Out	100 - 156.25 MHz Programmable Synthesizer Reference Out
Intrinsic jitter	TBD	TBD
Output amplitude	700 mV (typical)	700 mV (typical)
Selectable clock divider	Divide by n, with n = 2,4,8	Divide by n, with n = 2,4,8

Clock and Data Recovery	1005	1005
Data rate	1.25 to 14.5 Gbps	1.25 to 14.5 Gbps
Loop bandwidth	Tunable 6 to 10 MHz	Tunable 6 to 10 MHz
CDR output	No	No

Breakout Cables	1005	1005
Length	30 cm	30 cm
Connectors	SMA, Male	SMA, Male
Skew	< 2 ps skew match	< 2 ps skew match

Error Detector	1005	1005
Number of channels	4	4
RF input	AC coupled differential	AC coupled differential
Impedance	100 ohms between differential outputs	100 ohms between differential outputs
Data rate	1.25 Gbps to 14.50 Gbps	1.25 Gbps to 14.50 Gbps
Data rate step size	2 kbps	2 kbps
PRBS patterns	2n-1, n = 7, 9, 10, 11, 15, 23 or 31	2n-1, n = 7, 9, 10, 11, 15, 23 or 31
Sensitivity	25 mV	25 mV
Max input	1000 mV	1000 mV
Clock source	Independent CDR on each input channel	Independent CDR on each input channel
Polarity inversion	Yes	Yes
Equalizer	Programmable linear input CTLE equalizer	Programmable linear input CTLE equalizer
Eye contours	3D Eye Monitor on each input to allow advanced measurements such as BER contours and eye parameters	3D Eye Monitor on each input to allow advanced measurements such as BER contours and eye parameters

ORDERING INFORMATION

BERT - XXXX - X - PXIE
BERT - XXXX - X - MTRQ

Model number
1005 = 1.25 to 14.50 Gbps, 4 channels
(includes 2 x BERT-9005-1)

Number of channels
4 = 4 channels

ACCESSORIES

BERT-9005 = Replacement 30cm cable, ±2 ps phase matching between differential pairs, SMA RF connectors.
BERT-9006 = Replacement 60cm cable, ±2 ps phase matching between differential pairs, SMA RF connectors.

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.

General Enquiries sales@quantifiphotonics.com
Technical Support support@quantifiphotonics.com
Phone - NZ +64 9 478 4849
Phone - USA +1-800-803-8872

quantifiphotonics.com

QUANTIFI PHOTONICS®
A Teradyne Company