Agilent
N2101B 10.3125 Gb/s Bit Error Ratio Tester

Data Sheet

The N2101B PXIT 10.3125 Gb/s Bit Error Ratio Tester (BERT) consists of a high accuracy clock source, data pattern generator, and error detector. It will automatically perform bit error ratio analysis to characterize the quality of devices at 12 standard internal rates from 155 Mb/s to 8.5 Gb/s.

In conjunction with a synthesizer such as the Agilent N2099A, the N2101B BERT can operate at any rate up to 10.3125 Gb/s.

To realize the most complete value of the N2101B it can be combined with the other Agilent PXIT family of products such as the N2100B PXIT Digital Communication Analyzer and the N2102B Pattern Generator.

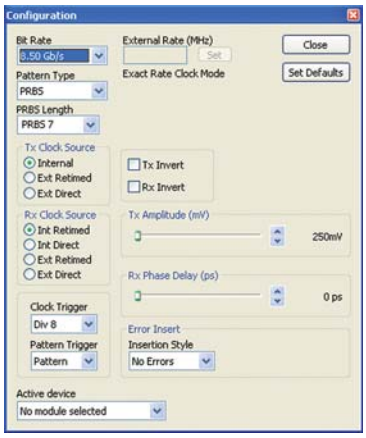
Agilent Technologies

Functionality

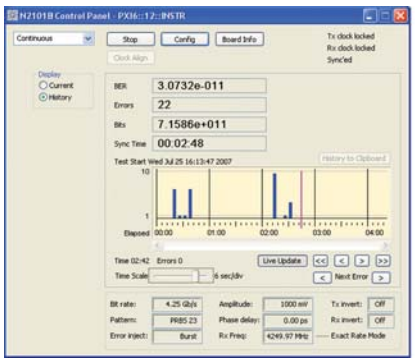
- Single instrument 3-slot wide PXI card containing pattern generation with error detection
- Easily combined with DCA, Synthesizer, Pattern Generator or multiple BERT modules in a PXI chassis
- Bit Error Rate in three modes - History (GUI only), Continuous, and Time Window
- Automatic clock data align
- Eye opening measured and/or extrapolated to a defined error rate
- Jitter Bathtub display and analysis
- Error injection: single error or error rate injection

Features

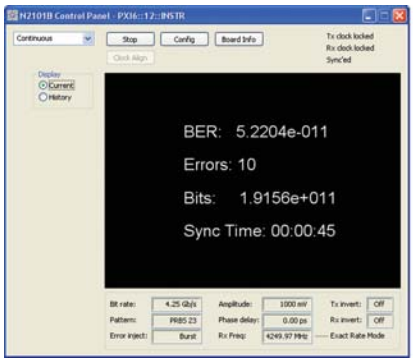
- Significantly smaller than a conventional BERT
- Differential data generation and analysis
- User selectable data patterns:
  - PRBS 2^n -1, n=7, 9, 11,15, 23, 31
  - K28.5, K28.7 and CR Pat
- User defined patterns
  - 2048 bits maximum length
  - 16 Kbytes if pattern length is integer multiple of 64
- Pattern generation and BER measurements using the internal clock source for the following rates:
  - 155 Mb/s (OC-3/STM-1)
  - 622 Mb/s (OC-12/STM-4)
  - 1.0625 Gb/s (1xFibre Channel)
  - 1.25 Gb/s (Gigabit Ethernet)
  - 2.125 Gb/s (2xFibre Channel)
  - 2.488 Gb/s (OC-48/STM-16)
  - 2.500 Gb/s (Parallel Optics, PCI-Express)
  - 3.125 Gb/s (Xaui)
  - 4.25 Gb/s (4xFibre Channel)
  - 5.0 Gb/s (Parallel Optics, PCI-Express II)
  - 6.25 Gb/s (Double XAUI)
  - 8.5 Gb/s (8xFibre Channel)
- Pattern generation and BER measurements using an external clock at any rates from 622 Mb/s up to 10.3125 Gb/s. Therefore the N2101B can generate patterns and perform BER measurements on these standard rates.
  - 9.95 Gb/s (OC196/STM64)
  - 10.3125 Gb/s (10 Gigabit Ethernet)
- Connector compatibility
  - PCI, PXI-H, PXI-1



The user friendly configuration screen.



Bit Error Rate: History Mode.



Bit Error Rate: Continuous Mode

Performance Specifications

Pattern generator

Output jitter	2.5 ps RMS (max) *1.5 ps RMS characteristic*
Rise/Fall times (20-80%)	25 ps (max) *22 ps characteristic*
Output voltage range (single-ended)	250 mV to 1 V
Amplitude resolution	5 mV

Error detector

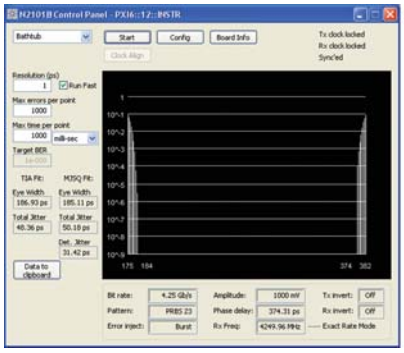
Input range (differential)	50 mV to 2 V
Input sensitivity (differential)	50 mV
Input impedance (single ended)	*50 Ohm* (*characteristic*)
Input impedance (differential)	*100 Ohm* (*characteristic*)
Phase margin sweep range <8 Gb/s	> 2 UI
Phase margin sweep range >8 Gb/s	200 ps

Clocks

Divided clock rate outputs	1, 2, 4, 8 & 128 (output on separate port)*
Pattern trigger	Triggers every 64th pattern for PRBS
Pattern trigger/clock output voltage	*1 V pp* (*characteristic*)
Clock voltage output (dc coupled)	*400 mV to 1.1 V* (*characteristic*)
External clock input voltage range	*500 mV to 1 V* (*characteristic*)
External clock input frequency range	500 MHz to 10.3125 GHz

* For 155 Mb/s there is only one clock output option available (the divide by 1)

Note: Unless stated otherwise signals are AC coupled and 50 ohm terminations are expected.



Jitter Bathtub display with corresponding eye width, total Jitter, and deterministic Jitter measurements.

Software

The N2101B BERT and its accompanying software fully complies with PXI specifications, enables the user to control the instrument through the included Windows® application control panel, without any user development required. The DLL provides an API through which custom applications can be easily developed to integrate the BERT. An ActiveX Control wrapper for the DLL is included, too.

Software operating systems
- Microsoft Windows® XP (32-bit)
- Windows 7 (32-bit, 64-bit)

Standard compliant drivers
- IVI-COM, IVI-C, LabVIEW, MATLAB

Supported application development environments (ADE)
- VisualStudio® (VB.NET, C#, C/ C++), VEE, LabVIEW, LabWindows/ CVI, MATLAB

Agilent IO Libraries
- Includes: VISA Libraries, Agilent Connection Expert, IO Monitor

Sample code
- C++ sample code shows how to use the DLL directly.
- Visual Basic sample code shows how to use the ActiveX Control.
- C# sample code also shows how to use the ActiveX Control.

Ordering

N2101B PXIT BERT Option 300 155 Mb/s to 10.3125 Gb/s module

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