



Agilent Technologies

Errata Notice

This document contains references to “Centellax.” Please note that the test and measurement product portfolio once owned by Centellax, Inc. is now part of Agilent Technologies. For more information about these products and support, go to **www.agilent.com/find/bert-news**.

12.5 Gb/s Parallel Channel BERT

Highly cost effective solution for characterizing crosstalk susceptibility, backplanes and multi-lane serial data systems



Product Highlights

- Modular architecture supports 1-5 generator or detector heads
- Integrated four tap de-emphasis
- Fully programmable generator output/detector input parameters
- Transparent jitter pass-through
- Swept aggressor channel delay for crosstalk characterization
- Single port remote control of all channels through USB or GPIB
- Compact size

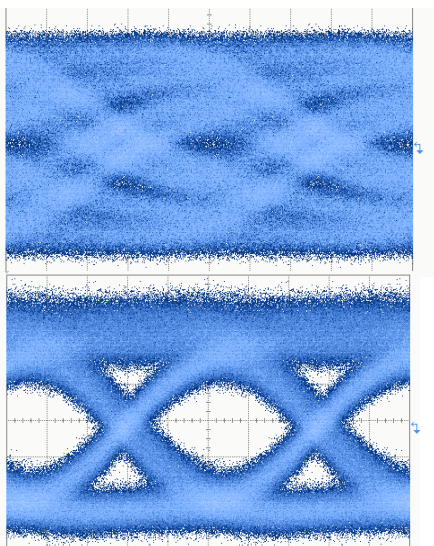
A better solution when one channel is just not enough...

The PCB12500 is a modular, multi-channel signal integrity test system ideal for characterizing multi-lane serial data channels. By adding remotely mountable heads, each of its 5 channels can be configured as either a generator, or error detector to form a Bit Error Rate Tester (BERT). Patterns available include various lengths of hardware generated PRBS, clock patterns, and DC logic 0 and logic 1. All heads can operate with differential or single ended signal connections. Output parameters in the generator heads and input parameters in the error detector heads can be independently programmed, or ganged together for convenience. Presets for common logic families simplify user set up.

Independent generator and detector heads

Each head connects to the PCB12500 controller through a 1 m cable. This allows it to be located near the signal connection points in the device under test, minimizing cable loss.

The modular architecture allows you to purchase only the heads your application requires. No need to spend more on unused output or input channels.



Integrated De-emphasis

Generator heads include integrated two-tap and four-tap de-emphasis conditioning. Commonly used in higher data rate systems to open eyes by counteracting high frequency loss in the channel, applying de-emphasis to the test signal is required for receiver testing. Other vendors' generators require additional dedicated external signal processors. The internal de-emphasis conditioning in the PCB12500 generator heads eliminates the expense of additional signal processors, as well as the associated signal degradation resulting from the extra cables used to connect them.

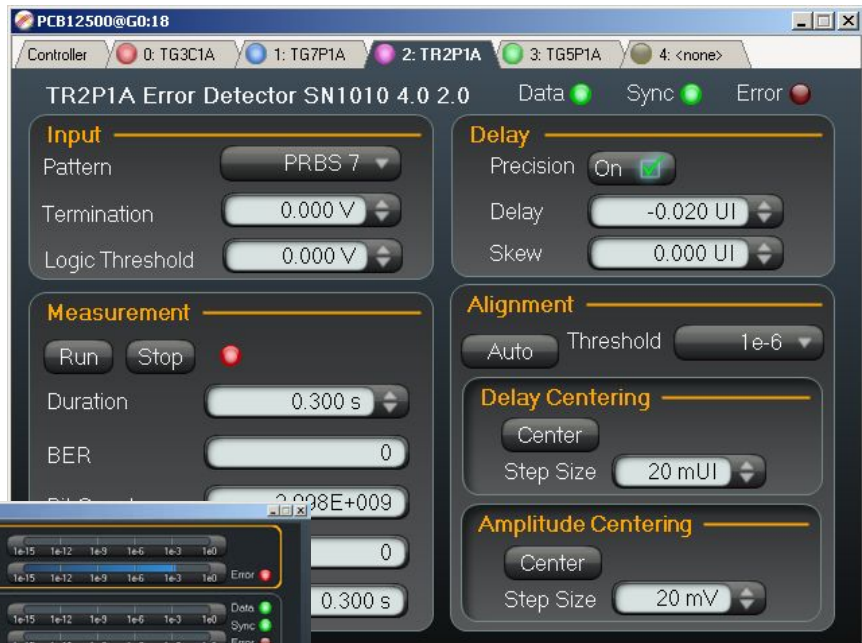
PCB12500 Datasheet

Centralized control

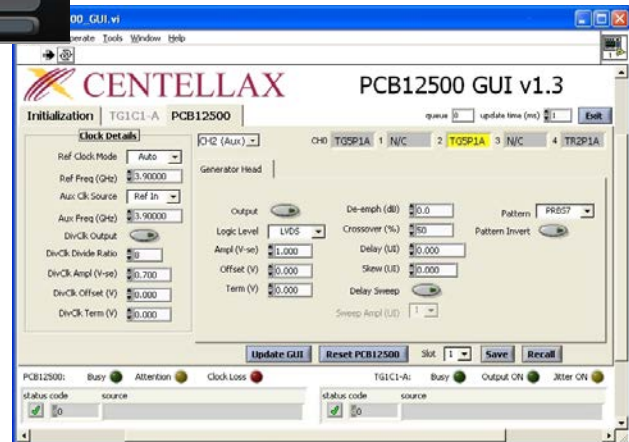
Controlling multiple pattern generators or signal sources for characterizing multi-lane devices or cross talk is cumbersome and confusing. In addition to the need to address multiple instruments, the command syntax or user interface usually differs. The Centellax Signal Integrity Studio (SIS) application provides customers the ability to control multiple Centellax instruments through a Windows-based Graphical User Interface (GUI).

Set up is easy using the Signal Integrity Studio application. For repetitive testing, setups can be stored and recalled at a later time.

The results view shows composite BER along with the performance of the individual lanes. Bar graphs give a quick indication of any lane specific problems without the need to look at the individual BER numbers.



Also available, LabVIEW® open source code drivers and stand alone GUI for the PCB12500. All of the operating parameters of the PCB12500 and all connected heads are displayed in a single window, allowing the user to instantly see the state of the entire system.



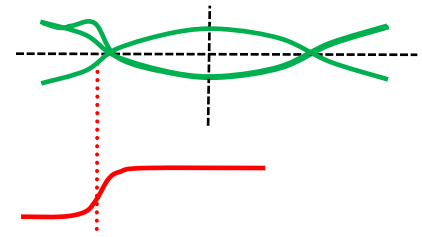
Characterizing Crosstalk Susceptibility

Characterizing your system or backplane for crosstalk susceptibility has been a difficult challenge in the past. Serial BERTs are often used for this purpose, utilizing a full rate or 2X multiplied clock output for the adjacent channel aggressor signal. But does this really stress your DUT adequately?

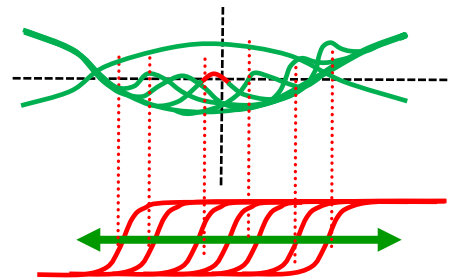
Generally the receiver is only susceptible to crosstalk induced errors when the transitions occur in the sampling window of the detector. The use of a double rate clock as the aggressor does not assure that the transitions will occur in the detector decision time window, as the clock to data skew in the BERT, the skew in the signal path lengths, and the receivers clock recovery latency all combined, rarely results in signal alignment.

The PCB12500 overcomes this problem by independently sweeping the phase delay of each of the aggressor generators up to ± 2 UI relative to the reference generator. The delay sweep modulation signal is a low frequency triangular wave, assuring adequate dwell time in the sensitive detector decision time window.

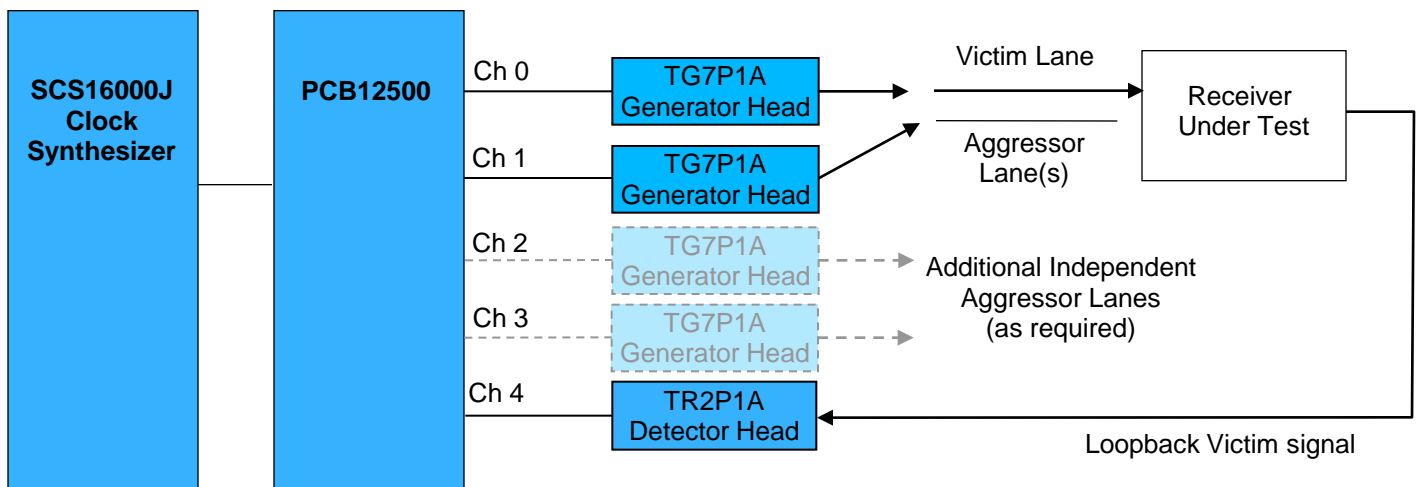
For multi-lane systems and backplanes, multiple generator heads can be programmed to independently sweep multiple aggressor paths. Each channel uses a different low modulation frequency.



Testing with fixed delay aggressors can result in induced interference outside of the critical receiver sampling time window, which is the center of the eye.

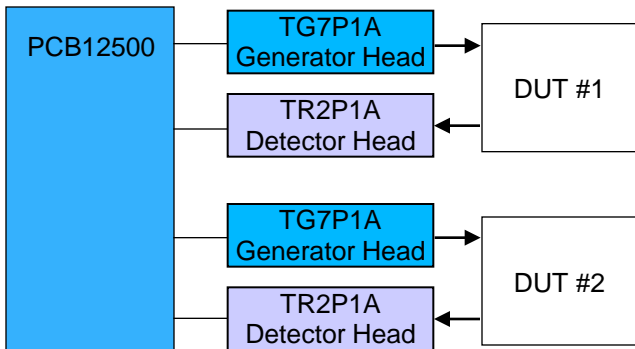
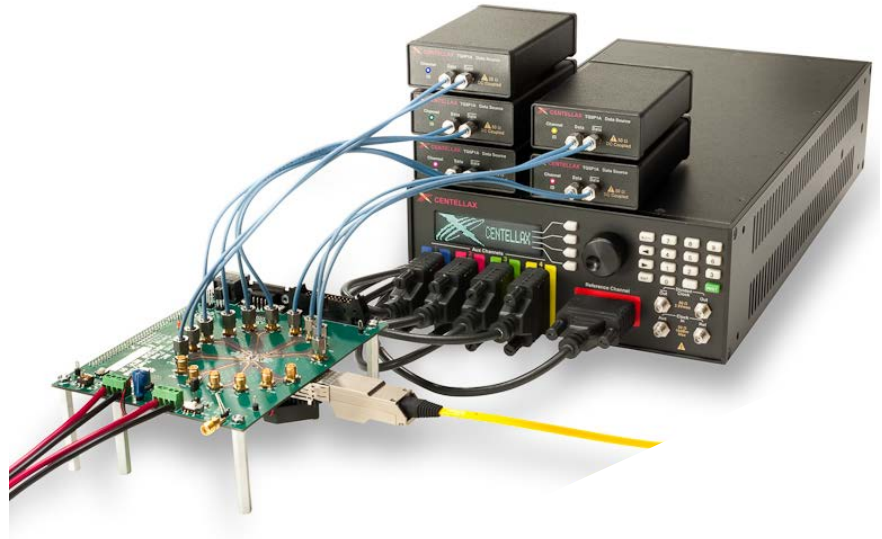


Slewing the delay of the aggressor assures impairment will occur during the sampling window.



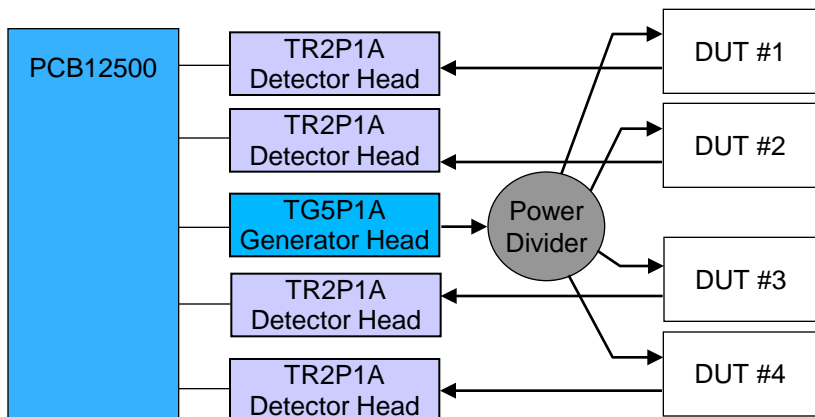
Multi-Lane device testing

Multi-lane devices and SERDES are best characterized with live traffic on all lanes. The PCB12500 provides a convenient source of up to 5 lanes of non-synchronized PRBS patterns. The phase delay of all lanes relative to the reference lane can be adjusted independently, or even swept to test for framing errors.



Parallel testing single lane devices

100% or batch sample testing single lane devices in a production environment can be expensive in capital costs of the instruments, and test times.



Systems based on the PCB12500 for parallel testing of multiple devices are cost effective and simple to implement. Configurations based on a single system allow implementation of 2 independent channels of serial BERT, up to 5 independent pattern generators, or single shared pattern source with 4 independent error detectors.

PCB12500 Datasheet

Specifications

Input Clock Frequency	1.5 GHz – 12.5 GHz
Input Clock Amplitude	200 mV – 2.0 V < 6.5 GHz (-10 dBm to +10 dBm) 500 mV – 2.0 V ≥ 6.5 GHz (-2 dBm to +10 dBm)
Residual Jitter	3 ps rms maximum < 6.5 GHz 1.5 ps rms maximum ≥ 6.5 GHz
Divided clock output:	
Divider ratio	1, 2, 4, 8 – 512 in steps of 1, 514 – 1024 in steps of 2, 1028 – 2048 in steps of 4, 2056 – 4088 in steps of 8
Configuration	Differential. Will operate in single ended mode
Amplitude	0.3 to 0.7 V in 5 mV steps, single ended
Output Offset	-2.0 to +2.0 V in 5 mV steps
Termination Voltage	-2.0 to +2.0 V in 5 mV steps
Remote Control Interface	USB2.0 and IEEE-488 (GPIB)
Power Requirements	
Voltage	100 – 240 VAC, autoranging
Frequency	50 – 60 Hz
Power Consumption	170 W maximum

Physical and Environmental

Temperature, Operating	+10 to +40 °C
Temperature, Non-Operating	- 40 to +70 °C
Dimensions (<i>Height, Width, and Depth</i>)	100 mm (3.9 in) x 214 mm (8.4 in) x 425 mm (16.7 in)
Mass	3.3 kg (7.1 lbs)

Compliance

EMC	Complies with: European EMC Directive 2004/108/EC, IEC/EN 61326 CISPR 11 Group 1 Class A AS/NZS CISPR 11 ICES/NMB-001
Safety	Complies with: European Low Voltage Directive 2006/95/EC, IEC/EN 61010-1, CSA C22.2 No. 61010-1, UL 61010-1 This product is designed to be used in an indoor environment to Pollution Degree 2 (IEC 61010) and Enclosure Protection level IP20 (IEC 60529)

PCB12500 Datasheet

Ordering Information

<u>Product Code</u>	<u>Description</u>
PCB12500	12.5 Gb/s Parallel Channel BERT
TG7P1A	1.5-12.5 Gb/s 4-Tap Pattern Generator Remote Head
TG5P1A	1.5-12.5 Gb/s 2-Tap Pattern Generator Remote Head
TR2P1A	1.5-12.5 Gb/s Error Detector Remote Rx Head
SCS16000 Series	16 GHz Clock Synthesizer

Product Options

-OPT101	European Power Cord
-OPT102	UK Power Cord
-OPT103	US/Canada Power Cord
-OPT109	China Power Cord

Warranty and Calibration Service

-OPT300	1 Year Warranty Extended to 3 Years
-OPT301	1 Year Warranty Extended to 5 Years
-OPT320	Centellax Calibration – Per Incident
-OPT321	Annual Centellax Calibration for 3 Years
-OPT322	Annual Centellax Calibration for 5 Years

More Information

For additional information, to schedule a product demonstration, or to request a quote, contact your local authorized Centellax Distributor or:

Centellax Sales Department

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