DATA SHEET

N4980A
Multi-Instrument BERT Software

KEYSIGHT TECHNOLOGIES

Multi-Instrument Control and Measurements at your Fingertips

Product highlights

- Intuitive setup for all Keysight Technologies instruments in the test system
- Single and multi-lane bit error rate testing
- Crosstalk susceptibility testing with active aggressor signals
- Fast and efficient parallel jitter tolerance testing
- Bathtub view
- Graphical pattern editor for easy user pattern creation

Applications

- Serial data receiver characterization
- Testing devices with high SerDes counts
- Optical transceiver/transponder characterization

Focused, centralized control

The opening screen of the N4980A multi-instrument BERT software provides a menu of all Keysight Technologies instruments it supports. A convenient discover mode polls the bus in use (GPIB and/or USB) to find all connected instruments. Users can then perform a single click connect all or individually select an instrument to configure for the test at hand. Once selected, control for all instruments is focused in a single, easy to understand and navigate interface application.

Need to run the test again in the future? The entire setup can be saved to a file and recalled at any time.

To improve understanding of signal flow in complicated test set-ups, users can assign an alias, such as port ID, signal names, etc., to the instrument channels.

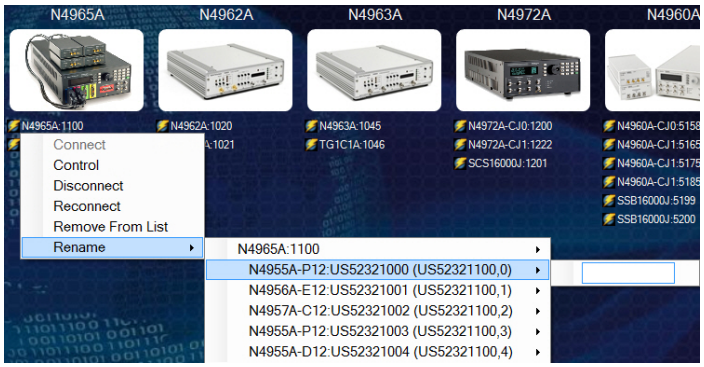


Figure 1. Assigning an alias.

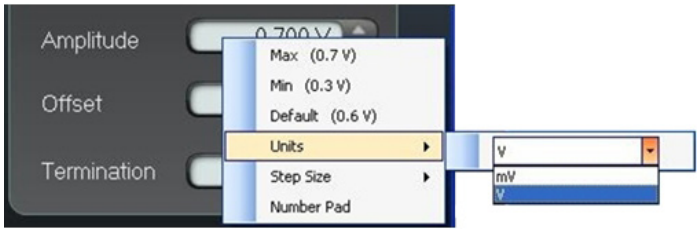


Figure 2. Selecting units.

Figure 3. Entering numeric parameters.

Numeric parameters can be entered from a pull down list, pop up keypad, or by spinning the wheel on your mouse.

Single or parallel BER measurements with ease

Bit error rate measurement testing is simple with the intuitive control screens. The base software package is free of charge and can perform single-channel BER, multi-channel BER with an unlimited number of channels, and bathtub measurements.

Need to make a change in the setup after you have started a test? No problem. Measurements can be stopped at any point and reset to correct set up errors without needing to wait for the preset time or bit count to be achieved.

Figure 4. Intuitive control screens.

Figure 5. Parallel measurement.

Bar graphs provide quick indication of relative BER results during testing of multi-lane devices. Users can instantly spot a problem in a single lane without needing to look for outliers in a table of BER numbers.

Graphical results

Any BERT can give you measurements in a table of results. The N4980A multi-instrument BERT software provides more with graphical results which are easier to interpret—allowing you to quickly gain insight into what is happening in the device under test.

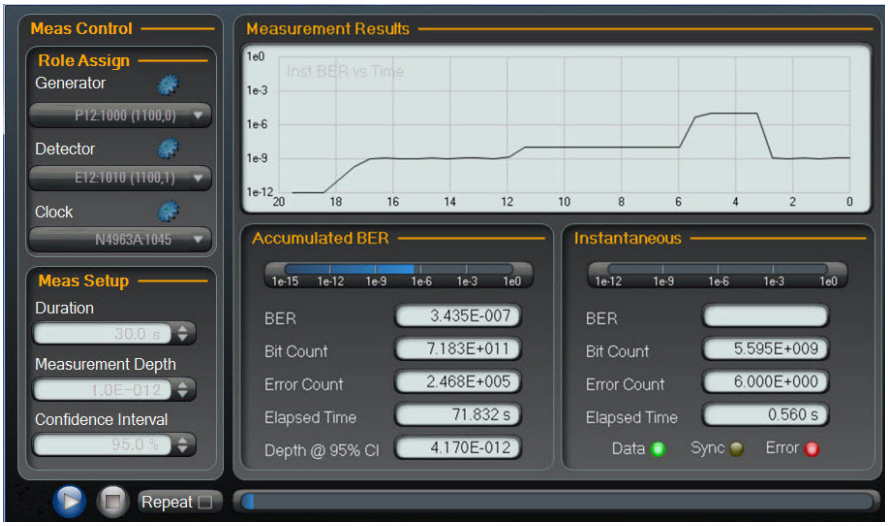


Figure 6. Graphical measurement results.

Strip chart view shows history of instantaneous BER. Device setting or mode changes which impact bit error performance can be instantly seen in real time, without needing to analyze a column of numbers.

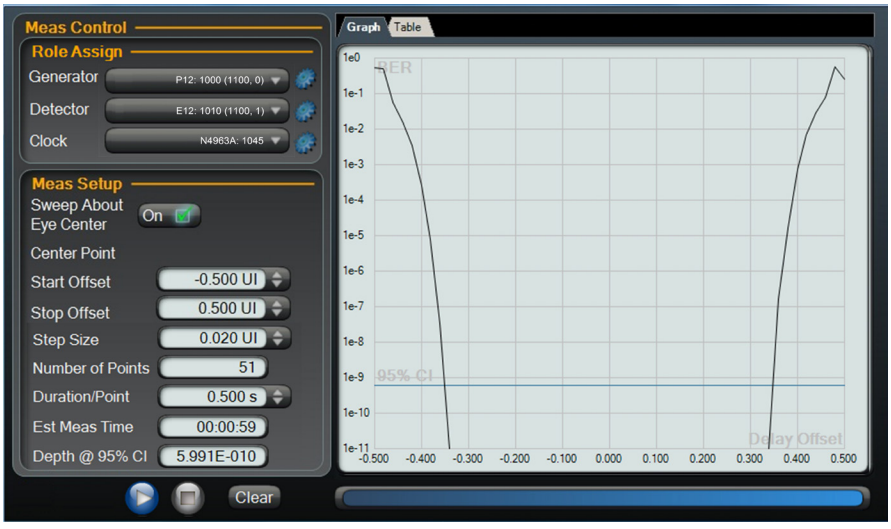


Figure 7. Bathtub view.

Bathtub view provides a quick visualization of eye opening at various BER confidence levels. Eye diagrams measured with real time or sampling scopes simply cannot capture enough data in a reasonable amount of time to accurately provide this information.

Virtual multi-channel BER setup

The N4980A multi-instrument BERT software also facilitates the setup and execution of multi-channel BER measurements using the virtual instruments feature. Up to four N4960A serial BERT 17 and 32 Gb/s instruments can be configured providing four channel BER measurement capability.

Figure 8. N4980A multi-channel BER measurement interface.

Figure 9. N4960A multi-channel hardware configuration.

Simplify jitter tolerance measurements

With the optional JTOL extension, the N4980A multi-instrument BERT software can perform JTOL measurements as simply as it measures BER (the JTOL software package requires a license for use). As with BER, both single and multi-channel JTOL can be measured. By running in parallel, multi-lane devices can be characterized much faster than conventional testing of each lane sequentially.

Measurements can operate in compliance mode, where the stress point at each jitter frequency is tested according to a specific template and then moved to the next frequency, or characterization mode, where testing continues until BER failure is reached.

To provide flexibility in trading off test resolution for test time, the user can select from the following search algorithms:

- Binary
- Binary + linear up/down
- Linear up/down
- Log up/down

Figure 10. Jitter tolerance measurements.

JTOL test limit templates can be saved and recalled, simplifying the set up for the next test. A simple to use “point and click” template editor allows the user to add or remove test points with a click of the mouse. With the JTOL template editor, you can create templates to meet the testing criteria of the most common standards.

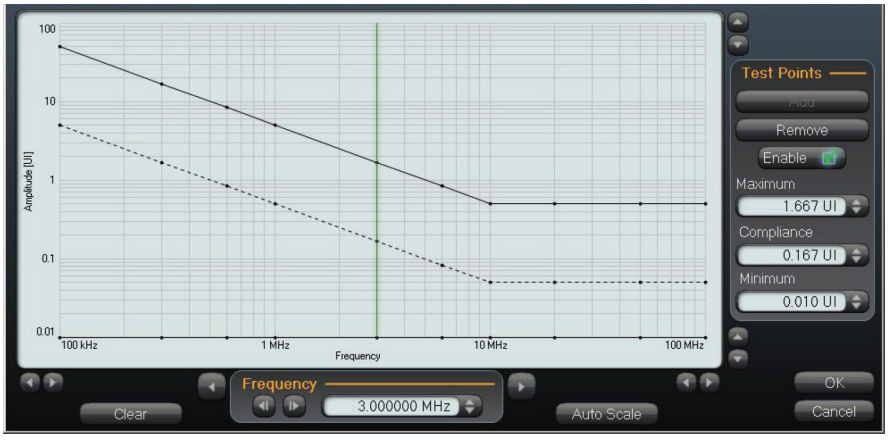


Figure 11. Jitter tolerance test limit template.

Programmable patterns

For special pattern requirements, programmable patterns up to 8 Mb in length can be easily created with powerful editing tools. Patterns can then be uploaded into the N4960A serial BERT.

The main programmable pattern editor dialog box is used to create and manage pattern streams. Pattern streams are composed of one or more sub-patterns. Each sub-pattern contains a single pattern definition. Using sub-patterns allows users to break down complex patterns for easier organization.

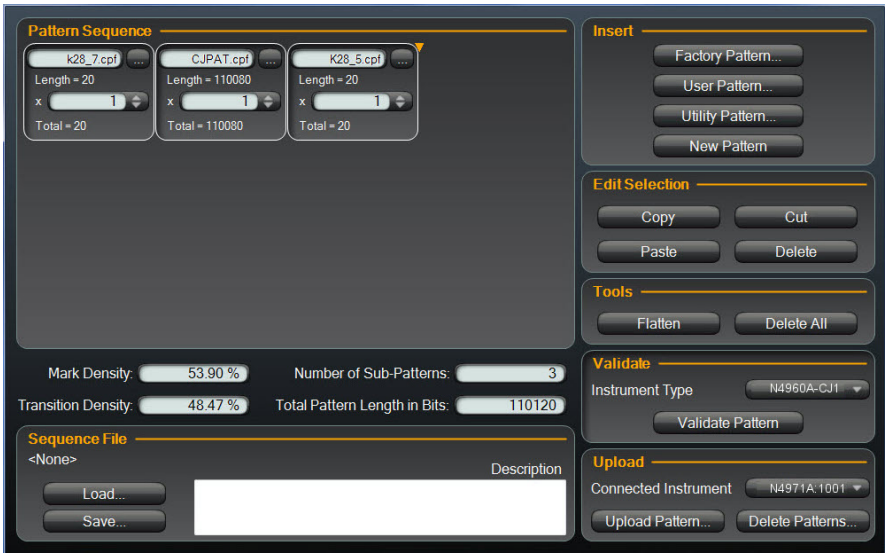


Figure 12. Pattern editor.

Sub-patterns can be edited at the bit level using the Edit Pattern dialog. In this dialog, users can create, view, edit, and find specific bit sequences.

Once the pattern definition is complete, it can be validated and uploaded to the N4960A serial BERT controller. It can also be saved to the PC as a *.cpf file.

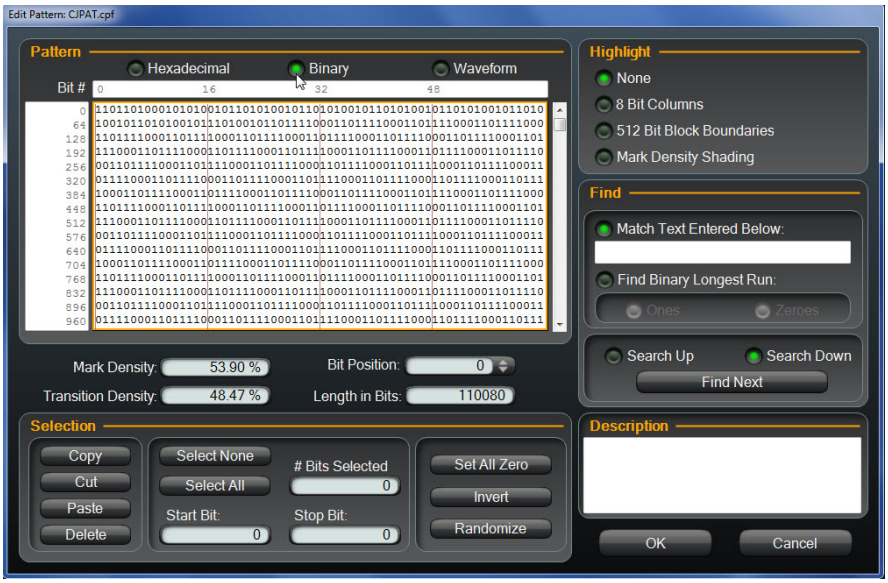


Figure 13. Sub-pattern editor.

Simplify tap weight computation

The N4980A Multi-instrument BERT software includes a powerful de-emphasis tap weight computation tool that simplifies the process of computing tap weights, reducing the time required to a few seconds. Starting from a measured or simulated S-Parameter file of the data path to be equalized, the software calculates the optimum tap values necessary to create the ideal compensation filter response. The user can control tap configurations, so different solutions with different ranges of pre- and post-cursors can be synthesized. Once the data has been analyzed and desired results obtained, a single click loads the computed tap weights directly into the N4951B-D17/-D32 pattern generator head.

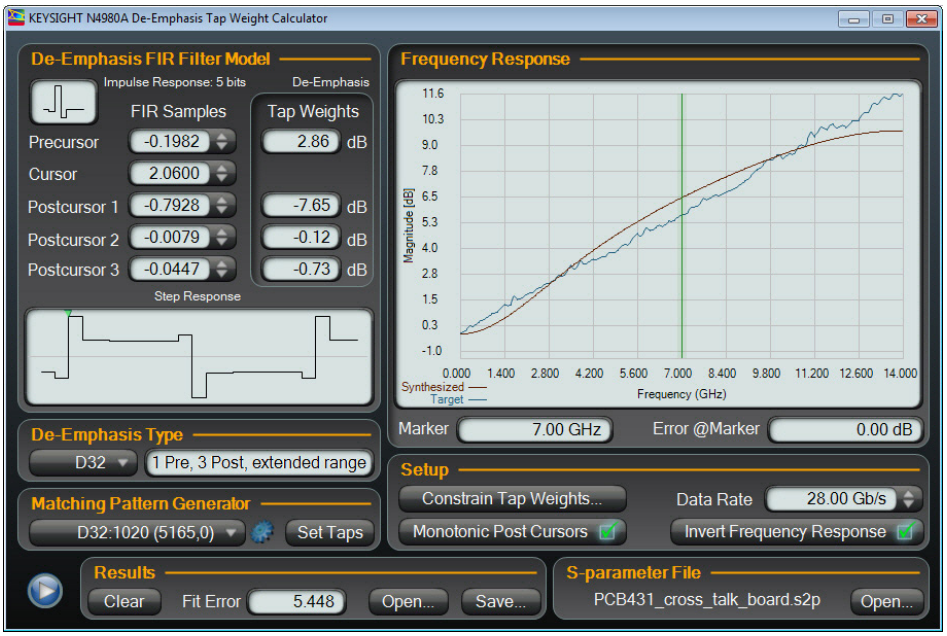
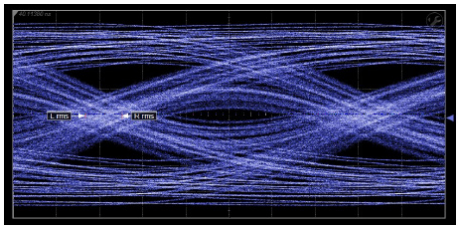
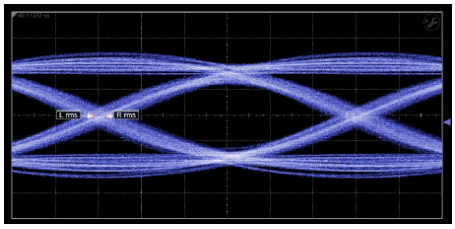


Figure 14. De-emphasis tap weight calculator.



No de-emphasis.



De-emphasis equalization applied.

Specifications

Instruments supported	
N4962A	Serial BERT 12.5 Gb/s
N4963A	Clock synthesizer 13.5 GHz
N4972A	Clock synthesizer 16 GHz
N4960A	Serial BERT controller
N4951A	Pattern generator 17/32 Gb/s remote head
N4951B	Pattern generator 17/32 Gb/s remote head
N4952A	Error detector 17/32 Gb/s remote head
N4965A	Multi-channel BERT controller
N4955A	Pattern generator 12.5 Gb/s remote head
N4956A	Error detector 12.5 Gb/s remote head
N4957A	Clock doubler remote head
N4971A	Programmable pattern generator 13 Gb/s
OS supported	
	Microsoft Windows 7 (32 or 64 bit)
	Microsoft Windows 10 (32 or 64 bit)
System requirements	
PC	Intel Pentium or equivalent
I/O	USB2.0 or IEEE-488 adapter [1]
Screen resolution	XGA+ (1152 x 864) minimum
Memory	500 MB, (4 GB for 64-bit OS)
Disk space	100 MB
OS add on	Microsoft .NET Framework [2] Version 3.5
I/O libraries [3]	National Instruments or Keysight

1. IEEE-488 required for N4962A or N4963A support.
2. Can be downloaded for no charge from www.microsoft.com web site.
3. Can be downloaded for no charge. Details given in Installation Instructions.

Ordering information

The N4980A multi-instrument BERT software provides all functionality described in this data sheet except jitter tolerance measurements. The jitter tolerance measurement package is an option enabled by a software key. A trial version is available. For ordering or obtaining a trial key, contact your Keysight Technologies sales representative.

Product option

Product code	Description
N4980A-JTS	Jitter tolerance software package

More information

For additional information, to schedule a product demonstration, or to request a quote, contact your local authorized Keysight Technologies distributor or Keysight sales department.

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

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