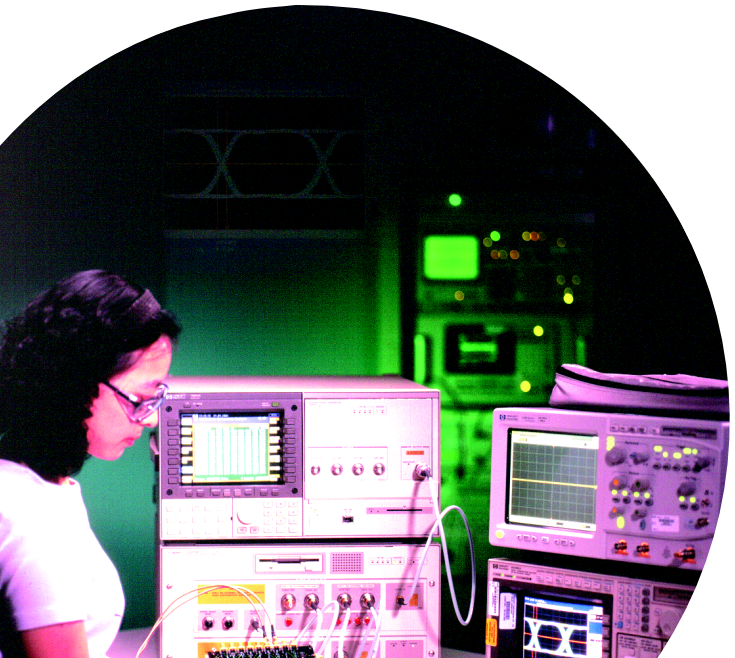
Reach tomorrow's market today

Accurately characterize your Gbit components fast



Agilent 71612C 12.5 Gb/s error performance analyzer

Agilent Technologies

Prove your design of lightwave and Gbit devices with confidence

Are you responsible for the research, development or manufacturing test of Gbit lightwave and digital components, devices and sub-systems? Then Agilent's 71612C error performance analyzer is the ideal solution for generating high quality, low distortion waveforms across the entire 100 Mb/s to 12.5 Gb/s range.

With this high performance serial pattern generator and error detector, you can perform error analysis to verify the operation and quality of lightwave submarine cable systems, SONET/SDH telecom and datacom transceivers, Gbit datacom serial links, high-speed logic devices, and optical amplifiers and modulators.

And the analyzer can be used to test 10.6 Gbit ethernet and forward error correction (FEC) rates. Giving you a breadth of applications to help you thoroughly test and characterize your devices for complete confidence in your product.

Performance summary

Take a closer look at a few of the many advantages the 71612C analyzer offers:

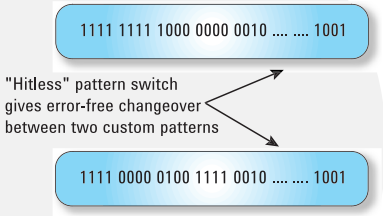
- Generate exceptional waveforms even with reflective or poor terminations
- Dedicate the analyzer's whole display for pattern editing
- Simulate long distance testing using burst-mode gating in recirculating loop tests
- Quickly locate the optimum decision point in the eye waveform with auto-decision thresholds and phase alignment
- Identify individual errored bits in custom patterns using error location analysis (ELA)
- Display any bit in a custom pattern using the flexible pattern trigger
- Automatically predict conventionally unmeasurable low BER using Q-factor measurement and eye-contour analysis
- Generate real-life test patterns to stress your system-under-test
- Create a cost effective 12.5 Gb/s frequency agile jitter measuring system
- Convert electrical-to-optical and optical-to-electrical signals that are SONET/SDH compliant

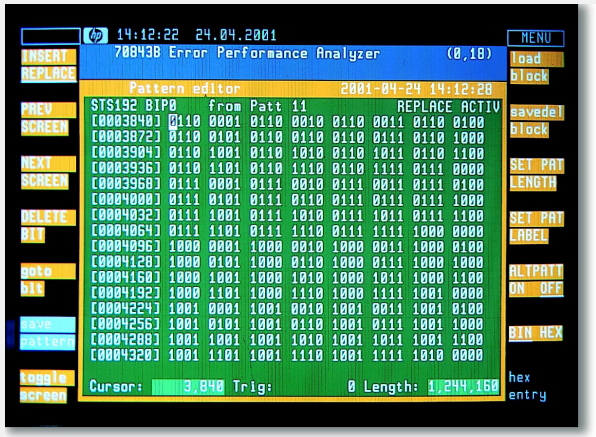
Create effective test patterns to stress test components and sub-systems

Because the analyzer's large color display can be totally dedicated to pattern editing, you can create complete, structured SONET and SDH frames that accurately represent signals carried by transmission systems. You can simulate multiple SONET/SDH frames too; the analyzer has over 8 Mbit of user-programmable pattern memory — large enough to simulate up to six different OC-192/STM-64 frames simultaneously.

The analyzer's on-screen pattern editor means you can efficiently perform real-time manipulation of even the most complex patterns. Copy, cut and paste at the touch of a key, then store your patterns internally or to the integral flexible disk.

To see how your devices respond to pattern-dependent errors, use the "hitless" pattern switch to change error-free between two custom patterns. Each pattern can be up to 4 Mbit in length.





Display the whole bit pattern and perform real-time editing of your longest test patterns

Easily assess long-distance transmission systems

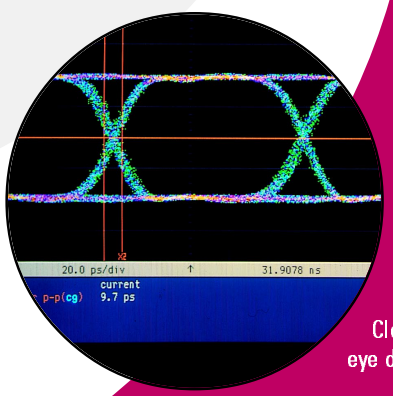
The analyzer's fast PRBS synchronization algorithm allows you to make reliable BER tests using burst gating. This facility lets you easily simulate transoceanic and coast-to-coast transmission systems using fiber loop on the bench.

Set up and measure fast

Simplify BER measurements using the analyzer's auto-decision threshold and clock/data delay routines. These sequences automatically locate the optimum decision point in the input diagram, clearly displayng eye width and height for user-defined error ratio thresholds.

Improve device performance

The analyzer's output waveform has low jitter and fast transistion times. This means you can characterize devices more accurately and improve critical corner-case shortcomings.



Clear waveform of data output eye diagram at 10 Gb/s

Test more efficiently with additional application software

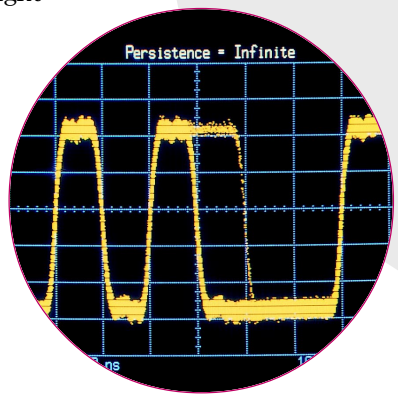
Optimize your designs with error location analysis

Use error location analysis (ELA) to help you differentiate between systematic and random errors within RAM based patterns. This software (optional) allows you to develop reliable high-speed components and sub-systems faster than ever.

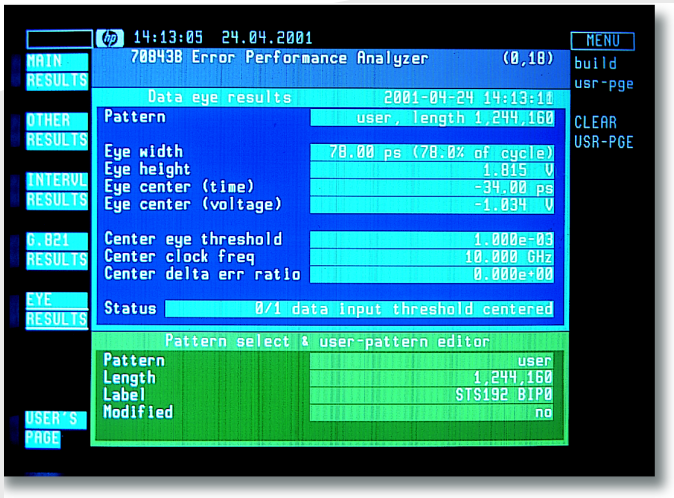
Bit BER
Locate the cause of systematic errors. Just specify any bit in a user-defined pattern and perform BER measurements on that bit.

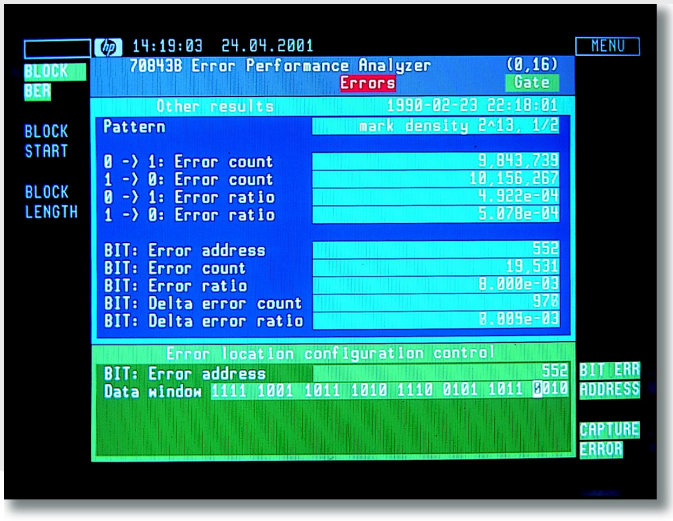
Block BER
Locate the cause of systematic errors that affect longer runs of bits, for example, a corrupt header in a SONET or SDH frame. Perform BER measurements on a range of bits within a user-defined pattern.

Error-location capture
Discriminate between random and systematic errors. In a user-defined pattern, automatically highlight the position of each errored bit in turn – displaying the address of the errored bit – and show the surrounding bit pattern. Then automatically measure BER of each errored bit.

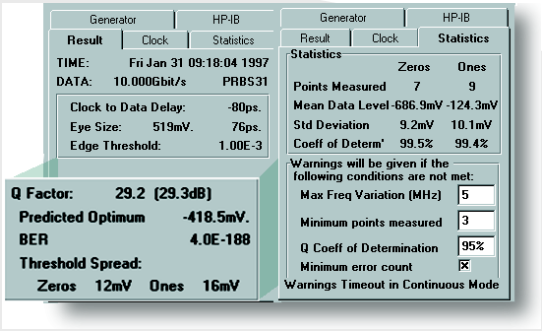


Digital communications analyzer displaying errored bit





Error location analysis has identified errored bit 552 within a long, repetitive pattern. The BER value of bit 552 is also displayed.



Prove the operating margin of optically amplified systems

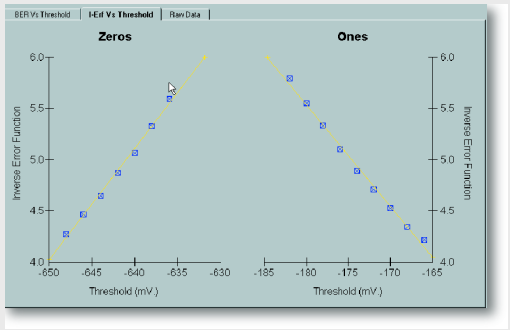
E4543A application software with the 71612C can perform Q-factor measurements, or generate eye-contour diagrams to reveal even the smallest degradations in the signal, quickly and efficiently. This highly acclaimed combination is regarded as the accepted industry standard.

Structured pattern software provides flexible test stimulus

Conclusively stress test your components and devices by simulating live traffic conditions using the E4544A STM-64/OC-192 functional test application software. This software increases the test capability of the 71612C analyzer letting you create, edit, and store your own SONET/SDH test patterns. Alarm generation, payload types, and error injection are just a few of the selections available.

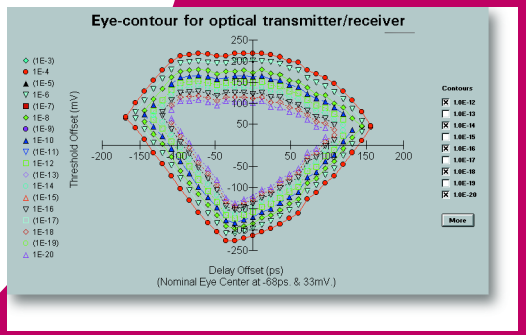
Easily measure the electrical signal-to-noise ratio at the receiver

Estimate very low BER from Q-factor when it is impractical using conventional techniques. E4543A software performs this measurement by dividing the data into errored 1s and 0s and fitting each set to an ideal curve (assuming Gaussian noise statistics). The equivalent mean- and standard-deviation are calculated allowing Q-factor and BER to be automatically predicted.



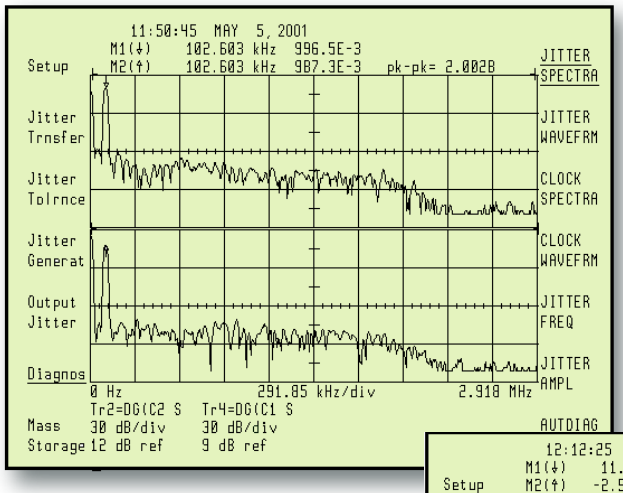
Predict low BER with eye-contour analysis

Contours down to BER of 10^{-20} can be predicted from Q-factor calculations. Using the E4543A software, eye-contour plots can provide vital information about degradations due to noise and intersymbol interference (ISI).



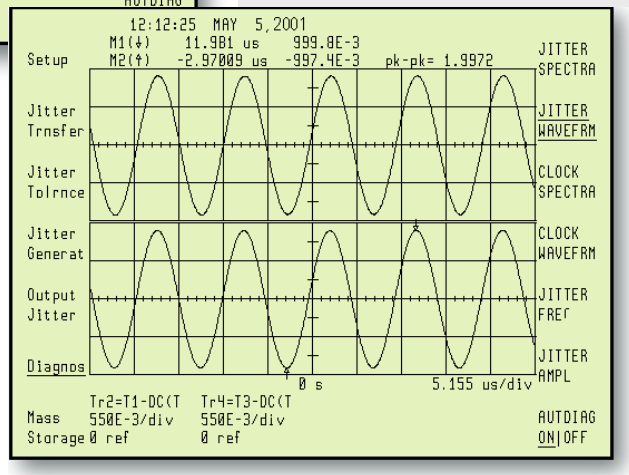
Add even more test capability to the 71612C analyzer

Create a unique frequency agile jitter system to test your telecom and datacom components and sub-modules.Combining the 71612C with the 71501C jitter analyzer allows you to fully analyze jitter from 100 Mb/s to 12.5 Gb/s — so that when your devices are finally installed into the network, you can be confident that they don't introduce impairments into the signal.



Demodulated jitter spectrum

Not simply a pass/fail jitter tester, but a powerful diagnostic test system. With a suite of tests to help you fully investigate sub-standard jitter performance, you can view demodulated jitter spectrum and waveform, clock spectrum and waveform, plus jitter frequency and amplitude.



Demodulated jitter waveform

Create a powerful frequency agile jitter analysis system

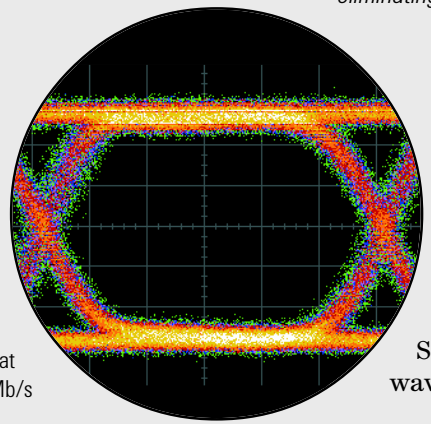
Using Agilent's 71612C analyzer and the 71501C jitter analysis system, fully characterize jitter of your devices — from the chip/component level through to complete transmission systems. With the 71501C controlling the 71612C and co-ordinating jitter measurements, you can perform standard (SONET/SDH) or customized jitter mask testing automatically. And because the system is completely frequency agile, these tests can be performed at any rate from 100 Mb/s to 12.5 Gb/s including gigabit ethernet at 10.6 Gb/s and FEC line rates.

Characterize the jitter performance of devices, components and systems

Perform jitter transfer, jitter tolerance, and jitter generation and measurement too. The 71612C analyzer coupled with the 71501C jitter system lets you rigorously characterize components, devices or systems to industry standards to ensure a high level of performance in the presence of jitter.

Make Gbit test interfacing easy

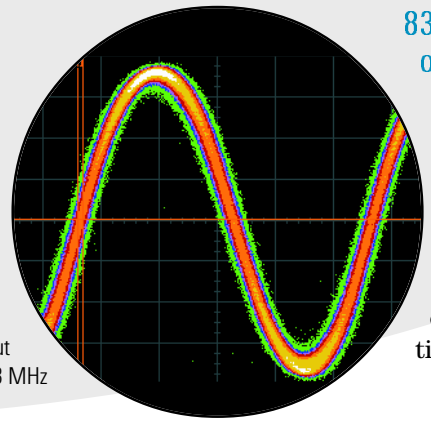
When testing differentially driven components and characterizing optical devices, independent control of the 71612C pattern generator's dc-coupled complementary clock and data outputs is indispensable. This enables the analyzer to interface to a wide range of devices and IC families, eliminating the need for level conversion.



Agilent 83433A unfiltered optical waveform at 9953.28 Mb/s

83433A lightwave transmitter electrical to optical convertor

Generate 10 Gb/s or 2.5 Gb/s data and clock signals using the 71612C pattern generator. Input these signals into the 83433A and convert them to SONET/SDH compliant optical waveforms.



Agilent 83434A recovered clock output at 9953.28 MHz

83434A lightwave receiver optical to electrical convertor

The 83434A recovers clock and data from STM-64/OC-192 SONET/SDH optical waveforms. The linear non-retimed data output allows the 71612C error detector to optimize decision threshold and timing to optimize BER.

Forward error correction (FEC)

The latest FEC techniques now increase line rates up to 12.5 Gb/s. The 71612C analyzer can be used to BER test not only standardized FEC rates but also emerging FEC rates above 12 Gb/s. What's more, you can use the pattern editor to create appropriately coded patterns to stress test your devices to the limit.

10 gigabit ethernet

The versatile 71612C can be used to analyze a variety of telecom and datacom devices. For example, the emerging 10 Gbit ethernet network provides a transmission system that addresses some of the bandwidth limitations of today's datacom networks. The analyzer can perform BER measurements of gigabit ethernet systems and components at 10.6 Gb/s.

Related literature and products

71612C error performance analyzer
Technical specifications
5988-3344EN

71612C error performance analyzer
Configuration guide
5988-3345EN

83433A/83434A lightwave transmitter/receiver
Product overview
5968-9251E

E4543A Q-factor and eye-contour application software
Product overview
5988-3320EN

E4544A STM-64/OC-192 functional test application software
Product overview
5988-3319EN

Locating errors in Gigabit transmission systems
and components
5988-3321EN

Testing 10 Gb/s SONET/SDH equipment
and components
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Frequency agile jitter measurement system
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71501C jitter analysis system brochure
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86100 DCA digital communications analyzer
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Characterize your SONET/SDH devices fast
and accurately (OmniBER 725) brochure
5988-0327EN

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