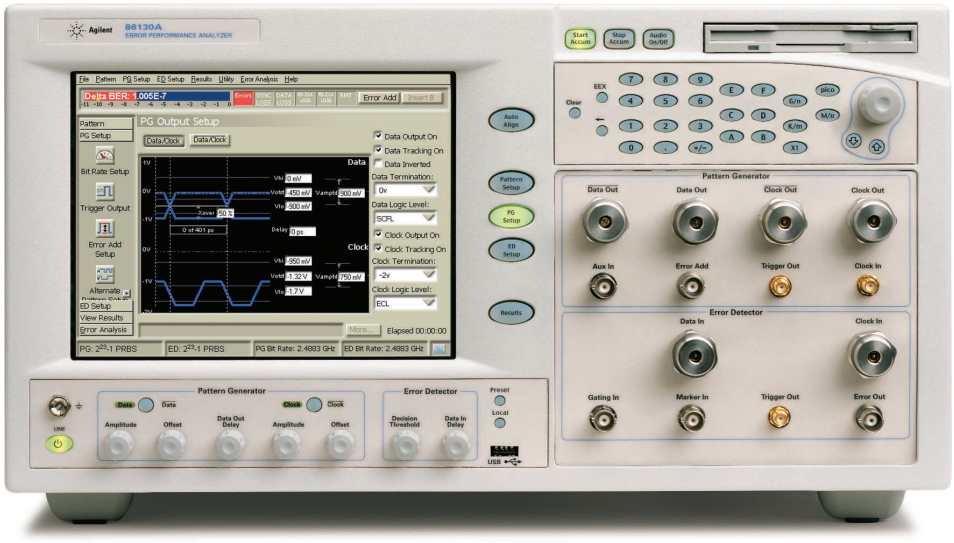
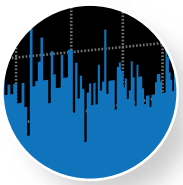
86130A

Should a Bit Error Ratio measurement be hard to make? We don't think so.

BitAlyzer®

- Powerful analysis leads you to where problems lie
- Intuitive operation allows you to concentrate on the problem, not the test equipment
- Double the power when teamed with Agilent Technologies 86100B Infiniium DCA

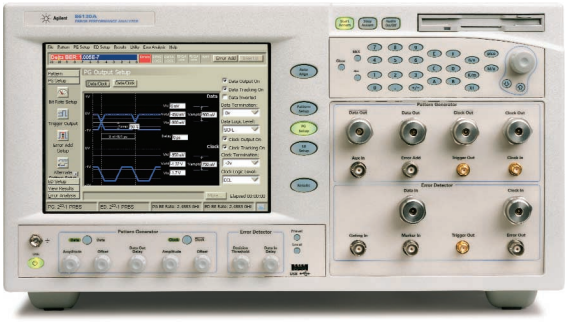




Agilent 86130A
BitAlyzer 3.6 Gb/s Error Performance Analyzer

Agilent Technologies

SYNTHESYS RESEARCH INC

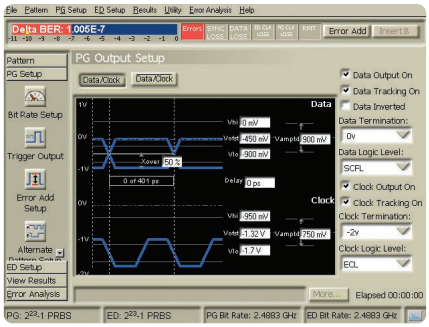


The Agilent 86130A BitAlyzer is a 3.6 Gb/s general-purpose bit error ratio tester designed for high-speed digital components and systems. The 86130A includes error analysis technology that records and analyzes errors. This provides you with information to help solve your design problems and eliminate manufacturing defects. Other features include an intuitive user interface that has a similar look and feel to the Infiniium DCA Oscilloscope, and excellent waveform shape that ensures you are driving your device with the best possible stimulus.

Let your test equipment be part of the solution...

Take the pain out of Pattern Generator setup

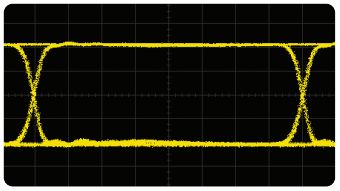
The common data logic levels are easily selectable from a pull down menu— or use your own custom levels with the graphical amplitude screen. Raise the high voltage level, for example, and the offset and peak-to-peak automatically follow— no need to use a calculator any more.



Pattern Generator setup

Have confidence

that the pattern you selected will be delivered by the Pattern Generator with the highest possible fidelity. The waveform performance of the instrument is excellent.

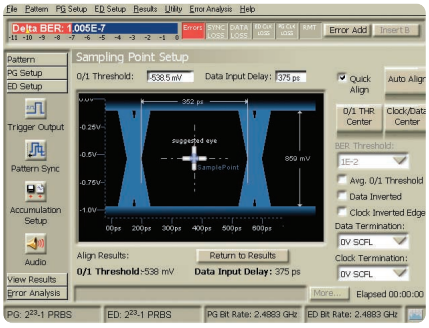


Pattern Generator Waveform

Not part of the problem

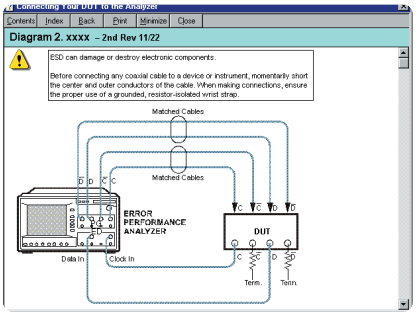
Easy error detector setup

The 86130A de-mystifies one of the most misunderstood adjustments used in making good BER measurements—setting the best sampling point. The instrument can optimize the clock/data delay, and the decision threshold automatically—or allow experienced users to override the chosen settings.



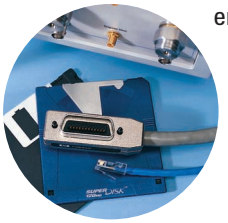
Instant help

The Agilent 86130's On-line help system is a complete operating manual, a measurement reference, and it won't get lost either.

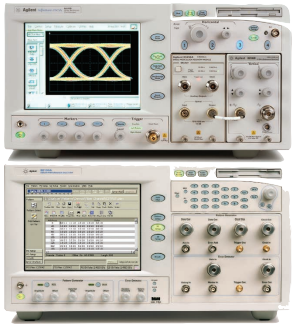


Easy connectivity

Get information into, and out of the BitAlyzer easily. Data entry can be achieved using any or all of the following: touch screen, front panel buttons, USB keyboard or mouse. Data may be exported using the LS-120 floppy drive, GPIB, or LAN. Remote control is also a breeze with the *Plug&Play* driver.



Double your design power...



...by combining the Agilent 86130A BitAlyzer with the 86100B Infiniium DCA for the complete picture

Easy to use

And don't forget jitter...

...the industry standard Agilent 71501D makes the ideal companion to fully exercise critical components

Advantages for Manufacturing

- ***Plug&Play* driver**
  Easy automation in HP VEE®, LabView®, C++ etc.
- **Compatible with HP 71603B**
  Leverage your old code with minimum changes
- **Easy storage and sharing of results**
  LAN/GPIB connectivity and 3.5" Superdrive
- **High throughput**
  With Quick Auto Align, the optimum sampling point is found in about 1 second for any PRBS pattern. This spells high throughput in manufacturing.
- **Low cost per test**
- **Low cost of ownership**
  Worldwide support, long calibration interval

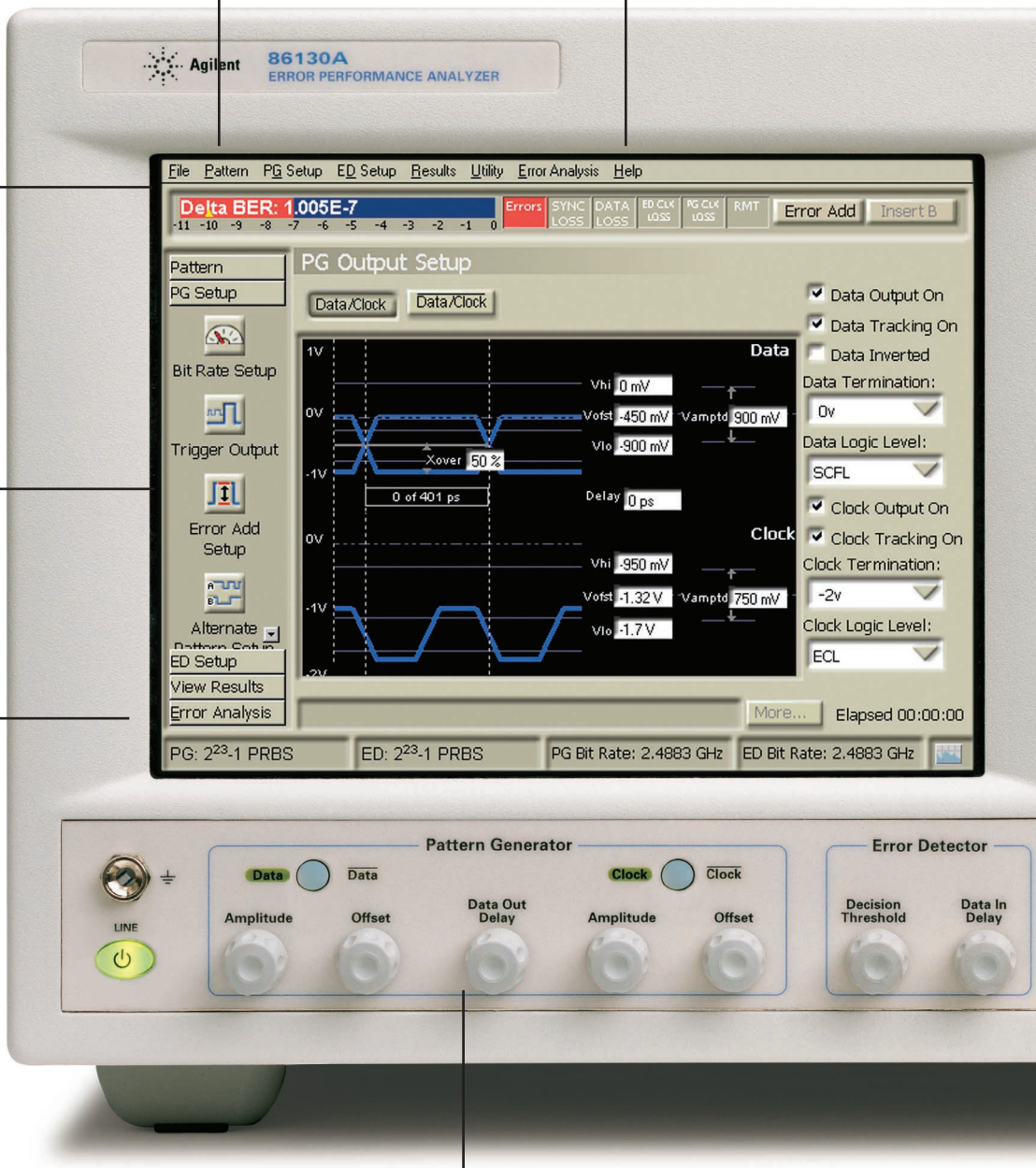
Advantages for R&D

- **Don't waste time remembering how to use the test equipment**
  Intuitive design, sensible placement of controls
- **Use the power of patented error analysis**
  Let the equipment guide you to where problems lie
- **Communicate**
  Use this test equipment remotely. Store results, print or import into your favorite Windows® applications.
- **Wide delay range for low speed testing**
  Up to 1 bit period of delay makes testing OC-3 parts easier

Usable performance

Familiar Windows® user interface
Reduces the learning curve

Powerful on-line help
Easy to find what you want, whether your question is on how to operate the instrument, or how to make the best measurements



Constant display of instantaneous BER
Always available

Large, sharp touch-sensitive screen
Use the touch-screen to control the instrument—or use the buttons, keyboard or mouse

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Patented, powerful SyntheSys™ error analysis
Turns you into an analysis expert

Analog-like controls
For common adjustments such as output levels and clock/data delay

The Big Picture

One-touch Auto-Alignment
Clock and data acts like "Auto-Scale" on an oscilloscope, helping to ensure that your measurements are accurate

120-MB LS-120 SuperDisk™ floppy drive
Makes it easy to save lots of work (and reads/writes to 3.5" disks), as well as making pattern storage and system software updates fast and easy

Instant access to common functions
You won't get lost in buried menus

Excellent waveform shape
from the pattern generator—so you can be sure that you are driving your device with the best possible stimulus

Flexibility
The 86130A offers 3.6 Gb/s performance using an external clock source, or switch to the internal synthesizer for operation up to 3.0 Gb/s.

Code compatible
With the well-known HP 71603B 3 Gb/s Error Performance Analyzer with the minimum of GPIB changes

USB Port
To use the supplied keyboard and mouse if desired

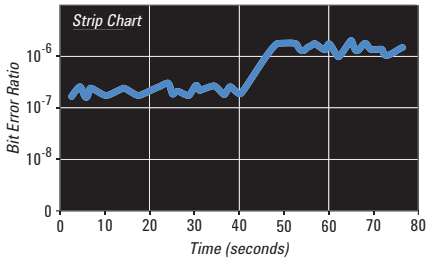
Make sense of your errors

The 86130A studies precise error locations and uses this information to present views of error statistics that go far beyond simple bit error ratio.

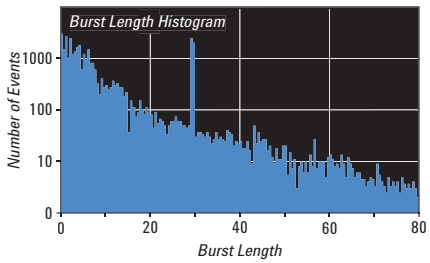
Burst error analysis

Understanding bit and burst error statistics is the first step in characterizing errors

- Link studies
- Recording systems
- Error correction coding



General monitoring of error ratios for both bit and burst measurements are best done with a strip chart that shows error ratio progress over time. For example, it can quickly show the effect of tuning on your error performance.

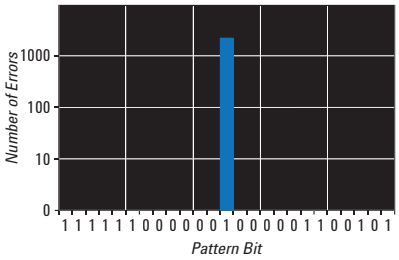


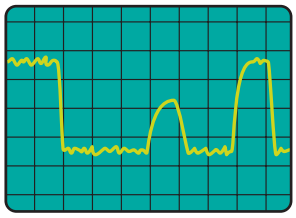
Here is a traditional profile for a burst-prone channel used in a telemetry recording system. It shows a peculiar occurrence of a fixed-length error burst. This fixed-length error was the result of a hardware failure that caused a fixed number of bits to be forced to zero.

Pattern sensitivity analysis

Automatically display pattern dependencies and locate the problem pattern

- Channel coding
- Equalization tuning
- Optimizing bandwidth
- Logic debug





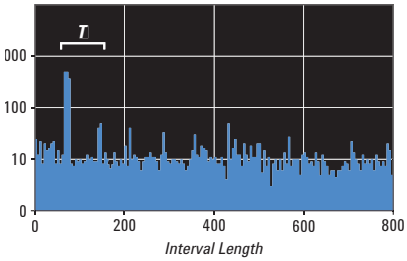
A typical example of a pattern sensitive error in this isolated bit.

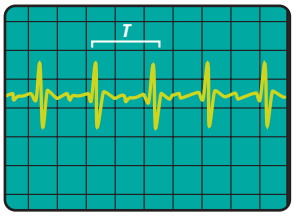
In this histogram, we see that all measured errors happened at a single location of the test pattern. This corresponds to a 0001000 sequence. Such isolated "ones" sensitivity can be caused by poor frequency response.

Error-free interval analysis

Reveal periodic error behavior in your system and isolate the root cause

- EMI
- FEC interleave selection
- Manufacturing troubleshooting
- Electro-mechanical interference





For example, a corrupt power supply might have switching noise that has caused bit errors.

This error-free interval histogram easily identifies that many errors are coming from a repetitive cause. Using the cursors to measure the repetition rate, you have a clue for where to look next.

SYNTHESYS RESEARCH, INC.

See more clearly

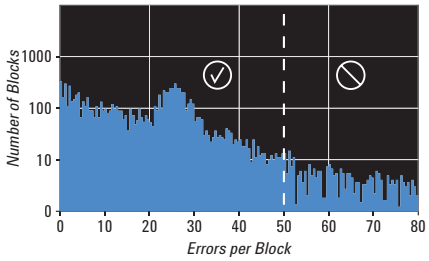
Understand the causes of bit errors like never before. By using SyntheSys Research's patented error analysis technology, the 86130A BitAlyzer shows error correlations and sensitivities that reveal the mechanisms behind the errors.

Bit errors come in many types. BitAlyzer technology helps distinguish between the varieties that might be present. For example, understanding whether errors are isolated, bursty or repetitive gives important clues. Going further, correlation to block sizes, pattern sensitivities, electromagnetic or electromechanical interference may all be uncovered.

Errored block analysis

Isolate unusable packets to predict system performance

- SONET
- MPEG-II
- Disk drive sectors
- Proprietary networks
- Manufacturing go/no-go testing

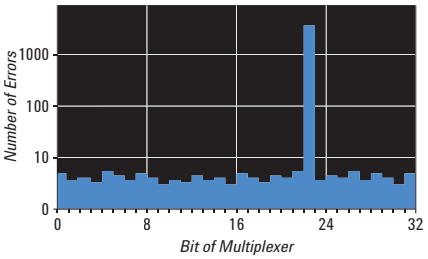


Histograms of block error statistics can be used to predict retransmisision rates under real-world conditions. In this example with block sizes set to emulate system packets, nearly all packets are acceptable.

Error correlation analysis

Track down defects by using error correlation analysis

- Mux/Demux testing
- Magnetic/optical recording
- Hardware fault isolation

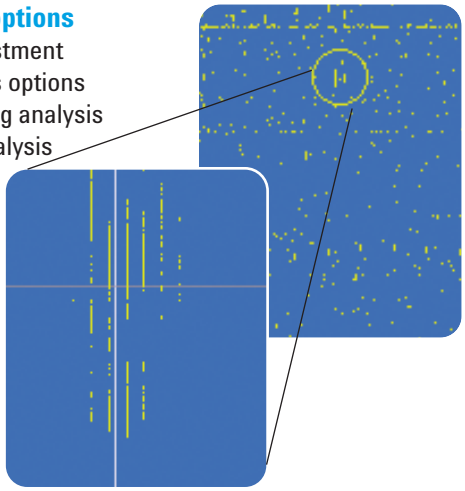


The error correlation analysis shows error correlation to the individual channels in a 32:1 mux test. All designs have intrinsic numbers associated with them (e.g. bus widths, ECC block sizes, formats). By correlation with these intrinsic values, errors can be traced back to their origin.

Advanced analysis options

Add value to your investment with advanced analysis options

- Error correction coding analysis
- 2-D error mapping analysis



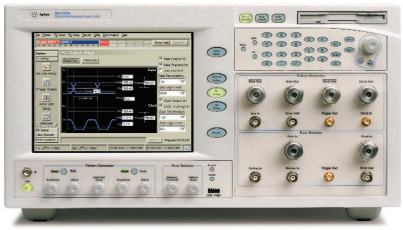
2-D error mapping creates a raster scan view of errors from your data stream. This example of magnetic tape reveals the impact of a scratch on the tape surface.

ECC Performance Data	
Symbols in Group	36,108
Groups Processed	97,044
C1 Symbol Errors	37,082
C1 Blocks with Error	16,011
C1 Symbols Corrected	21,850
C1 Blocks Failed	2,107
C2 Symbol Errors	15,232
C2 Blocks with Error	14,941
C2 Symbols Corrected	15,232
C2 Blocks Failed	0
Erasures Used	0
Erasure Symbols Corrected	0
Uncorrectable Symbols	0

Block error correction codes can be emulated and verified. By passing errors from uncorrected streams through the ECC analysis option, performance of the proposed systems can be studied.

The Agilent 86130A BitAlyzer... a whole product solution

The performance of the Agilent 86130A BitAlyzer is only a small part of what you get from Agilent Technologies. Only Agilent offers the depth and breadth of enhancements, software, services and support to help you meet your measurement objectives. Please contact Agilent for more information.



Product summary

- 50 Mbit/s to 3.6 Gbit/s (3.0 Gbit/s with internal synthesizer)
- Sub-45 ps risetimes and excellent waveform performance
- Clock/data delay range of up to a full bit period (useful for low-speed testing)
- Advanced error analysis
- Expandable platform (to add analysis as you need it and protect your investment)
- 8 Mbit pattern memory
- GPIB, LAN (Ethernet), Parallel printer port
- Keyboard and mouse

Peripheral and product interfaces

Parallel printer port
Printer support
VGA monitor output
Keyboard and mouse

Pre-sales service

Rentals, leasing and financing
Consulting services
Application notes
Custom product modifications

Training and access to information

On-site user training
Web-based support of frequently asked questions
Manuals available on the instrument, on CD-ROM and on the Web
Literature on the Web

Connectivity

GPIB
Plug&Play driver
LS-120 SuperDisk drive (also accepts 3.5" floppy disks)

Post-sales support

Standard one year global warranty
Worldwide Call Center and Service Center support network
Two year calibration intervals

Ordering information

Agilent Technologies 86130A BitAlyzer: Integrated Pattern Generator and Error Detector

Option 86130A-100: 2-D Error Mapping
Option 86130A-200: Error Correction Coding Analysis
Option 86130A-300: Add E4422B 4.0 GHz Synthesized Signal Source

Additional Literature

Technical Specifications
Literature number 5968-8545E

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Korea:
(tel) (82-2) 2004-5004
(fax)(82-2) 2004-5115

Latin America:
(tel) (305) 269 7500
(fax) (305) 269 7599

Taiwan:
(tel) 080-004-7866
(fax) (886-2) 2545-6723

Other Asia Pacific Countries:
(tel) (65) 375-8100
(fax) (65) 836-0252
Email: tm_asia@agilent.com

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