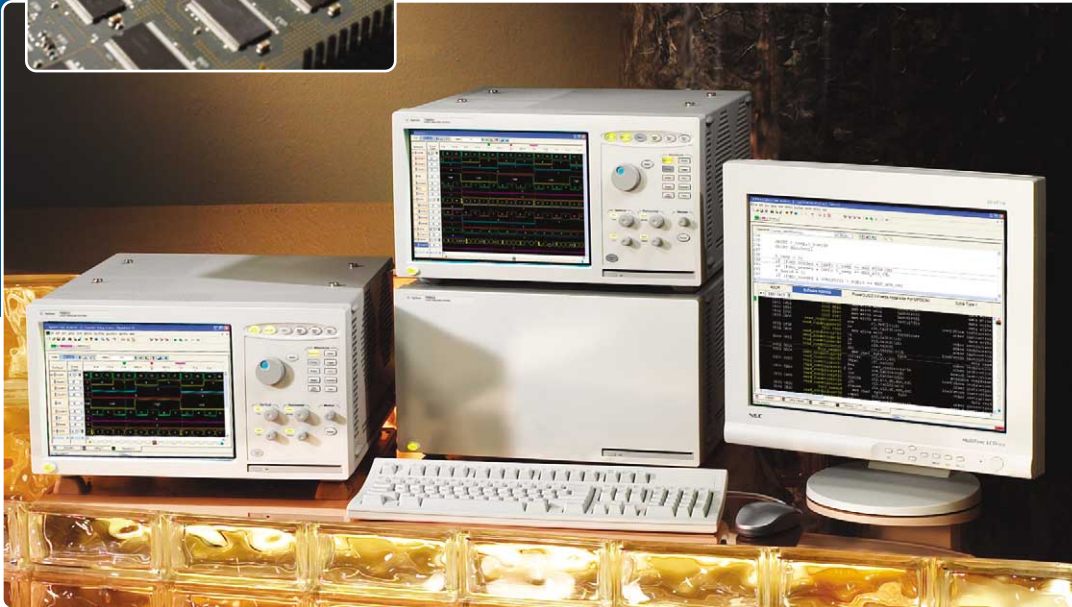
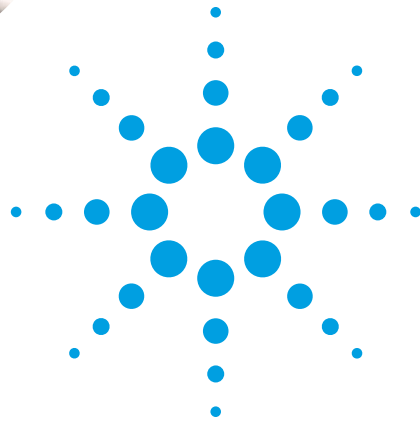
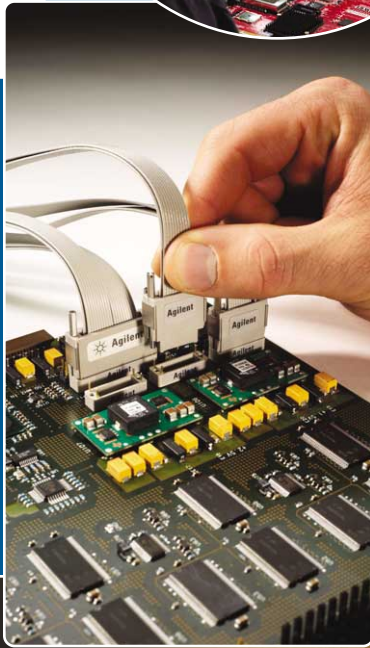




Agilent Technologies 16900 Series Logic Analysis Systems



**Exceptional
Performance**

**Intuitive User
Interface**

**State of the
Art Probing**

**All within
Budget**



Agilent Technologies

Get your leading-edge designs to market faster

Debugging today's digital systems is tougher than ever. You need high-performance, reliable tools to help you overcome the difficult engineering challenges you face.

The 16900 Series logic analysis systems help you solve tough debug problems, minimize your project risk, and get your leading-edge products to market faster.

These systems provide excellent performance and accurate, reliable measurements – priced to match your budget. And, because you can't measure what you can't probe, we've used innovative probing technologies so you can access critical signals in your designs. These analyzers include an award-winning intuitive Windows® graphical user interface and straightforward triggering capability – so you spend more time on design and debug and less time learning how to use them.

From our HP test and measurement foundation, Agilent's leadership in logic analysis spans four decades. Beginning with the creation of the logic analyzer in the 1970s, Agilent consistently delivers high-value products that keep pace with your latest designs and set the standard of price-performance and ease of use in the logic analysis market.

Now a new generation of logic analyzers, the Agilent 16900 Series logic analysis systems, deliver what you've come to expect from the industry leader in logic analysis...and more.



Figure 1. Conquer your toughest debug problems with an Agilent 16900 Series logic analysis system.

Get the performance you need at a price to match your budget

The Agilent 16900 Series logic analysis systems deliver the power and performance you need to conquer your toughest debug problems.

The mainframe you select is the foundation of your system. The 16900 Series mainframes' multithreading software architecture takes full advantage

of gigabit local area networks (Gbit LANs) and the latest in multi-processor, large memory computer technology to achieve the fastest performance in the industry. They provide you with extremely rapid zooming, searching and scrolling updates for deep memory, high-channel count acquisitions.



Figure 2. The 16900 Series logic analysis systems provide exceptional performance, usability and superior probing at prices to match your budget.

Performance doesn't end with the mainframe. Agilent's 4 GHz timing zoom and eye finder technologies make accurate measurements on high-speed signals, so you can find critical problems that occur on the industry's fastest buses. You get accurate and reliable measurements, all time-correlated, for today's complex circuits, with expandability and performance headroom to cover future technology trends.

Agilent Model Number	16900A	16902A	16903A
Number of Slots	6	6	3
Multiframe Pro Expandability	Yes	Yes	No
Display Type(s) and Resolution	Supports up to 4 external monitors; up to 1600 x 1200	Built-in color touch screen, 12.1 inch, 800 x 600; supports up to 4 external monitors up to 1600 x 1200	Built-in color touch screen, 12.1 inch, 800 x 600; supports up to 4 external monitors up to 1600 x 1200
PCI Expansion Slots	2 full profile, 1 low profile	2 full profile, 1 low profile	1 full profile, 1 low profile

Table 1. Agilent modular 16900 Series mainframes.

Easily integrate the analyzer into your debug environment

In addition to performance, usability and excellent pricing, you also get flexibility. You can make measurements and analyze, store and share data according to your work style. Whether you work alone at a bench or with team members distributed around the world, the 16900 Series provides a use model that easily integrates into your debug environment.



Figure 3. Get the most comprehensive view of your data with extended desktop viewing using up to four monitors.

Work at your bench – operate the analyzer via touch screen or keyboard and mouse.

Expand view across multiple monitors – get the most comprehensive view of your data with extended desktop viewing using up to four monitors.

Remotely control and monitor the logic analyzer – access a remote logic analyzer over the network with hosted power mode or via built-in Windows XP desktop sharing. Receive an e-mail when the logic analyzer triggers.

Comply with your company's network standards – add anti-virus software to the open Windows XP Pro-based analyzer.

Use the power of your latest multiprocessor, deep memory PC or server – increase your analyzer's usage and team's productivity. Use any Windows-based computer on the network to host the logic analyzer application software and remotely control the logic analyzer. View and analyze captured data on the PC while the logic analyzer makes additional measurements. You can also create setups for your next round of measurements.

Run automated tests – execute a series of tests via Microsoft® DCOM programmability.

Offload data for custom analysis – move data quickly over the optional Gbit LAN connection to an external computer.

Share results and setups easily, anywhere in the world – transfer files to USB flash drives or to shared drives over high-speed LAN to share or archive results and setups with team members worldwide. Copy and paste data into other applications and document your findings.

Combine mainframes to expand measurement capability – use mainframes individually, then connect them together when you need to analyze complex, multiple-bus problems.

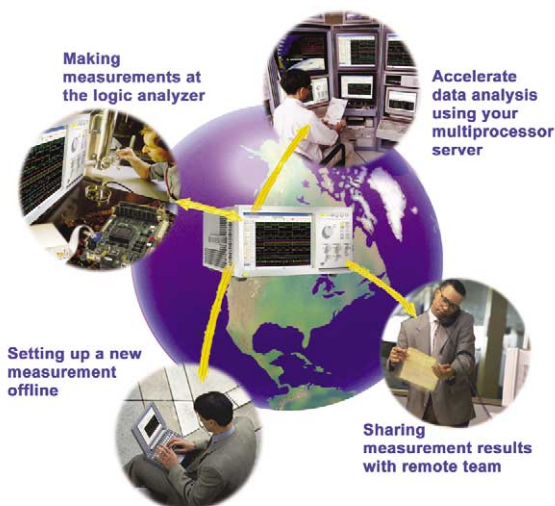


Figure 4. Whether you work alone at a bench or with team members distributed around the world, the 16900 Series provides a use model that easily integrates into your debug environment.

Easily configure your 16900 Series system

Configuring a 16900 Series modular system is as easy as 1, 2, 3.

Select the probing, measurement modules and analysis options that are best suited for your specific application.

1 connect → create the physical and electrical connection between the logic analyzer and your device under test with innovative probing.

2 acquire → obtain accurate and reliable measurements, with power to support future technology trends.

3 view & analyze → consolidate large amounts of data rapidly into displays that provide views of your system's behavior in a format you understand.



Figure 5. Soft touch connectorless probes provide a powerful combination of easy, reliable connection with high performance.



Figure 6. Choose from a family of acquisition modules to meet your requirements.

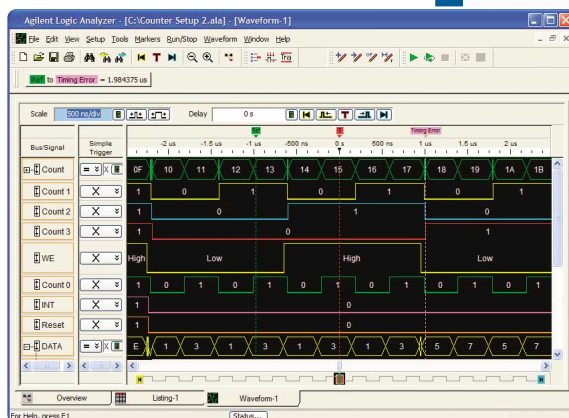


Figure 7. Get instant insight into your design with multiple views and analysis tools.

Get accurate measurements with reliable probing

Agilent Technologies offers a wide variety of probing accessories that support general-purpose and application-specific measurement needs.

Agilent consistently delivers the leading edge in probing hardware and techniques to give designers like you access to the very signals that hold the key to your system's problems.

Quickly debug your FPGA and surrounding system

FPGAs play an increasingly important role in your digital designs. The high level of features and integration available in today's FPGAs allows you to use them in ways that weren't envisioned just a few years ago. It's likely that your FPGA design contains a subsystem or system that formerly would have occupied an entire board.

These higher levels of integration present new challenges for

designers. Signals that were previously available on the board may exist exclusively as nodes inside the FPGA. Getting visibility across critical internal interactions can be time-consuming. This makes integration of the FPGA and the surrounding system challenging.

Logic analyzer measurements are particularly effective in debug of FPGAs and the surrounding systems. Collaborative

development efforts between Agilent and Xilinx have produced an effective solution for in-circuit FPGA debug, the FPGA dynamic probe.

Combined with an Agilent logic analyzer, the FPGA dynamic probe provides the most effective solution for debugging complex and elusive problems.



Figure 8. The FPGA dynamic probe dramatically increases debug productivity.

View internal FPGA activity. With a logic analyzer, you are normally limited to measuring signals at the periphery of the FPGA. With the dynamic probe, you get the additional benefit of being able to look at signals internal to the FPGA. View up to 64 internal FPGA signals for every physical pin.

Make multiple measurements in seconds. Moving probe points internal to an FPGA used to be time consuming. Now, in less than a second you can easily measure a different group of internal signals — without recompiling — and FPGA timing stays constant when you select new groups of internal signals for probing.

Leverage the work you did in your design environment. The FPGA dynamic probe is the first tool on the market that maps internal signal names from your FPGA design tool to your logic analyzer. Eliminate mistakes and speed the setup of signal and bus names and connections on logic analyzers.

Accurate measurements start with reliable probing

Soft touch connectorless probing

Agilent's soft touch probing advantages include quick, easy connection, minimal loading on your target system and no need for a connector designed into your target circuit board.

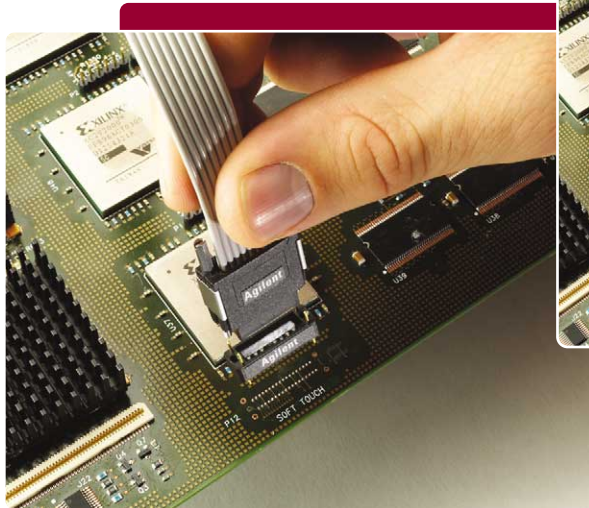


Figure 9. The compact 17-channel soft touch probe is ideal for tight spaces or times when fewer signals need to be probed.

Connector probing

Connector probes are a proven industry standard for probing many signals in one easy connection.

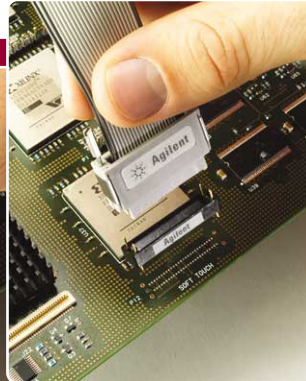


Figure 10. Soft touch connectorless probes reduce capacitive loading by as much as 80% compared to other connectorless solutions.

Flying-lead probing

Flying-lead probes provide flexibility for solving a variety of probing problems. They offer connection to individual signals so you can measure ones you may not be able to measure otherwise.



Figure 11. Use Agilent's high-performance flying-lead probes when you need the most flexibility in probing.

Save time analyzing your unique design with a turnkey setup

Agilent Technologies and our partners provide an extensive range of bus and processor analysis probes. They provide non-intrusive, full-speed, real-time analysis to accelerate your debugging process.

Save time making bus- and processor-specific measurements with application-specific analysis probes that quickly and reliably connect to your device under test.

Display processor mnemonics or bus cycle decode.

Get support for a comprehensive list of industry-standard processors and buses.

Agilent and Third-Party Processor Support

ARM®
IBM
Infineon
Intel®
Motorola
Siemens

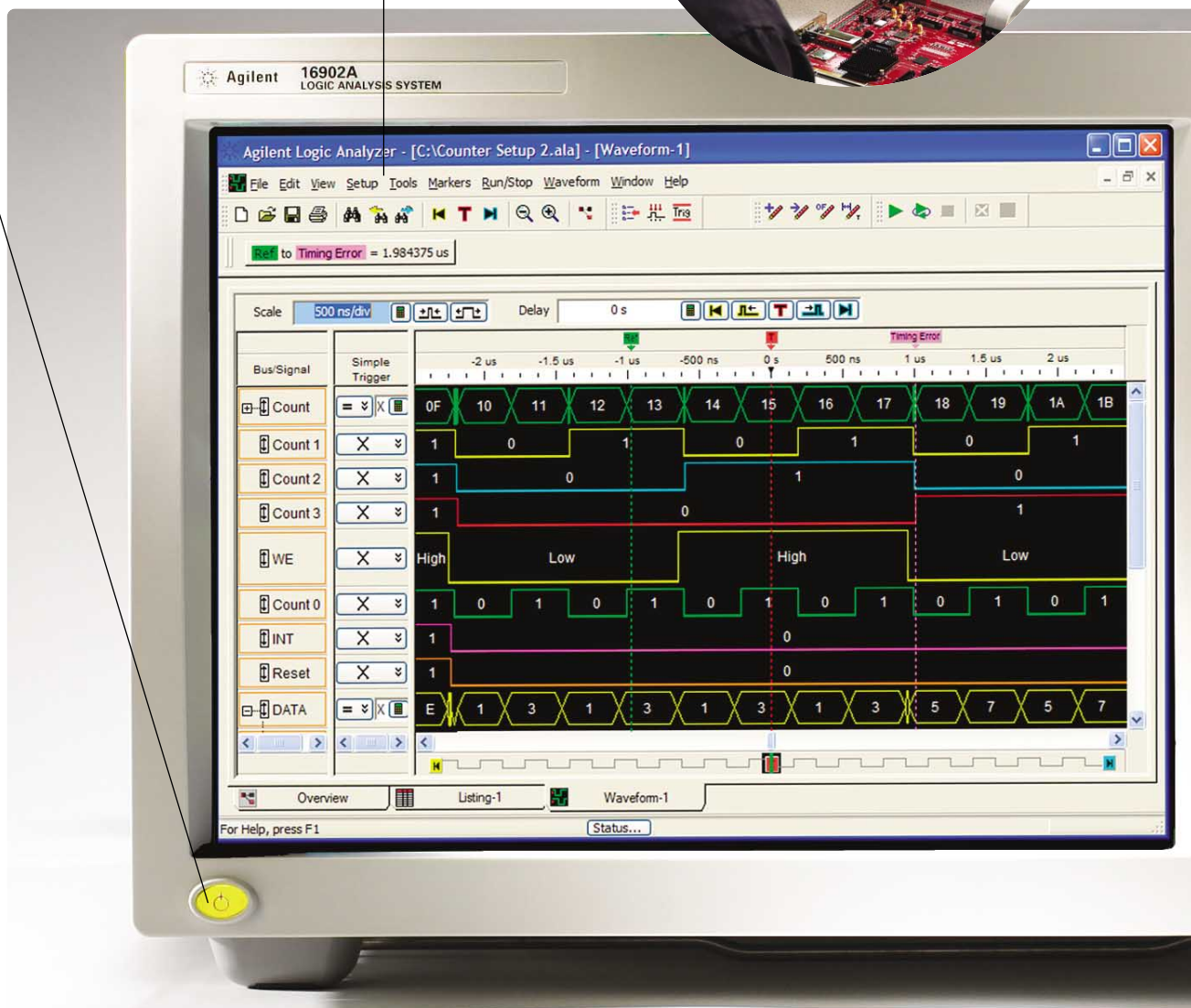
Agilent and Third-Party Bus, Protocol or FPGA Support

CAN
DDR 266, DDR 333, DDR II, DDR 400
2 Gbit Fibre Channel
HyperTransport
I²C
Compact PCI
PCI CardBus
PCI-EIO
PCI Express
PCI Mezzanine
PCI-X 1.0, 2.0
RS-232, RS-449
USB 1.1, USB 2.0
Xilinx: Virtex, Virtex-E, Virtex II, Virtex II Pro, Spartan-II, Spartan-II E, Spartan-III

Get exceptional performance, usability and superior probing at a price to match your budget

Color touch screen gives you direct access to all logic analyzer functionality so you can stay focused on your measurement. The 307.34 mm (12.1-inch) display enables you to view more data, like relationships between multiple signals and buses.

Recessed power key ensures the logic analyzer stays powered on in the middle of a critical measurement.



Internal 80 GB hard drive lets you easily store your setups, results and screen shots.

General-purpose knob lets you quickly adjust your viewing and measurement parameters. Select a modifiable variable by touching it, then turn the knob to quickly step through values for the variable.

New file key returns the logic analyzer to a known state – an important feature if you share your logic analyzer with other team members.

Dedicated shortcut keys give instant access to the most frequently used menus, functions, displays, and on-line help.

Scaling and scrolling knobs let you quickly change the vertical and horizontal position settings of the display. Adjust the display to get just the information you need.

“Touch Off” key disables the touch screen and allows you to point out anomalies to a colleague without altering the display settings.

Global marker knob helps you track down tough problems and accurately place markers to make critical timing measurements. Up to 1,024 global markers designate the same exact point in time throughout every display.

Built-in CD-RW drive lets you archive large data files, install third-party application packages and update the application software conveniently.

LED backlit buttons show you the current logic analyzer settings at a glance.



Choose the modules that meet your specific needs

Modular expandability is the key to the long-term value of the Agilent 16900 Series logic analysis systems. Purchase the capability you need now, then expand as your needs evolve. Configure a custom logic analysis system with analyzer modules to fit your performance and price needs. Protect your investment by upgrading memory depths or state speeds as your needs change.

Only Agilent enables you to split each logic analyzer module into two separate time bases. You can correlate activity across multiple buses using a single module with this capability.

- Create higher-channel-count systems by combining modules.
- Find elusive cause and effect problems separated in time by using deep memory.

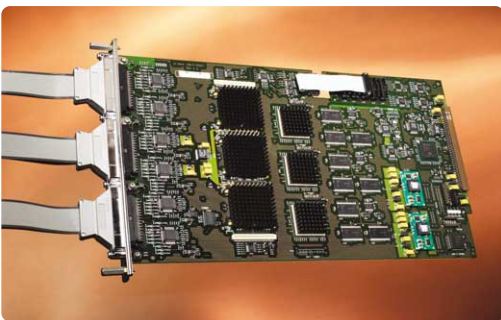


Figure 13. Combine multiple acquisition modules when you need to measure across many channels.

Make accurate high-speed state measurements

Eye finder automates the process of finding the precise moment to sample each signal relative to the clock.

- Quickly determine which signals have activity.
- Compensate for skew induced by variances in signal path lengths.

Accurately measure precise timing relationships

A parallel acquisition architecture provides up to 4 GHz high-speed timing zoom simultaneously with other state or timing measurement. Timing zoom stays active all the time with no tradeoffs.

- Gain confidence in your system, whether you're making timing or state measurements.

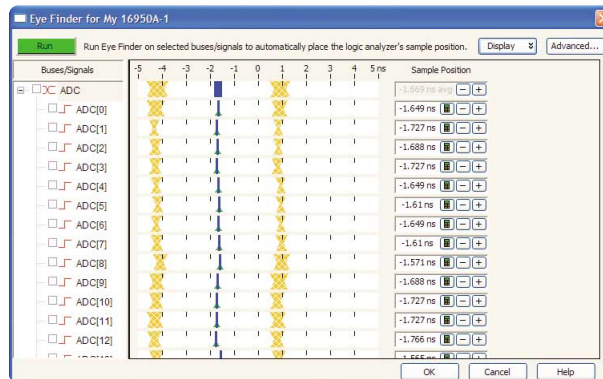


Figure 12. Automate your setup and hold adjustments with eye finder.



Figure 14. Modularity provides configuration flexibility to meet your measurement needs—now and in the future.

Choose the modules that meet your specific needs (continued)

Agilent Model Number	Ultra Performance 16950A ²	High Performance 16910A ² / 16911A ²
Channels Per Module	68	102 / 68
Max Channels on Single Time Base and Trigger	340	510 / 340
High-Speed Timing Zoom ¹	4 GHz (250 ps) with 64 K depth	4 GHz (250 ps) with 64 K depth
Max Timing Sample Rate (Half/Full Channels)	1.2 GHz (833 ps)/ 600 MHz (1.67 ns)	1.0 GHz (1.0 ns)/ 500 MHz (2.0 ns)
Max State Clock Rate	600 MHz	450 MHz with option 500, 250 MHz with option 250
Max State Data Rate	800 Mb/s	500 Mb/s with option 500 250 Mb/s with option 250
Memory Depth	256 K up to 64 M	256 K up to 32 M
Supported Signal Types	Single-ended and differential	Single-ended
Eye Finder Capability	Yes	Yes
Eye Scan Capability	Yes, in future software release	No
Probe Compatibility	90-pin cable connector	40-pin cable connector

1. All channels, all the time, simultaneous state and timing through same probe.

2. Probes are ordered separately. Please specify probes when ordering to ensure the correct connection between your logic analyzer and the device under test. Specify desired memory depth, state clock and data rate using available options. Feature also available via software upgrade to existing module.

Table 2. Select the analyzer modules that best suit your requirements.

Support for other modules

The 16900 Series also support the following 16700 Series measurement modules:

- 16740A, 16741A, 16742A
- 16750A/B, 16751A/B, 16752A/B
- 16753A, 16754A, 16755A, 16756A
- 16720A pattern generator supported in future software release

Headroom for your future needs (Extend the life of your equipment)

Easily upgrade your 16900 Series modules. “Turn on” additional memory depth and state speed when you need more. Purchase the capability you need now, then upgrade as your needs evolve.

16910A 16911A	Upgrade max. state speed from 250 MHz to 450 MHz and max. data rate from 250 Mb/s to 500 Mb/s
	Memory depth options 256 K, 1 M, 4 M, 16 M or 32 M
16950A	Memory depth options 256 K, 1 M, 4 M, 16 M, 32 M or 64 M

Unleash the complementary power of a logic analyzer and an oscilloscope

Effectively track down problems across the analog and digital portions of your design. Easily make time-correlated measurements between an Agilent 16900 Series logic analysis system and an Infiniium 54800 Series oscilloscope with the Agilent E5850A time-correlation fixture.



Figure 15. With the Agilent E5850A time-correlation fixture, you can make time-correlated measurements between an Agilent logic analyzer and oscilloscope.

Simplify debug with intuitive triggering

Agilent's intuitive triggering helps you identify the cause of elusive problems in less time – so you can debug and validate your design more quickly.

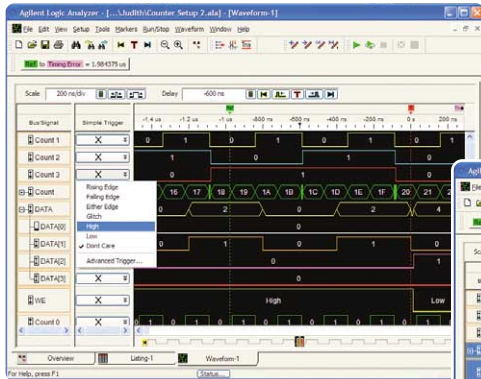


Figure 16. Define a single trigger event as a combination of levels, edges, patterns or glitches across multiple signals and buses.

Simple Trigger

Set the trigger according to how you think about your target signals. Use standard events, such as rising edge, falling edge, glitch or pattern to define a trigger event. These events are accessible via an easy pull-down menu without leaving the waveform display.

You can set the trigger for an event on the basis of activity on one or more buses or signals. Simply select the patterns, edge or levels for the signals that apply.

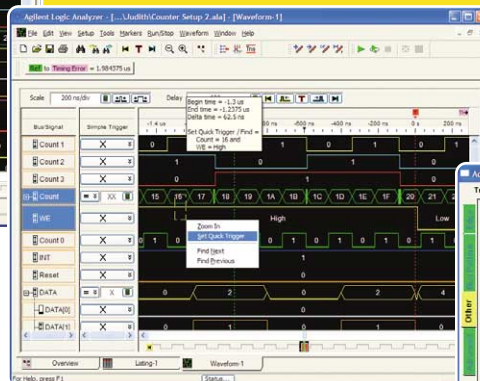


Figure 17. Create a trigger by simply drawing a box around an event in the current trace.

Set "Quick Trigger"

See something you didn't expect in the current trace? Simply draw a box around the questionable event and select **Set Quick Trigger** to see if it occurs again. You don't have to spend time defining the trigger. The analyzer does the work for you.

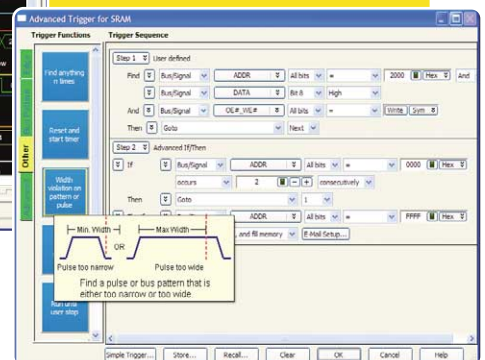


Figure 18. Customize a trigger to specify the sequence of events leading up to a trigger event.

Advanced Trigger

With the **Advanced Trigger** feature, you can customize a trigger for your specific situation. You can use modifiable trigger functions as individual trigger events or as building blocks for complex scenarios.

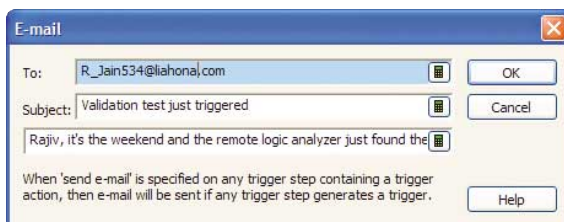


Figure 19. Working remotely? Tell the analyzer to send you an e-mail when it finds a trigger condition and acquires a snapshot of your system.

Icons provide a graphical representation for each trigger function. Simply drag-and-drop an icon into the trigger sequence. To fully define the trace event, fill in the blanks with values or select standard options from the pull-down menu.

Get instant insights into your design with multiple views and analysis tools (continued)

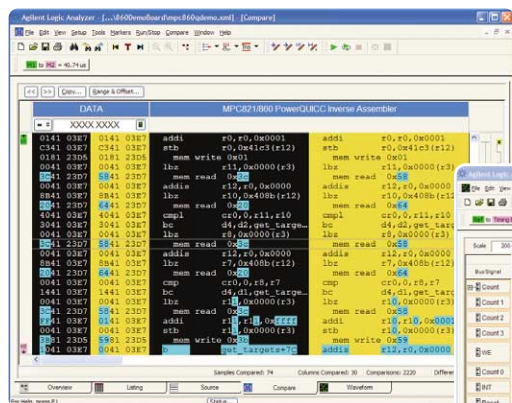


Figure 23. The Compare window lets you quickly identify differences between two traces.

Compare Window

Find functional differences between a known good device and one that has a problem by comparing traces from each device.

Determine how your device will respond differently under varying operating conditions like temperature or frequency changes.

Find intermittent errors. Stop a repetitive run when a compare difference or number of differences is found.

Work remotely and let the analyzer notify you via e-mail when a new acquisition has more than a specified number of compare differences.

Compare traces of different lengths or just a specific range of the trace. Offset the reference data so that the samples being compared are properly aligned.

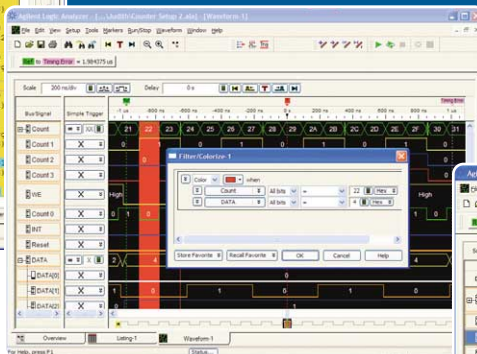


Figure 24. Customize your data view with the Filter/Colorize tool.

Filter/Colorize Tool

Perform analysis scenarios without losing or re-acquiring the data when you're not sure what you're looking for in the data, or when you're capturing a difficult-to-reproduce event.

Focus on just the information you need. Filter uninteresting data such as cache fills from deep, complex acquisition traces.

View code execution. Filter out unexecuted code fetches using Agilent's advanced inverse assembly filtering for popular processors.

Gain quick insight into the frequency of an event. Scroll through the trace with the filter tool's color highlighting enabled.

Save time performing your favorite analysis scenarios. Store and recall your favorite search/filter conditions, each individually named for easy recognition.



Figure 25. Make quick measurements across buses with global markers.

Making Measurements and Customizing Analysis

Make quick, precise measurements using snap-to-edge marker placement.

Track a symptom on one bus to its cause on another bus or signal using time-correlated global markers.

Mark and navigate to points of interest with individually colored, named and annotated markers.

Identify timing violations easily. Stop a repetitive measurement on specified statistical limits. Statistics show the low, high and average interval measurements.

Customize your measurement by developing your own inverse assemblers or analysis tools with the Analysis API.

Further your success with a complete line of services, support and purchasing alternatives

The scalable price/performance and intuitive usability of the 16900 Series logic analyzers are only part of the total solution available from Agilent Technologies. Agilent understands your changing needs and provides a wide range of service and support products that offer the flexibility you need to be successful.

Calibration Services guarantees measurement confidence to keep your logic analyzer operating at peak precision.

Repair Services provide fast, high-quality repair.

Test Instrument Consulting delivers technical expertise to complete and implement your test strategies for your application.

Process Consulting assists you in integrating test processes and technology into your current environment.

Education and Training delivered either on-site or at a convenient Agilent training center gives you access to our depth of product expertise and keeps you abreast of emerging technologies.

Ensure that your equipment can handle your future needs with the right logic analyzer and purchasing plan. When selecting the logic analyzer that's right for you, consider these flexible purchasing options so you can get the best tools for the job, regardless of your company's financial constraints.

Lease and Finance allows you to expense equipment costs or purchase equipment when your budget won't cover the purchase price up front.

Rent Today meets your short-term needs by providing you the latest Agilent equipment and configuration options, fast delivery and exceptional service from our Preferred Rental Partners (PRPs).

Trade-Up capitalizes on your previous logic analyzer investment by trading in for a substantial credit on a new model with higher performance. Stretch your budget and better manage your assets while upgrading to the latest solutions.

Contact your local Agilent representative to find the logic analyzer that's right for you and the best option for acquiring it. www.agilent.com/find/trade-up

For more information on Agilent support solutions: www.agilent.com/find/tm_services

For more information on Agilent education and training: www.agilent.com/find/education

For current promotions and special offers on logic analyzers, including trade-up offers, visit www.agilent.com/find/logic-offer

Related Literature

Publication Title	Publication Type	Publication Number
<i>Agilent Technologies 16900 Series Logic Analysis Systems</i>	Data Sheet	5989-0421EN
<i>Agilent Technologies Timing and State Modules for the 16900 Series Logic Analysis System</i>	Data Sheet	5989-0422EN
<i>Agilent Technologies FPGA Dynamic Probe</i>	Data Sheet	5989-0423EN
<i>Probing Solutions for Agilent Technologies Logic Analyzers</i>	Catalog	5968-4632E
<i>Processor and Bus Support for Agilent Technologies Logic Analyzers</i>	Configuration Guide	5966-4365E

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Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.



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Agilent's Test and Measurement software and connectivity products, solutions and developer network allows you to take time out of connecting your instruments to your computer with tools based on PC standards, so you can focus on your tasks, not on your connections. Visit www.agilent.com/find/connectivity for more information.

By internet, phone, or fax, get assistance with all your test & measurement needs

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www.agilent.com/find/assist

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Canada:

(tel) 877 894 4414

(fax) 905 282 6495

China:

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(fax) 800 820 2816

Europe:

(tel) (31 20) 547 2323

(fax) (31 20) 547 2390

Japan:

(tel) (81) 426 56 7832

(fax) (81) 426 56 7840

Korea:

(tel) (82 2) 2004 5004

(fax) (82 2) 2004 5115

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