

## **16700 Series Logic Analysis System**

Catalog



Debugging today's digital systems is tougher than ever. Increased product requirements, complex software, and innovative hardware technologies make it difficult to meet your time-to-market goals.

The Agilent Technologies 16700 Series logic analysis systems provide the simplicity and power you need to conquer complex systems by combining state/timing analysis, oscilloscopes, pattern generators, post-processing tool sets, and emulation in one integrated system.



**Agilent Technologies**

# System Overview

## Modular Design

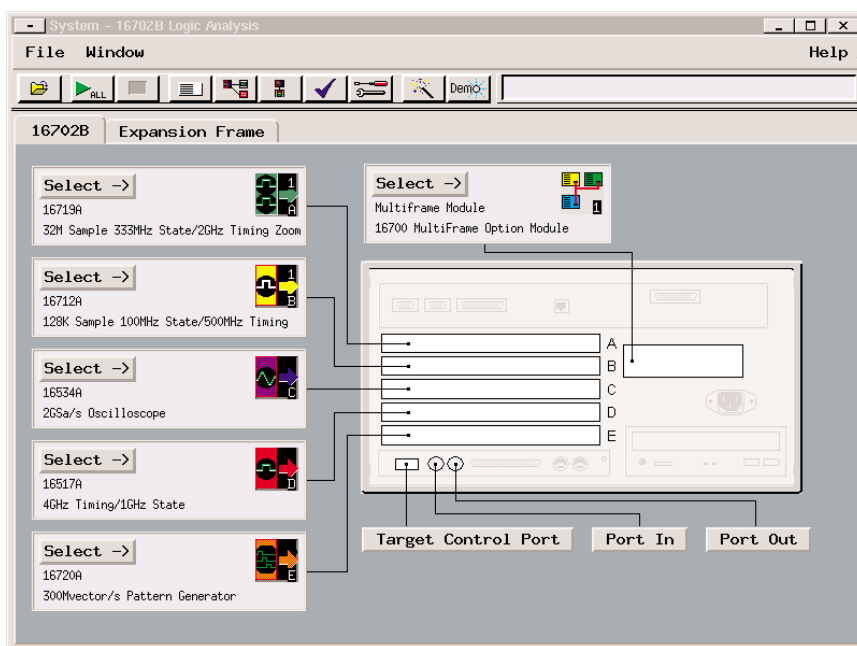
### Modular Design Protects Your Long-Term Investment

Modularity is the key to the Agilent 16700 Series logic analysis systems' long term value. You purchase only the capability you need now, then expand as your needs evolve. All modules are tightly integrated to provide time-correlated, cross domain measurements.

Module Choices	User Benefits
State/Timing	Agilent offers a wide variety of state/timing modules for a range of applications, from high-speed glitch capture to multi-channel bus analysis.
Oscilloscopes	Identify signal integrity issues and characterize signals quickly with automatic measurements of rise time, voltage, pulse width, and frequency.
Pattern Generation	Use stimulus to substitute for missing system components or to provide a stimulus-response test environment.
Emulation	An emulation module connects to the debug port (BDM or JTAG) on your target. You have full access to processor execution control features of the module through the built-in emulation control interface or a third-party debugger.

### External Ports

Target Control Port	Use the target control port to force a reset of your target or activate a target interrupt.
Port-in/Port-out	A BNC connector allows you to trigger or arm external devices or to receive signals that can be used to arm acquisition modules within your logic analyzer.



**Help** enables you to access the online user's guide and measurement examples.

**Figure 1.1.** The system boot up screen shows you what modules are configured into your logic analysis system.

# System Overview

## Features and Benefits

### System Capability

Touch Screen Interface	The Agilent 16702B mainframe supports a large, 12.1 inch LCD touch screen and redesigned front panel controls for an easy-to-operate, self-contained unit requiring minimal bench space and offering simple portability.
Multiframe Configuration	By connecting up to eight mainframes and expanders you can simultaneously view 8,160 time-correlated traces for buses in a large channel count, multibus system.
Enhanced Mainframe Hardware	Mainframe now includes a 40X CD-ROM drive, a 18 GB hard disk drive, 100BaseT-X LAN, and 128 MB of internal system RAM (optional 256 MB total).
Scalable System	<ul style="list-style-type: none"> <li>• State/timing analyzers</li> <li>• Oscilloscopes</li> <li>• Pattern generators</li> <li>• Post-processing tool sets</li> <li>• Emulation modules</li> </ul>
	<ul style="list-style-type: none"> <li>• Select the optimum combination of performance, features, and price that you need for your specific application today, with the flexibility to add to your system as your measurement needs change.</li> <li>• View system activity from signals to source code.</li> </ul>

### Measurement Modules/Interfaces

The Agilent 16760A State/Timing Module	With up to 1.5 Gb/s state speed, the 16760A lets you debug today's and tomorrow's ultra-high-speed digital buses. NEW Eye scan gives a rapid comprehensive overview of signal integrity on hundreds of channels simultaneously
<b>NEW</b> The Agilent 16750 Series State/Timing Modules	With up to 600 MHz state speed and up to 64 MBytes of trace depth these modules help you address today's high-performance measurement requirements. (See page 20)
The Agilent 16720A Pattern Generator	With up to 16 MVectors depth and 300 MVectors/sec operation and up to 240 channels[1] of stimulus, the 16720A provides a new level of capability that makes complex device substitution a reality. Supports TTL, CMOS, 3.3V, 1.8V, LVDS, 3-state, ECL, PECL, and LVPECL.
High-Speed Bus Measurements Made Simple with Eye Finder Technology	Agilent's eye finder technology automatically adjusts the setup and hold on every channel, eliminating the need for manual adjustment and ensuring accurate state measurements on high-speed buses.
Timing Zoom Technology	Simultaneously acquire data at up to 4 GHz timing and 600 MHz state through the same connection. Timing Zoom is available across all channels, all the time. (See page 24)
VisiTrigger Technology	<ul style="list-style-type: none"> <li>• Use graphical views and sentence-like structure to help you define a trace event.</li> <li>• Select trigger functions as individual trigger conditions or as building blocks to easily customize a trigger for your specific task.</li> </ul>
Processor and Bus Support	<ul style="list-style-type: none"> <li>• Get control over your microprocessor's internal and external data.</li> <li>• Quickly and reliably connect to the device under test. (See page 38)</li> </ul>
Direct Links to Industry Standard Debuggers and High-Level Language Tools	<ul style="list-style-type: none"> <li>• Debuggers provide visibility into software execution for systems running software written in C and C++ as well as active microprocessor execution control (run control).</li> <li>• Import symbol files created by your language tool. Symbols allow you to set up trigger conditions and review waveform and state listings in easily recognized terms that relate directly to the names used for signals on your target and the functions and variables in your code.</li> </ul>
Direct Links to EDA Tools	<ul style="list-style-type: none"> <li>• Use captured logic analysis waveforms to generate simulation test vectors.</li> <li>• Easily find problems by comparing captured waveforms with simulated waveforms.</li> </ul>

[1] 240 channel system consists of five 16720A pattern generator modules with 48 channels per module. Full channel mode runs at 180 MVectors/s and 8 MVectors depth. 300 MVectors/s and 16 MVectors depth are offered in half channel mode.

# System Overview

## Features and Benefits

### Data Transfer, Documentation, and Remote Programming

Direct Link to Microsoft® Excel via Agilent IntuiLink	<ul style="list-style-type: none"> <li>Automatically move your data from the logic analyzer into Microsoft Excel with just a click of the mouse. (See page 13)</li> <li>Use Microsoft Excel's powerful functions to post-process captured trace data to get the insight you need.</li> </ul>
Transfer Data for Offline Analysis - Data Export	<ul style="list-style-type: none"> <li>Fast binary (compressed binary) from the FileOut tool provides highest performance transfer rate.</li> <li>ASCII format provides same format as listing display, including inverse-assembled data.</li> </ul>
Transparent File System Access	<ul style="list-style-type: none"> <li>Access, transfer, and archive files.</li> <li>Stay synchronized with your source code by mapping shared directories and file systems from your Windows 95/98/NT/2000/XP-based PC directly onto the logic analyzer and vice versa.</li> <li>Move data files to and from the logic analyzer for archiving or use elsewhere.</li> </ul>
Documentation Capability	<ul style="list-style-type: none"> <li>Save graphics in standard TIFF, PCX, and EPS formats.</li> <li>Print screen shots and trace listings to a local or networked printer.</li> <li>Save your lab notes and trace data in the same file by entering relevant information in the Comments tab of the display.</li> </ul>
Remote Programming with Microsoft's COM Using Microsoft Visual Basic or Visual C++	<ul style="list-style-type: none"> <li>Perform pass/fail analysis, stimulus response tests, data acquisition for offline analysis, and system verification and characterization tests.</li> <li>Powerful-yet-efficient command set focuses on your programming tasks, resulting in a shorter learning curve while maintaining necessary functionality.</li> </ul>

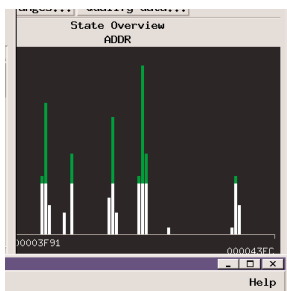
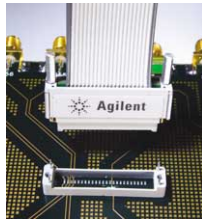
### System Software Features

Post-Processing Analysis Tools	Rapidly consolidate large amounts of data into displays that provide insight into your system's behavior. (See page 40)
Setup Assistant	Quickly configure the logic analysis system for your target microprocessor. (See page 10)
Tabbed Interface	<ul style="list-style-type: none"> <li>Groups like tasks together so you can quickly find and complete the task you want to perform.</li> <li>Spend your time solving problems, not setting up a measurement.</li> </ul>
Multi-Windowed View of Target System Activity	<ul style="list-style-type: none"> <li>View your cross-domain measurements, time-corrected on the same screen. (See page 11)</li> <li>Debug faster because you can view system activity at a glance.</li> </ul>
Global Markers	Track a symptom in one domain (e.g., timing) to its cause in another domain (e.g., analog).
Resizable Windows and Data Views	<ul style="list-style-type: none"> <li>Magnify your view or zoom in on a boxed area of interest.</li> <li>Resize waveforms and data or quickly change colors to highlight areas of interest.</li> </ul>
Web-Enabled System	<ul style="list-style-type: none"> <li>Directly access the instrument's web page from your web browser. (See page 12)</li> <li>Remotely check the instrument's measurement status without disturbing the acquisition.</li> <li>Remotely access, monitor and control your logic analysis system.</li> </ul>
Network Security	<ul style="list-style-type: none"> <li>Protect your networked assets and comply with your company's security requirements with individual user logins that provide system integrity.</li> </ul>
<b>NEW</b> Time Correlation with Infiniium 54800 Series Oscilloscopes	<ul style="list-style-type: none"> <li>Make time-correlated measurements using an Agilent 16700 Series logic analyzer and an Agilent Infiniium 54800 Series oscilloscope.</li> <li>View Infiniium oscilloscope waveforms in the 16700 logic analyzer's waveform display.</li> <li>Use the 16700 logic analyzer's global markers to measure time between any domain in the 16700 and voltage waveforms acquired by the Infiniium oscilloscope.</li> </ul>

# System Overview

## Selecting the Right System

### Selecting a system for your application



#### Select a mainframe (page 8)

Choose a system based on your needs:

- Self-contained unit or a unit with external mouse, keyboard, and monitor
- Expander frame for large channel count requirements



#### Determine your probing requirements (page 14)

- Are you analyzing a microprocessor?
- Do you need to probe a specific package type?



#### Select the measurement modules to meet your application needs

- State/Timing Logic Analyzers (page 18)
- Oscilloscopes (page 31)
- Pattern Generation (page 34)
- Emulation (page 38)



#### Add post-processing tool sets for analysis and insight (page 40)

- Source correlation
- Data communications
- System performance analysis
- Serial analysis
- Tool development kit



#### Support, services, and assistance (page 131)

- Training classes
- Consulting
- On-line support
- Warranty extension

# Mainframes Display

12.1" LCD display with touch screen on the 16702B makes it easy to view a large number of waveforms or states.

Select a modifiable variable by touching it, then turn the knob to quickly step through values for the variable.

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



Dedicated knobs for horizontal and vertical scaling and scrolling. Adjust the display to get just the information you need to solve your problem.

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

Dedicated knobs for global markers help track down tough problems. A symptom seen in one domain (e.g., timing) can be tied to its cause in another domain (e.g., analog).

Figure 2.1. The Agilent 16702B quickly tracks down problems in your design while saving precious bench space.

# Mainframes

## Back Panel



Figure 2.2. The mainframe and expander frame provide advanced capabilities for debugging complex target systems.

# Mainframes System Screens



Figure 2.3. Icons in the power-up screen give you quick access to common tasks.

**System Admin** allows you to quickly set up the instrument on your network, configure print servers, set up user accounts for security or install software updates.

**Setup Assistant** is a guided menu system that helps you configure the logic analysis system for your target microprocessor or bus. Online information guides you through the setup. (See figure 2.4)

**Demo Center** provides simple demos of the most commonly used features.

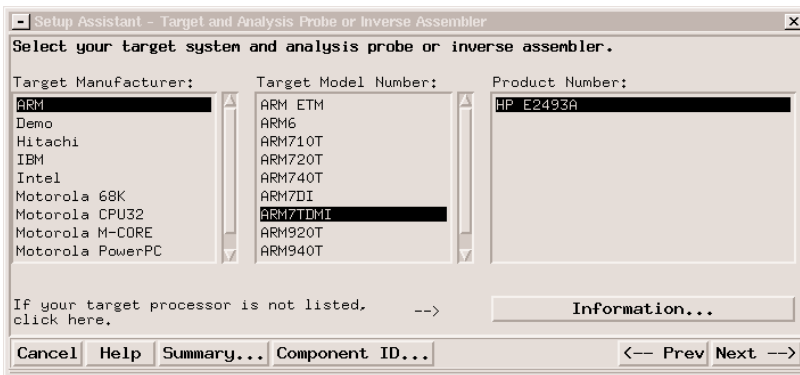


Figure 2.4. Setup Assistant gets you up and running quickly.



# Mainframes System Screens

## See the Big Picture of Your Prototype System's Behavior

A large external display (option 001) with multiple, resizable windows allows you to see at a glance more of your target system's operation. A built-in, flat-panel display in the 16702B fits in environments with limited space. Color lets you highlight critical information so you can find it quickly.

Use one system to examine target operation from different perspectives. Multiple time-correlated views of data let you confirm both signal integrity and software execution flow. These views are invaluable in solving cross-domain problems.

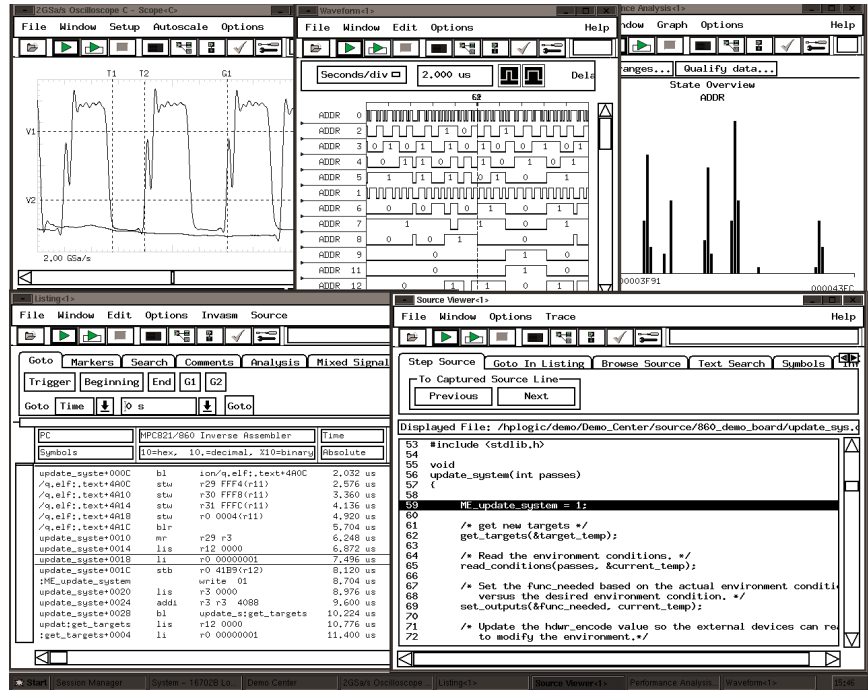


Figure 2.5. You can quickly isolate the root cause of system problems by examining target operation across a wide analysis domain, from signals to source code.

# Mainframes System Screens

## Expanding Possibilities with Network Connectivity

Web-enabled instrumentation gives you the freedom to access the system—anywhere, anytime. Have you ever needed to check on a measurement's status while you were in a remote location? Now you can.

## With a Web Enabled Logic Analysis System You Can...

...install Agilent IntuiLink to seamlessly transfer data from the system to a PC

...access Agilent's Web site for the latest online manuals and technical information

...access the logic analysis system's Web page from your browser by using the instrument's hostname as a URL

...access the system's user interface directly from within your browser, giving you full control of all analysis functions

...remotely check current measurement status to find out if the system has triggered

...quickly check instrument status to determine if the system is available for use

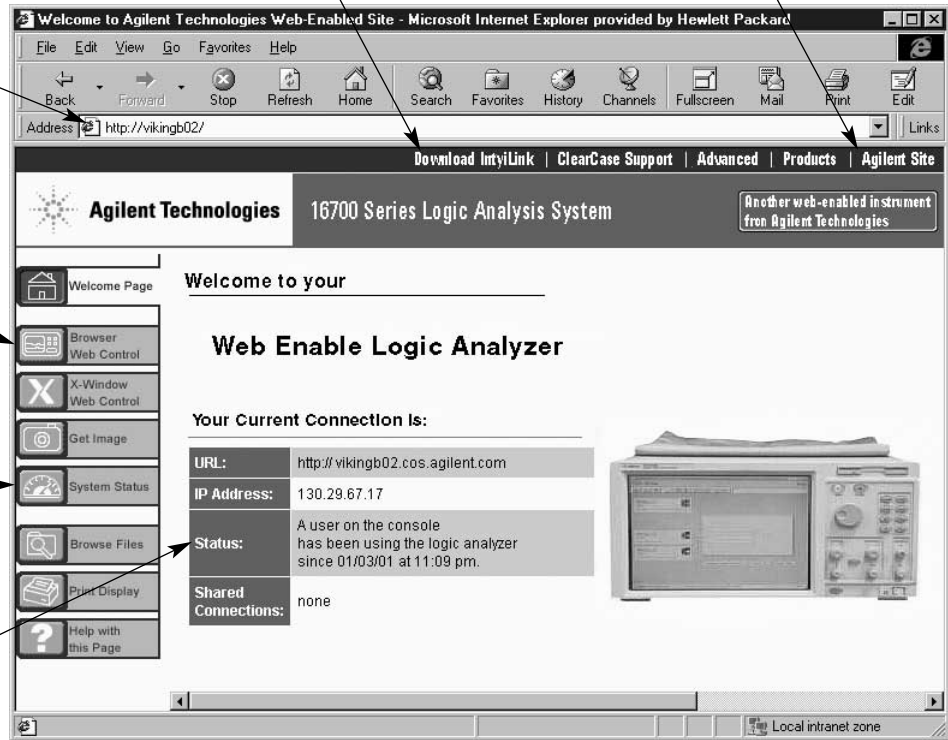


Figure 2.6. Your logic analyzer is its own web site. From the Home Page, you can perform multiple remote functions.