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Find the *Keysight / Agilent 16510B* at our website: ***Click HERE***

LOGIC ANALYZERS
State and Timing Analysis Modules
HP 16510B, 16511B

DESIGNED FOR HP-IB SYSTEMS

HP 16510B, HP 16511B State/Timing Module

Full-Featured State Analysis

The HP 16510B offers 80 channels of full-featured state and timing analysis. You can configure up to 400 channels of state and timing in the HP 16500A frame, or examine up to 10 processors at the same time. Each HP 16510B can operate as a separate state/timing analyzer, while time correlation is available over the HP 16500A intermodule bus (IMB).

Trigger Across 160 Channels

Simplify data tracking through pipelined architectures with the use of the HP 16511B 160-channel 35 MHz state/100 MHz timing module. You can trigger across all 160 channels, making the flow through the pipeline easier to follow.

Trigger on complex handshaking routines across several synchronous processors and display all of the data on the same screen to debug multiprocessor systems. RISC, wide bus, and ASIC integration tasks become easier when you can look at all of the data with one state or timing analyzer. Data correlation across all 160 channels is built-in; you do not have to create arming sequences.

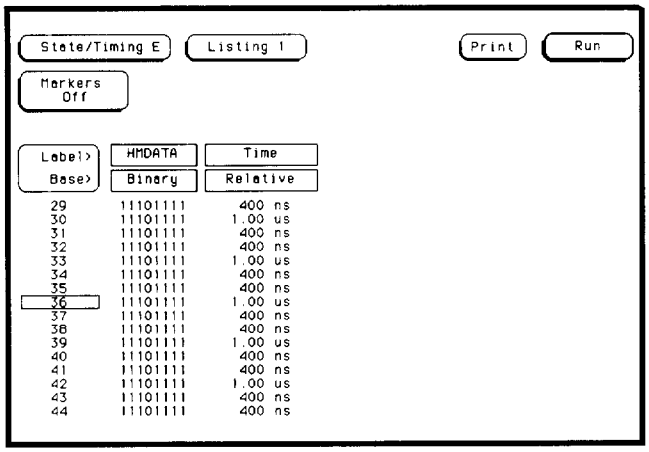
View Activity of two parts of a System

The HP 16510B and 16511B can be configured into two independent state analyzers or a single state and one timing analyzer. Measurements that would normally require two instruments can now be made with a single instrument.

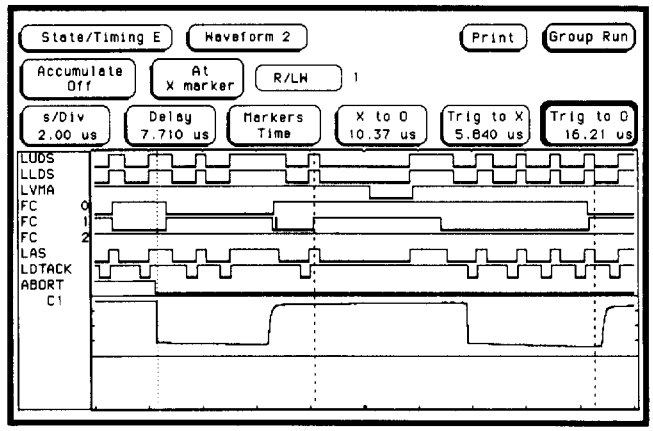
For example, by using the state analyzer to focus on a specific I/O routine, you can watch both the program execution and the activity on the I/O lines with a time-correlated display. Or, when you need to examine the interaction of two microprocessors, the HP logic analyzers can display time-correlated state listings.

Use the State Analyzer as a Window to the System

When a trigger sequence is too complex for the scope, use the state analyzer's powerful 8-level, 8 resource term trigger to locate the problem; then use another measurement module to get a detailed picture of the fault. The state and timing analyzer can be used together to define when a problem occurs and then either arm or trigger the HP 16530A/16531A oscilloscope or HP 16515A/16516A 1 GHz timing analyzer to capture data. This approach saves time and helps avoid the extra work of finding a problem with a scope alone.



Time tagging measures the time between states. You can get an accurate picture of the time it takes your system to make the transition from one state to another.



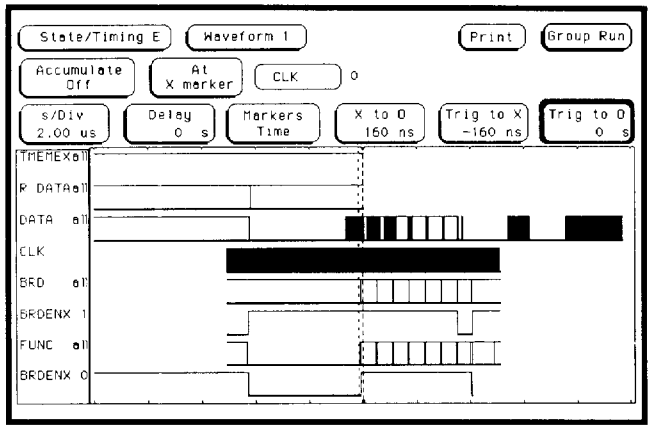
Transitional timing on every channel gives a wide view of system activity. (Shown here with a time-correlated oscilloscope channel.)

Measure the Time Between States

With time tagging turned on, you can measure the time it takes your system to make the transition between one state or another. The time information is displayed along with the state data, so you can get a clear picture of an event's duration. Combine state tagging with storage qualification to confirm the length of an information transfer without actually storing all of the data.

Transitional Timing on ALL Channels

The HP 16510B and 16511B logic analyzers store timing data only when there is a transition, thus avoiding redundant data. This effectively extends the memory by lengthening the time covered by an acquisition. Because the timing analyzer samples at full speed, events that are seconds or even minutes apart are captured with 10 ns resolution. Use transitional timing for analysis of asynchronous data busses, where activity often occurs in bursts, followed by long periods of dead time.



Transitional timing captures 20μs of data with 10 ns resolution.

Use Postprocessing to Snare Elusive Timing Faults

Use the timing analyzer's postprocessing to find setup and hold violations. Use the specify-stop-measure feature to acquire data until the time interval between two patterns violates a specified condition. Transitional timing can supply a long pre-trigger record length, so you can look back in time to discover the cause of the problem.

System Performance Analysis

The HP 10390A system performance analysis software (SPA) provides an overview of system activity. It can be used with another state machine in the same analyzer to find the activity of interest in order to make time interval measurements. Or, it can be used in state overview mode to help identify execution segments as prime targets for optimization.

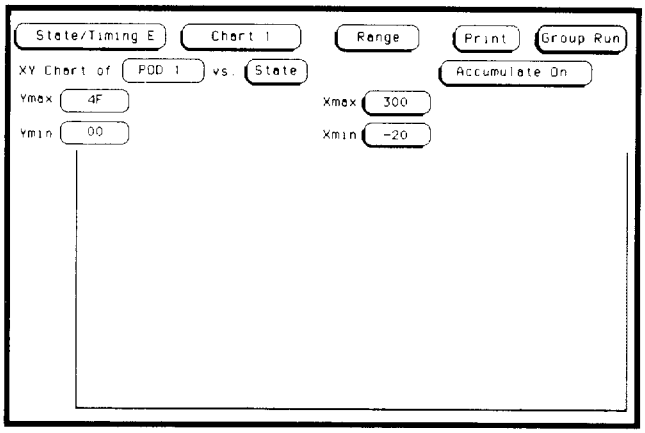
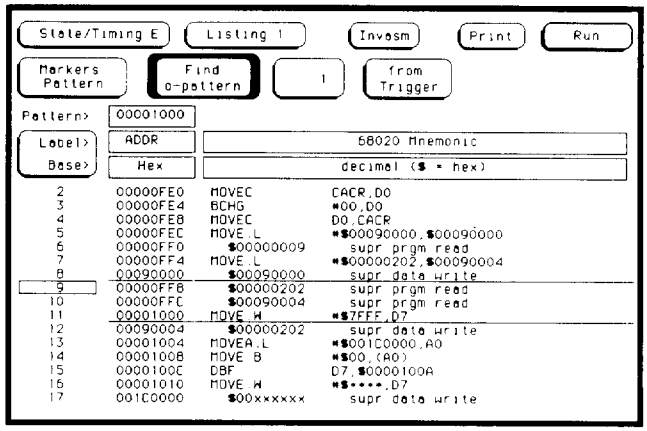


Chart mode shows characteristic signature of a memory read cycle.

Debug Microprocessors

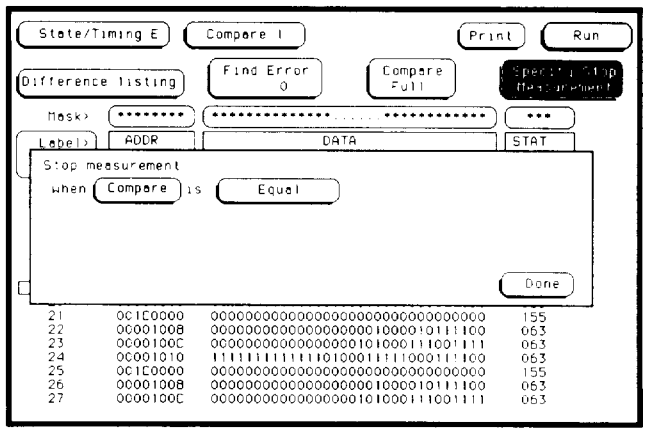
HP preprocessors tailor the HP 16510B and 16511B to microprocessors from Intel, Motorola, Zilog, National, Hitachi, GTE, Rockwell, and NEC. These preprocessors simply plug directly into the CPU socket. Companion software converts the acquired state data to microprocessor mnemonics, making it easy to monitor program execution. See pages 262 through 264 for microprocessor and bus interface support details.

For designs that use custom or proprietary CPUs, use the HP 10320C user-definable interface to connect HP logic analyzers to your system. The HP 10391B inverse assembler development package can be used to develop custom software that converts the acquired state data to CPU mnemonics.



A Motorola 68020 inverse assembly listing.

Model	HP 16510B	HP 16511B
Timing	100 MHz all 80 channels	100 MHz all 160 channels
State	35 MHz all 80 channels	35 MHz all 160 channels
Memory	1 Kbit/channel	1 Kbit/channel
Triggering	8 Levels, each with branching, store qualification, complex pattern recognition	



Use the state analyzer compare mode to identify faulty states.

See page 292 for ordering information.

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