Bus Doctor™
Serial ATA
Protocol, Timing, & Statistical Analysis

Protocols and Standards:
- Serial ATA (SATA) 1.0
- SATA II
- ATA/ATAPI 6

Speeds:
- 1.5 Gb/sec

Detection Capabilities:
- Out-of-Band singnaling (OOB)
- Framing, Primitive, Disparity, Coding & Protocol errors
- Does not support SSC

Display Capabilities:
- Command Listing
- State Listing
- Trace Histogram for navigational aid
- Data Block (Hex/ASCII)
- Real-Time Statistics
- Timing Waveform
- Post-Capture Filtering

Advanced features:
- Up to 256 million events in dedicated memory
- 12 level trigger with counters and timers
- 4ns per 144-bit event resolution

The Bus Doctor family of protocol analyzers provides unprecedented power, ease, depth, breadth and portability for those examining and diagosing busses and interfaces. The Bus Doctor analyzer becomes a dedicated Serial ATA protocol analyzer by connecting it to the Bus Doctor Serial ATA bus pod. The system provides Serial ATA developers the deep trace buffer and triggering to capture and work with this emerging high-speed bus.

The Serial ATA pod supports bi-directional transfers at 1.5 Gb per second. With the deepest trace memory option, the Bus Doctor allows the user to capture up to 1 Gigabyte of SATA traffic (256 million events). At the Command level, the Serial ATA analyzer provides a summery of each FIS including Command, LBA, Blocks transferred, Status, etc. The State display provides decoding of each Double-word transfer for those needing to monitor Serial ATA software, device drivers, or firmware. The analyzer displays the 10b codes as well as the 8b.

It detects and can trigger on Framing, Primitive, Disparity, Coding and Protocol errors as Out-Of-Band (OOB) signaling. The high-level triggers each provide drop-down boxes so the user can select specific Packets, Commands, Features, etc., from a list without memorizing codes or positions. The Data Block display provides a quick reference for the display of data payloads in both Hex and ASCII. For hardware engineers, the Timing Waveform display shows Serial ATA Link signal activity.

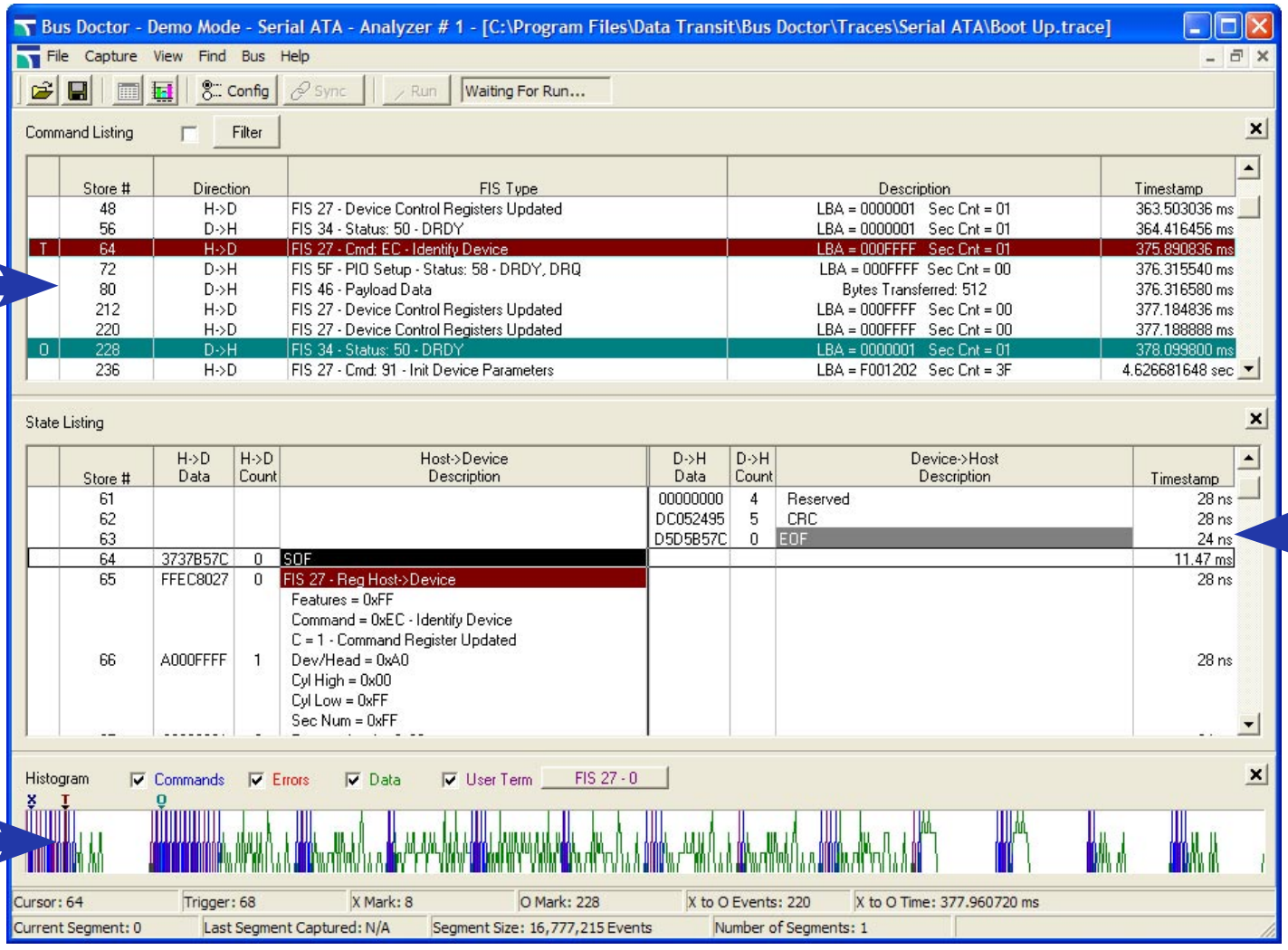
State Listing

The State Listing displays a list of all of the captured events. For each event, this display shows reference Store Number, the Timestamp (relative or absolute) and the Data, Count and Description for each of the two traffic directions.

In this display or the Command Listing, the user may set two markers, X and O, with a mouse click. An advanced 12 level find sequencer may be use to search through the buffer to find exact event patterns or specific events.

Command Listing

All of the trace's commands are summarized in this display. This window shows the store number of the first event associated with the command, the traffic direction, FIS Type, Description and Timestamp. The Timestamp may be displayed as either the relative elapsed time since the previous command or the absolute time from a user-definable origin.



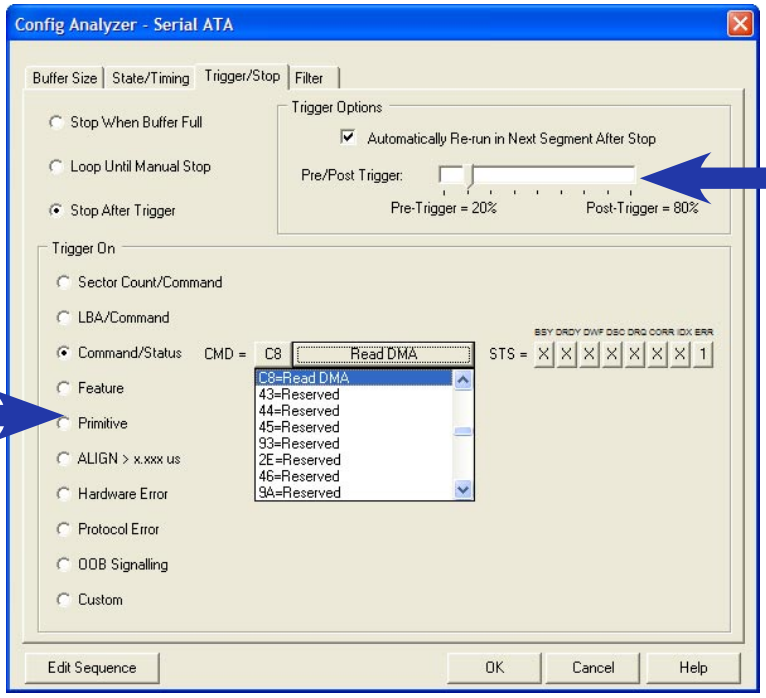
Histogram

The histogram's primary purpose is a navigation aid, showing an overall view of the entire trace. Commands, data, and errors are shown in blue, green, and red, respectively. A *User Term* may also be defined and is shown in purple.

Double-Clicking in this window, or anywhere in the Command or State Listing displays will synchronize all of the displays.

Pre-Trigger / Post-Trigger

The Pre/Post adjustment bar controls the ratio of captured data before or after the trigger position. The Auto Re-run feature makes it possible to capture multiple traces overnight or over the weekend automatically.

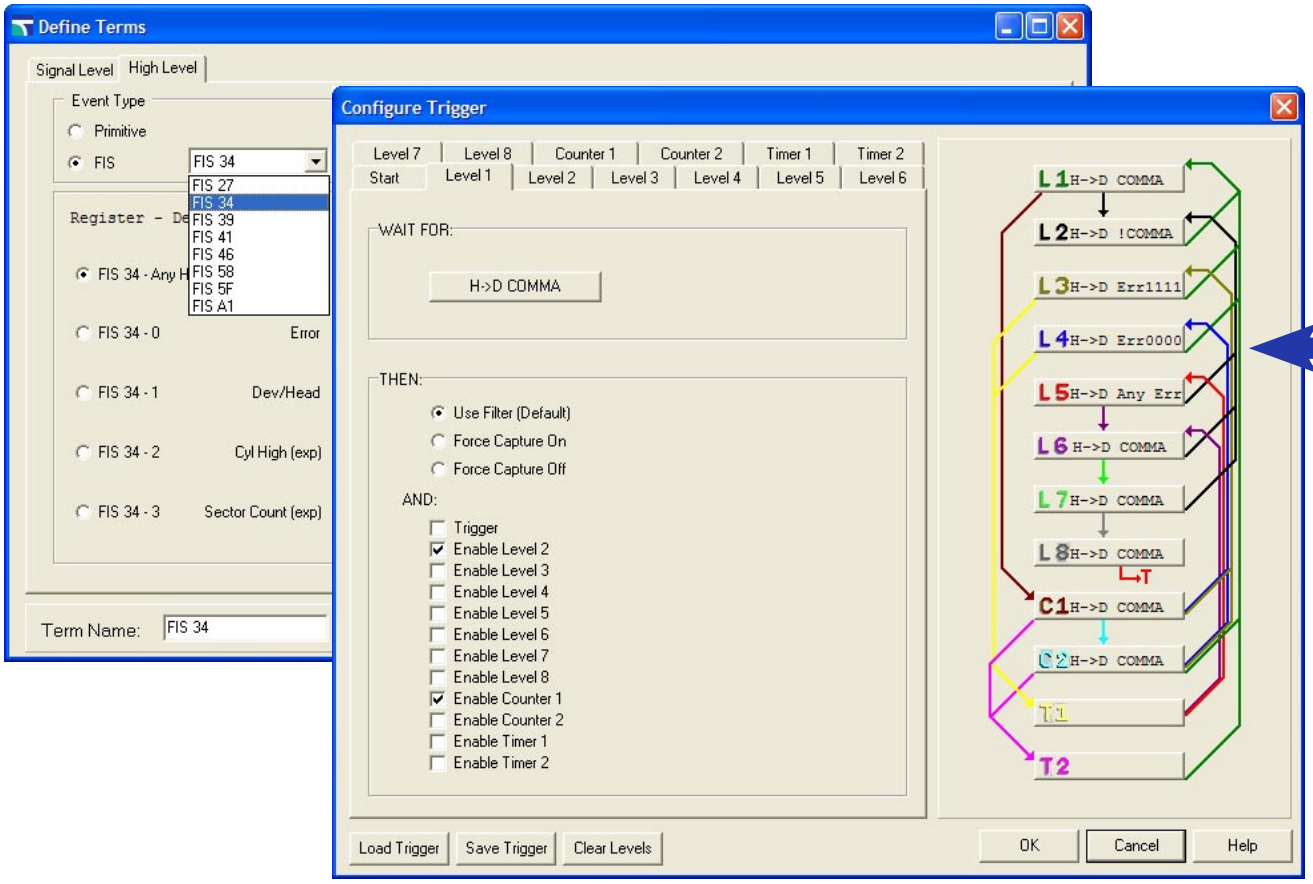


Triggering

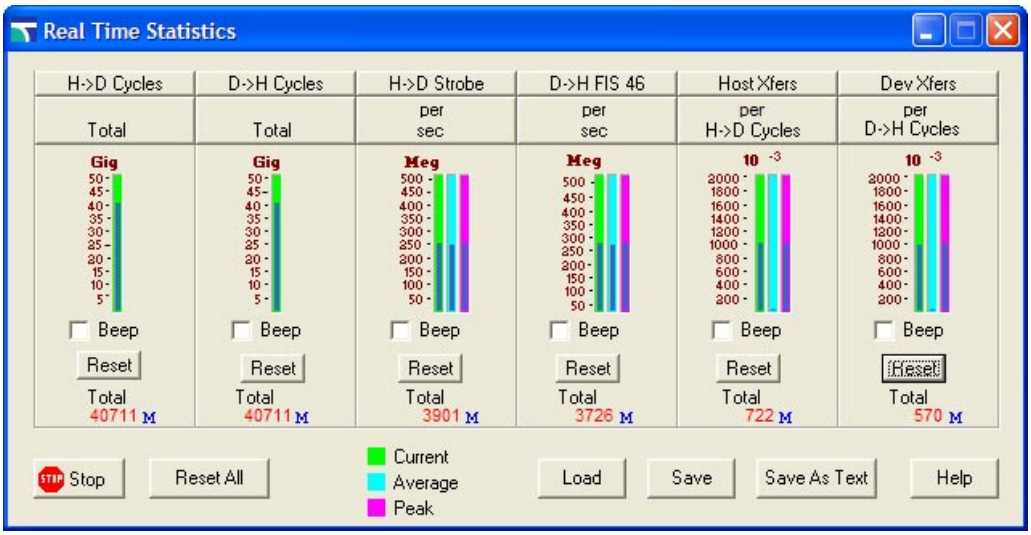
Powerful, high-level dialogs, including pull-down menus and other selection tools make it easy to set up triggers for stopping traces at a desired event or sequence of events.

Trigger Sequencer

Users may create their own trigger using the sequencer that has 12 levels including 2 timers and 2 counters.

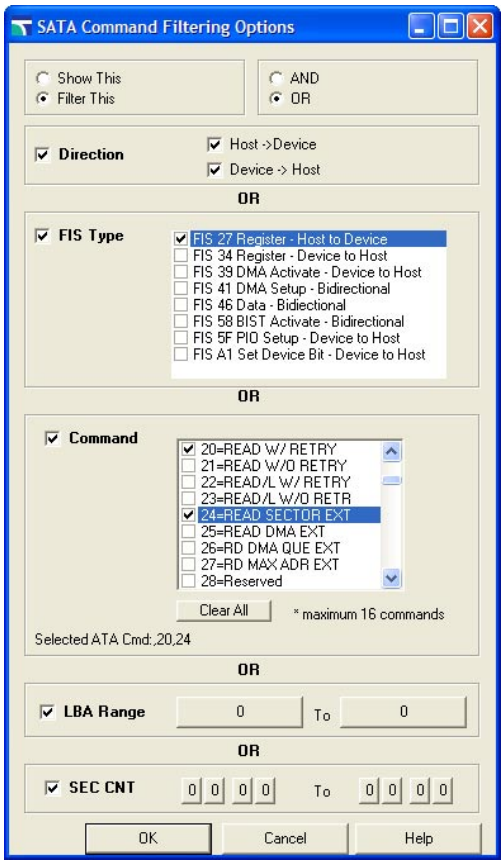


The Real-Time Statistics menu reports what the bus is doing currently, comparing each instantaneous parameter with its average, and peak performance levels. It is preconfigured for certain common statistical measurements, but can be easily reconfigured by the user for almost any type of metric desired. The configurations can be saved and loaded for future use. The results may be exported to a text format..



The Command Listing Filter is a powerful feature that allows for filtering the trace's commands after the capture has been taken. It does not affect the trace, just the way in which it is displayed. This means that the same trace may be viewed in a variety of ways. After the filter has been defined, it may be toggled off and on by a check-box above the Command Listing display.

The filter dialog may be used to identify certain commands to either include or exclude from the listing display. These commands may be selected by direction and FIS type. When applicable, users may also select LBA range, Sector Counts and up to 16 specific ATA Commands.



Analyzer Compatibility:

- All Bus Doctor 108 Channel Analyzers
- All Bus Doctor MultiPod™ Analyzers

Physical

- Dimensions: 2.31 x 8.19 x 6.13 inches (5.87 x 20.80 x 15.56 cm)
- Weight:
  Pod: 1.5 lb. (.68 kg)
  Power Adapter: 1.25 lb. (.57 kg)
- Bus Connection: 2 gen 1 Serial ATA ports
- Analyzer Connection: 6 18-channel Bus Doctor connectors

Power Requirements:

- 100-250VAC, 50-60Hz

LED Indicators:

- Transmission Error*
- Idle*
- Command
- OOB Signaling*
- Frame*
- Primative*
- Protocol Error
- Power

* 2 indicators, one per channel

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