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Bus Doctor™
ATA/ATAPI/UDMA
Protocol, Timing, & Statistical Analysis

Protocols and Standards:
- ATA ver 1 through ATA/ATAPI 6
- SFF8020
- Mt. Fuji
- SCSI MMC

Speeds:
- PIO Modes 0-4
- DMA Modes 0-2
- UDMA-33 through 133

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

Advanced Features
- 12 level trigger with counters and timers
- Filtering by trigger level
- Up to 256 million events in dedicated memory
- 4 ns 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 ATA/ATAPI/UDMA protocol analyzer by connecting it to the Bus Doctor ATA bus pod. The system provides ATA developers the deep trace buffer and triggering to capture and work with this popular bus.



The ATA/ATAPI pod supports both normal and small form-factor connectors. It provides the features needed by hardware engineers such as multi-level triggering, filtering, state configuration, and timing analysis of PIO, DMA, and UDMA transfers with speed capability exceeding 200MB/s. It supports ATA/ATAPI 6, as well as the 48-bit LBA addressing of terabyte-plus drives. It decodes the ATA commands used by hard drives, and the ATAPI protocol used by CD, DVD, and Tape devices. At the Command level, the ATA/ATAPI analyzer provides a big-picture view for testers who are troubleshooting system level or application level issues. The State display provides register-level access details for those needing to monitor ATA/ATAPI software, device drivers, or firmware. For hardware engineers, the Timing Waveform display provides for analysis of ATA/ATAPI signal activity.

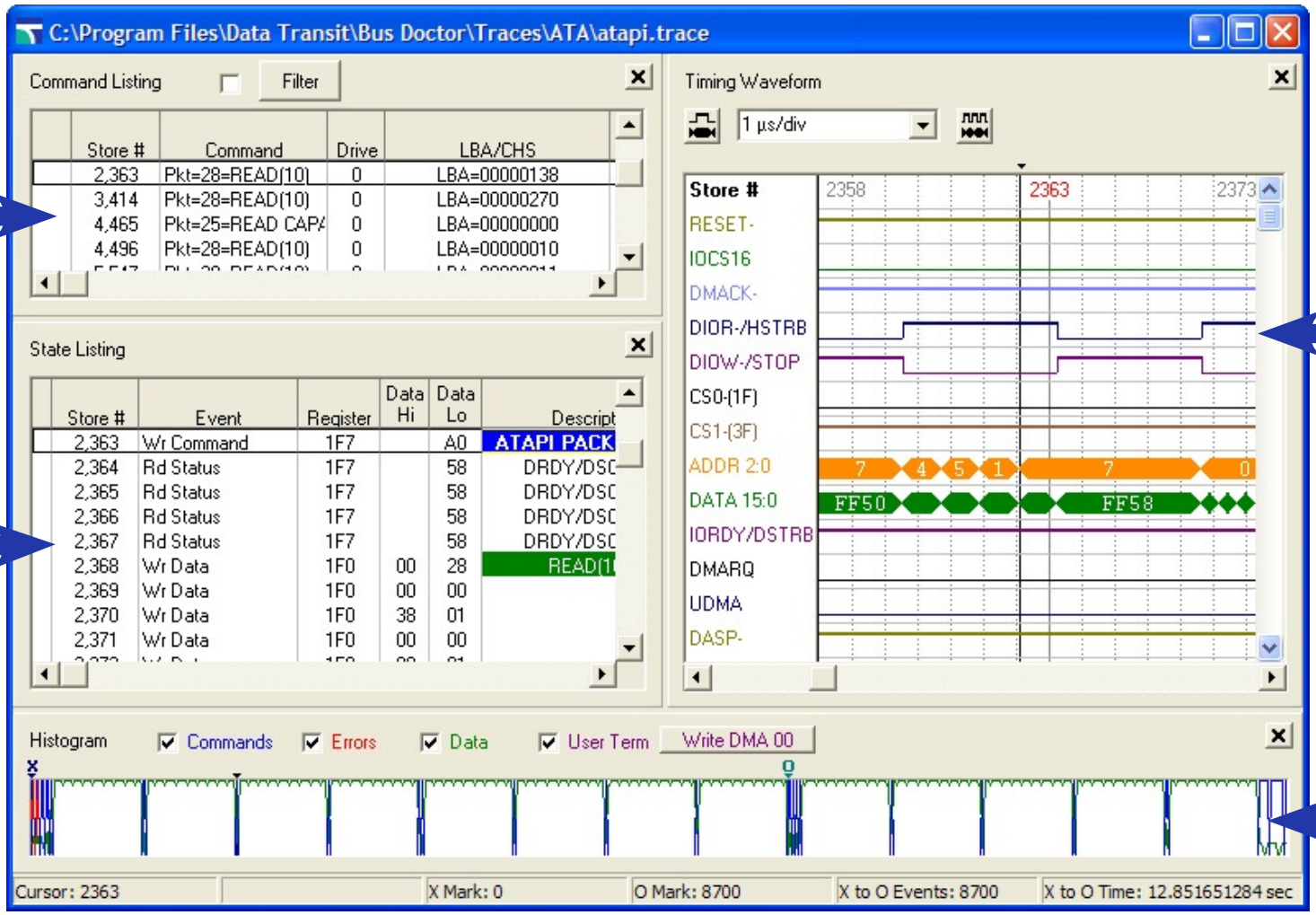
Data Transit bus pods capture bus traffic nonintrusively, without re-transmitting or re-timing any signals.

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 OP Code and command name, drive number, LBA/CHS value, block count 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.

Timing Waveform

The Timing Waveform shows a signal level representation of the trace, each row representing a channel or channel group. The user may reorder the rows or change the colors according as desired. Data may be displayed in hex, decimal, binary or ASCII formats.



Histogram

The histogram's primary use is as 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.

Clicking in this window, or anywhere in the Command, State or Timing Waveform displays will synchronize all of the displays.

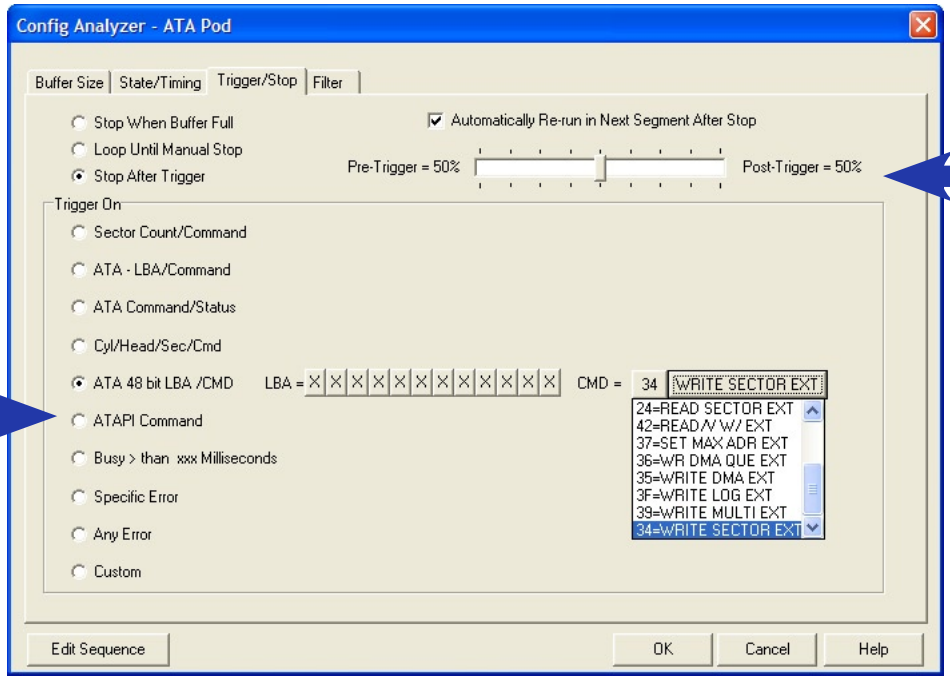
State Listing

The State Listing displays a list of all of the captured events. For each event, the display shows its reference Store Number, Event Name, Register value, Data Hi and Lo, Description and Timestamp.

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 used to search through the buffer to find exact event patterns or specific events.

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.

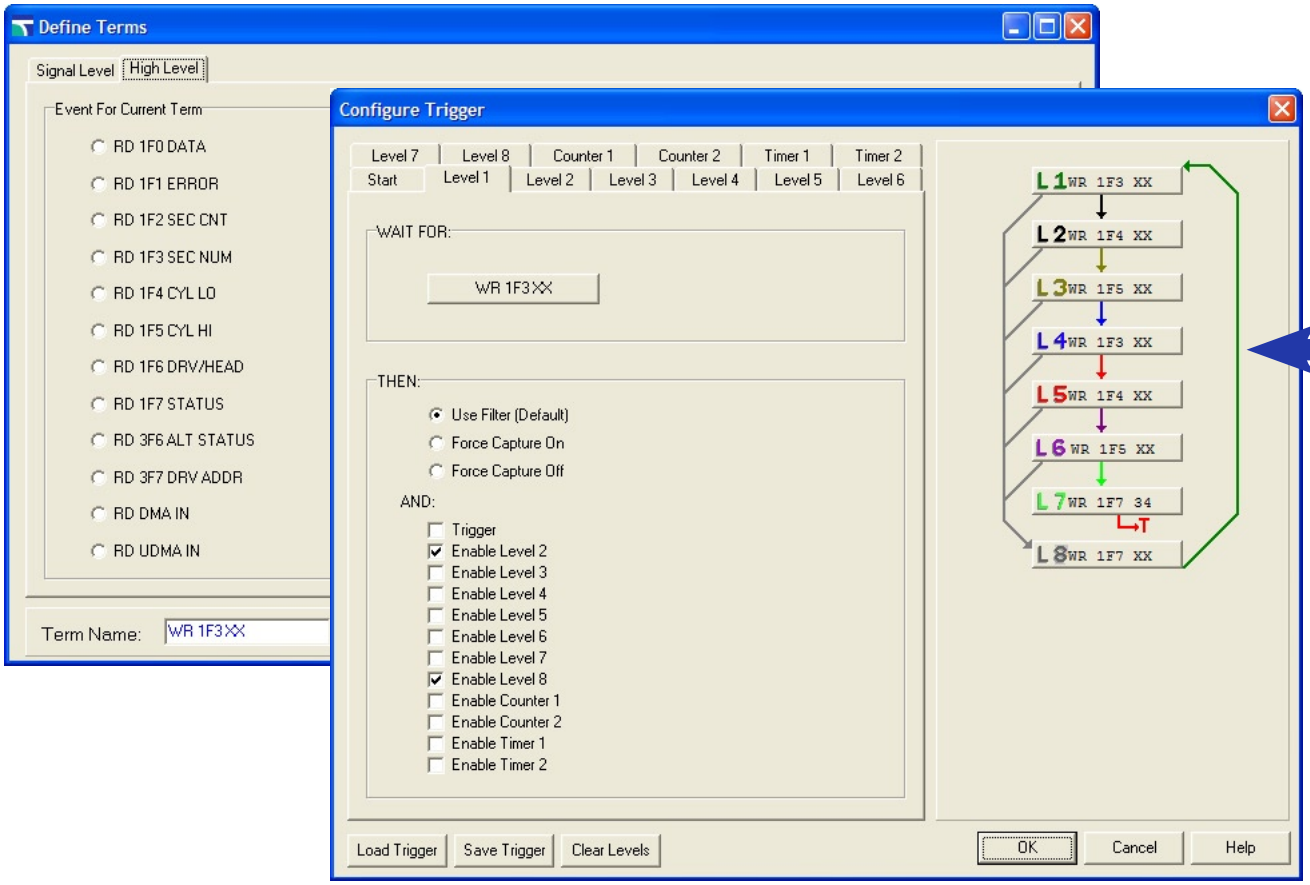


Triggering

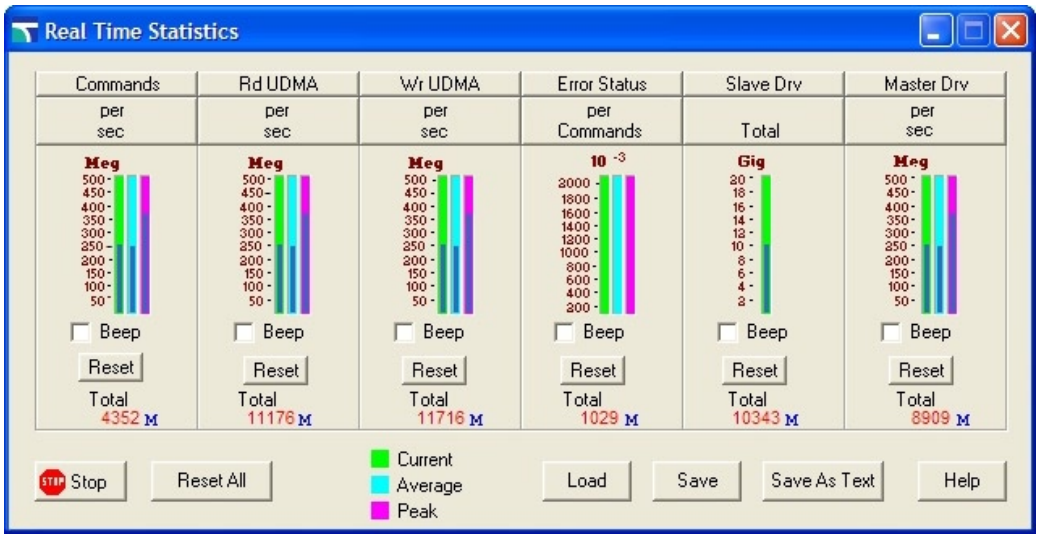
Powerful, high-level dialogs, including pull-down menus and other selection tools make it easy to set up triggers for stopping traces at a desired event or sequence of events.

Trigger Sequencer

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

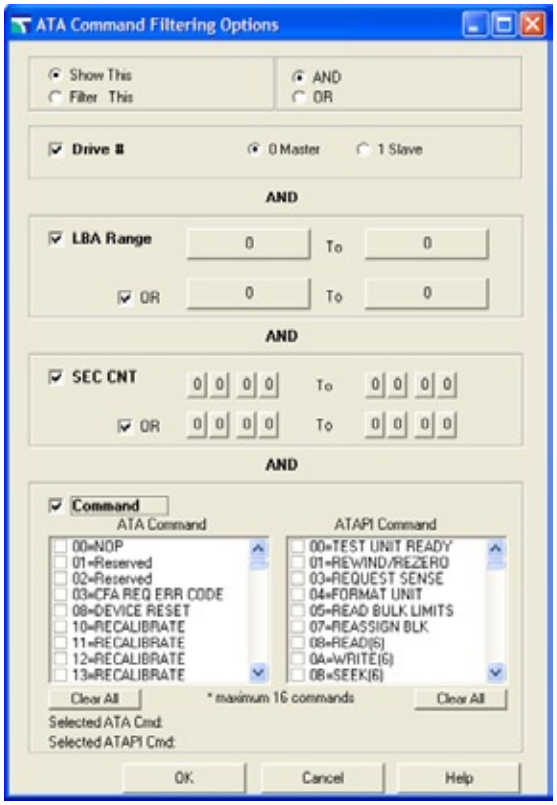


The Real-Time Statistics menu reports what the bus is doing currently, comparing each instantaneous parameter with its average, and peak performance levels. It is preconfigured for certain common statistical measurements, but can be easily reconfigured by the user for almost any type of metric desired. 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 their master/slave source, LBA range, and/or Sector Counts. In addition, up to 16 specific ATA and ATAPI commands may be chosen.



Analyzer Compatibility:

- All Bus Doctor 36 Channel Analyzers
- All Bus Doctor 108 Channel Analyzers
- All Bus Doctor Multipod™ Analyzers

Physical

- Dimensions: 5.54 x 3.18 x .9 inches (13.57 x 7.79 x 2.21 cm)
- Weight: 0.32 lb. (.14 kg)
- Bus Connection: ATA Connector
- Analyzer Connection: 2 18-channel Bus Doctor connectors
- No external power is necessary
- Includes an 18 inch (44.1 cm) IDE cable with 4 40-pin connectors
- TTL user signal-in pin (with ground)

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