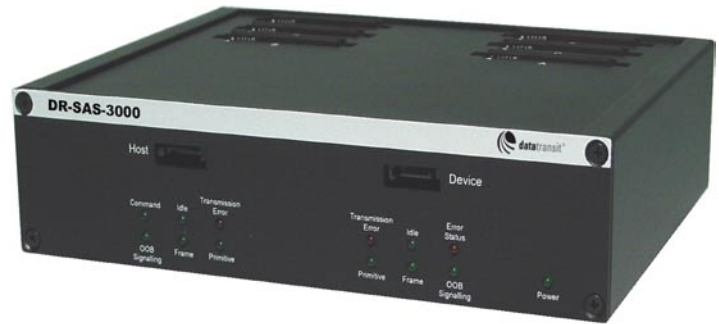




BUS DOCTOR™

Serial Attached SCSI (SAS)

Protocol, Timing & Statistical Analysis



PRODUCT DESCRIPTION

► **Protocols & Standards:**

- > SAS 1.0
- > Serial ATA (SATA) 1.0

► **Speeds:**

- > 3.0 Gb/sec

► **Detection Capabilities:**

- > Capture and decode of SAS traffic
- > Out-of-Band signaling (OOB)
- > STP, SSP, SMP decode support
- > Framing, Primitive, Disparity, Coding & Protocol errors
- > ATAPI 5 command decode

► **Display Capabilities:**

- > Command Listing
- > State Listing
- > Trace Histogram for navigation aid
- > Data Block (Hex/ASCII)
- > Real-time Statistics
- > Timing Waveform
- > Post-capture filtering
- > Post-capture statistics

► **Advanced Features:**

- > Up to 256 million events in dedicated memory
- > 12 level trigger with counters and timers
- > 4ns resolution

The Bus Doctor family of protocol analyzers provides unprecedented power, ease, depth, breadth and portability for those examining and diagnosing busses and interfaces. The Bus Doctor analyzer becomes a dedicated SAS protocol analyzer by connecting it to the Bus Doctor SAS bus pod. The system provides SAS developers the deep trace buffer and triggering features required for this high-speed bus.

The SAS pod supports bi-directional transfers at 3.0 Gb per second. With the deepest trace memory option, the Bus Doctor allows the user to capture up to 256 million events. At the Command level, the SAS analyzer provides a summary of each SAS Frame type including Command, address, blocks transferred, status, etc. The State display provides decoding of each double-word transfer for those needing to monitor SAS software, device drivers, or firmware. The analyzer displays 10b codes as well as 8b ones.

It detects and can trigger on Framing, Primitive, Disparity, Coding and Protocol errors as well as Out-Of-Band (OOB) signaling. The high-level triggers each provide drop-down boxes so the user can select specified frames, 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.

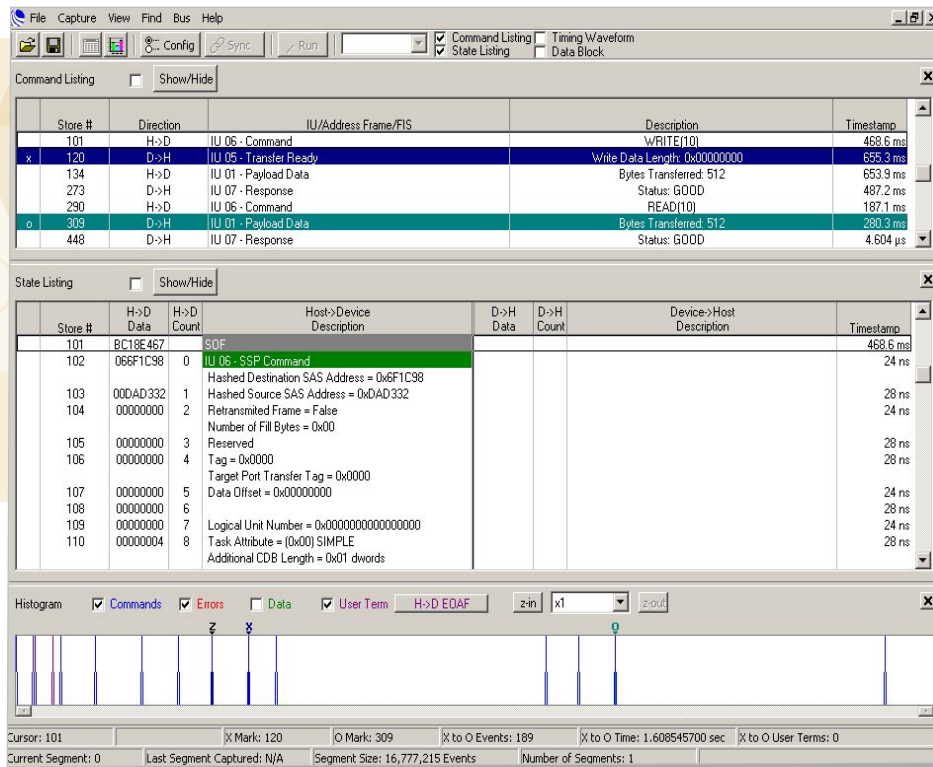
Command Listing

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, SAS Frame type, Description and Timestamp may be displayed as either the relative elapsed time since the previous command or the absolute time from a user definable origin.

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



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.

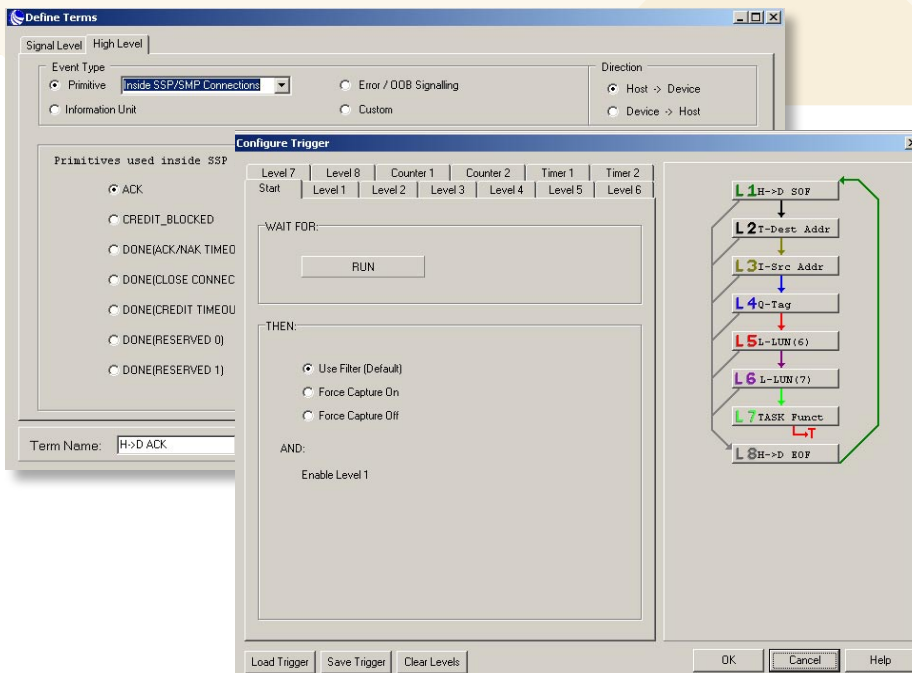
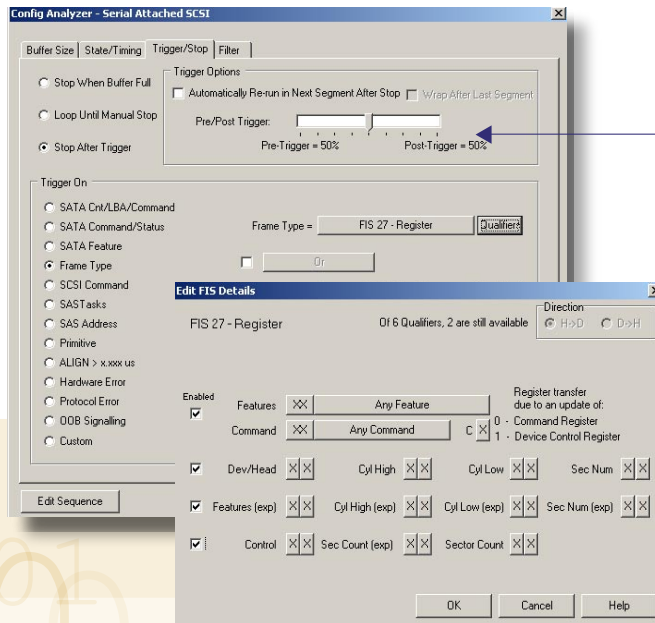
Clicking in this window, or anywhere in the Command or State Listing displays will synchronize all of the displays.

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.

Pre-Trigger/Post-Trigger

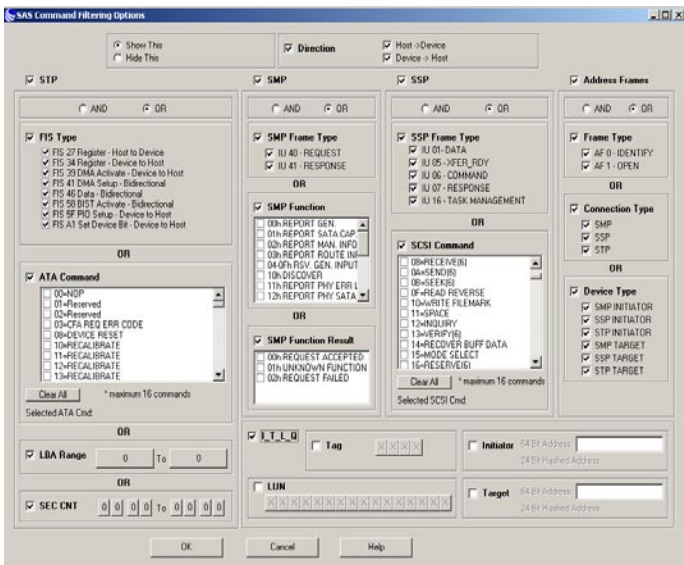
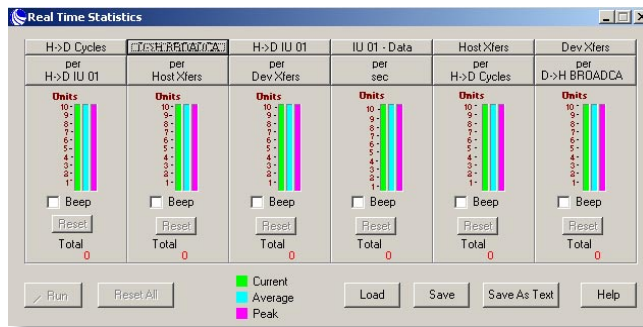
The Pre/Post adjustment bar controls the ratio of captured data before or after the trigger position. The Auto Re-run feature makes it possible to capture multiple traces overnight or over the weekend automatically.



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 Show/Hide 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 manner in which it is displayed. This means 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, SMP Frames/Functions, and device types.

A State Listing Show/Hide feature is also provided to allow for additional filtering of the State Listing.

- ▶ Analyzer Compatibility:
 - > All Bus Doctor™ Workstation 108 Channel Analyzers
 - > All Bus Doctor Rx™ 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*
 - > Primitive*
 - > Protocol Error
 - > Power
- * 2 indicators, one per channel

About Data Transit

Founded in 1990, Data Transit designs, manufactures and sells the Bus Doctor™ line of protocol analyzers. Data Transit's Bus Doctor modular approach allows users to attach different bus pods to a single analyzer as needed. This unique modular approach provides customers with a superior value proposition while giving them the advantage of using a single tool for multiple applications. Data Transit also produces PacketMaker™ traffic generators.



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