

**dap** TECHNOLOGY •



ADVANCED SERIES

FIRESTEALTH  
810bN



## PRODUCT OVERVIEW:

DapTechnology's **FireStealth810bN**® with its patent pending non-intrusive bus monitoring technology, is the industry's first "Stealth Mode" IEEE 1394b analyzer. Based on the InvisiPHY® technology, the **FireStealth** IEEE 1394b analyzer is a bus monitoring device that is attached to the IEEE 1394b bus leaving the existing topology unaffected. The device does not participate in the bus configuration and thus, no topology reconfiguration and node ID reassignments occur. The **FireStealth's** passive personality and non-intrusive behavior renders it invisible to all other devices on the IEEE 1394b bus. Also, it does not participate in any bus management activities such as root contention, cycle start generation & transmission arbitration.

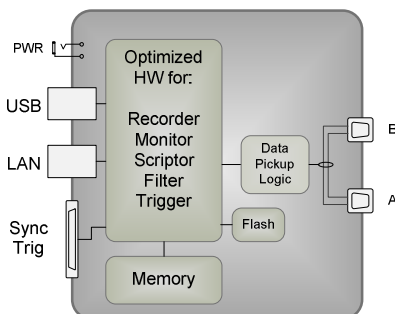
The **FireStealth** is a small, compact instrument that is equipped with 1 GB internal memory. The unit offers extensive hardware filtering and trigger possibilities due to efficient programmable logic and an on-board processor. It supports up to 800Mb transfer rate (beta Mode only). Two 1394b connectors allow for convenient connection to the system under test.

The **FireStealth** may be connected to a host computer via the USB 2.0 interface. Furthermore, an Ethernet port allows for easy network integration and remote control. The graphical user interface runs on Windows™ XP(64) or Windows™ 7(64). It is intuitive and offers a user-friendly way of data presentation and user control. Additionally the included API even allows you to build your own control software by using its interfaces to several programming languages like C++, LabView™ and LabWindows™.

The seamless integration of the Mil1394 protocol (based on SAE AS5643) makes the **FireStealth** a great tool for many Aerospace & Defense development tasks. DapTechnology has taken considerable efforts to fully support the SAE AS5643 protocol in all major functional areas of the **FireStealth** and continuously updates the analyzer functionality according to implementation requirements and ongoing standardization efforts.

### Key Features

- Supports 100b, 200b, 400b, and 800b Mbps data transfer rates
- Host connection to PC via USB 2.0 or 10/100BaseT LAN
- On-board 400 MHz RISC processor and programmable logic
- 1024 MByte internal memory
- Supports Windows™ XP(64) or Windows™ 7(64)
- 2 FireWire connectors (Beta)
- Enhanced Scriptor functionality for real-time monitoring and analysis
- Powerful software provides:
  - Monitor
  - Recorder
  - Topology
  - Scriptor (programmable in C-like language)
  - Filter and Trigger
  - Support for VS (Mil1394), AV/C, SBP2, AMI-C, IP1394 and IIDC protocols
- Internal Self-Test
- API with C/C++, LabView™ and LabWindows™ interfaces



## A COMPLETE SOLUTION:

The **FireDiagnostics Suite** is the most comprehensive collection of 1394 analysis, simulation and interface tools for a wide range of applications. Apart from well established and hardware assisted analyzer tools like Monitor, Recorder, Generator, Commander and Scriptor, the suite also offers a set of software tools designed to integrate the FireSpy products in a wide variety of testing applications, as well as extend customization of its functionality beyond the baseline feature set provided by DapTechnology.

The foundation for all software tools included in the FireDiagnostics Suite is formed by the **Application Programming Interface (API)**. With its interfaces for a wide range of development environments like C/C++, LabView™ and LabWindows™ and support for both Windows and Linux operating systems, the application of FireSpy analyzers is extremely flexible. With its feature-rich function library, all hardware assisted analyzer tools like the Recorder and Generator can be controlled as well as more low-level 1394 bus functions.

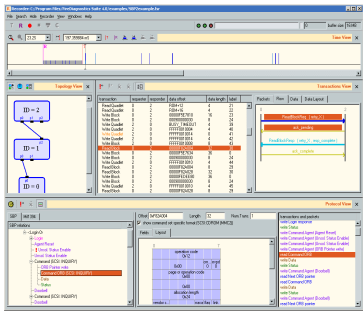
The **Recording Viewer** is a standalone application designed to permit trace (recorded data) analysis offline, i.e. without a connected FireSpy. The same comprehensive set of analysis tasks is available but allows for a much smaller PC footprint than having the entire FireSpy application installed.

The **Signal Monitor** is an easy-to-use Mil1394 sub-system monitor and analysis tool that benefits from the hardware-implemented Mil1394 protocol. A customizable set of status signals can be pulled from the bus and displayed in near real-time on a customizable graphical Control Panel. Alarms can be setup to alert the operator of out-of-range values.

Another cornerstone of the FireSpy products is the unparalleled high-level **protocol support**. Besides the hardware-assisted integration of Mil1394 the FireSpys also support software-based analysis capabilities for consumer and industrial control based applications. The different protocols require very different implementation details and are therefore very unique in their implementation. However, some key characteristics can be identified and are listed below:

- Nested protocol header decoding
- Protocol payload separation
- Handshake verification
- Logical grouping of related transactions
- Separate protocol view
- Protocol layer CRC and Parity Check
- Customization of display details

Additionally, separate applications (**Format Editor and Protocol Editor**) allow for the modification and extension of the factory default decoding and identification definitions. This extremely powerful and versatile tool enables experienced users to build on top of the standard definitions, engage in early prototyping and benchmarking of protocols still in the specification development process, as well as add proprietary extensions.



The **Recorder** is the main tool for data traffic capturing and analysis. Running all in HW/FW it guarantees precise time measurement, reliable data capture, instantaneous triggering and enough memory for even very complex analysis tasks. It contains several display views, which can all be switched on or off individually.

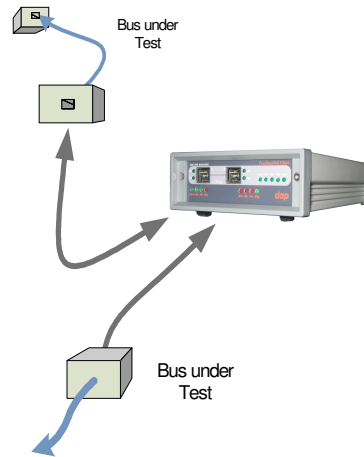
**Time View** - timing analysis of events and packets, resolution of 10 ns.

**Packet View** - chronological packet display with Trigger indicator and error verification

**Transaction View** - transaction-oriented display, verification of transaction completeness, transaction list or flow-diagram display

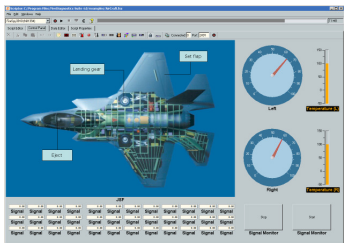
**Topology View** - static bus-topology display at the trace cursor position

**Protocol View** - high-level protocol analysis, encapsulated protocol verification, handshake verification, etc.



The FireStealth requires a pass-through wiring. Due to its symmetrical but entirely passive data pickup logic it has to be connected between other devices on the bus. Contrary to other FireSpy bus analyzers it cannot be in a leaf node position.

The internal signal monitoring path replicates the essential receive elements of a physical layer device and furthermore allows analysis information using dedicated logic blocks like Clock Recovery, Deserializer, Comma Detect, 8b/10b Decoder, Descrambler and Packet/Event Detector.

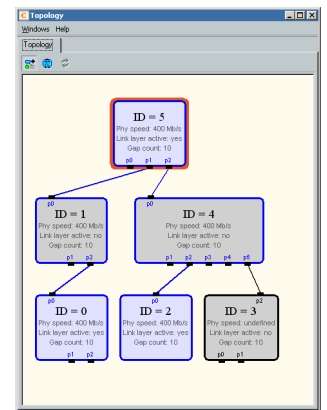
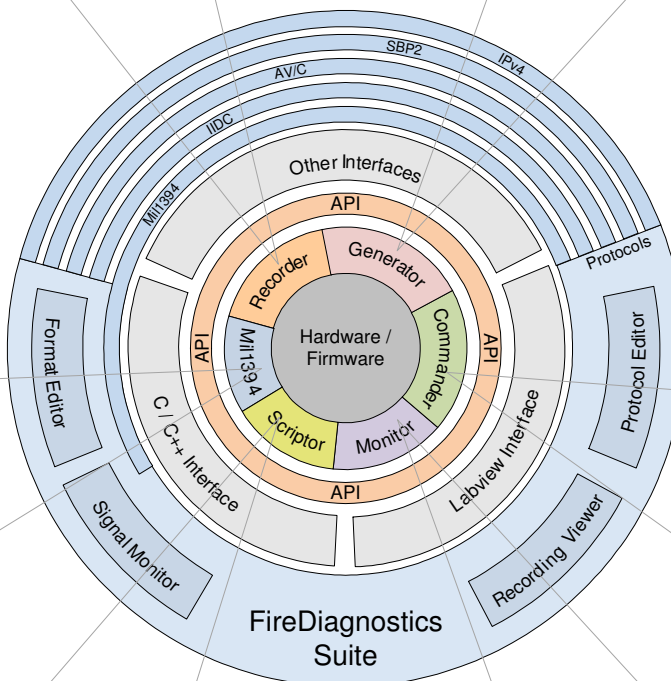


The **Mil1394** protocol HW level support for the FireSpy is an essential component for supporting AS5643. Key features include:

**Generation** - STOF and stream generation, 1µs resolution

**Verification / Calculation** - Timing, Vertical Parity Check, Heartbeat

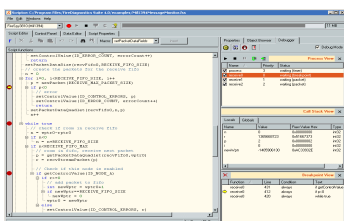
**Monitoring** - asynchronous stream payload field extraction



The **Topology** tool can be used to display the current bus topology

**Topology Analysis** - live display of the current bus topology

**Device Analysis** - NodeID assignment after Bus Resets, Power Classes



The **Scriptor** permits the definition of C-like scripts to control almost anything in the FireSpy, including reception of packets and bus events.

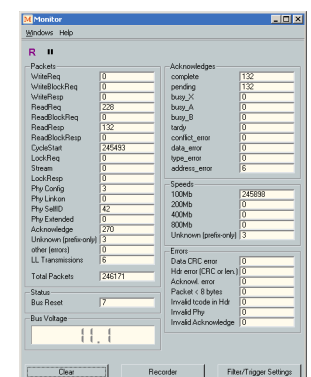
**Script editor** - C-like script editor/compiler with automatic code block generation, integrated Debugger, floating-point data type support

**Data editor** - defines data elements that can be used by the script

**Control Panel** - display of values using different types of meters (gauge, LCD, thermometer, etc.).

The **Monitor** gives a quick indication of activities on the bus under test. The displayed data is updated in real time.

- Number of packets of specific types
- Number of packets of specific speeds
- Number of acknowledge packets
- Number of error packets
- Total number of packets
- Number of bus resets
- Bus voltage measurement



## MAIN FEATURE SUMMARY:

### GENERAL

- Supports 100(B), 200(B), 400(B) and 800(B) Mbps transfer rates
- Connects to host using USB2.0 interface or to LAN via 10/100 Base-T
- Electrical isolation between IEEE 1394 and host (USB)
- 992 MByte memory for packet and data storage
- Firmware field upgradeable to enable future expansions
- AUX connector for:
  - Trigger input and output functions
  - Recording external events
- Software runs on Windows™ XP(64) and Windows™ 7(64)

### MONITOR

- Displays bus activity:
  - Counts packets according to type, speed, ack and error condition
  - Counts number of bus resets

### RECORDER

- Time stamping of all packets and status events with 10ns resolution
- Packets hidden by slower connections are visible as 'prefix only' packets
- Extensive packet/event filtering/trigger/search capabilities
- Adjustable trigger position within programmable record buffer size
- Cyclic pre-trigger buffer management option
- Different kinds of packet display views
- Precise time measurements
- Marking of individual packets or packet ranges
- Export format for re-generation of packets with non-Stealth analyzer

### SCRIPTOR

- Script Editor
- Data Editor
- Control Panel
- Several Sample Scripts

### TOPOLOGY

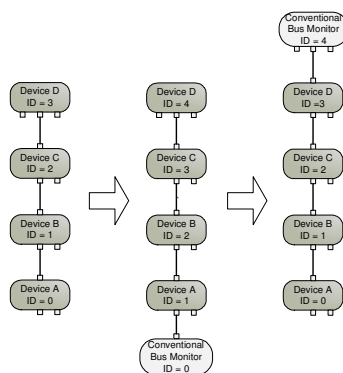
- Graphical Display of current Bus Topology
- Live topology updates upon Bus Reset Detection

## Non-Intrusive Analysis:

A serious shortcoming in off-the-shelf PHYs - from the data monitoring point-of view - is the "intrusive" nature of regular PHY silicon. Commercial PHYs are architected to provide both receive (RX) and transmit (TX) functionality since regular bus devices want to receive as well as send data. Therefore, it is a requirement that these devices fully participate in the tree identification, bus enumeration and become real participants on the bus. This, however, is not necessarily the case for pure "data monitoring" devices. If the goal is to provide only data monitoring (listening) functionality, it is actually desired that the "monitor" is not part of the bus as it influences and changes the system under test. The dynamic nodeID enumeration in IEEE1394 would stay unaffected when "connecting" a non-intrusive monitor.

The figure demonstrates the typical problem. A number of IEEE1394b-2002 devices are connected via 1394b connections. The addition of an additional device is shown in the middle/right graphic. All devices' nodeIDs get re-enumerated as a new tree-identification process reconfigures the bus. In this example the bus monitor ends up at the bottom of the tree with the lowest nodeID. When added to the bus via a different connection location there is fair chance that the newly added

device wins the arbitration and becomes the root node (device with the highest node ID). Only in this case all other nodeIDs stay the same. However, it must be pointed out that for most testing applications this is a highly undesirable configuration. In IEEE1394 the root node has a very specific status with some important bus supervision functions. Having the monitor be the root and having it take over these responsibilities is a severe change of the system under test and bears very little resemblance to the original configuration.



## SPECIFICATION:

<b>Dimensions:</b>	125 mm x 48 mm x 224 mm
<b>Weight:</b>	770 g
<b>Operating Range:</b>	0 – 45 C
<b>Power Requirements:</b>	12V, 10 Watt maximum
<b>Compliance:</b>	FCC Class A
<b>Connections:</b>	USB2.0 connector for host computer RJ45 Ethernet connector 2x IEEE 1394 connectors (Beta)
<b>Indicators:</b>	Green LEDs for: Sync, Speed, USB, Power, Ethernet, Trigger  Red LEDs for: Record, Scriptor Active, Ready  Bicolor LEDs for: Port Polarity, Port Signal  Buzzer
<b>Switches:</b>	Tumble switch for Power On/Off
<b>Package Content:</b>	FireStealth810bN Power adapter (12V, 1250mA) 1394b Cable (Beta9 – Beta9) 2x 1394b Cable (9pin, 1 meter) Trigger Cable
<b>Product warranty:</b>	12 months limited warranty
<b>Part Number:</b>	FS081bN or FS081bNP5HSS (w. Mil1394 SW protocol package and 12 months Extended Warranty)
<b>Optional Configuration:</b>	-
<b>SW Add-on modules:</b>	SBP2 protocol software package IIDC protocol software package AV/C protocol software package IP1394 protocol software package AMI-C protocol software package Mil1394 protocol software package



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