dap TECHNOLOGY

GEN2 SINGLE SERIES

FIRESTEALTH
810bN

1394 SM

MIL1394

PRODUCT OVERVIEW:

DapTechnology's **FireStealth810bN**© with is 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™ Operating Systems. 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 controlling software or interface using C/C++ or LabVIEW™.

The seamless integration of the AS5643 protocol 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
- GUI and API for Windows™ Operating Systems
- 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 AS5643, AV/C, SBP2, AMI-C, IP1394 and IIDC protocols
- Internal Self-Test
- C/C++ API with wrappers for LabVIEW™
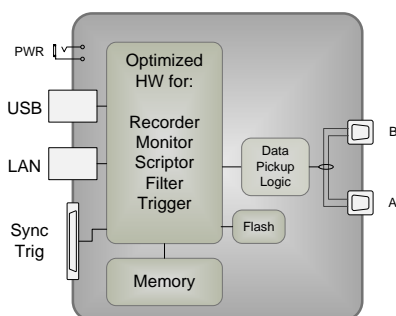
A COMPLETE SOLUTON:

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++ and support for the Windows operating system, 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 AS5643 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.
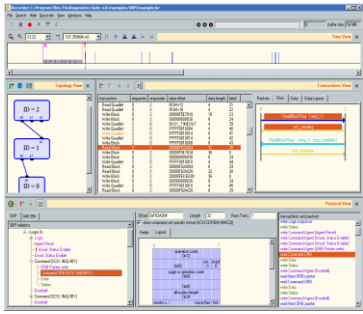
The **Recorder** is the main tool for data traffic capturing and analysis. Running all in HW/FW it guarantees precise time measurement, reliable data capture, instantaneous triggering and enough memory for even very complex analysis tasks. It contains several display views, which can all be switched 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.
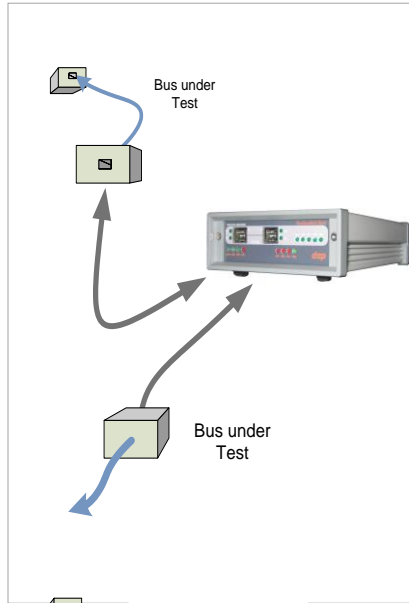

The FireStealth requires a pass-through wiring. Due to its symmetrical but entirely passive data pickup logic it has to be connected between other devices on the bus. Contrary to other FireSpy bus analyzers it cannot be in a leaf node position.

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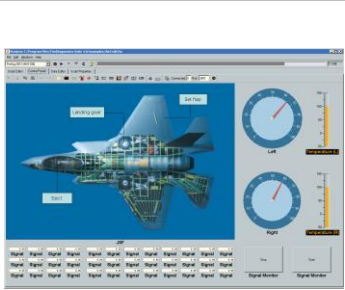
The **AS5643** protocol HW level support for the FireSpy is an essential component for supporting AS5643. Key features include:

Generation - STOF and stream generation, 1μs resolution
Verification / Calculation - Timing, Vertical Parity Check, Heartbeat
Monitoring - asynchronous stream payload field extraction

AS5643

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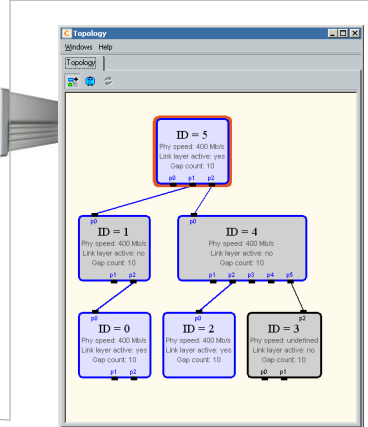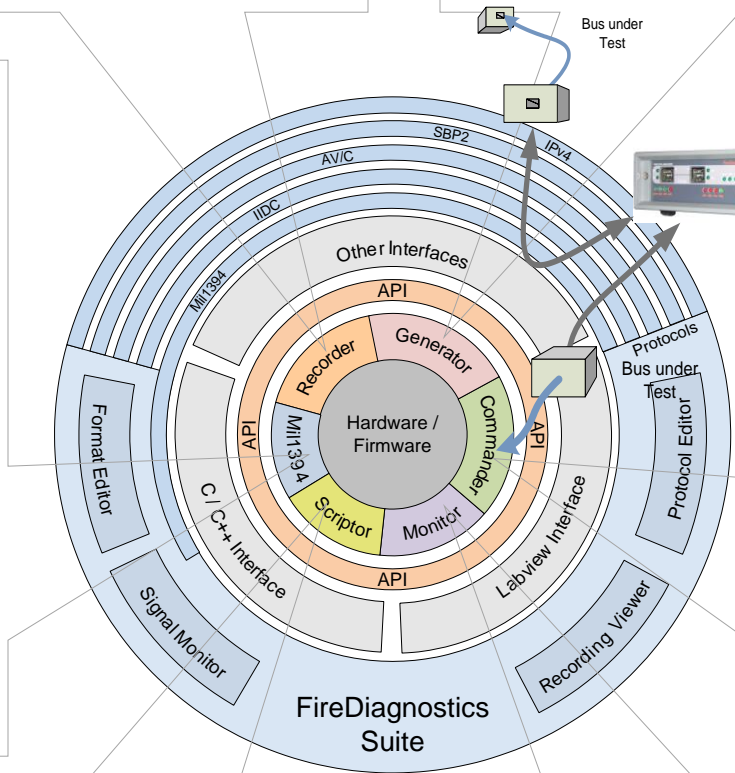
The **Topology** tool can be used to display the current bus topology

Topology Analysis - live display of the current bus topology
**Device Analysis** – NodeID assign-ment after Bus Resets, Power Classes
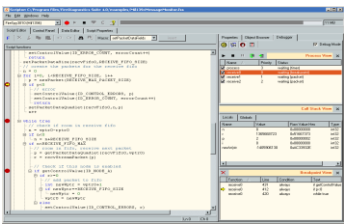
The **Scriptor** permits the definition of C-like scripts to control almost anything in the FireSpy, including reception of packets and bus events.

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
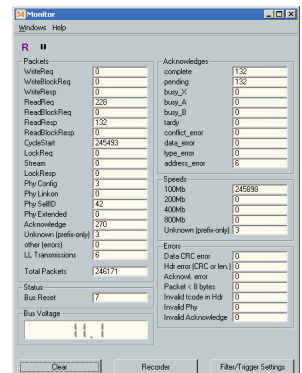
MAIN FEATURE SUMMARY:

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 IEEE1394 and host (USB)
- 992 MByte memory for packet and data storage
- Firmware field upgradeable to enable future expansions
- AUX connector for:
  o Trigger input and output functions
  o Recording external events
- GUI and API for Windows™ Operating Systems

MONITOR
- Displays bus activity:
  o Counts packets according to type, speed, ack and error condition
  o 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
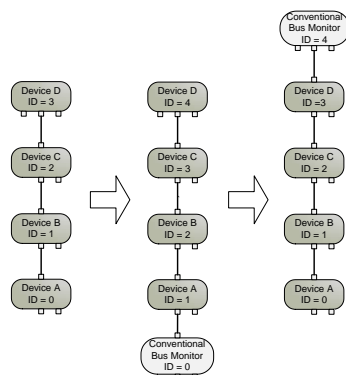- Data Editor
- Control Panel
- Several Sample Scripts

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:

Dimensions:	125 mm x 48 mm x 224 mm
Weight:	770 g
Operating Range:	0 – 45 C
Power Requirements:	12V, 10 Watt maximum
Compliance:	FCC Class A
Connections:	USB2.0 connector for host computer RJ45 Ethernet connector 2x IEEE 1394 connectors (Beta)
Indicators:	Green LEDs for: Sync, Speed , USB, Power, Ethernet, Trigger
	Red LEDs for: Record, Scriptor Active, Ready
	Bicolor LEDs for: Port Polarity, Port Signal
	Buzzer
Switches:	Tumble switch for Power On/Off
Package Content:	FireStealth810bN Power adapter (12V, 1250mA) 1394b Cable (Beta9 – Beta9) 2x 1394b Cable (9pin, 1 meter) Trigger Cable
Product warranty:	48 months limited warranty
Part Number:	FS081bN or FS081bNAS5643 with AS5643 SW protocol package
Optional Configuration:	FS081bNSR with Symbol Recorder SW package
SW Add-on modules:	SBP2 protocol software package IIDC protocol software package AV/C protocol software package IP1394 protocol software package AMI-C protocol software package AS5643 protocol software package

CONTACT INFORMATION:

sales@daptechnology.com   www.daptechnology.com

dap TECHNOLOGY •
DapTechnology B.V.
Beatrixstraat 4
7573AA Oldenzaal
The Netherlands
Ph: +31 541 532941

dap USA •
DapUSA, Inc.
780 W San Angelo Street
Gilbert, AZ 85233
United States of America
Ph: +1 480 422 1551