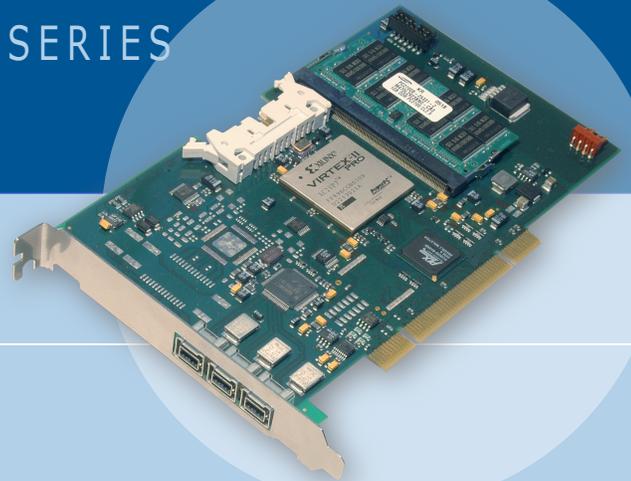




GEN2 SINGLE SERIES

FIRESPY

850  
450b  
450bT



## PRODUCT OVERVIEW:

The **FireSpy850**, **FireSpy450b** and **FireSpy450bT** bus analyzers complete the second generation of FireWire analyzers offered by Dap-Technology. Based on the industry leading FireSpy810, as well as the form factor advantages introduced with the FireSpy3850, make these new PCI form factor analyzer cards the most compelling package for card-based 1394 analysis solutions found in the industry.

The PCI formats take flexibility to a higher level. This solution enables users to install the FireSpy hardware in any PC that has at least one PCI slot available. This allows for installation of the FireSpy Analyzer in developers' existing PCs, rugged field service laptop or lunchbox computer.

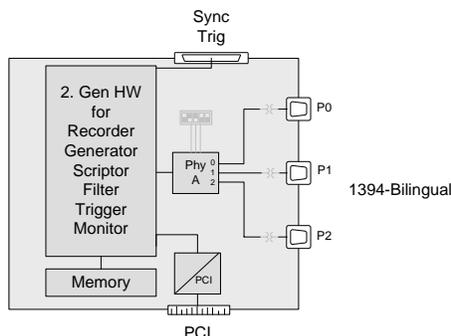
The **FireSpy50xx** are equipped with 1 GB of on-board memory. The units offer extensive hardware filtering and trigger possibilities due to efficient programmable logic and an on-board processor. They support up to 800Mb (400Mb for the FS450b) transfer rate and are fully IEEE 1394b compliant. Three bilingual or Beta 1394 ports (depending on model) allow for convenient connection to the system under test.

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 **FireSpy50xx** the preferred tool for many Aerospace & Defense development tasks. For long distance applications DapTechnology also offers the FS450b in an impedance matching transformer configuration, i.e. the FireSpy model **FSx50xx**.

### Key Features

- IEEE 1394-1995, 1394a-2000 and 1394b-2002
- 100, 200, 400, 400b and 800b transfer rates
- PCI 2.1 compliant
- On-board 400 MHz RISC processor and programmable logic
- 1024 MByte internal memory
- GUI and API for Windows™ Operating Systems
- Optional Bus Power
- Powerful software provides:
  - Monitor
  - Recorder
  - Commander
  - Scriptor
  - Generator
  - Filter and Trigger
  - Support for AS5643, IEC61883, AV/C, SBP2, IP1394 and IIDC protocols
- Internal SelfTest
- C/C++ API with wrappers for LabVIEW™



## 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++ 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.

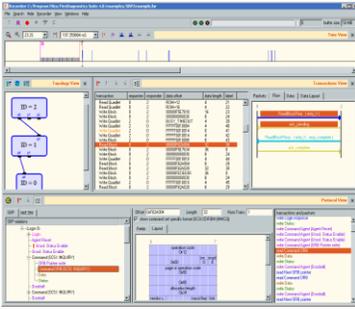
The **Recording Viewer** is a standalone application designed to permit trace (recorded data) analysis offline, i.e. without a connected FireSpy. The same comprehensive set of analysis tasks is available but allows for a much smaller PC footprint than having the entire FireSpy application installed.

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.

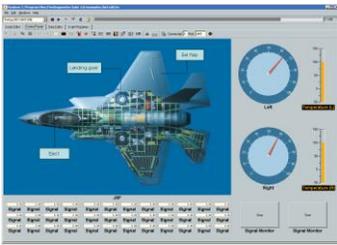
**Time View** - timing analysis of events and packets, resolution of 10 ns.

**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.



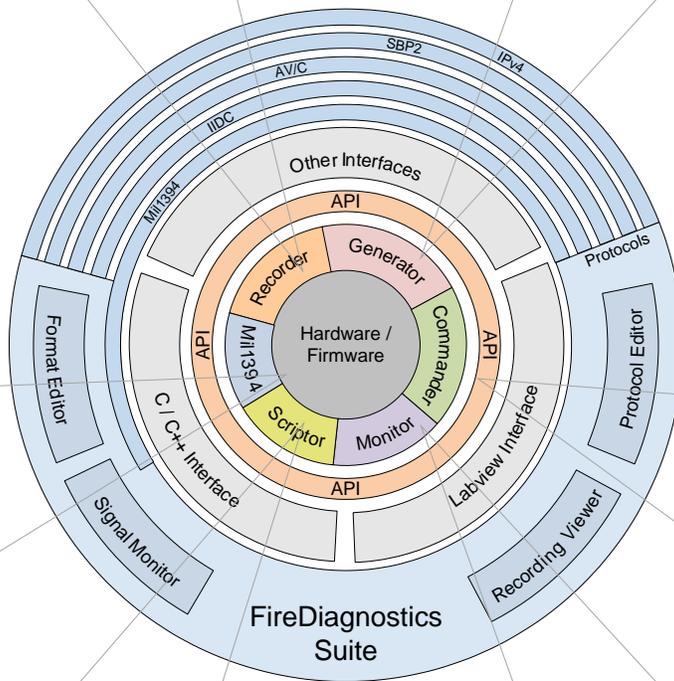
The **AS5643** protocol HW level support for the FireSpy is an essential component for supporting AS5643. Key features include:

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

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

**Monitoring** - asynchronous stream payload field extraction

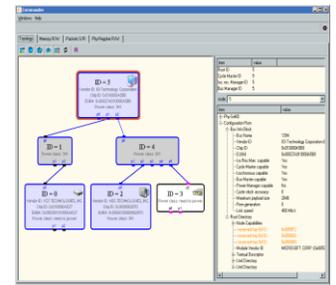
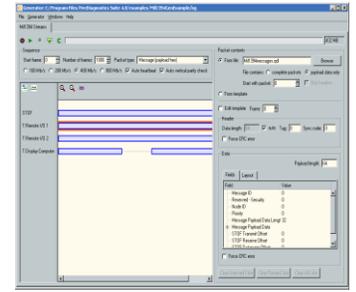
**AS5643**



The **Generator** is optimized for the generation of isochronous stream data packets offering the most comprehensible feature set for the insertion of errors, streaming of simultaneous channels and payload definitions from stored files.

The **Stream Generator** includes a powerful graphical editor to specify slots with stream sequences to be sent for up to 63 channels. Each sequence consists of one or more stream packets with selectable data sources that can be fixed or from file.

For each sequence one can select various options such as speed, packet size and header fields, including erroneous values. The overall sequence size is customizable in multiples of Cycle Periods. All Generator slots can be run in a looped-mode continuous transmission. Both the **Stream Generator** and the **Scriptor** can run in parallel for advanced isochronous and asynchronous combination testing.

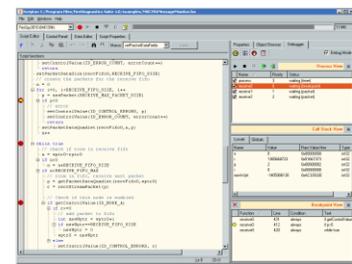


The **Commander** can be used to control the FireSpy functionality on a basic 1394 protocol level:

**Topology** - live display of the current bus topology, Configuration ROM Explorer

**Memory Read/Write** - R/W/L to memory locations of remote nodes, **Packet S/R** - RX/TX of all packets, unformatted and erroneous packets.

**PHY Register** - R/W of PHY registers of the local and R of the remote nodes.



The **Scriptor** permits the definition of C-like scripts to control almost anything on the FireSpy, including sending and receiving packets. It is the preferred tool for the generation of individual asynchronous packets, asynchronous sequences and the simulation of entire handshakes.

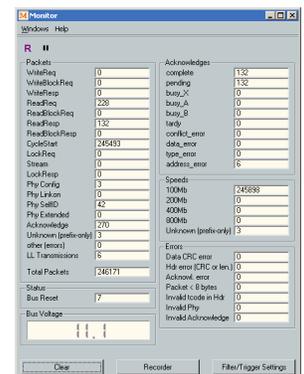
**Script editor** - C-like script editor/compiler with automatic code block generation, integrated Debugger, floating-point data type support

**Data editor** - defines data elements that can be used by the script, i.e. generation data

**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

- IEEE 1394-1995, 1394a-2000 and 1394b-2002 compliant
- Supported Speeds and Modes:

		FS450b	FS450bT	FS850
Port Modes	S100	<i>Beta</i>	<i>Beta</i>	<i>Legacy</i>
	S200	<i>Beta</i>	<i>Beta</i>	<i>Legacy</i>
	S400	<i>Beta</i>	<i>Beta</i>	<i>Bilingual</i>
	S800	-	-	<i>Beta</i>
Connectors		<i>Beta</i>	<i>Beta</i>	<i>Bilingual</i>
Transformer		-	Yes	-

- PCI 2.1 compliant
- Optional Bus Power (2.8 W at 12V) (except FS450bT)
- 992 MByte memory for packet and data storage
- Firmware field upgradeable to enable future expansions
- GUI and API for Windows™ Operating Systems

## MONITOR

- Displays bus activity:
  - Counts packets according to type, speed, ack and error condition
  - Counts number of bus resets
- Measurement of bus power voltages (except FS450bT)

## 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, including:
  - Time View, displays all packets on a time line, including the prefix
  - Packet View, displays packets as list plus selected packet options
  - Transaction View, displays transactions as list or flow graph
  - Topology View, graphical topology displays as is during recording
  - Protocol View, displays packets decoded to selected protocol
- Precise time measurements
- Marking of individual packets or packet ranges
- Export format for re-generation of packets by Scriptor or API

## GENERATOR

- Simultaneous generation of up to 63 iso streams
  - Graphically programming of stream transmit block
  - Data payload import from file
- Generator and Scriptor run simultaneous for stream and asynchronous packet generation
- Special Mil1394 stream generator package (optional)

## SCRIPTOR

- Script Editor
  - C-like scripting language
  - Function Library
  - Macros to automatically generate blocks of code
  - Syntax coloring
  - Integrated Debugger
  - Floating point data types
- Data Editor
- Control Panel
  - Graphical display elements for data value representation
  - Ethernet-connected Client Panels for remote data monitoring
- Several Sample Scripts

## COMMANDER

- Reading and/or writing of local and reading of remote PHY registers
- Reading and/or writing of remote memory locations (incl. CSR register space)
- Possibility to graphically view the current Topologies
- Sending of user definable packets

# SPECIFICATION:

- Dimensions:** PCI: half length, 125 x 48 x 209 mm
- Weight:** 150 g
- Operating Range:** 0 – 70 C
- Power Requirements:** 12V, 10 Watt maximum (without providing 1394 bus power)
- Compliance:** FCC Class A
- Connections:** 32bit/33MHz PCI connector, universal keyed (for 3.3V and 5V slots)  
3 IEEE 1394-connectors (bilingual or Beta)
- Indicators:** -
- Switches:** Dip-switches for PHY port Speed/Mode Selection, (FS450b and FS450bT only)
- Package Content:** FireSpy850  
1394b Cable (Beta9 – Beta9)  
2x 1394b/1394a Cable (Bilingual9 – 6pin)
- Product warranty:** 36 months limited warranty
- Part Number:** FS085 or FS085P5HSS (w. AS5643 SW protocol package)
- Optional Configuration:** FS045b or FS045bAS5643 (w. AS5643 SW protocol package, with TSB41BA3)  
FS045bT or FS045bTAS5643 (w. AS5634 SW protocol package, with TSB41BA3 and transformer)
- 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



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