PRODUCT OVERVIEW:

FireTrac™ complements DapTechnology’s successful FireSpy® and Mil1394 OHCI host adapter product lines. It clearly is the next generation Mil1394 (SAE AS5643) data processing, simulation and testing solution.

DapTechnology has seen an increasing demand for more streamlined hardware systems for the processing of AS5643 (and generic 1394) data streams. Customers get increasingly involved in monitoring the actual data content rather than the 1394 layer. And for simulation purposes, they require advanced error insertion capabilities that can only be accomplished with non-off-the-shelf Link Layer implementations. IRIG time-stamping of monitored events on the bus is a typical requirement.

FireTrac™ is the answer for this market need. It is designed to natively (not just as an add-on protocol) support Mil1394 (SAE AS5643). Besides the standard IEEE1394 features, FireTrac™ has been architected to provide hardware level support for Mil1394 (SAE AS5643) which reduces host processor burden, specifically for packet encapsulation, data extraction, receive/transmit STOF offsets, etc. As a key example, FireTrac™ handles Mil1394 transmission timing entirely in hardware therefore making it a lot more accurate. It is important to understand that FireTrac™ is a dedicated and optimized solution for the processing of AS5643 type traffic. Support for this protocol is embedded in the hardware and not just in a software layer, as is provided with other solutions that rely on COTS OHCI chipsets.

Another key element is FireTrac™’s customization capability. Personality Profiles allow the solution to be adapted for use in embedded systems which typically have limited resources, and/or with powerful host processors that can utilize even the fully featured profile. Additionally, FireTrac™ is supported on a variety of operating systems.

Key Features

- IEEE 1394b-2002
- SAE AS5643 and Mil1394 enhancements
- S200b, S400b transfer rates
- PMC form factor with carrier cards (PCI, PCIe, cPCI, cPCIe, etc…)
- PCI-X 2.0a Host Interface
- IRIG B122 and IEEE1344
- Support for:
  - Windows™ XP and Windows™ 7 (32-bits and 64-bits)
  - Linux
  - VxWorks
  - LabView (RT)
  - SGI IRIX
- 9 active transformer coupled FireWire ports (adapter cable)
- C/C++ API

Software & Personality Profiles:

FireTrac™ uses a combination of 1394 and Mil1394 support in hardware, as well as a robust, well designed 1394 software Stack (FireStack®) running on a host computer. Interfacing to this stack can be done via an API that offers C/C++ interfaces on multiple platforms and a LabVIEW interface on Windows. Currently, DapTechnology supports Windows, VxWorks, Linux, IRIG and NI-LabView (RT) platforms.

An essential feature of FireTrac™ is its thin software and firmware layer. In order to be usable in embedded designs having limited resources, great emphasis was given to keep the footprint and host system resource utilization fairly small. And, in order to optimize and streamline performance, the individual features and functions of FireTrac™ are grouped into so-called Personality Profiles. These profiles may be purchased separately so that the user may configure their system based on individual requirements.

The following profiles are available:

- Low-Level API Profile
- 1394 Software Stack Profile
- 1394 Software Stack + Bus Management Profile
- Mil1394 Bus Interface Profile
- Advanced Mil1394 Bus Interface Profile (pending)

For detailed features and components of these profiles see the last page and/or the online products page.

AN “ENABLING” Mil1394 SOLUTION:

FireTrac™ provides a very universal approach to dealing with Mil1394 (AS5643) type of traffic. It is uniquely suited for SAE AS5643 Level Data Extraction and Analysis (RX) but also Data Generation and Device Simulation (TX). Together with its customers, DapTechnology has identified a wide range of applications with a few usage models prevailing.

For this reason DapTechnology has decided to create dedicated solutions based on the FireTrac™ platform. Such application-centric solutions are focused on very specific tasks and, due to their very clearly defined requirements, DapTechnology is able to even further optimize the firmware and software architecture.

Examples for such “customized” solutions are:

- Data Recorders (single/multi-channel, with/without Stealth, …)
- System Simulators (multi-streams generator, error injection, …)
- System Monitors (Health, Data Extraction, …)
POSITIONING OF FIRETRAC:

At first sight the new FireTrac™ might appear as a solution positioned right in-between the FireSpy® product line and DapTechnology’s series of Mil1394 (SAE AS5643) compatible OHCI - host adapter cards (as well as other implementations using the OHCI technology). While this is not entirely wrong, it needs to be pointed out that FireTrac™ is more than just a marriage of both.

FireTrac™ has been designed from the ground up to provide extended features and functionality in areas that are difficult to accomplish with COTS OHCI Link Layer devices (precise timing, ...) without having the data analysis overhead of the FireSpy® architecture. The table below is intended to show the strengths of FireTrac™ (middle) relative to the other two product groups:

<table>
<thead>
<tr>
<th>Mil1394 - Physical Layer</th>
<th>FireSpy</th>
<th>FireTrac</th>
<th>Mil1394 I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Transformers</td>
<td>Model Dependent</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>38999 Connectors</td>
<td>With Adapter Cable</td>
<td>With Adapter Cable</td>
<td>With Adapter Cable on PMC version</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mil1394 - Transmit</th>
<th>FireSpy</th>
<th>FireTrac</th>
<th>Mil1394 I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol Encapsulation</td>
<td>Host / Embedded SW</td>
<td>Software / Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>Transmission Mechanism</td>
<td>Embedded Software</td>
<td>Enhanced OHCI</td>
<td>OHCI</td>
</tr>
<tr>
<td>STOF Offset Timing</td>
<td>Hardware</td>
<td>Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>TX Offset Accuracy</td>
<td>Hardware, limited</td>
<td>Hardware</td>
<td>Software, OS Latency</td>
</tr>
<tr>
<td>Configurable TX streams (OHCI Contexts)</td>
<td>limited</td>
<td>Enhanced OHCI</td>
<td>Software</td>
</tr>
<tr>
<td>Linked &amp; Looped</td>
<td>Embedded Software</td>
<td>Enhanced OHCI</td>
<td>Software</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automated Packet Manipulation</th>
<th>Data Manipulation</th>
<th>Data Origination</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPC Generation</td>
<td>Hardware</td>
<td>Hardware</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mil1394 - Receive</th>
<th>FireSpy</th>
<th>FireTrac</th>
<th>Mil1394 I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol Encapsulation</td>
<td>Host / Embedded SW</td>
<td>Software / Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>Reception Mechanism</td>
<td>Recorder / Sign. Extract.</td>
<td>Enhanced OHCI</td>
<td>OHCI</td>
</tr>
<tr>
<td>MessageID Filtering</td>
<td>Hardware, limited</td>
<td>Hardware, limited</td>
<td>Hardware, limited</td>
</tr>
<tr>
<td>Configurable RX Streams (OHCI Contexts)</td>
<td>Hardware</td>
<td>Enhanced OHCI</td>
<td>OHCI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame Synchronization</th>
<th>RX STOF packets</th>
<th>External Sync Signal</th>
<th>Internal Clock</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Hardware</td>
<td>Hardware</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>Hardware</td>
<td>Hardware</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VPC Verification</th>
<th>skip incorrect packet</th>
<th>mark incorrect packet</th>
<th>ignore incorrect packet</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Hardware</td>
<td>Hardware</td>
<td>Software</td>
</tr>
<tr>
<td>-</td>
<td>Hardware</td>
<td>Hardware</td>
<td>Software</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timestamping</th>
<th>1394 Timebase</th>
<th>AS5643 Timebase</th>
<th>IRIG-B Input Timebase</th>
<th>Free Running</th>
</tr>
</thead>
<tbody>
<tr>
<td>1394 Timebase</td>
<td>Cycle Time</td>
<td>Frame Offset</td>
<td>Model Dependent</td>
<td>Hardware Clock</td>
</tr>
<tr>
<td>AS5643 Timebase</td>
<td>Cycle Time</td>
<td>Frame Offset + Number</td>
<td>Yes</td>
<td>Hardware Clock</td>
</tr>
<tr>
<td>IRIG-B Input Timebase</td>
<td>Model Dependent</td>
<td>Yes</td>
<td>-</td>
<td>Software, OS Latency</td>
</tr>
<tr>
<td>Free Running</td>
<td>Hardware Clock</td>
<td>Hardware Clock</td>
<td>Software, OS Latency</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Automated Packet Manipulation</th>
<th>Data Destination</th>
<th>Host Memory</th>
<th>Automated Data Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>On-Board Memory</td>
<td>Yes</td>
<td>(pending)</td>
</tr>
<tr>
<td>-</td>
<td>Host Memory</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Apart from its standard IEE1394 features, FireTrac™ has been architected to provide hardware level support for Mil1394 (SAE AS5643) which reduces host processor burden, specifically for packet encapsulation, data extraction, receive/transmit STOF offsets, etc…It is important to understand that FireTrac™ is a dedicated and optimized solution for processing of AS5643-type traffic with support for the AS5643 protocol embedded within the hardware, as opposed to just a software layer implementation which is typically provided with other solutions relying on COTS OHCI chipsets.
**MAIN FEATURE SUMMARY:**

**General:**
- IEEE 1394b-2002 compliant
- Supported Speeds: S200B, S400B
- 3 independent bus channels (FireLink, PHY, transformers)
- Field-upgradable
- PCI Specification 3.0 compliant
- PCI-X 2.0a, Mode-1, Decode-C latency, 100MHz, 64-bit data
- 66MHz PCI mode indication supported (M6EN)
- DMA Transfer (sustained 3x 400Mbs/1394 bus traffic at max bus load)
- IRIG B122 and IEEE1344
- Abstraction Layers for Operating System (OSAL) and Link (LAL)

**Personality Profiles**
- Run-time configurable and licensable
- Configurable packing for small footprints (optional)
- Allows to design a customized and changeable feature set
- Provide streamlined functionality (see table for details)
- Support for IEEE1394 and MIL1394 (SAE AS5643)
- Please contact DapTechnology for requirements with high level protocols (SBP2, IIDC, AVC, IP, ...)

**SPECIFICATION:**

**Dimensions:**
- PMC form factor, 15 x 74 x 154 mm

**Weight:**
- 130g

**Operating Range:**
- 0 – 70 C

**Power Requirements:**
- 7 Watts (max.)

**Compliance:**
- FCC Class A

**Connections:**
- 64-bit PMC connector configuration, Off-board connector (high density) for transformer coupled 1394b ports

**Indicators:**
- -

**Switches:**
- -

**Package Content:**
- FireTrac FT3460bT PMC card, Optional 3-foot fan-out cable allowing 9 bus connections (Beta) and IRIG input (PMC3CH3FBM-IRIG)

**Product warranty:**
- 12 months limited warranty

**Part Number:**
- FT3460bT-OPT1-OPT2-OPT3-OPT4-[OPT5]

**OPT1:**
- PMC – no Carrier Card
- (Carrier) PCI – PCI (64bit) Carrier
- Card PCle – PCI Express Carrier
- CPCI – CompactPCI Carrier
- PCle Express Carrier

**OPT2:**
- WIN – Windows (XP/64, 7/64)
- (Operat. VxW – VxWorks™ System) LIN – Linux
- IRIX – SGI IRIX
- LVRT – LabVIEW (RT)

**OPT3:**
- PF0 – (PF3 + PF5)
- (Person. PF1 – Low Level Profiles) PF2 – SW Stack
- PF3 – SW Stack & Bus Mgmt.
- PF4 – MIL1394
- PF5 – Advanced MIL1394 (pending)
- (only applicable for VxWorks OS)

**OPT4:**
- (SBC) – Single Board Computer type
- (please contact DapTechnology)

**[OPT5]:**
- HSS – HW/SW Ext. Warranty
- HS – HW Ext. Warranty
- SS – SW Ext. Warranty

**Accessories:**
- PM3CH5F19FP-IS:
  - 3-Channel/9-Port Off-board cable (5 feet) to 19” panel with 1394b(female) (or 38999) connectors and IRIG and Sync Inputs
- PM3CH5F19FP:
  - 3-Channel/9-Port Off-board cable (5 feet) to 19” panel with 1394b(female) (or 38999)
- PM3CH6FBM:
  - 3-Channel/9-Port Off-board cable (6 feet) with bilingual male termination
- PM3CH20FNT:
  - 3-Channel/9-Port Off-board cable (20 feet) without termination

Please check our [website](http://www.daptechnology.com) for pictures of cables and accessories and contact Dap directly for other cable requirements.

**CONTACT INFORMATION:**

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