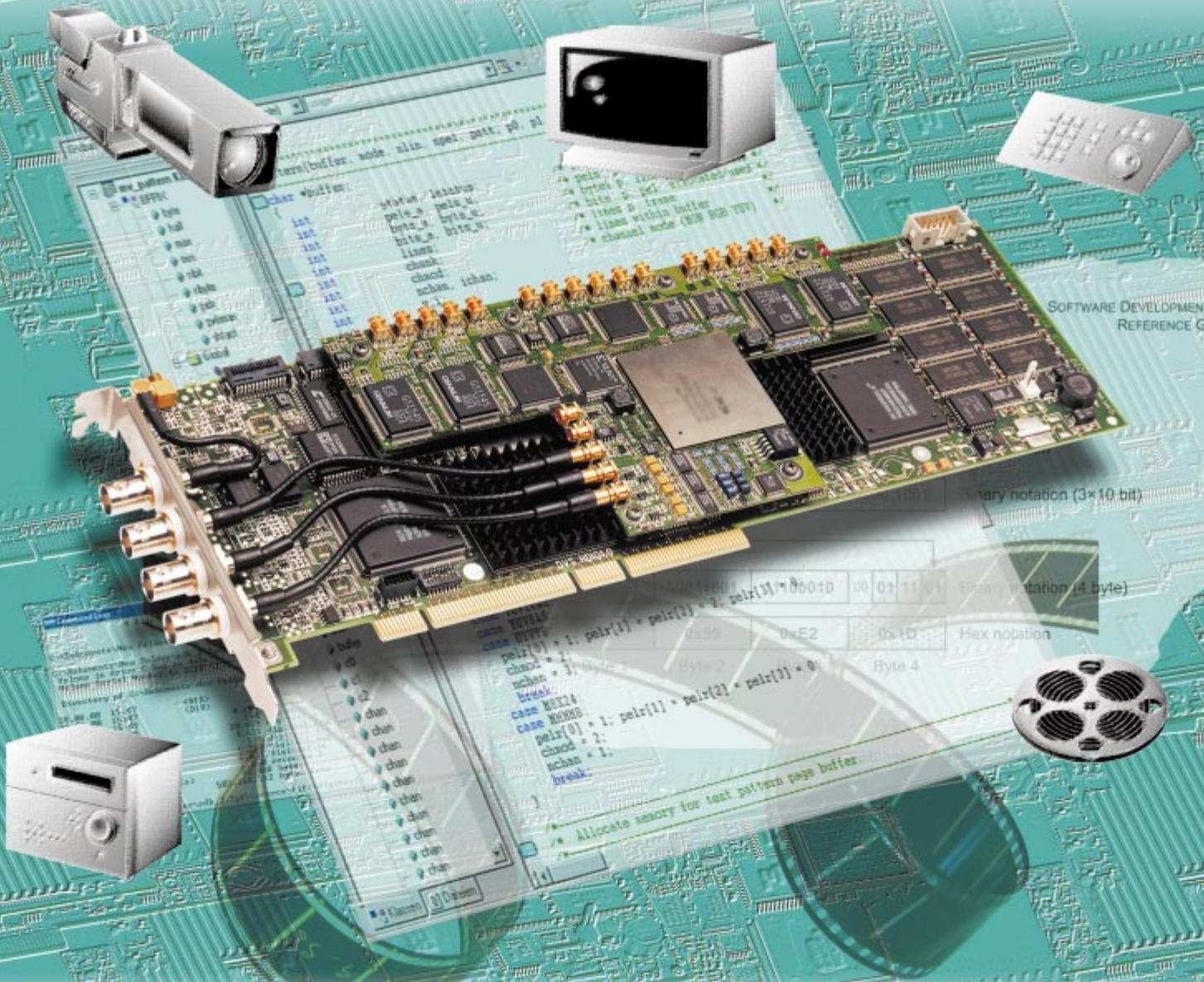




64-Bit PCI Board for HDTV Digital Serial I/O

HDStationOEM



Uncompressed HDTV Real-Time I/O
for Professional Applications

- ▶ Single-Slot 64-Bit PCI-Bus Board for Uncompressed HD Video and Audio In-/Output
- ▶ Serial Digital HD I/O (SMPTE 292M)
 - 8 Bit and 10 Bit Video
 - YCbCr/4:2:2
- ▶ Analog Component Outputs (RGB/YUV Switchable)
- ▶ Digital Color Space Converter for RGB/4:4:4 Storage Format
- ▶ Supported Rasters:
 - according to standards SMPTE 240/260, 274, 295, and 296
 - Film 2k: 2048×1556
 - Graphics: 1024×768, 1280×1024
 - and many others
 with frame rates from 24 to 72 Hz
- ▶ 10 bit Lookup Table (LUT)
- ▶ Overlay
- ▶ Independent HD Input and Output to On-Board DRAM (Delay Line)
- ▶ RS-422 Input and Output
- ▶ 4 Stereo Channels of Digital AES/EBU and Embedded Audio
- ▶ LTC I/O
- ▶ Internal Timebase with Analog Genlock Input (Bilevel, Trilevel)
- ▶ Bilevel, Trilevel, or HV-TTL Analog Sync Output
- ▶ Sophisticated Software Development Kit (SDK)

Choice of Extended I/O Modules:

1. Single-Link HDTV and SDTV I/O according to SMPTE 292 and SMPTE 259 (1.5 GBit/s, 270, or 360 Mbit/s)
2. Dual-Link HDTV and SDTV I/O according to SMPTE 292 and SMPTE 259 (1.5 GBit/s, 270, or 360 Mbit/s) for RGB and Key Channel

HDStationOEM

The HDStationOEM is the OEM product of the HDStationPRO family. It is centered around the DVS HDStationBoard, a powerful single-slot 64-bit PCI board for real-time input & output of uncompressed HDTV or SDTV signals. With the HDStationBoard a computer can capture or play back 8 and 10 bit HDTV data streams.

Using the software development kit (SDK) you can build elaborate HDTV editing and storage solutions with the HDStationOEM. This makes it *the* powerful and reasonably priced base to build professional applications for your customers in all production and post-production fields like

- | | |
|--------------------|----------------------|
| ◆ Graphics | ◆ Animation |
| ◆ Compositing | ◆ Rotoscoping |
| ◆ Rendering | ◆ Non-Linear Editing |
| ◆ Color Correction | ◆ Telecine Transfers |

and many more.

Seamless Integration

The HDStationBoard fits into a high-end, standard personal computer or workstation, thus offering high-speed, high-quality desktop video with serial digital and analog I/O on a low-cost and easily expandable platform. Running under Windows NT®, Windows® 2000, Linux®, or Solaris™ you can integrate the HDStationOEM into a wide range of workstations.

A 64-bit PCI-bus interface offers the bandwidth needed to transfer HD signals in real-time to main memory or even to a high-speed disk array. On-board DRAM buffers latency times of the PCI bus in streamed I/O applications. It can also be used as a dual-port frame buffer for input and output of stills and short clips while allowing parallel CPU access.

Supported Standard and Non-Standard Rasters

The HDStationOEM supports the common HDTV standards 1035i/1080i, 1080p, and 720p as well as the popular progressive 1080sF raster with segmented frames. Furthermore, the HDStationOEM is suited for film scanning and film post production applications, as it also provides the film rasters 1920×1080 and 2048×1556 in 24 Hz progressive as well as segmented frame mode. For flicker-free monitoring, analog output is possible in 60, 72, or 96 Hz with repetition of segmented frames.

In addition, extended I/O modules provide serial digital as well as analog output according to SMPTE 259 (D1/D5 @ 50/59.94/60 Hz).

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Linux is a registered trademark of Linus Torvalds.
Solaris is either registered trademark or trademark of Sun Microsystems, Inc. in the United States and other countries. DVS is independent of Sun Microsystems, Inc.

The modular design of the HDStationBoard enables the HDStationOEM to support future interlaced and progressive HDTV and film resolutions.

Data Formats

The supported data formats depend on the I/O module mounted on the HDStationBoard. Besides an analog output, all modules provide I/O of uncompressed serial digital video signals. Three different I/O modules are available:

- ◆ The **HR (HiRes) module** offers single-link SDI I/O for HDTV in $YC_bC_r/4:2:2$.
- ◆ The **SH module** offers single-link SDI I/O for HDTV and SDTV in $YC_bC_r/4:2:2$.
- ◆ The **SHDL module** offers dual-link SDI I/O. This adds RGB and a key channel to the HDStationOEM, thus providing HDTV and SDTV I/O in $YC_bC_rA/4:2:2:4$, $RGB/4:4:4$, or $RGBA/4:4:4:4$.

Storage may be either in YC_bC_r or RGB format with or without key channel. I/O color space and internal storage format may be different thanks to an integrated digital color space processor, which performs bidirectional on-the-fly $RGB \leftrightarrow YC_bC_r$ conversion. The color space converter also affects the analog monitoring output, which is able to display stored video data of any format in RGB or YUV.

Audio and LTC

4 digital stereo channels of AES/EBU and embedded audio (Audio-in-Video) are available similar to digital VTRs. In addition, there is a separate LTC I/O.

Flexibility

RS-422 ports are available, which can be used to implement VTR master control and VTR emulation.

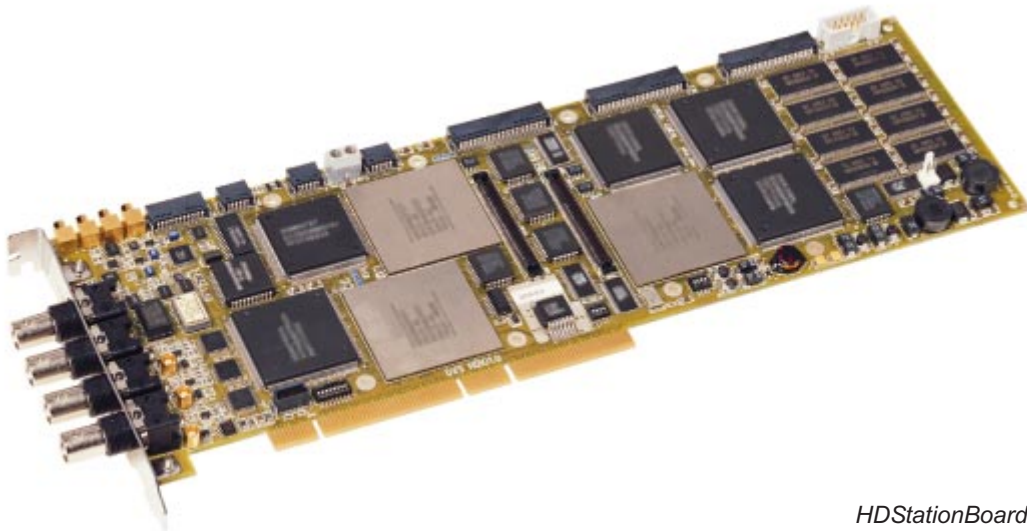
Lookup tables are provided at the analog output for operations such as gamma correction.

An on-board GPI port can be used for various control purposes, for example stepping through a sequence of weather maps.

Software Development Kit

The SDK facilitates the integration of the HDStationOEM into applications of OEMs and solution providers. It consists of C libraries, a FIFO API, device drivers, sample source code, and tools for basic hardware setup and diagnostics.

- ◆ The video C library is a collection of C functions that allow you to access all hardware capabilities. The file converter C library lets you handle different video and audio file formats easily.
- ◆ The FIFO API enables real-time direct I/O video applications. It uses the concept of FIFOs, which are implemented using on-board DRAM. Two means are provided for accessing the on-board DRAM: It can be mapped into the application address space or an on-board DMA engine may be used for transferring data between system RAM and on-board DRAM.
- ◆ The device driver assures hardware accessibility through the SDK functions.
- ◆ Several small examples written in C make it easy to learn creating own applications.
- ◆ The delivered tools allow setting basic operation parameters as well as troubleshooting.



HDStationBoard.

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Specifications

	Input	Output
Video Analog		4 BNC* for RGB/YUV, S
HR Module: Single-Link HD SDI I/O (SMPTE 292)	1 BNC plus loop-through	2 BNC
SH Module: Single-Link HD SDI I/O (SMPTE 292) Single-Link SD SDI I/O (SMPTE 259)	1 BNC plus loop-through 1 BNC plus loop-through	2 BNC 2 BNC
SHDL Module: Dual-Link HD SDI I/O (SMPTE 292) Dual-Link SD SDI I/O (SMPTE 259)	2 BNC plus loop-through 2 BNC plus loop-through	2x2 BNC 2x2 BNC
Reference Input Analog Genlock Input	1 BNC	
Audio Embedded Audio, 4 Dig. Stereo Channels AES/EBU, 4 Digital Stereo Channels	via Video Input 4 XLR (or 4 BNC)	via Video Output 4 XLR (or 4 BNC)
Timecode Longitudinal	1 XLR female	1XLR male
Data and Control Interfaces Serial RS-422 GPI	1 DB-9 2 TTL	1 DB-9 3 TTL
PCI PCI Standard Board Size PCI Bus Requirements Electrical Types	According to Rev. 2.1 Full-length, single-slot 32/64 bit, 33/66 MHz 3.3 or 5 V (universal)	
Internal Processing Color space conversion, LUT, dual-port frame buffer, frame repetition		
Software for HDStationOEM SDK (software development kit) incl. driver		
* Mounted on the HDStationBoard back panel. All other connectors are on additional slot-panels, break-out cables, or an optional break-out box.		

Configuration

HDStationOEM

Single-slot 64-bit PCI-bus board for uncompressed HD video and audio including:
HD digital serial I/O (SDTV and dual-link SDI optional); analog genlock input; four RS-422 interfaces; analog and digital outputs with selectable text overlay; driver for Windows NT®, Windows® 2000, Linux®, and Solaris™.

Additionally SDK including C-API, source code examples, development tools for setup, configuration, control, and diagnostics.

I/O Modules

The HDStationOEM is delivered with an I/O module mounted directly to the HDStationBoard. The following I/O modules are available:

HR Module

Single-Link HDTV SDI

◆ YCbCr/4:2:2

SHDL Module

Dual-Link HDTV & SDTV SDI

◆ YCbCr/4:2:2

SH Module

Single-Link HDTV & SDTV SDI

◆ YCbCr/4:2:2

◆ YCbCrA/4:2:2:4

◆ RGB/4:4:4

◆ RGBA/4:4:4:4

Supported HDTV Standard Rasters

1035i 59.94/60 (SMPTE 240/260)

1080i 50/59.94/60 (SMPTE 274)

1080p 23.98/24 (SMPTE 274)

1080p 29.97/30 (SMPTE 274)

1080sF 23.98/24 (SMPTE 274)

1080sF 29.97/30 (SMPTE 274)

1080i 50 (SMPTE 295)

720p 59.94/60 (SMPTE 296)

Other rasters such as XGA or 2k film resolution are also available. Additional rasters can be implemented upon request.



HDStationBoard with SHDL module.

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