COMPUTING

SharpCaster™ PCIE-8205

Broadcast Video Accelerator

Preliminary Data Sheet

All-in-one solution enables broadcast-quality video applications in standard servers

- Complete software and hardware encode and transcode solution for broadcast applications, including:
  - Main and multi-screen distribution
  - DSNG and live event contribution encoders with 10-bit 4:2:2 support
  - Ingest & play-out servers
- Up to 8 main-screen or 16 multi-screen ABR (Adaptive Bit Rate) HD transcodes per card
- Up to 4 main-screen or 16 multi-screen ABR HD encodes per card
- Ready to license for Multi-channel Dolby Digital Pro, AAC-LC, HE-AAC and MPEG-1 Layer II audio support
- Full-height, half-length PCI Express form factor compatible with 1RU and 2RU servers
- Support for High Video Quality Features:
  - Motion Estimation
  - Real-life Video Coding
  - IDR, PTS and GoP aligned ABR support
  - Interlaced to progressive conversion
- MPEG-2 and H.264 encoding and transcoding

The Artesyn SharpCaster PCIE-8205 broadcast video accelerator delivers the highest-density solution with no compromise in video quality for the most demanding broadcast application requirements. It is designed to meet the needs of MSOs (multi Service Operators) who must deploy new video services and subscriber features over their networks, with the right level of scalability and high video quality.

Compared to software-only solutions, the SharpCaster PCIE-8205 accelerator delivers scalability in terms of higher video quality versus channel density, less power and less server footprint. By using a standard off-the-shelf PCI Express form factor, the SharpCaster PCIE-8205 accelerator is easily deployable in off the shelf platforms, which can advance broadcast application development.

Through its use of the Magnum D7 Pro broadcast SoC technology, the SharpCaster PCIE-8205 accelerator delivers industry leading video quality and channel densities with software application stacks specifically designed to meet the most challenging requirements for each application in the contribution, production and distribution broadcast market segments.

Full support for the Magnum software application stacks and ProAPI, combined with support for SDI/ASI inputs and transport stream access across the PCIe interface allows broadcast OEMs to focus on delivering innovative software features in a standard server platform without compromising video quality, density and power.

ARTESYN™
EMBEDDED TECHNOLOGIES

High-quality Video Broadcast Functions

ALL-IN-ONE SOLUTION:

- Enables broadcast-quality video applications in standard servers
- Complete software and hardware encode and transcode solution for broad cast applications:
  - Main and multi-screen distribution
  - DSNG and live event contribution encoders with 10-bit 4:2:2 support
  - Ingest & play-out servers

TRANSCODING SUPPORT:

- Up to 8 main-screen or 16 multi-screen ABR (Adaptive Bit Rate) HD transcodes per card
- Up to 4 main-screen or 16 multi-screen ABR HD encodes per card
- Any to any transcoding – MPEG-2 and H.264

ENCODING SUPPORT:

- Up to 4 HD/SD 10-bit 4:2:2 encodes per card
- MPEG-2 and H.264 encoding

BROADCAST VIDEO FEATURES

- Hierarchical motion estimation with large search ranges
- All available mode decisions
- Up to 80 Mbps CABAC
- Real-life Video Coding Features:
  - Fade detection
  - Flash detection
  - Skin tone detection
  - Noise filtering
  - Pre-deblocking
- IDR, PTS and GoP aligned ABR support
- Interlaced to progressive conversion
- SD to HD up-scaling and HD to SD downscaling
- Aspect ratio conversion
- Logo insertion and graphics overlay with animation and fade-in/out support
- Statistical multiplexing support
- MPEG-2 transport stream support over PCIe

AUDIO SUPPORT:

- Multi-channel Dolby Digital Pro (end-user license required)
- AAC-LC
- HE-AAC
- MPEG-1 Layer II audio support

Representative Performance

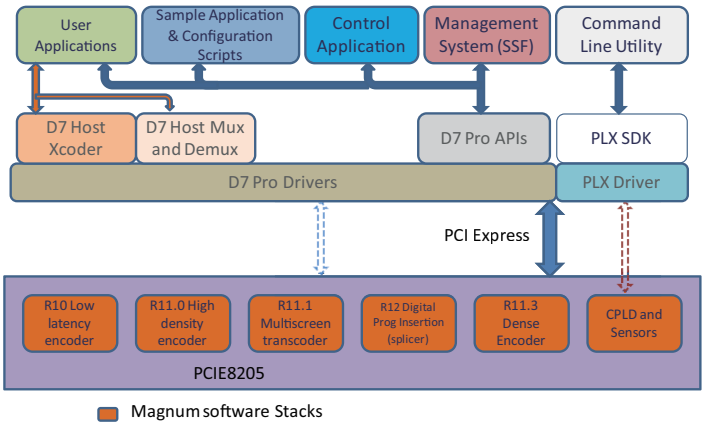
Example Video Processing Application	Software Stack	1 x SharpCaster™	1 x SharpCaster™	2 x SharpCaster™	4 x SharpCaster™
# of D7 Pros		2	4	8	16
480I30 H.264 to 480I30 MPEG2	R11.0	16 ch input -> 16 ch output	32 ch input -> 32 ch output	64 ch input -> 64 ch output	128 ch input -> 128 ch output
1080I30 MPEG2 to 1080I30 H.264	R11.0	4 ch input -> 4 ch output	8 ch input -> 8 ch output	16 ch input -> 16 ch output	32 ch input -> 32 ch output
HD MPEG2 to 720P30 H.264	R11.1	4 ch input -> 8 ch output	8 ch input -> 16 ch output	16 ch input -> 32 ch output	32 ch input -> 64 ch output
HD/SD H.264 to 480I30 H.264	R11.1	4 ch input -> 16 ch output	8 ch input -> 32 ch output	16 ch input -> 64 ch outputt	32 ch input -> 128 ch output

* Table to be used as reference point. Please refer to SharpCaster user manual for specific I/O configurations and output densities or consult your local Artesyn Field Application Engineer (FAE).

Example Board Configurations

Part Number	# of D7 Pros	ASI or SDI Inputs	Input Coding	HD Support	MP2	AVC (H.264)	Output Audio Codec	Audio Channels
High Density Transcoders								
R11.0	2	0	8b420	Yes	Input/Output	NA	MP1L2/AAC	Up to 5.1
R11.0	2	2	8b420	Yes	NA	Input/Output	DOLBY	Up to 16
R11.0	4	0	8b420	Yes	Input/Output	NA	DOLBY	Up to 5.1
R11.0	4	4	8b420	Yes	Input/Output	Input/Output	MP1L2/AAC/DOLBY	Up to 16
ABR/Multiscreen Transcoders								
R11.1	2	0	8b420	No	Input	Input/Output	MP1L2/AAC	Up to 5.1
R11.1	2	2	8b420	Yes	Input	Input/Output	DOLBY	Up to 16
R11.1	4	0	8b420	No	Input	Input/Output	DOLBY	Up to 5.1
R11.1	4	4	8b420	Yes	Input	Input/Output	MP1L2/AAC/DOLBY	Up to 16
High Density Encoders								
R11.3	2	2	8b422/10b422	No	Output	NA	MP1L2/AAC	Up to 5.1
R11.3	2	2	8b422/10b422	Yes	NA	Output	DOLBY	Up to 16
R11.3	4	4	8b422/10b422	No	Output	NA	DOLBY	Up to 5.1
R11.3	4	4	8b422/10b422	Yes	Output	Output	MP1L2, AAC, DOLBY	Up to 16

SharpCaster PCIE-8205 Software Diagram



Software Overview

The SharpCaster™ PCIE-8205 available software modules provide either direct or indirect access to the Magnum D7Pro ProAPIs for the various available Magnum application stacks. Direct access facilitates easy porting of existing customer applications already accessing the Magnum ProAPI. Indirect access allows customers to take advantage of Artesyn's front panel control and I/O stream configurator. At one level higher the Artesyn Network Management System (NMS) module provides customers with configuration and management of SharpCaster PCIE-8205 based server platforms over a LAN or WAN.

THE SOFTWARE PACKAGE INCLUDES MODULES BELOW:

Management System: The Artesyn' System Services Framework (SSF) is responsible for configuration and monitoring of one or more server systems with one or more SharpCaster PCIE-8205 over a LAN or WAN and essentially acts as a management system. It includes a comprehensive GUI and CLI (Command Line Interface) for configuring card OS drivers, alarm management, system hierarchy tree display, event reporting and statistical data preview.

Control Application: The Artesyn Control application's primary function is to setup and monitor media streams on a single server with one or more SharpCaster PCIE-8205. User added C code will communicate with this application for proper system setup. The control application configures and controls the Magnum D7Pro devices via the Magnum ProAPI library and sets up the proper data paths for each Magnum D7Pro device through a stream configurator. Its Hardware Diagnostics Module interfaces with the hardware diagnostics API for alarm set up and monitoring, overall system health and bandwidth monitoring, as well as the collection and presentation of system operational statistics.

Magnum ProAPI Library: The Magnum ProAPI Library provides access to the APIs for the various Magnum D7Pro application software modules. A hardware diagnostics API is also included that manages access to a stacks, such as the R10 low latency 10-bit 4:2:2 encoder stack, the R11.0 dense transcoder stack, the R11.1 multi-screen ABR transcoder stack, the R11.3 dense encoder stack, etc. Artesyn's initial release of the SharpCaster PCIE-8205 software will support the R11.0, R11.1 and R11.3 application stacks. Support for other available application stacks from Magnum will be added in future releases of the SharpCaster PCIE-8205 software.

Operating System Driver Support

- Microsoft: Windows 7 64-bit
- Linux: Fedora Core, Ubuntu 12 and Centos 6.x

Overview

MAIN CHIPSET

- 2 Magnum D7Pro (Option 1)
- 4 Magnum D7Pro (Option 2)

SWITCH INTERCONNECT

- PCI express Gen 3.0 Non-Blocking Switch
  - PCI Express Base Specification rev 3.0
  - PLX PEX8713

HOST INTERFACES

- PCI Express x 4 Gen 3.0

EXTERNAL INTERFACES

- Optional input:
  - DIN connectors: 4 SDI/ASI Receivers
  - SDI: 3G/HD/SD (SMPTE 424M/292M/259M)
  - Routing : (1) SDI/ASI input per D7Pro
- 12 V DC Auxiliary Power: (Optional)
  - 6 pin Molex Connector

POWER REQUIREMENTS***

- Estimated Peak Electrical Power: 54 W (Option 2)
- Estimated TDP: 36 W (Option 1); 62 W (Option 2)

THERMAL CHARACTERISTICS***

- Typical operating range: 5 °C to 20 °C
- Airflow requirements: 400 LFM

RELEVANT CARD SIZE

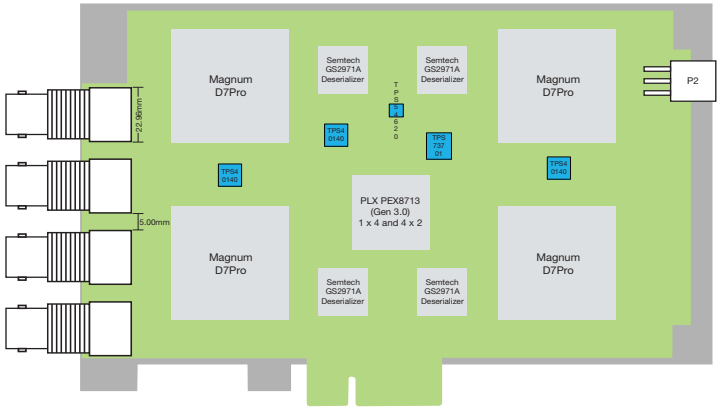
- Full Height Half Length H x L:
  106.7 mm x 167.7 mm
- Single width

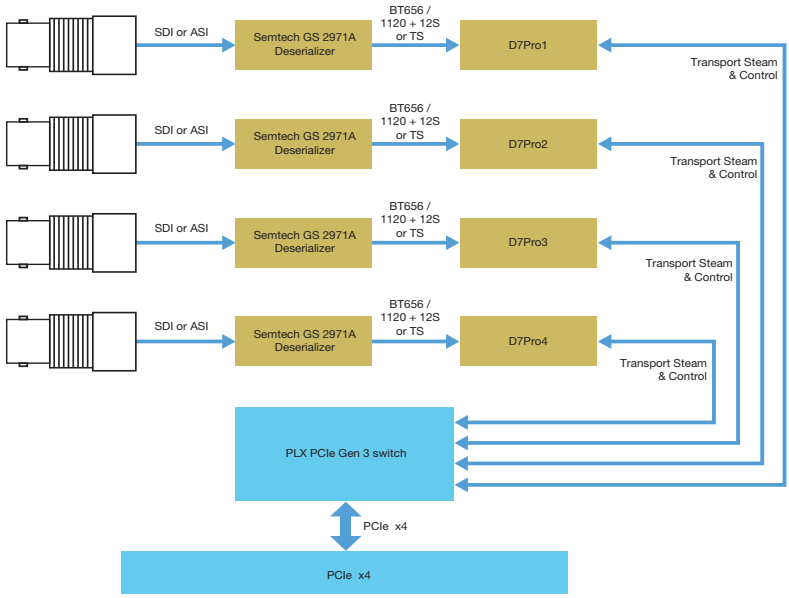
RELEVANT STANDARDS

- PCI-SIG PCI Express Base Specification rev. 2.0

****Please note these values are subject to change.*

SharpCaster PCIE-8205 Block Diagram





SOLUTION SERVICES

Artesyn Embedded Technologies provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24 x 7 technical support. Renewal services enable product longevity and technology refresh.

WORLDWIDE OFFICES

Tempe, AZ U.S.A.	+1 888 412 7832	**Shanghai, China**	+86 21 3395 0289
Munich, Germany	+49 89 9608 2552	**Tokyo, Japan**	+81 3 5403 2730
Hong Kong	+852 2176 3540	**Seoul, Korea**	+82 2 3483 1500

ARTESYN™
EMBEDDED TECHNOLOGIES

www.artesyn.com