neonCaster Gen I

Ittiam’s neonCaster Gen I Hardware Platform is a configurable and scalable platform for high performance, high density streaming and recording applications. With support for multi-channel HD encoding, transcoding, and dense audio transcoding, this platform can realize a range of applications in the industrial, defense and broadcast markets.

neonCaster employs an architecture combining the advantages of video accelerators present in Texas Instrument’s DM816x Processor with the flexibility of Texas Instrument’s multicore programmable C667x DSP (Shannon). The platform is provisioned with a rich set of interfaces and can operate as a full length PCIe card or in a 1 RU rack unit. The platform also incorporates an FPGA to integrate the interfaces with the processors on board, with spare capacity to run other processing algorithms. A powerful 1.2 GHz ARM Cortex™-A8 serves as the application processor running a high performance media framework, with enough headroom for additional middleware and applications.

The neonCaster platform is offered as a ready-to-manufacture design, along with Board Support Package (BSP), Codecs, Media Framework and middleware integrated as Media SDKs for various use cases.

HIGHLIGHTS

- **High performance** product in neonCaster family of hardware platforms
- PCIe form factor
- Suitable for **Broadcast, Industrial, Surveillance, Medical and Defense** applications
- Hardware platform with System Software and Media SDKs
  - Server, Player / Client, Recorder, Transcoder, Multi-viewer
  - Multi-channel H.264 **Full-HD** (1080p60) 4:2:0 Encode, Decode, Transcode
  - H.264 **4:2:2 10-bit Encode**

System Software

Ittiam delivers system software on neonCaster Gen I in the form of Media SDKs to enable single or multi-channel server, player / client, recorder, transcoder and mixer / switcher use cases. Media SDK realizes **end-to-end media flow** and integrates the Software IPs such as codecs and media protocol stacks for streaming / recording in the form of configurable pipelines. In addition, the SDK includes application modules that enable features like configuration management, device management and filed firmware upgrade.

The SDK framework utilizes an efficient scheduler to maximize efficiency of operation across multiple cores and co-processors. The System Software solutions are licensed in SDK form with well defined APIs which can be used by OEMs to build end-applications and user-interfaces. Sample applications and user-friendly documentation further accelerate integration process. The System Software SDKs are available in Standard **Pre-built configurations** and can be migrated to OEM custom hardware.

High Quality Video Encoding and Processing

Ittiam’s broadcast grade codecs employ advanced algorithms for motion estimation and rate control to ensure high quality video encoding. Efficient implementations and targeted optimizations on Texas Instruments’ SoCs enable high densities while maintaining video quality. Ittiam’s video codecs integrate Scene Change Detection, Look Ahead Processing, Intelligent Transcoding using upstream decoder features, Sub-GOP adaptation, Force I-GOP and other features to provide premium quality for both encoding and transcoding use cases. Also available are pre and post processing algorithms for Motion Adaptive/Compensated Temporal Filtering, Denoising, Deinterlacing and Scaling to deliver an enhanced viewing experience.
Integration & Solutions

Tablets, wide

Broadcast, 32+Channels

Edge Connector

Ittiam

units

Consumer

is

Broadcast,

100+Channels

of

components,

60/59.94/50/29.97/30/25/24/23.96

range

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solutions

SD Video Inputs

720/704/640/544/528/352x480

Ittiam

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Audio Inputs

Motion Adaptive/Compensated Spatio-Temporal filter (MATF/MCTF) based Denoiser

Motion adaptive Deinterlacer

Transcoding, Transrating, Telecine detection, Logo insertion

Video Encode Resolutions

MP2G 4:2:0 up to HD: MP@HL

MP2G 4:2:2 up to HD: MP@HL

H.264 4:2:0 up to HD: HP@L4.3

H.264 4:2:2 10 bit up to HP@L4.3

Audio

MPEG1 Layer 2

AAC-LC/HE-V1/V2

Dolby AC3

Dolby DD+/EAC3

Sample rate converter

Downmixer

Audio loudness measurement and control (CALM/EBU)

Audio Encode/Transcode Densities

MP12 ➔ HE-AACv2 (stereo) 100+Channels

HE-AACv2 ➔ MP12 (stereo) 180+Channels

Dolby (AC3 5.1) ➔ HE-AACv1 32+Channels

Video Encode Resolutions

1920x1080p 60/59.94/50/29.97/30/24/23.96 fps

1920x1080i 30/29.97/25 fps

720p 1280x720@50/60 fps

NTSC 720/704/640/544/528/352x480

PAL 720/704/640/544/528/352x576

Mobile CIF, QVGA, SIF, QCIF

Motion Adaptive/Compensated Spatio-Temporal filter (MATF/MCTF) based Denoiser

Motion adaptive Deinterlacer

Transcoding, Transrating, Telecine detection, Logo insertion

Video Encode Densities

H.264 2x1080p60 / 3x1080i60 / 16x480i/576i

MPEG2 3x1080i60 / 16x480i/576i

MPEG2 422 1x1080p60

H.264 422 10 bit 1x1080i60

Video Transcode Densities

MPEG2 ➔ H.264 3x1080p60 / 8xSD

H.264 ➔ MPEG2 2x1080p60 / 8xSD

MPEG2 ↔ H.264 2x1080i60 → [1080i60 + 720p+480i]