

# ST2110, ST2059, NMOS IP cores

Professional Media Over Managed IP

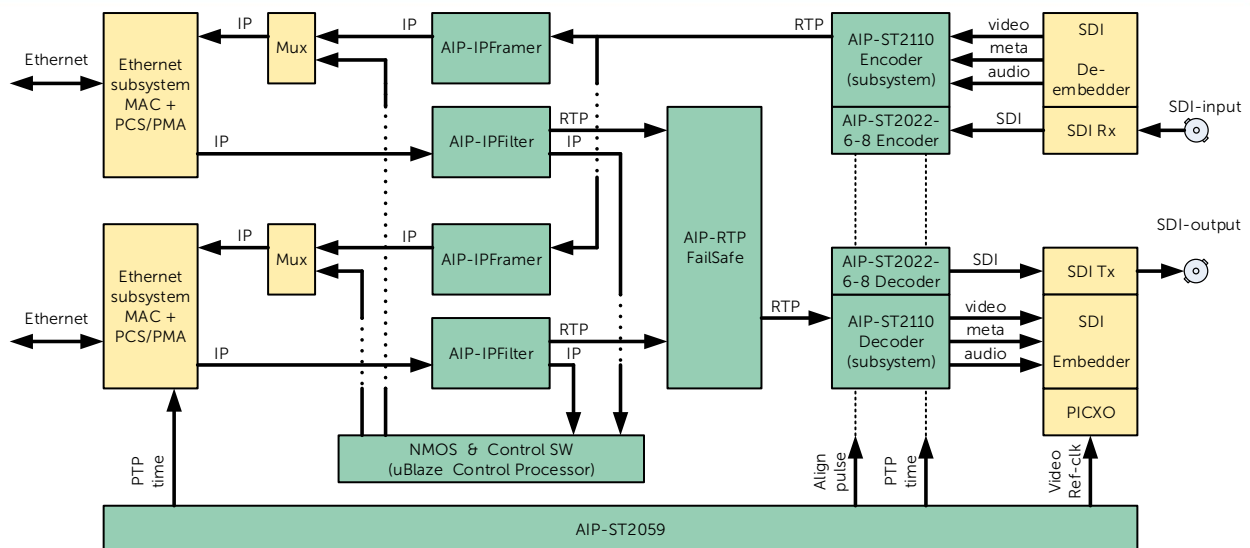


Figure 1: Available reference design

Nextera video and Adeas have teamed up to provide a complete solution for standards based Video over IP. Our fully modular solution consists of FPGA cores, control software, and an end-to-end reference design enabling turn-key development and fast time to market.

## Available IP cores

- SMPTE-ST2110 Encoder / Decoder  
-10, -20, -21, -22, -30, -31, -40
- SMPTE-ST2059 Time Synchronisation  
-1, -2
- SMPTE-ST2022-6 / ST2022-8
- IP Framer and Filter
- RTP Failsafe (ST2022-7)
- NMOS Control Software  
IS-04, IS-05, IS-08, IS-09

## Applications

- SDI-IP gateways
- PCI-e adapters
- Cameras
- Displays
- Media Servers
- Standards converters

## RTL & Software

- RTL and SW drivers, daemons included
- Modular & Configurable
- Reference design available

## Video

Format and Frame Rate Independent

- RGB, YCrCb, Key
- 4:4:4, 4:2:2, 4:2:0
- 8, 10, 12, 16 bits per component
- Uncompressed & Compressed
- HD, 3G, 4K, 8K

## Audio

- Sample Rate Independent
- Programmable packet time
- PCM: L16, L20, L24, AES3

## Network speeds

Network speed independent

- 1 Gb/s, 10Gb/s, 25Gb/s, 100Gb/s

## Interoperability

- Successfully tested at numerous official interops and test events (JT-NM Tested)

# ST2110, ST2059, NMOS IP cores

## Professional Media Over Managed IP

### NMOS CONTROL SOFTWARE

The NMOS Software Core enables SMPTE ST2110 based products to interoperate on a multi-vendor IP network.

Developed by the Advanced Media Workflow Association (AMWA) and specified by the Joint Taskforce on Networked Media (JT-NM). Enables devices to be truly ST 2110 compliant.

- IS-04: Discovery and Registration
- IS-05: Connection Management
- IS-08: Audio Channel mapping
- IS-09: System Parameter Specification

Delivered as a standalone Linux Daemon.

### HARDWARE RTL CORES

The following IP cores are designed in RTL and are controllable by SW drivers and daemons which are all included.

#### **SMPTE-ST2110 Codec**

The ST2110 IP core provides broadcast and professional AV equipment the ability to send and/or receive professional media over IP networks. The core supports the following sub standards:

- ST2110-10: System timing
- ST2110-20: Uncompressed active video
- ST2110-21: Traffic shaping
- ST2110-22: Compressed video
- ST2110-30: PCM digital audio
- ST2110-31: AES3 transparent transport
- ST2110-40: Ancillary data

The modularity and configurability allow an efficient implementation, using only the necessary RTL logic to minimize resources. Supports gateway and synthetic essence operation.

#### **SMPTE-ST2022-6 / -8 Codec**

The ST2022-6-8 IP core provides ST2022-6 (the transport of SDI signals over IP Networks) in a SMPTE ST2110-10 (timing) environment.

It is designed to work seamlessly together with the ST2110 and ST2059 IP cores.

### **SMPTE ST2059 Time Synchronisation**

The ST2059 IP core provides broadcast and professional AV equipment the ability to support the generation of deterministic timing signals for video and audio systems.

The core supports timing and synchronization per:

- ST 2059-1: Alignment of Signals to Epoch
- ST 2059-2: Profile for IEEE1588 PTP

Configurable to output multiple programmable reference clock and sync signals, supports the generation of HH:MM:SS:FF Time Code including drop frame, and is network speed independent.

### **RTP Fail-Safe (ST2022-7)**

The IP core provides broadcast and professional AV equipment seamless protection switching (hitless failover) using 2 Ethernet ports. One RTP stream is reconstructed out of 2 input RTP streams. Able to cope with Ethernet jitter, latency differences between streams and re-ordered packets. The RTL core is fully configurable as needed.

### **IP Framer**

This IP core provides the formatting of RTP packets into UDP/IP packets. It assembles and adds UDP, IP and MAC headers, calculates and inserts checksums, and provides VLAN tag headers and specific MAC header commands. Features high performance IPv4 and IPv6 support for small and large packets.

### **IP Filter**

This IP core filters incoming packets from an Ethernet MAC and distributes them to the appropriate channel. Programmable by SW control, it removes faulty packets and strips IP, VLAN and/or UDP headers from media channels.