



# Neuron

## CONVERT

**IP gateway, bridge, synchronizer and format converter for IP, SDI and hybrid baseband video and audio**

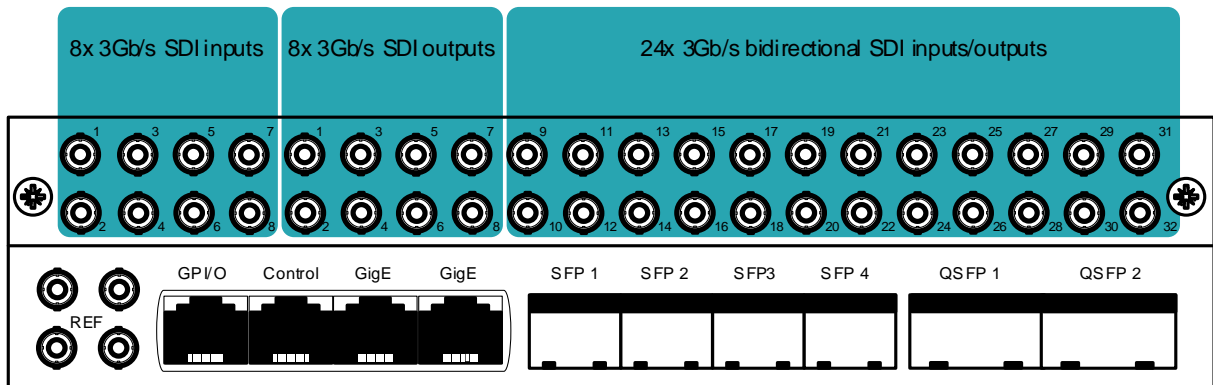


Due to constant product research and development, all specifications are subject to change without notice. EVS does not warrant or assume any legal liability or responsibility for the accuracy, completeness, availability and/or delivery of the products and/or services listed in this datasheet. Copyright © 2022 EVS

# Block schematics of configurations



## I/O Panel



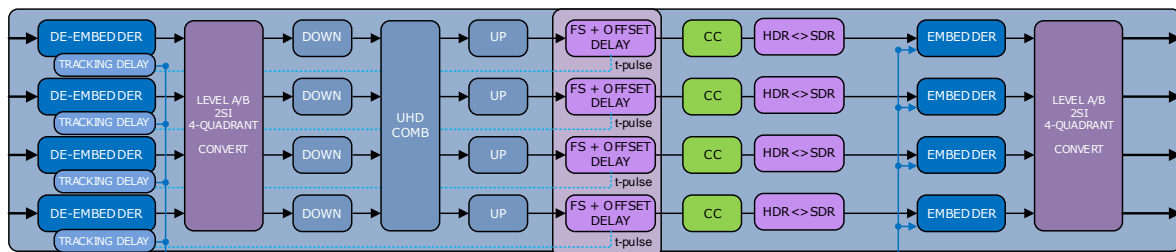
## I/O of configurations

	SDI Inputs <sup>1</sup>	IP Inputs <sup>1</sup>	SDI Outputs <sup>1</sup>	IP outputs <sup>1</sup>
CPG1616-2Q6/2Q7	16	32 <sup>2</sup>	16	32 <sup>2</sup>
CPI2424-2Q6/2Q7	0	48 <sup>2</sup>	0	48 <sup>2</sup>
CPS2020	20	0	20	0

<sup>1</sup>) amount of FHD (1080p50/59.94) channels

<sup>2</sup>) Redundant streams

## Processing paths



The CONVERT has up to 8 of these UHD processing paths, depending on the configuration, which include audio de-embedding, framesync, up/down/cross conversion, UHD remapping, HDR<-> conversion, Proc Amp, embedding and audio gain/phase/delay functionality.

## Features

The CONVERT is a multi-channel A/V-over-IP transceiver developed for use within low-latency and high-bandwidth Ethernet IP networks. Using the ST2110 and ST2022 encapsulation methods, the CONVERT is capable of processing up to 32x 3Gb/s Full HD signals, or up to 8 UHD signals, and transport them over redundant Ethernet links or SDI I/O (optional).

The CONVERT can be utilized in many ways. Each video channel is capable of frame-synchronizing, up/down/cross conversion, color correcting, UHD remapping, embedding, de-embedding, audio gain and phase and optionally dynamic (B-COM) or LUT-based HDR conversion. Grouping four signal paths will offer UHD handling. Virtually any signal can be processed, from SD to UHD signals.

Optionally, the CONVERT can be enhanced with an SDI I/O module. This will add physical connectors and allows easy integration of video over IP networking with existing SDI baseband operations acting as bridge or gateway.

- Standards supported: UHD-SDI (12G single wire or four-wire in 4 Quadrants or 2SI), 3G-SDI level A, HD-SDI, ST2022-6/7 and ST2110-20/30/40.
- Up to 24 IP video listeners, 24 IP audio listeners and 24 IP ancillary data listeners
- Up to 16 channels of bridging SDI to/from Ethernet (requires SDI optional board)
- Up to 32 channel frame-sync to local clock on external ref (B&B or ST2059)
- Up to 32 channels of up/down/cross conversion (UHD requires 4 channels)
- Up to 8 channels UHD remapping (SQD from/to 2SI, 4 wire from/to 1 wire)
- Up to 16 times 16 channel audio de-embedding
- Up to 16 times 16 channel audio embedding
- Up to 24 times Proc-amp for RGB, YCrCb and RGB-Black gains and black and white clip
- 512 channels audio gain/phase and offset delay
- Mono channel audio matrix (256ch de-embedded audio, 256ch ST2110-30 I/O and MADI IO)
- Up to 4x64 channels MADI IO
- Clean switch and fast switch capabilities between all inputs (IP and/or SDI)
- Clean switch between incoming SDI and IP signals
- Each SDI or IP input can be used as a back-up signal for an SDI or IP output
- Redundant IP signals in and out (double stream or ST2022-7)
- Transparency of VANC data to ST2110-40 in SDI capable configurations
- PTP Network timing with slave functionality on the Ethernet ports, compliant with SMPTE ST2059-2 External black burst inputs
- Audio synchronization
- HDR<->SDR conversion, Dynamic or LUT based
- 2x Analog bi-level reference out
- Multicast and unicast selectable per streams
- Selectable VLAN and priority per stream
- Compatible protocols: ACPv2, DNS, IGMPv2, IGMPv3, LLDP, HDCP, SDP, NMOS IS04, NMOS IS-05, 802.1as, ST2059-1/2, ST2022-6/7, ST2110-20/30/40

## Applications

- Universal SDI to Ethernet bridge in Ethernet networks (with optional SDI I/O board)
- Point to point (back-to-back) applications for direct replacement of CWDM systems (with optional SDI I/O board)
- SDI router replacement; Router unit for distributed routing over an IP network with clean switching
- Outputs at shader position. Ultra-fast clean switching.
- Enabling local or remote productions over private or commercial networks
- Network attached processor
- All 4k 4 wire challenges
- Video frame synchronization
- Video Auto phasing
- Audio embedding and de-embedding
- 4 wire synchronization and alignment
- Up, down and cross conversion
- HDR conversion

## Ordering information

### Hardware options:

- **NBASE-BOARD:** Neuron base processing board
- **NSDI40-BOARD:** Neuron SDI IO board, with 8x 12G in, 8x 12G out and 24 bidirectional IO on HD BNC

### Software options:

#### Base configuration SDI (please select ONE of below line items, maximum of 2 per board)

**CPG1616-8** Convert Processing/gateway 8 channel (including embedding, de-embedding, FS) includes IP IO

#### Option to add SDI I/O

CON-SDI8824 SDI 32 channel - 8x UHD or 32x FHD - 8x 12G SDI in - 8x 12G SDI out and 24x FHD SDI bidirect, **requires NSDI40-BOARD**

#### Option to add up, down and cross conversion (please add ONE of below line items, maximum of 2)

CON-UDC8 up/down/cross conversion channels 1-8 (2x UHD)

#### Option to add adaptive HDR<->SDR and HDR<->HDR conversion (please add ONE of below line items, maximum of 2)

CON-AdaptHDR8 Adaptive HDR<->SDR HDR<->HDR conversion channels 1-8 (2x UHD)

#### Option to add proc-amp and RGB color correction (please add ONE of below line items, maximum of 2)

CON-PROC8 proc-amp and RGB color correction channels 1-8 (2x UHD)

#### Option to add audio shuffling, delay, gain and phase (please add ONE of below line items)

CON-APR512 Audio Processing option for 512 channels Gain/phase/delay

#### Option to add MADI I/O on SFP+ cage - MSA SFP is not included (please add ONE of below line items, maximum of 4)

CON-MADI64 MADI I/O option bi-directional 64 channel, MSA SFP is not included

#### Base configuration SDI (please select ONE of below line items, maximum of 4 per board)

**CPS2020-8** Convert SDI only 8 channel (2x UHD or 8x FHD) embedding, de-embedding, FS (2x 12G SDI in, 2x 12G SDI out and 6x FHD SDI bidirect), **requires NSDI40-BOARD**

#### Option to add up, down and cross conversion (please add ONE of below line items, maximum of 4)

CON-UDC8 up/down/cross conversion channels 1-8 (2x UHD) **requires minimal CPS2020-8**

#### Option to add adaptive HDR<->SDR and HDR<->HDR conversion (please add ONE of below line items, maximum of 4)

CON-AdaptHDR8 Adaptive HDR<->SDR HDR<->HDR conversion channels 1-8 (2x UHD) **requires minimal CPS2020-8**

#### Option to add proc-amp and RGB color correction (please add ONE of below line items, maximum of 4)

CON-PROC8 proc-amp and RGB color correction channels 1-8 (2x UHD) **requires minimal CPS2020-8**

#### Option to add audio shuffling, delay, gain and phase (please add ONE of below line items)

CON-APR512 Audio Processing option for 512 channels Gain/phase/delay

#### Option to add MADI I/O on SFP+ cage - MSA SFP is not included (please add ONE of below line items, maximum of 4)

CON-MADI64 MADI I/O option bi-directional 64 channel, MSA SFP is not included

#### Base configuration SDI (please select ONE of below line items, maximum of 3)

**CPI2424-8** Convert IP only 8 channel (2x UHD or 8x FHD) (FS) includes IP IO

#### Option to add up, down and cross conversion (please add ONE of below line items, maximum of 3)

CON-UDC8 up/down/cross conversion channels 1-8 (2x UHD) **requires minimal CPI2424-8**

#### Option to add adaptive HDR<->SDR and HDR<->HDR conversion (please add ONE of below line items, maximum of 3)

CON-LUTHDR8 Adaptive HDR<->SDR HDR<->HDR conversion channels 1-8 (2x UHD) **requires minimal CPI2424-8**

#### Option to add proc-amp and RGB color correction (please add ONE of below line items, maximum of 3)

CON-PROC8 proc-amp and RGB color correction channels 1-8 (2x UHD) **requires minimal CPI2424-8**

#### Option to add audio shuffling, delay, gain and phase (please add ONE of below line items)

CON-APR512 Audio Processing option for 512 channels Gain/phase/delay

#### Option to add MADI I/O on SFP+ cage - MSA SFP is not included (please add ONE of below line items, maximum of 4)

CON-MADI64 MADI I/O option bi-directional 64 channel, MSA SFP is not included

## Specifications

### Reference I/O

Connector Type	Micro BNC (HD BNC)
Number of inputs	1
Number of outputs	2, Loop input or analog reference out
Termination	75 Ohms when not looped
Bi-Level	PAL/NTSC Black Burst ITU624

### Gigabit Ethernet

Connector Type	RJ45
Number	1
Standards	10/100/1000 Base-T
Protocols streaming	AES67, ST2059
Protocol control	ACPv2
Cable	Shielded twisted pair

### QSFP Cages

Number of cages	2
Standards	QSFP28, 100GbE
Protocols	ST2022-6, ST2110, AES67, ST2059

### SFP Cages

Number of cages	4
Standards	MSA
Protocols	MADI

### Serial video inputs (optional)

Standard	SMPTE ST 2082, HD-SDI ST292, ST296 ST274, 3G-SDI ST424 (Level A) ST425-1
Number of Inputs	8
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Serial video outputs (optional)

Standard	SMPTE ST 2082, HD-SDI ST292/ST296/ST274, 3G-SDI ST424 (Level A)/ST425-1
Number of Inputs	8
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Serial video bi-directional connections (optional)

Standard	HD-SDI ST292/ST296/ST274 3G-SDI ST424 (Level A)/ST425-1
Number of Inputs	24
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Miscellaneous

Weight	Approx. 2050gr
Operating temp.	0°C to +40°C
Dimensions	400 x 193 x 42mm (LxWxD)

### Electrical

Voltage	+12V nominal (tolerance:-1V/+0.5V)
Power	100-120Watts