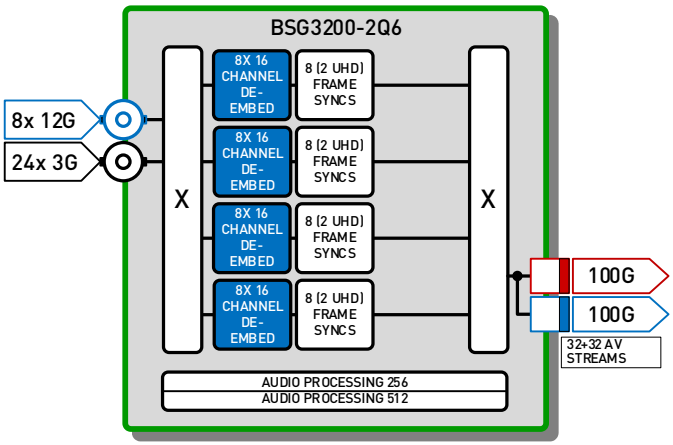
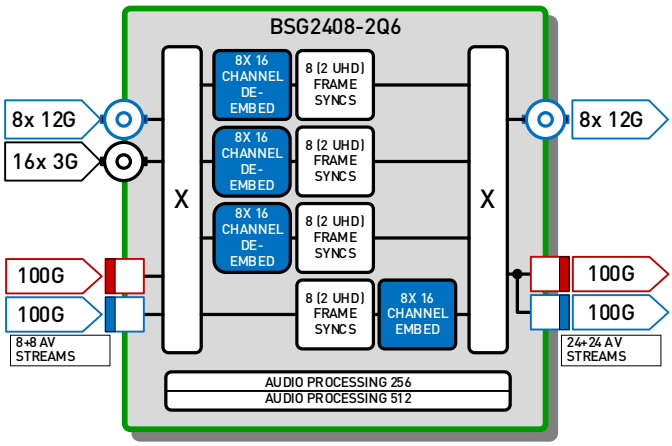
Neuron

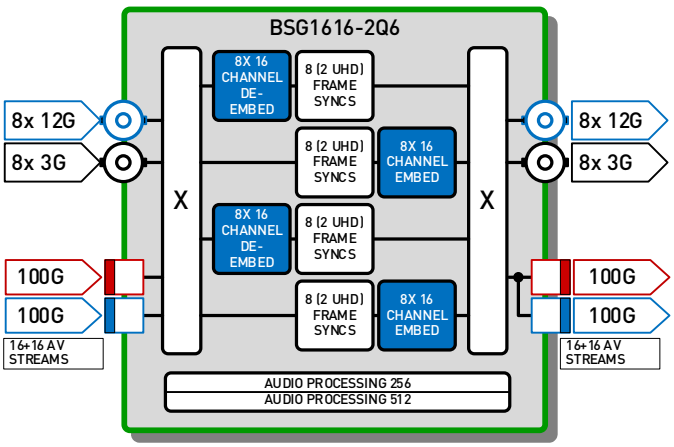
BRIDGE

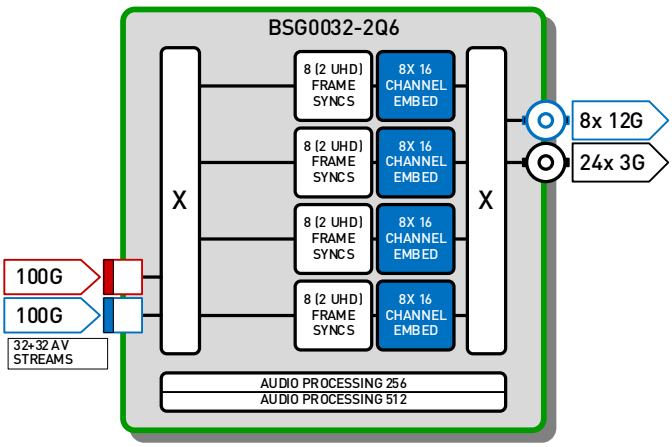
IP gateway, bridge and synchronizer for IP, SDI and hybrid baseband video and audio

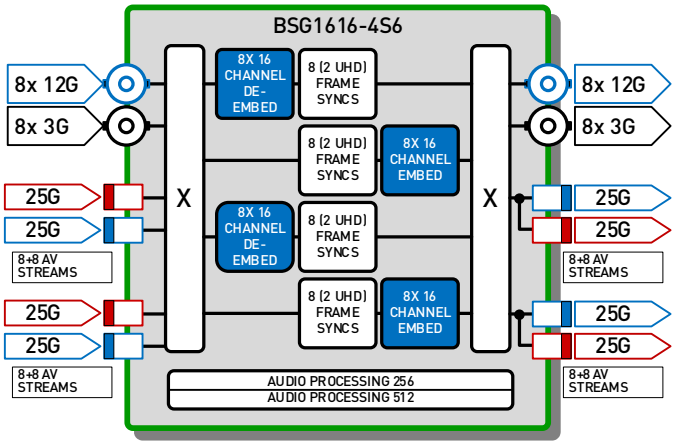
Block schematics of configurations

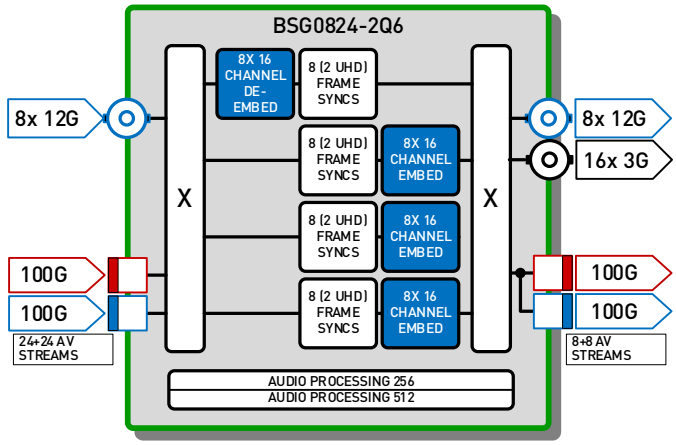




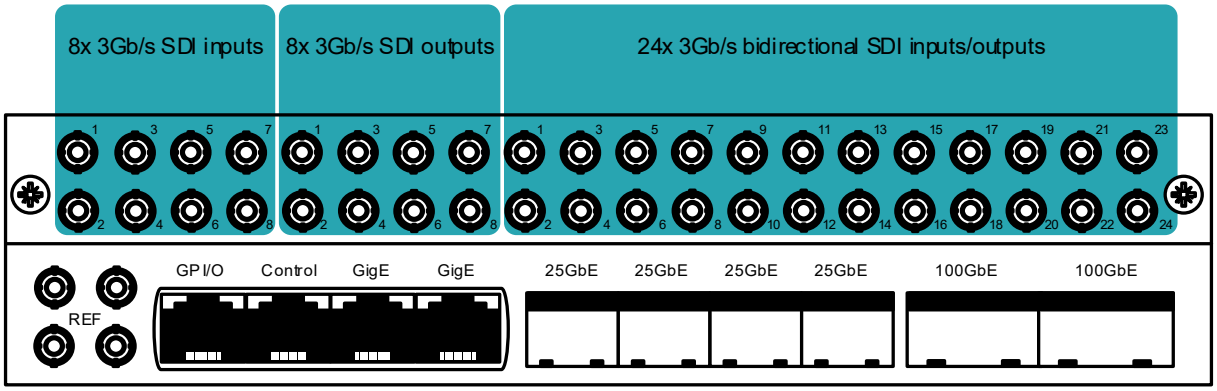








I/O Panel



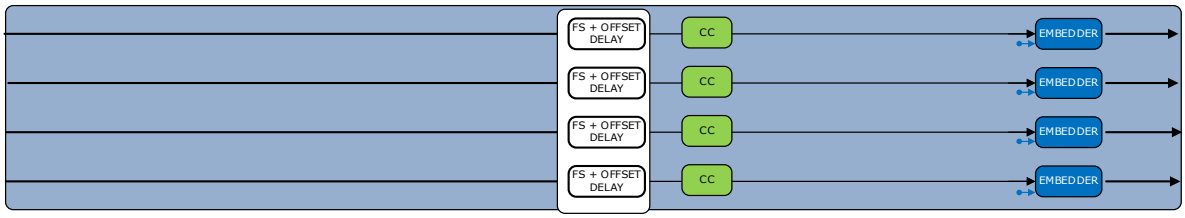
The BRIDGE offers 32 x 1080p processing paths in various configurations. Depending on the loaded configuration, some paths with include de-embedding and/or embedding. All paths include frame synchronization, audio gain/phase/delay processing, and color-correcting processing amplifiers.

I/O of configurations

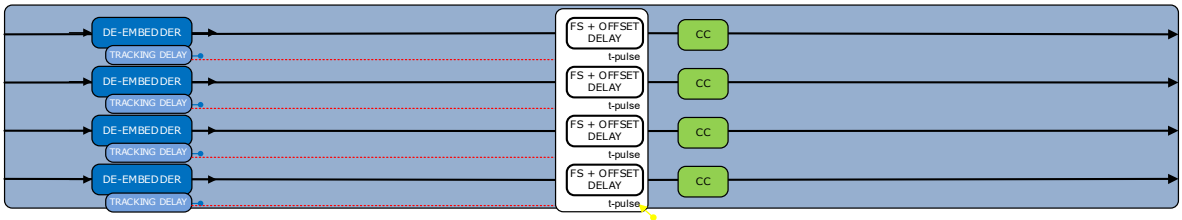
	SDI Inputs[1]	IP Inputs[1]	SDI Outputs[1]	IP outputs[1]
BSG3200-2Q6	32	0	0	64[2]
BSG2408-2Q6	24	16[2]	8	48[2]
BSG1616-2Q6	16	32[2]	16	32[2]
BSG0824-2Q6	8	48[2]	24	16[2]
BSG0032-2Q6	0	64[2]	32	0

[1]) amount of FHD (1080p50/59.94) channels
[2]) Redundant streams

Embedding paths



Deembedding paths



Features

The BRIDGE is a 32-channel media-over-IP transceiver developed for low-latency Live IP networking. Supporting all modern encapsulation standards like ST2022-6 and ST2110, the BRIDGE can process up to 32 x 1080p signals to and from SDI and IP via redundant 100GbE or 25GbE network interfaces, with configurations enabling bridging in either direction in groups of 8 x 1080p.

The BRIDGE can process up to 32 channels of video and multiple audio channels in half a rack unit. Two BRIDGEs can fit into a single 1RU Neuron chassis. Interworking of ST2022-6 to 2110-20/30 and back is also supported.

The BRIDGE is equipped with an SDI I/O module, which supports up to 40 x SDI I/O via HD-BNC connectors.

- Supports asynchronous SDI inputs
- Standards supported: UHD (single wire 2Si, 4 wire SQD/2Si), FHD Level-A, HD, SD SDI, ST2022-6 and ST2110-20 on 50Hz and 59.94Hz. (2160p, 1080p, 1080i and 720p)
- UHD remapping of single wire to four-wire SQD/2SI and vice versa
- UHD signals consume 4 x 1080p channels, so capacity for up to 8 x 2160p channels on 1 BRIDGE
- 32 frame-syncs to local clock or external ref (B&B or ST2059)
- 32 optional color correctors / processing amplifiers
- 32 channels of bridging SDI to/from Ethernet: uncompressed video transport using ST2022-6 or ST2110-20 encapsulation, selectable per individual stream
- Clean switching mode
- Fast switching mode
- Interworking of IP to IP (e.g., ST2110 to and from ST2022-6)
- Supports synchronous audio inputs
- Up to 32 times 16 channel de-embedding
- Up to 32 times 16 channel embedding
- Up to 512 x 512 audio channel shuffler
- Up to 512 channel audio gain (-99dBFs to +12dBFs in 0,25db steps)
- Up to 512 channel audio phase (0 or -180deg)
- Up to 512 channel audio offset delay (up to 1 second per channel in 1ms intervals)
- Up to 512 audio channels on a maximum of 32 ST2110-30/AES67 streams capability (in and/or out)
- Dual QSFP28 single 100Gb/s MAC interface or Quad SFP28 4x 25Gb/s MAC
- PTP Network timing with slave functionality on the Ethernet ports, compliant with SMPTE ST2059-2
- External black burst inputs
- 2x Analog bi-level reference out
- Multicast and unicast configurable per streams
- Automatic fan control
- Stream and Ethernet port redundancy
- Each SDI or IP input can be used as a back-up signal for an SDI or IP output
- A single SDI or IP input can be replicated to 2 IP outputs for creating identical stream (port replication, ST2022-7 compliant)
- Compatible protocols: ACPv2, DNS, IGMPv2, IGMPv3, LLDP, DHCP, SDP, NMOS IS04, NMOS IS04, 802.1as, ST2059-1/2, ST2022-6, ST2110-20/30/31

Applications

- Universal SDI to Ethernet bridge in Ethernet networks (with optional I/O expansion board)
- Gear box for UHD signals
- Point to point (back-to-back) applications for direct replacement of CWDM systems (with optional I/O expansion board)
- System 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
- Video frame synchronization
- Video Auto phasing
- Audio embedding and de-embedding

Ordering information

Hardware options:

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

Software options:

- **BRIDGE-8:** Bridge 8 channel (2x UHD) – All configurations can be used (requires reprogramming) including IP & SDI IO and audio processing. Requires SDI IO option board.
- **BRIDGE-16:** Bridge 16 channel (2x UHD) – All configurations can be used (requires reprogramming) including IP & SDI IO and audio processing. Requires SDI IO option board.
- **BRIDGE-24:** Bridge 24 channel (2x UHD) – All configurations can be used (requires reprogramming) including IP & SDI IO and audio processing. Requires SDI IO option board.
- **BRIDGE-32:** Bridge 32 channel (2x UHD) – All configurations can be used (requires reprogramming) including IP & SDI IO and audio processing. Requires SDI IO option board.

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	3
Standards	10/100/100 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	2
Standards	SFP28, 10/25GbE
Protocols	ST2022-6, ST2110, AES67, ST2059

Serial video inputs (optional)

Standard	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	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	100-200Watts