



# Neuron

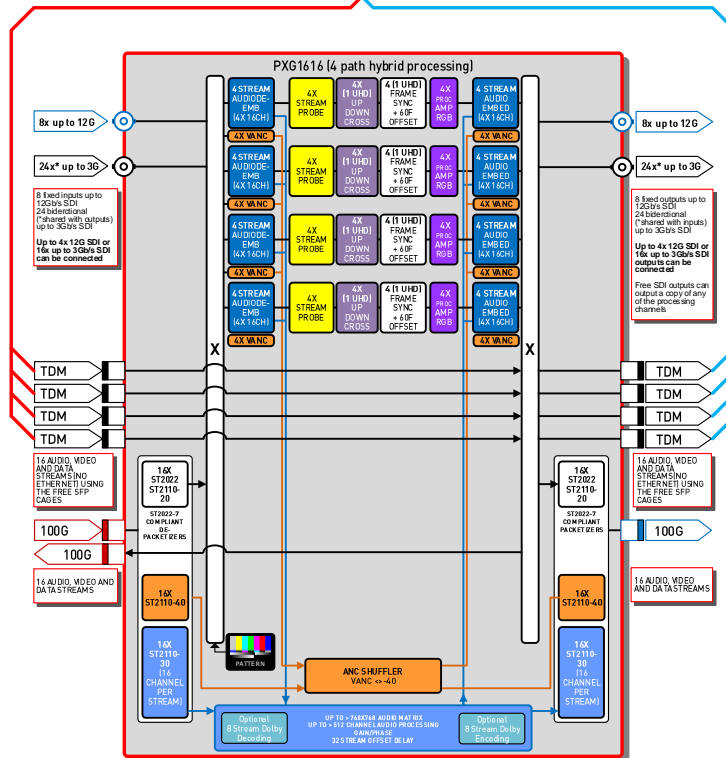
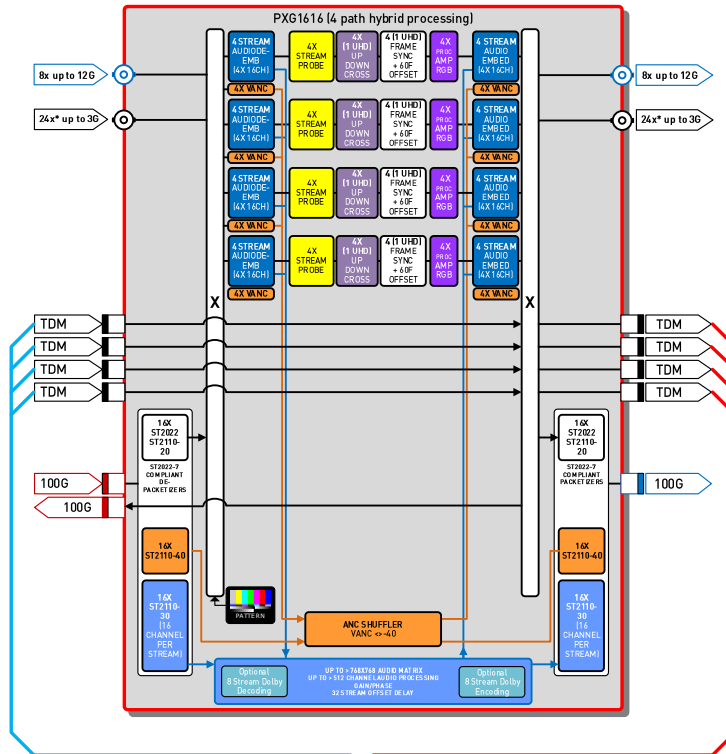
## PROTECT

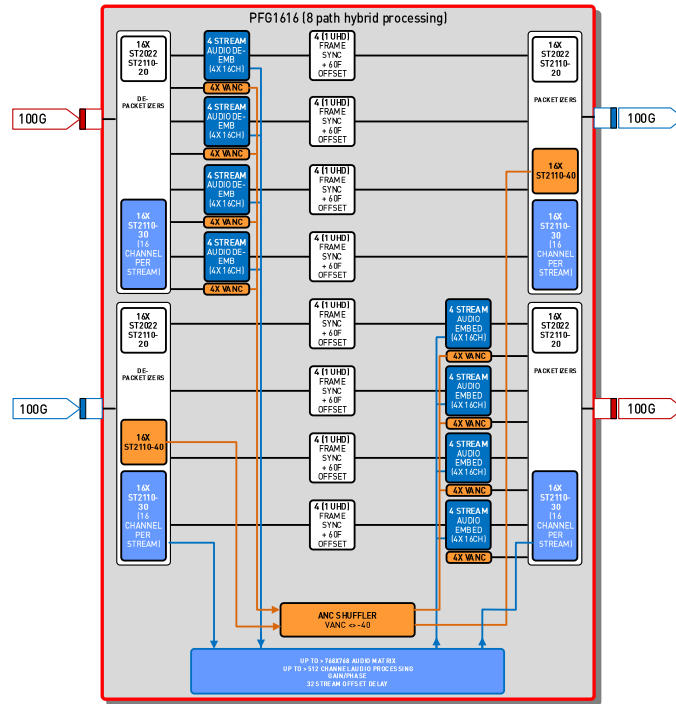
**IP media gateway, firewall, bridge, synchronizer and format converter with probing external backup switch**



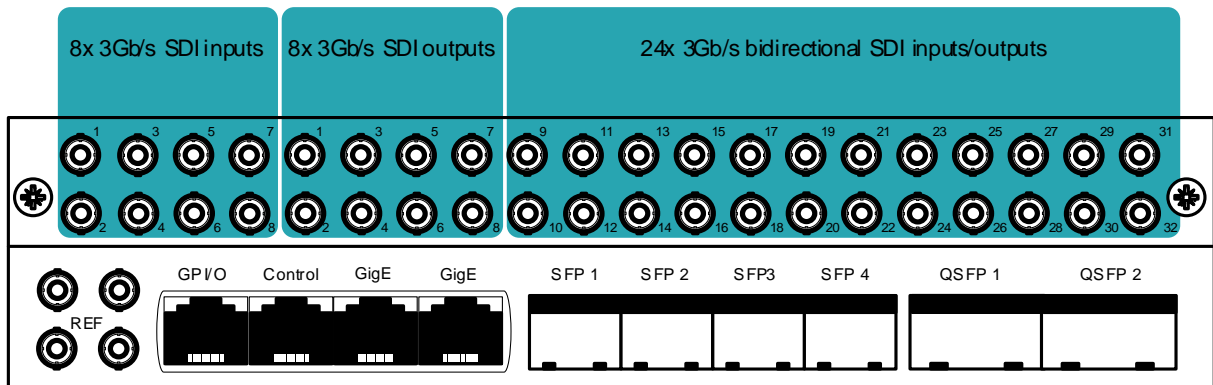
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# Block schematics of configurations





## 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>
<b>PFG1616-2Q6/2Q7</b>	16	32	16	16
<b>PXG1616-1Q6</b>	16	32	16	16 <sup>2</sup>

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

<sup>2</sup>) Redundant streams

## Features

The PROTECT is the system which will guarantee and safeguard signals within facilities or interconnection between venues. This product can be used as Firewall only or as a multi-channel A/V-over-IP transceiver, video Probe, failover switch and firewall developed for use within low-latency and high-bandwidth Ethernet IP networks. Using all modern encapsulation standards like ST2022-6 ST2110, the PROTECT is capable of handling up to 16x 3Gb/s or 4x 12Gb/s SDI signals (requires optional SDI board) and transport them over redundant two individual 100G Ethernet I/O. Addition video and audio processing is part of the Neuron package and can optionally be enabled.

Depending on the configuration the PROTECT shows another character. One configuration act as failover switch, ideally suited for handover/playout center applications where the other configuration will focus on an isolation between venues.

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

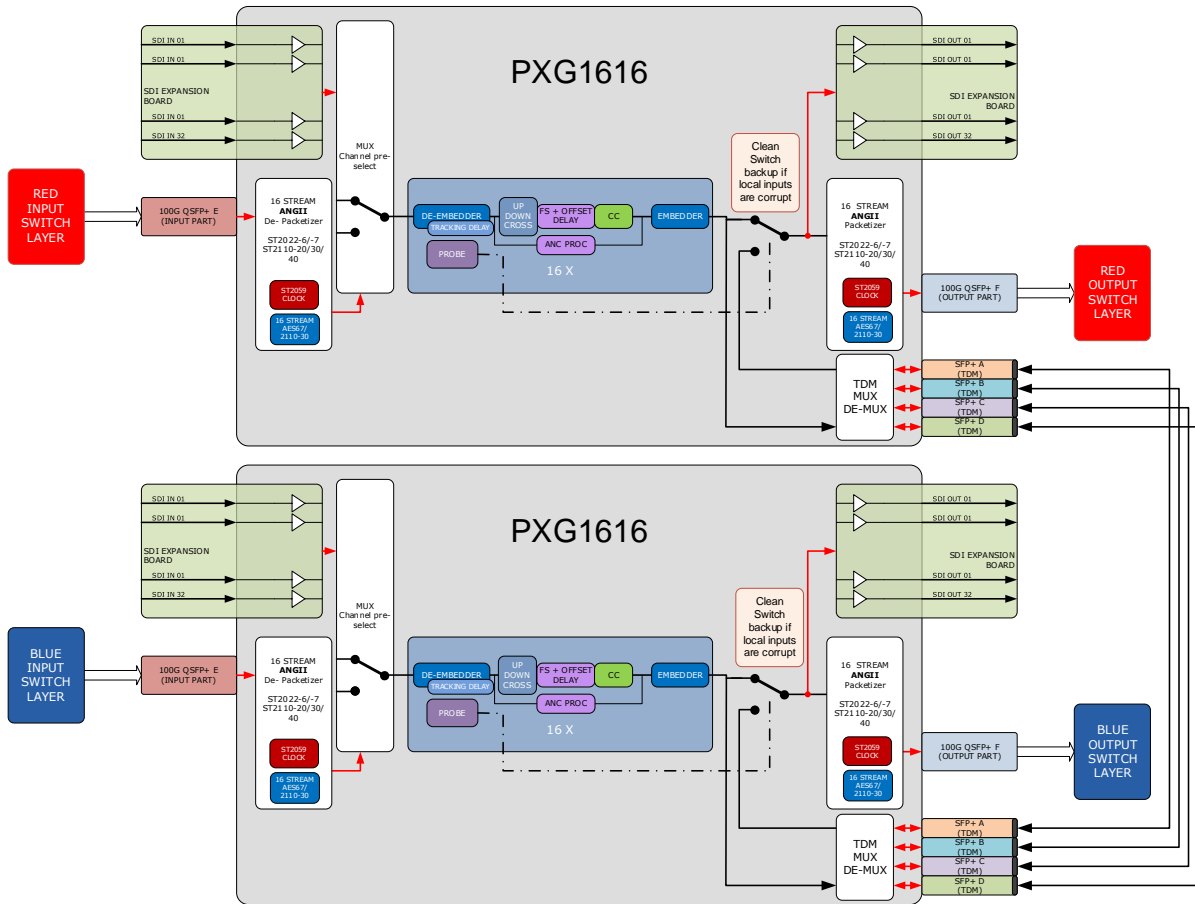
Depending on the configuration the PROTECT will offer:

- Cost efficiency by integrating IT equipment and speed in a broadcast environment. Lowering cable cost and scalable systems.
- Supports asynchronous SDI and IP inputs
- Video Standards supported: UHD-SDI, 3G-SDI level A, HD-SDI, SD-SDI, ST2022-6, ST2110-20
- Clean audio switch-over through V fade
- Tracking audio delay
- Output configuration of 2 x main + 2x backup or 4 x main (In 2x2 backup channel has no clean audio processing)
- Probe functions: SDI carrier detect, TRS validation, ANC checksum validation, video content freeze detection, video content black detection, VANC WST and OP47 present detection, Timecode availability, audio channel detection (16 channels), Audio silence detection (16 channels), Audio Clip/5 sample full-scale indication (16 channels)
- An extensive probing matrix allows adjustment of individual classes of importance of the channels next to the main and backup channels.
- Up to 16 channel frame-sync to local clock on external ref (B&B or ST2059)
- Up to 16 channels of bridging SDI to Ethernet (ST2022-6 or 2110-20/30) and/or back (requires SDI optional board)
- Up to 16x 16 channel audio de-embedding
- Up to 16x 16 channel audio embedding
- Up to 16 channel up/down/cross from and to a maximum of 16x 1080p or 4x 2160p (optional)
- 512 channel Audio gain/phase/delay and shuffler (optional)
- Several configurations of Ethernet links for maximum signal transport using both QSFP's for true IP isolation and provide link redundancy via the SFP+ connections.
- Clean switch between local signals and bus signals
- Redundancy in IP signals: 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)
- Multiple transport types available for each SDI input including uncompressed video transport using ST2022-6 encapsulation
- 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 selectable per streams
- Selectable VLAN and priority per stream
- Compatible protocols: ACPv2, DNS, IGMPv2/3, DHCP, 802.1as, ST2059-1/2, ST2022-6, 2110-20/30/31

## Applications

- U Playout center / handover application
  - Redundant (using 2 boards) 16 channel probing and backup switching
  - Clean switching between two Neuron Boards if upstream network or play-out server fails
- Full IP isolation (Firewall/DMZ)
  - Trucks/trucks
  - Facilities/facilities
- Monitoring signals

## Application example



In the above schematic two PROTECT cards are interconnected via 4 SFP+ connections. These connections do not use Ethernet as a transport layer but our own TDM bus. You can use a Direct Attached Copper wire (DAC) or a fiber connection if the frames are more than 1m (3ft) apart.

This application gives you full redundant probing, transport, 100% Ethernet isolation if your input or output is “hostile”. Up down cross conversion (playout applications). Compatibility with SDI, ST2022 and ST2110-10/20/30(40 to come), ST2059.

## Ordering information

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### 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:

**Base configuration Protect probing/failover (please select ONE of below line items when only probing is needed, maximum 2 per board, TWO when failover is required)**

**PXG1616-8** Protect 8 channel with probing and cross connection including de-embed/embed, IP IO, **select 2 boards when failover and redundancy is required**

#### Option to add SDI I/O

PRO-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 for each base config, maximum 2 per board)**

PRO-UDC8 up/down/cross conversion channels 1-8 (2x UHD) **requires PXG1616-8**

**Option to add offset delay for Statistical Multiplex improvement (please add ONE of below line items for each base config, maximum 2 per board)**

PRO-StatMux8 Additional offset delay for Statistical Multiplex improvement 1-8 (2x UHD) **requires PXG1616-8**

**Base configuration Protect Firewall (please select ONE of below line items, maximum 2 per board)**

**PFG1616-16** Protect 16 channel Firewall including de-embed/embed, including IP IO

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

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

## 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 (2 Future use)
Standards	10/100/100 Base-T
Protocols streaming	NA
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	proprietary
Protocols	proprietary

### Serial video inputs (optional)

Standard	UHD-SDI ST2082, 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

### Audio shuffler

Protocol	SWP08
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### Serial video outputs (optional)

Standard	UHD-SDI ST2082, 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