



NIO550

IP Media gateway with 8 x SDI

A Synapse® product

Synapse

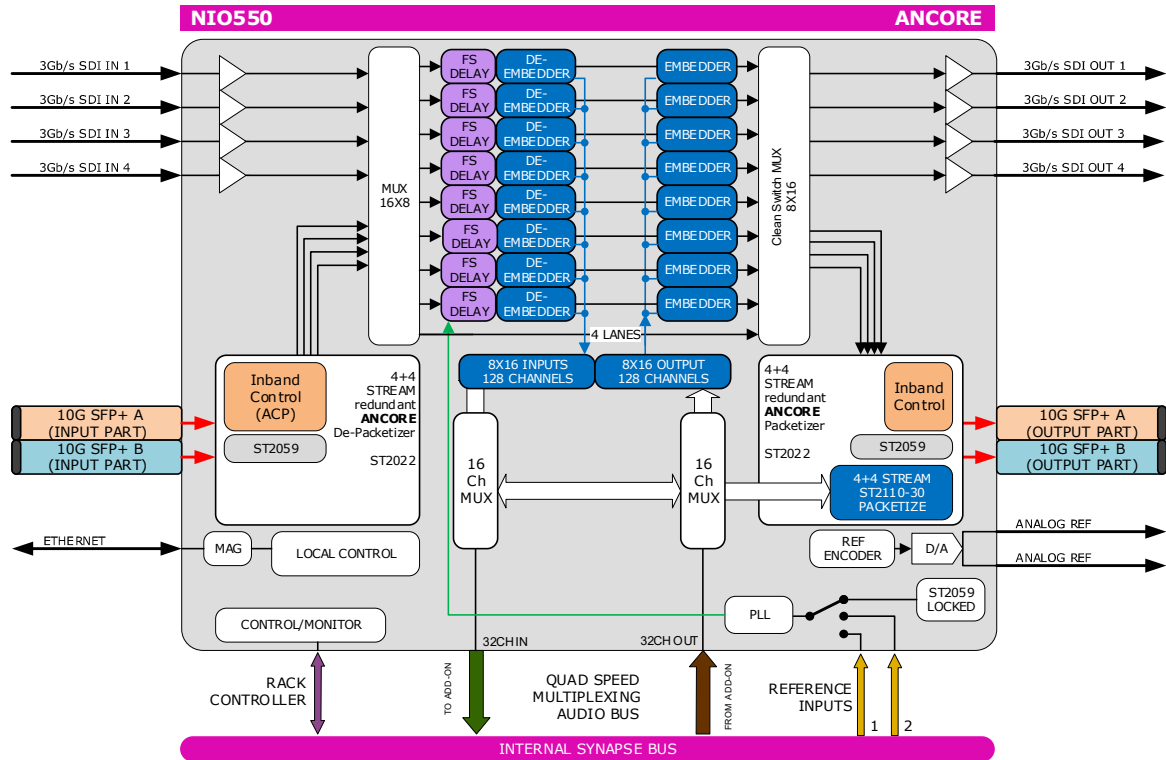


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Block schematic & I/O panel



3Gb/s, HD, SD SDI IN 1	3Gb/s, HD, SD SDI IN 2	
3Gb/s, HD, SD SDI IN 3	3Gb/s, HD, SD SDI IN 4	
3Gb/s, HD, SD SDI OUT 1	3Gb/s, HD, SD SDI OUT 2	
3Gb/s, HD, SD SDI OUT 3	3Gb/s, HD, SD SDI OUT 4	
10Gb ETHERNET 1		
10Gb ETHERNET 2		
ETHERNET (DATA CHANNEL IN 10Gb Ethernet)		
REF OUT 1	REF OUT 2	

BPH50

ANCore

ANCore is the award winning networkable production audio and video system based on industry standards. Due to its highly flexible architecture, ANCore can help customers to move to an IP based infrastructure with compatibility of all possible current and future standards. At this moment, the card is compatible with ST2022-6. Of course, ST2059 is also within the capability of this card as well and compatibility with new standards will be achieved by future upgrades.

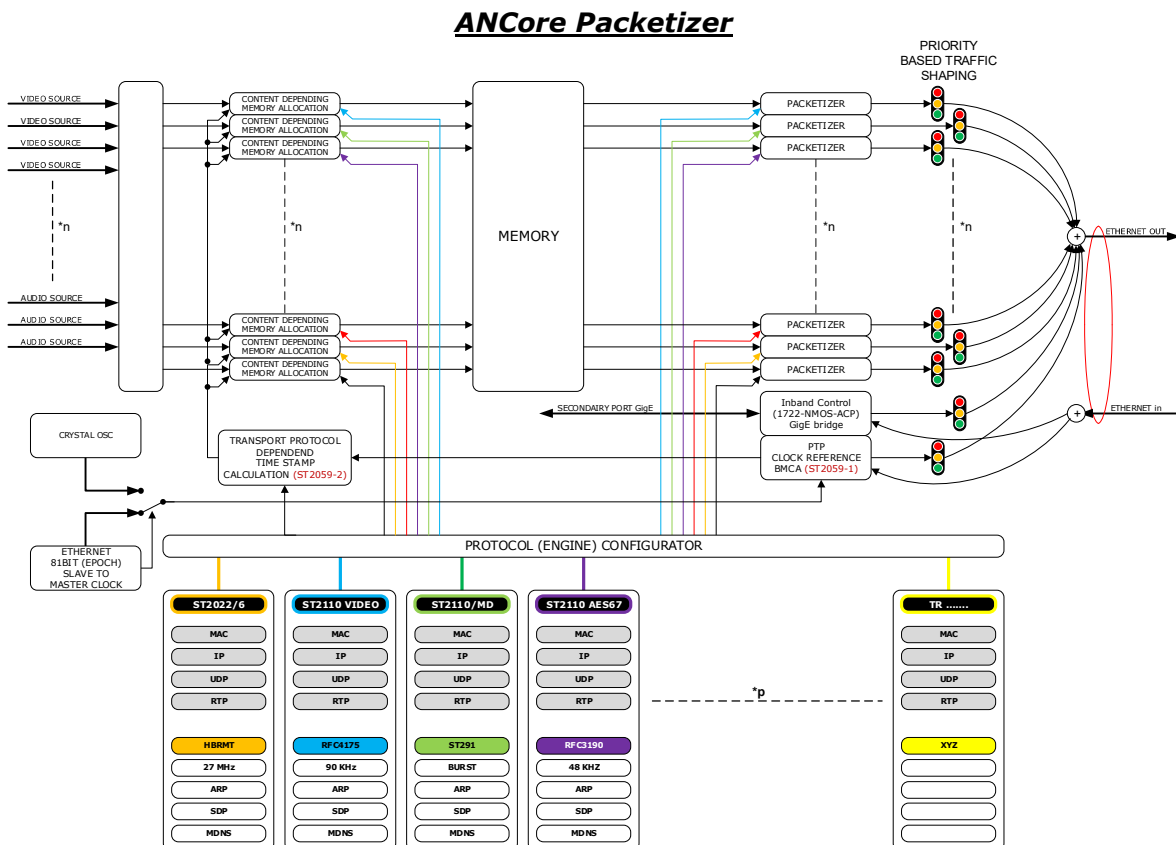
By use of today’s massive backbone speed of modern, IT based Ethernet equipment, ANCore will change the way in which video and audio (live) production infrastructures are build.

The ANCore:

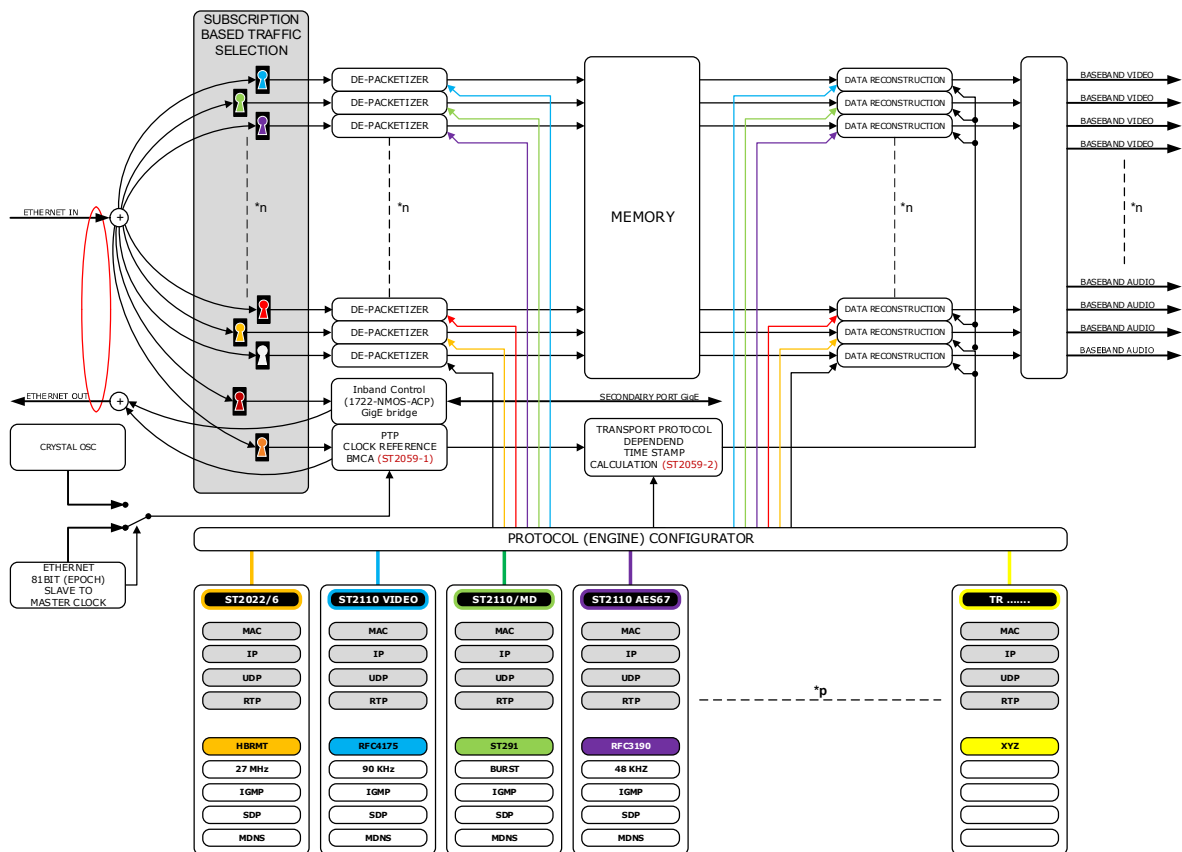
- Axon in-house developed
- Agnostic for all current and future Ethernet based formats.
- Agnostic for all Ethernet speeds
- Modular structure

The packetizer & de-packetizer

- Protocol standard agnostic powered by “Protocol (engine) Configurator”
- Low maintenance
- Easy customization
- Adaptive behaviour standards that can be distinguished from each other
- First packetizer with “Traffic shaper”



ANCore de-packetizer



The modular structure of the ANCore enables to use the different engines for all different standards. A protocol (engine) configurator enables on the fly switching between the different standards and allows translation to and from different standards. Only the protocol unique and required parameters are set and influence the appropriate engine to do its job. This can be done for every stream individually.

ST2022-6 (including redundancy)

This standard describes a transport protocol that can be used for the real time transport of video/audio over IP networks.

In this standard, it is specified that the entire payload of the serial digital interface signal including all VANC and HANC data be encapsulated as one stream.

As extra feature, redundancy is implemented. This can be fast switching (which can interrupt the picture) and clean switching. The clean switch functionality is part of the product. It is based on SDI switching, make before break principle, which is ideal for live productions. S2022-7 requires buffering, which could cause latency up to 450ms.

ST2110 protocols

This standard is used to separate the essence of the SDI framework in separate streams, together with synchronization protocols. From an SDI input signal all video is separated and transmitted in a video-essence stream. Audio is separated and transmitted in an ST2110-30 audio-essence stream that is based upon an AES67 definition. Ancillary data is also transmitted separately in an ANC-essence stream, which is covered by the ST2110-40 chapter of the protocol suite.

NMOS (IS-04)

Network based discovery of connected nodes. It stands for Networked Media Open Specification, set up by the Advanced Media Workflow Association (AMWA). They are a

growing family of specifications, which are available to both suppliers and end users, to deliver interoperability between various standards and suppliers. The NIO550 will support IS-04 for network discovery and advertising its capabilities.

ST2059

This standard describes the synchronization of nodes in a network to a defined Master clock. The protocol is using a profile of the IEEE-1588 Precision Time Protocol. With this implemented the endpoints can synchronize over the Ethernet network without the need for an external traditional analog reference.

Features

The NIO550 is a Synapse card that can bridge up to 4 SDI channels into 2x 10Gb/s Ethernet on two SFP+ modules.

The NIO550 offers clean switch functionality. One of the synchronizing paths will act as the extra source, which is necessary for make before break functionality.

The NIO550 provides 2 reference (B&B) outputs that can be locked to the PTP based network clock (802.1as/ST2059) when available in the main video network. The offset of this output to its original reference can be adjusted.

Axon's ANCore is based on open standards but adds quite some extra functionality to the system.

- Cost efficiency by integrating IT equipment and speed in a broadcast environment. Lowering cable cost and scalable systems.
- Modularity by full integration of ANCore in Synapse
- Controllability by full integration of Cortex (Cerebrum) as the management system
- Highly scalable by using ANCore in a distributed network environment, operating as a single entity.
- Simplicity by allowing a switchless back-to-back use of ANCore devices (point to point applications avoiding CWDM infrastructures and cost).

Altogether a revolutionary new method of providing (IT based) networkable infrastructure into a live production application.

- 4 x 3Gb/s SDI inputs and outputs
- 2x 10Gb/s Ethernet SFP+ cage, supports SR, LR, ZR range modules
- 8 frame synchronizers and 16 channel de-embedders (one signal path is used for clean switch, make before break principle)
- 4 pass-through paths
- Clean switch between incoming SDI and IP signals
- Redundancy in IP signals. Back-up path could be IP as well as SDI
- Audio shuffling can be achieved with a DIO88 as add-on card (16 channels/card)
- Audio mux in groups of 16 channels of audio
- Ancore; Up to 4 redundant media streams and Up to 4 dedicated redundant audio streams of ST2110-30 with audio with 8 or 16 channels of audio channels per stream (Transmit only)
- Compatible with the following input (auto selecting) and output formats
 - 1080p/59.94
 - 1080p/50
 - 1080i/59.94
 - 1080i/50
 - 720p/59.94
 - 720p/50
- 2x Analog bi-level reference out with adjustable delay
- 1x 1Gb/s Ethernet for multiple applications for bridging data to and from the 10G link and for Controlling the NIO550 directly without the use of the Synapse rack-controller.
- Quad speed audio bus Embedding and de-embedding through synapse bus (At time of writing only one video channel can become the source of the Quad Speed Bus)
- Multicast and Unicast selectable per streams
- ST2059/PTP with master slave functionality on the 10Gb/s ports and on the 1Gb/s port, IGMPv2 support
- Compatible protocols
 - ACP, IGMPv2, DHCP, 802.1as, ST2059-1/2, ST2022-6, ST2110-30 Transmit only

Applications

- Universal SDI to Ethernet bridge in Ethernet networks
- Point to point (back to back) applications for direct replacement of CWDM systems
- Router card for distributed routing over an IP network with clean switching
- Output card at shader position. Ultra-fast or clean switching.
- Enabling local or remote productions over private or commercial networks

Ordering information

Module:

- **NIO550:** IP Media gateway with 8 x SDI

Standard I/O:

- **BPH50_NIO550:** I/O-panel for NIO550

Specifications

Serial Video Input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of Inputs	4 inputs
Connector	DIN 1.0/2.3
Equalization	Typical maximum equalized length of Belden 1694A cable: 70m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return Loss	> 15dB up to 1.5GHz

Serial Video Output

Number of Outputs	4 outputs
Connector	DIN 1.0/2.3
Signal Level	800mV nominal
DC Offset	0V \pm 0.5V
Rise/Fall Time	135ps nominal
Overshoot	< 10% of amplitude
Return Loss	> 15dB up to 1.5GHz (typ.) > 10dB up to 3GHz (typ.)
Wideband Jitter	< 0.2UI

Ethernet interface

Cage	SFP+
Number of cages	2
Supported modules	SR, LR, ZR (Optical)
Phy	2 x 10GB/s, Max. power 1.5W/module

Miscellaneous

Weight	Approx. 450g
Operating Temperature	0 °C to +40 °C
Dimensions	137 x 296 x 40 mm (HxWxD)
Phy	Max. power 1.5W per SFP+ module

Electrical

Voltage	+24V to +30V
Power	<18 Watts