GNS600

SCTE104 VANC inserter, Ethernet data-bridge for 3G, HD and SD SDI Inputs and X31 Cue encoder/decoder

A Synapse® product
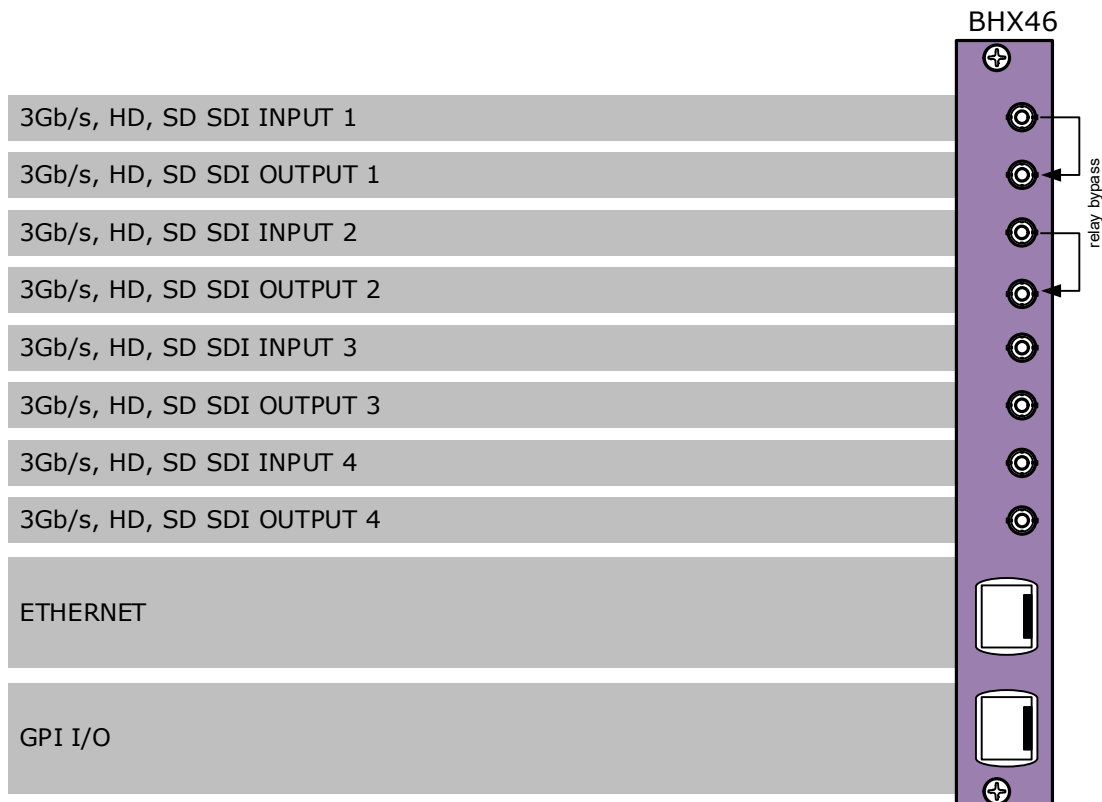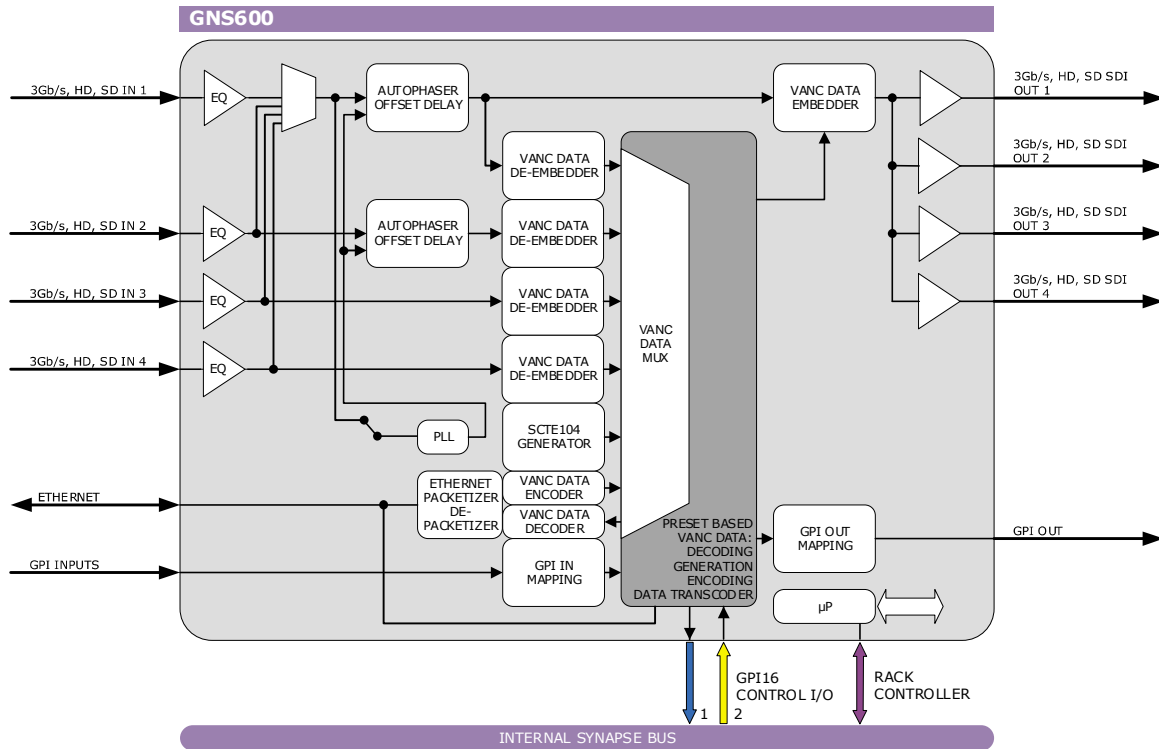
Block schematic & I/O panel

GNS600

3Gb/s, HD, SD IN 1	EQ	AUTOPHASER OFFSET DELAY
3Gb/s, HD, SD IN 2	EQ	AUTOPHASER OFFSET DELAY
3Gb/s, HD, SD IN 3	EQ
3Gb/s, HD, SD IN 4	EQ

VANC DATA DE-EMBEDDER

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SCTE104 GENERATOR

PLL

ETHERNET PACKETIZER DE-PACKETIZER

VANC DATA ENCODER

VANC DATA DECODER

GPI IN MAPPING

VANC DATA MUX

PRESET BASED VANC DATA: DECODING GENERATION ENCODING DATA TRANSCODER

VANC DATA EMBEDDER

GPI OUT MAPPING

µP

ETHERNET

GPI INPUTS

GPI OUT

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

1 GPI16 CONTROL I/O 2

RACK CONTROLLER

INTERNAL SYNAPSE BUS

BHX46

3Gb/s, HD, SD SDI INPUT 1

3Gb/s, HD, SD SDI OUTPUT 1

3Gb/s, HD, SD SDI INPUT 2

3Gb/s, HD, SD SDI OUTPUT 2

3Gb/s, HD, SD SDI INPUT 3

3Gb/s, HD, SD SDI OUTPUT 3

3Gb/s, HD, SD SDI INPUT 4

3Gb/s, HD, SD SDI OUTPUT 4

ETHERNET

GPI I/O

relay bypass

Features

The GNS600 is a 3G, HD and SD SDI SCTE104 inserter with SDI inputs outputs.
SCTE104 information present in the SDI signal can be transcoded and inserted into the main 3G, HD or SD SDI signal. The GNS600 can insert data from both the Ethernet and SDI domain into lines in the SDI domain or insert a user defined cue on a preset base.

The GNS600 can insert or decode SMPTE-2010 packets containing SCTE104 Digital Program Insertion (DPI) messages to/ from VANC. Transcode between SCTE104 HD and SCTE104 SD data is also possible.
The card will decode the SCTE104 DPI messages (contained on any or only user specified lines) and monitor for specific (user defined) content and trigger the appropriate GPO or pass the DPI message content to other control systems via Ethernet connection.
Messages received as SCTE104 packets will be treated as status changes and may be logged by an external system.

The card will encode the cues received from local GPI, or via ACP as predefined (user configurable) SCTE104 DPI Operation messages packets.
The card will also format information, received as Ethernet from external control systems, and inject this SCTE104 messages. Note: SCTE104 specifies availability of user defined operation names on ID C000-FFFE, these are supported on this card.

This data embedding is transparent to embedded audio that might be present in the SDI domain.
The card has preset configurations and these can be recalled on the reception of appropriate SCTE104 DPI messages, via local GPIs or manual control via ACP

Another function of this card is as standalone card that can insert or decode X31 cues into or from the vertical blanking. The card will decode the cues and pass the status to GPI.

- SCTE104 (HD) translation into SCTE104 (SD) bridging
- GPI triggered SCTE104 DPI or user defined message (preset based)
- GPI outputs triggered by SCTE104 DPI messages (preset based)
- 3x GPI input and 4 x bidirectional GPI/O (so up to 7 inputs)
- 10 additional GPI inputs and 16 outputs with the bus controlled GPI16 ADD-ON card
- Ethernet controlled SCTE104 insertion (embedding of SMPTE2010)
- AFD insertion
  - WSS/VI
  - S2016
- 4 processed outputs
- 32 Presets
- X31 Cue encoding and decoding
  - Formats:
    - 1080i/50
    - 625/50
  - Inserts incoming cues generated on GPI's on the platform in WST-B in SD format or OP47 in HD
  - Output of GPI's on extra card
    - Receive the incoming SDI or HD-SDI data stream
    - Drive GPI16 card as output
    - GPI16 cards may be accessed by multiple decoder cards in same chassis
  - GPI inputs come from HSI21 card
- Locks to SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Conversion abilities

The GNS600 card is able to switch and convert the following between the following video formats:

FUNCTIONS	Output							
(Input)	576i50(625)	480i59.94(525)	720p50	720p59.94	1080i50	1080i59.94	1080p50	1080p59.94
576i50(625)	Bridge/ Swap SCTE104 to/from		SCTE104 SD to HD		SCTE104 SD to HD		SCTE104 SD to HD	
480i59.94 (525)		Bridge/ Swap SCTE104 to/from		SCTE104 SD to HD		SCTE104 SD to HD		SCTE104 SD to HD
720p50	SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from	
720p59.94		SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from
1080i50	SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from	
1080i59.94		SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from
1080p50	SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from	
1080p59.94		SCTE104 HD to SD		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from		Bridge/ Swap SCTE104 to/from

* = OP47-SDP

Note: input format = HD,SD SDI 2 and 3 input format

Note: output format = HD,SD SDI 1 input format

Note: different field-rates on inputs cannot be mixed, empty squares are No Operation

Effective on lines	Field 1	Field 2
576i50(625)	7..22	320..335
480i59.94(525)	11..21	274..284
720p50	8..25	
720p59.94	8..25	
1080i50	8..20	571..583
1080i59.94	8..20	571..583
1080p50	7..41	
1080p59.94	7..41	

Applications

All SCTE104 insertion applications like:
- Advertisement insertion
- local news triggers
- GPI transport
- SCTE104 removal or transcoding

Ordering information

Modules:
- **GNS600:** SCTE104 VANC inserter, ethernet data bridge for 3G/bs, HD and SD SDI inputs and X31 Cue encoder/decoder

Relay bypass I/O:
- **BHX46_GNS600:** I/O panel for GNS600 with relay bypass

Specifications

Serial Video Input (SDI)

Standard	3Gb/s, HD and SD SDI: 424M, SMPTE 425M (3Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 259M
Number of Inputs	3
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
Return Loss	> 15dB up to 270MHz

Serial Video Output

Standard	3Gb/s, HD and SD SDI: 424M, SMPTE 425M (3Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 259M
Number of Outputs	4
Connector	BNC
Signal Level	800mV nominal
DC Offset	0V ±0.5V
Rise/Fall Time	135ps nominal
Overshoot	< 10% of amplitude
Return Loss	> 15dB to 1,5Gb/s
Jitter	< 0.2UI

Ethernet

Standard	10Base-T, 100Base-Tx IEEE 802.3
Connector	8P8C

VANC Standards

Standard	SCTE104 - 2014
	SMPTE2010

Miscellaneous

Weight	Approx. 250g
Operating Temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	<17 Watts