



GSU150/160-HSU150/160

3Gb/s, HD, SD up converter/synchronizer with side curtain and optional audio shuffler

A Synapse® product

Synapse

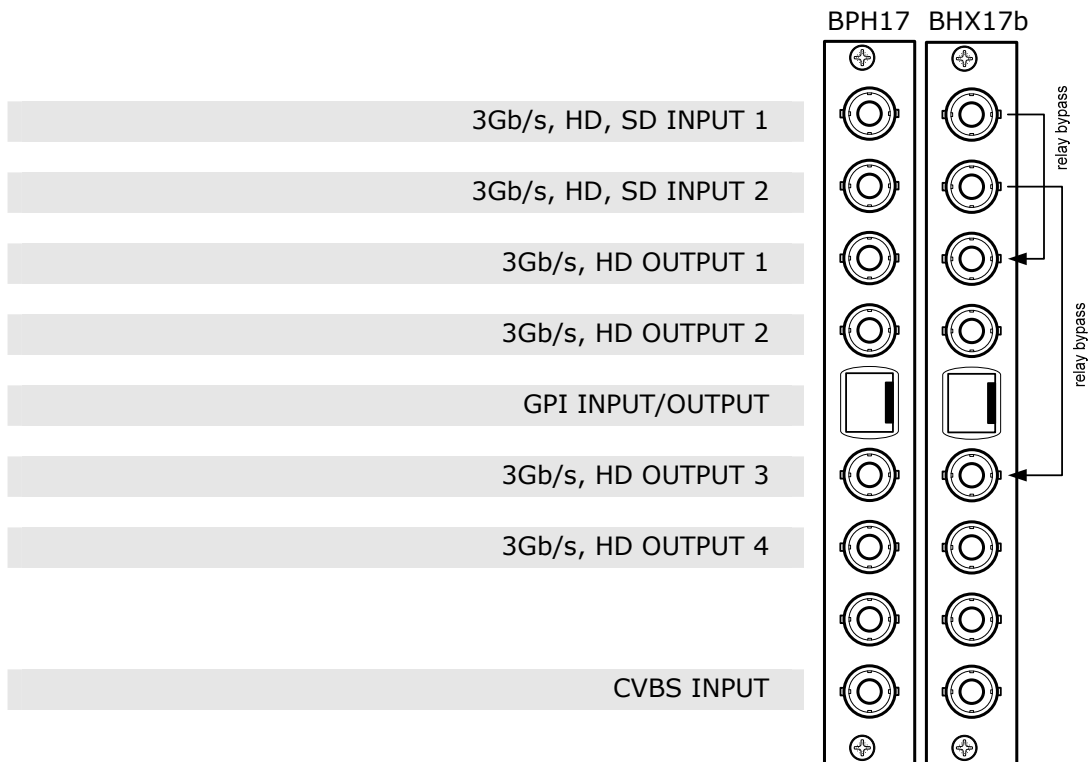
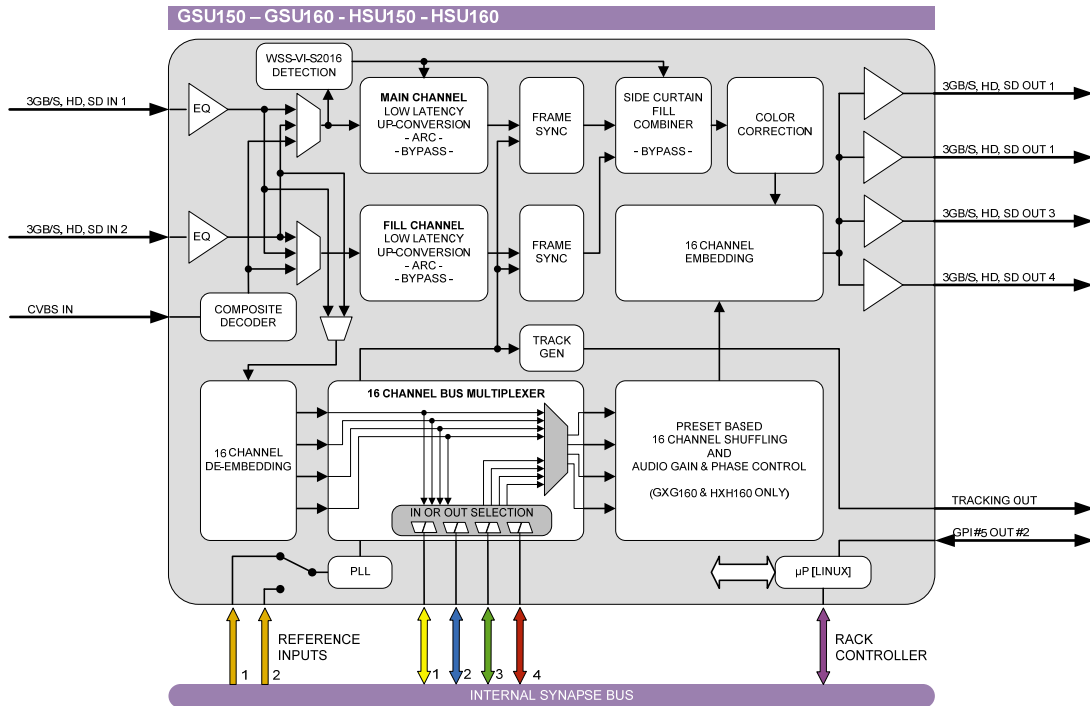


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Block schematic & I/O panel



Features

The GSU150/160 and HSU150/160 are *low latency* up, down, cross converters with 16 channel audio transparency. The powerful audio matrix multiplexer can transport audio from the embedded domain to the Synapse bus and vice versa.

The GSU160 or HSU160 add a full audio shuffler and audio proc-amp with gain and phase control. The GSU150/160 is compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use.

The HSU150/160 are compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility

- Low latency conversion process (as low as 6ms in controlled timing environment)
- Up conversion from 2 selectable SDI inputs or a CVBS input
- 5 GPI inputs for ARC and Shuffle triggers
- Transparent for 16 channels of embedded audio
- Transparent for timecode
- Side wing/curtain up-conversion for 4:3 pillarbox on graphics background
- Embedded domain audio shuffling, gain and phase control (GSU-HSU160 only)
- Embedding through synapse bus
- De-embedding to Synapse bus with transparent input to output handling
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Compatible with:
 - 270 Mbit/s (SMPTE 259M) 50 and 59.94Hz
 - 1485 Mbit/s (SMPTE 292M) 50 and 59.94Hz
 - 2970 Mbit/s (SMPTE 424M) 50 and 59.94Hz (GSU150/160 only)
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Conversion abilities

The G-HSU150/160 cards are able to convert the following video formats:

CONVERSION		Output															
		1080p29.97	1080p25	1080p23.97	1035i59.97	1080p50*	1080p59.94*	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	720p23.98	480i59.94(525)	576i50(625)	
Input 1 or 2	1080p29.97	x															
	1080p25		x														
	1080p23.97			x													
	1035i59.97				x												
	1080p50*					x											
	1080p59.94*						x										
	1080i59.94							x									
	1080i50								x								
	720p59.94									x							
	720p50										x						
	720p29.97											x					
	720p25												x				
	720p23.98													x			
	480i59.94(525)	x		x	x		x	x		x		x		x	x		
	576i50(625)		x				x		x		x		x				x
CVBS	480i59.94(NTSC)	x		x	x		x	x		x		x		x	x		
	576i50(PAL)		x				x		x			x					x

* = GXG models only

Applications

- Truck input up converter/synchronizer
- Infra structure up/down/cross conversion
- Up conversion with side-fill/curtain input

Ordering information

Module:

- **GSU150:** 3Gb/s, HD, SD-SDI up converter
- **GSU160:** 3Gb/s, HD, SD-SDI up with audio shuffler proc-amp
- **HSU150:** HD, SD-SDI up converter*
- **HSU160:** HD, SD-SDI up converter with audio shuffler proc-amp*

Standard I/O:

- **BPH17_GSU150:** I/O-panel for GSU150 with RJ45 GPI/O
- **BPH17_GSU160:** I/O-panel for GSU160 with RJ45 GPI/O
- **BPH17_HSU150:** I/O-panel for HSU150 with RJ45 GPI/O
- **BPH17_HSU160:** I/O-panel for HSU160 with RJ45 GPI/O
- **BHX17b_GSU150:** I/O-panel with relay bypass and RJ45 GPI/O for GSU150
- **BHX17b_GSU160:** I/O-panel with relay bypass and RJ45 GPI/O for GSU160
- **BHX17b_HSU150:** I/O-panel with relay bypass and RJ45 GPI/O for HSU150
- **BHX17b_HSU160:** I/O-panel with relay bypass and RJ45 GPI/O for HSU160

* upgradable to 3b/s

Specifications

Serial Video Input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of Inputs	2
Connector	BNC
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 1.5GHz

CVBS Video Input

Standard	PAL (ITU624-4), NTSC (SMPTE 170M)
Number of Inputs	1
Impedance	75 Ohms
Return Loss	> 35dB up to 10MHz
Frequency Response	< ± 0.25 dB (100KHz to 4.2MHz)
Differential Gain	< ± 0.5 % typical
Differential Phase	< $\pm 0.2^\circ$ typical
Noise Floor	< -57dB RMS (black video, 15KHz to 5MHz)
C/L Gain	< ± 0.5 %
C/L Delay	< ± 9 ns
Minimum Delay	3 lines

Serial Video Output

Number of Outputs	4
Connector	BNC
Signal Level	800mV nominal
DC Offset	0V ± 0.5 V
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

Miscellaneous

Weight	Approx. 450g
Operating Temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

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