



## GFS-HFS-SFS100/110

3Gb/s, HD, SD frame synchronizer  
with optional audio shuffler

A Synapse® product

*Synapse*

MASTER  
Card

3 TRIPLE RATE  
GB/s, HD, SD

 Powered  
by LINUX

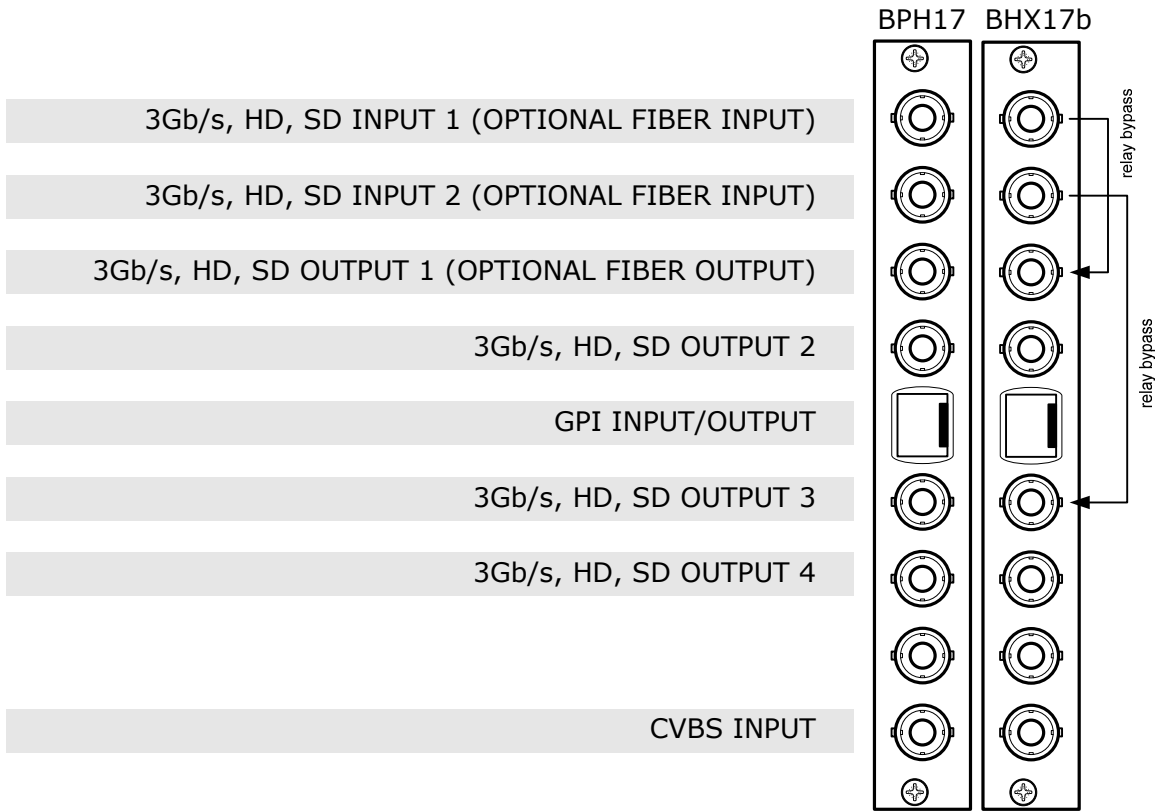
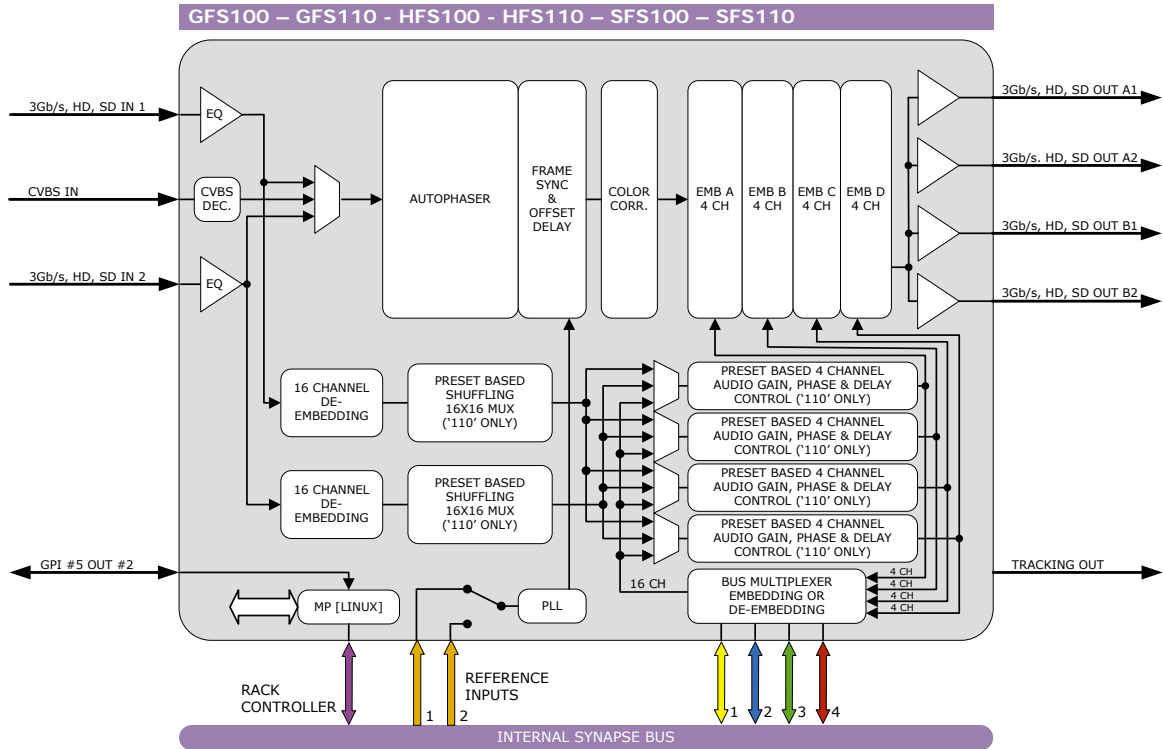
Upgradable to  
3Gb/s

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Block schematic & I/O panel



## Features

The GFS100/110, HFS100/110 and SFS100/110 are frame synchronizers with backup inputs and 16 channel audio transparency and color correcting capabilities. The powerful matrix multiplexer can feed audio from the embedded domain into the Synapse bus to an ADD-ON card like the DIO48. This matrix multiplexer also allows for audio to be inserted from the ADD-ON bus into the embedded domain of the G-H-SFS100/110. The GFS110, HFS110 and SFS110 add a full audio shuffler and audio proc-amp with gain and phase control.

The GFS100/110 is compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 use. The HFS100/110 is compatible with SD-SDI (270Mb/s) and HD-SDI (1.5Gb/s) and can be future upgraded to 3Gb/s compatibility. The SFS100/110 is limited to 270Mb/s only but can also be upgraded to HD or even 3Gb/s.

- 3 inputs: 2 SDI and 1 composite.
- Compatible with the following input formats (auto selecting) (1080p only for GFS100/110):
 

▪ 1080p/59.94	▪ 720p/59.94
▪ 1080p/50	▪ 720p50
▪ 1080i/59.94	▪ 720p30
▪ 1080i/50	▪ 720p25
▪ 1080p/29.97	▪ 720p24
▪ 1080p25	▪ SD525
▪ 1080p24	▪ SD625
▪ 1035i/59.94	
- Frame sync with output phase control in Frames, Lines and pixels with respect to reference. Delay setting are stored per output format for a constant latency operation.
  - 30 Frames delay offset (per channel)
 

▪ 1080i60	▪ 1080p24
▪ 1080i50	▪ 1035i60
▪ 1080p30	▪ 1080p60
▪ 1080p25	▪ 1080p50
  - 60 Frames delay offset (per channel)
 

▪ 720p60	▪ 720p25
▪ 720p50	▪ 720p24
▪ 720p30	
  - 125 Frames delay offset (per channel)
 

▪ SD525	
▪ SD625	
- 5 GPI inputs assignable to different preset banks
  - Input selection
  - Audio shuffling, gain and phase (110 only)
- Transparent for 16 channels of embedded audio
- Embedded domain **cross input** audio shuffling, gain and phase control (GFS-HFS-SFS110 only)
- Embedding and de-embedding through synapse bus
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for NTSC inputs
- Locks to Bi-level, Tri-level syncs or SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary cards:

- DAC20, DAC24, DAS24, DIO48, ADC20, ADC24, DIO24, DLA44, DLA43

## Applications

- Transmission output frame synchronizer with backup input.
- General purpose post router autophaser.

## Ordering information

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**Module:**

- **GFS100:** 3Gb/s, HD, SD Frame synchronizer
- **GFS110:** 3Gb/s, HD, SD Frame synchronizer with audio shuffler proc-amp
- **HFS100:** HD, SD Frame synchronizer converter\*
- **HFS110:** HD, SD Frame synchronizer with audio shuffler proc-amp\*
- **SFS100:** SD Frame synchronizer converter\*\*
- **SFS110:** SD Frame synchronizer with audio shuffler proc-amp\*\*

**Standard I/O:**

- **BPH17\_GFSxxx:** I/O-panel for G-H-SFS100/110

**Relay bypass I/O:**

- **BHX17b\_GFSxxx:** I/O-panel for G-H-SFS100/110

**Fiber outputs:**

- **BPH17T\_FC/PC\_GFSxxx:** I/O panel for G-H-SFS100/110 with one fiber transmitter on FC/PC
- **BPH17T\_SC\_GFSxxx:** I/O panel for G-H-SFS100/110 with one fiber transmitter on SC

**Fiber inputs:**

- **BPH17R2\_FC/PC\_GFSxxx:** I/O panel for G-H-SFS100/110 with two fiber receivers on FC/PC
- **BPH17R2\_SC\_GFSxxx:** I/O panel for G-H-SFS100/110 with two fiber receivers on SC

For other fiber options please contact AXON

\* Upgradeable to 3Gb/s

\*\* Upgradeable to HD or HD + 3Gb/s

## Specifications

### Serial Video Input

<b>Standard</b>	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
<b>Number of Inputs</b>	2
<b>Connector</b>	BNC
<b>Equalization</b>	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s, and 250m at 270Mb/s
<b>Return Loss</b>	> 15dB up to 1.5GHz

### CVBS Video Input

<b>Standard</b>	PAL (ITU624-4), NTSC (SMPTE 170M)
<b>Encoding</b>	12 bits
<b>Number of Inputs</b>	1
<b>Impedance</b>	75 Ohms
<b>Return Loss</b>	> 35dB up to 10MHz
<b>Frequency Response</b>	< $\pm 0.25$ dB (100KHz to 4.2MHz)
<b>Differential Gain</b>	< $\pm 0.5$ % typical
<b>Differential Phase</b>	< $\pm 0.2^\circ$ typical
<b>Noise Floor</b>	< -57dB RMS (black video, 15KHz to 5MHz)
<b>C/L Gain</b>	< $\pm 0.5$ %
<b>C/L Delay</b>	< $\pm 9$ ns
<b>Minimum Delay</b>	3 lines

### Serial Video Output

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

### Reference Input through RRC

<b>Number of Inputs</b>	2 on SFR18, 2 on SFR08 and 1 on SFR04
<b>Tri-level</b>	SMPTE274M, SMPTE296M 600 mVp-p nominal, 75 Ohms terminated through loop
<b>Bi-level</b>	PAL Black Burst ITU624-4/SMPTE318, Composite NTSC SMPTE 170M 1Vp-p nominal, 75 Ohms terminated through loop

### Miscellaneous

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

### Electrical

<b>Voltage</b>	+24V to +30V
<b>Power</b>	<17 Watts