



**GEB880-840-800-440-400**  
**HEB880-840-800-440-400**

**3Gb/s, HD, SD basic audio embedder**

**A Synapse ® product**

*Synapse*

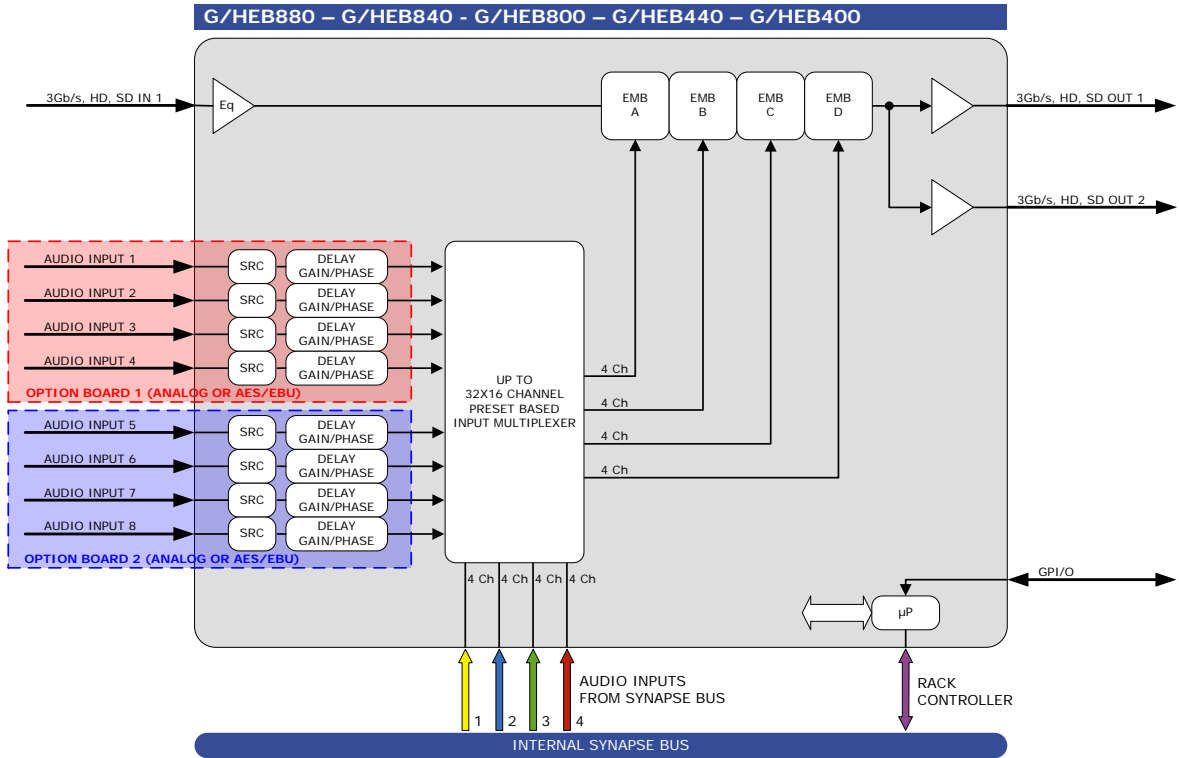


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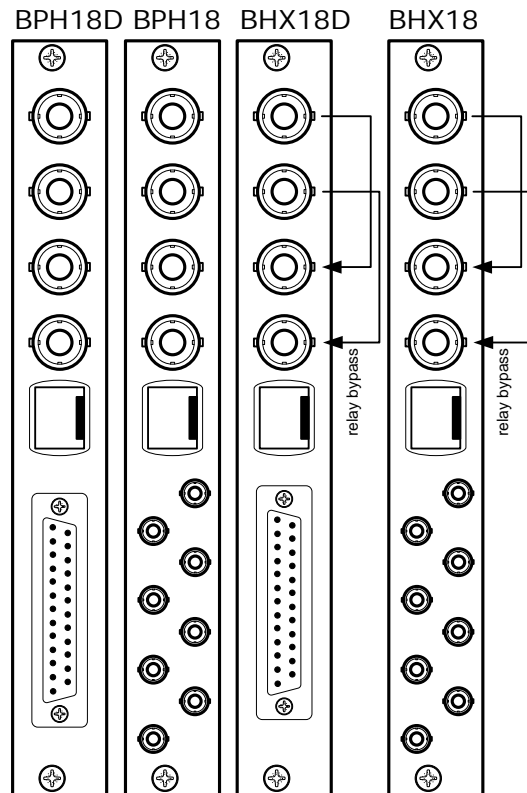
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Block schematic & I/O panel



- 3Gb/s, HD, SD SDI INPUT 1 (OPTIONAL FIBER INPUT)
- 3Gb/s, HD, SD SDI OUT 1 (OPTIONAL FIBER OUTPUT)
- 3Gb/s, HD, SD SDI OUT 2 (OPTIONAL FIBER OUTPUT)
- GPI INPUT/OUTPUT
- AES/EBU OR ANALOG AUDIO INPUTS



## Features

The G-HEB880-840-800-440-400 is a 3GB/s, HD SDI and SD SDI audio embedder. It is capable of inserting or appending up free-running AES/EBU digital audio channels or analog audio channels. The card has 2 option input boards: 4 mono analog audio inputs (4ch total) per board, or 4 stereo AES/EBU inputs (8ch total) per board.

In addition, four ADD-ON cards can be connected to create a routing matrix. The architecture of Emb\_A to Emb\_D blocks is identical. The local AES inputs can be controlled to adjust Phase, Gain and delay (on the fly).

Future upgrades are possible, like for instance the HEB400 can be future upgraded to HEB880, GEB800 or GEB840, etc. This allows for staged implementation of HD infrastructures and spread the cost over multiple budget years.

- Compatible with the following input formats (auto selecting) (1080p only for GEB):
 

▪ 1080p/59.94	▪ 720p/59.94
▪ 1080p/50	▪ 720p50
▪ 1080i/59.94	▪ 720p30
▪ 1080i/50	▪ 720p25
▪ 1080p/30	▪ 720p24
▪ 1080p/25	▪ SD525
▪ 1080p(sf)/23.98	▪ SD625
▪ 1035i/59.94	
- Up to 8 AES/EBU inputs with sample rate converter (available with 110 Ohm and 75 Ohm inputs)
- Up to 8 analog audio inputs (available with balanced or unbalanced connectors)
- 8 extra AES/EBU inputs through the Synapse bus
- 2 SDI + embedded audio outputs
- 8 presets that configure all 16 input channels at once. controlled by GPI or ACP (Cortex)
- Audio level and phase control
- Audio offset delay up to 1300 ms
- AES/EBU inputs accept synchronous streams like Dolby E and asynchronous up to 96kHz sampling via the built in Sample Rate Converters.
- 16 extra audio channels (4 groups) with ADD-ON card for input multiplexing
- Peak detection 0, -6, -12 and -18dBFS
- Silence detection with threshold (-100 to -20dBFS) and time control (1 to 255 sec)
- Transparent for ATC time code RP188, RP196, RP215
- Locks to SDI input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 input, 1 or 2 fiber outputs or a fiber in and output (replacing 1 SDI in and output) on the I/O panel
- Optional relay bypass (BHX18 or BHX18D)

Complementary cards:

- ADC20, ADC24, DIO24, DIO48, DLA44, DLA43

## Applications

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- 3Gb/s, HD and SD audio embedding
- Up to 16 channel Preset based audio embedding

## Input options

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This platform has 2 option boards which define the inputs of the card. Refer to the block schematic for the position of the option boards. These are the options:

Card model	Option board 1	Option board 2
GEB880	4 AES/EBU inputs (8 channels)	4 AES/EBU inputs (8 channels)
HEB880	4 AES/EBU inputs (8 channels)	4 AES/EBU inputs (8 channels)
GEB840	4 AES/EBU inputs (8 channels)	4 analog inputs (4 channels)
HEB840	4 AES/EBU inputs (8 channels)	4 analog inputs (4 channels)
GEB800	4 AES/EBU inputs (8 channels)	None
HEB900	4 AES/EBU inputs (8 channels)	None
GEB440	4 analog inputs (4 channels)	4 analog inputs (4 channels)
HEB440	4 analog inputs (4 channels)	4 analog inputs (4 channels)
GEB400	4 analog inputs (4 channels)	None
HEB400	4 analog inputs (4 channels)	None

## Ordering information

### Module:

- **GEB400:** 3Gb/s, HD, SD 4 channel analog audio dual SDI embedder
- **GEB440:** 3Gb/s, HD, SD 8 channel analog audio dual SDI embedder
- **GEB800:** 3Gb/s, HD, SD 8 channel digital audio dual SDI embedder
- **GEB840:** 3Gb/s, HD, SD 8 channel digital audio and 4 channel analog audio dual SDI embedder
- **GEB880:** 3Gb/s, HD, SD 16 channel digital dual SDI audio embedder
- **HEB400:** HD, SD 4 channel analog audio dual SDI embedder
- **HEB440:** HD, SD 8 channel analog audio dual SDI embedder
- **HEB800:** HD, SD 8 channel digital audio dual SDI embedder
- **HEB840:** HD, SD 8 channel digital audio and 4 channel analog audio dual SDI embedder
- **HEB880:** HD, SD 16 channel digital audio dual SDI embedder

### Standard I/O:

- **BPH18\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with unbalanced audio inputs
- **BPH18D\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with balanced audio inputs

### Relay bypass I/O:

- **BHX18\_xEBxxx:** relay I/O panel for GEBxxx/HEBxxx with unbalanced audio inputs
- **BHX18D\_xEBxxx:** relay I/O panel for GEBxxx/HEBxxx with balanced audio inputs

### Fiber outputs\* :

- **BPH18T\_FC/PC\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with one fiber transmitter
- **BPH18T2\_FC/PC\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with two fiber transmitters
- **BPH18DT\_FC/PC\_xEBxxx:** I/O panel with DSub for G/HEBxxx with one fiber transmitter
- **BPH18DT2\_FC/PC\_xEBxxx:** I/O panel with DSub for G/HEBxxx with two fiber transmitters

### Fiber inputs\* :

- **BPH18R\_FC/PC\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with one fiber receiver
- **BPH18R2\_FC/PC\_xEBxxx:** I/O panel for GEBxxx/HEBxxx with two fiber receivers
- **BPH18DR\_FC/PC\_xEBxxx:** I/O panel with DSub for G/HEBxxx with one fiber receiver
- **BPH18DR2\_FC/PC\_xEBxxx:** I/O panel with DSub for G/HEBxxx with two fiber receivers

### Fiber inputs and outputs\* :

- **BPH18TR\_FC/PC\_xEBxxx:** I/O panel for G/HEBxxx with one fiber transmitter and one receiver
- **BPH18DTR\_FC/PC\_xEBxxx:** I/O panel for G/HEBxxx with one fiber transmitter and one receiver

\* Ordering information fiber input and/or output modules:  
- In case of SC connector: replace FC/PC by SC.

## 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

### Serial Video Output

<b>Number of Outputs</b>	2
<b>Connector</b>	BNC
<b>Signal Level</b>	800mV nominal
<b>DC Offset</b>	0V $\pm$ 0.5V
<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

### AES/EBU Input

<b>Connector</b>	25 pins female sub-D (balanced) or DIN1.0/2.3 coax (unbalanced)
<b>Standard</b>	AES-1992 for balanced synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
<b>Number of Inputs</b>	4 or 8
<b>Sampling Rate</b>	32 kHz to 96 kHz asynchronous 48 kHz Synchronous (SRC=off)
<b>Resolution</b>	24 bits
<b>Minimum Input/Output Delay</b>	2 ms
<b>Impedance</b>	110 Ohms or 75 Ohms
<b>Level</b>	0.2V to 1V nom for Coax, 2V to 7V for balanced operation

### Analog Audio Input

<b>Connector</b>	25 pins female sub-D (balanced) or DIN1.0/2.3 coax (unbalanced)
<b>Standard</b>	High impedance 24 bit A/D converter
<b>Number of Inputs</b>	4 or 8
<b>Resolution</b>	24 bits
<b>Minimum Input/Output Delay</b>	2 ms
<b>Impedance</b>	10 kOhm
<b>Level</b>	Up to +24dBu for 0dBFS embedding, switchable to +18, +15 and +12dBu

### 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. 250g
<b>Operating Temperature</b>	0 °C to +50 °C
<b>Dimensions</b>	137 x 296 x 20 mm (HxLxD)

### Electrical

<b>Voltage</b>	+24V to +30V
<b>Power</b>	<15 Watts