



## HSU30/31

**High performance HD-SDI upconverter with enhanced noise reduction with optional audio shuffler**

**A Synapse® product**

*Synapse*

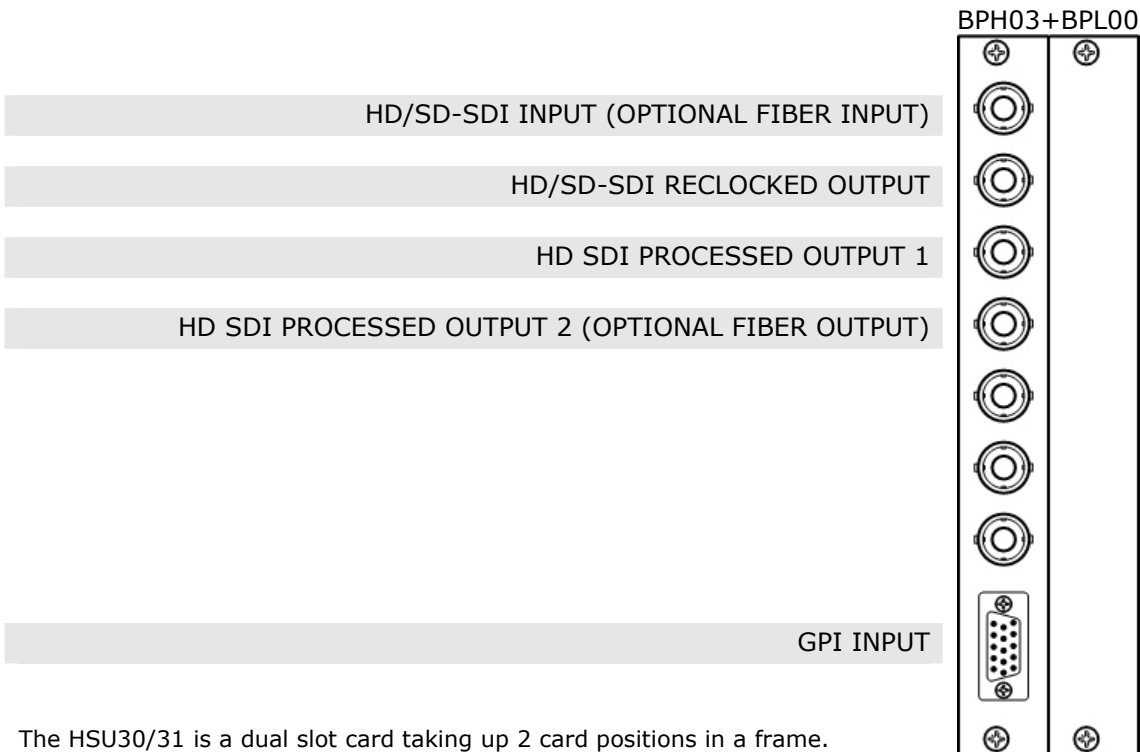
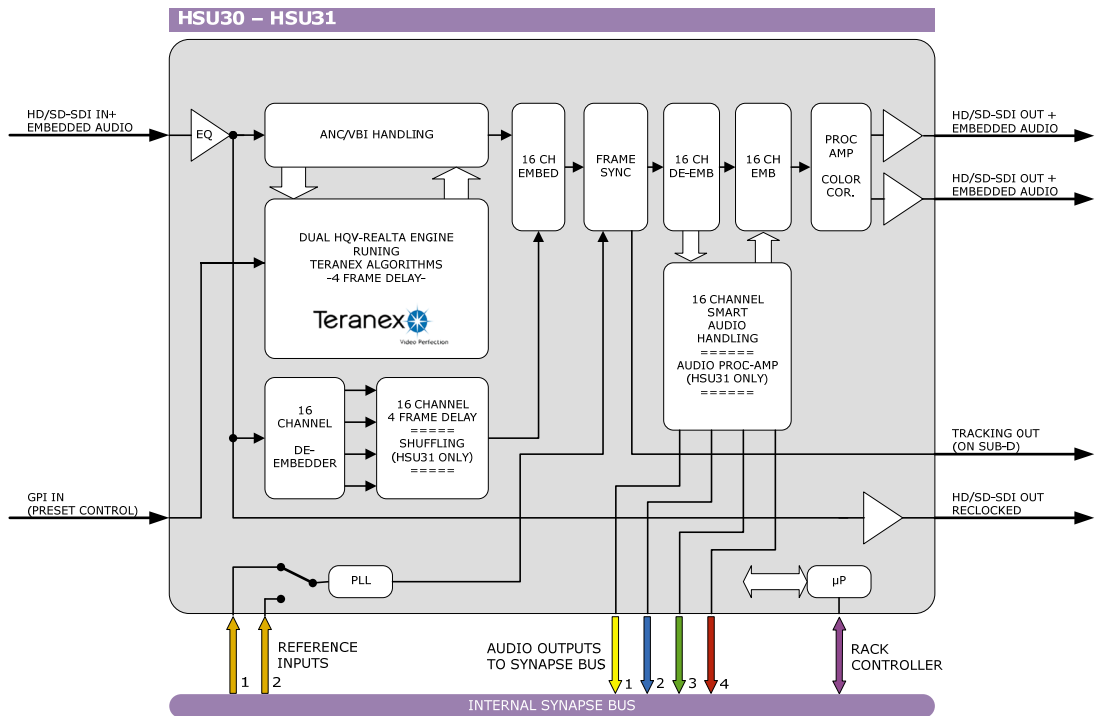


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Block schematic & I/O panel



The HSU30/31 is a dual slot card taking up 2 card positions in a frame.  
**For fiber connectivity see [www.axon.tv](http://www.axon.tv)**

## Features

The HSU30/31 high-end upconverter is similar to the HSU20, but with enhanced noise reduction algorithm that can be applied to the input signal for smooth conversion quality where the source is less than ideal. The unit runs the advanced Teranex algorithms. It is based on an AXON Synapse card that enables compatibility with the unique ADD-ON functionality of the Synapse system.

The advanced algorithms are running on two HQV Realta DSP's. This gives the board 2 Trillion operations per second processing power, and is the most powerful modular processing card at the time of its introduction.

- Enhanced noise reduction
- HD/SD-SDI input
- 1 reclocked output
- 2 processed outputs
- Frame sync with built-in 16 channel smooth audio handling
- Audio offset delay -30ms to +1270ms
- Full audio shuffling of all 16 channels (HSU31 only)
- Audio gain and phase control of all 16 channels (HSU31 only)
- GPI preset control for audio shuffling (HSU31 only)
- GPI preset control for the built-in ARC
- All audio is present on ADD-ON bus for monitoring
- Transparent to Closed Captioning
- Transparent to timecode
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional 1 fiber input (replacing 1 SDI input) or 1 fiber output (replacing 1 SDI output) on I/O panel

## Conversion abilities

The HSU30 and HSU31 can handle the following conversions:

| CONVERSION |                | Output     |         |           |        |                |             |
|------------|----------------|------------|---------|-----------|--------|----------------|-------------|
|            |                | 1080i59.94 | 1080i50 | 720p59.94 | 720p50 | 480i59.94(525) | 576i50(625) |
| Input      | 1080i59.94     | x          |         |           |        |                |             |
|            | 1080i50        |            | x       |           |        |                |             |
|            | 720p59.94      |            |         | x         |        |                |             |
|            | 720p50         |            |         |           | x      |                |             |
|            | 480i59.94(525) | x          |         | x         |        | x              |             |
|            | 576i50(625)    |            | x       |           | x      |                | x           |

## Applications

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The HSU30 and HSU31 are engineered for applications in MCR and OB vans where analog sources or sources with MPEG artifacts are used. Also in transmission applications where a station output needs to convert every possible (legacy) source into the HD transmission chain. The HSU31 enables 16 channels of audio swapping when the SD and HD embedded audio designation is different.

- Highest quality up-conversion (for noisy signals)
- Archive material restoration for HD replay purposes
- Studio output up-conversion
- Ingest up-converting with preset audio shuffling (HSU31 only)

## Ordering information

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### Module:

- **HSU30:** High performance upconverter with enhanced noise reduction
- **HSU31:** High performance upconverter with enhanced noise reduction, with full 16 channels of audio swapping

### Standard I/O:

- **BPH03\_HSU30:** I/O-panel for HSU30
- **BPH03\_HSU31:** I/O-panel for HSU31

### Fiber outputs:

- **BPH03T\_FC/PC\_HSU30:** I/O-panel for HSU30 with fiber transmitter on FC/PC
- **BPH03T\_SC\_HSU30:** I/O-panel for HSU30 with fiber transmitter on SC
- **BPH03T\_FC/PC\_HSU31:** I/O-panel for HSU31 with fiber transmitter on FC/PC
- **BPH03T\_SC\_HSU31:** I/O-panel for HSU31 with fiber transmitter on SC

### Fiber inputs:

- **BPH03R\_FC/PC\_HSU30:** I/O-panel for HSU30 with fiber receiver on FC/PC
- **BPH03R\_SC\_HSU30:** I/O-panel for HSU30 with fiber receiver on SC
- **BPH03R\_FC/PC\_HSU31:** I/O-panel for HSU31 with fiber receiver on FC/PC
- **BPH03R\_SC\_HSU31:** I/O-panel for HSU31 with fiber receiver on SC

## Specifications

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### HD/SD Serial Video Input

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|                     |   |
|---------------------|---|
| <b>Standard</b>     | 625/50 or 525/59.94 SMPTE 259M-C (270Mb/s) with SMPTE 272M embedded audio<br>SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M |
| <b>Equalization</b> | 1080i/59.94, 1080i/50, 720p/59.94, 720p/50<br>Automatic to 100m @ 1.5Gb/s with Belden 1694A or equivalent cable.                      |
| <b>Return Loss</b>  | > 15dB up to 1.5GHz   |

### HD/SD Serial Video Output

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|                           |   |
|---------------------------|---|
| <b>Standard</b>           | SMPTE 292M (1.5Gb/s), SMPTE 274M, SMPTE 296M, SMPTE 349M    |
| <b>Signal Level</b>       | 1080i/59.94, 1080i/50, 720p/59.94, 720p/50<br>800mV nominal |
| <b>DC Offset</b>          | 0V $\pm$ 0.5V   |
| <b>Rise and Fall Time</b> | 200ps nominal for HD, 750ps nominal for SD                  |
| <b>Overshoot</b>          | < 10% of amplitude  |
| <b>Return Loss</b>        | > 15dB up to 1.0Gb/s, > 10dB up to 1.5Gb/s                  |
| <b>Wideband Jitter</b>    | < 0.2UI   |

### Reference Video Input

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|                         |   |
|-------------------------|---|
| <b>Standard</b>         | PAL (ITU624-4), NTSC (SMPTE 170M)         |
| <b>Number of Inputs</b> | 2 on SFR18, 2on SFR08, 1 on SFR04         |
| <b>Connector</b>        | BNC                                       |
| <b>Signal Level</b>     | 1V nominal                                |
| <b>Impedance</b>        | High impedance, with loop for termination |
| <b>Return Loss</b>      | > 25dB to 10MHz                           |

### Miscellaneous

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|                              |                                       |
|------------------------------|---------------------------------------|
| <b>Weight</b>                | Approx. 500g                          |
| <b>Operating Temperature</b> | 0 °C to +50 °C                        |
| <b>Dimensions</b>            | 137 x 296 x 40 mm (HxWxD) = DUAL SLOT |

### Electrical

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|                |                       |
|----------------|-----------------------|
| <b>Voltage</b> | +24V to +30V          |
| <b>Power</b>   | <29 Watts (dual slot) |