



# Synapse

## DSF66

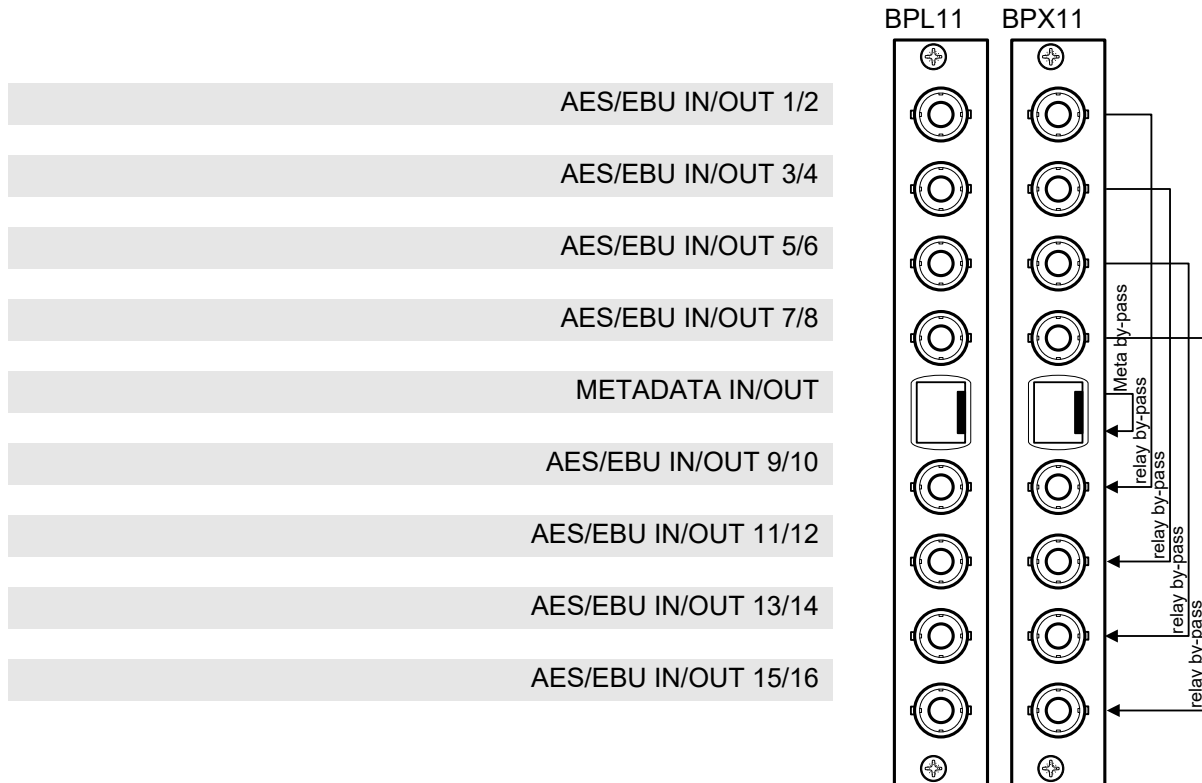
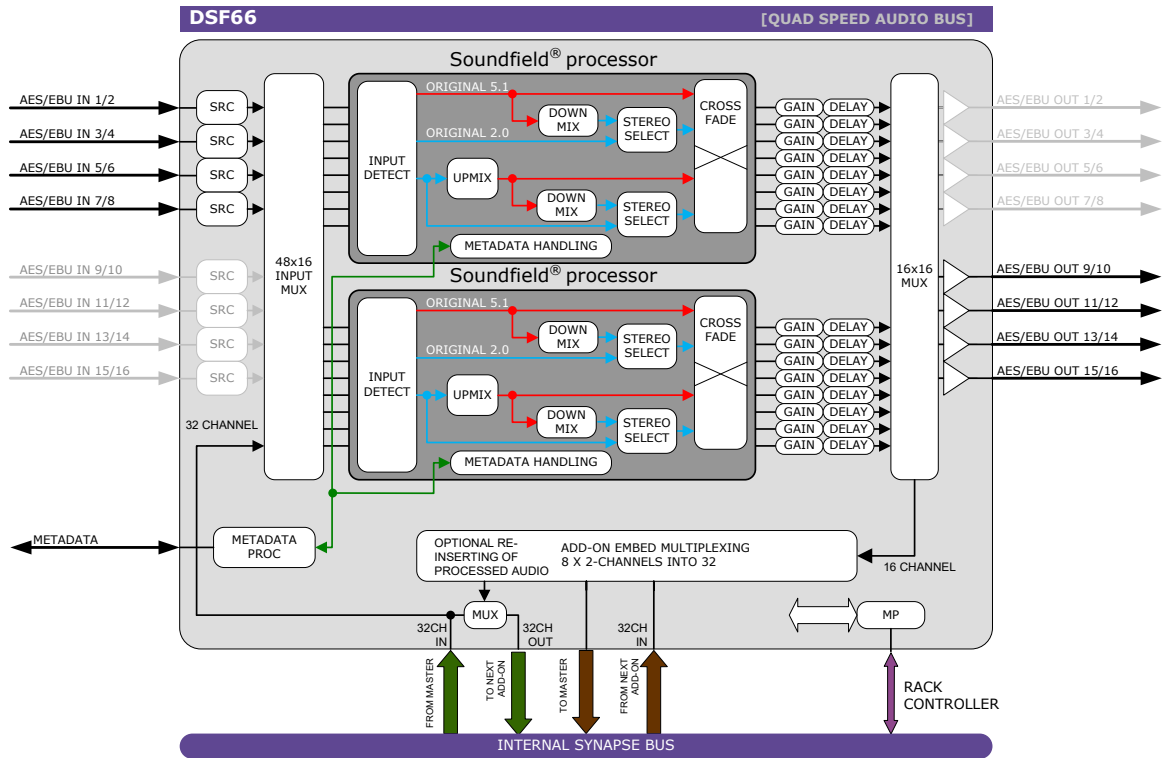
**Dual digital audio upmixer and downmixer based on SoundField® algorithms**

A Synapse® product



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Block schematic & I/O panel



## Features

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The DSF66 is a dual hardware stereo-to-5.1 upmix and downmix processor, designed for HD broadcasters who use a lot of archived stereo material and wish to generate acceptable 5.1 broadcast mixes from stereo soundtracks. The DSF66 has a shared metadata input and shared physical I/O.

Software and hardware upmixing tools have existed for some years, but most of them create material for the extra three channels in a 5.1 mix by using processing, for example adding reverb or applying phase-shifts to the stereo material to create information for the rear surround channels. Instead, the DSF66 generates the material for the extra channels by closely analyzing the source stereo signal over time. Using a unique algorithm developed for the purpose, the DSF66 can detect reverberant content in the stereo signal, differentiate it from the direct sounds in the mix, and separate it out.

Users can adjust the details of the processing directly from the DSF66 GUI in Cortex, with control offered over a variety of different parameters including the level of the direct and ambient components in the front and rear channels, and the divergence of the Centre channel in the generated 5.1 mix, with options from a discrete Centre channel at one extreme to a phantom Centre at the other. Output level controls are also offered for each of the channels in the final 5.1 mix.

The I/O configuration of the DSF66 can be changed to allow for convenient connection of external inputs, outputs or a combination. In standalone mode the DSF66 has 4 AES/EBU inputs and 4 AES/EBU outputs (8 mono in and 8 mono out). In (quad speed) ADD-ON mode the unit can be configured as 8in (16 mono in) or 8 out (16 mono out) to connect either 16 mono external source channels listen to 16 external channels in 8-out mode. If processing of embedded audio from a master card is required the unit can be used without physical I/O and all channels are routed from and to the Quad Speed Audio bus

- 3 physical I/O modes 8-in, 4-in + 4-out, or 8-out
- Output gain and delay adjustments
- 2x Upmix stereo to 5.1
- 2x Downmix from 5.1
- Cross fading between upmixed and discrete 5.1 (5.1/2.0 input auto-sensing)
- Cross fading between downmixed and discrete 2.0 (5.1/2.0 input auto-sensing)
- 8 presets for convenient storing of use cases.
- Locks to Black & Burst, AES input and Mastercard.
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

## Applications

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- High-End upmixing and downmixing of broadcast related program audio streams
  - To ensure a constant 5.1 + Stereo output regardless of input format
  - Simultaneous independent Upmixer and Downmixer (LoRo or LtRt)

## Ordering information

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### Module:

- **DSF66:** 16 channel processing (dual 5.1/2.0) digital audio upmixer/downmixer ADD-ON card

### Standard I/O:

- **BPL11\_DSf66:** I/O panel for DSF66 with unbalanced AES/EBU in and out

### Relay bypass I/O:

- **BPX11\_DSf66:** I/O panel for DSF66 with unbalanced AES/EBU in and out with relay bypass

## Specifications

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### AES Audio Input

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<b>Connector Standard</b>	BNC 75 Ohm AES-1992 for synchronous or asynchronous PCM/AES, SMPTE 276M for single ended synchronous or asynchronous PCM/AES
<b>Number of Inputs</b>	4 (8)
<b>Sampling Rate</b>	32 kHz to 192 kHz Synchronous 48 kHz in Master/ADD-On mode
<b>Resolution</b>	24 bits when AES inputs selected, 20 bits in Master/ADD-ON mode
<b>Minimum Input/Output Delay</b>	TBD
<b>Impedance Level</b>	75 Ohms 0.2V to 1V nom

### AES Audio Output

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<b>Number of Outputs</b>	4 (8)
<b>Connector</b>	BNC,
<b>Resolution</b>	24 bits
<b>Sampling Rate</b>	48KHz synchronous
<b>Minimum Input/Output delay</b>	TBD
<b>Maximum Input/Output offset delay</b>	4000 ms

### Reference Input through RRC

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<b>Number of Inputs</b>	2 on SFR18, 2 on SFR08 and 1 on SFR04
<b>Bi-level</b>	PAL Black Burst ITU624-4/SMPTE318, Composite NTSC SMPTE 170M 1Vp-p nominal, 75 Ohms terminated through loop
<b>Word clock</b>	AES11-2003 Annex B, not terminated on loop 48kHz

### Miscellaneous

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

### Electrical

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<b>Voltage</b>	+24V to +30V
<b>Power</b>	<10 Watts