



G/HMA100/110/120/130/140

**Dual 3Gb/s, HD, SD embedded domain shuffler with
MADI I/O and analog or digital audio I/O**

A Synapse ® product

The logo for Synapse, written in a light blue, cursive script font.

Quad speed
MASTER

3 TRIPLE RATE
Gb/s, HD, SD

 Powered
by **LINUX**

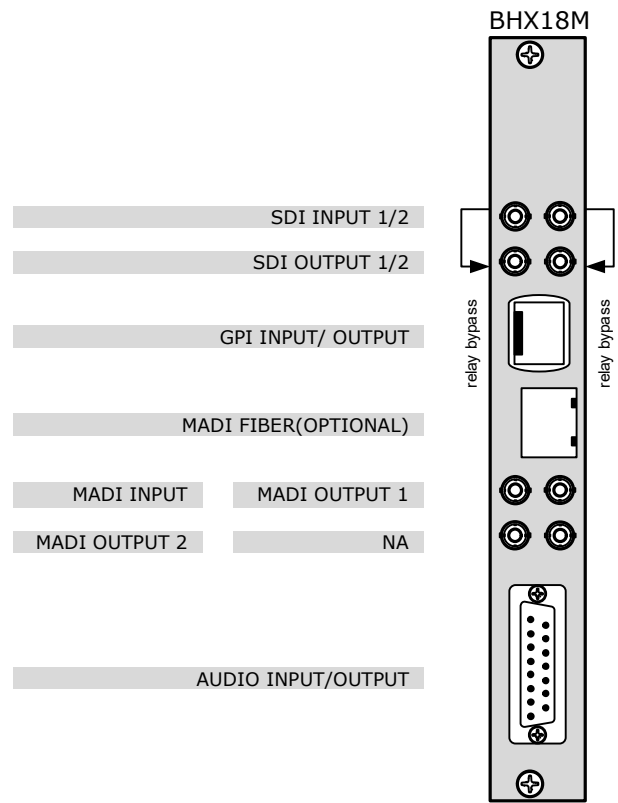
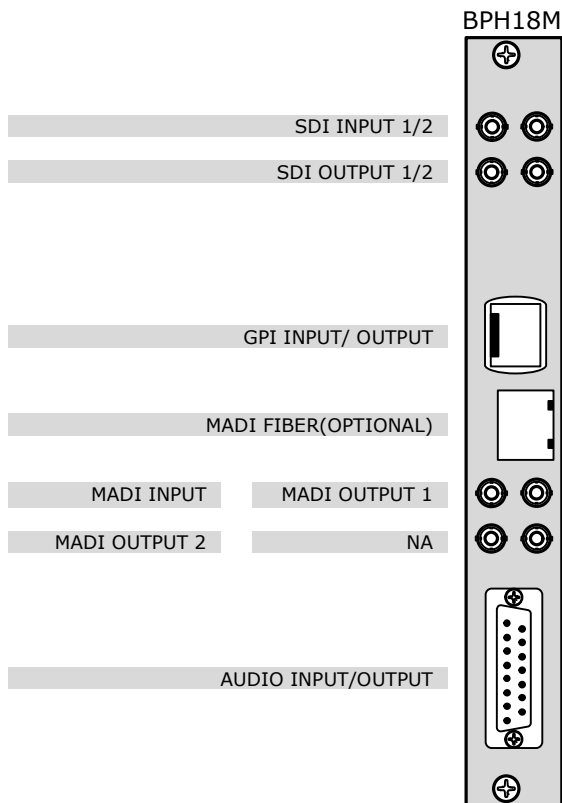
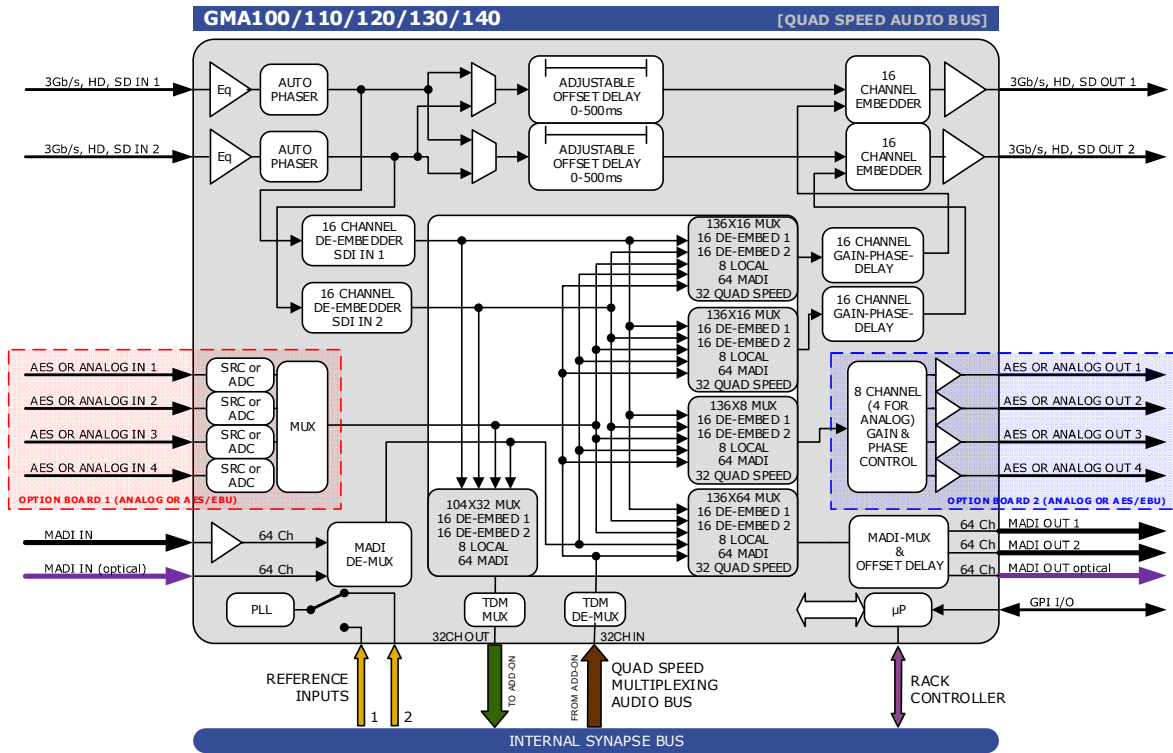
Upgradable to
3Gb/s

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Block schematic & I/O panel



Features

The GMA100 is a dual SDI (up to 3Gb/s) embedded domain audio shuffler with a 64 channel MADI in and output.

The core of this card is a massive anything to anything shuffler/MUX. It allows for any available source to be placed on any available output. The total audio routing capability is a massive 136 channels to 136 channels.

The Quad Speed audio bus allows for implementation of 'in between' audio processing. So next to the massive shuffling we can add a Quad Speed ADD-ON card and allow for watermarking (DAW77/88/99), loudness control (DLA42/43) or additional AES/EBU I/O (DIO88)

- MADI input (up to 64 channel)
- MADI output (up to 64 channel)
- Both MADI channels are bi-directional for future 128channel applications
- Dual SDI (SD, HD and 3Gb/s) video inputs
- Dual SDI (SD, HD and 3Gb/s) video outputs
- Compatible with the following input formats (auto selecting) (1080p only for GMA):
 - 1080p/59.94
 - 1080p/50
 - 1080i/59.94
 - 1080i/50
 - 1080p/29.97
 - 1080p25
 - 1080p(sf)/23.98
 - 720p/59.94
 - 720p50
 - SD525
 - SD625
- Video offset delay between 0 and 500ms per video
- Quad Speed Audio ADD-ON bus for bidirectional audio processing
 - Streaming channel 1-32
- 4 analog audio inputs (on G/HMA110)
- 4 analog audio outputs (on G/HMA120)
- 4 digital audio inputs (on G/HMA130)
- 4 digital audio outputs (on G/HMA140)
- Append and overwrite modes
- Audio level and phase control for the channels that enter the embedders
- Audio offset delay up to 5000 ms for the channels that enter the embedders
- Peak detection 0dBFS
- Transparent for ATC time code RP188, RP196, RP215
- Locks to Tri-level, Bi-level syncs or input
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)
- Optional fiber transceiver for MADI
- Optional 1 fiber input or 1 fiber output (replacing 1 SDI input or output) on the I/O panel
- Optional relay bypass (BHX18)

Complementary cards:

- DLA41/42/43/44, DAW77/88/99 and DIO88 (plus all future quad speed audio ADD-ON cards)

Applications

- 3Gb/s, HD and SD embedded domain to MAD I and vice versa shuffler
- In video routing audio shuffler via MAD I TDM bus (2 GMA100 will give a 4 Video 64 audio channel anything to anything shuffler)
- MAD I audio (mixing console) to embedded video converter.

Input options

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
GMA100	None	None
HMA100	None	None
GMA110	4 analog inputs (4 channels)	None
HMA110	4 analog inputs (4 channels)	None
GMA120	None	4 analog outputs (4 channels)
HMA120	None	4 analog outputs (4 channels)
GMA130	4 AES/EBU inputs (8 channels)	None
HMA130	4 AES/EBU inputs (8 channels)	None
GMA140	None	4 AES/EBU outputs (8 channels)
HMA140	None	4 AES/EBU outputs (8 channels)

Ordering information

Module:

- **GMA100:** Dual channel 3Gb/s, HD, SD embedded MAD I shuffler
- **HMA100:** Dual channel HD, SD embedded MAD I shuffler
- **GMA110:** Dual channel 3Gb/s, HD, SD embedded MAD I shuffler with analog audio inputs
- **HMA110:** Dual channel HD, SD embedded MAD I shuffler with analog audio inputs
- **GMA120:** Dual channel 3Gb/s, HD, SD embedded MAD I shuffler with analog audio outputs
- **HMA120:** Dual channel HD, SD embedded MAD I shuffler with analog audio outputs
- **GMA130:** Dual channel 3Gb/s, HD, SD embedded MAD I shuffler with digital audio inputs
- **HMA130:** Dual channel HD, SD embedded MAD I shuffler with digital audio inputs
- **GMA140:** Dual channel 3Gb/s, HD, SD embedded MAD I shuffler with digital audio outputs
- **HMA140:** Dual channel HD, SD embedded MAD I shuffler with digital audio outputs

Standard I/O:

- **BPH18M_GMAxxx:** I/O panel for GMAxxx with unbalanced 75 Ohm inputs/outputs

Fiber I/O:

- **BPH18MT_FC/PC_GMAxxx:** I/O panel for G-HMAxxx with fiber transmitter on FC/PC
- **BPH18MT_SC_GMAxxx:** I/O panel for G-HMAxxx with fiber transmitter on SC
- **BPH18MR_FC/PC_GMAxxx:** I/O panel for G-HMAxxx with fiber receiver on FC/PC
- **BPH18MR_SC_GMAxxx:** I/O panel for G-HMAxxx with fiber receiver on SC
- **SFP-FIBER-TR:** Single 3Gb/s, HD, SD SDI long range receiver for BPH18M/BHX18M

Relay bypass I/O:

- **BHX18M_GMAxxx:** I/O panel for GMAxxx with unbalanced 75 Ohm inputs/outputs with relay bypass

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

Serial Video Output

Number of Outputs	2
Connector	BNC
Signal Level	800mV nominal
DC Offset	0V \pm 0.5V
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

MADI I/O

Number of Input/Outputs	2
Connector	Din1.0/2.3 75 Ohm according to AES10-2008
Link Transmission Rate	125 Mb/s (+/- 100ppm) (Varispeed not supported)
Output Voltage	800 mV nominal
Rise and Fall times	1ns nominal
Cable length	Typical maximum equalized length of Belden 1694A cable: 150m at 125Mb/s

Reference Input through RRC

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

Miscellaneous

Weight	Approx. 250g
Operating Temperature	0 °C to +50 °C
Dimensions	137 x 296 x 20 mm (HxLxD)

Electrical

Voltage	+24V to +30V
Power	<15 Watts