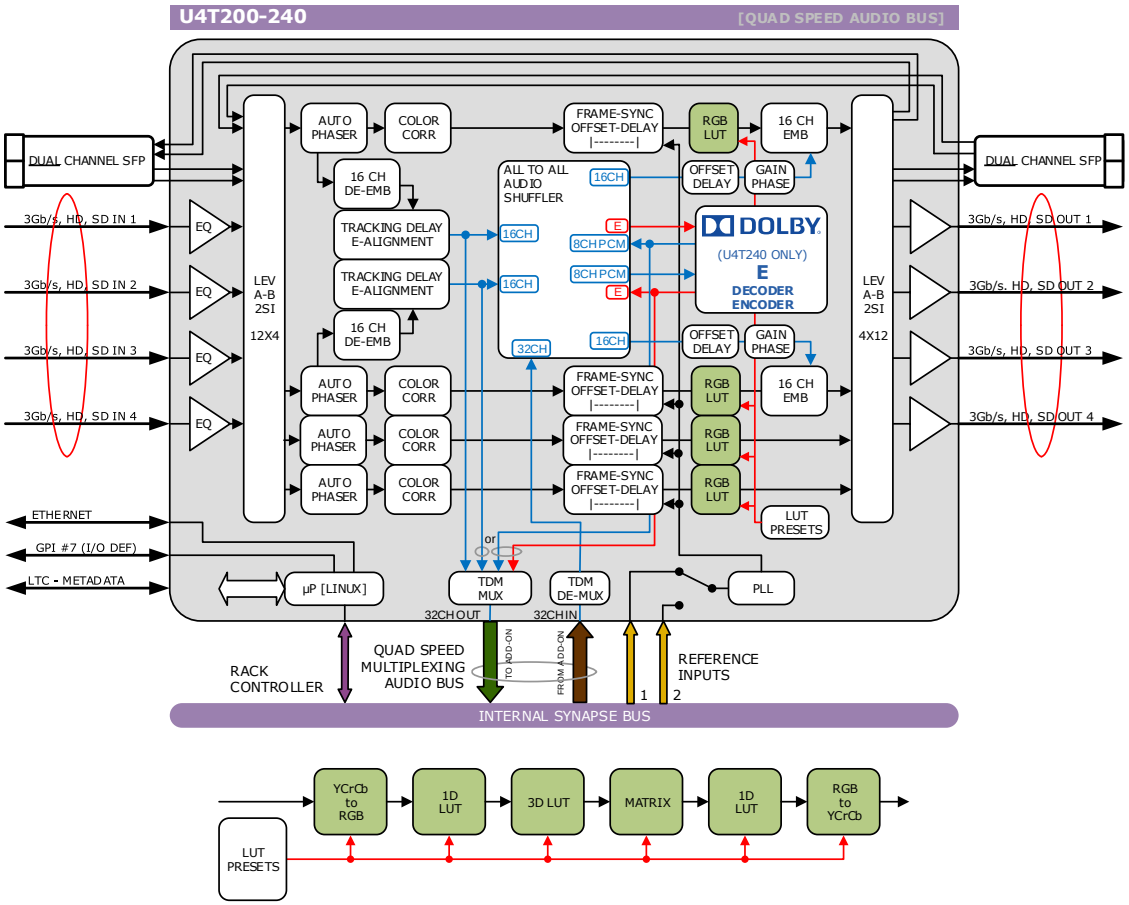
U4T200-240

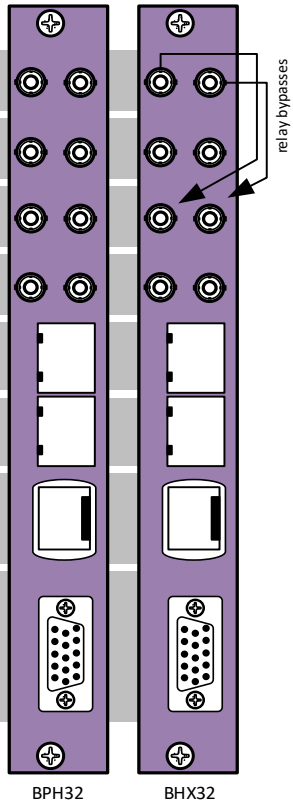
4K (3840x2160) Ultra HD 4 wire toolbox with
LUT based color space and dynamic range converter
And optional Dolby E processing

A Synapse® product

Block schematic & I/O panel



3Gb/s, HD, SD SDI INPUT 1	3Gb/s, HD, SD SDI INPUT 2
3Gb/s, HD, SD SDI INPUT 3	3Gb/s, HD, SD SDI INPUT 4
3Gb/s, HD, SD SDI OUTPUT 1	3Gb/s, HD, SD SDI OUTPUT 2
3Gb/s, HD, SD SDI OUTPUT 3	3Gb/s, HD, SD SDI OUTPUT 4
INPUT/OUTPUT SFP-1 (DUAL CHANNEL)	
INPUT/OUTPUT SFP-2 (DUAL CHANNEL)	
Gigabit ETHERNET	
GPI I/O, LTC, METADATA	



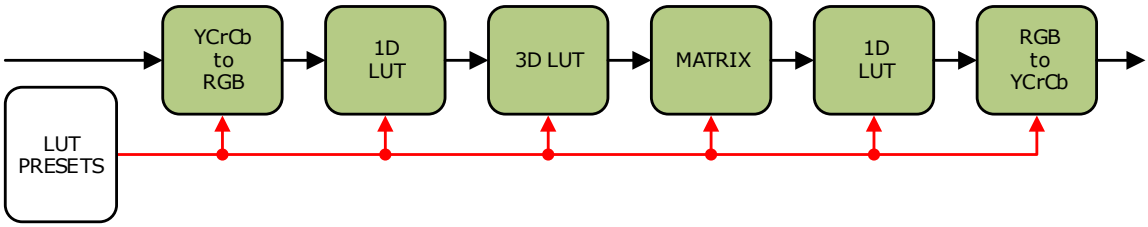
Features

The U4T200 and U4T240 are 4k (4 wire) production toolboxes that will ease the challenges of a 4 wire production setup where the left top corner (channel A) is used to carry VANC and HANC data like timecode and embedded audio. We also added a second quadrant audio de-embedder and embedder with full audio shuffling.

The difference between the U4T100/140 and U4T200/240 is the addition of a LUT based color space and dynamic range conversion. The LUT can be stored on 16 presets and selected on the fly. The unit is compatible with standard LUT tables in either 1D and 3D format

The I/O is capable of handling four times 1080p formatted as level A, level B or 2Si (two sample interleaved). The card can also be used with 1080i, 720p, SD and 1080psf 23.98.

The '240' has an extra Dolby E encoder and decoder on board and will be capable of handling these signals internally. A Quad Speed Audio bus can be used for additional Dolby E processing or other audio processing by using an ADD-ON card like the DEE28.



This topology will give you the opportunity to perform three methods fully preset based across modes:

1 YCrCb to RGB > 1D LUT > RGB to YCrCb
2 YCrCb to RGB > 3D LUT > RGB to YCrCb
3 YCrCb to RGB > 1D LUT > Matrix > 1D LUT > RGB to YCrCb

- *LUT based Color space and Dynamic range conversion.*
- *16 LUT presets for standard LUT tables (.cube, .LUT, .txt)*
- *1D LUT 10bits 1024 RGB values (1024x3 rows)*
- *3D LUT 10bits 35.937 RGB values (33x33x33)*
- *Side by Side split screen mode with slider for evaluation of LUT*
- *LUT bypass mode*
- *Compatible with ITU-R BT709 and ITU-R BT.2020 I/O (conversion matrix from YCrCb to RGB and back)*
- Extremely low intrinsic latency of 5 lines
- 4 inputs
  - Separate internal processing channels
  - input autophasers
  - Framesyncs and offset delay blocks controllable in two stages (LeftTop+rest)
- 4 outputs
- RGB color correction of all 4 processing channels as one
- 4K 4 wire (3840 x 2160)
- Level A,B and 2Si compliant
- Compatible with the following formats
  - 1080p59.94
  - 1080p50
  - 1080i59.94
  - 1080i50
  - 720p59.94
  - 720p50
  - SD 525 and SD 625
  - 1080psf 23.98
- Transparent for 32 channels of embedded audio in first and second video quadrant.

- Full audio shuffling between all audio sources and destinations.
  - Move audio from quadrant 1 to quadrant 2
  - 32 channel Quad Speed Bus connectivity
    Quad Speed Bus out channel 17 to 32 are De-embbeder 2 ***or*** the Dolby Channels
  - All channels (embedded and QSB) can be a source for the Dolby processor
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Applications

- All 4k 4 wire challenges
- 4 wire synchronization and alignment
- embedding and de-embedding in all UHD applications
- Encoding and decoding to and from Dolby E embedded data
- Color correction
- Level A to level B or to 2Si conversion in any direction.

Complementary cards

- DEE28 for extra Dolby E processing. Up to 3 extra cards for 4 Dolby E channels total
- DIO88 for physical AES/EBU I/O
- All other Quad Speed Bus Cards like DSF66, DLAxx

Ordering information

Module:
- **U4T200:** 4k (4 wire) toolbox
- **U4T240:** 4k (4 wire) toolbox with embedded Dolby processing

Standard I/O:
- **BPH32_U4T200:** I/O panel for U4T200 or U4T240

Relay bypass I/O:
- **BHX32_U4T200:** I/O panel for U4T200 or U4T240 with relay bypass

Fiber outputs:
- **Standard video SFP**

Fiber inputs:
- **Standard video SFP**

Specifications

Serial Video Input

Standard	3Gb/s SDI:SMPTE424/5 (Level B)
Number of Inputs	4 (up to 8)
Connector	DIN 1.0/2.3
Equalization	Typical maximum equalized length of Belden 1694A cable: 90m at 2.97Gb/s, 120m at 1.485Gb/s,
Return Loss	> 15dB up to 1.5GHz

Serial Video Output

Number of Outputs	4 (up to 8)
Connector	DIN 1.0/2.3
Signal Level	800mV nominal
DC Offset	0V ±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

Miscellaneous

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

Electrical

Voltage	+24V to +30V
Power	20 Watts