



UXU400 – UXU410

High End 4k (UHD), 3Gb/s, HD, SD up/down/cross converter with
LUT based color space and dynamic range converter
Synchronizer with optional audio shuffler

A Synapse® product

The Synapse logo, which is the word "Synapse" written in a light blue, cursive script font with a slight shadow effect.

MASTER
Card

3 TRIPLE RATE
Gb/s, HD, SD

4K
ULTRAHD
3840 x 2160

AFD ready
S2016

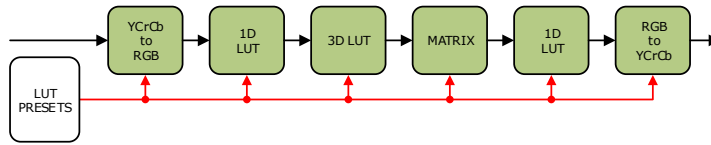
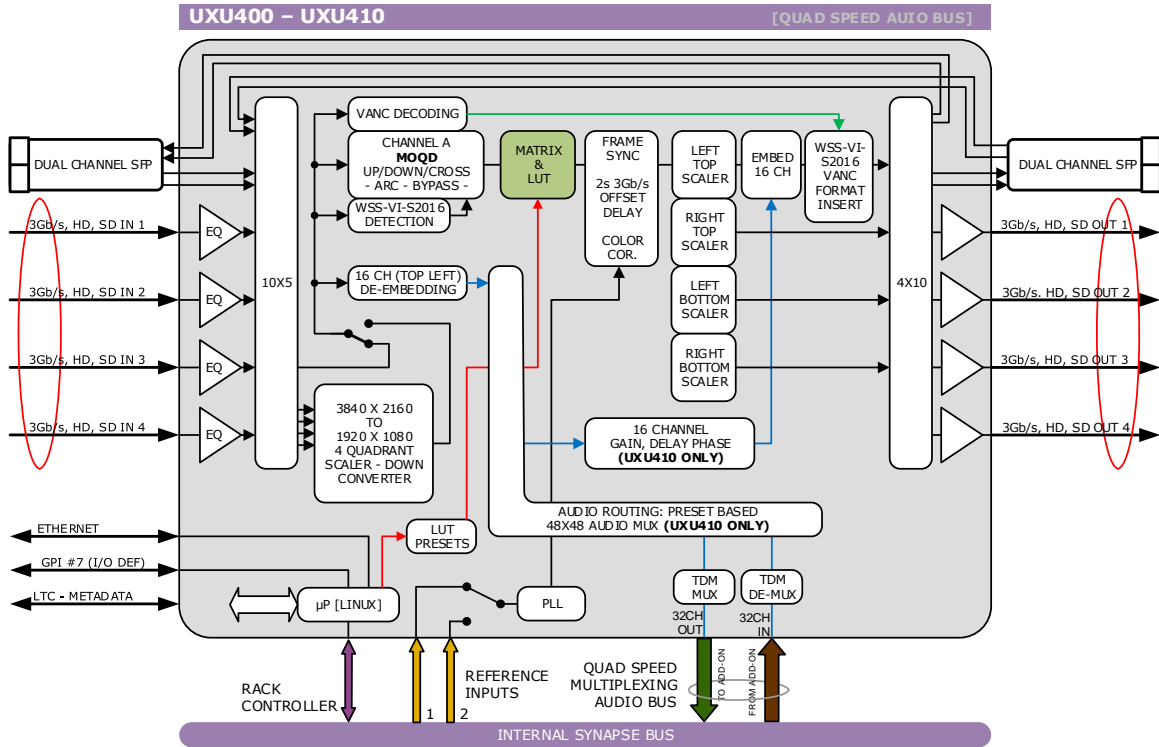


SFP Flexible I/O

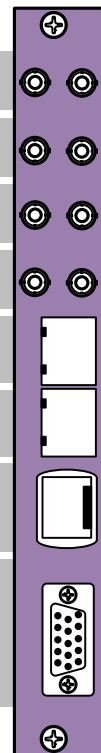
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Block schematic & I/O panel



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)	
ETHERNET	
GPI I/O, LTC, METADATA	



BPH32

Features

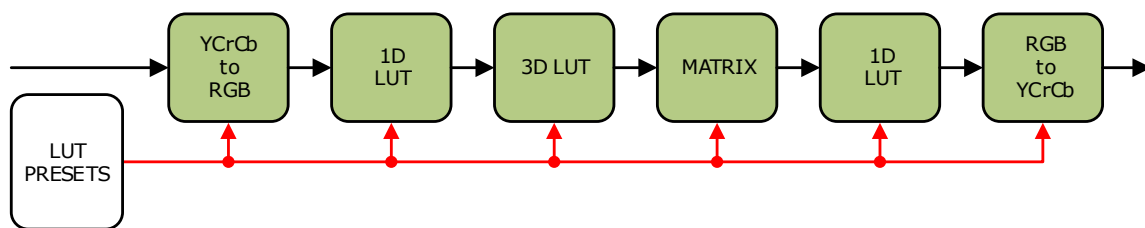
The UXU400/410 is a HIGH END up/down/cross converter. Based on Axon's **Motion Optimized Quality De-interlacer (MOQD)**, and extensively computer optimized scaling and filter algorithms the new 400 series of up/down/cross converters ensure the absolute best quality video conversion from any standard to any standard within the same framerate. The card allows you to simulcast any output standard in any format from any source standard.

The embedded audio is carried over to the SD, HD or 3Gb/s domain. The appropriate aspect ratio can be applied by control of VI, WSS and GPI inputs by use of 16 presets per output that can store the aspect ratio conversions.

Also included is a 4K 4 wire interface. The UXU400 and UXU410 can up and down convert to and from 4k (3840x2160)

The difference between the GXG400/410 and UXU400/410 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

Beside a high quality up/down/cross converter, these cards also have very powerful cross-input audio shufflers and proc-amps (410 only). Any of the 64 audio source channels (16 from SDI 1, and 32 from the quad speed audio bus) can be routed to any of the 48 output channels (16 to SDI output 1 and 32 to the quad seed audio bus)



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)*
- *Industry highest quality de-interlacing algorithm using Axon's MOQD*
- *4 SDI inputs*
- *Up to 4 optional extra inputs/outputs by use of 2 SFP cages (fiber or copper, CVBS and HDMI)*
- *Medium latency conversion process (2 frames)*
- *Compatible with the following input (auto selecting) and output formats (only one output standard can be chosen for both outputs simultaneously)*

- 1080p/59.94
- 1080p/50
- 1080i/59.94
- 1080i/50
- 1080p/29.97
- 1080p/25
- 720p/59.94
- 720p/50
- SD525
- SD625
- 3840x2160/50 UHD
- 3840x2160/59.94 UHD
- 3Gb/s signals level A and level B compatible (also 4k I/O)
- Frame sync with auto-phaser and control in Frames, Lines and pixels with respect to reference. Delay setting are stored per output format for a constant latency operation.
 - 25 Frames delay offset (per channel) for all 1080 formats
 - 25 Frames delay offset (per channel) for all 720 standards
 - 25 Frames delay offset (per channel) for all SD standards
- All ARC modes contain Anamorphic, Center Cut, V-Zoom, LBox-16:9, LBox-14:9, PBox-4:3, PBox-14:9 and Variable H and V (50-200%)
- 16 free individual programmable preset banks with settings for:
 - Down conversion
 - Up conversion
 - Cross Conversion
 - Transparent pass through (with ARC function)
 - Simultaneous VI, WSS and AFD (S2016) insertion
 - Embedder shuffling, gain and phase (any to any (in 410 only))
 - audio delay setting
- Multiple GPI inputs/outputs with predefined modes:
 - Mode 1 = 16 (4 bit) preset choice + take and 3 GPI outputs)
 - Mode 2 = 8 presets by single GPI trigger
 - Mode 3 = TBD
 - Mode 4 = TBD
- ARC triggers by VI, WSS, WSS-ext and S2016 (AFD)
- Transparent for 16 channels of embedded audio per video channel
- Embedded domain 64x64 routing to and from the individual in/outputs and Quad Speed Audio Bus (410 only)
- Quad Speed Embedding and de-embedding through synapse bus
- Video proc-amp (Y and C control)
- Color corrector (RGB and total gain, RGB and total black)
- Hue control for 59.94 SDI inputs
- Locks to Tri-level, Bi-level or SDI input 1 or 2
- Full control and status monitoring through the front panel of the SFR04/SFR08/SFR18 frame and the Ethernet port (ACP)

Complementary cards:

- DIO88, DLA44/43/42/41, DAW30, DSF66, DDP24/94, DBD28 or any future Quad Speed Bus ADD-ON card

Conversion capabilities

		CONVERSION	Output													
			2160p59.94	2160p50	1080p59.94	1080p50	1080p29.97	1080p25	1080i59.94	1080i50	720p59.94	720p50	720p29.97	720p25	480i59.94(525)	576i50(625)
HDMI Input	SDII Input	2160p59.94			x		x		x		x		x		x	
		2160p50				x		x		x		x		x		x
		1080p59.94	x		x		x		x		x		x		x	
		1080p50		x		x		x		x		x		x		x
		1080p29.97	x		x		x		x		x		x		x	
		1080p25		x		x		x		x		x		x		x
		1080i59.94	x		x		x		x		x		x		x	
		1080i50		x		x		x		x		x		x		x
		720p59.94	x		x		x		x		x		x		x	
		720p50		x		x		x		x		x		x		x
		720p29.97	x		x		x		x		x		x		x	
		720p25		x		x		x		x		x		x		x
		480i59.94(525)	x		x		x		x		x		x		x	
		576i50(625)		x		x		x		x		x		x		x
CVBS	480i59.94(NTSC)	x		x		x		x		x		x		x		
	576i50(PAL)		x		x		x		x		x		x		x	

Applications

- LUT based color space and Dynamic Range conversion from UHD to HD and back
- High End Truck dual input frame synchronizer and anything to anything converter
- High End Infrastructure up/down/cross conversion
- High End transmission up/cross conversion
- UHD (4k) up and down conversion from and to any supported video standard in the same frequency

Ordering information

Module:

- **UXU410:** High End 3Gb/s, HD, SD-SDI up/down/cross converter with full audio shuffling and HDR+WCG conversion
- **UXU400:** High End 3Gb/s, HD, SD-SDI up/down/cross converter and HDR+WCG conversion

Standard I/O:

- **BPH32_UXU410:** I/O panel for UXU410

Fiber outputs:

- **Standard video SFP**

Fiber inputs:

- **Standard video SFP**

Specifications

Serial video input

Standard	SD,HD and 3Gb/s SDI: SMPTE 292M, SMPTE 259M, SMPTE424
Number of inputs	4 (+ up to 4 via SFP cage)
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, and 250m at 270Mb/s
Return loss	> 15dB up to 1.5GHz

Serial video output

Number of outputs	4 (+ up to 4 via SFP cage)
Connector	DIN 1.0/2.3
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)
Wideband jitter	< 0.2UI

Reference Input through RRC

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

Miscellaneous

Weight	Approx. 550g
Operating temperature	0 °C to +40 °C
Dimensions	137 x 296 x 20 mm (HxWxD)

Electrical

Voltage	+24V to +30V
Power	24W