

UHD Solutions

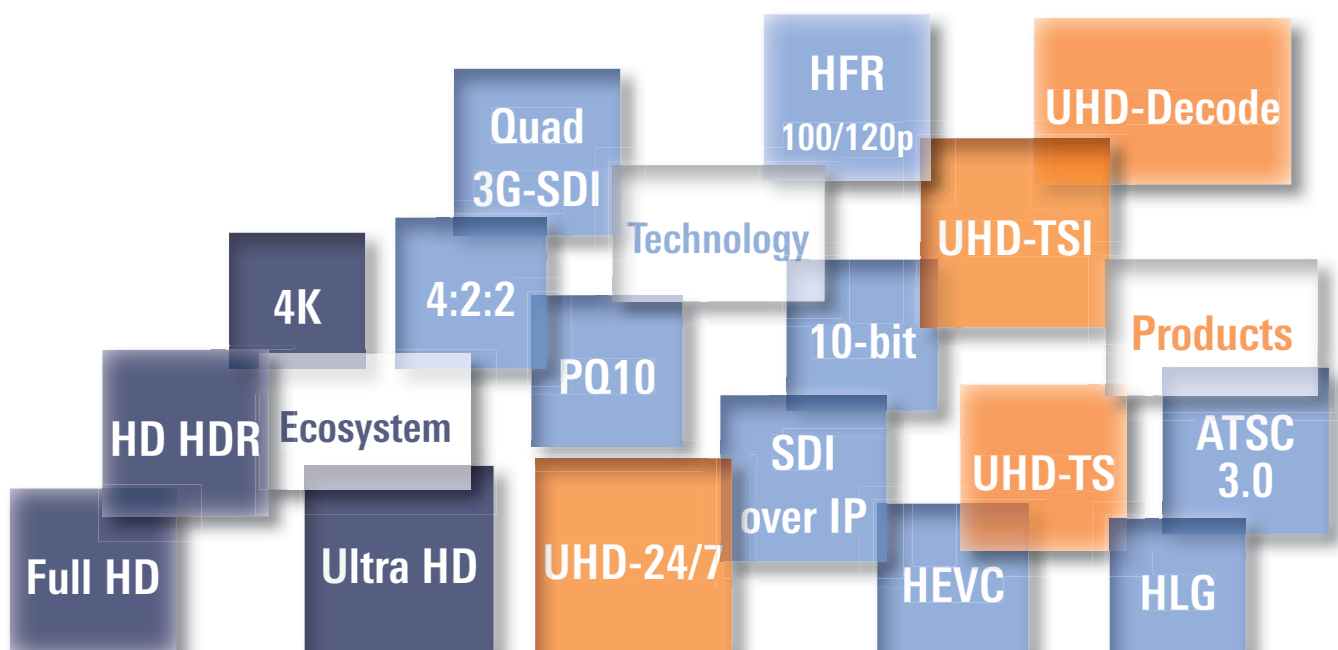
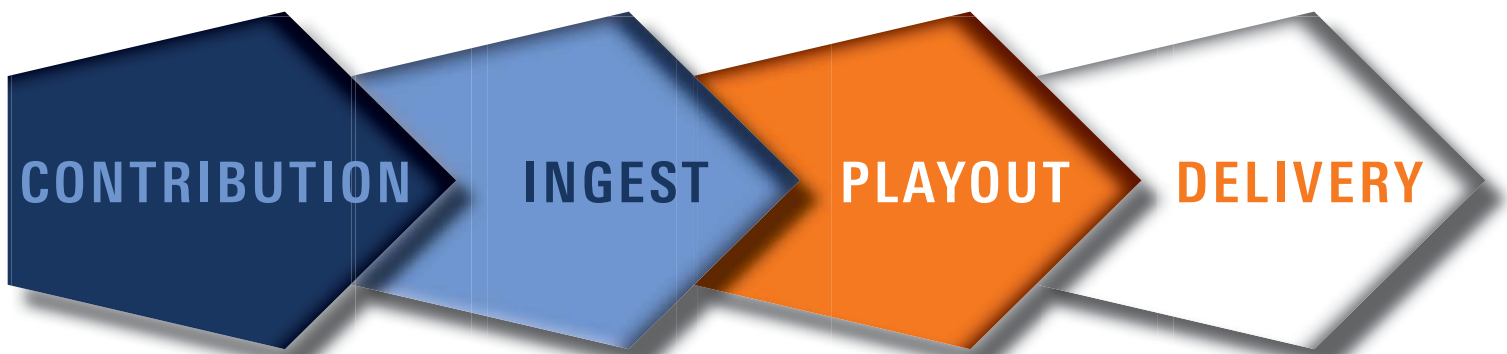
Software-based Video Processing
for Live, Linear Broadcast and IPTV

Ultra HD, also named 4K, is now a reality for a large number of linear channels around the world, mostly distributed over satellite broadcast and IPTV networks. Some terrestrial broadcast trials have also been carried out for months if not years already in certain countries.

Indeniably, 4K / UHD is here to deeply modify the video landscape along with emerging technologies such as High Dynamic Range [HDR], Wide Color Gamut [WCG ie. BT2020/2100], then followed by High Frame Rate [HFR] at 100/120fps and later 8K.

Being an Ultra HD pioneer since 2013, BBright proposes a range of solutions from the lowest cost UHD Transport Stream demo loop, to features rich UHD trials and up to the most advanced integrated UHD playout with graphics insertions for a live channel.

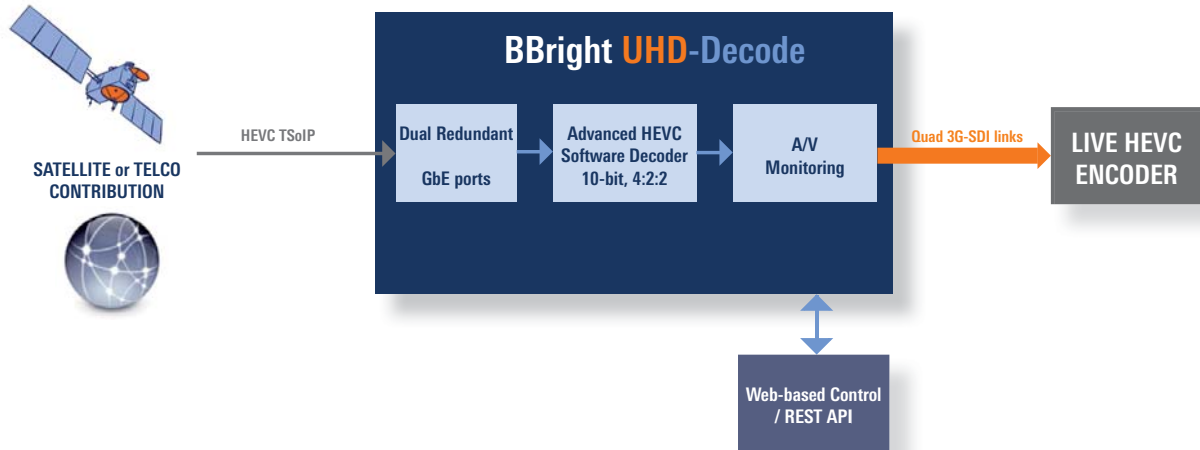
Working with an UHD expert provides a wealth of experience, allowing to save deployment time by selecting field proven appliances fully supporting these new and demanding video technologies.



USE-CASE: Ultra HD CONTRIBUTION

For Live and Linear Channels Decoding and Monitoring

- Ultra HD (3840 x 2160p) at 25, 29.97, 30, 50, 59.94, 60fps HEVC / H.265 decoding
- HEVC / H.265, 10-bit, 4:2:2 decoding
- TSoVerIP Multicast (UDP / RTP) input, up to 130Mbps
- Quad 3G-SDI outputs, Level A and Level B, four quadrants or 2-SI pixels
- HDR compliant: PQ10 and HLG
- HDMI 2.0a / 2.0b [option]



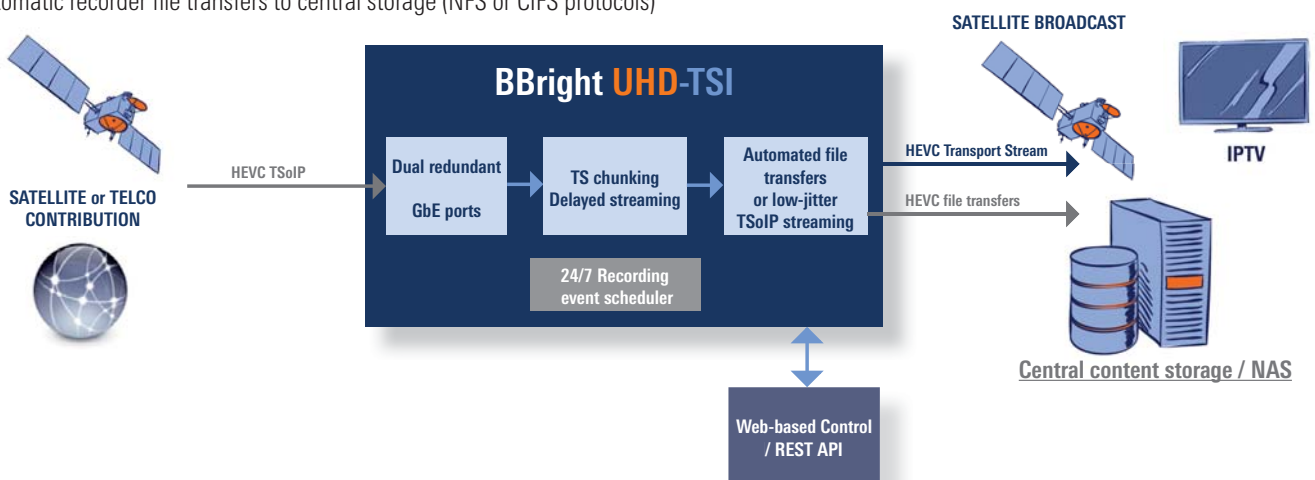
ORDERING INFORMATION and OPTIONS

- Part number: **UHD-Decode**
- Software option: **High bit rate (> 80Mbps)**

USE-CASE: Ultra HD Transport Stream INGEST

For Linear or Live High Bit Rate TS Contribution Recording

- Ultra HD (3840 x 2160p) at 25, 29.97, 30, 50, 59.94, 60fps, or Full HD / HD / SD transport stream recording
- Dual TSoVerIP Multicast (UDP / RTP) inputs, with IGMPv3 SSM and FEC, up to 130Mbps
- Live stream input monitoring; video thumbnails and audio meters
- HDR compliant: PQ10 and HLG
- 24/7 recording event scheduler on GUI
- Automatic recorder file transfers to central storage (NFS or CIFS protocols)



ORDERING INFORMATION and OPTIONS

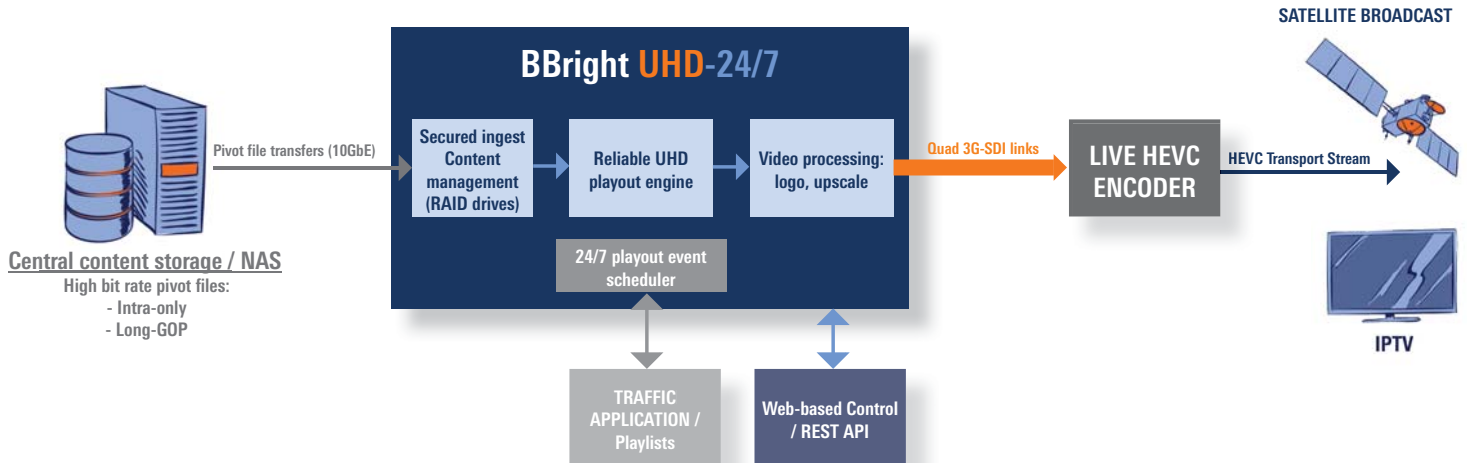
- Part number: **UHD-TSI** (3 TB storage)
- Software option: **Time delay streamer**

UHD Solutions Playout - Delivery

USE-CASE: Ultra HD Baseband **PLAYOUT**

■ For Advanced Linear Channels with Scheduler and Dynamic Logos / Channel Branding

- Ultra HD output (3840 x 2160p) at 25, 29.97, 30, 50, 59.94, 60fps, or Full HD (1920 x 1080p)
- Multiple XAVC, AVC, HEVC, ProRes 4:2:2 pivot formats
- HDR compliant: PQ10 and HLG
- Multiple logo insertions (still or animated), fixed or scheduled
- 24/7 playout event scheduler on GUI or external playlist import [option]
- Automatic content purge and faster than real-time file ingest



ORDERING INFORMATION and OPTIONS

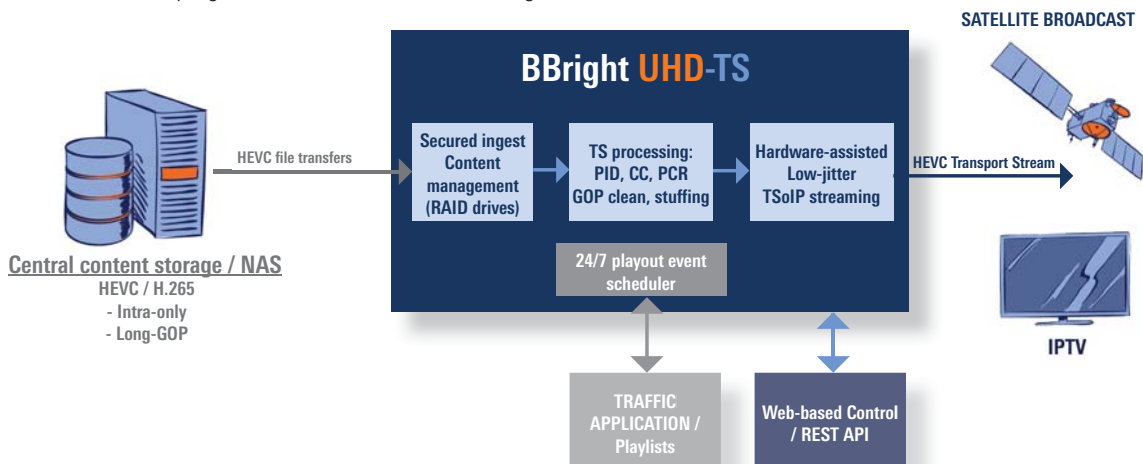
- Part number: **UHD-24/7** (7 TB storage)
- Software option: **Playout scheduler**



USE-CASE: Ultra HD Transport Stream **DELIVERY**

■ For Linear Channels with Scheduler or Simple Demo Loops

- Ultra HD (3840 x 2160p) at 25, 29.97, 30, 50, 59.94, 60fps, or Full HD / HD / SD streaming
- HEVC / H.265 and AVC / H.264 low-jitter TSoverIP Multicast (UDP / RTP)
- Raw TS, or PID remapping, bit rate stuffing, PCR and Continuity Counter alignment, GOP cleaning
- HDR compliant: PQ10 and HLG
- 24/7 playout event scheduler on GUI or external playlist import [option]
- Automatic content purge and faster than real-time file ingest

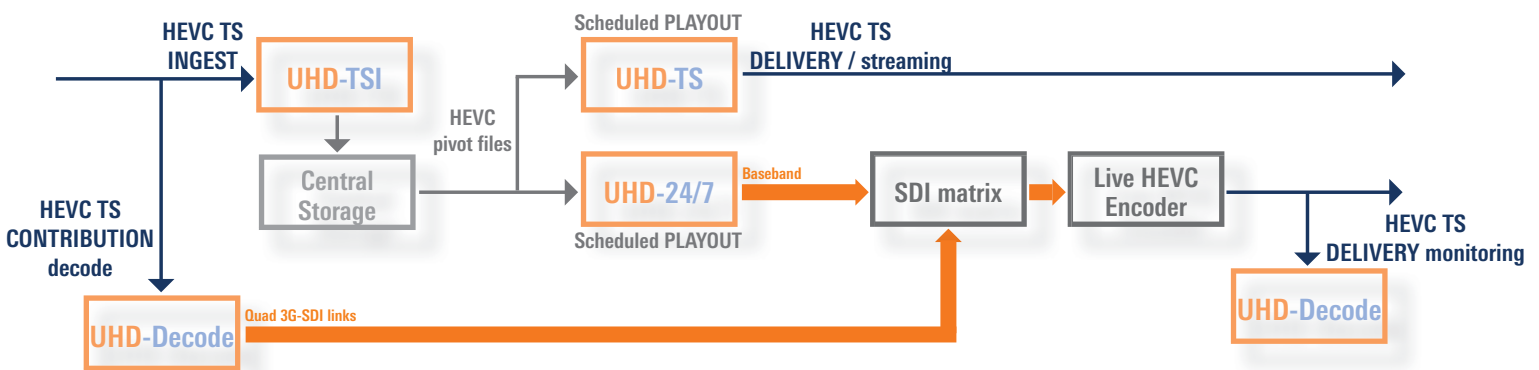


ORDERING INFORMATION and OPTIONS

- Part number: **UHD-TS** (1 TB or 3 TB storage)
- Software option: **Playout scheduler**



UHD Solutions Contribution - Ingest - Playout - Delivery



ULTRA HD GLOSSARY

- **ATSC 3.0**, Advance Television Standard Committee, new 3.0 terrestrial format in USA / South Korea for UHD transmission
- **Bit depth**, Number of bits/increments used to code the luminance and chrominance. All HDR options require 10-bit video encoding
- **BT.709 / Rec. 709**, Standard color space for HD video content
- **BT.2020 / Rec. 2020**, Extended color space for UHD video content
- **BT.2100**, Specifies two options, PQ or HLG, for producing FHD / UHD phase 1 / UHD phase 2 HDR video content
- **EOTF**, Electrical Optical Transfer function; convert digital pixel values to display's light values
- **FHD / Full-HD**, Full High Definition, 1920x1080 resolution, with progressive scan
- **HDR**, High Dynamic Range for luminance i.e. refers to either PQ, HLG, Dolby Vision or Technicolor-Philips HDR schemes
- **HDR10**, HDR scheme based on PQ EOTF with static metadata
- **HEVC**, High Efficiency Video Code, also named H.265
- **HFR**, High frame Rate; applies to progressive frame rates above 60fps for television, and frame rates above 24fps for cinema
- **HLG**, HDR scheme based on Hybrid Log-Gamma OETF described in BT.2100 (together with BT.2020 and 10-bit depth). No metadata. Notes: HLG is backward compatible with SDR displays. HLG can be re-calculated from PQ
- **MaxCLL / MaxFALL**, Maximum Content Light Level / Maximum Frame-Average Light Level; brightest pixel light value in a video content / the maximum value of frame-average maxRGB for all frames in the content
- **MPEG-H**, Audio Codec for ATSC 3.0 in South Korea
- **NGA**, New Generation Audio; augmented audio channel count and/or object-based audio for a more immersive experience
- **OETF**, Optical Electrical Transfer Function; converts the captured scene light to digital pixel values
- **PQ**, HDR scheme based on Perceptual Quantization EOTF described in ST 2084. No metadata
- **SDR**, Standard Dynamic Range for HD, FHD or UHD content
- **SMPTE ST 2086**, Defines static metadata that is included with mastered HDR content to convey the color volume of the mastering display and the luminance of the content
- **SMPTE ST 2094**, Define content dependent dynamic metadata with color transforms optimized for each scene, and each display
- **Tone mapping**, Conversion of luminance values in one color space to luminance values in another color space
- **UHD (phase) 1**, Ultra High Definition at 3840 x 2160 resolution, with frame rate 25fps to 60fps, for Broadcast, IPTV, VOD, OTT use
- **UHD (phase) 2**, Ultra High Definition at 7680 x 4320 resolution, with frame rate 25fps to 120fps, for Broadcast, IPTV, VOD, OTT use
- **3G-SDI**, Baseband UHD transmission over four cables in QFHD (4 quadrants) or 2-Sample Interleaved pixels, in Level A or Level B
- **4K**, For cinema use at 4096 x 2160 resolution, with 24fps
- **8K**, Ultra High Definition at 7680 x 4320 resolution, with frame rate 59.94/60fps, for Broadcast, IPTV, VOD, OTT use

HFR and 8K UPGRADE PATH

- **High Frame Rate**: **UHD-TS, UHD-TSI, UHD-Play** servers are software upgradeable to HFR
- **8K / UHD phase 2**: **UHD-TS, UHD-TSI** servers are software upgradeable to Ultra HD phase 2 (8K)
Please contact sales for more information

February 2017, rev. 1.0. Product specifications are subject to changes without notice and are not contractual



Member of Ultra HD Forum