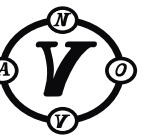


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Low-Latency Video Gateways

P-Link video gateways, powered by Perseus™, enable substantial bandwidth reduction in contribution and distribution of HDTV and UltraHDTV video.

P-Link Low-Latency Video Gateways

P-Link video gateways for video contribution, powered by Perseus™, are a line of powerful and cost-effective products designed to achieve over 3x bandwidth reduction for real-time contribution and distribution of high-quality HDTV and UltraHDTV video over IP networks.

By taking advantage of the revolutionary patented Perseus™ technology, P-Link gateways provide broadcasters and service providers with flexible and extra-efficient solutions for high quality professional video transport. The P-Link family includes the first combined SD/HD/3G/3D/UHD video gateway powered by Perseus™, and the first high efficiency real-time UltraHD video gateway.



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P-Link Low-Latency Video Gateways

Thanks to the revolutionary Perseus™ encoding technology, P-Link provides the best-in-class solution for low-latency transport of contribution quality and broadcast quality television signals over IP networks.

The patented Perseus™ compression technology enables low-latency transport of SD, HDTV, 3G-HDTV, Stereoscopic 3D and even UltraHD over IP/Ethernet links, at much lower bitrates than JPEG2000 compression.

The P-Link gateway enables broadcasters to utilize cost-efficient IP links for high quality, low-latency contribution. SRTP encapsulation ensures perfect synchronization of all video, audio and ancillary data. IP multicast allows for multi-redundant backup streams for critical live events.

P-Link enables service providers to utilize visually lossless Perseus™ compression and IP/Ethernet technology to build cost effective managed video services on top of IP-MPLS, Metro Ethernet or SONET/SDH transport networks.

P-Link video gateways can be configured via an easy-to-use web interface, which also offers extensive monitoring.

Applications

- Professional broadcast contribution, up to high-framerate UltraHD
- Live sports and event contribution
- Studio-to-studio media exchange
- Managed video services over IP
- Film post-production (editing, special effects or daily workflow)
- UltraHD telepresence

Key features

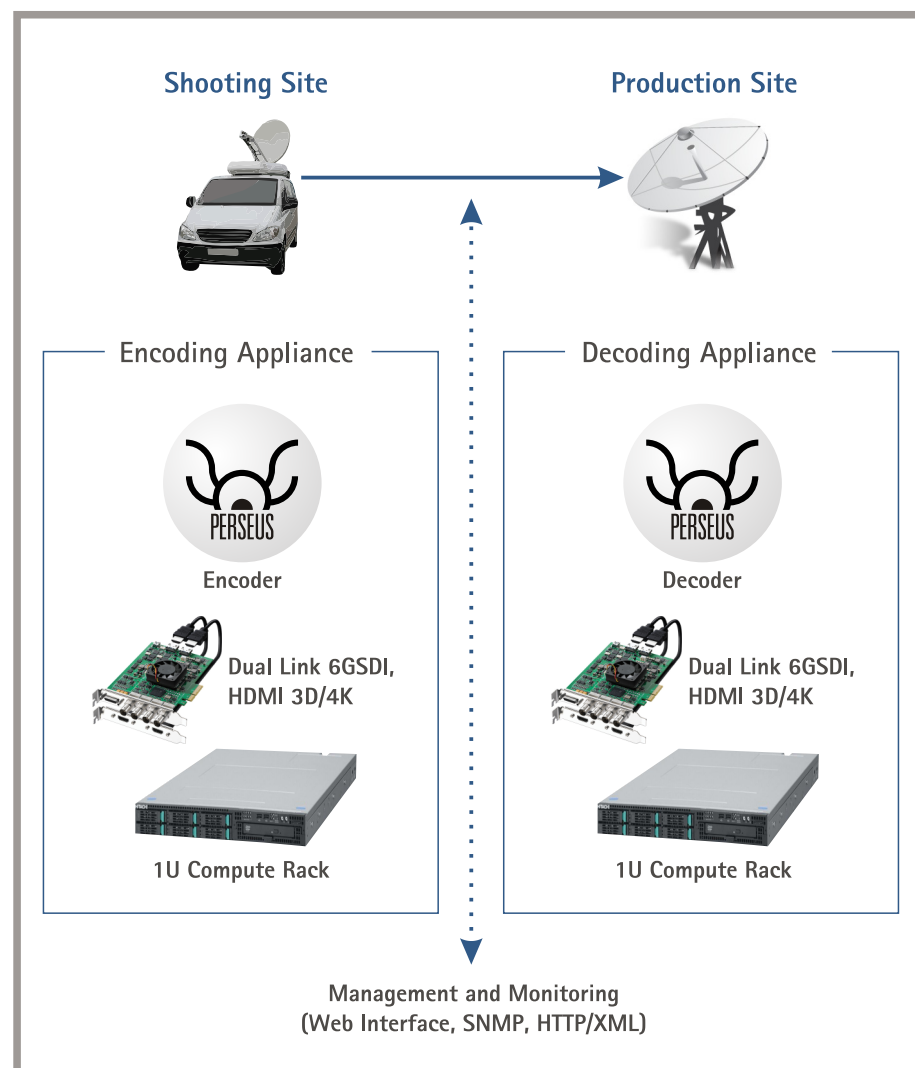
- Visually lossless Perseus™ intra-only 4:2:2 10-bit compression
- Resolutions and frame rates up to 3840p/60 UltraHD (with UHD configuration)
- Automatic rescaling of 4096x2160 camera input to 3840x2160 4K output (with UHD configuration)
- Very low end-to-end latency (intra-only encoding with no buffering)
- Precise and reliable CBR (Constant-Bit-Rate)
- Multi-channel encoding or decoding, 2 SD / HDTV or 1 UltraHDTV channel per unit
- Bidirectional mode for simultaneous encoding and decoding of SD/HD
- SRTP encapsulation for perfect synchronization of all video, audio channels and ancillary data
- External Audio input via flying lead, plus up to 16 pass-through audio channels via embedded SDI
- FEC for video over IP at no additional latency
- IP unicast, multicast and multiple unicast output
- Fail to no sync for external Mux auto switching
- Integrated frame store and reference sync on decoder
- User-friendly web GUI for real-time monitoring and control, SNMP monitoring and alerts
- Redundant power supply, rack-mountable 1U unit

Perseus™ compression technology

Thanks to the revolutionary patented Perseus™ technology, each frame/field is encoded with native 10-bit color depth and 4:2:2 YCbCr sampling at bitrates that for visually lossless video quality are typically 2.5x to 3.5x lower than the bitrates required by JPEG2000 appliances (translating into 60-70% bandwidth savings). Precise bitrate control also allows for additional bandwidth savings.

High frame-rate UltraHD support

P-Link in UHDTV configuration supports efficient low-latency transport of up to 3840p/60 UltraHD video, also providing for automatic cropping or rescaling to 3840p in case of 4096p 4K camera input.



External audio input

P-Link supports external audio input via flying lead, and also supports transmission of up to 16 mono channels of embedded SDI audio.

Transparent audio & ancillary data

Handling of audio (e.g., Dolby), whether it's linear PCM or pre-compressed audio, is fully transparent. Similarly, handling of ancillary data such as closed captioning, teletext, active format description, time code and other metadata is also fully transparent.

SRTTP encapsulation ensures perfect synchronization of video, multi-channel audio and associated ancillary data.

Robust transmission over IP

P-Link includes features to ensure robust operation and graceful degradation in the presence of IP transport impairments; buffering for IP jitter compensation, packet reordering, FEC and highly efficient error concealment with built-in frame store.

Hitless switching with IP diversity

P-Link is equipped with dual network interfaces for transport over redundant IP network links, and supports multiple IP unicast/multicast outputs per encoder.

On the decoding side, IP diversity reception enables hitless switching on packet loss or link failures.

Integrated frame store, refsyntax and test image transmission

P-Link decoder has a built-in frame store for locking the output SDI signal to an external reference sync signal (black burst / tri-level sync).

An encoder can be configured to transmit an internally generated test image at a configurable constant bitrate, to allow testing of network links prior to a live event.

Redundant hot-plug power supply and high reliability

The Hitachi compute servers used for P-Link meet the demanding needs of mission critical applications, with enterprise-class features such as hot-swap and redundant components for high availability.

Video interfaces	
Number of ports	2x3G/HD-SDI input ports 2x3G/HD-SDI output ports
Connector	Female BMC (75 Ohm)
Reference sync input	Tri-level and bi-level (black burst)
Video formats	
SD-SDI (maximum 2 channels)	SMPTE-259-C 625i25, 525i29.97
HD-SDI (maximum 2 channels)	SMPTE-292 720p50, 720p59.94, 720p60, 1080i25, 1080i29.97, 1080i30
3G-SDI (maximum 1 channel)	SMPTE-424 1080p50, 1080p60, 1080p59.94
Stereoscopic 3D HD-SDI (maximum 1 channel)	2x SMPTE-292
Dual-link 3G UltraHD (maximum 1 channel, requires UHD config.)	SMPTE-2036-1, 4K 3840x2160p25, 3840x2160p29.97, 3840x2160p50, 3840x2160p59.94, 4096x2160 also supported
Video compression	
Video compression	V-Nova Perseus™ 1
Video format	YCbCr 4:2:2, 10-bit per component
Number of channels	Up to 2 for SD/HDTV or 1 for 3G-HDTV, 3D and UltraHD
Video encoding bitrates	15 – 100 Mbit/s for HDTV 20 – 100 Mbit/s for 3G-HDTV 30 – 200 Mbit/s for UHDTV
Video encapsulation	SRTTP
Forward error correction	FEC over IP (based on ST2022 FEC)
Management and Monitoring	
Connector type	RJ-45
Features	Web interface, SNMP/Rest/Jason
Alarm relay	SNMP alarm
Monitoring video output	HDMI output dedicated
Physical and power	
Dimensions	1U full-width 19" industry-standard rack server
Power supply	Redundant hot-plug power supply
Operating temperatures	10°C to 35°C at sea level (storage temperatures -30°C to 60°C)

Product options	
P-Link-I	HDTV Gateway powered by Perseus™ encoding/decoding
P-Link-I-UHD	UltraHD encoding/decoding
P-Link-I-DUAL	HDTV Gateway, 2HD or 1HD and 1SD
P-Link-I-DEC	Decoder only, 1HD
P-Link-I-DEC-DUAL	Decoder only, 2HD or 1HD and 1SD
P-Link-I-3G	3G-SDI license for encoding/decoding
P-Link-I-3GDEC	3G-SDI license for decoding only
P-Link-I-3D	Stereoscopic 3D licence
P-Link-I-FEC	Forward error correction on IP input/output
P-Link-I-IDR	IP diversity reception (for hitless switching)
P-Link-I-SFP	Optical IP via SFP socket
P-Link-I-M2TS	ASI/MPEG2 TS pass through

"We are delighted by the Perseus-based solution developed together with Hitachi. The benefits are significant, driving substantial savings without compromising quality and enabling future-proof UltraHD capabilities. P-Link is an extremely valuable project to Sky Italy."

Massimo Bertolotti, Head of Innovation and Engineering Sky Italia