

QUASAR Ph.C™ Motion Compensated HD Upconverter

Affordable High Quality HD

Quasar Ph.C is the only HDTV upconverter that meets the quality expectations of your subscribers and advertisers. Affordable performance is now available through the application of the following proprietary S&W technology:-

Ph.C™ - motion estimation and motion compensation for optimal picture quality be the picture moving or static.

FormatFusion™ - optimized conversion for any source type - film, video, animation or any combination.

Prefix™ - Compression pre-processing - ensuring maximum quality on a compressed transmission or distribution system.

HDTV upconversion so good, the pictures jump out at you



The world's first motion compensated HDTV upconverter integrates Emmy® award winning technologies to deliver the best ever high definition pictures.



Meeting the quality demands of HDTV viewers

The growing popularity of high definition television has rapidly become one of the broadcast industry's key drivers.

Once viewers have experienced the stunning quality of HD pictures, they will settle for nothing less, and as they migrate to larger and more advanced display screens, their expectations of image quality become even greater. To maintain revenue levels without sacrificing profitability, broadcasters must be able to deliver the high quality pictures that viewers demand, without the expense of upgrading their entire plant to HD.

Upconversion is the obvious solution, but until now the choice has been limited to expensive and complex units designed primarily for post-production applications or to lower cost converters whose output does not always measure up to today's higher picture quality benchmark.

Now Quasar Ph.C, the world's first motion compensated HDTV upconverter, provides the answer. Not only does it deliver stunning upconverted pictures whatever the source, it does so at a remarkably affordable price.

Quasar Ph.C gives broadcasters the competitive edge by enabling them to produce the consistent, high standard, HD pictures their viewers expect, while maintaining a cost effective transition to HD. Users can continue working in standard definition, then, as they gradually migrate to full-scale HD operations, Quasar Ph.C provides the ultimate way to incorporate SD sources.

Advanced Snell & Wilcox technologies at the heart of Quasar Ph.C

Quasar Ph.C, with its unique FormatFusion process, represents the latest generation of high definition conversion products from Snell & Wilcox, whose twenty year track record in HD signal processing conversion was recognized with an Emmy award for HDTV up and downconversion in 2000.

Quasar Ph.C's world beating performance is based on this know-how and on the integration of three other Emmy award winning Snell & Wilcox technologies. Such advanced technology has never before been available in a product in this price range.

- **Ph.C** motion estimation guarantees that the resolution of Quasar Ph.C's upconversion output is maximized. Its algorithm has been customized to provide the best possible results for all types of material.
- 2:3 pull down detection based on **DEFT™** technology, handles the tricky frame rate issues associated with the upconversion of film originated video and mixed media.
- **Prefix** pre-processing applies a uniquely powerful 3D wavelet based algorithm to remove noise and other unwanted elements from the signal. This ensures that, when compressed, Quasar Ph.C's output uses the minimum valuable bandwidth, while retaining maximum fidelity and resolution. This is especially important in applications where the output is fed to a transmission or distribution encoder. Compression pre-processors used in conventional HD upconverters reduce bandwidth at the expense of picture quality. Their output is soft and smeared in comparison.

Additional Quasar Ph.C features

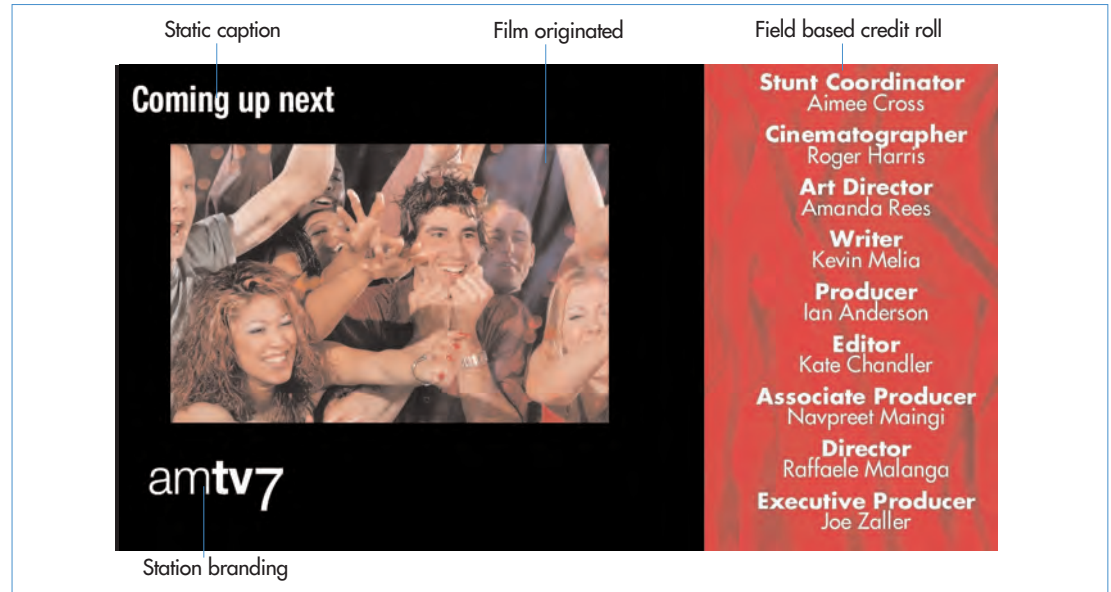
- **Enhancer** - a sophisticated enhancement control means that even legacy formats look good in HD.
- **Gamut Legalizer** - guarantees that all output is within legal limits making it suitable for the broadcast signal chain.
- **Color Space Converter** - provides conversion from SD Rec. 601 to HD BTU709.
- **Aspect Ratio Converter** - Allows sources to be reformatted with the most common options available as presets. Support for widescreen signalling enables seamless integration in the playout environment.
- **Closed Captions** - handled and converted to ensure compliance with legal obligations.

Low cost of ownership

Quasar Ph.C was designed from the ground up with plug & play operation in mind.

- It works straight from the box; installation expertise and time are minimized.
- Operational costs are reduced as no adjustments are required during operation.
- It's a complete system in a 1RU box, so no external devices are required, freeing up valuable real estate.

Outstanding performance whatever the source material - Quasar Ph.C deals with it all simultaneously



One of the greatest challenges in HD upconversion is to ensure flawless results regardless of the type of material being processed and the amount and variety of motion it contains - whether it's action-packed sporting events or graphics-rich commercials.

A further complication is that the majority of video material to be upconverted is likely to be composed of a mixture of sources such as film - with its 2:3 and 2:2 cadences - mixed film and video, captions, graphics, logos and, most importantly, station branding. Conventional HD upconverters use either linear or motion adaptive processing techniques, both of which tend to produce visible artifacts.

Linear conversion involves processing compromises that can create ringing or softness in the output. Adaptive mode switching causes intermittent loss of clarity and definition as well as producing objectionable artifacts on all but the simplest material. With both of these approaches, the maximum vertical resolution possible with a moving video scene is half the resolution of the input. This means that the HD upconversions are always at a lower resolution than the SD video source.

Quasar Ph.C on the other hand employs Ph.C and FormatFusion. This ensures that each individual element and characteristic of the picture is seamlessly processed with absolute precision, using the most appropriate conversion algorithm. The result is a dazzlingly clear and sharp HD output regardless of the nature or complexity of the source material.

User-friendly features make Quasar Ph.C a practical choice

Quasar Ph.C upconverts SD 525 and 625 line material to 720p and 1080i HDTV formats of the same frame rate. It provides comprehensive audio support including embedded, AES and compressed formats.

Designed from the ground up for "plug & play" applications in live production, playback and mastering & repurposing, the 1RU unit with redundant power supply, is easy to set up and operate with simple, intuitive controls. Quasar Ph.C's comprehensive range of image processing functions are accessed via a front panel control display designed with operational environments in mind.

Benefits include a simple navigation aid using colored backlights on the LCD, control knobs that enable users to control multi-settings without having to navigate up and down the hierarchy of options, and single level menus for ease of navigation.



Peace of mind

With Quasar Ph.C pictures look good. The product is designed to work with all types of material.

- Stress-free operation is achieved through operationally focused features such as
- Dual redundant PSUs
 - RollCall™ - the industry leading control and monitoring system

Quasar Ph.C uses FormatFusion and Ph.C to provide the best possible conversion with maximum resolution. Other products use linear and motion adaptive techniques which suffer from issues such as ringing, softness and adaptive mode switching artifacts.

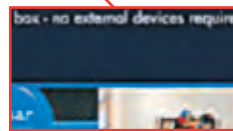
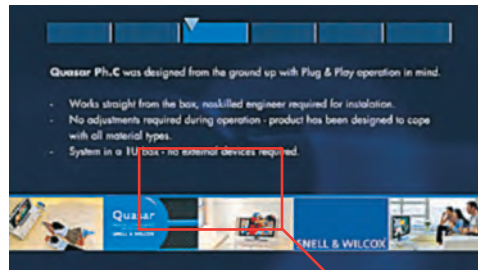
Stills
Quasar Ph.C achieves maximum resolution preserving the fine detail in graphics and sharpness of text. Softness and lack of detail are typical artifacts which are seen in other products.

Action
In fast moving sports action, detail and definition around key parts of the images such as the ball or player is critical. Quasar Ph.C uses Ph.C motion estimation and motion compensation to ensure full resolution and well defined motion. It is the only product that provides full resolution moving video images. Other products introduce blur and reduce resolution in moving areas.

Complex Pictures
A typical program output comprises many components such as station branding, credit rolls and video or animation. Quasar Ph.C handles all of these simultaneously without compromise. Other products cannot handle these types simultaneously. Image quality will be compromised.

Other Products

Stills



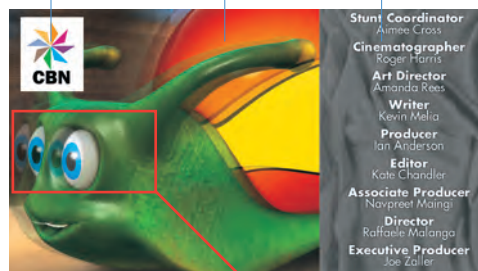
Action



Complex Picture

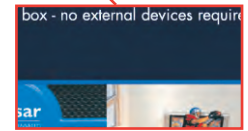
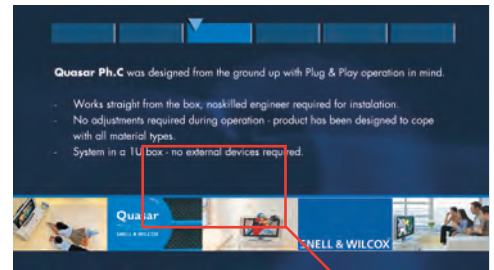
Station branding Animation

Credit roll
Frame based



Quasar Ph.C

Stills



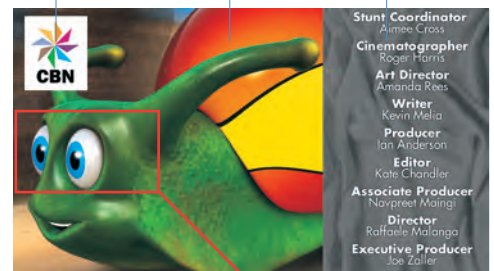
Action



Complex Picture

Station branding Animation

Credit roll
Frame based





As with all Snell & Wilcox "smart" infrastructure products, Quasar Ph.C is "self aware" and ready for centralized set up and monitoring through the RollCall network management system.

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Company policy is one of continuous product improvement. Specifications are therefore subject to change without notice.

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Signal Inputs

Serial Digital	SD 2 x 75 Ohm SD serial digital input at 270MHz, SMPTE259M-C with 8 embedded audio pairs SMPTE272M
Reference	1 x analog loop through HDTV Tri-sync SD Bi-sync SMPTE 240M/274M
Audio	4 balanced AES-3 pairs on 26 way D type

Signal Outputs

Serial Digital	HD 2 x 75 Ohm HD serial digital output at 1.48GHz, SMPTE 292 with 8 embedded audio pairs SMPTE299M
Audio	4 x balanced AES-3 pairs on 25 way D type

Control Interface

RollNet™	1 x RollCall remote via BNC
Ethernet	1 x RJ45 connector
RS422	1 x Control port 9 way D type
GPI	3 inputs, 3 Tally outputs via 15 way D type

Video Standards

Input Standard SD-SDI	625(576)/25i 525(480)/29i
Output Standard HD-SDI	750(720)/50P 750(720)/59P 1125(1080)/25i 1125(1080)/29i

Input format	Output format			
	1080/29i	720/59P	1080/25i	750/50P
525/29i	✓	✓	✗	✗
625/25i	✗	✗	✓	✓

Audio Controls

Processing	Internal processing for 8 pairs (16 channels), all internal processing applied as master (all pairs) or individually (per pair)
Mode	Master (PCM, Data, DolbyE)
Source selection	Source selection each embedded pair embed [1:8], AES [1:4], tones, mute, off Master & each pair
Gain	Master & each pair
Delay	Per pair
Invert	Per pair
Mix	Per pair

System Controls

Input	A and B Input Error action
Output	Line rate Frame rate Pattern
Synchronizer	Frame synchronizer Mode - Freerun, external, input, minimum delay, Horizontal Timing, Vertical Timing
Closed Captions and VI	SD close caption EIA608, EIA708 WSS Extract WSS / VI Insert SMPTE 2016.1

Memory
3GPI memories re-nameable
RollCall

Video Controls

Aspect Ratio Converter	Preset: 4:3>16:9PB, 4:3>14:9PB, 16:9FH>16:9, 16:9LB>16:9, 16:9S 0%, 16:9S 2.5%, 16:9S 5%, 16:9S 7.5%, User, WSS 10 User definable re-nameable memories 34 WSS memories Size, Pan, Asp, Position WSS Wide Screen Signaling Full user control provided Left, Right, Top, Bottom Full user control provided Left, Right, Top, Bottom Hue, Sat, Luma Proc Amp Luma Gain, Black Level, Chroma Gain, Hue, YC Delay, Legalize Noise Reduction/(Split Screen) Prefix MPEG Pre-processing Enhancer Ident User Memories Name, save and recall 10 user memories Input Loss Action Default Audio Output
User controls	
Input Blanking	
Output Blanking	
Blanking color	
Proc Amp	
Video Utils	
Health Monitoring	Fan Status PSU Status Unit Temperature Audio delay
Delay	Current video/audio delay OK

Reporting (also Logged)

Health Monitoring	Fan Status PSU Status Unit Temperature Audio delay
Delay	Current video/audio delay OK

RollTrack Output

Delay	Current video/audio delay
Input Status	OK

Specifications

Video Internal Processing	4:2:2 with 10 bit data paths
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Delay through the unit (Genlock Mode)

Input Locked	3 Frames
Referenced Locked	3 Frames + Synchronizer Delay
Free Run	3 Frames + Synchronizer Delay

Delay through the unit (Min Delay Mode)

525 to 720p59	1 Frame + 62SD lines or 180HD lines (Approximately 4 ms)
525 to 1080i29	1 Frame + 62SD lines or 134HD lines (Approximately 4 ms)
625 to 720p50	1 Frame + 62SD lines or 150HD lines (Approximately 4 ms)
625 to 1080i25	1 Frame +62SD lines or 112HD lines (Approximately 4 ms)

Electrical

Power Consumption	Approximately 80 W
Mains Supply	100-120V/200-240V AC 50/60Hz
Redundancy	Dual redundant power supplies
Fuse Rating	2 AT 250 V

Mechanical

Temperature Range	0° to 40° C operating
Case Type	1RU rack mounting
Dimensions	482 x 543 x 44.2 w,d,h (mm)



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