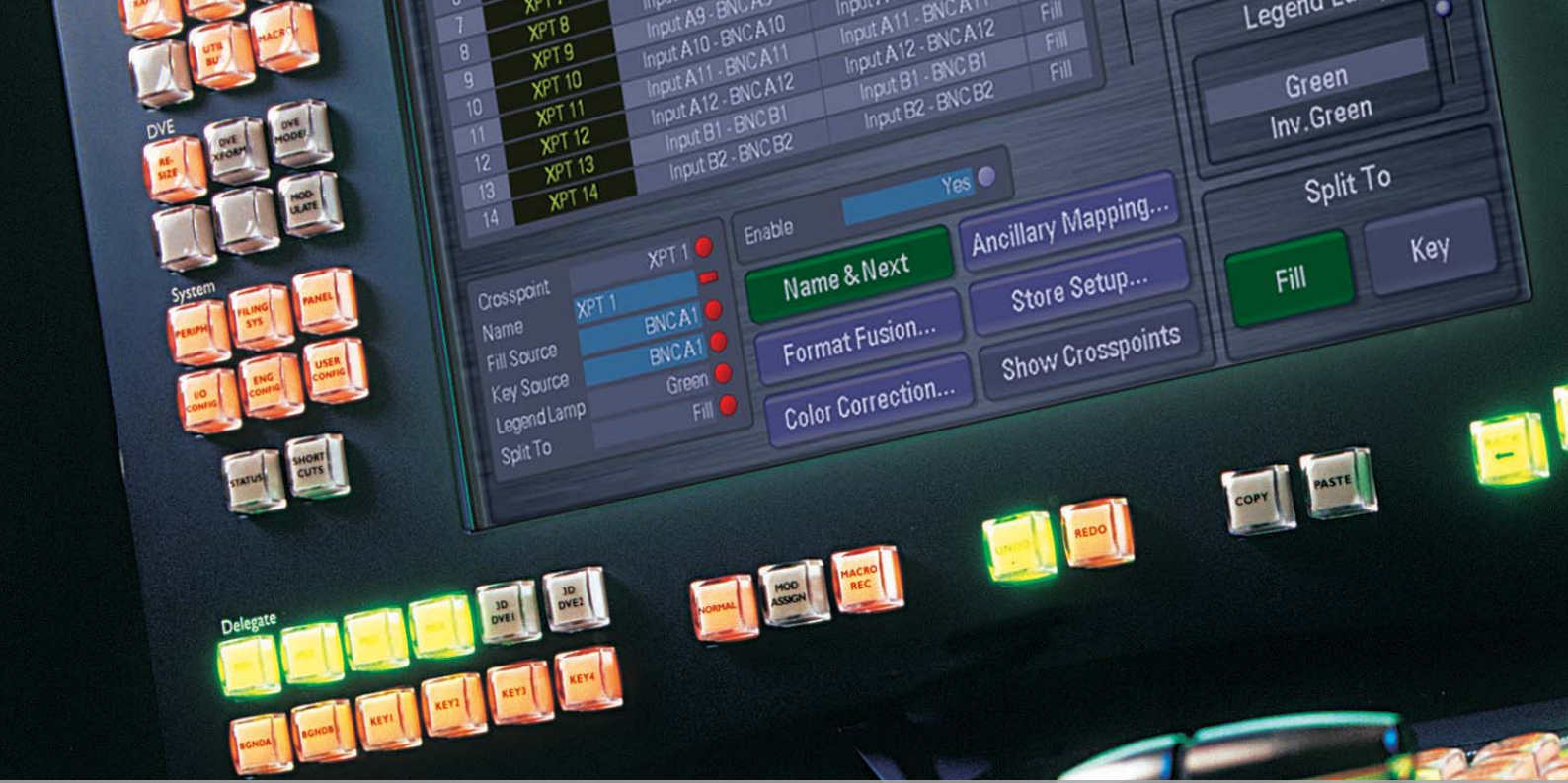




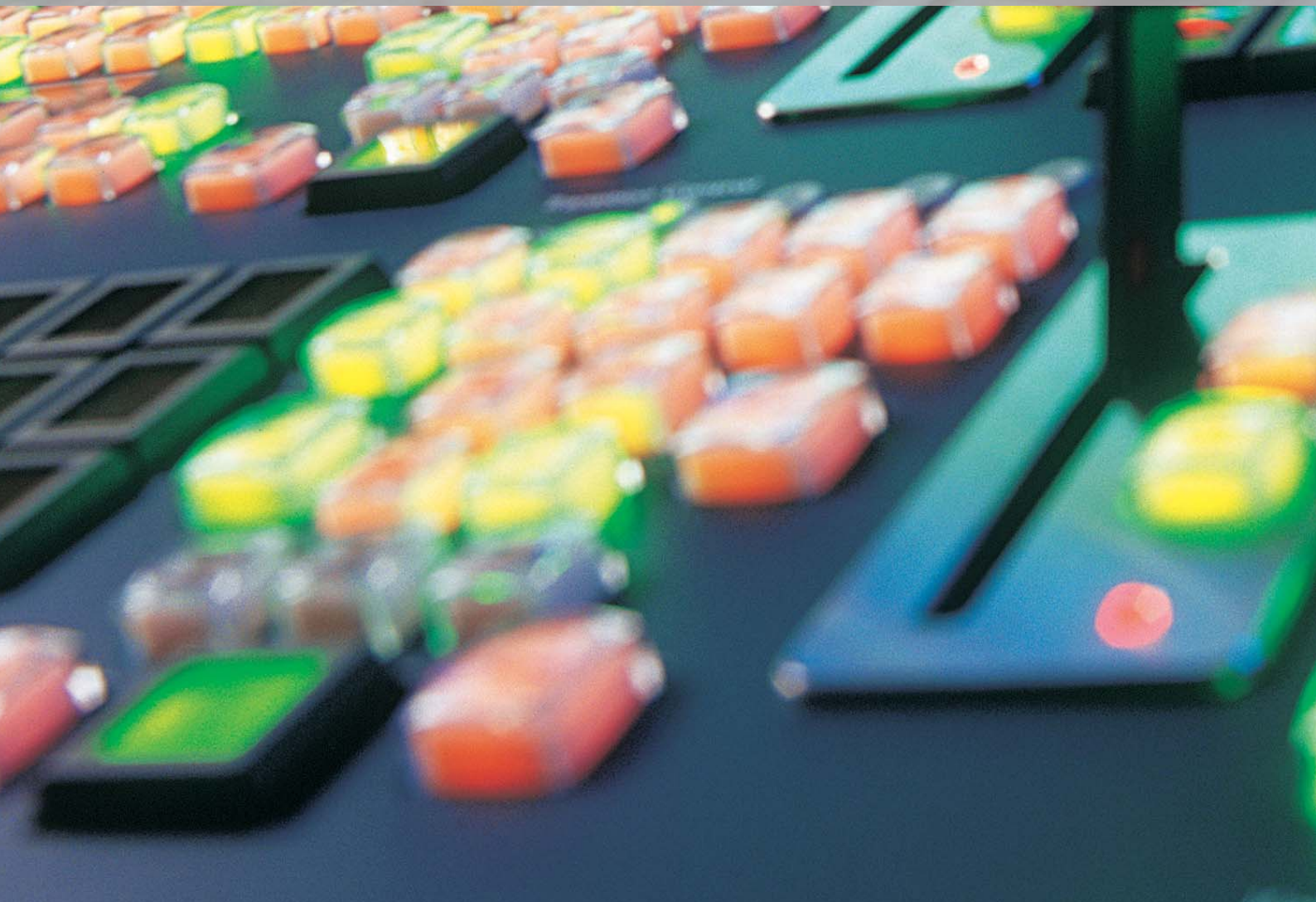
Kahuna 360 A Revolution in Live Production

4K
Available
Now!





Whatever the application, be it live studio-based production, large sports event, fast paced news, mobile or multi-screen broadcast, Kahuna 360 provides the solution for every production requirement, efficiently, creatively and with the reliability you can expect from Snell.





Kahuna 360

A Revolution in Live Production - Now Supports 4K!

Introduction

Powered by Snell innovation, Kahuna 360 is the new addition to the Kahuna family and a revolution in the world of production switchers. It has an unmatched feature set that has never before been possible, and offers a completely scalable path to all functionality and format requirements.

Kahuna 360 is built to simultaneously support the widest range of distribution platforms. In today's multi-platform environment, no switcher can match Kahuna 360's versatility. Furthermore, its intrinsically flexible and advanced architecture means that it can evolve with your business requirements, providing the resources you need, as and when you need them. All with optimum cost efficiency to keep your financial controller happy.

With up to 6 full Mix Effects, 7 keyers per M/E and unique Make M/E™ technology enabling 16 split sub level switchers, Kahuna 360 gives operators all the functionality they need to target a broader audience over a greater number of distribution platforms.

Another huge first for Kahuna 360 is FormatFusion3, a groundbreaking technology from Snell that provides the ability to mix SD, HD, single link 1080p and even 4K sources in a single production and provide multiple outputs of SD, HD, 1080p and 4K UHD TV.

As Kahuna 360 is part of the industry leading Kahuna family it takes advantage of the extensive array of control surfaces that technical directors are immediately comfortable on. There is of course a full upgrade path for all existing Kahuna installations, ensuring a quick and easy transition to Kahuna 360.

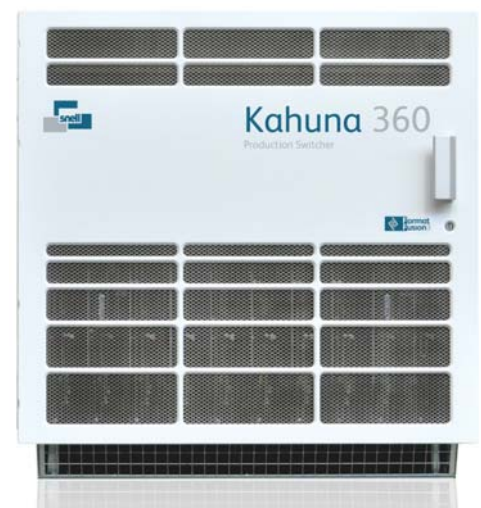
Key Features

- Digital production switcher
 - 4K/1080p/HD/SD switchable
- 4K UHD TV (3840 x 2160)
- 1080p single link
 - Level A and level B
- 120 inputs
- 64 fully assignable outputs
- 11 models, 1 M/E – 6 M/E (1-3 M/E 4K)
 - 7 keyers per M/E
 - 4 super keyers with resize engines
- 3 effects keys
- Make M/E™ technology
- FormatFusion3
 - On all inputs and all outputs
- Powerful 3D DVE effects with linear and non-linear effects
- Internal clipstore with 20 outputs
- Holds up to 71,200 frames / 40 minutes of uncompressed SD
- Cliptrax™ – audio for transitions
- Full RGB input and output color correction
- External equipment integration
 - Serial RS 422
 - Ethernet
- Multiple control surfaces support
- Integration with Snell production workflow tools
- News room automation
- Galaxy Event List
- K-Watch 360
- K-Mirror
- K-Manager



Flexibility and Beyond

Snell's proprietary FormatFusion3 technology, built into Kahuna 360, supports any combination of SD, HD, 3Gbps/1080p and 4K inputs and outputs, seamlessly converting them to and from the required standards. This capability eliminates the need for external conversion equipment, reduces initial capital outlay, removes system timing issues, and saves valuable engineering and setup time typically required for mobile production units and other regularly changing environments. Kahuna 360 thus accommodates a cost-effective shift to the industry's highest standards, supporting a controlled format migration capable of driving new business and revenue-generation opportunities.





Creative freedom

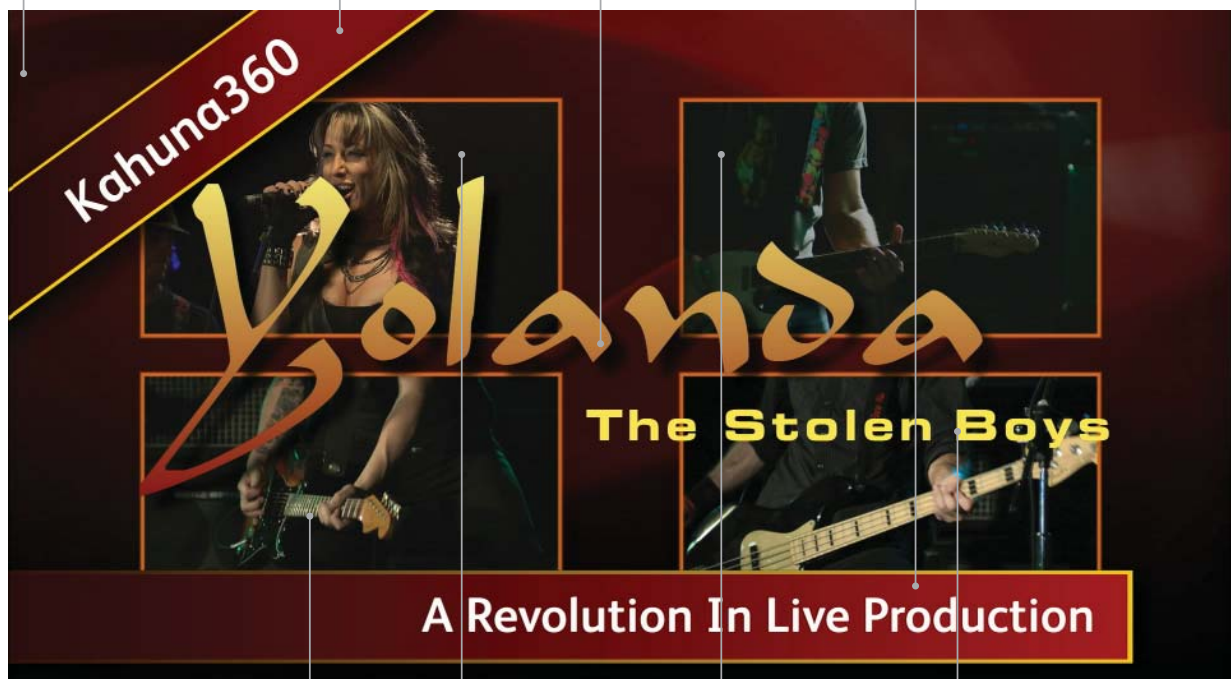
The power of a Kahuna 360 single mix effect

1080p looping background graphic

1080i bug

1080i DSK

1080i lower third



4 x 1080p sources inserted using the super keyers



Unique Make M/E™ technology allows operators to custom build their own M/E feature set to match specific production requirements.

Adaptability, Productivity, Creativity

In today's dynamic environments, flexibility is essential. Quite aside from your customer's needs, their customer's requirements might change in an instant, meaning that your goalposts and game plan need to be realigned. Kahuna 360 blends the family's powerful feature set with unique adaptability that lets the operator support multiple simultaneous productions to a range of delivery platforms. This approach maximizes freedom in combining switcher elements, keyers, DVE and effects to create literally any on-air look and feel.

Essentially in today's environment, Kahuna 360's new and radically different approach increases the life of, and return on your switcher investment.

Make M/E allows the user to select the available switcher power and create a tailor made M/E for an exact requirement - ie, select inputs, keyers, stores, DVE and outputs and, as a result, free up resources to users for other creative/editorial productions.

Uniquely powerful, Kahuna 360 can support up to six **full** M/Es, which can run multiple productions simultaneously from a single mainframe. Each full M/E has seven keyers, these are made up of four super keyers and three linear/luma (ekeys). The four full super keyers perform linear, luma and chroma keying and all come with their own resize engine. The three ekeys are downstream of the super keyers and have been designed to bring even more graphics to an M/E.

Creativity

- Unmatched freedom in combining mixers, keyers and 3D DVE effects to create any on-air style.
- New intelligence in the switcher allows Kahuna 360 to handle the mundane, freeing you to create great productions.

Flexibility

- Uniquely powerful, Kahuna 360 can run up to 16 productions simultaneously from a single mainframe.
- FormatFusion3 raises the bar for multi-format operations, supporting any combination of SD, HD, 1080p and 4K.

Productivity

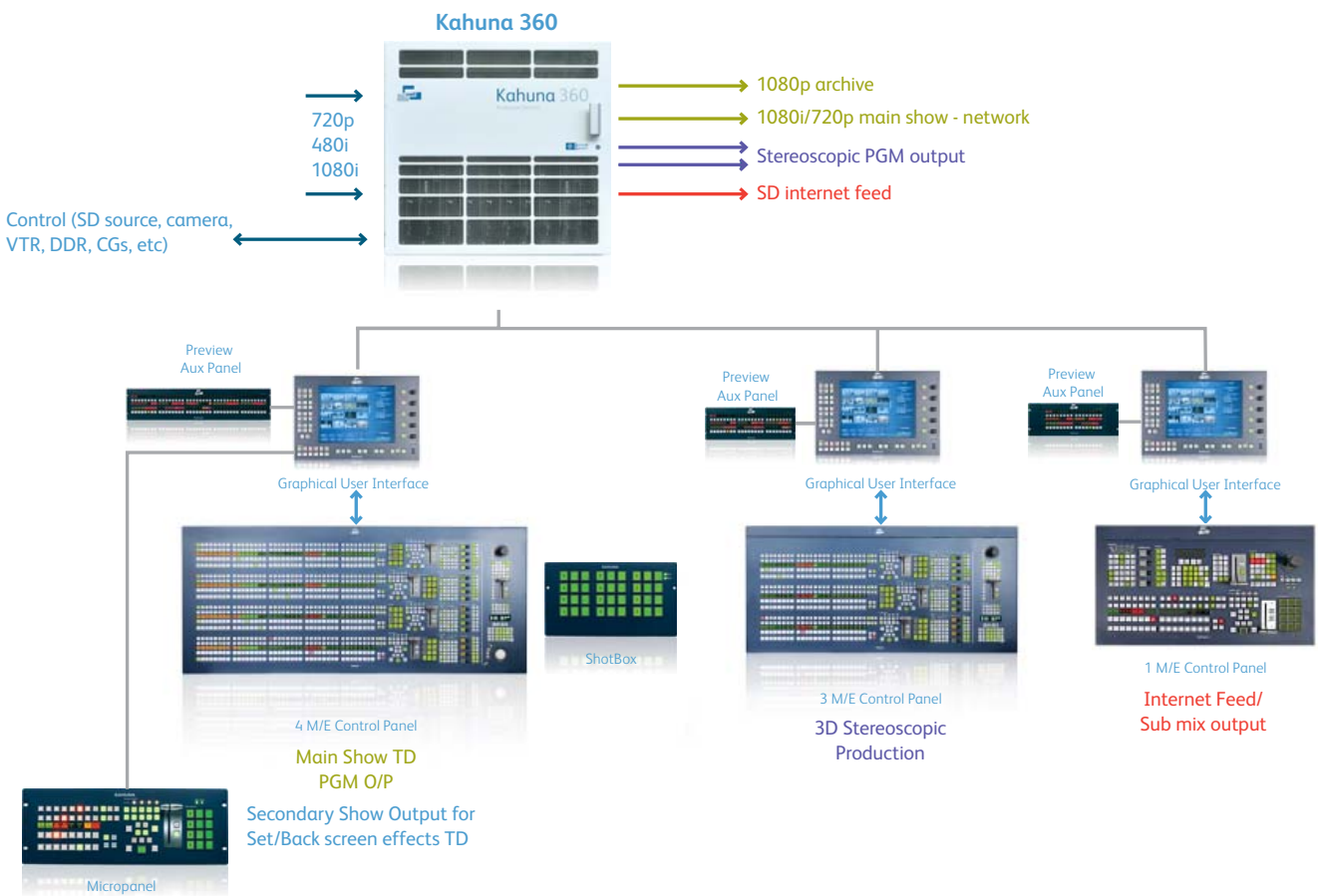
- Dramatically reduce the overhead of show set-up times.
- Advanced file workflow tools enable you to turn around content in seconds.

Reliability

- Designed for mission critical operations with a hot-swappable architecture.
- Innovative Live Assist features provide even greater on-air confidence.



Powerful & flexible



Kahuna 360
Multi-Production Example



Around the world Kahuna has been acknowledged as the industry standard for production switchers and as the needs of the industry evolve, so Snell switchers evolve with it.

Multiple Productions Made Easy
Kahuna 360 manages multiple productions with ease, it can support up to 6 full M/Es which can run up to 16 productions simultaneously from a single mainframe, with each production output controlled by a sub level switcher panel, and each of these having up to 120 inputs, transition effects, keyers and allocated DVE effects.

The Operator's Perspective
Freedom for creativity

The Kahuna 360 approach maximizes freedom in combining switcher elements, keyers, DVE and effects allowing operators to create literally any on-air look and feel.

Supporting users throughout the migration

Radical thinking and revolutionary concepts have their place in modern broadcast operations but so does consistency, reliability and support. One of the most important aspects of Kahuna 360 is its ability to support new and existing users through format migration with minimal impact. With Kahuna 360, the move from SD to 3G HD is easy and transparent.

The desk and switcher layout remains the same, the look and feel of your switcher remains unchanged – just its capabilities evolve in line with the operators' production requirements. Affordable super high quality – living with Kahuna 360 could not be more simple. If only everything in life was this straightforward.

Responding to changing live production needs, Kahuna 360 can be instantly reconfigured along with all associated routing and monitoring assets. Add in workflow tools that allow you to manage file-based assets and turn around late arriving content in seconds and you are presented with a new class in efficient and cost-effective production switchers.

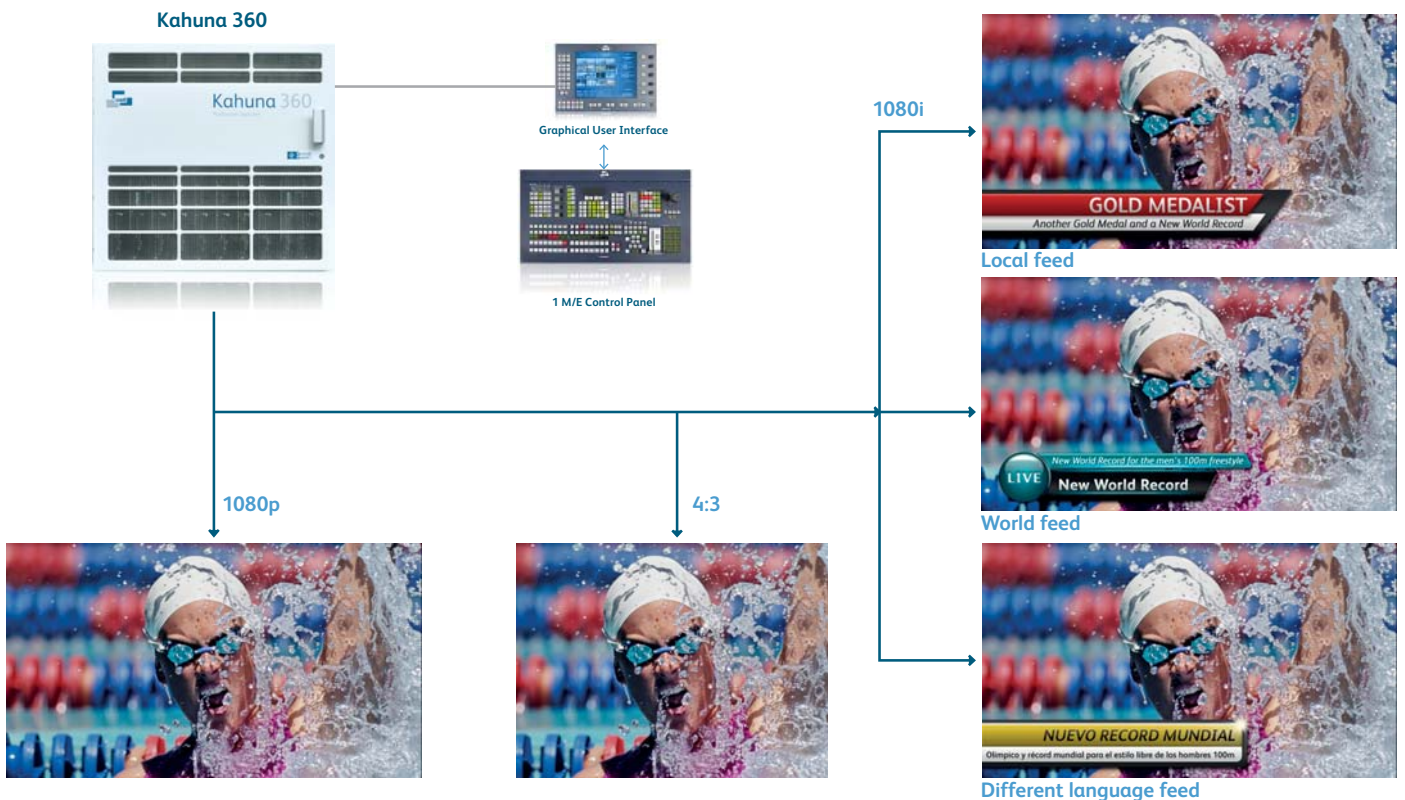
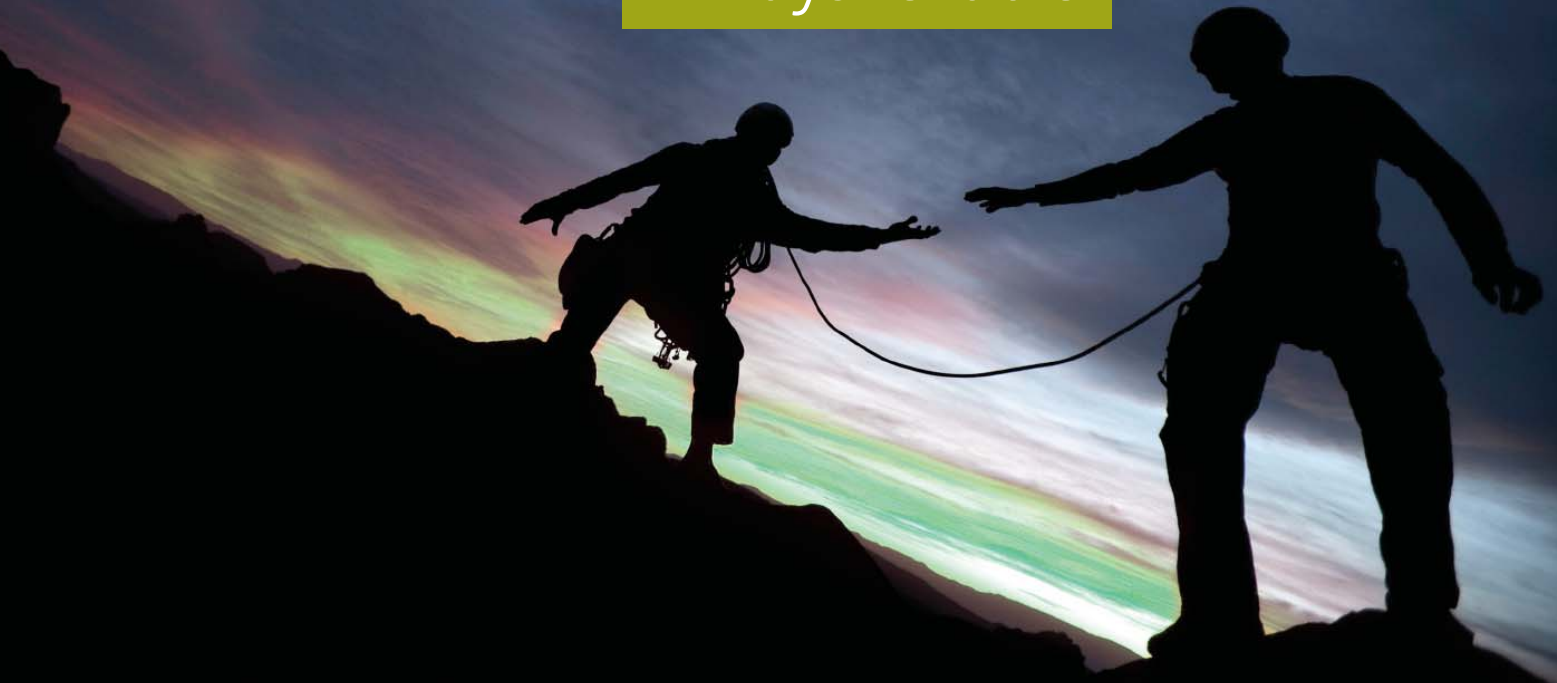
Among the many new innovations in Kahuna 360 is Source Safe™. This clever new technology senses a signal on an input and sets up the correct processing for that signal, without the need for operator intervention. With this capability, the system can detect the source format of signals coming through the plant to production and ensure that they can be brought smoothly into the workflow.

Kahuna 360 incorporates yet another Snell innovation in EPP™, (Enhanced Progressive Processing) which provides unparalleled video processing quality. Kahuna 360 does not simply support 1080p High Definition – it ensures that this super high quality remains uncompromised at every stage of the production process and is reflected in every output form, irrespective of delivery mechanism to the end viewer.



From live studio to sports, fastbreaking news, mobile or multi-screen production, Kahuna 360 possesses the flexibility, adaptability and creativity to differentiate your program output.

Always reliable



The power of 1M/E and Format Fusion3



The flexible, modular architecture of Kahuna 360 means you only have to buy what you need today and still have the framework to expand tomorrow.

The Television Evolution with 4K UHD TV and Kahuna 360

4K UHD TV is a new area that is being investigated for its potential adoption into mainstream television production. As industry professionals explore the practicalities of 4K production and how it can evolve, the production switcher element is already solved by Snell and the Kahuna 360.

The Kahuna 360 production switcher is "4K capable now", so you can truly install and use the Kahuna 360 in this new arena of television production and the new workflows it presents.

Kahuna360 integrates seamlessly into the 4K higher pixel world and provides the toolset to produce in 4K. It also enables HD and 4K to be mixed together either as backgrounds and key layers on the M/E. The output can also be in 4K or scaled down to HD.

You can be safe in the knowledge that by installing a Kahuna 360 today for your HD needs, you're covered for any 4K future demands

Effortless Integration

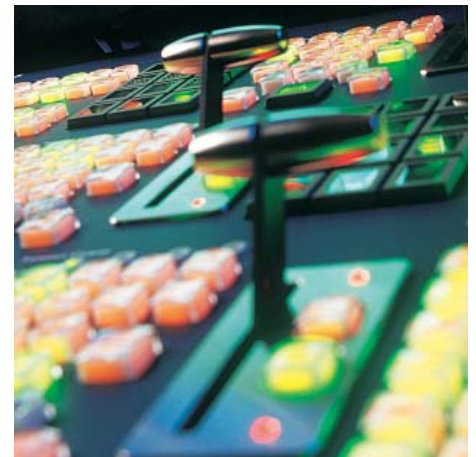
Integration is a key factor for all switchers and Kahuna 360 features an extensive protocol list enabling it to control a large number of third party external devices from robotic cameras to VTRs, from slo-mo to multiviewers and from servers to graphic systems. Kahuna 360 also benefits from an extensive range of Snell workflow tools including automated still image and audio file conversion, back up and file sharing tools, newsroom automation interfacing and event list execution.

Invest in Kahuna 360 Today and Plan for the Long Term

Kahuna 360 incorporates a modular systems architecture from the ground up. As a result, the switcher you purchase today will continue to grow and support your business long into the future. The financial realities of today place constraints on a business' capital investment program requiring any outlay to be justified. Kahuna 360 alleviates this pressure since the switcher can expand its capacity and capabilities over time as your business grows.

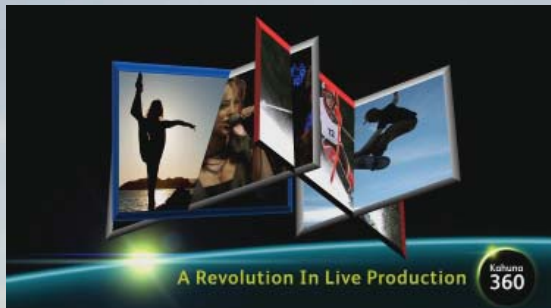
3D Quality

3D is a technology that offers fantastic future potential to broadcasters and other media focused companies. Without doubt, the media and broadcast industry will see significant future development around this imaginative platform – not just in television operations, but also across a range of mobile and PC-based applications.



Affordable super high quality – living with Kahuna 360 could not be more simple. If only everything in life was this straightforward.

Advanced productivity



Example 3D DVE Effects



3D DVE and Kahuna Application Software

3D DVE

The DVE provides an unmatched level of performance, offering unique show branding and world leading creativity.

Whether your productions are single or multiple channels of DVE, used in sports, music, light entertainment or news, the Kahuna 360 DVE can cater for any occasion.

The Technical Director has the flexibility to assign powerful channels of 3D DVE to any M/E. All programming setups are fast, efficient, effective and easy to store and recall. All DVE parameters can be included in a timeline and seamlessly transferred between multiple Kahuna 360 systems.

A Kahuna 360 system can support up to 20 3D DVE channels, with each board providing up to 4 video and key pairs with multiple combiners. It offers an extensive library of linear, non-linear and filmic effects for every channel, simultaneously.

Each channel has its own dedicated FormatFusion3 engine, ensuring that any source selected in the multi-format environment is provided for. This unique functionality is totally transparent to the operator, leaving them to concentrate on creating the show.

Integrated into the Kahuna 360 mainframe the 3D DVE is ideal for the OB environment as it saves rack space, weight and power, without having to compromise any inputs and outputs.

All timings to and from the 3D DVE are totally transparent when switched in or out, therefore preventing any mis-timed events. Make DVE™ technology is also unique to the Kahuna 360, and allows the efficient use of resource in one or multiple productions, to produce effects such as 4 box or intersecting multi-channels.

Moving forward with the Kahuna 360 3D DVE you know your future is protected when venturing into the 1080p world.

Kahuna Application Software

A range of software has been developed to compliment the Kahuna family providing complete control, streamlined workflows, continuous updates and a time saving on pre-production set-up time.

K-Watch 360

K-Watch 360 application software is a clearly unique product that enables a Kahuna system or multiple Kahuna systems to share the same files; typically graphics and video clips, with complete ease.

K-Watch continuously runs on a PC automatically searching for new graphics to convert to the Kahuna native file format.

K-Mirror

K-Mirror is designed to give complete control when updating projects in a single or multiple Kahuna systems. The

software allows projects on the Kahuna mainframe to mirror and update the project on the PC.

This application software streamlines workflow approaches, and offers a saving in pre-production set up time, and project backup.

K-Manager

K-Manager is a free software programme that enables one to convert files such as jpgs, bmp, tga, avi and wav files into Kahuna native files to import on the Kahuna. It also allows you to convert to jpgs etc from a sws file.

K-Manager also allows you to resize and change the still/clip standard whether you need 525/59.94 or 1080i/59.94 or even 720p/60.

K-Manager is simple to use on your PC once installed on your computer.

Galaxy Event List

Galaxy Event List works with Kahuna 360's third-party device control protocols to allow automation of mundane tasks, which in turn, gives operators more time for other aspects of a production. When, for example, a program or genre has a particular look and feel requiring a set series of repetitive interventions, operators can use Galaxy Event List to set these up in advance. During production, Kahuna 360 leverages third-party device control to trigger a specific sequence of actions by equipment including servers, VTRs, multiviewers, graphics systems, robotic cameras, and lighting controls. With these routine tasks handled through Galaxy Event List, the Kahuna 360 operator can spend less time setting up transitions and more time on making the elements between them more engaging.



Go the extra distance with fiber

With broadcast companies being tasked to cover varying productions from large stadia environments such as sports, music and live entertainment to local studio productions with on-screen monitors and large display screens, transporting signals to the production switcher has become more challenging and more demanding than ever before.

Fiber is now a vital element in helping to streamline high quality signal transmissions over greater distances without compromising the picture quality. Therefore, Kahuna 360 has expanded its support by offering fiber directly on both inputs and outputs making it more flexible, scalable and dynamic than any other production switcher on the market.

The Kahuna 360 fin structure allows for 12 inputs per input fin and 16 outputs per output fin and uses SFP (Small Form-factor Pluggable) technology. However your productions work, each input fin enables you to use fiber or coax or even both and the output fins offer a hybrid option accommodating for BNCs and fiber.

Input Fins enable you to use dual single mode Fiber SFP modules or Coax SFP modules or even both simultaneously.



The FDI Input Fin supports 12 inputs over 6 SFP Cages.



Output Fins offer a hybrid option accommodating for BNCs and Fiber. Each output Fiber SFP module is a single mode Fiber Dual Transmitter allowing for any future innovations and requirements.



The FDO Output Fin supports 16 outputs over 3 SFP Cages and 10 HD-SDI BNC's



Fiber SFP



Coax SFP

Whatever you choose today you can always mix and match tomorrow, upgrading whenever you need to.

Kahuna 360

Technical Specification

TV Standards

2.97Gbps Video Standards (1080p)

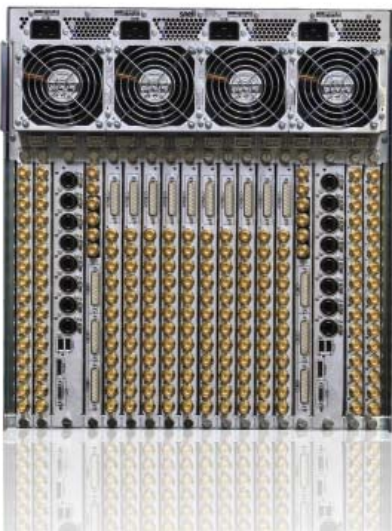
1080p 59.94Hz SMPTE-424M
 1080p 59.94Hz SMPTE-425M/Level A
 1080p 59.94Hz SMPTE-425M/Level B
 1080p 50Hz SMPTE-424M
 1080p 50Hz SMPTE-425M/Level A
 1080p 50Hz SMPTE-425M/Level B

1.485Gbps Video Standards (HD)

1080i 60Hz SMPTE- 274M(4), -292M(D)
 1080i 59.94Hz SMPTE-274M(5), -292M(E)
 1080i 50Hz SMPTE- 274M(6), -292M(F)
 1035i 60Hz SMPTE -260M,- 292M(A)
 1035i 59.94Hz SMPTE-260M,-292M(B)
 1080p 30Hz sF
 1080p 29.97Hz sF
 1080p 25Hz sF
 1080p 24Hz sF
 1080p 23.976Hz sF
 1080p 30Hz SMPTE- 274M(7) -292M(G)
 1080p 29.97Hz SMPTE- 274M(8) -292M(H)
 1080p 25Hz SMPTE- 274M(9) -292M(I)
 1080p 24Hz SMPTE- 274M(10) -292M(J)
 1080p 23.976Hz SMPTE - 274M(11) -292M(K)
 720p 60Hz SMPTE- 296M(1), -292M(L)
 720p 59.94Hz SMPTE- 296M(2), -292M(M)
 720p 50Hz

270Mbps Video Standards (SD)

576i 16:9
 576i 4:3
 480i 16:9
 480i 4:3



Reference

Analog genlock High definition tri-level syncs signal or SD 1V B and B

Cable Recommendations

- Maximum input Exceeds SMPTE292 & SMPTE424M
- 2.97Gbps Video Signals (1080P) >= 100 m of Belden 1694A cable
- 1.485Gbps & 270Mbps >= 160 m of Belden 1694A cable

Mainframe

Video Signal Inputs

- Up to 120, HD/SD-SDI, grouped in 12 off. SD/HD/1080p (270Mbps / 1.485Gbps / 2.97Gbps)
- Serial digital interface as REC601/ SMPTE 292M / SMPTE424M via BNC connectors
- Genlock reference 4 off Analog Sync (loop A and B through)

Video Signal Outputs

- Up to 64 HD/SD-SDI , grouped in 16 off, programmable via BNC connectors
- 2 Independent Sync Outputs with adjustable Phase offset per Ref Fin (4 in total)

Control Interfaces

- 120 Tally/GPO Outputs isolated contact closures via 25 way DType (12 per Input Fin)
- 96 (2x48) GPI TTL-level inputs via 25-way D-type connectors per Ref Fin
- 16 (2 x 8) 10/100/1000 baseT RJ45 Ethernet connectors with additional XLR security Fixings per Net Fin
- 12 (2 x 6) RS422 Control ports per Control Card

Power

- Kahuna mainframe Auto sensing 100-250 VAC Power supply 50/60 Hz nominal
- Two fully independent hot swappable PSU modules, with separate mains power feeds via 2 x 16A IEC-C20 socket. Dual Redundant requires two more fully independent PSU modules; with separate mains power feeds via 2 x 16A IEC socket
- Kahuna 11RU mainframe 3KW Maximum with all Power Consumption options fitted
- Temp range 41 to 104 ° F, 5 to 40° C non condensing operating

Mainframe Mechanics

- 11 Rack Unit
- Height 488mm, 19.21”
- Depth 647mm, 25.57”
- 18 Input / Output and Control Slots
- 10 x 12 Input Fin Slots
- 4 x 16 Output Fin Slots
- 2 x Net Fin Slots
- Front Fitting Processing PCB's and Power Supply Units

Training and Support

Kahuna Care Service

Snell's customer service offers first class solutions for optimizing your operations, through world-leading technical support and fast responsiveness during the life of your product.

Kahuna Care is a premium support package that offers professional services 24 hours a day all year round. Benefiting from advance parts replacement service, your mission critical system will always be maintained to the highest standard both quickly and effectively. Snell also offers health checks, repair services, training and spare parts packages, giving you total peace of mind throughout the life of your product. Snell's customer services are there to help and support you. For further information about Kahuna Care contact customersupport@snellgroup.com

Kahuna Club

Kahuna Club is an on-line community for Kahuna users, where information and ideas can be shared between users and owners, and where Snell can easily communicate with valued Kahuna customers.

The Kahuna Club web site provides all Kahuna customer contacts with a 24 hour, 365 day a year, one stop resource, featuring customer support, information on the latest product news, upgrades (options, spares and customer service contracts), special offers and discussion forum.

Training

To ensure that customers experience the full benefits of their switcher, Snell is committed to providing the highest levels of training for Kahuna owners, operators and engineers.

Training before and after a system purchase is available worldwide at customer premises, Snell offices or an alternative third party location. The duration of these training sessions will depend on user requirements.

Courses are available for basic or advanced operations, technical support, maintenance and familiarization. They can be custom-designed to meet specific requirements.

Kahuna Customer Services at a Glance

	In Warranty	Out of Warranty (without Kahuna care)	Out of Warranty (with Kahuna care)
9 to 5 phone support	✓	✓	✓
On-line support resources	✓	✓	✓
Advanced part replacement (next day service)	✓	✗	✓
24 x 7 x 365 phone support	✓	✗	✓
Repair service	not required	✓	not required
Health check	as needed	as needed	as needed

Power and flexibility in a compact 6RU frame



Introducing the Kahuna 360 Compact

Another 1st from Snell

Kahuna 360 Compact is the 1st of a new generation of switchers that delivers more power in the mid size production arena than ever before.

For sporting events, light entertainment shows, news production and presentations either in the studio control room, mobile vehicle or flyaways the Kahuna 360 Compact offers an elegant, reliable solution in a well engineered package that is understood the world over.

Kahuna 360 Compact tears up and redefines what is possible in the mid size production arena.

Available in 1 Full M/E and 2 Full M/E versions, the Kahuna 360 Compact can take on the demand from SD through to any future 1080p production requirement. This well featured approach has FormatFusion3 and works in tandem with the Switcher's powerful feature set. The switcher even mixes interlaced and progressive sources together in production and then simultaneously outputs SD/HD and 1080p with no restrictions on the number inputs or outputs, all integral to the 6RU mainframe.

Another first from Snell is Make M/E™ technology which is standard in the Kahuna 360 Compact. Make M/E™ breaks the tradition of the M/E and allows you to allocate your resources wherever you want them.

Kahuna 360 Compact Key Features

- SD/HD and 1080p (single link) format switcher
- Up to 60 inputs and 32 outputs, all capable of SD/HD or 1080p
- Full programmable outputs for multiple feeds
- Up to 11 key layers per M/E
- 8 Resize engines
- Make M/E™ technology
- 4 Channels of comprehensive integrated 3D DVE effects
- Large integrated clipstore with powerful editor
- RGB colour correction on inputs and outputs
- Sophisticated effects memory system and macros
- Multi-panel support
- Upgradeable with all Kahuna 360 options

Kahuna 360 Compact 2 M/E



Kahuna 360 Compact 1 M/E



Kahuna 360 Compact -
the smaller switcher
that's packed with power

For more information please refer to the Kahuna 360 Compact data sheets.

Innovation in the Multi-Screen World

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