



## SD / HD Production Switcher



**Configuration & Ordering  
Information**



## **Kahuna SD/HD Production Switcher**

### **Configuration Guide**

The Kahuna is the next generation of production switcher from Snell & Wilcox. Designed for the demands of today and tomorrows fast paced, large live production environments, equipped with a feature set to meet the requirements in post, Kahuna brings together the signal processing quality with a comprehensive feature set enabling a confident and creative production.

In addition to the powerful Mix Effect banks Kahuna has a further Digital Video Effects send and return architecture that can support up to eight 3D DVE effect images to be manipulated. The comprehensive "models" or effects capability of the DVE removes the need for a separate DVE unit along side Kahuna.

### **SD or HD – *it doesn't matter***

Kahuna can be a SD only; a HD only production switcher plus has the ability to be dual SD and HD. Kahuna does provide a transparent upgrade path to HD. An SD Kahuna system can be configured, installed and upgraded to HD with out any additional Hardware. A HD Kahuna can have the option to process SD and HD together to bridge the SD – HD gap.

### **About this guide**

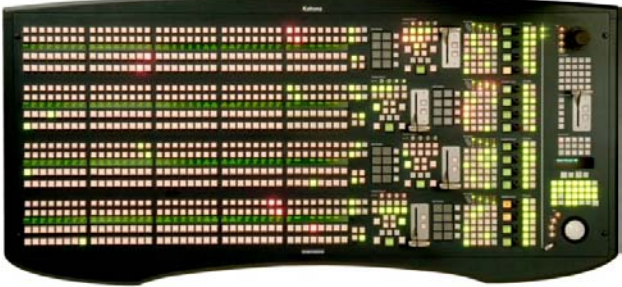




This is a straightforward guide that will describe the system components for the reader to become accustomed to the Kahuna Production Switcher. Details shown will include the standard feature set, optional feature set, order/part code, a short description with configuration information. The Technical Specification is included.

To create a system start with a base system and then add the desired feature or hardware item to the chosen base system. All individual items are listed if expanding an existing Kahuna production switcher system.

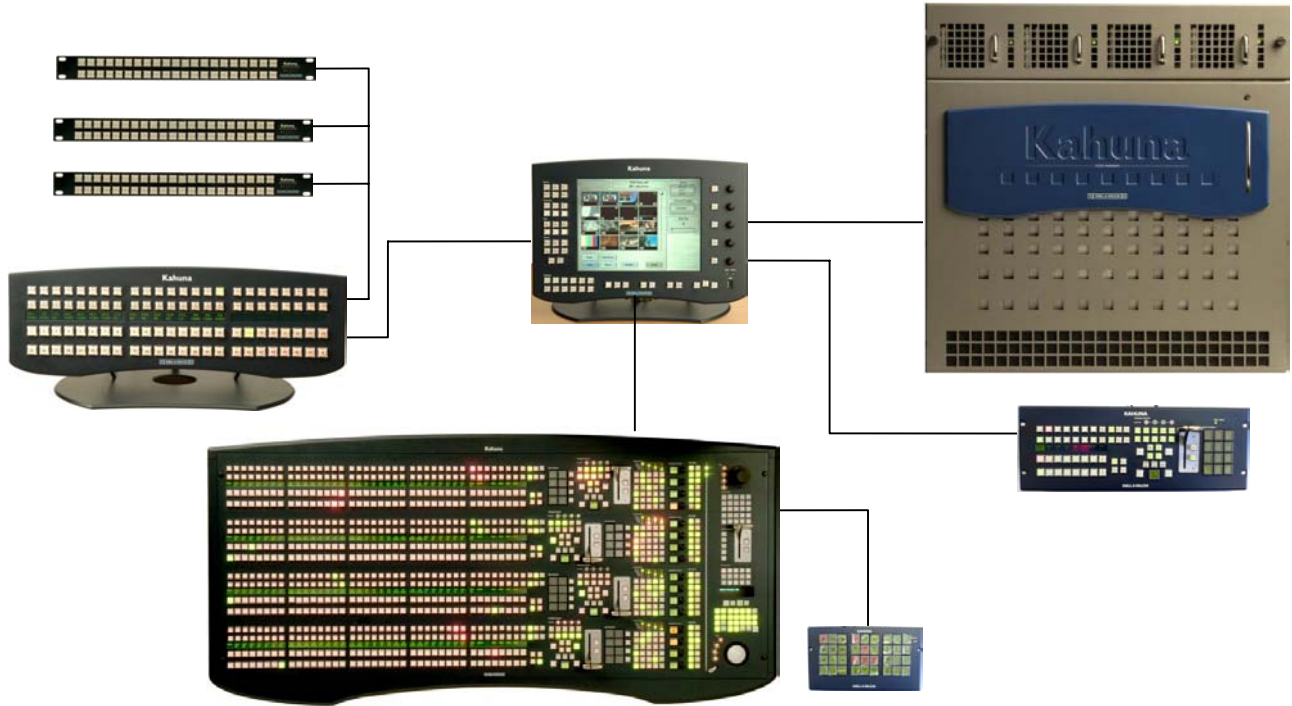
For further technical information please contact Snell & Wilcox.

*[www.snellwilcox.com](http://www.snellwilcox.com)*

## Kahuna Production Switcher Hardware Items

Item	Picture
<p><b>Control Surface</b></p> <p>The Control Surface is available as a 4M/E, 3M/E, 2 M/E versions and now a new 1 M/E panel.</p> <p>Here the 4 M/E control Panel is shown. <i>(With Mnemonics on all M/E banks)</i></p> <p>Control Surfaces are available complete with Mnemonics.</p>	
<p><b>Graphical User Interface</b></p> <p>Color touchscreen. One Graphical User interface is required with every Control Surface used. Also multiple GUIs can be used on one Kahuna system.</p>	
<p><b>Mainframe</b></p> <p>The Mainframe contains all the electronics for the Kahuna system. This includes all the Digital Video Effects processing, Switcher Processing and PSU for the mainframe (including redundancy)</p>	
<p><b>Master Auxiliary output Panel</b></p> <p>The master Aux panel sits along side the Kahuna control surface. In the 2M/E and 3 M/E versions the master Aux panel is built into the control surface.</p>	
<p><b>1 Rack Unit Aux Panel</b></p> <p>Single Aux output control panel.</p>	

**Kahuna System Interconnection**

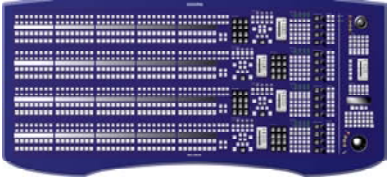
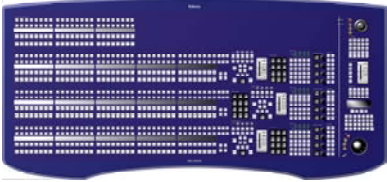
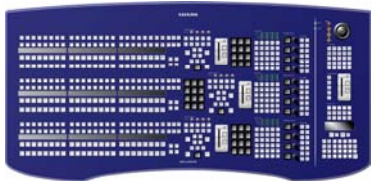


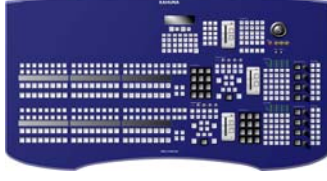



**Example:**





A 4 M/E Kahuna System -

- ❑ 4 M/E Control Surface
- ❑ Graphical Users Interface (GUI)
- ❑ 11 Rack Unit Mainframe
- ❑ Master Aux Panel
- ❑ 3 x 1 Rack Unit Aux Panel
- ❑ Micro Control Panel
- ❑ Shot Box

## Control Surfaces in the Kahuna SD/HD Production Switcher Range

<p><b>4 M/E Control Surface</b></p> <p>Notes</p> <p><u>Standard</u> 4 M/E panel with <b>40</b> Crosspoint buttons</p> <p>Master Aux panel separate</p>	
<p><b>3M/E Control Surface</b></p> <p>Notes</p> <p><u>Standard</u> 3 M/E panel with <b>40</b> Crosspoint buttons.</p> <p>Master Aux Panel Built in.</p>	
<p><b>3M/E Control Surface (Compact)</b></p> <p>Notes – New addition</p> <p><u>Compact</u> 3 M/E panel with <b>24</b> Crosspoint buttons.</p> <p>Master Aux panel separate</p>	
<p><b>2M/E Control Surface</b></p> <p>Notes</p> <p><u>Standard</u> 2 M/E panel with <b>40</b> Crosspoint buttons.</p> <p>Master Aux Panel Built in.</p>	
<p><b>2M/E Control Surface (Compact with TrackerBall)</b></p> <p>Notes</p> <p><u>Compact</u> 2 M/E panel with <b>24</b> Crosspoint buttons, and Tracker ball</p> <p>Master Aux panel separate</p>	
<p><b>2M/E Control Surface (Compact)</b></p> <p>Notes</p> <p><u>Compact</u> 2 M/E panel with <b>24</b> Crosspoint buttons.</p> <p>Master Aux panel separate</p>	
<p><b>1M/E Control Surface</b></p> <p>Notes</p> <p><u>Compact</u> 2 M/E panel with <b>16</b> Crosspoint buttons.</p> <p>Master Aux panel separate</p>	

### Ancillary Panels

<p><b>Micro Panel</b></p> <p>Notes – New addition</p> <p>1 M/E panel with 8 Crosspoints and source selection</p>	
<p><b>Shot Box</b></p> <p>Notes – New addition</p> <p>Shot box for assigning Snapshots, Timelines and Macro's Must be used with software version V2.5r1 and higher</p>	
<p><b>Master Aux Panel</b></p>	
<p><b>1U Aux Panel</b></p>	

### External Power Supplies.

Table showing available external power supplies

Control Surface Type	Description	Note	Order Number
1 M/E Control Surface	External DC PSU (703)	1 Supplied as Standard with panel 1 Optionally redundant	9648703
GUI	External DC PSU (703)	None Supplied as standard Option <i>(Power taken from Panel)</i>	9648703
Master Aux	External DC PSU (701)	None Supplied as standard Option <i>(Power taken from GUI)</i>	9648701
1U AUX Panel	External DC PSU (701)	1 Supplied with every Aux 1 optionally redundant	9648701
Micro Panel	External DC PSU (701)	1 Supplied as Standard with panel 1 Optionally redundant	9648701
Shot Box	External DC PSU (701)	1 Supplied as Standard with panel 1 Optionally redundant	9648701

\* Note – All Control Surfaces (2M/E – 4M/E) are powered by internal PSU's. Redundancy can be supplied optionally for these items..



## **Standard Features**

### **Video Standards**

Kahuna is a true multi video standard production switcher. Kahuna can be configured to be a SD Switcher, HD switcher or with the advance technology from Snell Wilcox can simultaneously process and manipulate SD together with HD sources within the same system and the same Mix effect bank, all in real time.

With this capability Kahuna processes SD 525/625 (4:3/16:9) and HD standards inclusive of 1080i, 720p (59.95 & 50Hz) and 24p.

### **Input & Output architecture**

The input configuration of Kahuna is scaleable and starts at 32 serial digital inputs. From this start point inputs are provided in groups of 16 working up to 48, 64 to 80 inputs all within the one mainframe. Any of these primary inputs can be backgrounds, Key Fill or Key signals. If working in a multi format environment any input can be assigned or mapped to be SD or HD, there is no additional hardware module restricting the setup capability. The number of inputs can be upgraded in the field.

Each Mix Effect is equipped with 2 x program and 2 x Preview outputs as standard. These outputs have the option to become programmable outputs. In addition to this each M/E has four Aux outputs. In the 2M/E and 3 M/E Kahuna systems additional Modules can be installed to increase the Aux output capacity.

The Kahuna architecture supports full M/E re-entry, Therefore any M/E output can be re-entered into any other M/E. Including the ability to Key a Mix Effect. Also the output from a Mix Effect can be sent off to the internal DVE on the Effects send bus. The result from the DVE is entered back into an M/E on the Effects return bus

### **Mix Effect Power**

The power within every Mix Effect in Kahuna is unmatched; each M/E has four Keyers. Each Keyer has the toolset to Linear, Luma Key and Chroma Key (option). The quality of the keyer processing has gain Snell & Wilcox a strong reputation as one of the industry's leading Keying developers. Each one of Kahuna Keyers is completely independent and can be prioritised giving more creative power. Each keyer has its own wipe generator that can be Transition at any giving point in time and has a separate control mechanism for this.

Complementing the Keyers each M/E is supplied with 4 utility buses that can be used to provide Video in the Wipe border and are used for external masking.

### **DMEM and GMEM - \*With Banking/Pages (Software 2.5r1 and Higher)**

A DMEM is the Snell & Wilcox term used for a snapshot/ memory register of a set up. A DMEM can be saved and recalled on an M/E basis and can be generated and copied to any M/E. This has been extended to a global basis, termed GMEM, this will store and recall an entire switcher set up.

### **Powerful Macros**

Kahuna has a powerful Macro facility that allows the user to create, modify and execute pre determine routines. The triggering of a macro can be assigned to the Programmable shot box arrangement on ever M/E or to any desired button. The GUI has a logical approach to showing and editing Macros.



## **Standard Features**

### **Timelines**

The Timeline facility on Kahuna gives the ability for users to create Key Frame effects, run, pause and edit. The timeline can run on an M/E basis or a global basis. There is a dedicated area on the Control Panel for the creation and management of a Timeline with a dedicated T'Bar for control.

### **Power Supply Units**

The Mainframe is fitted with 2 x PSU and the control panel has a single unit as standard. There are PSU redundancy options available.

### **Kahuna PC Application**

The Kahuna PC application gives the user/engineer an alternative method to perform setup tasks such as the renaming of crosspoints, mapping sources, up loading and downloading of Stills and Clips etc. This video centric application also provides the added benefit of a converting facility. Stills and Graphics that are generated for the SD domain (720 x 487 or 576 lines), can be converted to HD (1920 x 1080i or 1440 x 720).





## Optional Features

### Keyer Options

#### **ChromaKey**

Along with the standard Linear, Luma functionality, the Chroma keying option enables a Keyer to perform high quality Chroma key and compositing tasks. This option is offered on a system basis, when purchased every M/E Keyer on the system will have Chroma key.

#### **Keyer Digital Video Effects**

Each Keyer has a Resize Engine with 2D DVE capability when the Resize option is purchased. This enables each Keyer to have X - Y Positioning, Squeeze, Zoom and cropping. An extension to this option provides defocus, mosaic posterization and pixelization to every Keyer.

Therefore in a 4 M/E system 16 x Resize engines are available. This is completely separate functionality from the 3D DVE effects option.

### Key Border Generation

The functionality to produce **KEY EDGE BORDER**, extrusion and drop shadow is given with this option. The border edges can be created with the Matte or wash generator plus the ability to use the utility busses. **(Note that normal Borders are supplied as standard ie Wipe Borders and Resize Engine Borders)**

### Scaleable Inputs

This option allows a system to be configured from the standard 32 inputs to 48,64, and 80 inputs.

### Dual SD and HD operation *\*HD Kahuna only*

This option gives the capability to have both SD and HD sources together in a system, mix SD sources and HD sources within one M/E if purchased. This allows a SD source to be Keyed/overlaid over a HD background. This functionality is present on every keyer on a Kahuna System.

### Programmable outputs

This option gives each M/E the flexibility of programmable outputs. The user can define which outputs spigots are Program, Preview, Clean or World feed etc. Also the ability to select what Keyers can contribute to what output is gained.



## **Optional Features**

### **Extended Background Format Fusion** *\*(HD and SD/HD systems only)*

Kahuna systems that are configured to be only HD or SD/HD can employ this feature. Since the software release 2.1, Kahuna can float the Format Fusion engine of Key4 (in all M/E's) between Key 4 itself and the Background busses. When the Format Fusion engine is assigned to the Background Buses, this option allows directly control of the source. For example, in a HD M/E, when a SD source is switched up on a Background, the ability to show that source in native 4:3 or letterbox 16:9 can be achieved. Inversely if a HD source was switched up on a SD M/E, pan and scan control can be gained.

### **Additional Aux outputs**

Increases the number of Aux outputs in the 2M/E and 3 M/E configurations. Purchased in groups of 4 outputs, additional 16 for the 2 M/E and 8 for the 3 M/E (not yet released)

### **Ancillary Data on Aux Output**

This option allows Ancillary data on an input to be striped off and then re inserted on a select Aux output. A typical example is Embedded Audio, Embedded Audio is striped of an input source, the video is processed then switched to an Aux output, and the Embedded Audio is then re inserted. This answers any questions relating to Kahuna passing embedded Audio.

### **STORE** *(Still Store - Clip Store)*

#### **Still Store**

This powerful option allows Stills and Clips to be available on all M/E's in a Kahuna system. There is a maximum of 16 Stores (4M/E Kahuna), that can be designated for Stills or Clips. Stills and Clips are stored on an internal hard drive and are selected via the Color touch screen GUI. Stills and Clips can be FTP in and out of Kahuna.

#### **Clip Store**

The Clip Store element of this option provides the capability of playing sequences of Key with associated Fill and Video. In a 4 M/E system 4 stores can be assigned as Clips store. The capability of each store is 12 seconds of uncompressed HD.

**\*NEW\***

#### **Cliptrax**

This software-enabled option provides Audio information to be held within the store in Kahuna. Audio information can be played out with effects such as Transitional Wipes and DVE moves. Up to 20 Minutes can be held in every M/E. This does not effect the Video Storage capacity.

**Note the Ancillary Data on Aux Output must be included for this to function.**



## Safe Area

The Safe area option provides the ability to overlay graphics for the safe area, Title safe and centre of Screen.

## Modulation

This options allows Modulators to be attached to parameters such as the Resize engine to 'Shake' or vibrate the image. Modulators can also be assigned to washes. The advantage of this feature enables manipulation with creating a timeline.

## 3D Digital Video Effects - "IMPAKT"

Kahuna has an option for full 3D DVE effects. This option is a single board that provides 2 x Dual channels (Key + Video) or four independent Video Tiles. The mainframe has provision for two 3D DVE effects option boards. Hence giving the capability of 4 x Dual Channel or 8 x Tiles being manipulated simultaneously.

The catalogue of effects or models is extensive. Additionally there is a Trail store and Light generator capability with this option.

**\*NEW\***

### **IMPAKT – 3D DVE Effects Additional Models option.**

Additional models for the suite of DVE Effects. Available in both SD and HD systems.

## GPI/GPO

This option provides 48 General Purpose Inputs (GPI's), and 84 General Purpose Outputs (GPO's), for the 11RU mainframe.

## External Control

The External Control option provides RS422 control to External Devices with P-BUS and Serial tally protocol.

## Redundant Power Supplies

### *Options*

Full Power supply redundancy for the Mainframe and the Control Panel available as singular option.

Mainframe or Control Panel redundancy can be supplied separately.

GUI and 1 M/E redundancy supplies can be supplied separately.

1U Aux Panels, Master Aux, Micro Panel and Shot Box redundancy can be supplied separately.

### **GUI / Master Aux stand.**

Stand for the GUI and Master Auxiliary panels can be purchased separately.



## **RackMount Kits**

RackMount kits for both the GUI and Master Aux panel are available if the GUI stands are not preferred.



## **Kahuna system ordering information**

### **2M/E Kahuna (SD or HD) system**

When this version of Kahuna is ordered, the 2M/E Kahuna standard system (SD or HD) system package comprises of

- 2 M/E control Surface (with Mnemonics), 32 crosspoint buttons.
- GUI
- Stand for GUI
- 11 Rack unit Mainframe
- Standard power supplies (2 in Mainframe and 1 in the Control Panel)
- 32 inputs
- 16 outputs total. - 8 M/E outputs and 8 Auxiliary Outputs
- 2 Mix effects

Each M/E features

- 4 Full effects Keyers per M/E
- Linear & Luma processing
- Transition Engine per Keyer
- HD version will support all standards (inclusive of 1080i/59.94 & 720p)
- SD version 525/625
- Interconnection cables (Control Surface, GUI and Mainframe)
- 1 year warranty

Further desired options are added to this configuration.



## **Kahuna system ordering information**

### **3M/E Kahuna (SD or HD) system**

When this version of Kahuna is ordered, the 3M/E Kahuna standard system (SD or HD) system package comprises of

- 3 M/E control Surface (with Mnemonics), 40 crosspoint buttons.
- GUI
- Stand for GUI
- 11 Rack unit Mainframe
- Standard power supplies (2 in Mainframe and 1 in the Control Panel)
- 32 inputs
- 24 outputs total. - 12 M/E outputs and 12 Auxiliary Outputs
- 3 Mix effects

Each M/E features

- 4 Full effects Keyers per M/E
- Linear & Luma processing
- Transition Engine per Keyer
- HD version will support all standards (inclusive of 1080i/59.94 & 720p)
- SD version 525/625
- Interconnection cables (Control Surface, GUI and Mainframe)
- 1 year warranty

Further desired options are added to this configuration.



## **Kahuna system ordering information**

### **4M/E Kahuna (SD or HD) system**

When this version of Kahuna is ordered, the 4M/E Kahuna standard system (SD or HD) system package comprises of

- 4 M/E control Surface (with Mnemonics), 40 crosspoint buttons.
- GUI
- Stand for GUI
- 11 Rack unit Mainframe
- Standard power supplies (2 in Mainframe and 1 in the Control Panel)
- 32 inputs
- 32 outputs total. 16 M/E outputs and 16 Auxiliary Outputs
- 4 Mix effects

Each M/E features

- 4 Full Effects Keyers per M/E
- Linear & Luma processing
- Transition Engine per Keyer
- HD version will support all standards (inclusive of 1080i/59.94 & 720p)
- SD version 525/625
- Interconnection cables (Control Surface, GUI and Mainframe)
- 1 year warranty

Further desired options are added to this configuration.



## **Optional Features Packs**

### **For SD Kahuna**

A selection of options has been pre selected to aid the user to simplify the configuration stage.

#### ***SD Optional Feature Pack 1***

##### ***Items***

- 32 Additional SD inputs increasing the inputs to 64
- Chroma Key for all Keyers
- Resize engine for all Keyers
- Still - Clip Store
- Programmable Outputs
- Safe Area Generator
- General Purpose Inputs /and Outputs
- External RS 422 Control Ports
- Mainframe and Control Panel Redundancy (Additional Panels and Aux Panels not included)

#### ***SD Optional Feature Pack 2***

##### ***Items***

- 32 Additional SD inputs increasing the inputs to 64
- Chroma Key for all Keyers
- Resize engine for all Keyers
- Resize Engine Effects
- Programmable Outputs
- Still – Clip Store
- RGB Input Color Correction
- RGB Output Color Correction
- Safe Area Generator
- General Purpose Inputs /and Outputs
- External RS 422 Control Ports
- Mainframe and Control Panel Redundancy (Additional Panels and Aux Panels not included)





## **Optional Features Packs**

### **For HD Kahuna**

A selection of options has been pre selected to aid the user to simplify the configuration stage.

#### ***HD Optional Feature Pack 1***

##### ***Items***

- 32 Additional HD inputs increasing the inputs to 64
- Chroma Key for all Keyers
- Resize engine for all Keyers
- Programmable Outputs
- Safe Area Generator
- General Purpose Inputs /and Outputs
- External RS 422 Control Ports
- Mainframe and Control Panel Redundancy (Additional panels and Aux Panels not included)

#### ***HD Optional Feature Pack 2***

##### ***Items***

- 32 Additional HD inputs increasing the inputs to 64
- Chroma Key for all Keyers
- Resize engine for all Keyers
- Resize Engine Effects
- Programmable Outputs
- Still – Clip Store
- RGB Input Color Correction
- RGB Output Color Correction
- Safe Area Generator
- General Purpose Inputs /and Outputs
- External RS 422 Control Ports
- Mainframe and Control Panel Redundancy (Additional panels and Aux Panels not included)



## 3D DVE Effects “IMPAKT” Option - Models

Effect / Model	Format		Standard Models (Phase 1)	Additional Model Options - (Phase 2)
	SD	HD		
X - Y & Z Position	✓	✓	✓	
Horizontal & Vertical	✓	✓	✓	
Zoom	✓	✓	✓	
Crop Edges	✓	✓	✓	
Dual Tile	✓	✓	✓	
Defocus	✓	✓	✓	
Push & Squeeze	✓	✓	✓	
Rotation	✓	✓	✓	
Reflection	✓	✓	✓	
Perspective	✓	✓	✓	
Drop Shadow	✓	✓	✓	
Lighting	✓	✓	✓	
Slab and Box	✓	✓	✓	
Opacity	✓	✓	✓	
Page Turn & Lighting	✓	✓	✓	
Fragment	✓	✓	✓	
Blur, Hi Blur, and Pixelate	✓	✓	✓	
Mix Wipe	✓	✓	✓	
Ripples	✓	✓	✓	
Splits	✓	✓	✓	
Warp	✓	✓	✓	
Trail Store	✓	✓	✓	
Corner Pinning	✓	✓	✓	
Circular “Pond” Ripples	✓	✓		✓ (Phase 2 Release 1 )
Swirl	✓	✓		✓ (Phase 2 Release 1 )
Glow Effect	✓	✓		✓ (Phase 2 Release 1 )
Pre-set Effects	✓	✓		✓ (Phase 2 Release 1 )
User defined warps	✓	✓		✓ (Phase 2 Release 1 )
Dual Model DVE	✓	✓		✓ (Phase 2 Release 2 )
Flat Shatter Type effects	✓	✓		✓ (Phase 2 Release 2 )
Melt	✓	✓		✓ (Phase 2 Release 2 )
Extended Time line option	✓	✓		✓ (Phase 2 Release 2 )



## Items Descriptions

### Base systems

Item	Description	Part Number
Standard Definition 2 M/E Kahuna	2M/E SD Kahuna System with 2 M/E control panel (Mnemonics), GUI. Consists of 32 inputs 4 Keyers per M/E, 8 outputs and 8 Aux Outputs	K_SD_2ME
Standard Definition 3 M/E Kahuna	3M/E SD Kahuna System with 3 M/E Control Panel (Mnemonics), GUI, Consists of 32 Inputs 4 Keyers per M/E with 12 outputs and 12 Aux Outputs	K_SD_3ME
Standard Definition 4 M/E Kahuna	4M/E SD Kahuna System with 4 M/E control panel (Mnemonics), GUI, Consists of 32 inputs 4 Keyers per M/E, 16 outputs and 16 Aux Outputs	K_SD_4ME
High Definition 2 M/E Kahuna	2M/E HD Kahuna System with 2 M/E control panel (Mnemonics), GUI. Consists of 32 inputs 4 Keyers per M/E, 8 outputs and 8 Aux Outputs	K_HD_2ME
High Definition 4 M/E Kahuna	3M/E HD Kahuna System with 3 M/E Control Panel (Mnemonics), GUI. Consists of 32 Inputs 4 Keyers per M/E with 12 outputs and 12 Aux Outputs	K_HD_3ME
High Definition 4 M/E Kahuna	4M/E HD Kahuna System with 4 M/E control panel (Mnemonics), GUI. Consists of 32 inputs 4 Keyers per M/E, 16 outputs and 16 Aux Outputs	K_HD_4ME



**Feature Packs**

<b>Item</b>	<b>Description</b>	<b>Part Number</b>
Standard Definition Feature Pack 1	Feature Pack for all SD Kahuna's with 32 additional Inputs, Chroma Key, Resize engine on all Keyers, Still Store, Programmable outputs Safe Area Generator, GPI/GPO External RS422 control, PSU Redundancy	K_SD_OPT_P1
Standard Definition Feature Pack 2	Feature Pack for all SD Kahuna's with 32 additional Inputs, Chroma Key, Resize Engine on all Keyers, Resize engine effects, Still – Clip Store, RGB Input Color Correction, RGB Output Color Correction Programmable outputs Safe Area Generator, GPI/GPO External RS422 control, PSU Redundancy	K_SD_OPT_P2
High Definition Feature Pack 1	Feature Pack for all HD Kahuna's with 32 additional Inputs, Chroma Key, Resize Engine on all Keyers, Programmable outputs Safe Area Generator, GPI/GPO External RS422 control, PSU Redundancy	K_HD_OPT_P1
High Definition Feature Pack 2	Feature Pack for all HD Kahuna's with 32 additional Inputs, Chroma Key, Resize Engine on all Keyers, Resize engine effects, Still – Clip Store, Programmable outputs RGB, Input Color Correction, RGB Output Color Correction, Safe Area Generator, GPI/GPO External RS422 control, PSU Redundancy	K_HD_OPT_P2



**Individual items**  
**GUI + Panels**

<b>Item</b>	<b>Description</b>	<b>Part Number</b>
Color Touchscreen GUI	Graphical User Interface, <i>(required for every control Panel)</i>	K_GUI
1 M/E panel with Mnemonics	1 M/E Control Surface with Mnemonics displays on all M/E Banks	K_1ME_CP_MNEM
2 M/E panel with Mnemonics	2 M/E Control Surface with Mnemonics displays on all M/E Banks – Master Aux built in.	K_2ME_CP_MNEM
2 M/E Compact Panel with Mnemonics	2 M/E Compact Control Surface with Mnemonics on all M/E's. 24 Crosspoints per bus, With Tracker Ball	K_2ME_CP_COMPA CT_TB
2 M/E Compact Panel with Mnemonics	2 M/E Compact Control Surface with Mnemonics on all M/E's. 24 Crosspoints per bus	K_2ME_CP_COMPA CT
3 M/E panel with Mnemonics	3 M/E Control Surface with Mnemonics displays on all M/E Banks – Master Aux Built in.	K_3ME_CP_MNEM
3 M/E Compact Panel with Mnemonics	3 M/E Compact Control Surface with Mnemonics displays on all M/E Banks	
4 M/E panel with Mnemonics	4 M/E Control Surface with Mnemonics displays on all M/E Banks	K_4ME_CP_MNEM
*NEW Micro Panel	1 M/E 8 Crosspoint Control Surface	K_MICRO_CP
*NEW Shot Box	Multi level ShotBox	K_SHOTBOX
GUI /Master Aux Panel Stand	Stand for GUI and Master Aux panel	K_GUI Stand
Master Aux Panel	Master Aux control Panel with Mnemonics	K_GUI_MAUX_Stand
1RU Aux	1 Rack unit Aux with 42 buttons (max 16 to a system)	K_1U_AUX
GUI RackMount Kit	RackMount Kit for GUI	K_GUI_R/Mount
Master Aux RackMount	RackMount Kit for Master Aux Panel	K_MAUX_R/Mount



**Individual items**  
**SD & HD Mainframes**

Item	Description	Part Number
SD 2M/E Mainframe only	11RU SD 2 M/E Kahuna with 32 Inputs, 8 outputs & 8 Aux Outputs, 4 Keyers per M/E,	K_SD2ME_MF
SD 3M/E Mainframe only	11RU SD 3 M/E Kahuna Mainframe with 32 Inputs, 12 outputs & 12 Aux Outputs, 4 Keyers per M/E	K_SD3ME_MF
SD 4M/E Mainframe only	11RU SD 4 M/E Kahuna Mainframe with 32 Inputs, 12 outputs & 12 Aux Outputs, 4 Keyers per M/E	K_SD4ME_MF
HD 2M/E Mainframe only	11 RU HD 2 M/E Kahuna with 32 Inputs, 8 Outputs & 8 Aux Outputs, 4 Keyers per M/E	K_HD2ME_MF
HD 3M/E Mainframe only	11 RU HD 3 M/E Kahuna with 32 Inputs, 12 Outputs & 12 Aux Outputs, 4 Keyers per M/E	K_HD3M/E MF
HD 4M/E Mainframe only	11 RU HD 4 M/E Kahuna with 32 Inputs, 16 Outputs & 16 Aux Outputs, 4 Keyers per M/E	K -HD4ME_MF

**Individual items**  
**SD & HD options** *(part numbers for SD and HD shown)*

Item	Description	Part Number (SD & HD)
Additional Inputs	Additional 16 inputs (increasing to 48 Inputs)	K_SD_16IP
		K_HD_16IP
	32 additional SD inputs (increasing to 64 inputs)	K_SD_32IP
		K_HD_32IP
	48 Additional SD inputs (increasing to 80 inputs)	K_SD_48IP
		K_HD_48IP
Keyer options and Effects	Chroma Key for all Keyers	K_SD_CHKY
		K_HD_CHKY
	Resize Engine for all Keyers	K_SD_Resize
		K_HD_Resize
	Effects for all 2D DVE M/E Keyer <i>(must purchase K-HD- Resize)</i>	K_SD_Resize_EFF
		K_HD_Resize_EFF



Item	Description	Part Number (SD & HD)
Extended Background Format Fusion	Extended Background Format Fusion	K_EXT_FF
Border Generator	Border Generator for Outlines, Extrusions and DropShadows	K_SD_BORDERGEN
		K_HD_BORDERGEN
Color Correction	RGB Input Color Correction	K_SD_IP_CC
		K_HD_IP_CC
	RGB Output Color Corrector and Legalizer	K_HD_OP_CC
		K_HD_OP_CC
Still – Clip Store Option	Still Store with Clip Store for all M/E's	K_SD_Still_ClipStore
		K_HD_Still_ClipStore
*NEW Cliptrax	Audio functionality within all Stores	K_Cliptrax
Program outputs	Programmable Outputs on all M/E's	K_SD_Prog_OP
		K_HD_Prog_OP
Safe Area	Safe Area Generator	K_SD_OVERLAY
		K_HD_OVERLAY
Modulation	Modulation for parameters	K_MODULATION
GPI/O	84 General Purpose Outputs/ Tallies, 48 General Purpose Inputs	K_GPOS
RS 422 External Control ports	8 x RS422 ports for external control with P-Bus	K_EXT_Control
Additional Aux outputs	Additional 8 AUX outputs (for 2 and 3 M/E Kahuna's Only)	K_SD_SAX_OP
		K_HD_SAX_OP
Ancillary Data on AUX	Ancillary Data on Aux output	K_AUX_ANC



**Individual items**  
**3DVE “IMPAKT” Effects options**

Item	Description	Part Number (SD & HD)
3D DVE optional Models	Additional Models to the standard set.	K_3D_DVE_MODELS_1

**Individual items**  
**Additional Hardware**

Item	Description	Part Number (SD & HD)
3D Digital Video Effects “IMPAKT”	1 <sup>st</sup> option of 2 Dual Channels/ 4 Tiles of 3D DVE effects for Kahuna.	K_SD_3D_DVE_1
	Standard set of Models with this item	K_HD_3D_DVE_1
	2 <sup>nd</sup> option for 2 Dual Channels/ 4 Tiles of 3D DVE effects for Kahuna. <i>(Giving maximum of 2 option sets per Kahuna giving 4 Channels/ 8 Tiles)</i>	K_SD_3D_DVE_2
	Standard set of Models with this item	K_HD_3D_DVE_2
Single Mix effect	Complete M/E set.	K_SDAME
		K_HDAME
Redundant Power supply (Full System)	Full redundancy kit for a Kahuna system <i>(both Control Panel and mainframe).</i> <i>Included in the Feature Pack options.</i>	K_RED_PSU
Redundant Power Supply (Control Panel)	Redundancy for Control Panel only	K_CS_RED_PSU
Redundant Power supply (Mainframe)	Redundancy kit for Mainframe only	K_MF_RED_PSU
External DC supply (701)	Redundant PSU for 1U AUX panels, Master Aux, Micro Panel, ShotBox.	K_EXT_PSU_701
External DC supply (703)	Redundant PSU for GUI and 1 M/E Panel	K_EXT_PSU_703
Spares Kit	System Spares Kit	K_Spares_Kit





**Individual items**  
***SD and HD upgrade and Dual processing***

<b>Item</b>	<b>Description</b>	<b>Part Number</b>
HD upgrade	HD upgrade processing licence for SD 2M/E Kahuna	K_HDUP_2ME
	HD Upgrade processing licence for SD 3M/E Kahuna	K_HDUP_3ME
	HD upgrade processing licence for SD 4 M/E Kahuna	K_HDUP_4ME
Simultaneous SD/HD processing	Dual HD/SD processing licence for 2M/E Kahuna	K_HSDOP_2ME
	Dual HD/SD processing licence for 3M/E Kahuna	K_HSDOP_3ME
	Dual HD/SD processing licence for 4 M/E Kahuna	K_HSDOP_4ME

**Individual items**  
***Software***

<b>Item</b>	<b>Description</b>	<b>Part Number</b>
PC application	PC application for engineering sets, Still and Clips store management	K_PCA

**Individual items**  
***Commissioning and training***

<b>Item</b>	<b>Description</b>	<b>Part Number</b>
Commissioning	Onsite commissioning package covering setup and acceptance.	K_COM
Training	Technical / Engineering maintenance	K_T1_TRG
	Operational training (level 1 basic operation)	K_O1_TRG
	Operational training (Level 2 Advanced operation)	K_O2_TRG



## Ordering Example

A 4M/E HD Kahuna Production Switcher with 80 inputs, Chroma Keyer, Resize engines fully optioned. 2 Channels of 3D DVE effects, Master Aux Panel, 5x 1 Rack Unit, Clean programmable outputs, Serial tally and RS 422 control, color correction on outputs only, Still Store with Clip Store capability. Power supply redundancy. Commissioning, Technical and basic operation Training for 3 people.

Part Number	Description	Qty	Total
K_HD_4ME	4M/E HD Kahuna System with 4 M/E control panel, GUI. Consists of 32 inputs 4 Keyers per M/E, 16 outputs and 16 Aux Outputs	1	1
K_HD_48IP	48 Additional SD inputs (increasing to 80 inputs)	1	1
K_HD_CHKY	Chroma Key for all 4 Keyers in 1 M/E	1	1
K_HD_Resize	2D DVE for all Keyers	1	1
K_HD_Resize_EFF	Effects for Resize ( must purchase K-HD-Resize)	1	1
K_HD_3D_DVE_1	2 Dual Channels/ 4 Tiles of 3D DVE effects for Kahuna.		
K_HD_Prog_OP	Programmable Outputs on all M/E's	1	1
K_EXT_Control	8 x RS422 ports for external control with P-Bus	1	1
K_HD_OP_CC	RGB Output Color Corrector and Legalizer	1	1
K-HD_Still_ClipStore	Still – Clip Store	1	1
K_1U_AUX	1 Rack unit Aux with 42 buttons (max 16 to a system)	5	5
K-GUI_MAUX_STAND	Master Aux control Panel with Mnemonics	1	1
K_GUI Stand	Stand for GUI and Master Aux panel	2	2
K_RED_PSU	Full redundancy for a Kahuna system <i>(both Control Panel and mainframe)</i>	1	1
K_PCA	PC application for engineering sets, Still and Clips store management	1	1
K_COM	Onsite commissioning package covering setup and acceptance.	1	1
K_T1_TRG	Technical / Engineering maintenance	3	3
K_O1_TRG	Operational training (level 1 basic operation)	3	3



# KAHUNA PRODUCTION SWITCHER

TECHNICAL SPECIFICATION

(Version 1 .0)



## Features

### Video Signal Inputs

80 SD/HD Serial Digital	270Mbit/s/ 1.485Gbit/s serial digital interface as REC601/ SMPTE 292M via BNC connectors
Genlock Reference A&B	2 off Analog Sync (loop-through)

### Video Signal Outputs per ME

4 Programmable HD/SD-SDI	4 via 8 BNC connectors (2 feeds per output)
4 Timed Aux HD/SD SDI	4 via 8 BNC connectors (2 feeds per output)
Analog Sync Out	Timing Adjustable Sync output

### Control Interfaces Per ME

Control Panel	10/100 base T-X via 1 x RJ45 connector using one of the six RJ45's below
External Interfaces	2 x freely-assignable RS422 each via 1 x 9-way D-type
Diagnostics	RS232 (DCE) via 1 x 9-way D-type connector

### Control Interfaces Shared

GPI Inputs	48 x TTL-level inputs via 25-way D-type connectors
Tally/GPO Outputs	84 x isolated contact closures via 25-way D-type connectors
Six 10/100 Base T Ethernet connections	Six RJ45 connectors. Used for panel control, FTP, Offline download

### Control Interfaces (Control Panel)

Mainframe	10/100 base T via 1 x RJ45 connector
GUI (Graphical user display) and main panel	25-way D-type connector
3 USB Ports	USB 1.1/2.0 Ports (2 on Rear 1 on front of GUI)
Aux Control Port	RJ45 Daisy chain for 1U AUX panels
Main Aux	15 Way Dtype on Main Panel and GUI (with Power 3m)
Spare Control	15 Way Dtype on GUI

## Specifications

TV Standards (Options)	625/525 4:3
	625/525 16:9
	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
Analog Genlock signal	High definition tri-level syncs or SD 1V B&B
Input Return Loss	>15 dB to 750 MHz >12 dB to 1500
Maximum Input Cable Length	Exceeds SMPTE292 recommendations >= 100 m of Belden 8281 cable
Video Signal Output Return Loss	>15 dB to 750 MHz >12 dB to 1500
<b>Internal Processing</b>	
Pb & Pr Data Rate	37.125/6.75 MHz or/(1.001) MHz (4:2:2) @12bit
Resolution	10 bits. Output
Luma & Key Data Rate	74.25/13.5 MHz or (74.25/1.001) MHz @12bit



**Power**

Kahuna Mainframe Power Supply	Auto-sensing 100-250 VAC 50/60 Hz nominal Provision for two pairs of fully independent hot-plugable PSU modules, with separate mains power feeds via 4 x IEC socket. A pair of PSU's is standard. The second pair is an option (Giving Both Dual Redundant).
Kahuna Mainframe Power Consumption	1200 W Maximum with all options fitted
Control Panel Power Supply 2ME, 3ME, 4ME	Auto-sensing 100-250 VAC 50/60 Hz nominal Provision for two fully independent hot-plugable PSU modules, with separate mains power feeds via 2 x IEC socket. A single PSU is standard; the second is an option.
Control Panel Power Consumption	100W Maximum
Control Panel Power Supply 1ME	50W Maximum. Auto-sensing 100-250 VAC 50/60 Hz nominal Provision for two fully independent external PSUs giving dual redundant operation

**Mainframe**

Temperature Range	5 to 35° C non-condensing operating
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**Control Surfaces and Ancillary Panels**

Temperature Range	5 to 35° C non-condensing operating
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## Control Surfaces & Ancillary Panel Weights and Dimensions

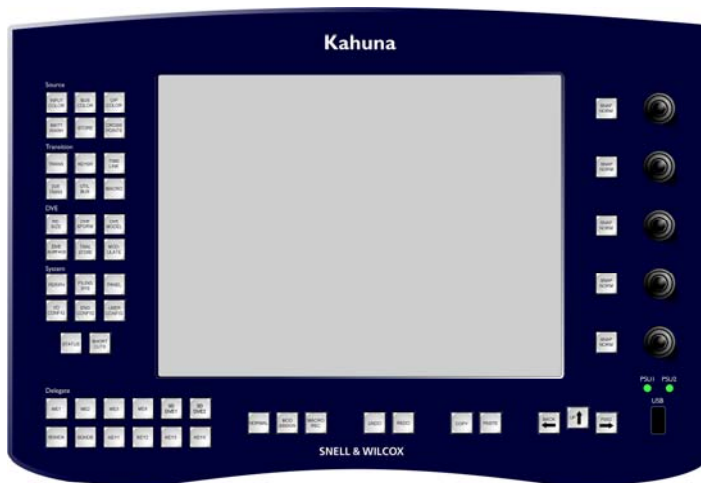
### Mainframe

Size	11RU	
Height	19.2 inches	~ 488 mm.
Width	19 inches nominal	~ 485 mm including brackets.
Depth	21.9 inches nominal	~ 558.1 mm including connectors
Weight	105.8lbs	~ 48kg



### GUI Panel Part Number: K\_GUI Order Code:9648700A

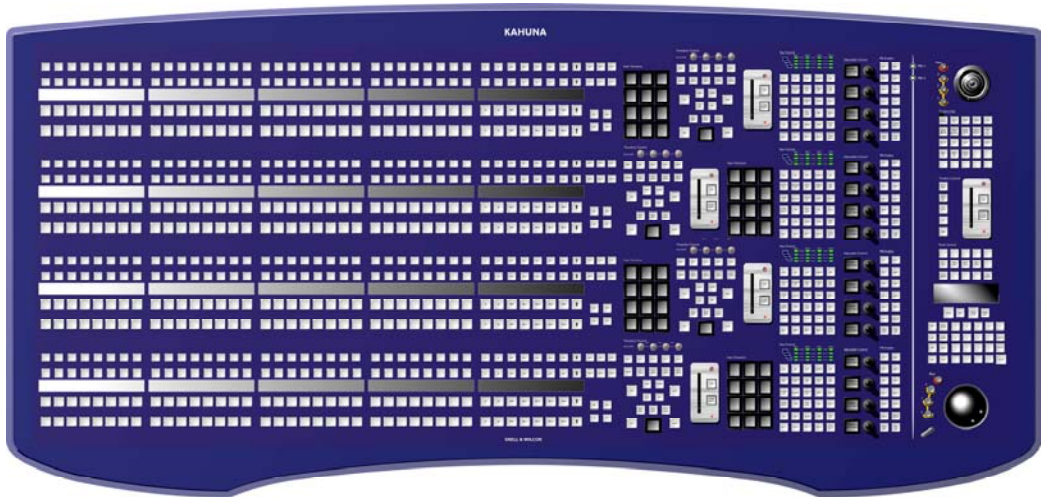
Height	11.5 inches	~ 292.6 mm (including stand)
Width	16.9 inches	~ 430 mm
Depth	3.2 inches	~ 81.7 mm
Weight	13.8lbs	~ 6.3kg



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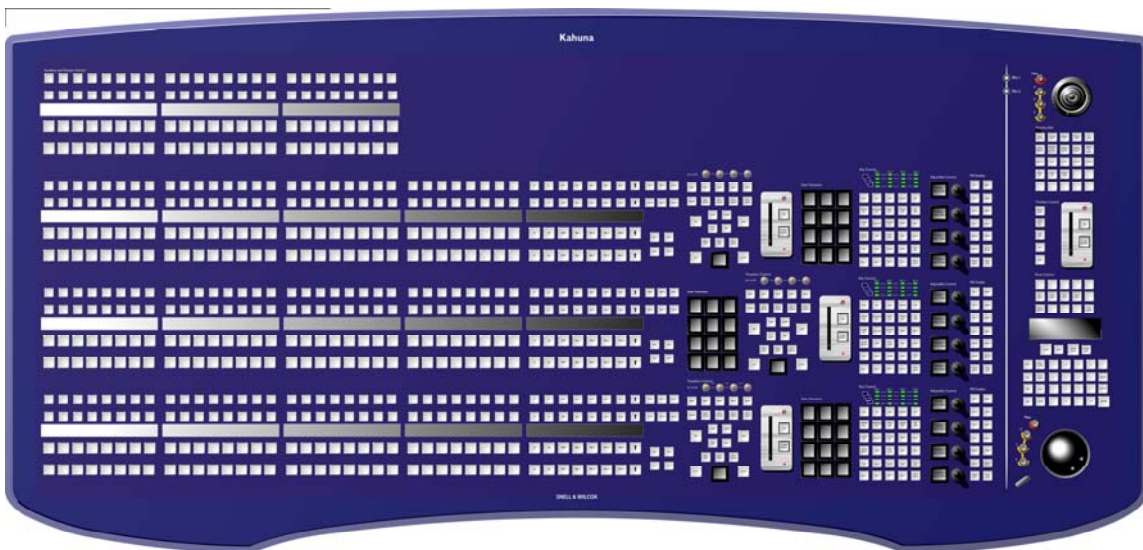
**4ME Control Surface Part Number: K\_4ME\_CP\_MNEM Order Code: 96484A**

Height	27.8 inches	~ 707.5 mm
Width	57.8 inches	~ 1468.4 mm
Depth	4.8 inches	~ 123.9 mm
Weight	105.8lbs	~ 48kg



**3ME Control Surface Part Number: K\_3ME\_CP\_MNEM Order Code: 9648300A**

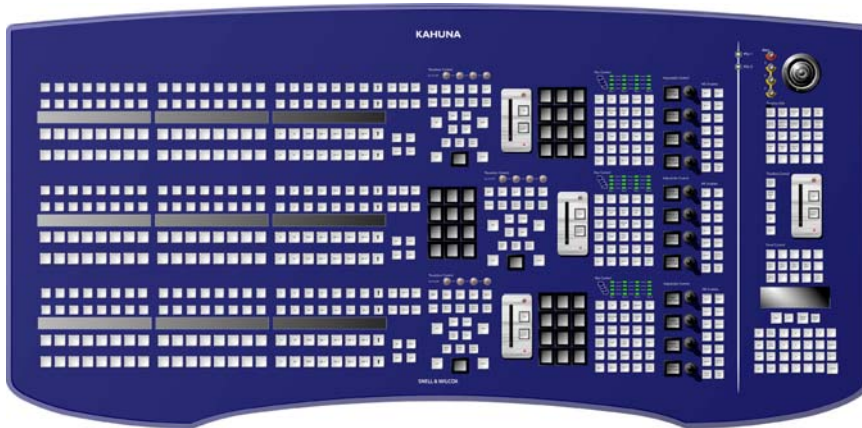
Height	27.8 inches	~ 707.5 mm
Width	57.8 inches	~ 1468.4 mm
Depth	4.8 inches	~ 123.9 mm
Weight	105.8lbs	~ 48kg



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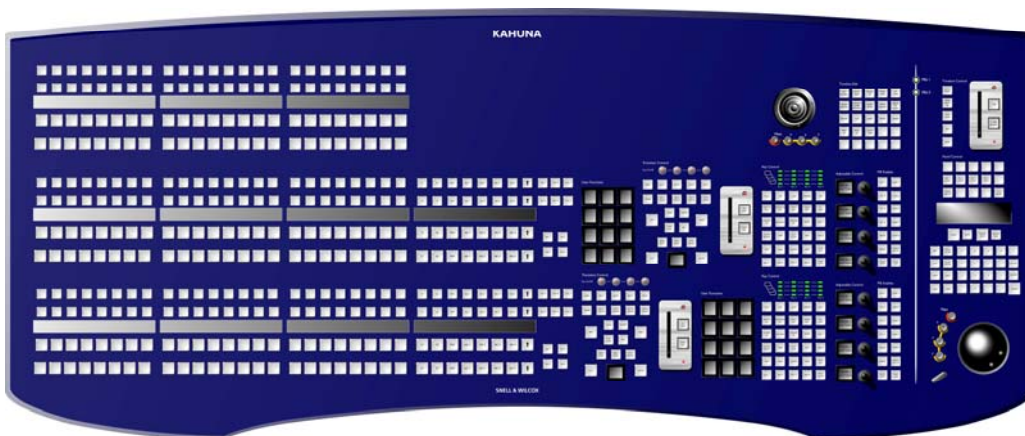
**3ME Compact Control Surface Part Number: K\_3M3\_COMPACT Order Code: 9648400**

Height	23.5 inches	~ 598 mm
Width	45.2 inches	~ 1148 mm
Depth	4.9 inches	~ 125 mm
Weight	75.8lbs	~ 33.5kg



**2ME Control Surface Part Number: K\_2ME\_CP\_MNEM Order Code: 9648200A**

Height	22.0 inches	~ 560.6 mm
Width	51.7 inches	~ 1315 mm
Depth	5.4 inches	~ 138 mm
Weight	77.1lbs	~ 35kg



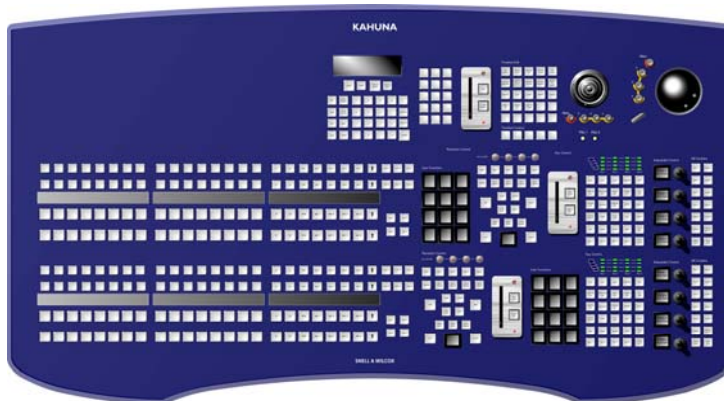
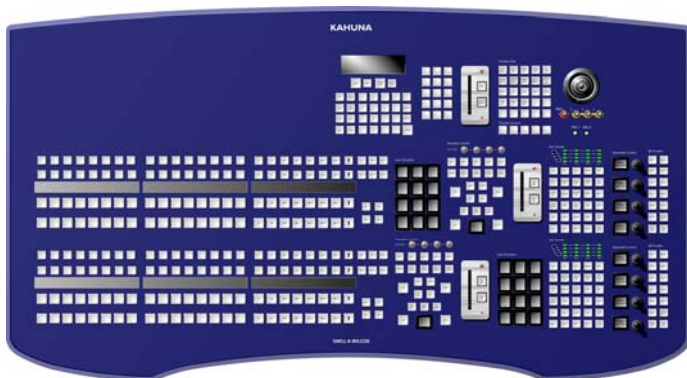


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<b>2ME Compact Control Surface Part Number:</b> K_2ME_COMPACT	<b>Order Code:</b> 9648600A
<b>2ME Compact Trackerball Control Surface</b>	<b>Part Number:</b> K_2ME_COMPACT_TB
	<b>Order Code:</b> 9648860

Height	21.7 inches	~ 553 mm
Width	39.2 inches	~ 997 mm
Depth	5.4 inches	~ 138 mm

Weight	62.8lbs	~ 28.5kg
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<b>1ME Control Surface Part Number:</b> K_1ME_CP_MNEM	<b>Order Code:</b> 9648100A
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Height	13.1 inches	~ 355 mm
Width	25.5 inches	~ 648 mm
Depth	6.4 inches	~ 163.7 mm

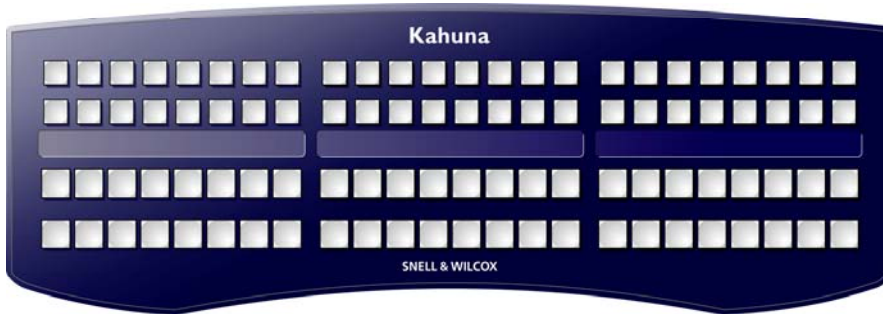
Weight	16.7lbs	~ 7.6kg
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**Master Aux Panel (without stand) Part Number: K\_MASTER\_AUX Order Code:9648900A**

Size	4RU	
Height	6.62 inches	~ 168.2 mm (including stand)
Width	19.8 inches	~ 504 mm
Depth	2.74 inches	~ 69.7 mm
Weight	8.1lbs	~ 3.7kg



**Remote Aux Panel Part Number: K\_1U\_AUX Order Code: 9648800A**

Size	1RU	
Height	1.7 inches	~ 44 mm (including stand)
Width	17.3 inches	~ 441.7 mm
Depth	5.8 inches	~ 148.8 mm
Weight	5.7lbs	~ 2.6kg



**Micropanel Part Number: K\_MICRO\_CP Order Code: 9649100**

Size	4RU	
Height	3.5 inches	~ 90.4 mm
Width	18.9 inches	~ 482 mm
Depth	6.9 inches	~ 177 mm
Weight	7.5lbs	~ 3.4kg



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<b>ShotBox</b>	<b>Part Number: K_SHOTBOX</b>	<b>Order Code: 9649200</b>
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	Height	2.54 inches	~ 64.5 mm
	Width	10.2 inches	~ 272 mm
	Depth	5.98 inches	~ 152 mm

	Weight	3.3lbs	~ 1.5kg
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