

Granite 2000, 1000 and 100

1 M/E Live Video Production Systems

Installation Planning Guide



Create Compelling Live Video

This Installation Planning Guide is intended to help plan the purchase and installation of the Broadcast Pix Granite 2000, Granite 1000 and Granite 100 live video production systems.

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Introduction

Each Broadcast Pix Granite™ 2000, 1000 and 100 live integrated production system combines a 1 Mix/Effect (M/E) Granite Switcher with a Granite Content Server running Fluent file-based workflow software.

The Granite Switcher is native HD with simultaneous multi-definition support of 1080i, 720p and SD. The Switcher has 6 keyers each of which have a DVE. All 6 are standard on the 2000, and 3 are standard and 3 more are optional on the 100 and 1000. The Granite Switcher and Server are connected with an included PCIe cable, and come with a keyboard and mouse.

The Granite Content Server provides a powerful and efficient file-based workflow, and includes a clip store, animation stores, graphics stores, Harris Inscribe Character Generator, Multi-View monitoring of video and files, watch-folders to streamline file import, and file-based macros. In addition, it can optionally control external audio mixers, robotic cameras, video servers and video streaming appliances. The Server provides support for two and optionally four monitors to provide an integrated multi-view plus macros control and graphics station.

Two I/O Levels

Two levels of SDI I/O available. The Granite 2000, 1000 and 100 each has 11 live SDI baseband video inputs and 6 SDI outputs, while the Granite 2000+, 1000+ and 100+ each has 22 live SDI inputs and 12 SDI outputs. All systems also add have 7 channels (with key) of file inputs from the Granite Content Server for graphics, animations and clips.

Three Choices of Control Surface

The Granite 2000 and 200+ model include a wide 1 M/E control panel. The Granite 1000 and 1000+ models include a more compact 1 M/E control panel. The Granite 100 and 100+ models are controlled by a mouse, included custom keyboard, or optional iPixPanel application running on an Apple iPad.

All Models Include



Granite 100 and 100+ includes



Custom Keyboard

Granite 1000 and 1000+ includes



1000 Control Panel

Granite 2000 and 2000+ includes



2000 Control Panel



iPad app can also be
used on any model

Standard Features

Granite Switcher

2000 Panel Layout

The Granite 2000 panel has 16 direct input source buttons, 16 shifted input source buttons for a total of 32 mappable inputs. Program/preview architecture with classic next transition section.

1000 Panel Layout:

The Granite 1000 panel has 9 direct input source buttons, 9 shifted input source buttons for a total of 18 mappable inputs. Program/preview architecture with classic next transition section.

100 Control Surface:

On the Granite 100 all of these same function may be reached from the custom keyboard, multi-view or SoftPanel. Or the iPixPanel app for an iPad may be used which has 8 direct inputs and 16 shifted.

PixButtons™:

Unique push buttons have built in displays that show an icon of the device selected (camera, clip, graphic, etc.), the channel number selected, and the exact file name selected of clips and graphics. Always know what content will appear; no other switcher has this.



Up to 6 Keyers:

On the Granite 100 and 1000, 3 keyers are standard and 3 more are optional, and all 6 are standard on the 2000. Each key has a 2 dimensional DVE, with reposition and cropping capabilities. One Chromakey/Luminance key is standard (upgradable to 8), with clip, gain, hue and spill suppression. An external CG can input one channel using video and key inputs, and a second channel using a self key.

Multi-Format, with Auto-Detect:

The SDI connectors enable any combination of video formats including: 1080i/59.94, 1080i/50, 720p/59.94, 720p/50, 486i (NTSC) and 576i (PAL). The system is selectable between 50 and 60 Hz, and between 16:9 and 4:3. When each SDI cable is connected, the switcher auto-detects its format, between 1080i, 720p and SD, and sets the format, and lights an indicator light to indicate format. Any input may be synchronous or asynchronous.

HD Processing:

1.5Gb/s HD, 10-bit 4-4-4, YPrPb processing.

Inputs:

11 SDI inputs on the 2000, 1000 or 100 model (22 on the 2000+, 1000+ or 100+ model), for cameras and other external sources, plus 14 video and key inputs for 7 channels of internal clips, animations and graphics from the Granite Server.

Outputs:

6 SDI outputs on the 2000, 1000 or 100 model (12 on the 2000+, 1000+ or 100+ model), plus in the future 2 DVI-D outputs will be activated. All SDI outputs are software assignable to Program, Preview, Aux, Clean Feed and PowerAux. Each SDI output can be assigned to 1080i, 720p or SD. Each DVI-D output must mirror one of the SDI output formats.

PowerAux and Standard Aux Outputs

The PowerAux output can output any source, and keys can be composited on top of it. It also processes the format. The background can be an external source, any internal source including the clip store, or program or preview. The PowerAux can maintain an output format (1080i, 720p or SD) and aspect ratio no matter what source it displays.

The other aux outputs are unprocessed, and so will output whatever the format is of the source they are asked to monitor, including any external source, or program or preview. So, if for example you are making a 1080i recording from a standard Aux, care should be taken to not change it to a non-1080i format.

Format Indicator Lights:

Each input and output has an indicator lights viewable from both the back and front of the Granite Switcher, which illuminate blue for 1080i, green for 720p, and orange for SD.

Standard Features, Continued

Granite Switcher, continued

AutoAspect™:

Mix and match 16:9 content with 4:3 content interchangeably. Each external live input, as well as each internal graphic and clip, can be adjusted to 4 different aspect treatments, Box, 14:9, Crop or None. Simultaneously output 16:9 and 4:3 on SD outputs.

Tally:

The Granite switcher includes tally for each of its inputs with 25 open collector outputs. For more see tally page.

Granite Content Server

Fluent Multi-View:

Customizable Multi-View showing internal file inputs and external SDI inputs in motion with tally status and under monitor displays, plus view all keyer assignments and internal clip and graphic libraries. Displayed on a dual or optional quad monitor card. See the Fluent Multi-View section of this guide for more on it.

Fluent Macros:

Save and recall switcher panel snap shots and sequences. Macros remember not only setups, but the exact file names of clips, graphics and metadata (mark points, auto start/stop/rewind, loop and roll/crawl speed). Sequence macros can automate your production to quickly recall and play out pre-saved sequences including keys, DVEs, specific clips and graphics, camera moves, audio follow, etc. Fluent Macros can be created and executed from the control panel and/or from a Macro window on one of the systems' monitors. Macros can also be played from a remote panel, SoftPanel, iPhone or iPad.

Fluent HD Still Stores:

2 channels of still store can support a wide-variety of still graphic formats from .TGA, .BMP, .GIF, .JPG, .PNG and .TIFF. Either 24 bit or 32 bit HD full screen graphics or a keyable graphic with an alpha channel

HD Character Generator:

2 channel HD character generator is a Harris® Inscrber® TitleMotion GS. Supports rolls/crawls, 2D & 3D animations, on-air graphic changes with .scribe editing, many pre-loaded templates and anti-aliased resolution of <16nS. The 2 channels of CG store can also hold graphics input to the system, like the still stores.

Fluent HD Clip Store:

1 channel clip store that supports compressed H.264 video with audio, with auto start/stop/rewind, mark points and looping capabilities. Play up to 120 hours (depending on compression settings) of .mov or .mp4 files encoded in H.264/MPEG-4 AVC, and play out image sequence animations files with key and audio.

Fluent HD Animation Stores:

1 or 2 animation store with auto start/stop/rewind, mark points and looping capabilities. Play out a folder of image sequence animations files with key and audio. Create this animation folder on the internal Inscrber CG, or on an external system like Aftereffects, Apple, Motion, etc. Plays folders of .tga, .bmp or .png files. Animations can be up to 800MB long compressed .tga or up to 100 frames uncompressed with 1 animation store, which is how the system ships, or it can be set to 2 animation stores each with one half the capacity. When set for 1 animation store, the second channel of the animation store may be used for single frame graphics.

Fluent Watch-folders:

Streamline the flow of clips and graphics files to the Granite Server from other systems like Final Cut and Photoshop. Add files to the show through standard network connections even when on-air.

Standard Features, Continued

Multiple Redundancies for Non-Stop Operation

The Granite system has many redundancies for non-stop on-air productions:

- Recovery system back-up software in the Server, with back-up hard drive optional.
- Redundant power supplies are available as an option on the Switcher and Server. A redundant power supply is standard on the 2000 control panel, and is optional on the 1000 control panel.
- All Granite 2000 and 1000 models have redundant control (network and serial) that enables the Granite Switcher to keep switching all cameras and other external sources and outputs from their control panel if the Granite Server should ever fail. This is fail-safe mode.

Note that when in fail-safe mode, you are switching between unprocessed inputs, and so if you are producing for example a 1080i show, care should be taken not to select an SD camera or other non-1080i source.

The Granite 100 models will go to one chosen source (the fail-safe input, which is user settable) if its Server should ever fail.

- If the physical control panel on the Granite 2000 and 1000 models should ever stop, a redundant included SoftPanel can be used.
- The optional premium Granite Server has both redundant power and a hardware RAID 10 storage array of four media drives, which enables a clip to continue playing without interruption if one or two drives should ever fail.

Granite 2000 User Interface: Control Panel and Integrated Multi-View

The Granite 2000 control panel combines a 1M/E switcher layout, with a banks of device controls that can be assigned to control a wide variety of internal and external devices. The device controls include a PixPad of PixButtons, a Joystick, knobs, motion controls and a display. The monitors are an integral part of the user interface and provide unprecedented feedback to the operator. The monitor layouts may be customized, as each element can be moved, resized and most can be replicated for team operation. A typical monitor configuration is shown below using the standard dual monitor configuration. See the Multi-View section of this manual for more on it.



Granite 1000 User Interface: Control Panel and Integrated Multi-View

The Granite 1000 control panel combines a 1M/E switcher layout, with a banks of device controls that can be assigned to control a wide variety of internal and external devices. The device controls include a PixPad of PixButtons, a Joystick, knobs, motion controls and a display. The monitors are an integral part of the user interface and provide unprecedented feedback to the operator. The monitor layouts may be customized, as each element can be moved, resized and most can be replicated for team operation. A typical monitor configuration is shown below using the standard dual monitor configuration. See the Multi-View section of this manual for more on it.



Granite 100 User Interface

The Granite 100 displays the same rich multi-view as the Granite 1000, but instead of a physical control panel the Granite 100 provides several other control methods, depending on user preference.

Multi-View Control

The most intuitive is to control it from the multi-view. All of the cameras, clips and graphics are displayed. Just click on a camera to bring it to air. To add a graphic, just click on a keyer. To change a graphic, just open the PixPad for the graphic or clip store you want, and click on the graphic. The standard 100 multi-view also adds controls for transitions and PixPad.



Multi-View Control, with a Touch-screen

For a tactile feel, add a touch-screen monitor. Now rather than click on the multi-view, you can just touch it with your finger.



Keyboard

Or use the standard keyboard, on which there are keyboard shortcuts for all switcher operations.

Custom Keyboard

In addition to the standard keyboard, the system includes a custom keyboard lettered for the switcher functions.



SoftPanel

Or open a SoftPanel on the GUI, and control it with a mouse. The SoftPanel has the exact same operation and layout as the Broadcast Pix 1 M/E control panel, so switcher operators will feel at home.



iPad

Control a Slate 100 with an Apple iPad. This powerful wireless device has a touchscreen. Just download the Broadcast Pix iPixPanel from the Apple application store and you have a powerful 1 M/E control panel. It even has the PixButtons from the Granite 1000 panel which tell you what device and file name you will get when you push a button. Add a wireless router to the Granite 100, and iPixPanel provides the freedom of wireless control.



Granite 100 User Interface, Options

Custom Keyboard

The custom keyboard is lettered with all control panel commands. It plugs into a USB port. It has a button that changes its operation from the control panel to a conventional keyboard, or a graphics operator can attach and use the conventional keyboard, which is also included.



iPad

The iPad has all the buttons from the 1ME control panel on a Granite 1000

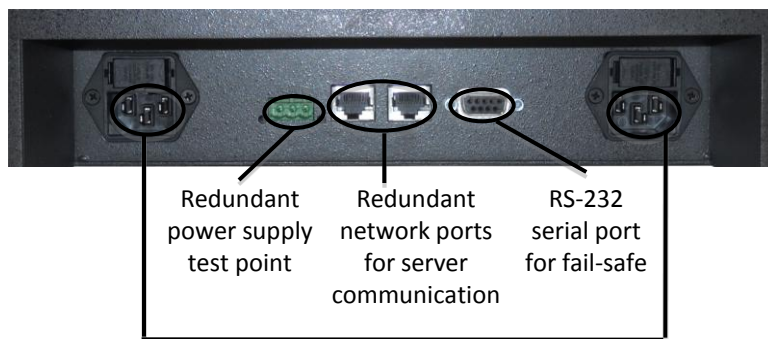


Granite 2000 and 2000+ Control Panel Specifications

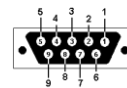
The control panel comes standard with two redundant internal power supplies that use standard IEC power cords (included). In addition, there are 2 redundant 100BASE-TX Category 5 network ports for communication to the server and an RS-232 serial connection for fail-safe control to the switcher.

One 10ft Cat 5 crossover network cable is included with each Granite 2000 and 2000+ system , in addition to a 10ft serial cable for fail-safe control. For custom wiring of the RS-232 serial cable, see pinout below..

Rear View of 2000 Control Panel

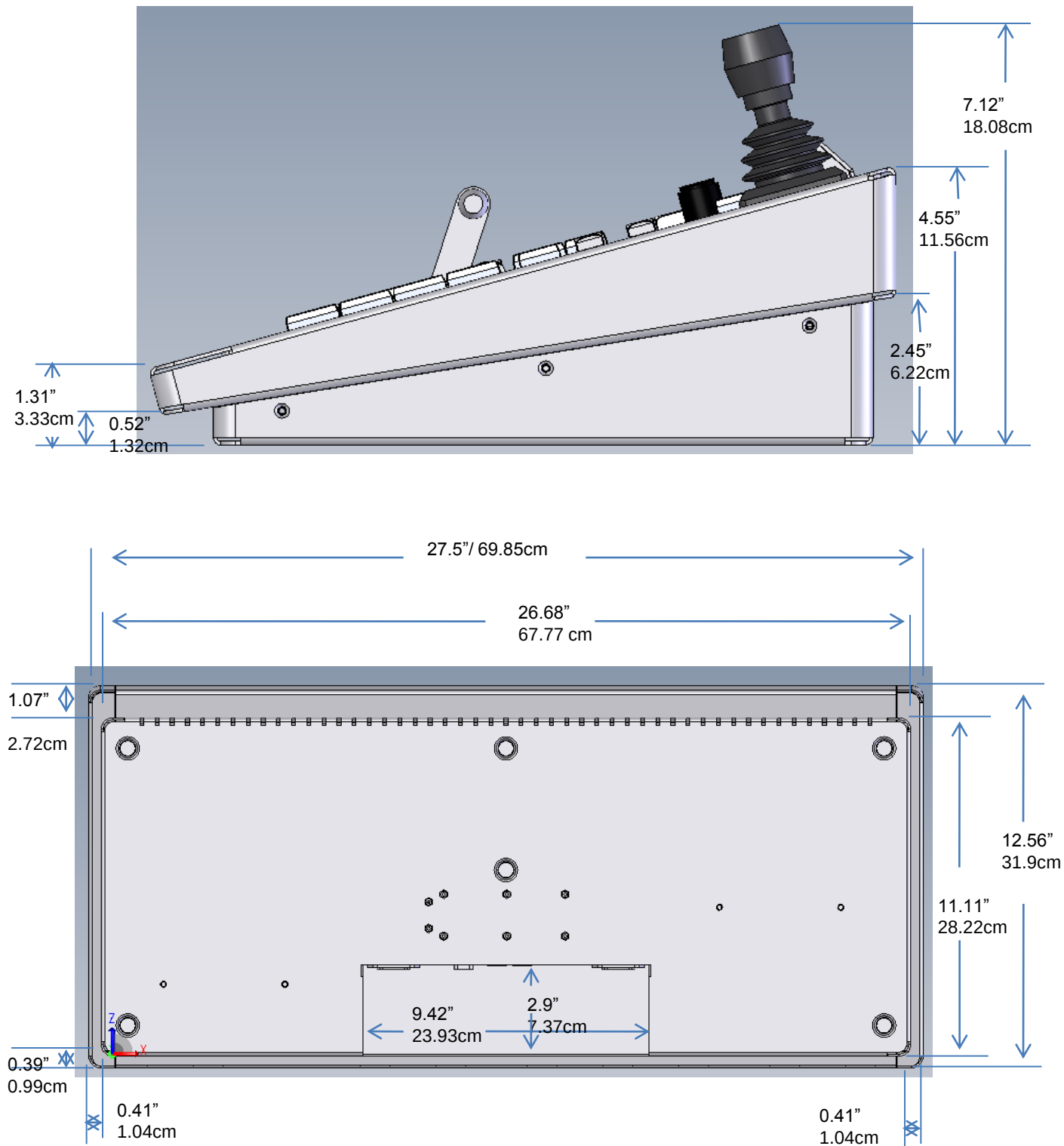


DP 9-pin Serial Cable Pinout:



Pin	Function
2	RXD
3	TXD
5	GND

Granite 2000 and 2000+ Control Panel Dimensions



Granite 1000 and 1000+ Control Panel Specifications

The control panel comes standard with one external power supply (upgrade to dual redundant power) that uses standard IEC power cords (included). In addition, there are 2 redundant 100BASE-TX Category 5 network ports for communication to the server and an RS-232 serial connection for fail-safe control to the switcher.

One 10ft Cat 5 crossover network cable is included with each Granite 1000 and 1000+ system , in addition to a 10ft serial cable for fail-safe control. For custom wiring of the RS-232 serial cable, see pinout below..

Rear View of 1 M/E Control Panel

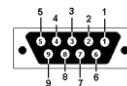


RS – 232
Serial port
for panel upgrades

Redundant
network ports
for workstation
communication

Power supplies
(Redundant supplies
optional)

DP 9-pin Serial Cable Pinout:

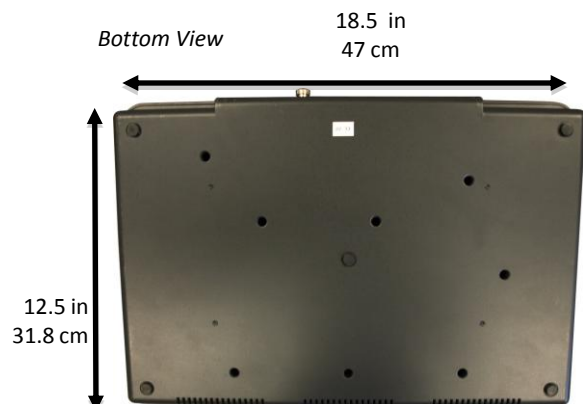


Pin	Function
2	RXD
3	TXD
5	GND

Top View



Bottom View

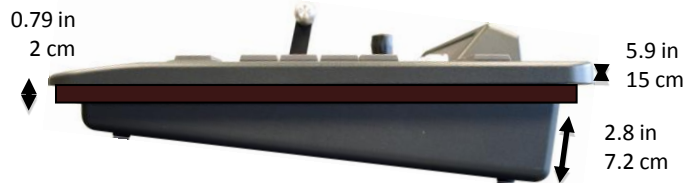


Granite 1000 and 1000+ Control Panel Dimensions

Side Views

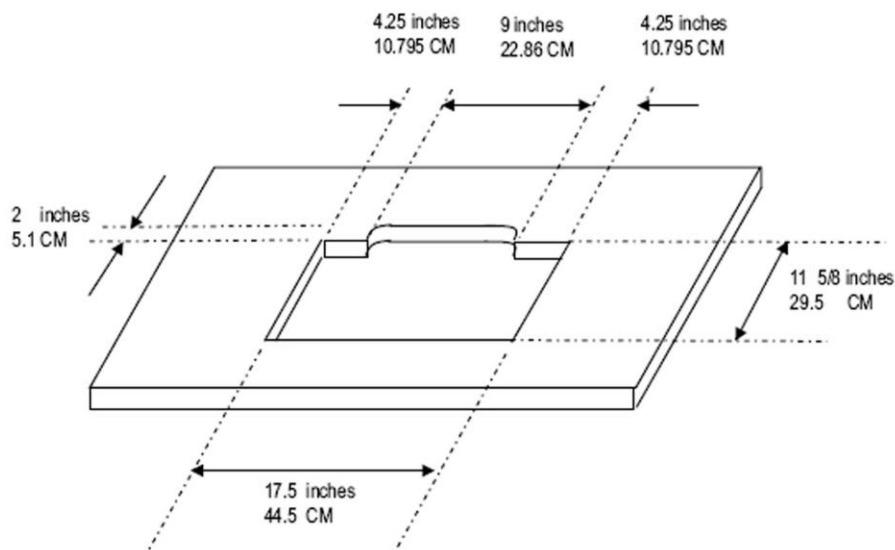
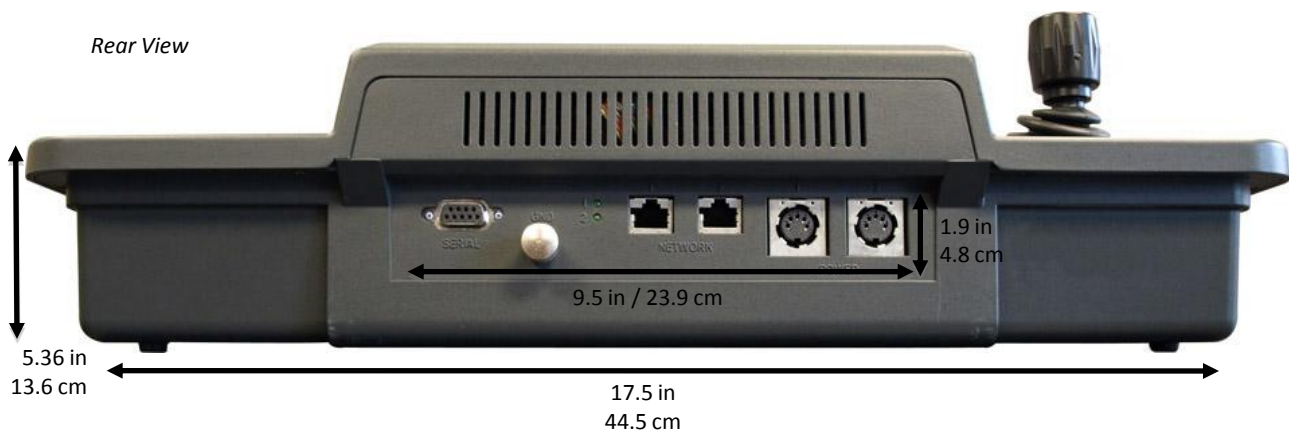


Tabletop installation of control panel:
Provides greater visibility of PixButtons.



Cut-out installation of control panel

Rear View



Dimensions for Control Panel

Granite Switcher

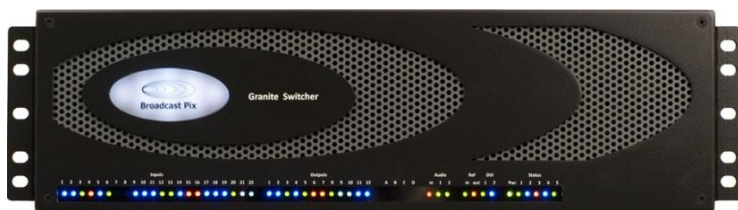
The Granite Switcher receives the video inputs via BNCs, and file inputs from the Granite Server via a PCIe cable. It provides the input, output, switching and keying functions of the live video production system.

The Granite 2000, 1000 and 100 models includes one HD/SD SDI board which provides 11 HD/SD inputs and 6 outputs. The Granite 2000+, 1000+ and 100+ model adds a second HD/SD SDI board which doubles the SDI I/O to 22 HD/SD inputs and 6 outputs. In addition, both models have 7 channels of file based inputs from the Granite Content Server, each with key, which would require another 14 video inputs on a conventional switcher.

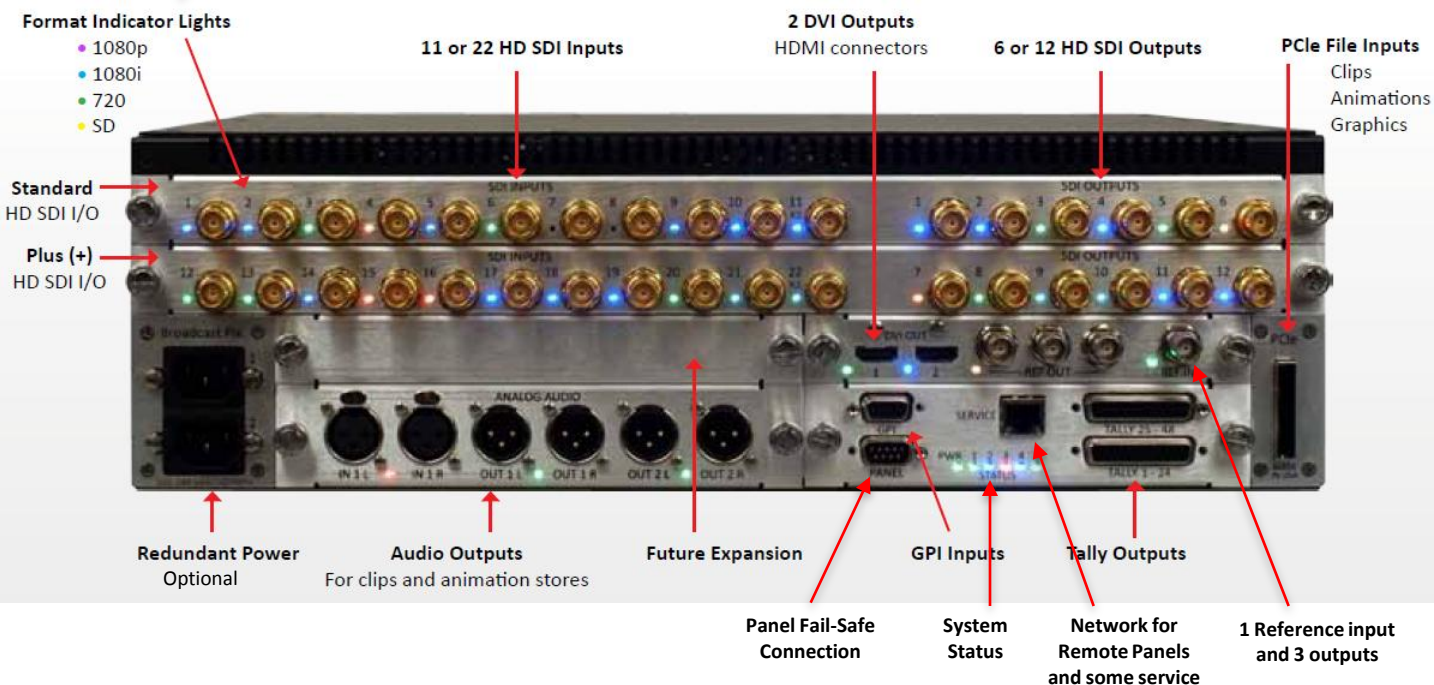
While Granite has a powerful internal CG, some users wish to connect an external CG, with its video and key cut cables. The key cut cable should be connected to input 11. The key fill cable can go to any input.

The Granite Switcher has two audio outputs, which are for the clip store and one of the animation stores.

	2000 1000 100	2000+ 1000+ 100+
Video Inputs:		
• SDI HD/SD	11	22
File Inputs:		
• Clip + key	2	2
• Animation + key	4	4
• Graphic + key	<u>8</u>	<u>8</u>
Total Inputs	25	36
Video Outputs:		
• SDI HD/SD	6	12
• DVI	<u>2</u>	<u>2</u>
Total Outputs	8	14



Granite Switcher
Front View



Granite Content Server

The Granite Content Server runs Windows XP for Embedded, Service Pack 3, and comes pre-installed with the appropriate software. The server runs the BPSwitcher application, which is necessary to operate the system with all its features. (Applications from vendors other than Broadcast Pix should not be added to the system, unless approved by Broadcast Pix, or they will hurt system performance and invalidate the warranty.)

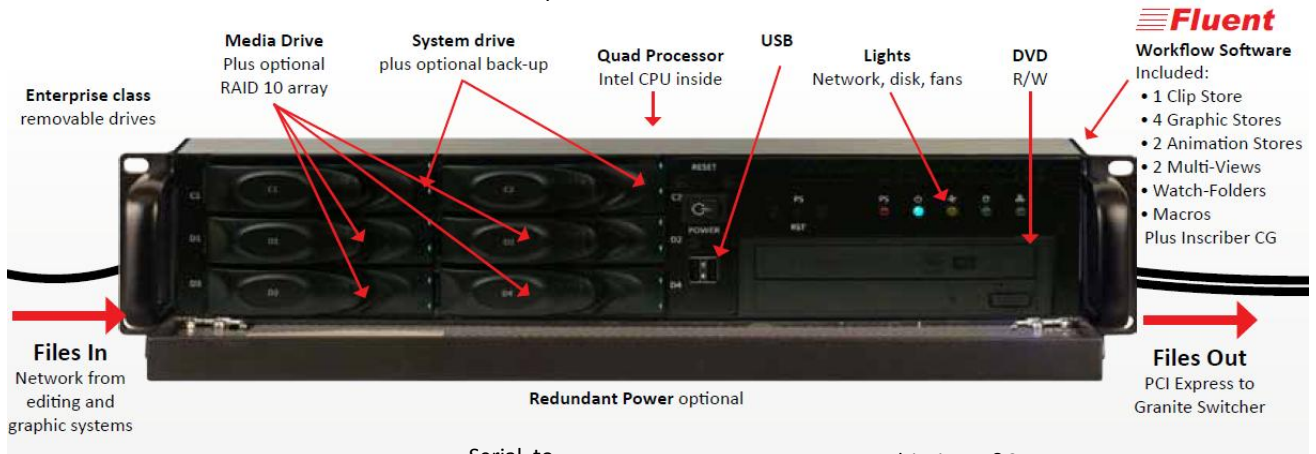
Content Server Specifications:

- Intel® Core™ 2 Quad 2.66 GHz processor
- 4 GB Ram memory
- 250 GB system hard drive (for applications and graphic storage), with back-up software
- Removable 250 GB video hard drives (for clip store storage), upgradable to 2 removable 500GB drives
- (1) DVD/CD R/W
- Redundant power supplies
- (2) 10/100/1000BASE-TX Ethernet ports (one used for private Broadcast Pix control)
- Serial port for fail-safe control
- (2) front-mounted USB 2.0 ports
- (6) rear-mounted USB 2.0 ports
- (2) USB ports for keyboard and mouse (supplied)

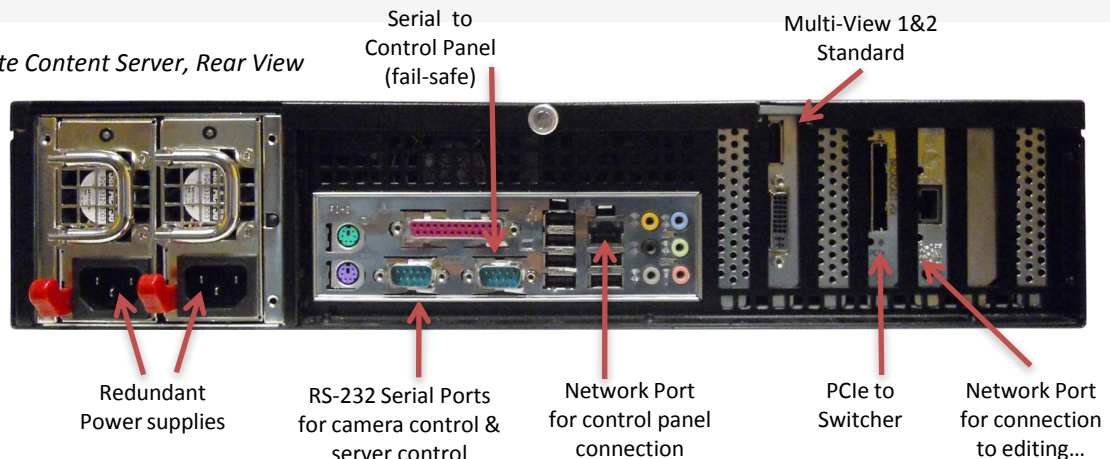
Premium Content Server(Optional) Adds:

- Redundant 250 GB system drive, RAID 1, with back-up software
- (4) Removable 250 GB video hard drives (for clip store storage), upgradable to 4 removable 500GB drives, RAID 10
- Redundant power supplies
- Sliding Rack Rails for standard 19" rack mount

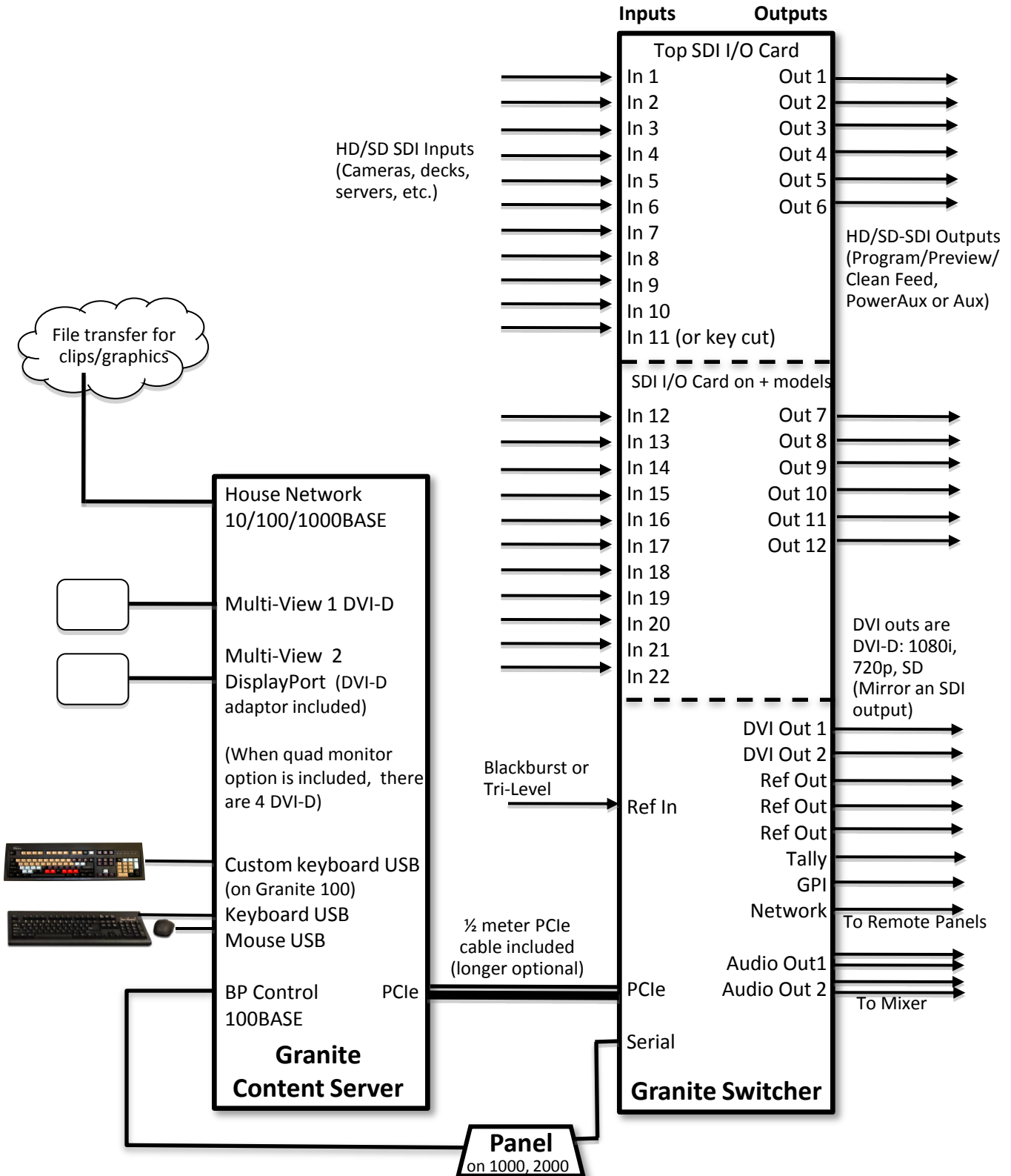
Granite Content Server, Front View, with door open



Granite Content Server, Rear View

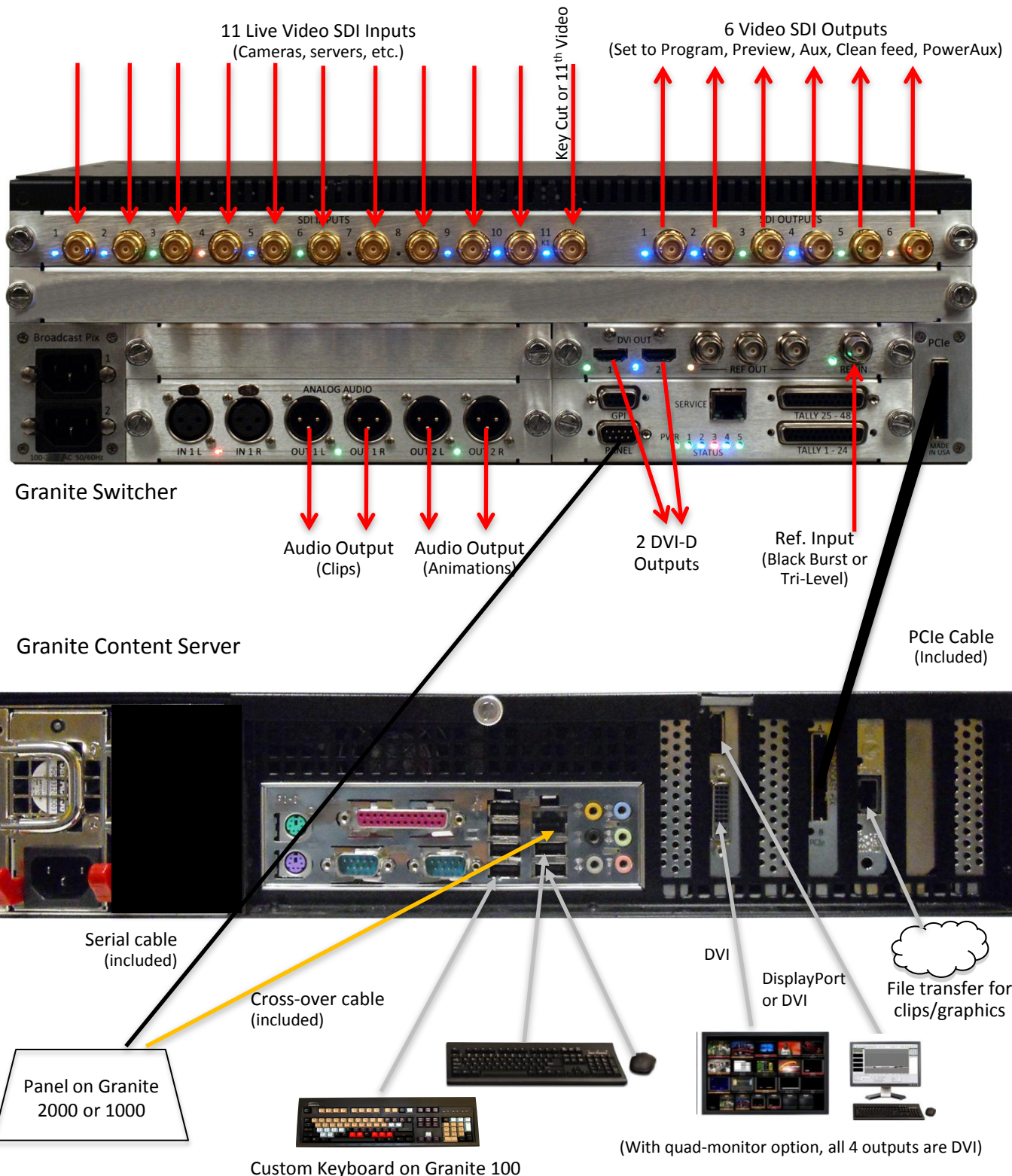


Granite 2000, 1000 or 100 Wiring Diagram



Granite 2000, 1000 or 100 Wiring Picture

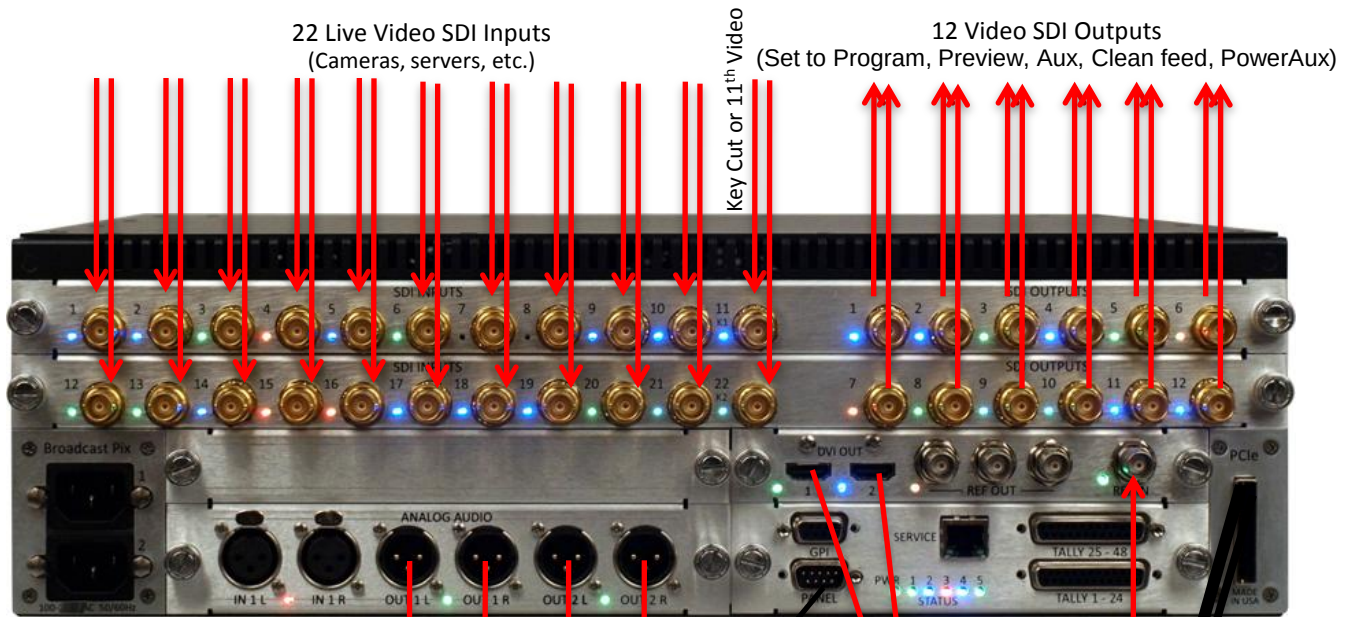
Note: Switcher has to be powered on before turning power on the server !



*Note: Switcher has to be powered on
before turning power on the server !*

Granite 2000+, 1000+ or 100+ Wiring Picture

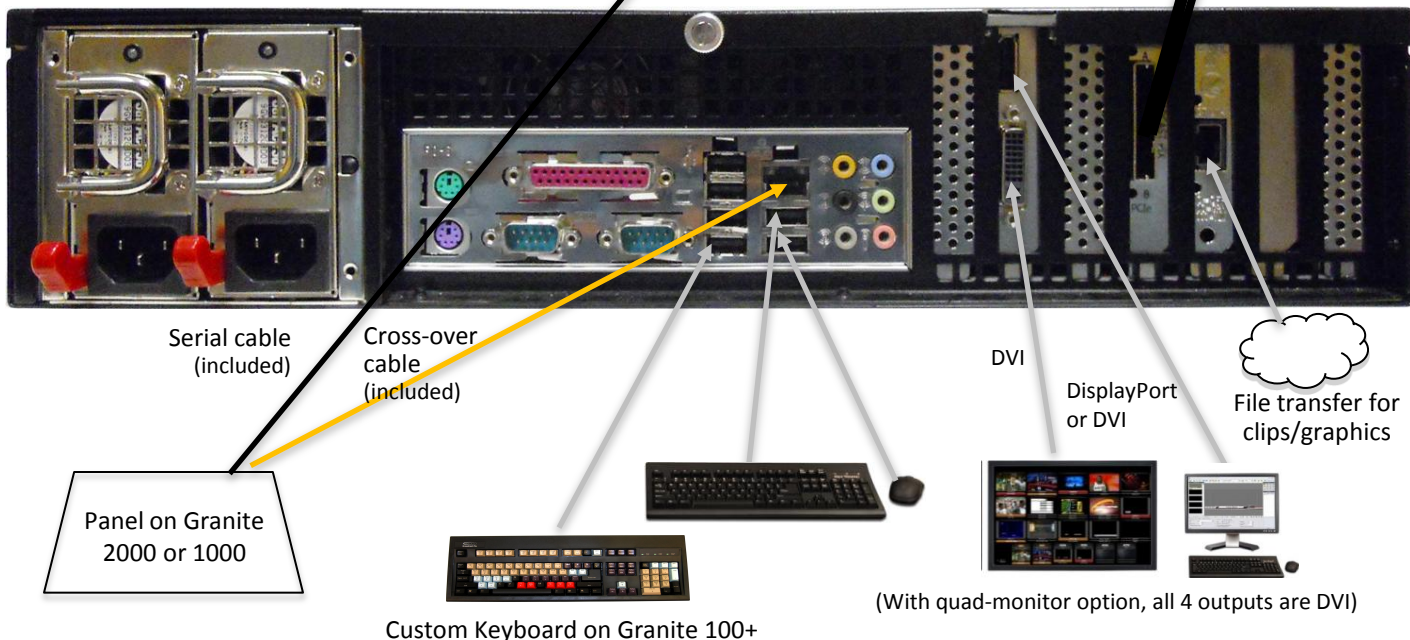
The 2000+, 1000+ and 100+ models adds a second SDI I/O board.



Granite Switcher

Granite Content Server

Shown with optional redundant power on premium server



File Inputs

One important way in which the Broadcast Pix Granite system stands out from other traditional switchers is its file-based architecture. Not only can the system support a wide-variety of live SDI video formats, it can also accept a wide-variety of standard graphic and video file formats.

A file is a graphic, clip or animation that is encapsulated in a computer file, such as a .tga graphic or a .mov QuickTime clip. It includes not only the content, but also the name of the file. Files are generally created from a computer/editing system like Apple Final Cut Pro, Adobe Premiere, Avid or an animation program like Artbeats or Digital Juice. The files are then sent over a 1 Gig network in either pre-production or during a production using Fluent Watch-Folders and stored internally in the Granite Content Server. Files can also be created with the included Harris Inscribe CG, as a CG or animation.

Accepted File Formats

The following 1920x1080 file formats can be played on the Granite system:

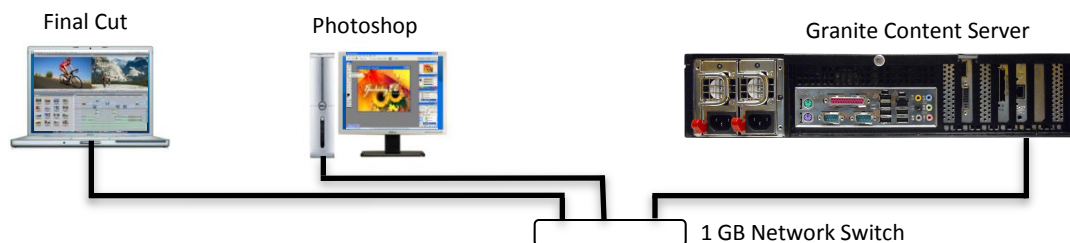
- HD Animations Stores: folders containing an image sequence of .tga, .bmp or .png files. Animations can be up to 800MB long compressed .tga or up to 100 frames uncompressed with 1 animation store, which is how the system ships, or it can be set to 2 animation stores each with one half the capacity. When set for 1 animation store, the second channel of the animation store may be used for single frame graphics.
- HD Clips Store: Play up to 120 hours (with premium server, depending on compression settings) of .mov or .mp4 files encoded in H.264/MPEG-4 AVC. Standard server plays up to 30 hours.

The HD Graphics Stores can play 1920x1080 files (as well as 720 and SD files) in: .tga, .bmp, .jpg, .png, .gif, .tif or Inscribe's .scribe

Fluent Watch-Folders

Fluent Watch-Folders greatly streamlines your live production workflow by enabling clips and graphics to be sent over a network from your favorite edit stations and graphics systems. For example, a Final Cut operator can send a clip into a Fluent Watch-Folder for the 6 o'clock news program, and it will automatically appear in the Granite system's Fluent Clip Store for the 6 o'clock news. Late breaking news can even flow into Watch-Folders during the middle of a live show. When it arrives the status bar on the multi-view lets the operator know it has arrived, and it shows up on the PixPad on both the multi-view and the control panel.

Typical Wiring for Watch-Folders



Virus Protection

Virus protection software is not installed in the system, as it does affect system performance. If the installation is in an environment where there is a lot of network activity than it is recommended that virus protection software be added, and turned off before each show. The AVG and Avast products have been tested by Broadcast Pix and work well, and are easy to turn off and on.

Fluent Multi-View

Every Broadcast Pix Granite switcher includes a customizable Fluent Multi-View to monitor all your internal and external sources, all keys, and preview and program for each M/E. Granite supports 2 monitors, and can be expanded with option #341 to support 4 monitors.

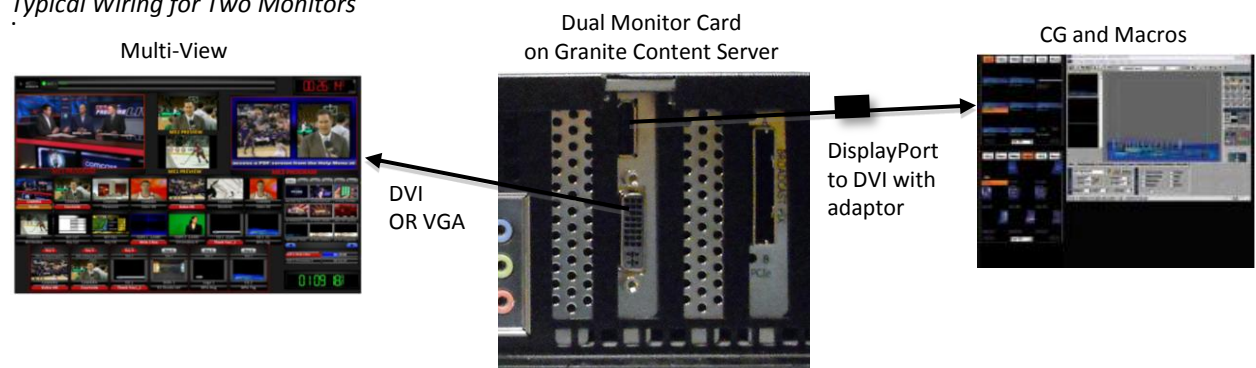
Connections: DVI-I and DisplayPort with DVI Adaptor

The standard 2 Multi-View support is through the Content Server's graphics card, as shown below. It provides one DVI-D connector and one DisplayPort connector. A DisplayPort to DVI-D adaptor is included. This standard output is through a dual-headed card where you can easily create custom layouts across two screens, in addition to using the factory default layouts. Custom layouts can then be saved and recalled at the click of a button.

Getting Started with a Default Multi-View

You may connect virtually any resolution monitor to the server, including: 1920x1080, 1366x768, 1680x1050 and 1280x1024. The Granite system will auto-detect the monitor size and launch a comprehensive default multi-view on the primary monitor, which shows all inputs, outputs, keys and two PixPad libraries. The second monitor can be used for the CG and for Fluent Macro windows, as shown below.

Typical Wiring for Two Monitors



View Program, Preview,...

The Multi-View displays windows for 4 compositions, such as program and preview, clean feed or PowerAux.

View Sources

The 4 graphic inputs channels and 2 animation channels are displayed as still images. Up to 8 moving sources from cameras and other external sources and the internal clip store are monitored in full motion. If you have more than 8 moving sources, then 7 of them will be monitored in full motion, and the rest will update more slowly. Once any source is in preview, program, or a keyer, that source monitor will now start to update in full motion. For this reason it is recommend to only map the sources necessary for a particular show, as the refresh rate of the monitors will improve. Typically, tape decks, servers and other secondary feeds will be connected to these inputs, so in most installations this is not a problem. In installations where all sources are necessary to monitor in full motion it is recommended to install external source monitors or a small supplementary multi-view.

View Files and Keys

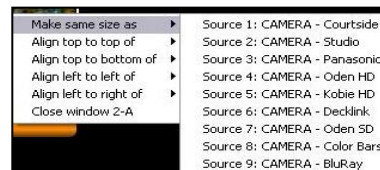
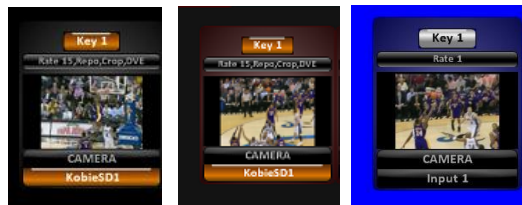
Unlike conventional multi-views, the Fluent Multi-View provides monitors of each keyer, and extensive file-based information. The PixPad corresponds and follows the one on the control panel to show libraries of clips, animations and graphics. File names and attributes are shown. The key windows also show attributes, such as whether a DVE has been applied.

Fluent Multi-View, Continued

Customizing the Multi-View

The Fluent Multi-View can be extensively customized. You can remove windows you do not use, rearrange the windows, resize them, and change the colors of the window frame and the background. You can make a duplicate copy of a window, like Program or a source, and put it on both monitors.

For example, you can rearrange the standard multi-view across two large wall monitors. The customization can be done by going to the drop down menu, unlocking the multi-view, and then just grabbing and resizing. Alignment and sizing tools are included. For more, see Multi-View Customization in the owners manual.



Quad Monitor Card - Option #341

In some installations the standard monitor card will be sufficient, but in most Granite 5000 installations you will want to have more screen spaces, especially when used by a team. The quad monitor card option upgrades the dual-headed card to a quad-headed card in the same PCI slot. The benefits of having up to four monitor outputs is the ability to spread out sources for specific users. For example, one screen could be used for a technical director, one for a graphics operator and one or two for producers. The flexibility gained with this option gives an endless amount of opportunities for producers and directors to create custom layouts based on their show needs. The output type for the four quad monitor output is DVI-D. Attach the included fan out cable to a large connector on the back of the content server.

For example, you might configure 4 monitors as shown below.



Monitor 4:
PixPad and CG



Monitor 1:
Outputs and Watch-Folders status



Monitor 2:
Sources and keys



Monitor 3:
PixPad and Macro Player

Fluent Multi-View, Continued

Integrated Apantac Multi-View - Option #347

In some installations, such as some Granite 2000+ and 1000+ installations, it may be desirable to show more external sources in full-motion than in the standard Fluent multi-view. The Apantac option provides 15 external source monitors in full motion on monitor 1. Then Monitor 2 provides 4 full motion output monitors for program, preview, etc. plus monitors for keys and for inputs above 15 that are in full motion when in use, and otherwise use round robin updates. Plus Monitor 2 also provides monitors for all internal sources (CG, graphics, animations and clips) and a PixPad of their thumbnail library.

This Apantac option comes with pre-configured set-ups on both the Apantac and Granite systems, that provide a common Broadcast Pix background across both monitors for tally and mnemonics (which is input to the Apantac system via its input 16), and the Apantac monitors are tiled on top of this background.

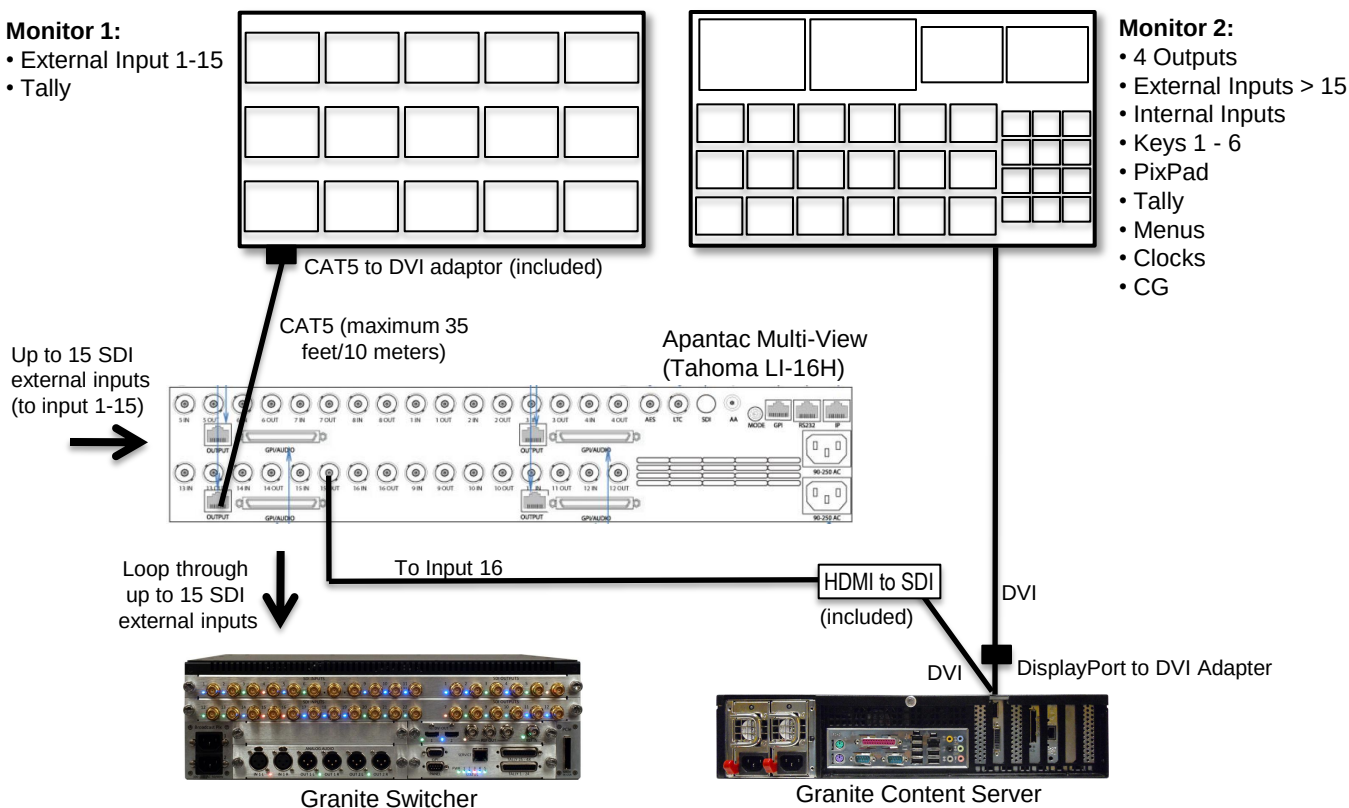
2 Monitor Solution

Monitor 1:

- External Input 1-15
- Tally

Monitor 2:

- 4 Outputs
- External Inputs > 15
- Internal Inputs
- Keys 1 - 6
- PixPad
- Tally
- Menus
- Clocks
- CG



Customizing the Apantac layout

This Apantac option is set up at the Broadcast Pix factory with a special preset to position its 15 monitors on top of a preset Broadcast Pix background. This may be customized by changing layouts on both systems. For example, some monitors may be made larger or smaller, or the color scheme can be changed. Or, the program and preview monitors may be moved to Monitor 1 in place of two of the source monitors, which also enables a more useful multi-view during any fail-safe operation.

Using Other Multi-Viewers

The Apantac multi-view has been tested and set-up by Broadcast Pix, and lends itself to this application due to its looping inputs and included HDMI converter. However, another brand of multi-view may be substituted by the user.

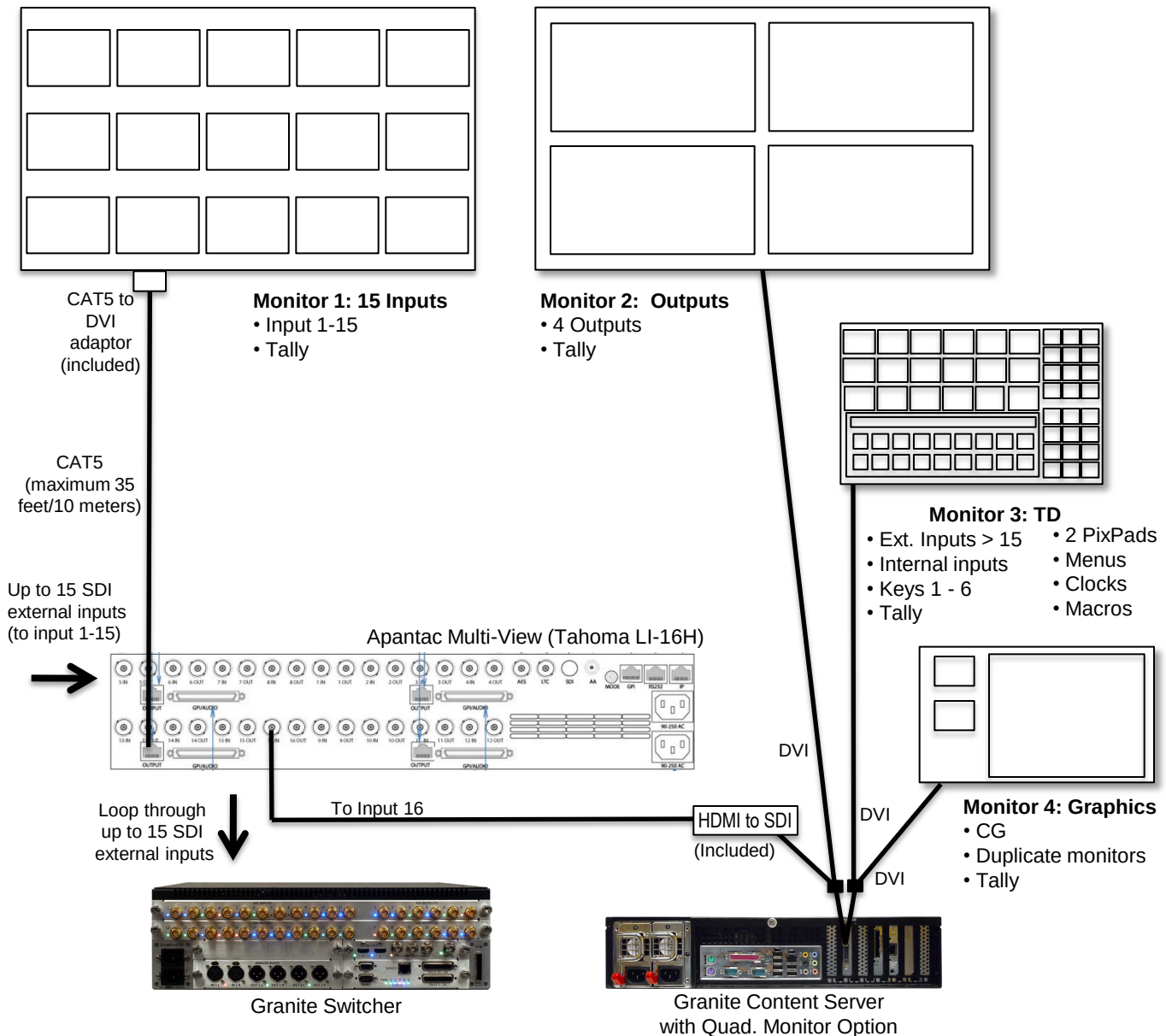
Fluent Multi-View, Continued

Integrated Apantac Multi-View - Option #347, continued

4 Monitor Solution

The Integrated Apantac multi-view can also be used with the Granite Content Server quad-monitor (option 341) . In this case the many things shown on the monitor 2 above can be distributed across three monitors.

For example, as shown below, monitor 1 and 2 can be large wall monitors with monitor 2 just showing four outputs, and then monitors 3 and 4 are smaller monitors for the Technical Director (switcher operator) and graphics operator.

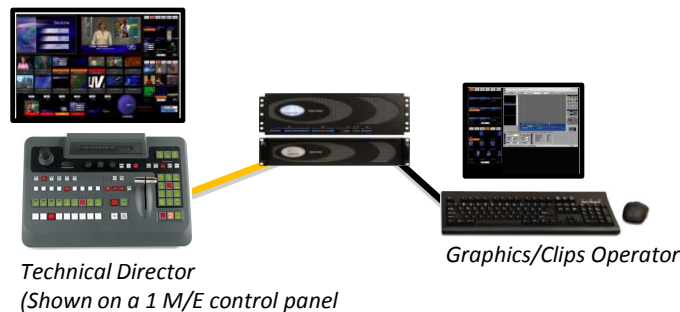


Team Operation

One of the unique features of all Broadcast Pix systems is control room operations are so integrated that compelling live video can be created by a minimal staff, even one person. A technical director can switch and control cameras, key on lower thirds, update guest graphics, change over-the-shoulder boxes, roll in opens and packages, plus trigger audio commands, all from one control panel. This tight interaction makes productions more efficient, and enables a solo operator to create a show that requires a team in a conventional studio.

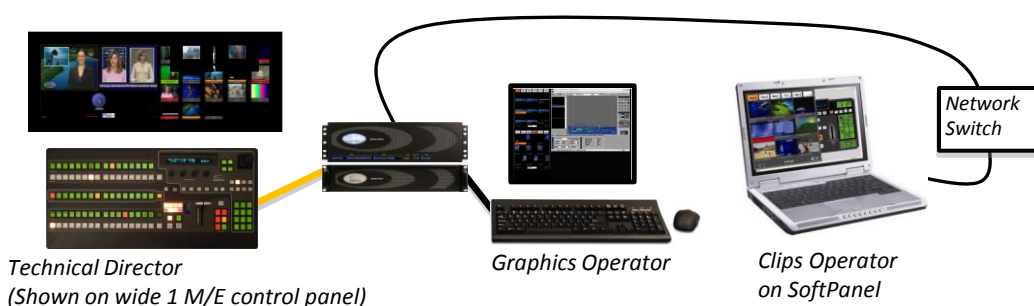
Two Person Operation

However, the Granite system is not limited to one person operation. There are times when in addition to having a complex switched production, multiple graphics and clips need to be updated and changed on the fly. The Granite system is highly scalable, and can easily accommodate multiple users. A common setup up for a Broadcast Pix studio is a technical director switching and calling the camera shots, plus a second operator changing graphics and clips as needed. Both users are controlling the same Broadcast Pix system, the technical director with the 2000 or 1000 control panel or with the 100's custom keyboard or optional iPad , and the graphics operator with a standard keyboard, mouse and dedicated graphics monitor.



SoftPanels for Larger Teams

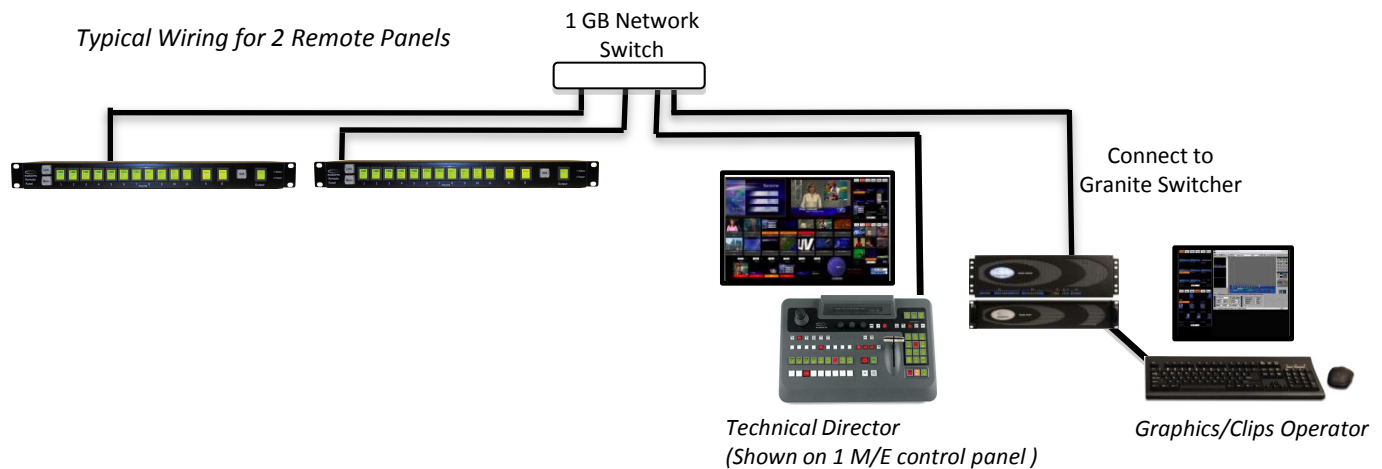
Through the use of SoftPanels, which are virtual control panels, users enter an IP address and have access to any part of the control panel to assist the director in various show needs. Since SoftPanels are Flash-based, users can right-click and zoom into various parts of the control panel for a custom look, as shown below. This not only focuses the user on their section, but also limits access to other parts of the panel, that the director may not want anyone to control. You may have as many SoftPanel licenses installed on your system as you wish, and they can easily be added on as an option. Each control panel/SoftPanel uses one license, the Granite comes with 3 licenses, but more may be beneficial. Larger teams can also use remote panels, and Apple apps as described on the following pages.



Team Operation, Continued

Adding Team Members with a Remote Panel – Option #110

1RU remote panel for controlling aux outputs and macros. Great for remotely changing one of your aux outputs for ISO recording or to feed an engineering monitor. Connect to the Service network connector on the Granite Switcher. For connecting 1 remote panel a cross-over cable may be used. For connecting more than one a small dedicated network switch should be added to connect them all with straight network cables, as shown below. In this case the control panel should also be connected to this switch, rather than use the cross over cable as this will streamline software updates.



Remote Panel



Team Operation, Continued

Expand the Team with an iPhone or iPod

You can also add a team member on an iPhone or iPod Touch. For example, if the primary switcher operator has his or her hands full switching a complex production, they can have an assistant use an iPod to find the next graphic or clip. Since the iPod is wireless, it can be anywhere.

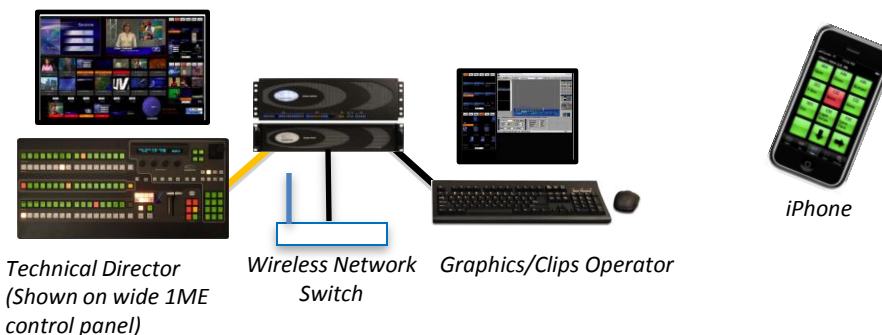
The iPixPad application replicates a Slate's PixPad, the bank of 12 buttons on the Broadcast Pix control panel that allows the user to fire off macro memories, as well as select clips and graphics. The iPixPad can also be used to augment control of a larger production by providing an additional operator, or even the director, with a wireless controller that can be used to run macros or select graphics or clips. Each Granite system has its own IP address, so iPixPad can control a specific system.

Installation: Go to the Apple apps store and download the free iPixPad app from Broadcast Pix to your iPhone (or iPod Touch). Connect the Granite Content Server to a wireless router. On the iPhone start the iPixPad app, and enter the IP address for the Granite Server. For long production you may wish to attach a power cable to the iPhone.



iPixPad app

iPhone Wiring



Expand the Team with an iPixPanel on a iPad

The iPad is large enough to hold an entire Broadcast Pix 1 M/E panel. It is installed in the same way that the above iPhone app is, expect that the iPad app is not free. It can be used to control anything a 1M/E panel can control except knob and joystick functions, and is handy for a wide variety of applications, from team members helping to using its wireless freedom of movement during set-up

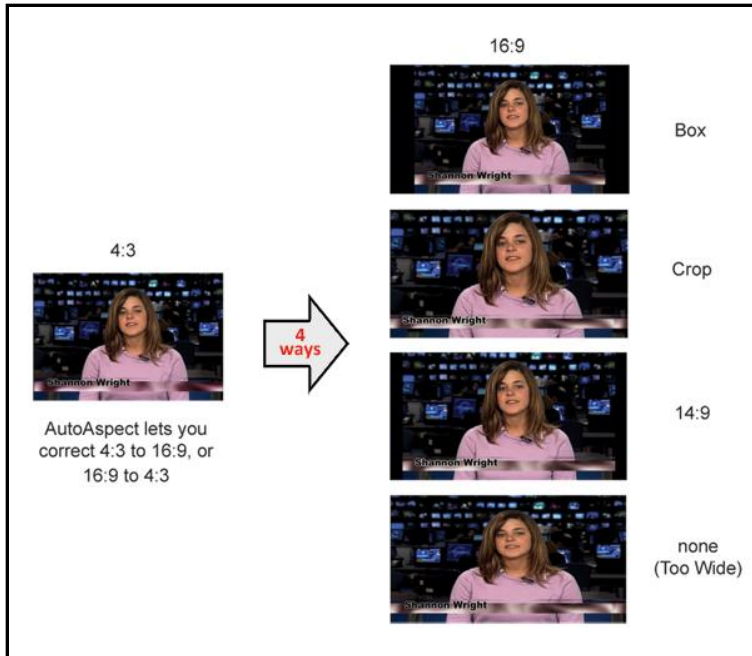


iPixPanel app

AutoAspect™

Whether you are creating a widescreen 16:9 show, or a traditional 4:3 show, AutoAspect solves the many challenges of mixing 4:3 and 16:9 content in the same production. Now 16:9 and 4:3 inputs, clips and graphics can be used interchangeably and mixed together in the same live production, while maintaining the native aspect ratio of each element. Conventional switchers can only stretch video when crossing aspect ratios, causing people to look too wide or too thin. Granite enables each input to be set to one of 4 aspect treatments: Box, Crop, 14:9 or None (anamorphic). And each clip and graphic in the libraries can be separately treated in the same four ways.

AutoAspect Input Treatment

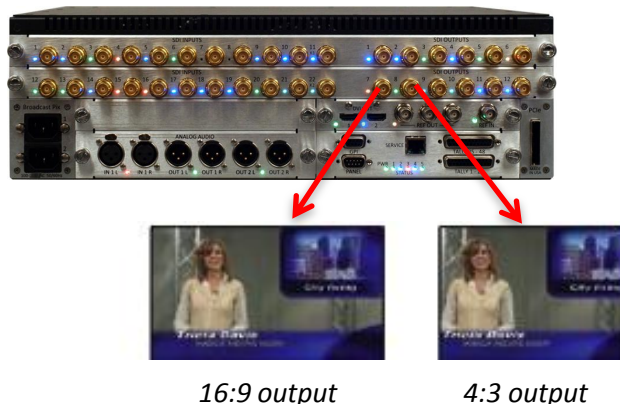


AutoAspect Controls



Simultaneous 16:9 and 4:3 Aspect Outputs

On Granite, you can also set each output for an aspect treatment, so you can for example output 16:9 and 4:3 versions of the same show. To set the output aspect, use the Video I/O set-up menu.



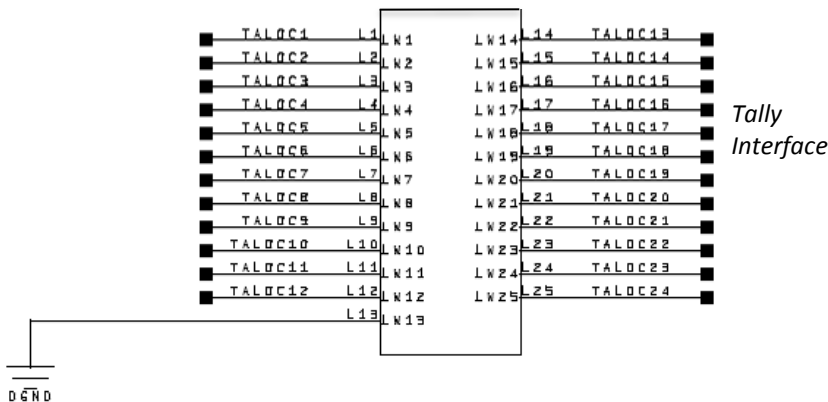
Tally

Standard Tally

The standard tally uses the lower Tally connector on the Granite Switcher which is marked Tally 1-24. These outputs are open collector driver circuits that can either sink current to ground or provide a TTL level logic interface.

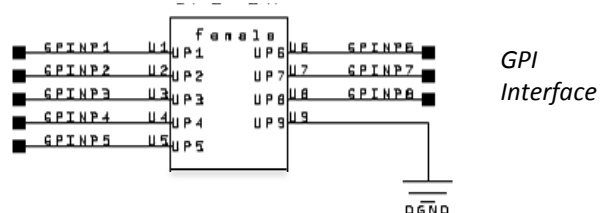


Tally outputs 1-12 are on pins 1-12, Ground is on pin 13, Tally outputs 13 – 24 are on pins 14 – 25. They sink current to ground when active and have a weak pullup to +5V when off so they can either be used to turn on a light or activate a circuit by sinking current to ground or could be used in an environment that is looking for a 0 to + 5V logic level.



Standard GPI

The GPI Input connector on the Granite Switcher provides 8 GPI inputs, which may be used, for example, to fire Macros.



Optional Tally

While standard tally will suffice in most studios, if you need to provide a stronger electric pulse to your cameras, then one of the following tally options should be used:

#29 – Tally Box 24: Adds relay contacts to tally up to 24 sources. Connects to the server through a USB connection and fits in a standard 19" rack space. Voltage needs to be supplied to the tally box from your camera control units or other source for the tally box to open and close the contact points, and accepts wire from 12 to 22 AWG. This option does not support General Purpose Inputs (GPI).

#28 – Tally Box 8: Adds relay contacts to tally up to 8 sources. Connects to the server through a USB connection. Voltage needs to be supplied to the tally box from your camera controls units or other source for the tally to open and close the contact points. This option also supports up to 8 GPIs, useful when needing to trigger macros in the Broadcast Pix system from an external device.

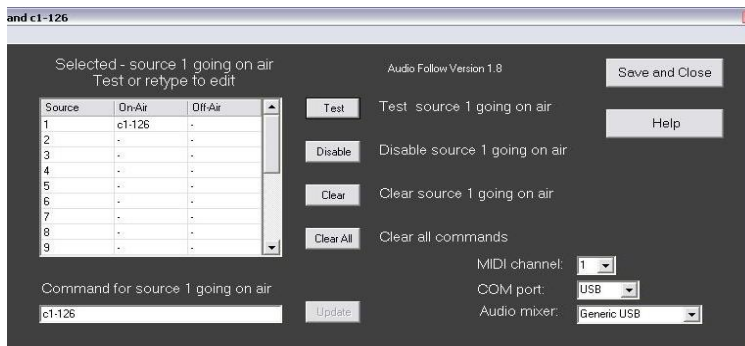


Audio-Follow-Video Option #880

The Broadcast Pix Granite system does not do any internal audio mixing, as powerful external audio mixers are cost effective and readily available, however any Granite system can remotely control external audio mixers through the MIDI (Musical Instrument Digital Interface) protocol. This method provides more control and options for the user, compared to conventional switchers that use the antiquated ESAM protocol, as MIDI works with many different types of audio mixers and is more powerful and affordable. Examples of controllable audio mixers are: Yamaha O1V96, DM2000, Mackie TT24, and Roland RSS M-400.

This option does not have to replace an audio operator, it can assist them. For example, when a clip from the internal Broadcast Pix clip store plays on air, it can automatically turn on the sliders for the clip store audio on the mixer, and when it goes off air the sliders turn off. Or, when an anchor on set is on air, it triggers a scene change to bring up his volume, adjust EQ settings and add some compression. All this is accomplished with the Audio-Follow-Video option from Broadcast Pix. For less demanding productions, when an audio operator is not desired, the audio follow option may be configured to completely take his place.

Broadcast Pix Audio-Follow Setup Window



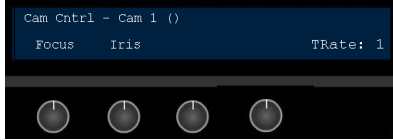
The Audio-Follow option includes a M-Audio MIDI to USB converter to connect your audio mixer to the Granite Content Server through the MIDI In & MIDI Out ports, as shown below. If desired, you may also use a straight USB cable, if your audio mixer accepts MIDI control over USB. Once connected, simply enter your parameters in the command grid and start switching. Since the Broadcast Pix Granite system is file based, these settings are saved on a show by show basis so every Broadcast Pix show that you produce can have unique Audio-Follow commands.



Sony Camera Control Option #800 (RS-232C)

In addition to remotely controlling audio mixers the Broadcast Pix Granite system can control robotic cameras through the Sony VISCA™ protocol, for the ultimate ‘one-man-band’ production. Examples of controllable cameras are: Sony BRC-300, BRCZ-330, BRCH-700, EVI-HD1 and many others.

The Broadcast Pix software can control up to 9 cameras, with 6 presets each, directly from the 2 M/E control panel. It uses the joystick to pan/tilt/zoom and knobs in the Device Control to adjust focus, iris and other settings. There is a total of 6 presets per Sony camera. Each camera, preset and menu settings appear directly on the PixButtons™ of the PixPad, as shown below, for ease of use and greater control.



4 Knobs for control of:
Focus, Iris and CCU Settings



3-Axis Joystick
Positions Camera:

- Left-right: pan
- Up-down: tilt
- Twist: zoom

Camera Select PixPad

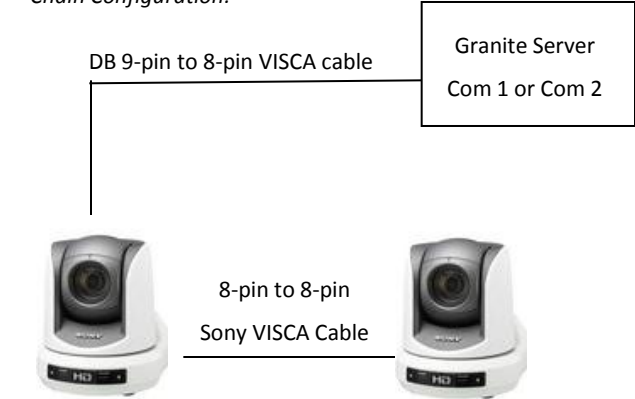
1	2	3
4	5	6
7	8	9

Sony Settings PixPad

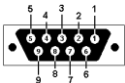
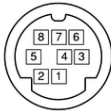
Update PSet	Set Cam Addr	One Push W Bal
Start Auto Focus	Start Auto Iris	Start Auto White
White Bal Inside	White Bal Outside	White Bal A.T.W
	Cam Select	

A typical installation for the Sony VISCA cameras uses an RS-232C daisy chain configuration, see below for example. Where a DB 9-pin to Mini Din 8-pin VISCA cable is used to connect the first camera to the content server’s communications port (COM 1 or COM 2) and the other cameras are looped through each other with a Mini Din 8-pin to Mini Din 8-pin VISCA cable through the VISCA In/Out ports. There is a maximum length of 15 meters (50 feet) when using an RS-232C configuration. A 10 foot test cable is included with the system when this option is purchased.

Sony VISCA RS-232C Daisy Chain Configuration:



Sony VISCA Mini Din 8-pin Male to DB 9-pin Female Pinout:



Pin	Function
1	DTR
2	DSR
3	TXD
4	GND
5	RXD
6	GND
7	n/a
8	n/a

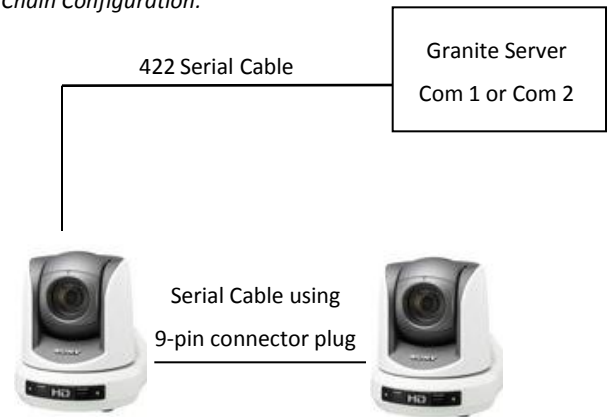
Pin	Function
6	DSR
4	DTR
2	RXD
5	GND
6	TXD
1	n/a
7	n/a
8	n/a
9	n/a

Sony Camera Control Option #811/814/818 (RS-422)

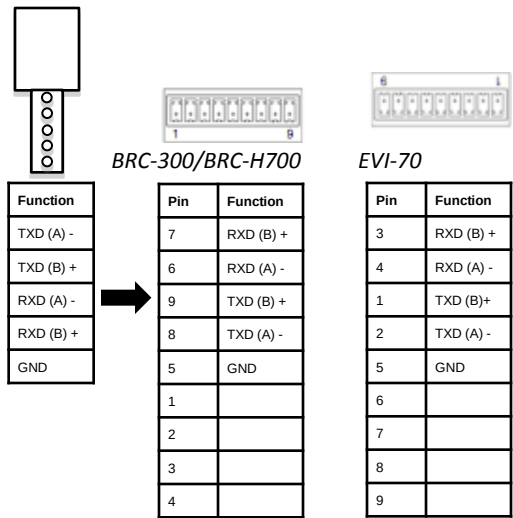
For installations needing longer runs you may also use an RS-422 configuration, which extends the maximum length to 1,200 meters (4,000 feet). Note, not all Sony VISCA cameras support RS-422 communication. When using an RS-422 connection, there are 3 configuration options, and depending on installation needs, you may connect cameras in a daisy chain, star or star/daisy chain combination.

The single camera or daisy chain configuration, (option # 811) includes a DB 9-pin RS-232 to screw terminal RS-422 converter, which plugs into the server in either COM 1 or COM 2. From the screw terminal you may connect your first camera using the 9-pin connector plug provided with the camera. From the same connector you may loop communication to the rest of your cameras. See below for wiring diagram.

Sony VISCA RS-422 Daisy Chain Configuration:

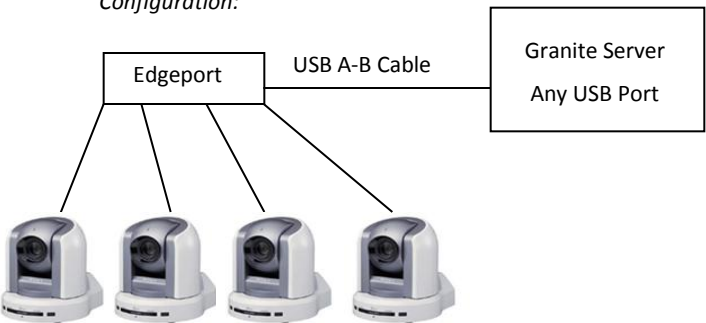


RS-422 Pinout to Connector Plug:

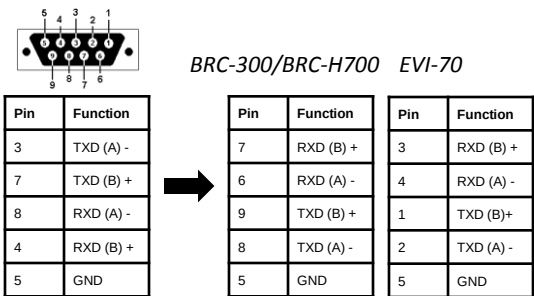


If controlling more than one camera, there is an optional 4 or 8 port Edgeport serial extender (option #814 or #818) which plugs into a USB port on the server. It provides either 4 or 8 DB 9-pin RS-422 connectors to accommodate a star configuration or a star/daisy chain configurations. This method is useful when needing to run long home run to various studios, from which you can then daisy chain. Depending on your installation needs, this may save in cable runs. See below for the wiring diagram.

Sony VISCA RS-422 Edgeport Configuration:

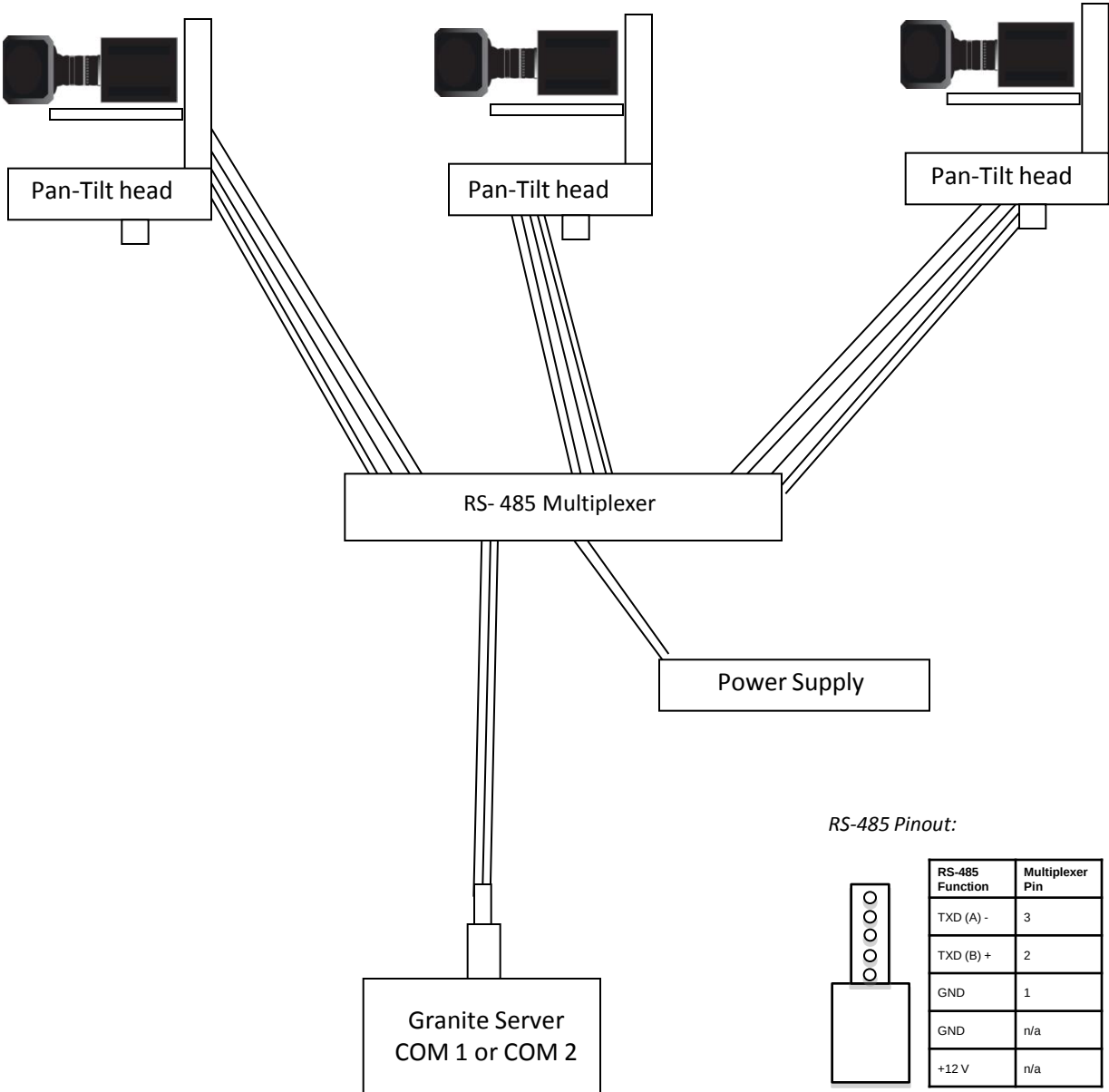


DB 9-Pin Serial Cable Pinout:



Hitachi Camera Control Option #801 (RS-485)

The Broadcast Pix Granite system can also control Hitachi cameras with the Eagle Pan/Tilt heads and protocol. Up to 9 Cameras, with 32 presets each, are connected to the server using a serial RS-485 connection, which has a maximum length of 1,200 meters (4,000 feet). A DB 9-pin RS-232 to screw terminal RS-485 converter is included, which plugs into the server in COM 1 or COM 2 and feeds a Multiplexer (or wire splice) that sends 5 wires to each camera head, 3 are for communication and 2 for power. All cameras connect to a multiplexer to split power and communication to all your cameras. The Pan-Tilt heads, Multiplexer, power supplies and cables are provided from Eagle.



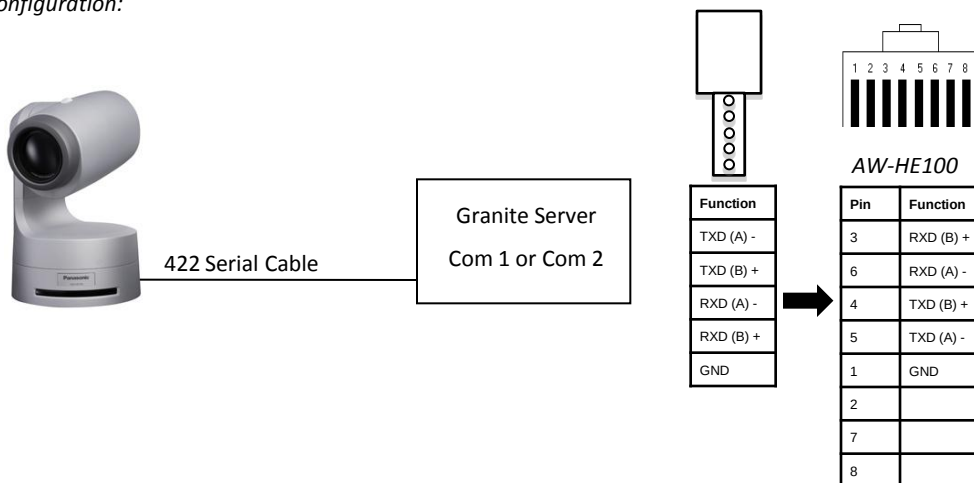
Panasonic Camera Control Option #802 (RS-422)

The Broadcast Pix system can control a wide-range of Panasonic cameras, including the AW-HE100, AW-PH400 and other Panasonic pan-tilt camera control systems.

This software option can control up to 12 different robotic cameras, each of which may have up to 100 presets. Typical installations use a RS-422 configuration, which extends the maximum length to 1,200 meters (4,000 feet). All cameras are configured in a daisy chain configuration where all control cables are connected back at the Broadcast Pix server.

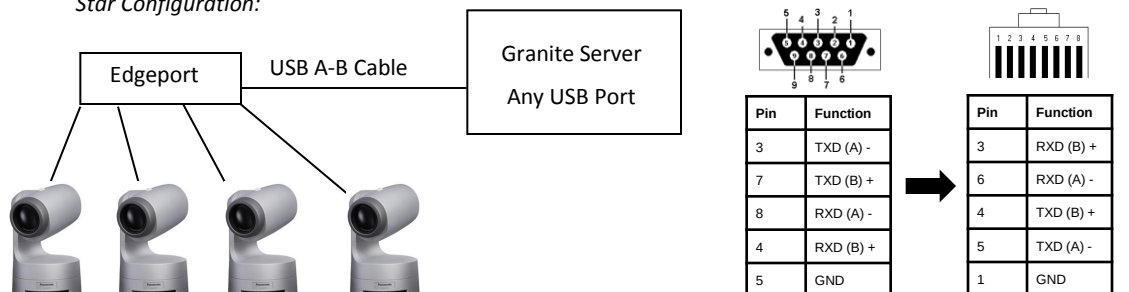
The single camera configuration, (option # 811) includes a DB 9-pin RS-232 to screw terminal RS-422 converter which plugs into the server in either COM 1 or COM 2. From the screw terminal you may connect your first camera using a standard RJ-45 connector, which Plugs directly into the camera. You may connect up to 2 convertors for 2 cameras, since there are only 2 RS-232 ports on the server. See below for the wiring diagram.

Single Panasonic RS-422 Configuration:



If controlling more than one camera, there is an optional 4 or 8 port Edgeport serial extender (option #814 or #818) which plugs into a USB port on the server. It provides either 4 or 8 DB 9-pin RS-422 connectors to accommodate a star configuration. See below for the wiring diagram.

Panasonic RS-422 Edgeport Star Configuration:



Other Options

Granite Switcher Options

#126 – Keys 4/5/6: (Standard on the model 2000 and 2001+) Increases the standard 3 keys to 6 keys, each with a DVE. Keys 4, 5 and 6 can not be transitioned in the Mix/Effect section. This option is typically used for ‘set and forget’ graphics, such as a logo or game clock.

#140: Additional Advanced Keys: Increases the standard 1 Chromakey and Luminance key to 8. Chromakeys are source-based allowing for up to 8 different parameters, useful for creating a virtual set.

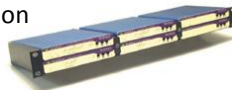
#130 HDMI In: External converter from HDMI to SD SDI (no audio) (Ensemble Designs BE83)

#131 Analog In: External converter from Analog composite, Y/C, YUV, to SD SDI (Ensemble Designs BE2)

#132 Analog Out: External converter from SD SDI to Analog composite, Y/C and YUV (Ensemble Designs BE11)

#133 Analog Out: External converter from HD SDI to Analog composite and SD SDI (Ensemble Designs BE92-M)

Up to 6 converters fit in 1RU with rack kit option available from Ensemble Designs.



#203 Redundant Power: Switcher is fitted with two redundant power supplies

Control Panel Options

#100 / #103: SoftPanel Licenses: Increase the 3 licenses that come with a Granite, with packs of 1 or 3. Useful when adding SoftPanels, iPixPads and iPixPanels for remote users. Every control panel, SoftPanel, iPhone, iPod or iPad uses 1 license each.

#105: 2M/E SoftPanel License: Software license to control 2M/Es. Provides software version on the GUI of the Granite 5000 2M/E panel. Includes support for 6 keys.

#201 Redundant Power for 1000 Panel: with this option, a second external redundant power supply is included for the 1000 control panel on the Granite 1000 and 1000+. (Internal redundant power is standard on the 2000 panel).

#10 1000 Control Panel: Add another physical control panel to a Granite1000 for redundancy or 2 panel operation, or add one to a Granite 100 to upgrade to a Granite 1000.

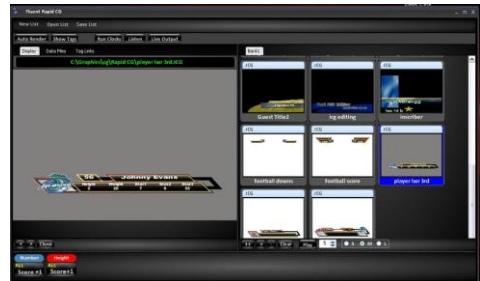
#20 2000 Control Panel: Add another physical control panel to a Granite 2000 for redundancy or 2 panel operation, or add one to a Granite 100 to upgrade to a Granite 2000.

Options, Continued

Granite Content Server & Fluent Workflow Options

#160 – Additional Inscriber CG license: Add another license of the Inscriber TitleMotion GS software to any PC to share graphic creation duties across your facility, without tying up the Granite Server. This option requires an additional PC provided by the user.

#172 Fluent Rapid CG: to connects on-air CG to a database, and/or to streamline CG graphic creation. A separate datasheet is available on Fluent Rapid CG.



#223 Extra Removable Media 1TB (2) Extra 500GB media drives in trays. Requires option #319.

#320 More Clip Storage-Standard: Doubles the standard media drives from one 250GB drive to one 500GB drive.

#243 Longer PCIe cable 3 meters: (standard is ½ meter) to connect to Granite Switcher

#247 Longer PCIe cable 7 meters: (standard is ½ meter) to connect to Granite Switcher

#240 Rack Rails: Sliding rack rails for the standard server, included in the Premium Server.

#211 Premium Server: Increases media storage from 1 250GB drive to 4 250GB drives with RAID 10 array for media drives, increases the system drive from 1 250GB drive to 2 250 GB drives with RAID 1 array for system drive, adds redundant power supplies and rack rails

#320 More Clip Storage-Premium: Doubles the standard media drives from four 250GB drives to four 500GB drives.

#262 Locking HDMI cable for DVI outputs - 2 meters:

Standard HDMI cables may be used, but these optional ones enable the cable to be locked in the Granite Switcher for a secure connection. Depress a button on the connector to unlock. The other end of the locking connector is HDMI.

#266 Locking HDMI cable for DVI outputs - 6 meters

See description above.



Close up of locking connector

Other Options, Continued

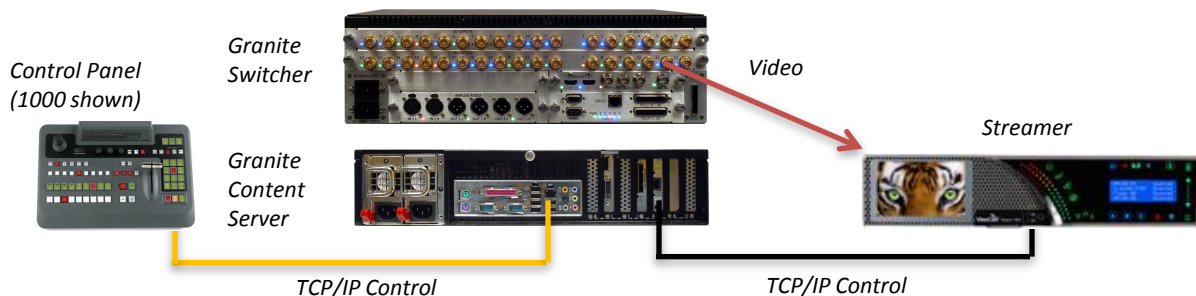
Other Device Control Options (beyond those describes earlier in this Guide)

#803 Telemetrics camera control: enables a Granite panel to control the line of Telemetrics robotic equipment including Pan/Tilt heads and pedestals. Use any brand of camera. The Granite control panel selects preset positions with PixButtons, and manually controls tilt, pan, zoom with its joystick. Knobs control iris and focus, and motion buttons control pedestal height. Control can be fully integrated with Broadcast Pix Fluent Macros, and with Telemetrics Studio software.

#823 External Server Control: Control a 360 Systems or Harris Nexio server through VDCP. Control up to three channels of clip stores directly from the control panel, with clip names appearing directly on the PixButtons™ of the PixPad. This option includes a 4 port Edgeport serial extender to control the server.

#824 Omneon server control: Control an Omneon server. Control up to four channels of clip stores with auto-start and looping controls, with clip names appearing directly on the PixButtons™ of the PixPad. This option includes a 4 port Edgeport serial extender to control the server.

#860 Streamer control: Enables control of any ViewCast streamer from the Granite control panel. On the panel, select the streamer with the device controls, then select up to 12 different streaming groups (MPEG, Flash, AVI, Real, WM2, etc.). Each group name appears on the panel's PixButton. Start or stop each stream, and view status from the panel. Even integrate control with Fluent Macros. The control is over a TCP/IP network, so the streamer can be remote from Granite.



Service Options

#601 (Americas)/603 (International) On site Training: Day 1 First day of training

#602 (Americas)/ 604 (International) On site Training: More additional consecutive day(s)

#605 Commissioning: One day of Broadcast Pix system commissioning

#610 Rapid CG Database consulting

#631 Extend warranty: Adds an additional year of parts and labor for Granite 100 or 100+

#632 Extend warranty: Adds an additional year of parts and labor for Granite 1000 or 1000+

#680 Owner's Manual: Additional hard-copy of owners manual

Very Low System Delay

Granite systems are ideal for HD image magnification (IMAG) productions, like projection, as they have only 1 frame of delay (33 mS in NTSC and 40 mS in PAL) with gen-locked cameras, even with format conversion between 1080i, 720p and SD on inputs and on outputs, aspect ratio conversion on input and output, and video inside a picture in picture box.

In contrast, conventional switchers usually add delay to convert an input format, convert an output format, change an aspect ratio, or show video inside a picture in picture box. When several of these steps are done, conventional switchers add a lot of delay, yet Granite adds none.

The only two circumstances where a Granite system adds delay, are two areas common to all equipment from all manufacturers. First, when asynchronous sources are used, such as an inexpensive camera without gen-lock, up to a frame of delay is added. Second, when using the optional 2M/E SoftPanel then when video from M/E 1 is re-entered into M/E2, such as inside a keyer, a frame of delay is added.

Granite Specifications

Granite Processing

Processing	HD 4-4-4 YPrPb, 10-bit 1080i
Reference Input	525 line or 625 line Black-burst or Composite video, 75 ohm BNC Or Tri-Level reference: 60 Hz syncs supported 480i29.97 (NTSC), 720p59.94, 1080i59.94 and 50 Hz syncs supported: 576i25 (PAL), 720p50, 1080i50
Standards	50 or 60Hz, switchable
Aspect Ratios	4:3 & 16:9, switchable, and each input and output may be set

HD/SD-SDI I/O

SDI Formats	Auto-Detection and setting to: 1080i/60/59.94, 720p/60/59.94, 1080i/50, 720p/50, 486i/59.94 and 576i/50
Standards	SMPTE 296M, SMPTE 274M, ITU-R BT601-5, SMPTE 259M and SMPTE 292M
Type of Connector	75 ohm BNC
Ancillary Data	Blanked on composited outputs; Not blanked on the Aux outs
Embedded audio	Blanked on composited outputs; Not blanked on the Aux outs
Max cable length	100 meters (325ft)
Number of inputs/outputs	Granite 100, 1000 or 2000: 11 inputs and 6 outputs Granite 100+, 1000+ or 2000+: 22 inputs and 12 outputs

DVI-D Outputs

Formats	Set to the same as an SDI output: 1280x720p 59.94/50, 1920x1080i 59.94/50, 720x480i/576i 59.94/50
Type of connector	HDMI (optional locking cables available)
Number of outputs	2

Analog inputs and outputs are also available as options (Option #131 and 132)

Audio I/O

Format	Balanced line level analog
Type of connector	XLR
Number of outputs	2 channel Stereo (Left/Right), for clip and animation playout

Granite Switcher Specifications

Dimensions	inches 19.4 x 16.3 x 5.2 millimeters 494 x 413 x 133
Rack units	3 RU
Weight	16 Lbs / 7 Kg
Power	350 watts

Granite Content Server Specifications

Dimensions	inches 19 x 23 x 3.5 millimeters 483 x 584 x 89
Rack units	2 RU
Weight	40 Lbs / 18 Kg
Power	450 watts

1000 Control Panel Specifications

Dimensions	18.5x12.5x8 inches / 47x31.8x20 centimeters
Weight	6.2 Lbs / 2.8 Kg
Power	(1) 50 watt power supply, external (redundant one optional)

2000 Control Panel Specifications

Dimensions	18.5x12.5x8 inches / 47x31.8x20 centimeters
Weight	16. 2Lbs / 23 Kg
Power	(2) 50 watt power supply, internal (redundant)

Contact Information

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