The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at **wvOASIS.gov**. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at **WVPurchasing.gov** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

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Procurement | Budgeting | Accounts Receivable | Accounts Payable

Solicitation Response(SR) | Dept: 0439 | ID: ESR12201700000002845 | Ver.: 1 | Function: New | Phase: Final | ▼ | Modified by batch , 12/21/2017

Header 📎 5

List View

| **General Information** | Contact | Default Values | Discount | Document Information |

Procurement Folder: 399216	**SO Doc Code:** CRFQ
Procurement Type: Central Purchase Order	**SO Dept:** 0439
Vendor ID: VS0000014736	**SO Doc ID:** EBA1800000006
Legal Name: HA Design Group LLC	**Published Date:** 12/8/17
Alias/DBA:	**Close Date:** 12/21/17
Total Bid: $93,870.63	**Close Time:** 13:30
Response Date: 12/20/2017	**Status:** Closed
Response Time: 10:12	**Solicitation Description:** On Air Broadcasting Switcher
	Total of Header Attachments: 5
	Total of All Attachments: 5

Proc Folder : 399216

Solicitation Description : On Air Broadcasting Switcher

Proc Type : Central Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2017-12-21 13:30:00	SR 0439 ESR12201700000002845	1

VENDOR

VS0000014736

HA Design Group LLC

Solicitation Number: CRFQ   0439   EBA1800000006

Total Bid : $93,870.63   **Response Date:**   2017-12-20   **Response Time:**   10:12:43

Comments:

FOR INFORMATION CONTACT THE BUYER

Michelle L Childers

(304) 558-2063
michelle.l.childers@wv.gov

Signature on File   **FEIN #**   **DATE**

All offers subject to all terms and conditions contained in this solicitation

Page : 1   FORM ID : WV-PRC-SR-001

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	ON-AIR BROADCASTING SWITCHER SYSTEM	1.00000	EA	$93,870.630000	$93,870.63

Comm Code	Manufacturer	Specification	Model #
52161540			

Extended Description : TOTAL SYSTEM INCLUDING WARRANTY, ONSITE COMMISSIONING, TRAINING, SHIPPING AND HANDLING CHARGES.

H A Design Group

6700 Springfield Center Drive
Suite J
Springfield, Virginia 22150

Phone: (703) -778-8760
Fax: (703) -778-8759

Quotation

Date	Quote #
12/20/17	HDGQ2830

Sold To:
West Virginia State Procurement
Michelle L Childers
Department of Administration,
Purchasing Division
Charleston   25305-0130
United States of America
Phone: (304) 558-2063
Fax:

Ship To:
EDUCATIONAL BROADCASTING
General Manager - SITE MANAGER
WSWP-TV
124 INDUSTRIAL PARK RD
BEAVER 25813   25813
United States of America
Phone: (304) 558-2063
Fax:

Here is the quote you requested.

Terms	Rep	P.O. Number	FOB	Ship Via
Net 30	SLEWIS		Origin	BestWay

Ln #	Qty	Manuf.	Part Number	Description	Unit Price	Ext. Price
1				**Master Control Switchers**		
2	3	GVG	IS-750-MC-75	Basic HD Master Control Package (for 75 ohm audio), including: - IS-750 - IS-750-AUDIO16-75 - IS-750-EAS - IS-750-EP16	$12,254.84	$36,764.52
3	3	GVG	IS-44-TBA	44-pin terminal block adaptor (GPI)	$48.39	$145.17
4	3	GVG	IS-750-DVE	Single Channel DVE	$3,222.58	$9,667.74
5	3	GVG	IS-750-MEM-2GB	2 GB of Animation Playout Memory	$1,287.10	$3,861.30
6	3	GVG	IS-750-E	Easytex	$2,577.42	$7,732.26
7				**Master Control Panel**		
8	1	GVG	IMC-PANEL-200	iMC Master Control Panel for IS-750 - 16 button PST/PGM	$16,129.03	$16,129.03
9	1	GVG	IMC-PANEL-GU	iMC Master Control GUI Panel Software for IS-750	$1,290.32	$1,290.32
10				**Pre-Router**		
11	1	GVG	CR3232-3GI	32x32 Single Link 3Gb/s HD Serial Digital Video Router, 2RU	$8,967.74	$8,967.74
12				**Commissioning & Training**		
13	1	GVG	IMAGE STORE-SP	Onsite StartPRO Commissioning for Image Store, Daily rate, Travel & Expenses NOT included - quoted (if and as required) as a separate line item per the Grass Valley policy in place at the time of quotation.	$1,634.41	$1,634.41

Ln #	Qty	Manuf.	Part Number	Description	Unit Price	Ext. Price
14	1	GVG	GS-TR	Travel and Living Expenses for On-site Services, calculated per the Grass Valley policy in place at the time of quotation.	$1,612.90	$1,612.90
15	1	GVG	GS-TT-DAIL	Traveling Time for Global Service Engineer Daily Rate	$967.74	$967.74
16	1	GVG	IMC-OST	1-day of IMC Operational onsite training. Price per session, Travel & Expenses NOT included - quoted (if and as required) as a separate line item per the Grass Valley policy in place at the time of quotation., 8 students max	$1,940.86	$1,940.86
17	1	GVG	GS-TR	Travel and Living Expenses for On-site Services, calculated per the Grass Valley policy in place at the time of quotation.	$1,612.90	$1,612.90
18	1	GVG	GS-TT-DAIL	Traveling Time for Global Service Engineer Daily Rate	$967.74	$967.74

SubTotal	$93,294.63
Sales Tax	$0.00
Shipping	$576.00
Total	**$93,870.63**

Please contact me if I can be of further assistance.

Purchaser's Acceptance

By signing this proposal in the space below or issuing a P.O., you represent and acknowledge that you have fully read, understand, and accept the terms and conditions of this quotation. That this proposal contains the complete agreement between the purchaser and HA Design Group LLC with respect to the articles described herein. That any other agreements, representations, and warranties, whether oral or in writing, made prior to or at the time of signing this proposal, are excluded and replaced by the terms herein; and that no change or addition to this proposal shall be valid or enforceable unless made in writing.

For Customer: _____   Date: _____

HA Design Group: _____   Date: _____

DESIGNATED CONTACT: Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Mr. Willy Halla, President & CEO
(Name, Title)
HA Design Group LLC
(Printed Name and Title)
6700 Springfield Center Drive Suite J Springfield, Virginia 22150
(Address)
703-778-8760 Ext. 101   Fax: 703-778-8759
(Phone Number) / (Fax Number)
whalla@hadesign.net
(email address)

CERTIFICATION AND SIGNATURE: By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

HA Design Group LLC
(Company)

(Authorized Signature) (Representative Name, Title)
Mr. Willy Halla, President & CEO

(Printed Name and Title of Authorized Representative)
December 20, 2017

(Date)
703-778-8760 Ext. 101   Fax: 703-778-8759

(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: EBA672

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

☐ Addendum No. 1   ☐ Addendum No. 6
☐ Addendum No. 2   ☐ Addendum No. 7
☐ Addendum No. 3   ☐ Addendum No. 8
☐ Addendum No. 4   ☐ Addendum No. 9
☐ Addendum No. 5   ☐ Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

HA Design Group LLC
_____

Company

Mr. Willy Halla
_____

Authorized Signature

December 20, 2017
_____

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"**Debt**" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.
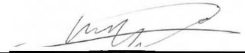
"**Employer default**" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"**Related party**" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: _____HA Design Group LLC of Springfield, Virginia 22150_____

Authorized Signature: _____ Mr. Willy Halla _____ Date: __December 20, 2017_____

State of _____

County of _____, to-wit:

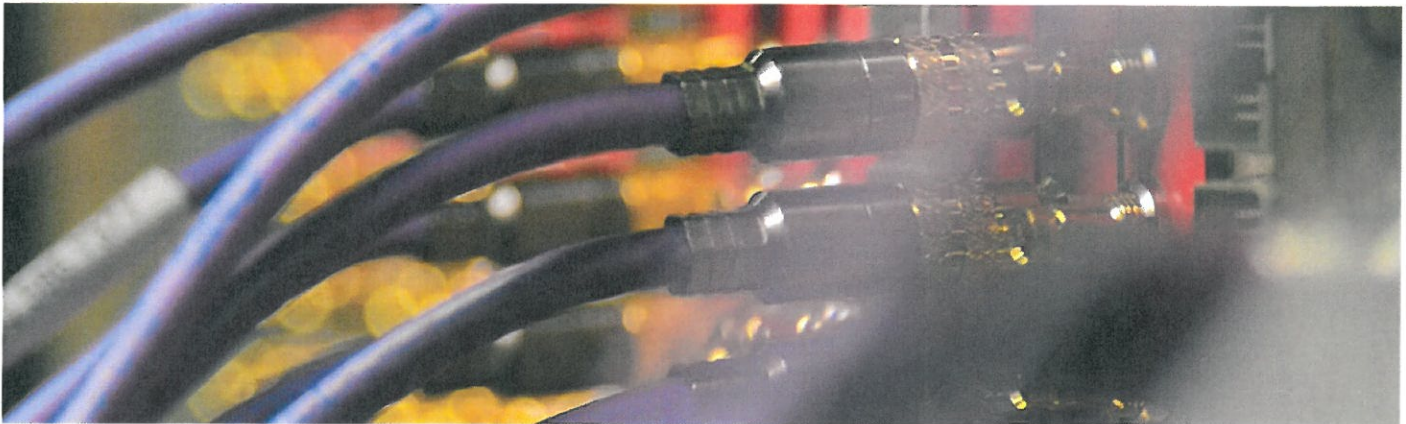Taken, subscribed, and sworn to before me this ___ day of _____, 20___.

My Commission expires _____, 20___.

AFFIX SEAL HERE   **NOTARY PUBLIC** _____

Purchasing Affidavit (Revised 08/01/2015)

NVISION Compact
Space and Cost Efficient Utility Routers

Audio/video routing innovations that simplify your workflows.

The NVISION Compact range is highly versatile, and ideally suited to utility routing applications. They are available for all core formats, including triple rate 3G/HD/SD, in matrix sizes from 8x8 to 32x32. The Compact Routers also have a built-in controller, eliminating the need for a costly external controller.

Triple Rate 3G/HD/SD

SMPTE ST 424 3 Gb/s models operate error free, with automatic reclocking data paths for 270 Mb/s, 1.483 Gb/s, 1.485 Gb/s, 2.967 Gb/s and 2.970 Gb/s rates. The 3 Gb/s routers protects your small router investment well into the future, with 1080p 50/60 support and Dolby E and DVB-ASI compliance.

HD/SD

SMPTE ST 292 1.485 Gb/s and 1.483 Gb/s HD models are equally clean, equally robust, and very affordable. Many applications do not require 3 Gb/s data rates, making these re-clocking routers a perfect fit for HD and SD facilities. All HD and SD Compact routers are now available without reclockers.

SD

SMPTE ST 259 SD models are the affordable solution for 270 Mb/s and DVB-ASI operation. They provide noninverting operation with any input to any output, with switching on the frame boundary, ensuring Dolby interoperability, even with embedded audio.

Analog Video

The analog composite video routers offer exceptional signal path linearity, and are designed to have very low differential gain and low differential phase to ensure no visible signal distortion.

AES

The NVISION range represents the best in the industry for digital audio routing, with frame accurate digital audio switching. AES routers operate in either synchronous or asynchronous modes, and are Dolby E compliant for phase accurate multichannel audio. Asynchronous routers allow easy interconnections when different audio sample rates are present, as with desktop audio production using 44.1, 48, 96 and 192 kHz audio formats.

Analog Audio

The analog audio routers offer exceptional audio fidelity with +24 dBu input and output levels, and virtually no crosstalk. They are an ideal solution for SMPTE longitudinal timecode (SMPTE ST 12 LTC).

Machine Control

The NVISION range's patented Dynamic Port Architecture simplifies machine control with configurable bidirectional data routing. Only NVISION port routers offer this bidirectional capability; other routing vendors require two ports to accomplish the same task. This saves power, rack space, and cabling.

NVISION Compact Space and Cost Efficient Utility Routers

Extremely small form factor
- Ultra thin saves rack space
- 1 RU and 2 RU sizes
- Lightweight design
- Non-square router configurations for monitoring applications

Full line of utility routers
- Future-proof 3G/HD/SD
- HD/SD
- SD
- Analog video
- AES (sync or async modes)
- Analog audio (can be used for timecode)
- Port
- DVB-ASI compliant
- Dolby E certified

Robust design
- Robust design for rugged conditions
- Highly reliable power supply over 500,000 hours MTBF
- Optional redundant power supply available
- Range operates with the entire NVISION router range

Powerful, free configuration tools
- Compact Router System Configurator (CRSC) software provides easy configuration of routers, including salvos and partitioning
- Software also allows programming of remote control panels, and configuration of network settings

Multiple control capabilities
- Ethernet and serial control
- Local button panel
- Remote control panel
- Graphical User Interface (GUI) panels
- Panel sizes include 32x32, 32x4, 32x1, 16x16, 16x4, 16x2, 8x8

Comprehensive Range

Compact routers	32x32	32x4	16x16	16x4	8x8
3G/HD/SD	X	X	X	X	X
HD/SD	X	X	X	X	X
SD	X				
AES	X		X		
Analog Video	X		X		
Analog Audio	X		X		
Machine Control	32 ports		16 ports		
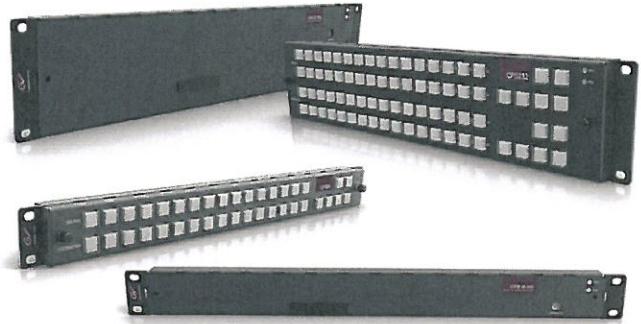
3G/HD/SD and SDI/AES Compact Routers

3G/HD/SD Digital Video
8x8 - 16x4 - 16x16 - 32x4 - 32x32

KEY FEATURES

- Triple rate 3G/HD/SD
- DVB-ASI compliant
- Router partitioning
- Scalable with the entire NVISION range of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel

ORDERING

CR0808-3GIG	8x8 3G/HD/SD serial digital video router, 1 RU
CR1604-3GIG	16x4 3G/HD/SD serial digital video router, 1 RU
CR1616-3GIG	16x16 3G/HD/SD serial digital video router, 1 RU
CR3204-3GIG	32x4 3G/HD/SD serial digital video router, 2 RU
CR3232-3GIG	32x32 3G/HD/SD serial digital video router, 2 RU

HD/SD Digital Video
8x8 - 16x4 - 16x16 - 32x4 - 32x32

KEY FEATURES

- Supports both SD and HD rates
- DVB-ASI compliant
- Router partitioning
- Scalable with the entire NVISION range of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel
- Non-reclocking versions available

ORDERING

CR0808-HD	8x8 HD serial digital video router, 1 RU
CR1604-HD	16x4 HD serial digital video router, 1 RU
CR1616-HD	16x16 HD serial digital video router, 1 RU
CR3204-HD	32x4 HD serial digital video router, 2 RU
CR3232-HD	32x32 HD serial digital video router, 2 RU
CR0808-HD-NR	8x8 HD serial digital video router, 1 RU, non-reclocked
CR1604-HD-NR	16x4 HD serial digital video router, 1 RU, non -reclocked
CR1616-HD-NR	16x16 HD serial digital video router, 1 RU, non-reclocked
CR3204-HD-NR	32x4 HD serial digital video router, 2 RU, non-reclocked
CR3232-HD-NR	32x32 HD serial digital video router, 2 RU, non-reclocked

SD Digital Video
32x32

KEY FEATURES

- Supports SD rates
- DVB-ASI compliant
- Router partitioning
- Scalable with the entire NVISION range of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel
- Non-reclocking versions available

ORDERING

CR3232-SD	32x32 SD serial digital video router, 2 RU
CR3232-SD-NR	32x32 SD serial digital video router, 2 RU, non-reclocked

AES Digital Audio
16x16 - 32x32

KEY FEATURES

- Unbalanced digital audio (AES-3id)
- Can operate in synchronous or asynchronous modes
- Router partitioning
- Scalable with the entire NVISION range of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel

ORDERING

CR1616-AES	16x16 async/sync AES digital audio router, 1 RU 75Ω
CR3232-AES	32x32 async/sync AES digital audio router, 2 RU 75Ω

Composite/stereo Analog and Machine Compact Routers, Remote Control Panels

Composite Analog Video
16x16 - 32x32

KEY FEATURES

- Analog composite video for NTSC and PAL
- Router partitioning
- Scalable with the entire NVISION Series of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel

ORDERING

CR1616-AV	16x16 analog video router, composite 1 RU
CR3232-AV	32x32 analog video router, composite 2 RU

Stereo Analog Audio
16x16 - 32x32

KEY FEATURES

- +24 dBu operating levels
- Can be used to route timecode
- Router partitioning
- Scalable with the entire NVISION Series of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel

ORDERING

CR1616-AA	16x16 analog audio router, 1 RU
CR3232-AA	32x32 analog audio router, 2 RU

Machine Control
16 or 32 ports

KEY FEATURES

- Patented dynamic port architecture
- Bidirectional data routing
- RJ45 connectors
- Scalable with the entire NVISION Series of routers
- Highly reliable power supply (over 500,000 hours MTBF)
- Optional control panel

ORDERING

CR16-PR	16 port machine control router with patented dynamic routing, 1 RU
CR32-PR	32 port machine control router with patented dynamic routing, 2 RU

Router Control Panels
8x8 - 16x2 - 16x4 - 16x16 - 32x1 - 32x2 - 32x4 - 32x32

KEY FEATURES

- Control panels (CPs) are sold separately
- Local control panels or remote control panels
- Remote control panels are programmable

Control panel connectivity	RP16 (1 RU)	RP32 (2 RU)	Router (1 RU)	Router (2 RU)
8x8 1 RU (CP0808)	X		X	
16x2 1 RU (CP1602)	X		X	
16x4 1 RU (CP1604)	X		X	
16x16 1 RU (CP1616)	X		X	
32x1 1 RU (CP3201)	X			
32x4 2 RU (CP3204)		X		X
32x32 2 RU (CP3232)		X		X

ORDERING

Note: Directly attaches to CR router or remote panel, except for CP3201 which only attaches to a RP16

CP0808	8x8 button panel 1 RU
CP1602	16x2 button panel for 1 RU
CP1604	16x4 button panel for 1 RU
CP1616	16x16 button panel for 1 RU
CP3201	32x1 button panel for 1 RU (requires purchase of RP16)
CP3204	32x4 button panel for 2 RU
CP3232	32x32 button panel for 2 RU

Remote Panel Expansion Kits

Note: Allows CP panel to operate separately and remotely via Ethernet. CP panel can be programmed using CRSC when mounted to an RP

RP16	Remote panel expansion kit for 1 RU
RP32	Remote panel expansion kit for 2 RU

Power Supply

CRPS1	Redundant power supply for compact routers and remote panels

Flexible System Architecture and Control

The NVISION Compact router control panel system is highly scalable, and allows up to four routers to be controlled from up to 16 remote control panels without the use of an external controller. The routers are can be remotely controlled and monitored via a serial connection and over Ethernet, using NVISION protocols or other third-party control software.
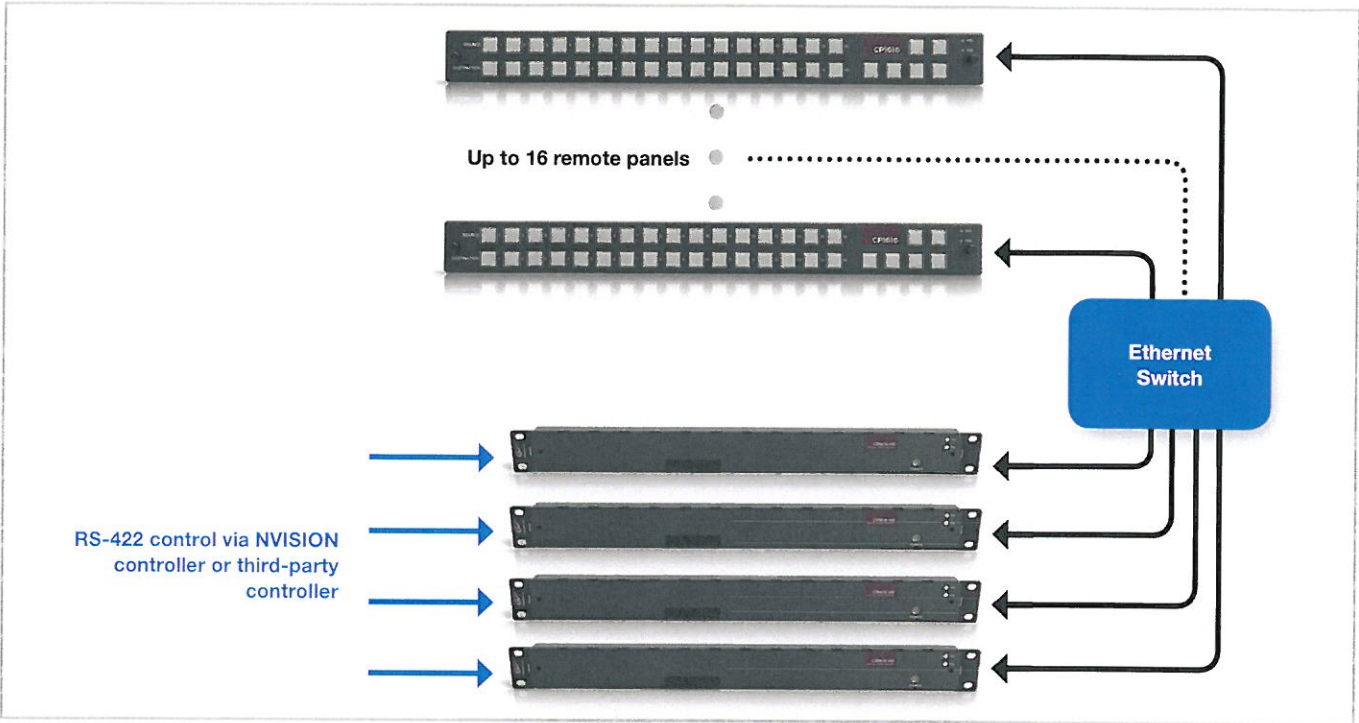
Integration with NVISION router control system

For the highest level of control flexibility, the NVISION Compact routers can be integrated with the NVISION's router control system. Field proven in hundreds of installations worldwide with millions of hours of continuous operation, the NVISION router control system is the ultimate for mission-critical applications. Designed to grow with your needs, it offers a full complement of user interface options, full redundancy, and an easy-to-use Java-based configuration editor. Its flexible and scalable architecture offers a choice of several core system controllers, and a wide variety of highly configurable hardware and virtual control panels.

Flexible System Configuration

The NVISION Compact Router System Configurator (CRSC) software is included with every router. This Java-based software provides all the tools and flexibility needed to custom tailor compact router systems to optimize and improve the efficiency of your facility. The software can configure IP settings, partition routers into multiple levels, program remote control panels for device level control, build salvos, and reconfigure large routing networks to meet changing facility workflows. Configurations can be devised offline, and easily uploaded over a network to the system.

Intuitive help system

Configurator has simple help screens and menus to guide users through each step.

NVISION Compact Space and Cost Efficient Utility Routers

Electrical
AC input: 90-250 VAC, 50/60 Hz, auto-ranging
AC fuses: No user serviceable fuses
AC connectors: 2, 12 VDC with external modules
AC power: PS0001-00, HB0321-00, 50 W, one IEC 320

AC power usage:
20W nominal (16x16 3 Gig, SWB, SD)
35W nominal (32x32 3 Gig, SWB, SD)
6W nominal (16x16 AES)
10W nominal (32x32 AES)
9W nominal (16x16 analog video)
16W nominal (32x32 analog video)
18W nominal (16x16 analog audio)
40W nominal (32x32 analog audio)
12W nominal (16x16 port machine)
22W nominal (32x32 port machine)

Regulatory compliance: UL listed and CE compliant

Mechanical
Dimensions:
1 RU for 16x16 (45 mm / 1.75 in.) high
2 RU for 32x32 (89 mm / 3.5 in.) high - 483 mm (19 in.) wide, 35 mm (1.38 in.) deep, without control panel - Exception: analog audio 57 mm (2.25 in.) deep, without control panel

Weight: 4.4 kg (2 lbs.) 16x16, 8.8 kg (4 lbs.) 32x32

Mounting: EIA 310-C, 19 in (483 mm)
Grounding terminal: Cooper, accepts 14-6 AWG

Serial Control
Type: 1 Serial port
Standard: SMPTE ST 207, EIA-422, configurable
Connector: 1, DE-9

Ethernet
Type: 10/100 Base-T
Standard: IEEE 802.3
Protocol: NVISION Ethernet protocol
Connector: 1, RJ45

Environmental Specifications
Operating temperature: 0 to 40° C (32 to 104° F)
Relative humidity: 0 to 90%, non-condensing

AES3id Inputs/Outputs
Type: Unbalanced digital audio
Standard: AES3id
Sample Rate:
Synchronous 48 kHz
Asynchronous 32 to 192 kHz
Connector: BNC
Impedance: 75Ω
Input level: 200 mV to 3.0 Vp-p
Output level: 1 V ±10%

Analog Audio Inputs/Outputs
Type: Analog audio
Connector: DB-25
Impedance: Input 20 kΩ, output 50Ω, nominal
Freq. response: 20 Hz to 100 kHz, <±0.5 dB
THD + Noise: <0.005%
SNR: >95 dB relative to +24 dBu (20 Hz to 20 kHz)
Crosstalk: >85 dB worst case
Input CMRR: >75 dB

Video Reference Input
Type: Analog video reference
Standard: PAL, NTSC or tri-level sync
Connector: Loop through, BNC
Impedance: 75Ω or Hi-Z
Input level: 0.5 Vp-p to 2.0 Vp-p
Input return loss: ≥30 dB to 5 MHz

SD Inputs/Outputs
Type: Standard definition serial digital video
Standard: SMPTE ST 259
Data rate: Auto reclocking at 270 Mb/s or auto bypass with pass-through from 19 Mb/s to 360 Mb/s
Note: Inputs do not reclock
Connector: BNC
Impedance: 75Ω
Cable equalization: 350m (1,148 ft.) Belden 1694A, 200m (656 ft.) Belden 1855A, or equivalent cable, at 270 Mb/s
Router path: Non-inverting
I/O return loss: >15 dB, 5 to 540 MHz
Output level: 800 mVp-p ±10 %
Output rise/fall time: 600 ps +10 %
Output overshoot: ≤10% of amplitude max
Output alignment jitter: ≤0.2 Ulpp from 1.0 kHz to 27 MHz
Output timing jitter: ≤0.2 Ulpp from 10 Hz to 1.0 kHz

SD and HD Inputs/Outputs
Type: High definition serial digital video
Standard: SMPTE ST 259, SMPTE ST 344 and SMPTE ST 292
Data rate: Auto reclocking at 270 Mb/s and 1.483 and 1.485 Gb/s or auto bypass with pass-through from 19 Mb/s to 1.5 Gb/s
Note: Inputs do not reclock
Connector: BNC
Impedance: 75Ω
Cable equalization: 150m (492 ft.) Belden 1694A, 85m (278 ft.) Belden 1855A, or equivalent cable, at 1.5 Gb/s
Router path: Non-inverting
Output level: 800 mVp-p ±10 %
I/O return loss: >15 dB, 5 MHz to 1.5 GHz
Output rise/fall time: ≤270 ps
Output overshoot: ≤10 % of amplitude max
Output alignment jitter: ≤0.2 Ulpp from 100 kHz to 150 MHz
Output timing jitter: ≤1.0 Ulpp from 10 Hz to 100 kHz

3G/HD/SD Inputs/Outputs
Type: High definition serial digital video
Standard: SMPTE ST 259-C, SMPTE ST 292 and SMPTE 424
Data rate: Auto reclocking at 270 Mb/s and 1.483, 1.485, 2.967, 2.970 Gb/s or auto bypass with pass-through from 19 Mb/s to 3 Gb/s
Note: Inputs do not reclock
Connector: BNC
Impedance: 75Ω
Cable equalization (for cables listed or equivalent cable): 400m (1,312 ft.) Belden 1694A, 250m (820 ft.) Belden 1855A at 270 Mb/s, 150m (492 ft.) Belden 1694A, 100m (328 ft.) Belden 1855A at 1.5 Gb/s, 100m (328 ft.) Belden 1694A, 45m (147 ft.) Belden 1855A at 3 Gb/s
Router path: Non-inverting
Output level: 800 mVp-p ±10 %
I/O return loss: >15 dB, 5 MHz to 1.5 GHz
>10 dB, 1.5 GHz to 3 GHz
Output rise/fall time: ≤135 ps
Output overshoot: ≤10 % of amplitude max
Output alignment jitter: ≤0.3 Ulpp from 100 kHz to 300 MHz
Output timing jitter: ≤2.0 Ulpp from 10 Hz to 100 kHz

Analog Video Inputs/OutputS
Type: Analog video
Standard: NTSC, PAL
Connector: BNC
Impedance: 75Ω
Input return loss:
>45 dB, DC to 6 MHz
>30 dB, 6 MHz to 30 MHz
Output return loss:
>45 dB, DC to 6 MHz
>4 0 dB, 6 MHz to 30 MHz
Input level: 1 Vp-p, nominal
Output level: 1 Vp-p, nominal
Output DC offset: 0V ±30mV relative to backporch
Input range: ±2 V
Insertion loss: 0 dB ±0.1 dB, any input to any output
Freq. response: 0 dBr ±0.05 dB, DC to 6 MHz
Differential gain: <0.1 %
Differential phase: <0.1°
Tilt: <0.1 %
Delay scatter: < ±65° at sub-carrier (PAL or NTSC) any input to any output
Noise spectrum: >60 dB test signal; luminance ramp
CMRR: >60 dB at 120 Hz
Crosstalk: >65 dB at sub-carrier frequency
Output to output isolation: Output Isolation: >90 dB at sub-carrier frequency DC Coupled System

Port Machine Inputs/Outputs
Type: Bidirectional, dynamically configured
Standard: EIA-422, ANSI/SMPTE ST 207
Connector: RJ45
Data rates: Up to 1 Mb/s

NVISION Compact Space and Cost Efficient Utility Routers

Digital Video Routers

CR0808-3GIG	8x8 single link 3G HD serial digital video router, 1 Ω
CR1604-3GIG	16x4 single link 3G HD serial digital video router, 1 RU
CR1616-3GIG	16x16 single link 3G HD serial digital video router, 1 RU
CR3204-3GIG	32x4 single link 3G HD serial digital video router, 2 RU
CR3232-3GIG	32x32 single link 3G HD serial digital video router, 2 RU
CR0808-HD	8x8 HD serial digital video router, 1 RU
CR1604-HD	16x4 HD serial digital video router, 1 RU
CR1616-HD	16x16 HD serial digital video router, 1 RU
CR3204-HD	32x4 HD serial digital video router, 2 RU
CR3232-HD	32x32 HD serial digital video router, 2 RU
CR0808-HD-NR	8x8 HD serial digital video router, 1 RU, non-reclocked
CR1604-HD-NR	16x4 HD serial digital video router, 1 RU, non -reclocked
CR1616-HD-NR	16x16 HD serial digital video router, 1 RU, non-reclocked
CR3204-HD-NR	32x4 HD serial digital video router, 2 RU, non-reclocked
CR3232-HD-NR	32x32 HD serial digital video router, 2 RU, non-reclocked
CR3232-SD	32x32 SD serial digital video router, 2 RU
CR3232-SD-NR	32x32 SD serial digital video router, 2 RU, non-reclocked

Analog Video Routers

CR1616-AV	16x16 analog video router, composite 1 RU
CR3232-AV	32x32 analog video router, composite 2 RU

Digital Audio Routers

CR1616-AES	16x16 async/sync AES digital audio router, 1 RU 75Ω
CR3232-AES	32x32 async/sync AES digital audio router, 2 RU 75Ω

Analog Audio Routers

CR1616-AA	16x16 analog audio router, 1 RU
CR3232-AA	32x32 analog audio router, 2 RU

Machine Control Routers

CR16-PR	16 port machine control router with patented dynamic routing, 1 RU
CR32-PR	32 port machine control router with patented dynamic routing, 2 RU Control Panels
	Note: Directly attaches to CR router or remote panel, except for CP3201 which only attaches to a RP16
CP0808	8x8 button panel 1 RU
CP1602	16x2 button panel for 1 RU
CP1604	16x4 button panel for 1 RU
CP1616	XY button panel for 1 RU
CP3201	32x1 button panel for 1 RU (requires purchase of RP16)
CP3204	32x4 button panel for 2 RU
CP3232	XY button panel for 2 RU

Remote Panel Expansion Kits

Note:	Allows CP panel to operate separately and remotely via Ethernet. CP panel can be programmed using CRSC when mounted to an RP
RP16	Remote panel expansion kit for 1 RU
RP32	Remote panel expansion kit for 2 RU

Power Supply

CRPS1	Redundant power supply for Compact Routers and Remote Panels

grass valley
A **BELDEN** BRAND

Datasheet

Imagestore 750

HD/SD Master Control and Branding Processor with Advanced Audio Processing

Promote your brand and efficiently deliver your channels.

Imagestore 750 from Grass Valley, a Belden Brand, is our top of the range master control and branding processor for highly automated specialty channels.

Many advanced audio features include 16 channel audio mixing/playout plus dynamic shuffling and gain control. There's also stereo to 5.1 upmixing, four Dolby decoders/encoders and sophisticated metadata processing. Multiple, high performance graphics features include dual DVEs.

With Imagestore 750, you get the best master control solution with the best on-screen branding possible.

KEY FEATURES

Multilevel branding graphics
- Designed for high impact, multilevel channel branding
- Easy selection between SD and HD (720p or 1080i at 50 Hz and 59.94 Hz)
- Four independent keying layers with preview output
- Integral flash-based store with capacity for more than 4,000 HD/SD images
- Dual fill and key inputs allow operation with an Intuition XG graphics co-processor for the most advanced graphics effects
- Emergency Alert System (EAS) crawls and audio mix-ins
- In-vision digital/analog clock insertion with Bugclock option
- Easytext template-based, automated character generator option for data-driven graphics, such as in-show promos
- Full compatibility with Vertigo graphics automation and asset management

Advanced audio mixing and processing
- 16 channel audio mixing using embedded audio, and/or 8 AES pairs, for 5.1 and multilingual audio
- Dynamic shuffle and gain control
- Up to 4 Dolby decoders/encoders per Imagestore 750
- 5.1 up-mixing using Linear Acoustic upMAX technology
- Versatile Easyplay 2 audio clip player, with simultaneous playout of up to four clips (16 channels), for voiceovers
- Advanced metadata processor with support for embedded metadata (as per RP-2020), metadata switching and metadata generation
- Audio description (AD) with automated mixing of commentary track
- User-friendly audio configuration tool

Video mixing
- A/B video mixing by cuts and fades
- Independent clean feed and auxiliary outputs
- Single or dual channel 2D DVE options for squeeze-and-reveal and picture-in-picture effects
- C and D inputs available to feed DVE, and can also be used as extra fill and key inputs for future expansion

Automated and manual control
- Full automation control using widely supported Oxtel protocol (serial, Ethernet) and GPI
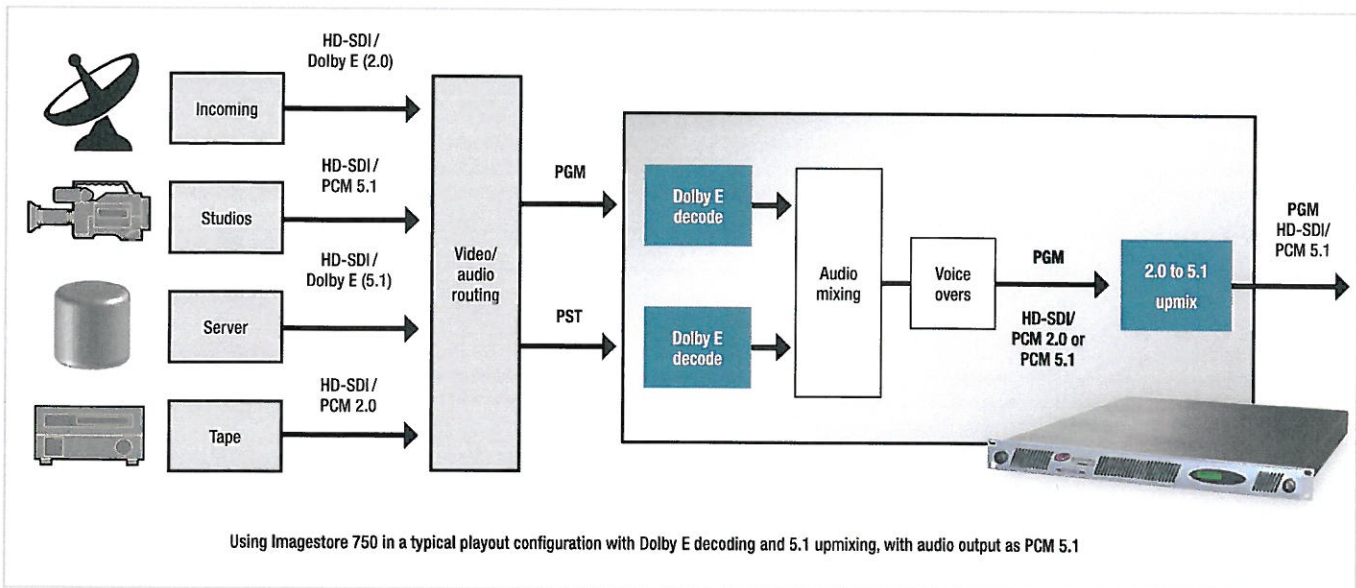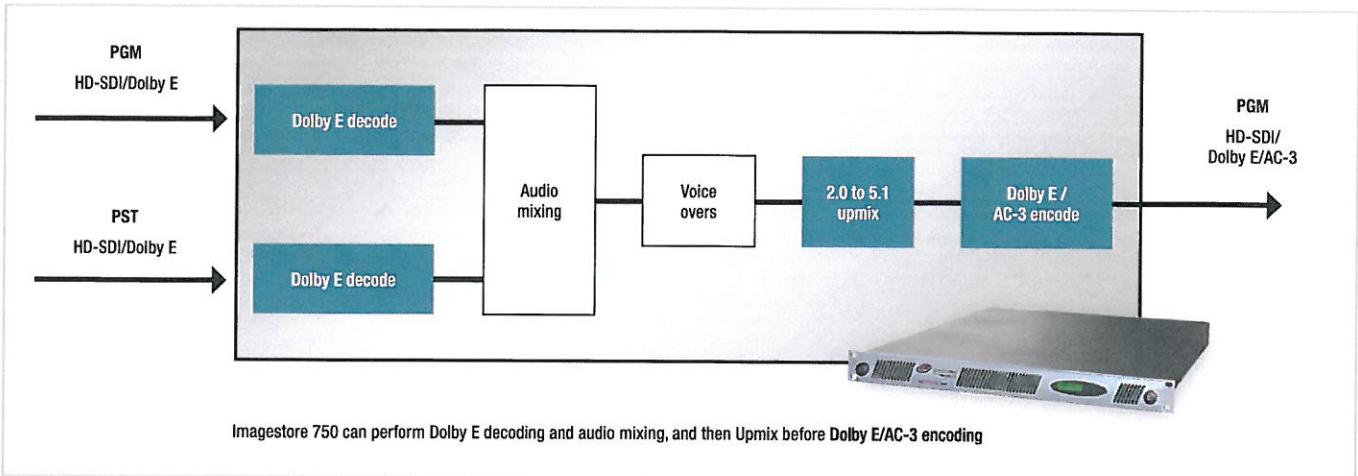- Manual control by iMC, Branding Panel, PresStation or Vertigo Xpanel

Robust design
- Flash memory for graphics storage and operating system
- Broadcast quality, real-time operating system
- Redundant hot swappable power supplies
- Mechanical bypass of program input
- Front panel diagnostics: configuration, temperature, power supplies, PLL
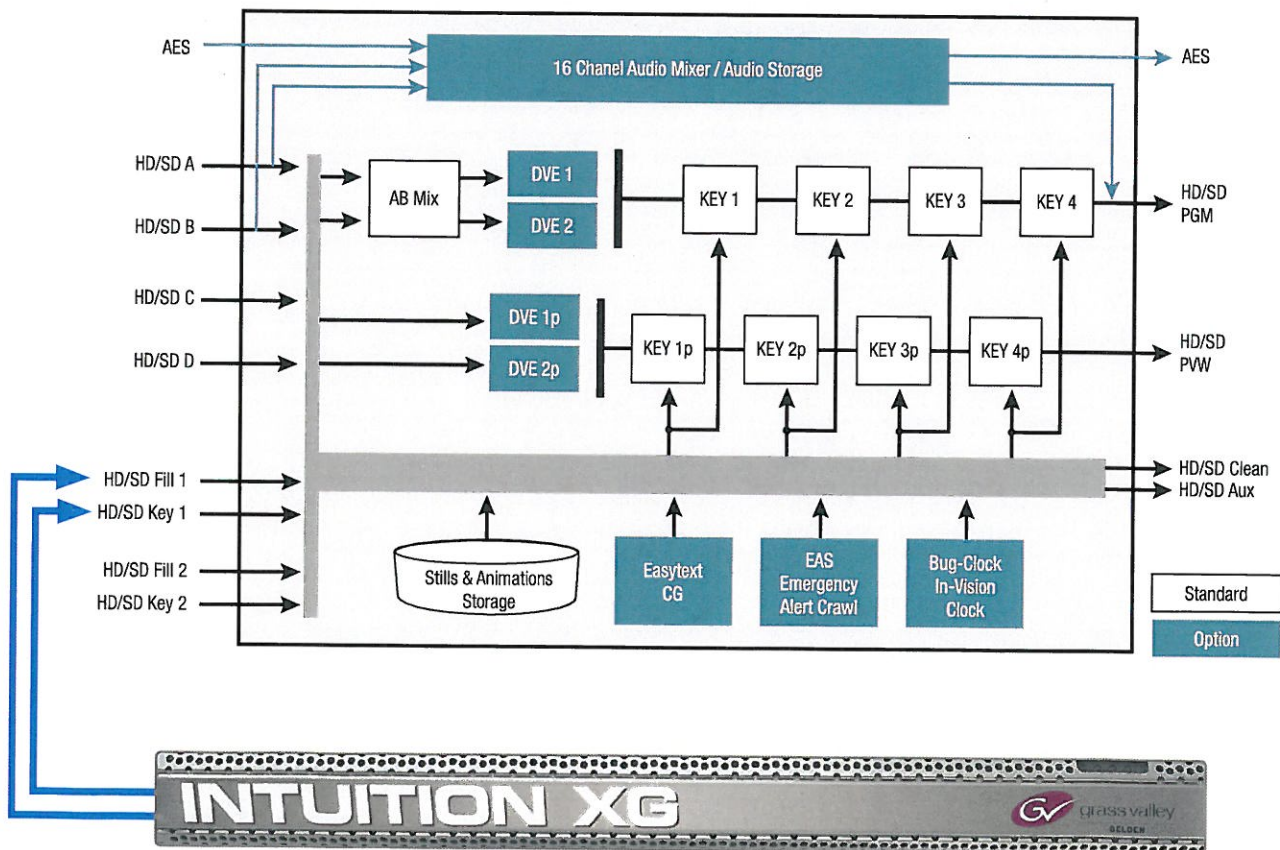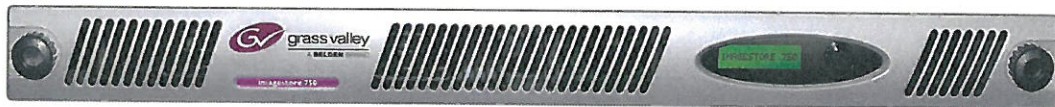
Dolby encoding/decoding & upmixing

Two key challenges with the playout of HD channels have traditionally been the handling of Dolby E during program mixing, and the use of 5.1 Upmixing to maintain the continuity of the audio when dealing with 5.1 and 2.0 signals. The Imagestore 750 simplifies these problems significantly, with integral Dolby E decoding/encoding and 5.1 Upmixing using Linear Acoustic technology.
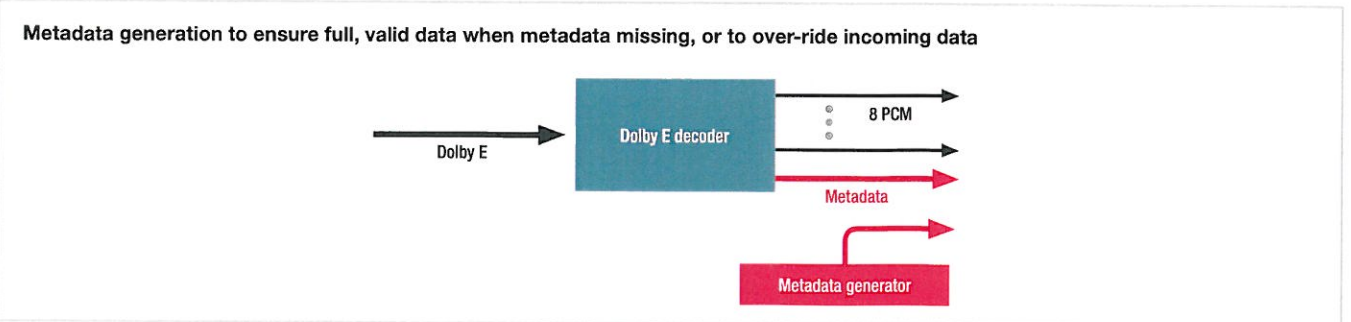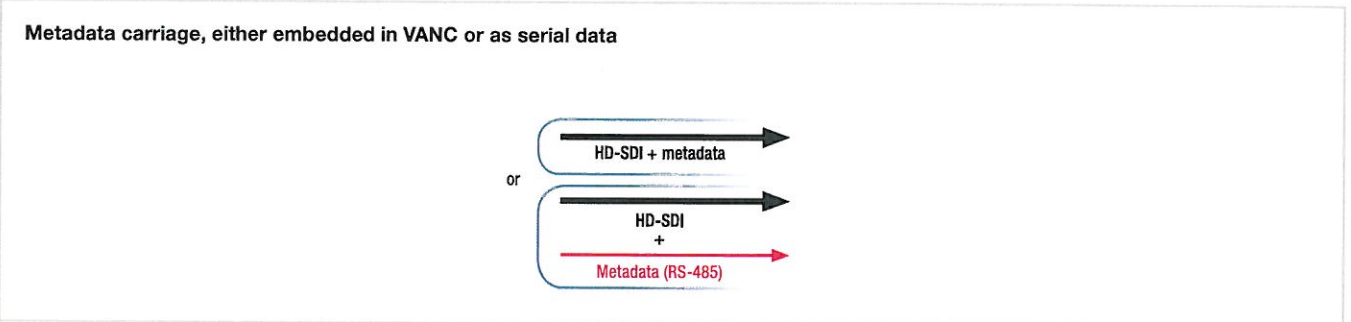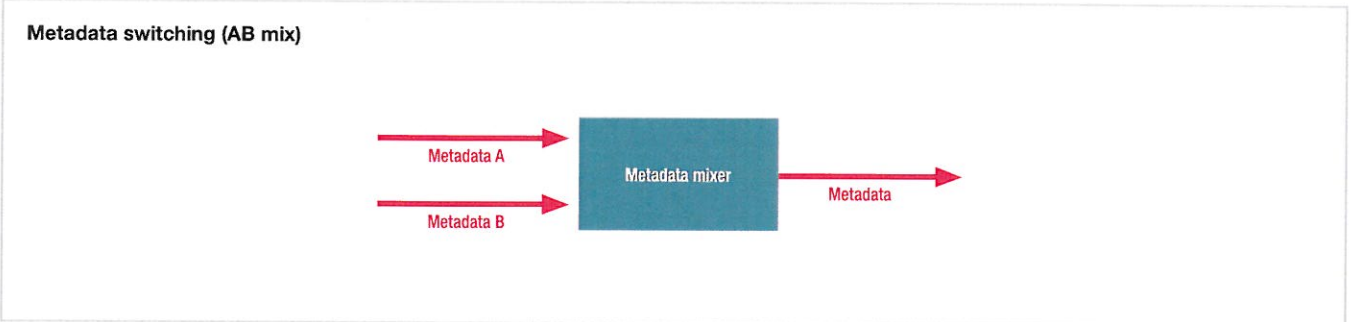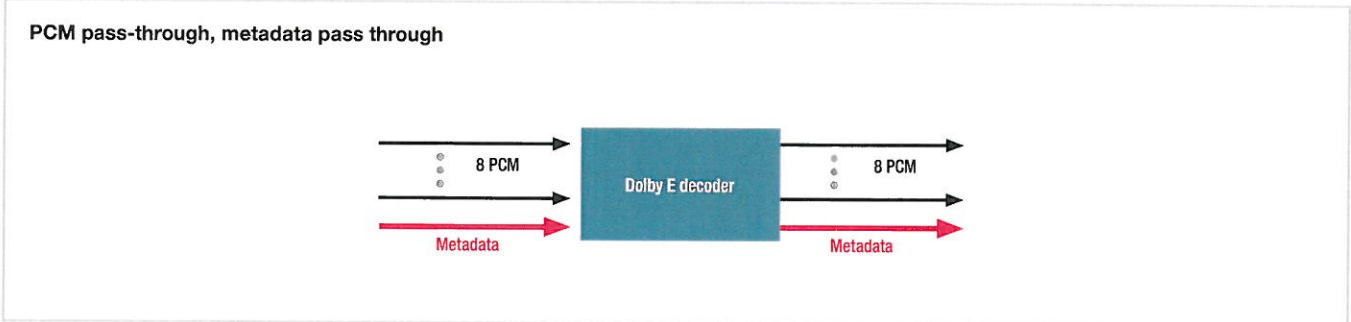

Imagestore 750 can perform Dolby E decoding and audio mixing, and then Upmix before **Dolby E/AC-3 encoding**

Using Imagestore 750 in a typical playout configuration with Dolby E decoding and 5.1 upmixing, with audio output as PCM 5.1
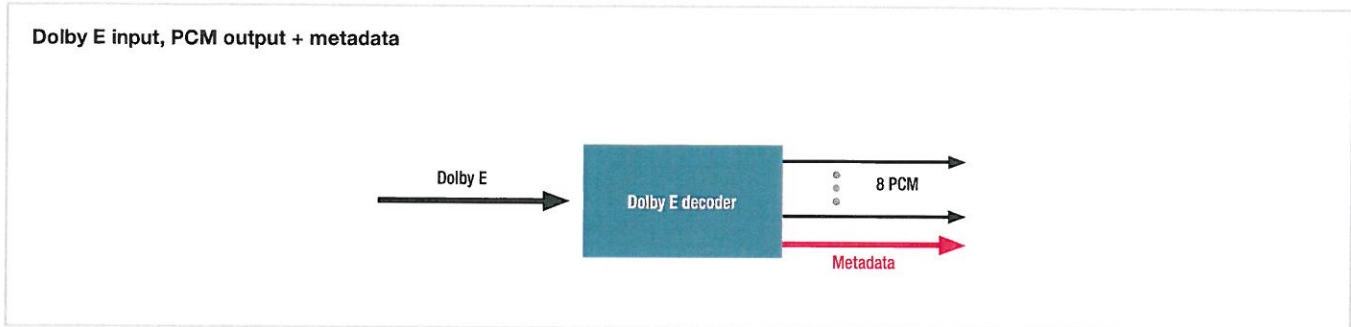
The Imagestore 750 can be fitted with up to four Dolby E decode/encode or 5.1 Upmixing processing modules, without any limitation on the possible combinations. The audio engine produces reliable and outstanding results, as the Dolby processing relies on genuine Dolby technology, while the Upmixing engine is based on the industry leading Linear Acoustic UpMAX™ technology.

Imagestore 750 can manage up to four streams of metadata, and is able to generate up to four presets (metadata banks). Moreover, its delay capabilities allow the video/audio/metadata to remain synchronous, and the audio can be switched seamlessly, regardless of the audio type (PCM 5.1 to PCM stereo, Dolby to PCM stereo etc).

This high level of integration of Dolby E decoding/encoding, Upmixing and metadata processing makes the Imagestore 750 the ultimate solution for audio management in playout.

Integral dynamic metadata processing

Imagestore 750 is equipped with an advanced metadata processor, including support of embedded metadata (as per RP-2020), metadata switching, and metadata generation:


Dolby E input, PCM output + metadata

Dolby E → Dolby E decoder → 8 PCM / Metadata

PCM pass-through, metadata pass through

8 PCM + Metadata → Dolby E decoder → 8 PCM + Metadata

Metadata switching (AB mix)

Metadata A / Metadata B → Metadata mixer → Metadata

Metadata carriage, either embedded in VANC or as serial data

HD-SDI + metadata

or

HD-SDI
+
Metadata (RS-485)

Metadata generation to ensure full, valid data when metadata missing, or to over-ride incoming data

Dolby E → Dolby E decoder → 8 PCM / Metadata

Metadata generator

Powerful, Single/Dual Channel DVEs

The integral dual or single channel HD/SD DVEs are ideal for branding and promotional transitions:
- High quality picture-in-picture and squeeze-and-reveal type DVE transitions
- 10-bit processing, advanced interpolation and sub-pixel motion and scaling
- Automated or manual control of DVEs
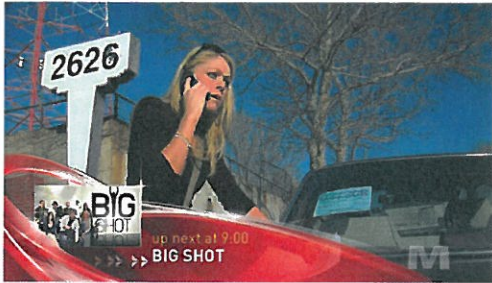
Animation, Storage and Playout

A wide range of multilayer animation playout effects can be performed:
- Four independent keying layers with preview output enable the playout of high impact, multilevel channel branding
- Integral still/animation store with capacity for more than 4,000 HD/SD images

Automated Character Generation

Imagestore 750 is ideal for highly automated, template-based character generation for channel branding and automated promos:
- Each of the four keying layers can insert a crawl layer or static (dynamically updated) text layer
- High quality characters are output with 256 level anti-aliasing, with easy drop shadow and transparency control
- Unicode characters in Truetype fonts, from 6 to 600 pixels, in any RGB color

Emergency Alert System Support

Broadcast quality EAS emergency text and audio messages can be inserted automatically using the EAS option:
- EAS operates with an external EAS receiver
- EAS messages are triggered by a GPI and the text is sent via RS-232
- EAS audio requires an A-to-D converter to provide AES input to the Imagestore 750

Flexible Multichannel, Manual Control Options

iMC fully featured, master control switching panel system for live and specialty channels
- Branding Panel provides highly graphical, touchscreen control, with multiple "hard" knobs and switches
- iMC panels or PresStation panel give full control over branding, but also allow for full router control and source selection
- Vertigo Xpanel GUI offers highly adaptable and intuitive control of multiple channels with channel ganging and full tallies

Optional Graphics Co-processor

- Imagestore 750 can be integrated with Intuition XG graphics co-processor
- Intuition XG offers a powerful HD/SD character generator, ideal for dynamic, data-driven graphics

Optional Advanced Audio Features Include Dolby Encoding/Decoding and 5.1 Upmixing
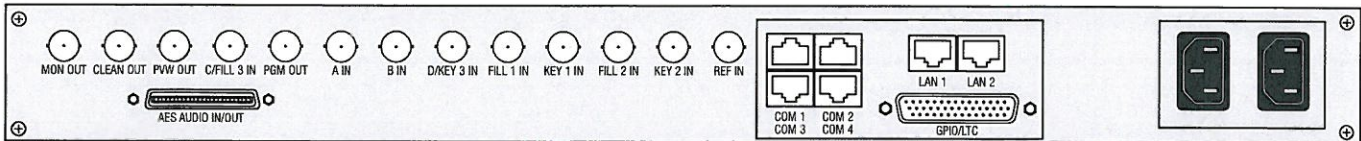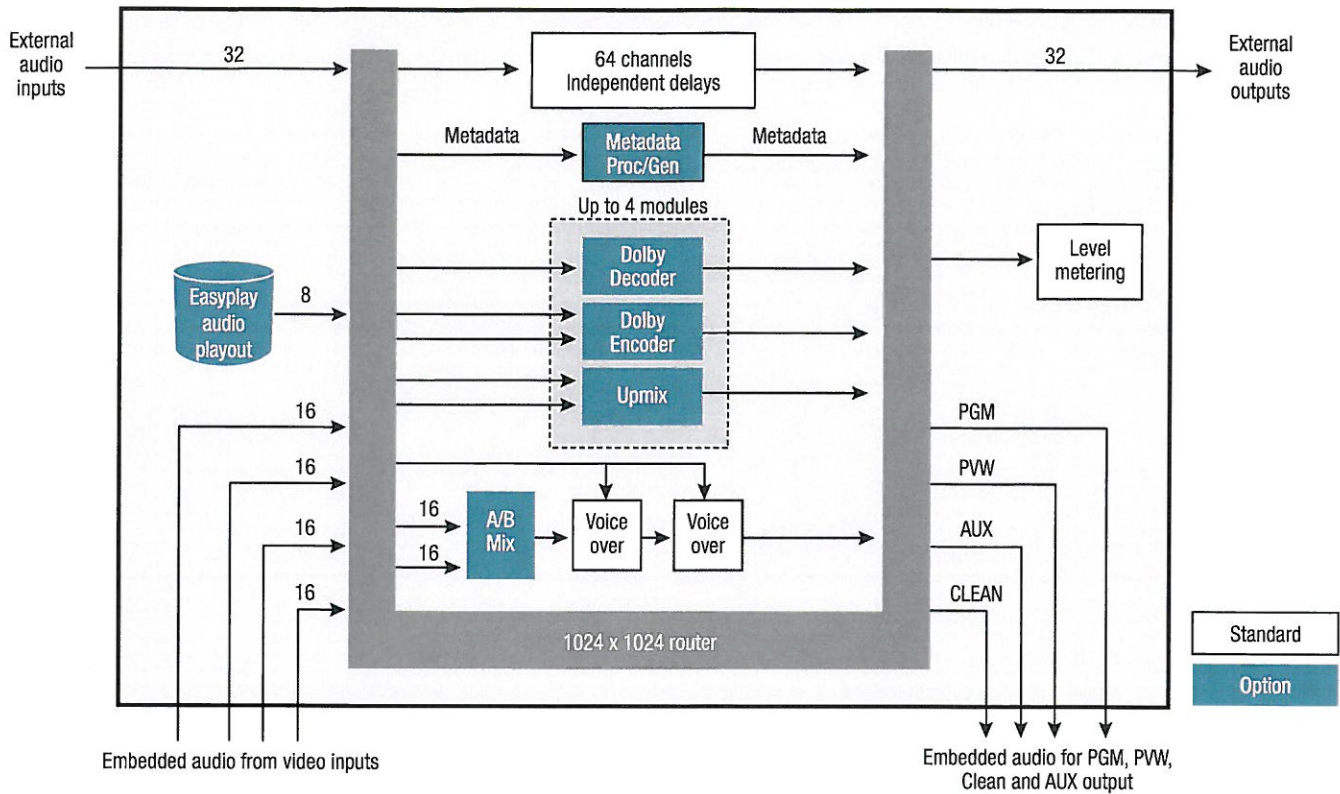
Imagestore 750 rear view

ORDERING

IS-750	Imagestore 750 channel branding processor (dual input, 2X fill and key, AB mix, PGM, PVW + clean out)

Options

IS-750-DVE	Single channel DVE
IS-750-DVE-DUAL	Dual channel DVE
IS-750-Audio6	Audio: 6 channels (1 group embedded, 6 AES IN, 6 AES OUT)
IS-750-Audio16	Audio: 16 channels (4 groups embedded, 16 AES IN, 16 AES OUT)
IS-750-EAS	EAS with one AES IN
IS-750-DOLBY	Dolby decode/encode bundles (various configurations available)
IS-750-UMX	Audio upmix option
IS-44-TBA	44-pin terminal block adapter for GPIO/LTC/metadata connections
IS-750-EP16	Easyplay 16 channels audio storage/playout

IS-750-ET	Easytext character generator
IS-750-Clock	Bugclock in-vision clock
IS-750-MEM-2GB	2 GB of animation playout memory
IS-750-HDD	Internal media storage hard disk drive kit
IS-750-PSU	Redundant (spare) PSU unit for IS-750
RCP-BR	Branding Panel
XPanel	SW control panel
iMC-Panel-300	Full size master control panel
iMC-Panel-200	Mid-size master control panel
iMC-Panel-100	Compact master control panel
iMC-Panel-GUI	Software GUI master control panel

GVB-1-0434B-EN-DS

iMC

Master Control Panel System for Live and Speciality Channels

Promote your brand and efficiently deliver your channels.

iMC panels from Grass Valley, a Belden Brand, are a comprehensive range of fully featured, master control surfaces for the Imagestore 750.
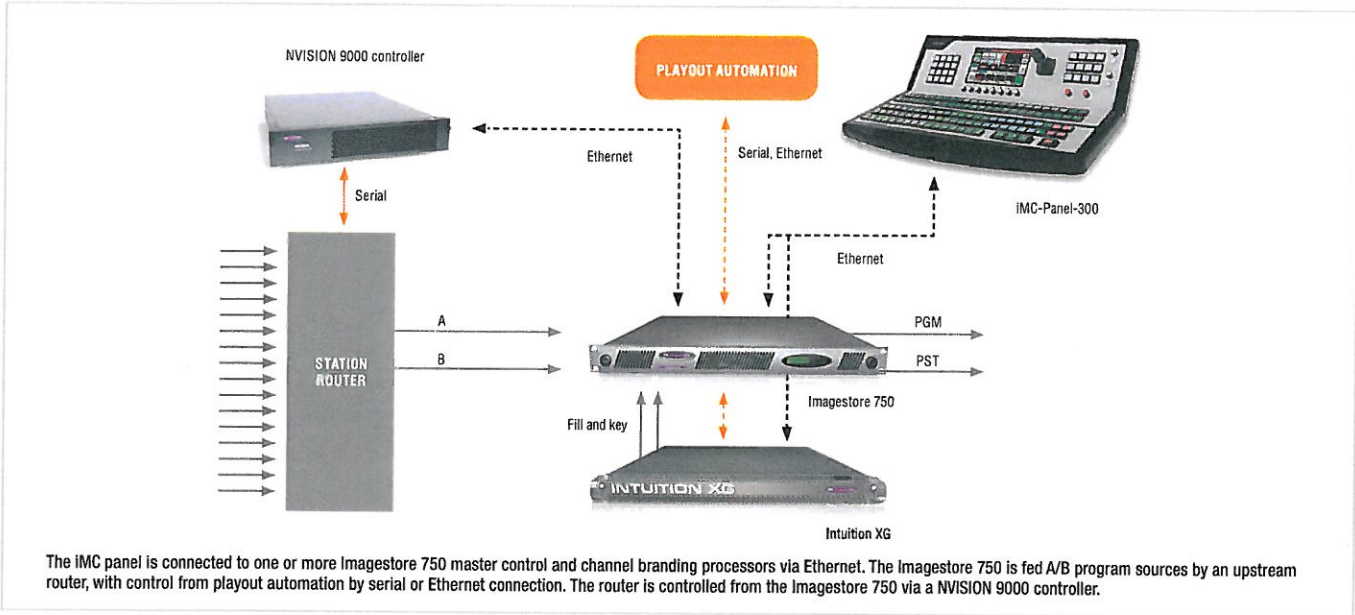
The panels offer all the live manual control capabilities needed by national broadcasters, regional stations and other providers of live programming.

iMC Master Control Panel System for Live and Speciality Channels

KEY FEATURES

- iMC is a range of four fully featured master control switcher panels for operation with the Imagestore 750
- Scalable system for operation in multichannel environments
- Controls Imagestore 750 processors directly via Ethernet
- Control surface comprises a hard panel for transmission control, and a separate "soft" screen for fast set-up and effective status monitoring

- Control of all core Imagestore 750 switching and channel branding functions
- Tight integration with Intuition XG graphics co-processor for control of advanced channel branding effects
- Rich integration with NVISION routers and NVISION 9000 controller
- Tight integration with Kaleido multiviewers including source management, tallies and layout control

The iMC panel is connected to one or more Imagestore 750 master control and channel branding processors via Ethernet. The Imagestore 750 is fed A/B program sources by an upstream router, with control from playout automation by serial or Ethernet connection. The router is controlled from the Imagestore 750 via a NVISION 9000 controller.

Full size, iMC-Panel-300
- 28.25 in W x 21 in D
- Four rows of 24 push-buttons for program, preset, and user definable buttons
- Color LCD touchscreen indicates the set-up state of the connected Imagestore 750 master control switchers, with quick access to keyer setups, squeeze presets, logo store, and audio setups
- Dedicated rotary controls for audio level adjustments
- 3-axis joystick for adjustment of logo position
- Transition controls provide instant selection of transition types and rates
- 16 user-configurable pushbuttons for channel selection, GPI control and other functions
- Dedicated control cluster for audio monitoring and metering functions
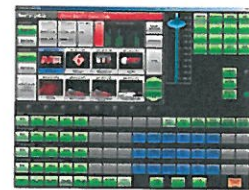
Mid-size panel, iMC-Panel-200
- 19.75 in W x 21 in D
- Four rows of 16 push-buttons for program, preset, and user definable buttons
- Color LCD touchscreen indicates the set-up state of the connected Imagestore 750 master control switchers, with quick access to keyer setups, squeeze presets, logo store, and audio setups
- Dedicated rotary controls for audio level adjustments
- 3-axis joystick for adjustment of logo position
- Transition controls provide instant selection of transition types and rates
- 16 user-configurable pushbuttons for channel selection, GPI control and other functions

Compact panel, iMC-Panel-100
- 3 RU rack-mountable button panel, 19.0 in W x 5.22 in H x 3.7 in D
- Two rows of 16 push-buttons for program, preset, and user definable buttons
- Dedicated rotary controls for audio level adjustments
- Transition controls provide instant selection of transition types and rates
- Dedicated touchscreen monitor required (not included)

Soft control panel, iMC-Panel-GUI
- Software-based GUI which emulates the functionality of the iMC-Panel-200
- Control by mouse or touchscreen interface
- Designed for a PC and requires display capable of supporting 1280 x 1024 resolution

ORDERING

iMC-Panel-300	Full size master control panel
iMC-Panel-200	Mid-size master control panel

iMC-Panel-100	Compact master control panel
iMC-Panel-GUI	Software GUI master control panel

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