Quantum[®] Elite

HDCP-COMPLIANT SCALABLE VIDEOWALL PROCESSING SYSTEM

High Performance Multi-Graphic Processing for Large Scale Videowall Systems

- Scalable videowall processing for large videowalls with up to 28 displays or more
- Card frame videowall processing system available with 8 or 15 slots
- High speed, dedicated video/graphic bus delivers real-time performance
- Flexibility to support a variety of input and output configurations
- HDCP-compliant input/output options





Introduction

The Extron **Quantum[™] Elite** is a scalable, expandable videowall processor configurable to support a variety of input, output, and windowing capabilities. It features high performance video scaling technology capable of producing very high quality images. The Quantum Elite offers two card-cage versions that support various combinations of input and output cards for HDMI, DVI, RGB, HDTV, or video sources. Hundreds of additional DVI or RGB sources can be streamed over an IP network to the Quantum Elite using the Extron QGE 100 graphics capture encoder. Each HDMI or DVI-I dual output card supports up to 128 video/graphic source windows, and multiple Quantum Elite card cages can be cascaded to create very large display arrays. A dedicated, high-speed video/graphic bus maintains real-time performance even under heavy loading of inputs.

The Quantum Elite provides a high performance, high reliability display processing solution for monitoring valuable infrastructure and assets.

The Quantum Elite maintains optimal full frame rate performance with a high speed 10 Gbps RAPT - Real-Time Asymmetric Packetized Transfer video/graphic bus that allows large numbers of inputs to be processed while preserving real-time control response and image performance. The scaling capability of the output cards allows up to 128 windows per output card. The combination of input cards for HDMI, DVI, RGB, or video, the QGE 100 computer-video capture IP encoder, and the ability to cascade multiple processors together provides a high degree of scalability. When used in conjunction with HDCP-compatible displays, the HDMI input and output cards allow the display of HDCP-encrypted content on the videowall. A green window with an alert message will be displayed if HDCP-encrypted content is sent to a non-HDCP compliant display.

A variety of display scenarios can be pre-programmed or created on-the-fly using Quantum Elite Control Software, an intuitive control interface for setup and system operation. Many sources can be shown at small sizes, a few at large sizes, or many other combinations. All of this is complemented by high performance image scaling technology, which accurately preserves the original image quality at all window sizes.

System reliability is significantly enhanced through use of a ruggedized operating system. The Quantum Elite is available with removable flash storage or a removable hard disk drive, depending on the model.

The Quantum Elite is delivered as a factory-configured, modular system and is available in different frame options. The product can be sized to the needs of a current application and then expanded as requirements evolve.

These advantages make the Quantum Elite ideal for all types of surveillance, presentation, and visualization applications, whether traffic, security, military, or process control.



Features

Highly Scalable Input / Output Configuration

Card frame videowall processing system

The Quantum Elite is available as two card frames: the Quantum Elite 615, a 6U model with 15 available card slots, and the Quantum Elite 408, a 4U model with eight slots. Both versions allow for various combinations of input and output cards to match specific source and videowall configurations.

HDCP-compliant system

HDCP-encrypted content can be displayed on HDCP-compatible displays when using Quantum Elite HDMI input and output cards.

HDCP Visual Confirmation

A green window with an alert message will be displayed if HDCP-encrypted content is sent to a non-HDCP compliant display.

Scalable, field-expandable systems

The Quantum Elite is highly scalable and can be expanded by adding input or output cards, or by cascading card frames together. This allows for system adaptability to fulfill future application needs. Quantum Elite system expansion is performed by Extron field staff.

Flexibility to support a variety of input and output configurations

The Quantum Elite can be configured with various combinations of inputs and outputs

within the available card slots. Input cards include a 12-input card for composite or S-video sources, a two-input card for RGB graphics or HD component video, a two-input card for DVI-D sources, and an HDCP-compliant two-input card for HDMI or DVI-D sources.

Output cards include an HDCP-compliant HDMI/DVI two-output card and a DVI-I twooutput card for DVI or analog RGB. Each output card supports two displays in the videowall.

Up to 128 video/graphic windows per dual output card

The Quantum Elite offers extensive windowing capabilities, with the ability to display up to 128 windows of video and graphics for each pair of displays in the videowall.

IP streaming of hundreds of RGB/DVI inputs

In addition to the input cards, hundreds of DVI or RGB graphics sources can be interfaced to the Quantum Elite over an IP network, using optional Extron QGE 100 Quantum Graphics Encoders.

Upload and display stored images

Image file types, including JPEG, GIF, PNG, and bitmaps can be uploaded to the Quantum Elite and used as backgrounds behind the windows, or displayed as a source.



High Performance and Image Quality

High speed, dedicated video/ graphic bus delivers real-time performance

The Quantum Elite features a 10 Gbps Real-Time Asymmetric Packetized Transfer - RAPT video/graphic bus that allows for simultaneous processing of numerous, high resolution input signals while maintaining real-time operational performance as well as optimal image quality at full frame rates.

Independent, on-board image processing

Each input or output card provides independent, on-board image processing for high quality upscaling and downscaling. This parallel image processing architecture eliminates use of shared control resources such as a dedicated bus or central processor, and enables rapid control for the user.

High quality image upscaling and downscaling

The Quantum Elite includes high performance image scaling technology offering both high quality upscaling and downscaling of video and high resolution RGB or HD video signals.

Supports digital and analog input signals up to 1920x1200

A wide range of standard definition, computer-video, and HD video sources can be accommodated by the Quantum Elite, up to 1920x1200 and HDTV 1080p/60.

Solid state flash storage

The Quantum Elite 615 model features CompactFlash-based data storage for the operating system and image files. This avoids the need for a hard disk drive and delivers continuous system operation and enhanced reliability. Write-protected flash storage eliminates the risk of virus retention, and allows for easy removal of data in secure environments.

Optimal reliability

The Quantum Elite delivers continuous 24/7 system reliability with redundant, hot-swappable power supplies and fans, and an optimized cooling system within the chassis. The RAPT video/graphic bus ensures continued display of content from connected video sources in the unlikely event of an operating system failure. The system returns to its previous operational state when rebooted.

Card Frames

Card Frames

The Quantum Elite is a factory-configured, modular system available in space-efficient 6U and 4U card frames. These house all image processing and input / output connectivity for supporting videowall systems with up to 28 displays or many more. It is configured at the factory to meet the needs of the customer, and can be expanded in the future as requirements evolve. For very large videowalls or applications requiring a large number of input sources, card frames can be cascaded together to increase input and output capacity. The Quantum Elite is designed to deliver continuous, 24/7 operational reliability in mission-critical environments.

Features

- Unmatched input bandwidth capability
- Dedicated 10 Gbps Real-Time Asymmetric Packetized Transfer
 RAPT video/graphic bus provides optimized real-time image performance
- · Accommodates input and output cards in any combination
- Dual high bandwidth, Gigabit Ethernet ports accept DVI or RGB graphics sources streamed from Extron QGE 100 Quantum Graphics Encoders
- Ethernet port for system control from a PC with Quantum Elite Control Software

- Integrates with external control systems from a PC with Quantum Elite Control Software
- USB port for image file upload or system upgrades
- Fast boot time, less than 90 seconds
- Maintains presentation of connected video sources in the unlikely event of an operating system failure
- · Redundant, hot-swappable power supplies and fans
- Optimal cooling and thermal management system no additional rack space required for ventilation







Quantum Elite 615

- Rack-mountable 6U, 15-slot card frame
- CompactFlash storage for the operating system is write-protected to prevent virus retention. It also offers enhanced reliability and quick system recovery in the unlikely event of an operating system failure.
- Second CompactFlash slot for storing image files
- Maximum input capacity¹:
- HDMI, DVI-D, or analog RGB or HD up to 28 sources
- Composite or S-video up to 168 sources
- Maximum output capacity²:
- HDMI or DVI-I up to 28 outputs

Quantum Elite 408

- Rack-mountable 4U, eight-slot card frame
- Hard disk-based data storage
 - Maximum input capacity¹:
 - HDMI, DVI-D, or analog RGB or HD up to 14 sources
 - Composite or S-video up to 84 sources
 - Maximum output capacity²:
 - HDMI or DVI-I up to 14 outputs
- ¹ Based on I/O card configuration with one slot occupied by the output card.
- $^{\scriptscriptstyle 2}$ Based on I/O card configuration with one slot occupied by an input card.

Input Cards

HDMI Input Card

- Accepts two HDMI or DVI-D signals
- Compatible with resolutions up to 1920x1200 and HDTV 1080p/60
- HDCP-compliant when used with Quantum Elite HDMI output cards and HDCP-compliant displays
- Auto input source detection simplifies system programming to streamline integration of new sources into the Quantum Elite
- Native 4:4:4 color quantization
- High performance scaling technology optimizes real-time image processing capacity for the dedicated video/graphic bus

DVI Input Card

- Accepts two DVI-D input signals
- Compatible with resolutions up to 1920x1200 and HDTV 1080p/60
- Auto input source detection simplifies system programming to streamline integration of new sources into the Quantum Elite
- Native 4:4:4 color quantization
- High performance scaling technology optimizes real-time image processing capacity for the dedicated video/graphic bus

RGB / HD Component Video Input Card

- Accepts two RGBHV, RGsB, and YPbPr input signals
- Compatible with resolutions up to 1920x1200 and HDTV 1080p/60, and supports custom resolutions
- Auto input source detection simplifies system programming to streamline integration of new sources into the Quantum Elite
- Native 4:4:4 RGB and 4:2:2 HD color quantization
- High quality motion adaptive 1080i deinterlacing
- High performance scaling technology optimizes real-time image processing capacity for the dedicated video/graphic bus

Video Input Card

- High density input configuration allows for up to 12 composite or S-video source connections
- Accepts NTSC, PAL, and SECAM standard definition video in any combination
- · Accommodates any mix of composite or S-video sources
- Auto input source detection simplifies system programming to streamline integration of new sources into the Quantum Elite
- High performance scaling technology optimizes real-time image processing capacity for the dedicated video/graphic bus
- Native 4:2:2 color quantization
- High quality de-interlacing
- High quality composite video decoding
- Time base stabilitization and automatic gain control for adaptability to poor quality video sources









Output Cards

HDMI Output Card

- Two HDMI outputs deliver HDMI or DVI signals to drive two videowall displays
- HDCP-compliant when used with Quantum Elite HDMI input cards and HDCP-compliant displays
- High performance scaling technology with dedicated image processing for low and high resolution video optimizes images for the videowall displays
- Display up to 128 windows per output card
- · Customize windows with captions, borders, and titles
- Output resolutions up to 1920x1200 and HDTV 1080p/60

DVI-I Output Card

- Two DVI-I outputs deliver DVI or analog RGB signals to drive two videowall displays
- High performance scaling technology with dedicated image processing for low and high resolution video optimizes images for the videowall displays
- Delivers consistent, high quality image performance regardless of input load
- Display up to 128 windows per output card
- Customize windows with captions, borders, and titles
- Output resolutions up to 1920x1200 and HDTV 1080p/60

Quantum[™] Connect HDCP-Compliant Videowall Processing System

The Extron Quantum Connect is a videowall processor that delivers the same high quality video scaling, windowing capability, and real-time performance as the Quantum Elite, at a lower price point. It is ideal for small to medium-sized videowalls with two to 14 screens in installations with permanent AV system configurations. The Quantum Connect is populated at the factory with any combination of HDMI and DVI-I output cards and input cards for HDMI, DVI, RGB, HDTV, or video sources. The dual output card supports up to 128 video/graphic windows and the high-speed RAPT video bus maintains real-time performance even under heavy loading of inputs. The Quantum Connect can accommodate up to 84 video inputs or 14 HDMI or RGB/DVI inputs, depending on the input and output card configuration.

The Quantum Connect is packaged into permanent configurations when shipped from the factory. Applications requiring greater scalability and the flexibility to expand over time should use the Quantum Elite processor.

Note: The Quantum Connect is shipped with a fixed I/O configuration, specified at time of ordering.



Features

- Delivers the same real-time performance and windowing capability of the Quantum Elite at a lower price point
- Scalable videowall processing for mid-sized videowalls with up to 14 displays
- Card frame videowall processing system available with eight slots
- High speed, dedicated video/graphic bus delivers real-time performance
- Flexibility to support a variety of input and output configurations



Computer Graphic Streaming



QGE 100

DVI/RGB Computer Screen Capture IP Encoder

The Extron QGE 100 Quantum Graphics Encoder is used to stream RGB or DVI screen captures from PCs or other graphic sources to Quantum Elite videowall processors. It provides high scalability, allowing hundreds of sources such as maps, data screens, and other low-motion graphic input signals to be interfaced to Quantum Elite over an IP network. The QGE 100 applies high performance, lossless compression with 4:4:4, 24-bit color source reproduction while using low bandwidth streaming into a Quantum Elite processor or QGE 100 Viewer software.

APPLICATION DIAGRAM

Features

- Stream RGB or DVI computer-video screen captures to the Quantum Elite over an IP network
- Allows simple connection of a DVI or RGB source to an IP network
- Uses existing network or a dedicated media network with standard, routable IP packets
- Lossless compression with 4:4:4, 24-bit color source reproduction maintains image fidelity while minimizing network bandwidth
- Compatible with DVI input resolutions up to 1920x1200 and analog RGB input resolutions up to 1600x1200
- Auto-sensing and flexible signal acquisition circuitry simplifies installation for both standard and non-standard sources

* The Quantum Elite must be installed with at least one 12-channel video input card if QGE 100 units are used. The card provides the data bridge between the incoming IP stream and the RAPT video/graphic bus.



Quantum Elite Control Software

Quantum Elite System Control and Configuration

The Quantum Elite Control Software is the application software and user interface for setting up, configuring, and managing the Quantum Elite videowall processing system. The user-friendly software is organized into a series of tasks, designed so that an integrator can easily navigate through them and quickly have a videowall system up and running, without complex setup procedures or programming. From there, videowall presentations can be created with the aid of a virtual canvas, with full control over the quantity, content, sizing, and placement of windows within the videowall display.

System Setup Tasks

Videowall system setup with the Quantum Elite Control Software is grouped into separate tasks that the integrator follows in sequence to set up and configure the videowall. First, network communication is established with the Quantum Elite unit. Then, the videowall display configuration is defined, and mullion or edge blend compensation applied, if necessary. Finally, the integrator configures the input sources to the system, including those connected to the input cards, RGB graphics sources streamed via QGE 100 units, and internally stored image files.

Virtual Canvas

With installation and configuration of the Quantum Elite inputs and outputs complete, the integrator or system operator can now begin designing presentations to be shown on the videowall. A large virtual canvas provides a visual on-screen layout of the videowall and its subdivisions. Windows may be added to the videowall by simply

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The software is organized into a series of tasks shown on the left, designed so that the user can easily navigate through them to set up the videowall.

dragging and dropping them onto the canvas. Once dragged onto the canvas, they may be sized and positioned anywhere. The large area bordering the videowall serves as a "staging" area for windows to be added to, removed from, or prepared for placement on the videowall.

Changes to the multi-window layout can be viewed instantaneously on the videowall display. The software application lets the user customize the layout by selecting the source input for each window, sizing and positioning the windows, adding a caption label or color border to each window, and sizing, positioning, and zooming images within the windows. These configurations are saved as window presets for future recall.

User Operation

Once videowall window presets have been created, the Quantum Elite Control software can be used to create a simple user interface, so that the system operator can quickly and easily recall these presets. The software lets the integrator create this interface with clickable buttons for each preset. This interface is fully customizable, including button color, size, and position, as well as background color, text color, and the font. A bitmap image can also be assigned to a button or the background of the interface.

Control System Integration

The Quantum Elite can be remotely controlled via RS-232 serial control using the Extron TouchLink[™] or other control system to recall presets and provide additional system functions, such as changing the source input for a window or applying captions or border colors to windows.



The virtual canvas provides a visual on-screen layout of the videowall, where windows can easily be added, sized, and positioned.

Applications

Command and Control Videowall System

This videowall system application employs a 15-slot Quantum Elite 615 for processing 11 locally connected sources, plus 12 additional PC sources for maps and data screens streamed over the LAN via QGE-100 Quantum Graphics Encoders. A single video input card accommodates the three standard definition sources. Two HDMI input cards are used for the Blu-ray Disc player and digital satellite feeds. Two additional input cards are used for the DVI and analog RGB PC signals. Together with the five dual HDMI output cards for the 5x2 videowall, the Quantum Elite 615 still leaves five slots open for scalability to support future system expansion. In the future, the system can be expanded to support hundreds of additional PC data or graphics sources over the LAN using QGE 100 streaming encoders.

HDCP Compliant Displays



Applications

Security and Surveillance Videowall System

In this application, input sources include 80 standard definition CCTV cameras for surveillance, four satellite TV receivers, and two PCs. The standard definition sources are connected to seven 12-channel video input cards. An additional input card is used for the PCs. The Quantum Elite 615 provides the capacity to accommodate all 86 input sources, together with the 6x2 videowall that requires six dual DVI-I output cards, all in just a 6U rack space unit. The high speed video/graphic bus easily supports all 86 inputs simultaneously while maintaining real-time performance, and the windowing capability allows all of them to be displayed on the videowall in separate windows. A dedicated PC with the Quantum Elite Control Software is used for system configuration and operation.



Specifications

PANEL DRAWINGS



Quantum Elite 408





SPECIFICATIONS

GENERAL	
Power	
Quantum Elite 615	Internal
	(2*) 100-240 VAC, 50-60 Hz power supplies
	*A redundant power supply is standard.
Quantum Elite 408	Internal
	(1) 100-240 VAC, 50-60 Hz power supply
Power consumption	300-500 watts (varies with configuration)
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 85%,
	noncondensing Operations and to a DE SE (E to a DE SO) (10% to DES(
	Operaling: +35 to +95 °F (5 to +35 °C) / 10% to 85%,
Cooling	Fone front to rear
Cooling	Fans, none to real
Mounting Deals mount	Vee
Rack mount	Yes
Enclosure type	Metai
Enclosure dimensions (per unit)	10 ["] 17 1" W + 10 0" D (() birth full real (wide)
Quantum Eille 615	10.5 H X 17.1 W X 19.3 D (60 fligh, full rack wide)
	(26.7 CM H X 43.3 CM W X 49.0 CM D)
	(Depth excludes connectors and handles. Width excludes
Quantum Elite 400	Duill-III rack ears.)
Quantum Eille 408	7.0 H X 17.1 W X 19.3 D (40 mign, luii rack wide) (17.0 cm Ll x 40.0 cm W x 40.0 cm D)
	(17.8 CIN H X 43.3 CIN W X 49.0 CIN D)
	(Depth excludes connectors and nandles, width excludes
Broduct weight	Duil-III I duk Edis.)
Augustum Elite 615	Without boards: 51.9 lbs (22.5 kg)
Quanum Line 015	Williout boards. 51.0 bs (23.3 Ky) Fully loadod: 60.5 lbc (27.5 kg)
Quantum Elita 408	Without boarder 22 lbs (27.3 Ky)
Quanum Line 400	Fully loaded: 38.5 lbc (17.5 kg)
	i uliy idaucu. 30.3 IDS (17.3 KY)

Boards	0.3 lb (0.6 kg)	
Shipping weight		
Quantum Elite 615	80 lbs (37 kg)	
Quantum Elite 408	58 lbs (27 kg)	
Boards	2 lbs (1 kg) per board	
Regulatory compliance		
Safety	CE, c-UL, UL	
EMI/EMC	CE, FCC Class A	
Environmental	Complies with the appropriate requirements of RoHS, WEEE.	
MTBF	30,000 hours	
Warranty	3 years parts and labor	
NOTE: All nominal levels are at ±10%.		
NOTE: Specifications are subject to change	without notice.	
VIDEO INPUT – QGE 100 (REMOTE HARDWARE)		
Number/signal type	1 analog or digital VGA-WI IXGA BGBHV BGBS BGsB	
nambonoighai typo	single link DVI-D	
Connectors	1 female DVI-I	
Horizontal frequency	31.4 kHz to 100 kHz	
Vertical frequency	50 Hz to 85 Hz	
Resolution range	640x480 to 1920x1200*	
	*1920x1200 is accepted for DVI-D single link, reduced	
	blanking only	
Formats	RGB, digital video	
Standards	DVI 1.0	
VIDEO PROCESSING – QGE 100 (REMOTE HARDWARE)		
Maximum data rate	4 95 Gbps (1 65 Gbps per color)	
Digital sampling	24 bit. 8 bits per color, 165 MHz standard	
Colors	16.78 million	
001013	10.7011000	

Quantum Elite 615

Specifications (cont.)

VIDEO INPUT - COMPOS	SITE AND S-VIDEO – QEC I12VID
Number/signal type	12 S-video, composite video
Connectors	2 female 26-pin HD (included adapter allows input on 24 female BNC econocetare)
Nominal level	1 Vn-n for Y of S-video and for composite video
	0.3 Vp-p for C of S-video
Minimum/maximum levels	Analog: 0.1 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 KHZ
verucal frequency	ου πz, σ9.94 πz
VIDEO PROCESSING - C	EC I12VID
Digital sampling	8 bits per color; 13.5 MHz standard
LOIOTS	טוווח איז.טו
VIDEO INPUT – QEC I2R	GB
Number/signal type	2 analog VGA-WUXGA RGBHV, RGsB, HDTV, component
Connoctoro	Video
CONNECTORS	2 remaie 15-pin HD 15 7 kHz to 100 kHz
Vertical frequency	50 Hz to 75 Hz
Resolution range	640x480 to 1920x1200, NTSC, PAL, 480p, 576p, 720p,
	1080і, 1080р
VIDEO PROCESSING - G	EC I2RGB
Digital sampling	24 bit, 8 bits per color; 205 MHz standard (RGB,
	component video)
Colors	16.78 million
VIDEO INPUT - QEC I2D	VI
Number/signal type	2 digital VGA-WUXGA RGB single link DVI-D
Connectors	2 female DVI-I (analog signals are not supported)
Horizontal frequency	31.4 kHz to 100 kHz
Vertical frequency Resolution range	50 Hz to 85 Hz
Formats	RGB digital video
Standards	DVI 1.0
VIDEO PROCESSING - C	DEC I2DVI
Maximum data rate	4 95 Ghns (1 65 Ghns ner color)
Digital sampling	24 bit. 8 bits per color: 165 MHz standard (RGB)
Colors	16.78 million
VIDEO INPUT - OEC 12H	DMI
NOTE: *Appropriate HDMI to DVI_D cables	or adapters are required for DVI signal input/output
Number/signal type	2 single link HDMI (or DVI-D*)
Connectors	2 female HDMI type A (analog signals are not supported)
Signal type	Single link HDMI (or DVI-D*)
Ligital video	KGB digital video (UVI and HDMI standards) or Y, Cr, Cb
	(HDMI standard)
EDID and DDC	Supports Extended Display Identification Data (EDID) and
	Display Data Channel
	(DDC) data using DVI and HDMI standards. Factory or
HDCP	CUSIOM EDID TADIES ARE USER SElECTABLE.
וטעו	(HDCP) using DVI and HDMI 1.3 standards
Horizontal frequency	31 kHz to 100 kHz
Vertical frequency	24 Hz to 85 Hz
Resolution range	640x480 to 1920x1200, 480p, 576p, 720p, 1080i, or
Standards	DVI 1.0. HDMI 1.3. HDCP 1.1
VIDEO PROCESSING – G	
Maximum data rate	4.95 GDPS (1.65 GDPS PER COLOR) 24 bit 8 bits per color: 165 MHz standard
bigital bamping	ביד טוג, ט טונס דטו טטוטר, דטט ואוווב סגמוועמוע

VIDEO PROCESSIN	G – QEC 02	
Maximum data rate	4.95 Gbps (1.65 Gbps per color)	
Digital sampling	24 bit, 8 bits per color, 165 MHz standard	
Colors	16.78 million	
VIDEO OUTPUT - (DEC 02	
Number/signal type	2 scaled RGRHV or single link DVI-D	
Connectors	2 female DVI-I (analog and digital signals are both active)	
Vertical frequencies	50 Hz, 60 Hz	
Scaled resolution	640x480 ^{1,2} , 800x600 ^{1,2} , 848x480 ^{1,2} , 1024x768 ^{1,2} ,	
	1150x870 ^{1,2} , 1280x768 ^{1,2} , 1280x1024 ^{1,2} , 1360x768 ^{1,2} ,	
	1400x1050 ^{1,2} , 1408x1050 ^{1,2} , 1600x1200 ^{1,2}	
	HUTV: 720p ^{1,2} , 1080p ^{1,2}	
Standarde	I = al 50 Hz, Z = al 60 Hz	
VIDEO PROCESSIN	G – QEC O2HDMI	
Maximum data rate	4.95 Gbps (1.65 Gbps per color)	
Digital sampling	24 bit, 8 bits per color, 165 MHz standard	
Colors	16.78 million	
VIDEO OUTPUT – (QEC O2HDMI	
Number/signal type	2 scaled single link HDMI (HDCP compliant)	
Connectors	2 female HDMI type A	
Vertical frequency	50 Hz, 60 Hz	
Scaled resolutions	640x4801,2, 800x6001,2, 848x4801,2, 1024x7681,2,	
	11504X8701,2,1280X7681,2,1280X10241,2, 1260y7691,0,1266y7691,0,1440y0001,0	
	1300X/001,2, 1300X/001,2, 1440X9001,2, 1400v10501 2 1408v10501 2 1600v12001 2	
	1680x10501,2, 1400x10501,2, 1000x12001,2, 1600x12001,2,	
	HDTV: 720p1.2. 1080p1.2	
	1 = at 50 Hz, $2 = at 60 Hz$	
Standards	DVI 1.0, HDMI 1.2, HDCP 1.1	
CONTROL/REMOTE	- PROCESSOR/DECODER/SCALER	
Ethernet norts	1 female B L45 connector for control networked	
Euromot porto	2 female RJ-45 for media transfer (QGE 100 sources)	
Ethernet data rate	Control port: 10/100Base-T, half/full duplex with	
	autodetect	
Quantum Elite 615	Media I and II ports: 10/100/1000Base-T, half/full duplex	
Ourselver Elite 400	with autodetect	
Quantum Elite 408	Media I: 10/100/1000Page T, belf/full duplex with Autodetect	
	ivieula II: TO/TOO/TOODBase-T, Hall/Tull uuplex with autodetect	
Ethernet protocol		
Control port	IP, TCP	
Media ports	IP, TCP, UDP, DHCP	
Storage		
Quantum Elite 615	1 GB nonvolatile user memory [(2) 512 MB, solid state	
Quantum Elita 408	arives) 80 CB (1 IDE drive)	
Internal operating system	Microsoft® Windows® XP Embedded	
Program control	Extron Quantum Elite control/configuration software for	
Ū	Windows®	
Model	Version Description	
Quantum Elite 615	Quantum Elite System 6U/15 slot	
Quantum Elite 408	Quantum Elite System 4U/8 slot	
QEC 02HDMI	Quantum Elite HDMI Output Card	
QEC I2HDMI	Quantum Elite HDMI Input Card	
QEC 02	Quantum Elite Output Card	
QEC 112VID	Quantum Elite 12 Video Input Card	
QEC I2RGB	Quantum Elite Dual RGB Video Input Card	
Quantum Elite Control Software	Quantum Elite Software	
QGE 100	Quantum Graphics Encoder	
For complete	specifications, please go to www.extron.com	
Specifications are subject to change without notice.		



Colors

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Inside USA / Canada Only	Inside USA / Canada Only
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16.78 million

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