Quantum Ultra

ULTRA-HIGH BANDWIDTH 4K VIDEOWALL PROCESSOR

VECTOR 4K SCALING

HYPERLANE 400 Gbps

EVERLAST POWER SUPPLIES

4K UHD

JITC CERTIFIED

Robust, Secure Videowall Processing with Unequaled Real-Time Performance

- Scalable 4K/60 videowall processing for display systems of any size
- Modular architecture accommodates a variety of input and output arrangements
- Future-ready 400 Gbps dedicated video bus delivers unparalleled real-time performance
- Supports 4K on one, two, or four connections
- H.264, MPEG2, Motion JPEG, and VNC stream decoding
- Manage multiple videowalls with varying resolutions and screen arrangements from a single processor

Extron

Quantum Ultra

Quantum Ultra is a modular 4K videowall processor with high-performance scaling and windowing technology which accommodates a wide range of applications. It features the Extron Vector™ 4K scaling engine and HyperLane® video bus capable of carrying high-resolution content from a multitude of sources for unmatched real-time performance. A single processor can support multiple videowalls with mixed resolutions and screen orientations, providing flexible system design with minimal complexity and cost. Portrait and landscape output support, output overlap, and mullion compensation ensure compatibility with nearly any display technology. The Quantum Ultra processor's features and performance make it a future-ready solution for any application.

VECTOR 4K SCALING

The Extron-exclusive Vector 4K scaling engine was developed in-house and engineered to deliver best-in-class image upscaling and downscaling. This enables accurate 4:4:4 processing and scaling of video signals up to 4K, as well as downscaling of 4K signals without losing critical image detail.

Quantum Ultra utilizes a modular architecture to meet the needs of any application. The frame is populated with input and output cards selected to match source and display requirements. Multiple frames can be configured and operated as a single system, accommodating videowalls of any size.

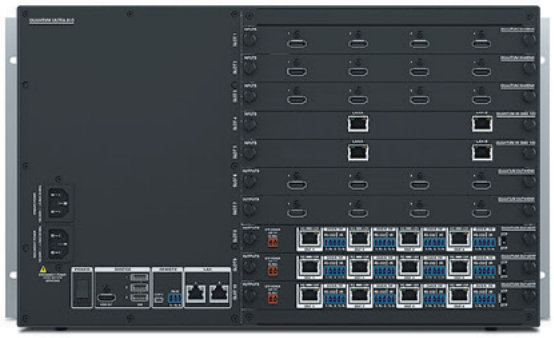
JITC CERTIFIED

Quantum Ultra is certified by the Joint Interoperability Test Command – JITC for use in government installations. Inclusion on the Department of Defense Information Network-Approved Product List - DoDIN APL validates that Quantum Ultra has successfully completed interoperability and information assurance testing for use in command and control, conference, training, and briefing room systems.

Extron Quantum Ultra CERTIFIED

Extron is working closely with industry-leading display manufacturers to guarantee consistent, stable presentation of source content when using professional displays with Quantum Ultra and Quantum Ultra Connect 4K Videowall Processors. Displays that pass an extensive testing program are identified as Quantum Ultra Certified. The Quantum Ultra Certification Program eliminates compatibility concerns. System designers can take comfort in knowing that the products have been tested together using established parameters, such as image acquisition, image stability, and EDID management. Specifying Quantum Ultra Certified displays streamlines videowall integration by reducing the need for on-site troubleshooting. For more information and a list of certified displays, visit www.extron.com/QUCertified.

Card Frames



Quantum Ultra 610

The Quantum Ultra 610 card frame can be populated with any combination of up to ten Quantum Ultra input and output cards to match source and display requirements. Multiple card frames can be configured and operated as a single system to accommodate any size videowall.

- **6U, 10-slot Card Frame**
- **Future-ready 400 Gbps HyperLane™ video bus delivers unparalleled real-time performance**
- **Dual-redundant, hot swappable Extron-engineered Everlast power supplies for 24/7, mission-critical environments**
- **Two AC power inputs**
- **Solid-state, write-protected operating system drive**
- **Secondary solid-state drive for image storage**
- **Simultaneous management of multiple output resolutions and screen arrangements from a single processor**

Quantum Ultra 305

The Quantum Ultra 305 supports any combination of up to five Quantum Ultra input and output cards. It features a single solid-state storage drive with an embedded, write protected operating system for fast boot times and reliable performance. The Quantum Ultra 305 is a powerful yet cost-effective solution for small to medium size videowalls.

- **3U, 5-slot card frame**
- **Future-ready 400 Gbps HyperLane dedicated video bus**
- **Single solid state storage drive with write-protected operating system**
- **Internal Extron Everlast power supply**
- **RS-232 and Ethernet interfaces provide direct connections for SIS control**
- **Simultaneous management of multiple display resolutions and screen arrangements from a single processor**

Input Cards

Quantum IN4HDMI

The Quantum IN4HDMI input card supports up to four 2K inputs, two 4K/30 inputs, or a single 4K/60 input. It quickly and precisely acquires standard source formats, as well as unique signal types common in military or medical environments.

- Up to four simultaneous HDMI inputs
- Supports signals from 480i to 4K/60
- Accepts 4K signals on one, two, or four connections
- 4:4:4 signal processing
- Source rotation
- Aspect ratio control

Quantum IN SMD 100

The Quantum IN SMD 100 streaming decoder card accepts up to four 1080p/60, eight 1080p/30, or 16 SD resolution streams and is compatible with MPEG-2, Motion JPEG, and H.264 streams at bit rates up to 40 Mbps. It supports the video sections of ONVIF Profile S, making it compatible with a wide variety of H.264 encoders and IP cameras.

- Hardware decoding of H.264 streams
- Adherence to ONVIF Profile-S video specification
- Decodes a wide range of resolutions up to 1080p/60
- Supports a wide range of streaming transport protocols

Output Cards

Quantum OUT4HDMI

The Quantum OUT4HDMI has four HDMI outputs and supports resolutions from 1024x768 to 4K/60. Output rotation, output overlap, mullion compensation, and custom output resolutions provide compatibility with nearly any display device.

- Quad-Channel mode supports four signals up to 2K/60
- Dual-Channel mode supports two single path 4K/30 signals
- Single channel mode supports 4K/60 as dual or quad-path
- 4:4:4 signal processing

Quantum OUT4DTP

The Quantum OUT4DTP shares the same features as the OUT4HDMI, and offers four DTP outputs that can send signals up to 330 feet (100 meters) over shielded CATx cable.

- Selectable DTP, XTP, and HDBaseT output modes
- Power insertion enables remote powering of DTP receivers
- Bidirectional RS-232 and IR insertion for AV device control
- RS-232 insertion from Quantum Ultra Ethernet control port

Expansion Cards

Quantum Expansion IN

Quantum Expansion OUT

Quantum Expansion IN and Quantum Expansion OUT cards link multiple Quantum Ultra videowall processors together, simplifying the design, integration, and operation of large videowalls. The expansion cards extend the high-speed HyperLane® bus between the processors, creating a common, shared bus. This makes all input sources available to all video outputs, eliminating the need for front-end switching. Up to five processors can be linked using four pairs of expansion cards.

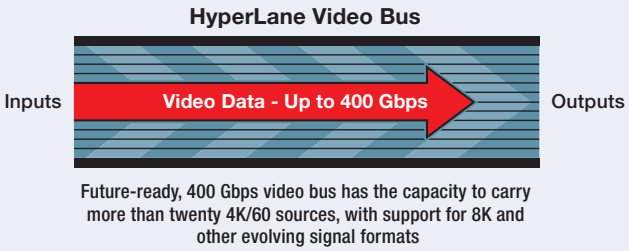
- Links multiple Quantum Ultra processors together to create a single large system
- Create videowalls with up to five processors and 168 total inputs/outputs
- Uncompressed fiber data link between expansion cards retains critical image quality
- Outputs are genlocked across each Quantum Ultra processor

HyperLane Video Bus

Quantum Ultra features a high-speed video bus that incorporates Extron HyperLane™ technology, which delivers real-time performance unattainable by other videowall processors.

The HyperLane bus serves one purpose - transporting video data between input and output cards. The dedicated nature of the bus means performance is completely consistent, predictable, and unaffected by any other element of the system. This provides smooth presentation of sources, with no variance in the frame rate of the displayed source layout.

The future-ready HyperLane video bus has a maximum throughput of 400 Gbps, providing full compatibility with the highest video resolutions currently in use, such as 4K/60 with 4:4:4 color sampling. It has the capacity to simultaneously carry more than twenty 4K/60 4:4:4 sources. It also possesses the bandwidth required to support evolving signal formats, such as 8K, along with the higher resolutions, high dynamic range - HDR, greater color depth, and the expanded color gamut these signals will provide.



Future-ready, 400 Gbps video bus has the capacity to carry more than twenty 4K/60 sources, with support for 8K and other evolving signal formats

HYPERLANE 400 Gbps

Security

Write Protected OS

Quantum Ultra's operating system is write protected, preventing any modifications to the file system without administrator password verification. The embedded OS also requires no intrusive updates, ensuring consistent, stable operation.

Physical and IP Port Disabling

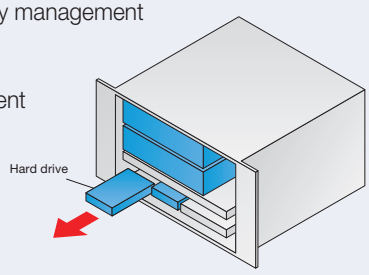
The physical USB, RS-232, and Ethernet ports can be enabled or disabled independently to restrict access to Quantum Ultra. IP and UDP ports can also be selectively enabled or disabled, locking out access to Telnet, SSH, HTTP, or other protocols.

Event Log

A system event log documents software, hardware, and connection-related events on the Quantum Ultra. It is maintained as a locally-stored file with a user-definable maximum size, and can be downloaded directly from the processor.

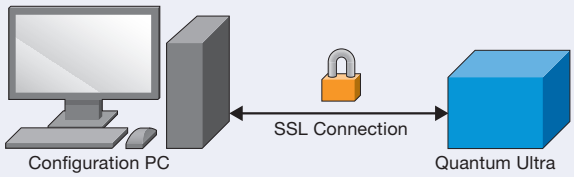
Removable Storage Disks

The operating system and data storage drives on the Quantum Ultra 610 are easily removed from the card frame, accommodating security management policies that mandate specialized storage or classification management procedures.



Encrypted Connection

SSL communication protocol provides an encrypted connection between the Videowall Configuration Software and Quantum Ultra for system setup and firmware updates.



Signed Firmware

Firmware updates are digitally signed by Extron, ensuring the file originated from Extron and has not been tampered with. All firmware updates require Administrator login, and are transferred across an encrypted connection for additional security.

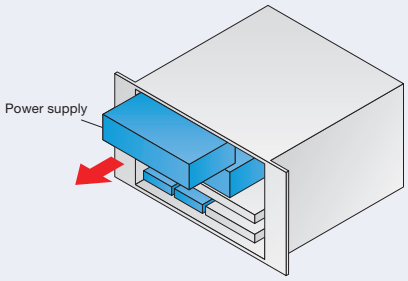
User-definable OS Password

Access to the Quantum Ultra operating system is protected with a user-definable password, allowing it to conform to an organization's security and scheduling policies.

Robust Operation

Dual Redundant, Hot Swappable Everlast Power Supplies

Quantum Ultra was engineered for continuous operation in mission-critical environments. Redundant, hot swappable Everlast power supplies — designed and Engineered by Extron — are a standard feature on the Quantum Ultra 610 card frame and deliver uninterrupted 24/7 performance. The Quantum Ultra 305 card frame utilizes a single internal Everlast power supply.

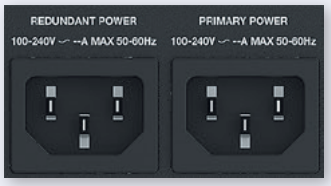


Unsolicited Failure Notifications

System administrators can be notified in the event of a critical component failure such as a power supply or fan, or when the recommended operating temperature is exceeded.

Two AC power inputs

For added power reliability, some 24-hour environments require two separate AC power sources, one as the primary source and the second for redundancy. The Quantum Ultra 610 provides two AC power inputs for continuous connection to both power sources.



Solid State Storage

A solid-state drive provides security and stability for Quantum Ultra's operating system. Solid state drives are impervious to failure modes common with mechanical drives, such as failed bearings, motors, and read/write heads. An additional benefit of the solid-state drive is fast system startup, taking less than 90 seconds to power up and display video on all configured outputs.

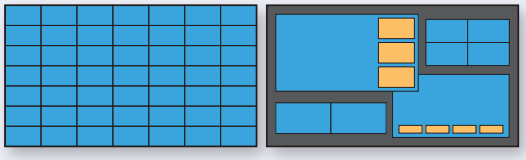
Processing and Control

4:4:4 Signal Processing

Quantum Ultra processing is always performed in the RGB domain with full 4:4:4 color sampling, which is critical for processing fine image details such as single pixel, colored lines and text in computer content.

Windowing

Quantum Ultra offers extensive windowing capabilities, with the ability to display up to 64 video, image, and clock windows from each output card. Restriction-free window placement allows side-by-side, overlap, and picture in picture positioning of images.



Source Rotation

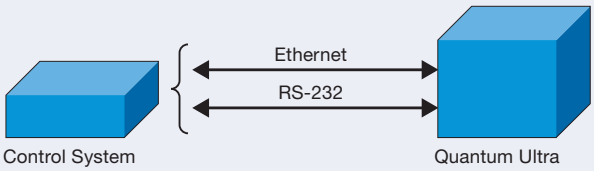
In addition to output rotation, sources can also be rotated in 90 degree increments. This provides flexible and creative presentation options for live content as well as internally stored images.

Internal, Dynamic Test Patterns

Quantum Ultra offers several internally-generated video test patterns to facilitate proper setup of display devices. Test patterns are dynamically generated to match the output resolution of the connected displays, allowing pixel-accurate calibration.

Direct, Full-Featured Control

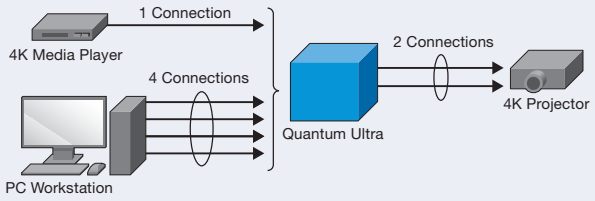
Control systems can connect directly to the Quantum Ultra using RS-232 and Ethernet. A full-featured control protocol allows access to preset selection, window source selection, window size, position, and visibility, window border appearance, window labeling, and many more presentation options.



Source Features

4K on 1, 2, or 4 Connections

Quantum Ultra offers the convenience of managing 4K video as a single, dual, or quad-path signal, for flexibility when working with 4K sources, peripherals, and displays.



VNC Sources

Quantum Ultra can display streamed content sourced from PCs running a Virtual Network Computing – VNC server application. Multiple VNC streams can be presented simultaneously on the videowall for collaborative sharing from local or remote PCs.

System Clocks and Timers

Internally generated clocks can be presented in a variety of time and date formats, in multiple time zones. Flexible size and color options present clock data clearly and effectively, and clock time can be synchronized to network time protocol – NTP.

Locally-Stored Images

Image file types, including JPEG, PNG, and BMP can be uploaded to the Quantum Ultra for use as backgrounds or displayed as source windows. Image transparency is supported via Alpha, level, and color keying.

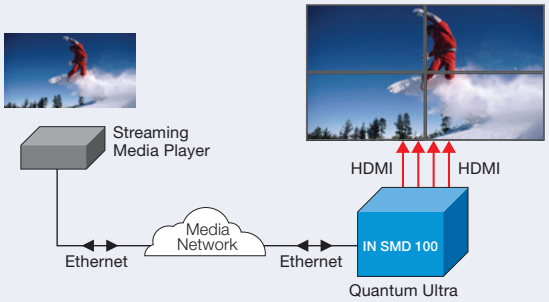
Window Borders and Text

Custom color borders with rounded corners, drop shadows, and transparency can be applied to any window type. Border titles and overlay text can be applied to a window and dynamically updated from the control system to indicate a change in the source's name, type, status, or classification level.

Streaming Video

Hardware Decoding

The Quantum Ultra IN SMD 100 input card supports hardware decoding of H.264 streams for presentation on the videowall. This eliminates the need for external decoders, reducing system cost and complexity.

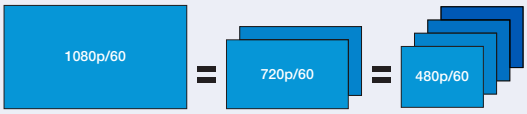


Compatible with Popular Streaming Formats

The IN SMD 100 input card is compatible with a wide variety common industry streaming formats, including H.264, MPEG-2, MPEG-4, and Motion JPEG.

Multi-resolution Decoding

The IN SMD 100 decodes a wide range of streamed resolutions up to 1080p/60. Users can opt to decode more streams at lower resolutions or fewer streams at higher resolutions, allowing efficient use of network and processing bandwidth.



ONVIF Profile S Compliance

The IN SMD 100 input card supports the video sections of ONVIF Profile S, making it compatible with a wide variety of H.264 encoders, IP cameras, media encoders, and other streaming devices. This simplifies component selection when designing a system, and ensures all elements work properly together.

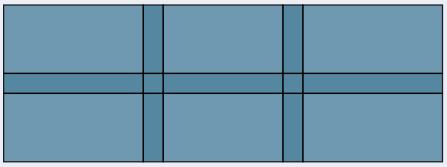
Multiple Network Connections

Two independently-configurable network connections allow decoding resources to be shared within the same subnet or split across multiple subnets. This provides increased flexibility when designing complex streaming networks.

Output Features

Output Rotation
Quantum Ultra's output signals can be rotated clockwise or counterclockwise in 90-degree increments, accommodating displays arranged in both portrait and landscape orientations.

Output Overlap
Output overlap provides redundant image data for edge-blended projection applications. Both horizontal and vertical overlaps can be applied simultaneously. Output overlap also simplifies operation with large direct-view LED systems, and other specialized displays.



Horizontal and Vertical Overlap

Custom Output Resolution
Quantum Ultra supports custom output resolutions, maximizing compatibility with evolving display technology, non-standard displays, and LED systems. This also eliminates the need for the display to perform internal scaling, increasing the quality of displayed content.

Multiple Simultaneous Resolutions
1080P, 4K, and other display types can be driven simultaneously at their native resolution from a single Quantum Ultra processor.

Mullion Compensation
Adjustable horizontal and vertical compensation extends the displayed image "behind" screen bezels, accurately presenting sources which span multiple displays.

Multiple Wall Control
A single Quantum Ultra processor can simultaneously drive multiple videowalls, and additional card frames can be added for very large systems. Up to 10 videowalls can be independently controlled, each with varying screen orientation, overlap, mullion compensation, and output resolutions.

Output Extension

DTP Output
The Quantum OUT4DTP output card extends signals up to 330 feet (100 meters) across shielded CATx cable when paired with the appropriate DTP receiver. This eliminates need for DTP transmitters when displays are not local to Quantum Ultra processor.

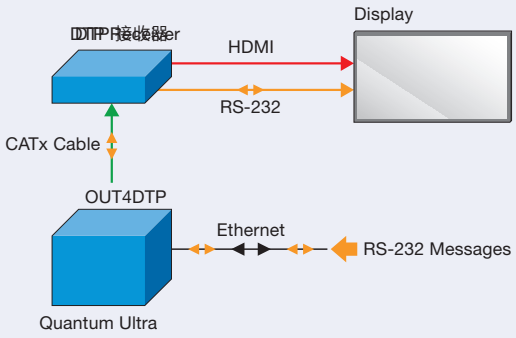
Selectable Twisted-pair Output Mode
Selectable DTP, XTP, and HDBaseT twisted pair output modes allows selection of the type of twisted pair technology best suited for the application. This provides system design flexibility and compatibility with the widest number of solutions.

DTP SYSTEMS XTP SYSTEMS HDBaseT COMPATIBLE

Power Insertion
Power insertion on the Quantum OUT4DTP enables remote powering of DTP receivers, simplifying integration and reducing space and power requirements at the display.

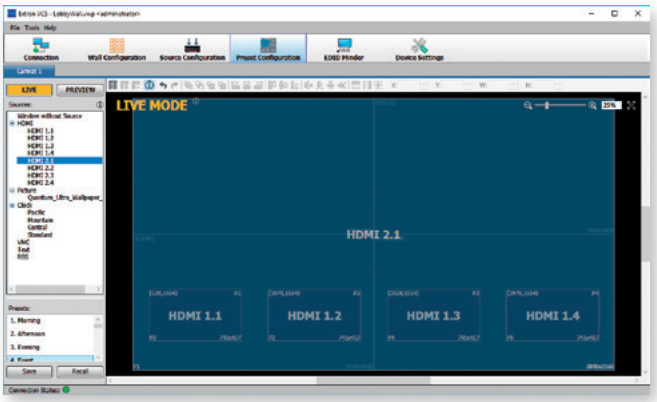
Bidirectional RS-232 and IR Pass-Through
Bidirectional RS-232 and IR pass-through data can be transmitted alongside the video signal and conveniently exchanged between AV devices located at the Quantum processor and DTP receivers.

RS-232 Insertion from Ethernet
RS-232 can be inserted from the Quantum Ultra Ethernet control port, allowing control of devices without the need for RS-232 ports on the control processor.



VCS

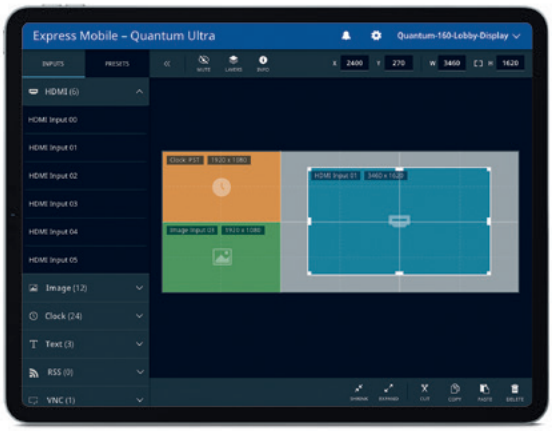
VCS features an intuitive interface, task-oriented workflow, and advanced configuration functionality. It gives you the power and flexibility required to get Quantum Ultra up and running fast, without sacrificing ease of use. Window presets are created by dragging and dropping sources onto a virtual representation of the videowall. Familiar editing controls streamline layering, aligning, and sizing of source windows. Live and Preview modes provide the option for immediate or controlled wall response to edits. Whether managing a few windows on one or two displays, or hundreds of windows across a multitude of displays, VCS provides an efficient solution for configuring and controlling Quantum Ultra.



- Efficient configuration for videowalls of any size and complexity
- Supports devices with Ethernet connectivity
- Configure systems while online or offline
- Stores all configuration and preset parameters locally on the videowall processor
- Separate User, Administrator, and Designer credentials define operational roles
- Undo/Redo edits to wall presets
- Create custom output resolutions based on connected display EDID
- Localized language display in window titles, plus Text and RSS windows
- System Overview Report
- Status indicators give users visual confirmation of processor connection

EMS-Quantum Ultra

EMS-Quantum Ultra combines the freedom of wireless control with an intuitive, easy to use application. It is compatible with Apple® iOS®, Google® Android™, and Microsoft® Surface platforms. Familiar finger gestures facilitate preset selection, window size and position, source selection, and other common operational tasks. It can act as the sole point of control or work in conjunction with VCS and a control system, such as an Extron IP Link® Pro control processor and a TouchLink® Pro touchpanel. Up to 10 mobile devices can control the Quantum Ultra system.



- Provides simple user control of Extron Quantum Ultra videowall processors from a mobile device
- Simplifies common operational tasks, such as preset selection, window management, and source switching
- Separate access credentials for Users, Designers, and Administrators
- Requires videowall processor with LinkLicense® for EMS-Quantum Ultra
- Easily preview presets prior to recalling
- Precise, pixel perfect editing of window size and position
- Create, save, and recall up to 128 window presets
- Multi-level Undo function
- Cut, Copy, and Paste functions easily replicate the selected window
- Alerts notify users of temperature warnings, along with power supply and fan failures

VCS FEATURES

Connection task
Allows connection to online processors, or manual definition of processors for offline editing.

Canvas Tabs
Allow access to up to 10 canvases, or independent videowalls, controlled from a single instance of VCS.

Wall Configuration task
For creating one or more screen arrays and assigning processor outputs to screens.

Source Configuration task
For configuring system inputs and virtual source types such as images or clocks.

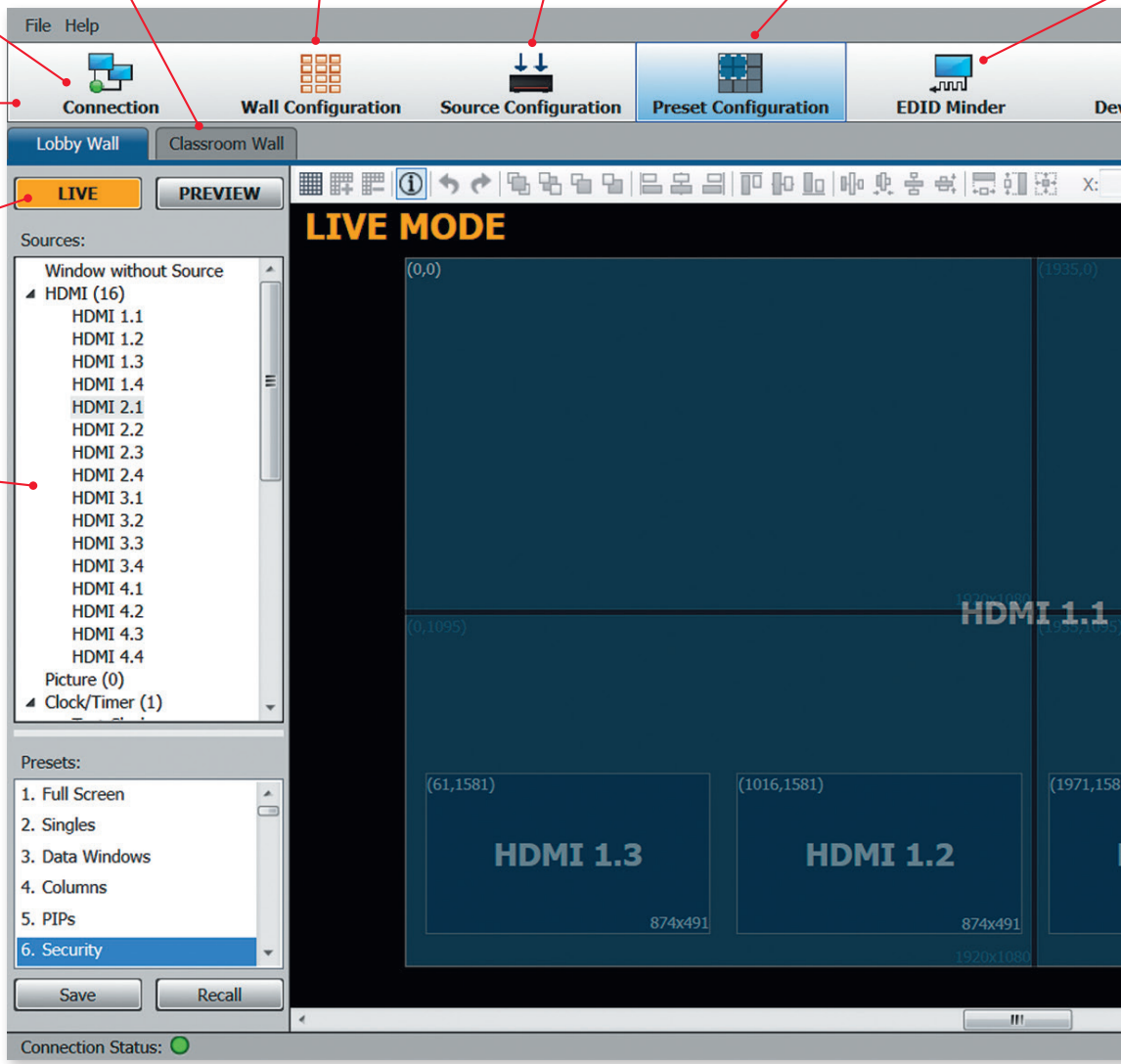
Preset Configuration task
For creating and recalling window presets as well as live edits.

Task-Oriented workflow
Simplifies integration by compartmentalizing each step of the configuration process.

Live/Preview mode
Allows edits to occur immediately on the videowall, or queued until a "Take" is performed.

Source List
Allows drag-and-drop placement of defined sources onto the virtual videowall area.

Presets Region
Allows management of up to 128 window presets per canvas



Snap Grid Management
Allows adjustment of snap grid density, and the ability to enable and disable the grid.

Horizontal Window Alignment
Allows windows to be left aligned, right aligned, or centered horizontally in relation to one another

Window Distribution
Allows windows to be distributed horizontally or vertically in relation to one another, or butted next to one another.

Undo/Redo
Allows edits to be undone and reapplied

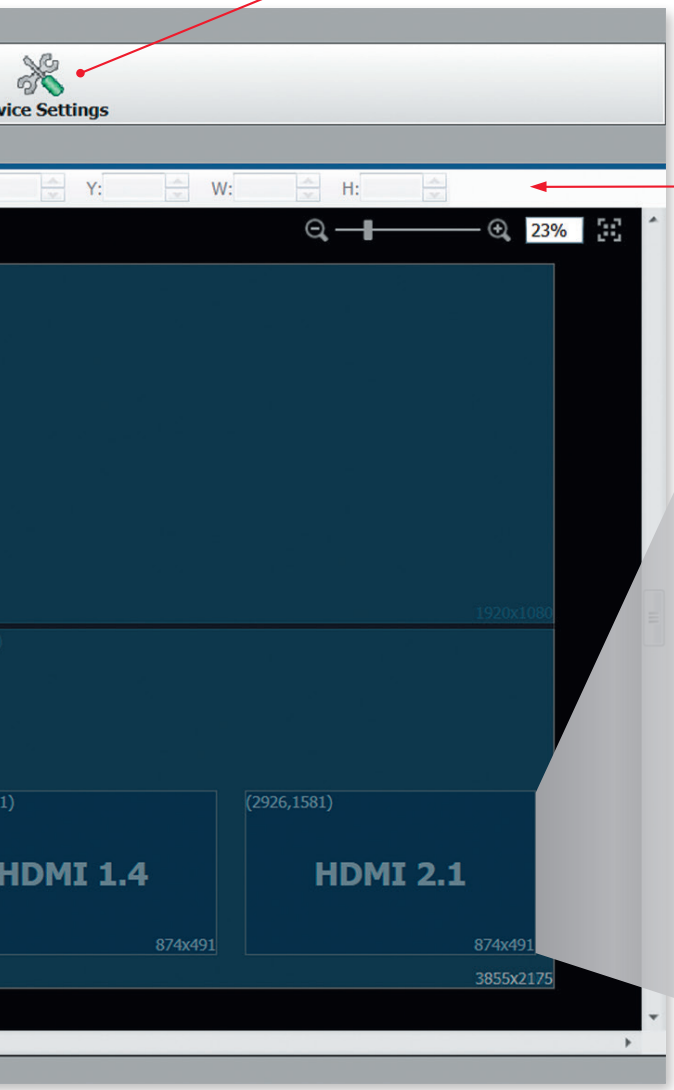
Layer Control
Sets the layer of the selected window or group of windows

Vertical Window Alignment
Allows windows to be top aligned, bottom aligned, or centered vertically in relation to one another

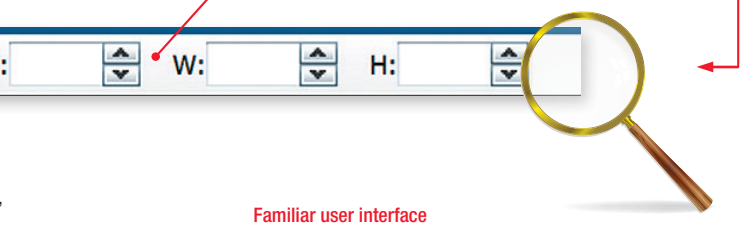
Window Size
Adjusts selected windows to the same height, width, or both in relation to the first selected window.

EDID Minder task
Facilitates EDID management and configuration of custom output modes.

Device Settings task
Displays processor status and facilitates communication setup and firmware upgrades.



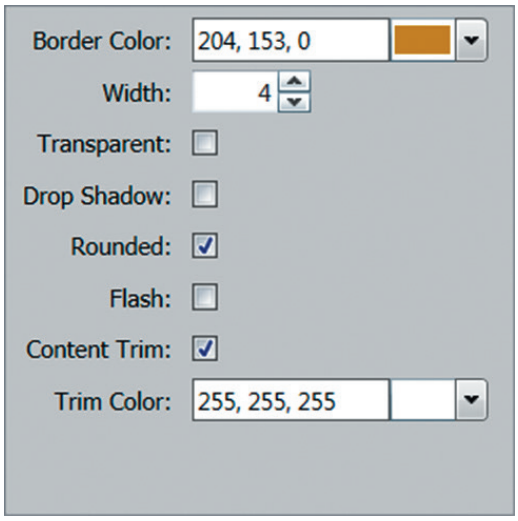
Discrete Size and Position Controls
Allows precise adjustment of window size and position, in single-pixel increments.



Familiar user interface
Universally-recognized icons and tools streamline management of source windows.

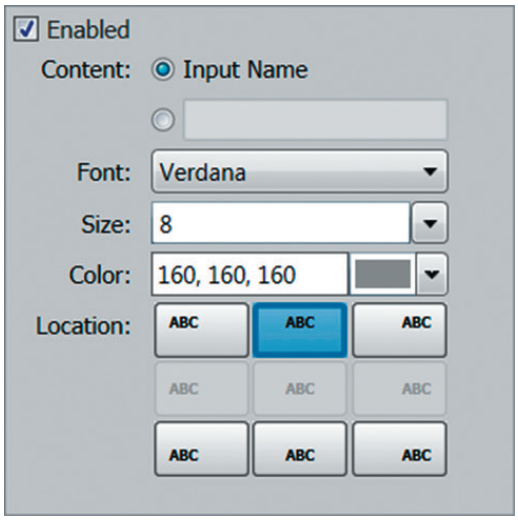
Window Styles

Up to 128 window styles can be created and applied to any source window. VCS simplifies style creation with easy-to-use interfaces for defining border and text properties.



Window Borders

The window border interface provides access to border color, width, transparency, drop shadow, and corner shape options. The Flash option is used to visually draw attention to a source window. Selecting Content Trim will outline the source content within the border, in the color specified by the Trim Color option.



Title Text and Overlay Text

Separate Title Text and Overlay text interfaces are used to define text styles, including font, font size, and font color. Text positions are quickly selected from visual representations of available options.

Extron Vector 4K Scaling Technology

For over 20 years, Extron has been engineering scaling and signal processing solutions that deliver uncompromised image quality and performance. As a result, we have become an industry leader in scaling technology, designing best-in-class products renowned for their quality, reliability, and ease of use. We have continually refined our technology to keep pace with evolving video formats – from standard definition to high definition signals, and now, 4K.

Engineered by Extron from the Ground Up

Vector 4K was developed internally by Extron's expert team of signal processing engineers. Extron engineers have crafted patented image processing technologies that set the industry benchmark for visual performance. Features such as 4:4:4 chroma sampling and bicubic scaling ensure very high image quality and preserve detail present in the original source material.

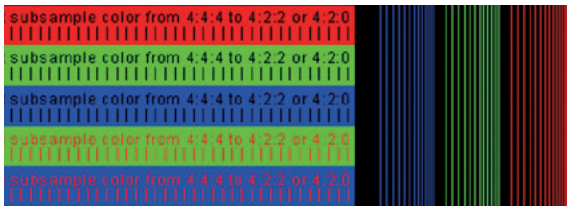
Patented Scaling Technology for the Most Demanding 4K Applications

By developing our own scaling technology, we can design to our own exacting specifications and have absolute control over the end product. Our many years of signal processing achievements have resulted in 24 worldwide patents for our scaling engines and video processing algorithms. These patented technologies are part of what makes Extron Vector 4K scaling the new benchmark for 4K video processing.

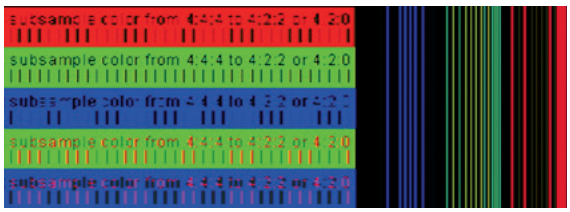
4:4:4 Chroma Sampling

Vector 4K processing is always performed in the RGB domain with full 4:4:4 color bandwidth, which is critical for processing fine image details. Competing 4K scalers commonly process in the component domain, employing 4:2:2 or 4:2:0 chroma subsampling. This decreases the bandwidth required to process the signal, at the expense of reduced color detail. Chroma subsampling may be acceptable when processing full-motion video content, but with

PC-generated content, subsampled color negatively impacts the clarity of the image. Vector 4K 4:4:4 color processing retains the fine color details present in the original source.



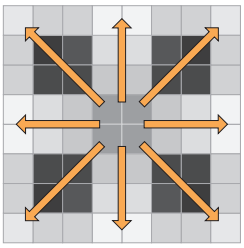
4:4:4 Chroma Sampling



4:2:2 Chroma Subsampling

Bicubic Interpolation

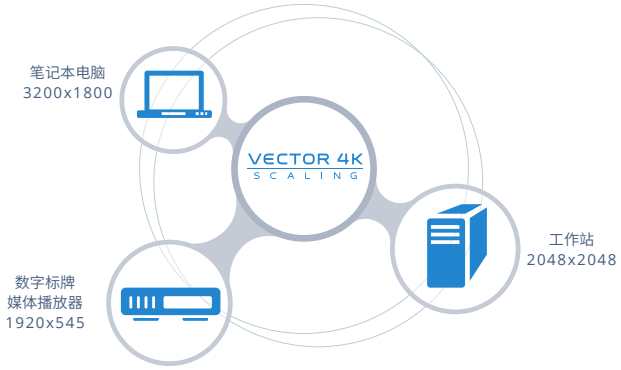
The Vector 4K scaling engine incorporates Extron-patented, multi-tap, bicubic interpolation, which creates a new pixel by averaging adjacent pixels above, below, to the sides, and diagonally of the new pixel. This produces sharp, accurate output, preserving single-pixel detail that other scaling methods lack. Vector 4K algorithms continually and dynamically adapt, ensuring optimal processing for upscaling, downscaling, or 1:1 pass-through applications.



Bicubic Interpolation

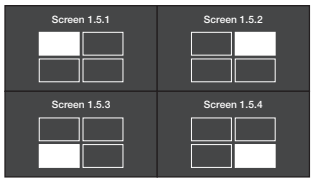
Dynamic Digital Input Detection and Auto-Image

Today's computer video standards allow for signal customization to suit the needs of a particular application or display. Such sources can present a challenge for signal processors that rely solely on fixed lookup tables of common resolutions, which are typically incomplete and quickly become obsolete. Vector 4K goes beyond conventional lookup tables, incorporating dynamic input detection which analyzes incoming digital video signals and accurately identifies the signal parameters before processing them for precise conversion and scaling.



Dynamic Internal Test Patterns

Extron Vector 4K scalers and signal processors are equipped with a set of dynamic, mathematically generated, vector-based video test patterns. They aid in configuring displays, and provide test signals to facilitate troubleshooting and expedite system recovery. These patterns are precisely generated based on the scaler's output resolution, and are automatically redrawn if the resolution is changed. This ensures that test patterns exactly match the signal resolution, producing sharp, crisp images, which in turn facilitate precise setup and configuration of display devices. Patterns specific to videowall applications are included, such as Diagonal Crosshatch, Edge Blend Alignment, and Display ID.



EDID MINDER

EDID Management

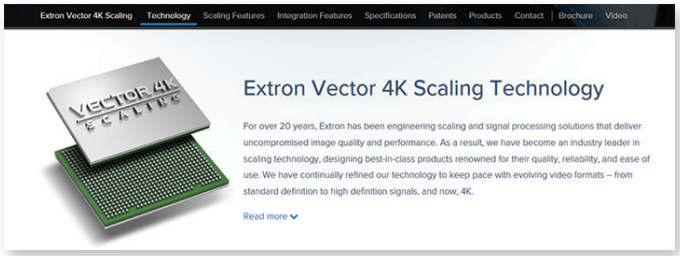
Vector 4K encompasses a range of advanced signal management technologies common across many of Extron's digital video product solutions, simplifying integration of digital video sources and displays, and ensuring optimal system performance and dependability. EDID Minder® manages EDID communication between devices so that preferred video formats are always correctly and reliably output from the source to the receiving device. Custom EDID can also be captured or uploaded to Extron products for special applications.

Integration Features

Vector 4K technology also provides features that aid in system integration, such as aspect ratio control, auto-memory and user presets, advanced HDCP management, and more.

Learn More

To learn more about Vector 4K scaling, visit **www.extron.com/vector4k**, where you can see interactive demonstrations of Vector 4K technology, view an informational video highlighting key features, and download the Vector 4K brochure.



www.extron.com/vector4k

OVERVIEW – QUANTUM ULTRA 610

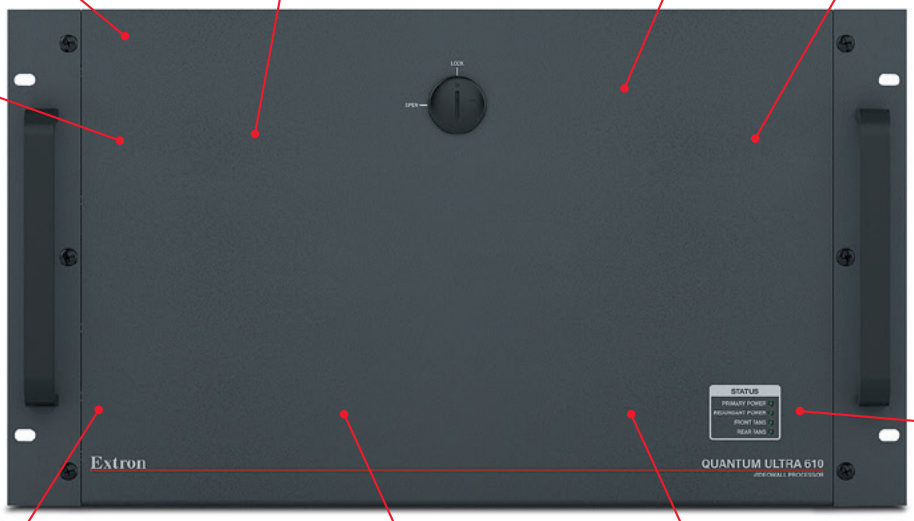
400 Gbps HyperLane high-speed video bus
Delivers unequalled real-time performance, easily accommodating the high-bandwidth demands of large videowalls displaying many simultaneous HD and 4K sources

Dual hot-swappable, redundant Everlast power supplies
Durable Extron-engineered power supplies maximize system uptime.

Output overlap, mullion compensation, custom output formats, and image rotation features support nearly every display type

Supports multiple videowalls from a single processor with varying screen orientation and resolution

6U, 10-slot card frame
Supports videowalls up to 36 screens in size. Additional processors can be configured and operated as a single system to accommodate larger videowalls.



Front panel LEDs
Indicate fan and power supply status.

Removable operating system and data storage drives
Accommodate security management procedures requiring data separation for varying security classifications.

Solid-state, write-protected operating system drive
Delivers reliable, long-term operation with fast start-up times.

Advanced 4:4:4 signal processing
Maintains color accuracy and fine picture detail.

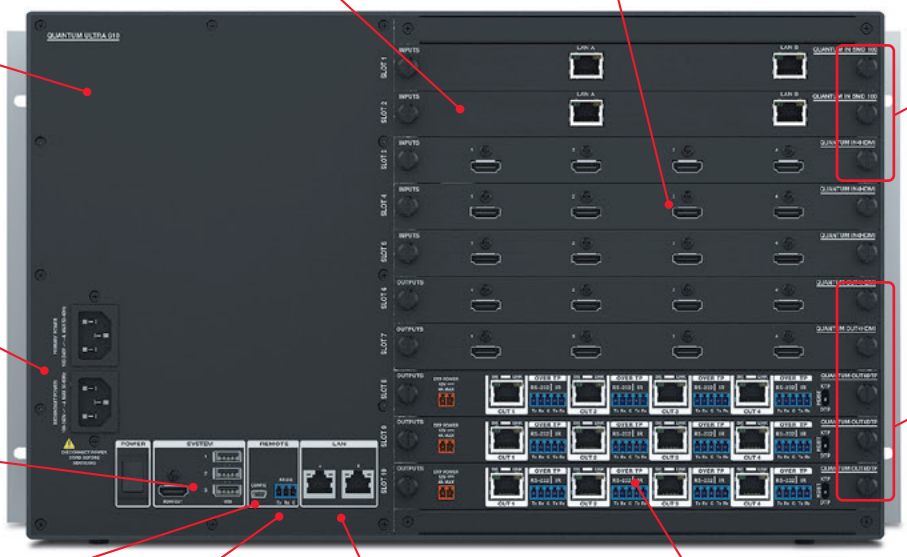
Flexible, modular card frame architecture
Supports any combination of input and output cards to meet the needs of any application.

IN SMD 100 decoder card
Decodes up to four 1080p/60, eight 1080p/30, or 16 SD streams and is compatible with MPEG2, Motion JPEG, and H.264 streams.

Power Save Mode
Provides a low power standby state to conserve energy when not in use.

Four-channel HDMI input card
Accepts four signals from 480i to 2048x1080 and 1920x1200 at 60 Hz. Dual-channel mode supports two single path 4K/30 signals, while single channel mode supports one dual-path or one quad-path 4K/60 signal.

Dual power connections
Provide separate power to each of the two power supplies.



Four-channel HDMI and DTP output cards
Delivers four signals from 1024x768 to 2048x1080 and 1920x1200 at 60 Hz. Dual-channel mode supports two single path 4K/30 signals, while single channel mode supports one dual-path or one quad-path 4K/60 signal.

System connections
Allow access to the embedded operating system and facilitate loading of picture files.

USB configuration port
Provides convenient user access for system configuration and monitoring.

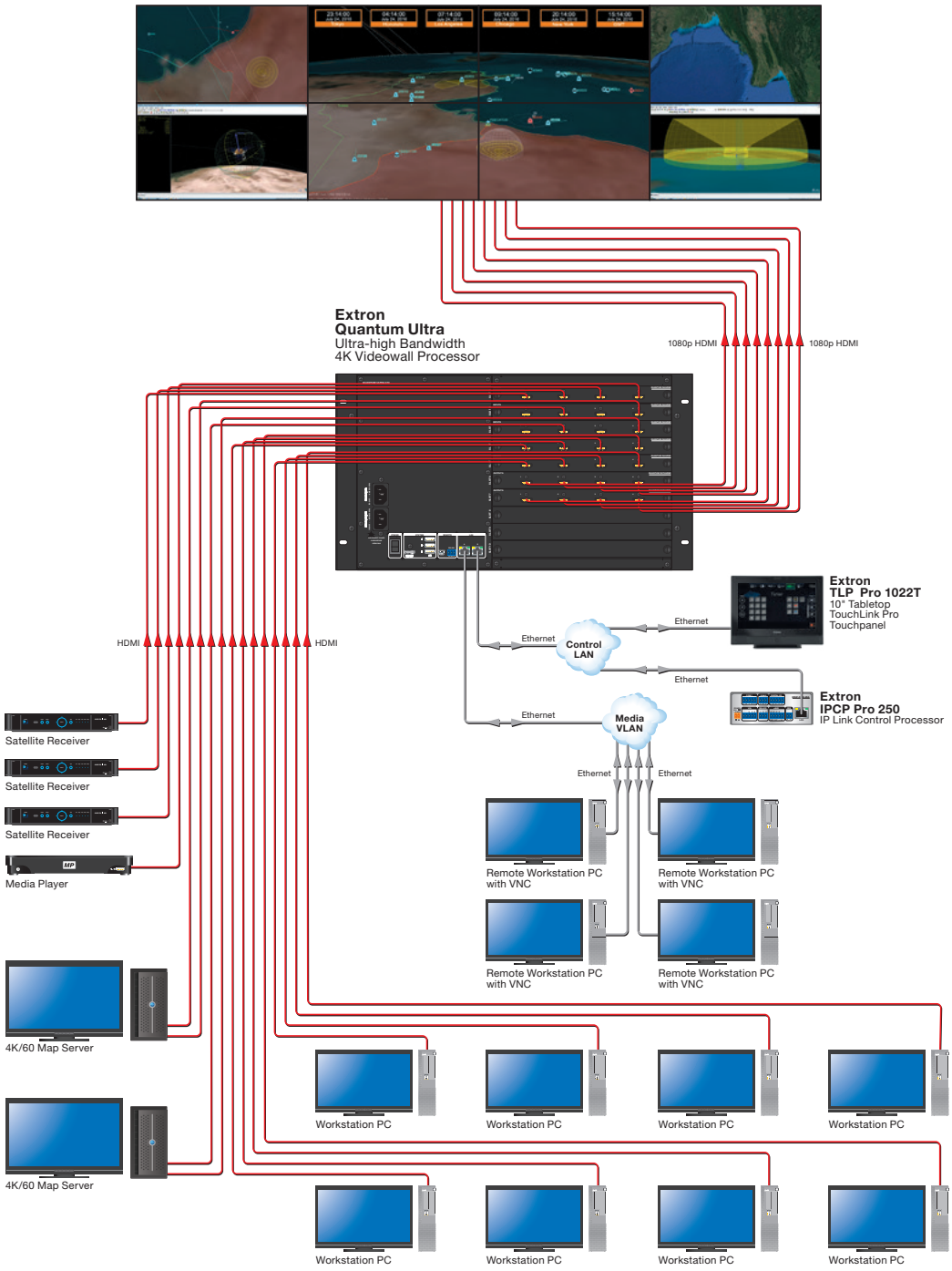
RS-232 Port
Provides easy access for direct system control and monitoring.

Ethernet port
Provides direct access for system configuration, monitoring and control.

Support for custom output resolutions
Maximizes compatibility with evolving display technology, non-standard displays, and LED systems.

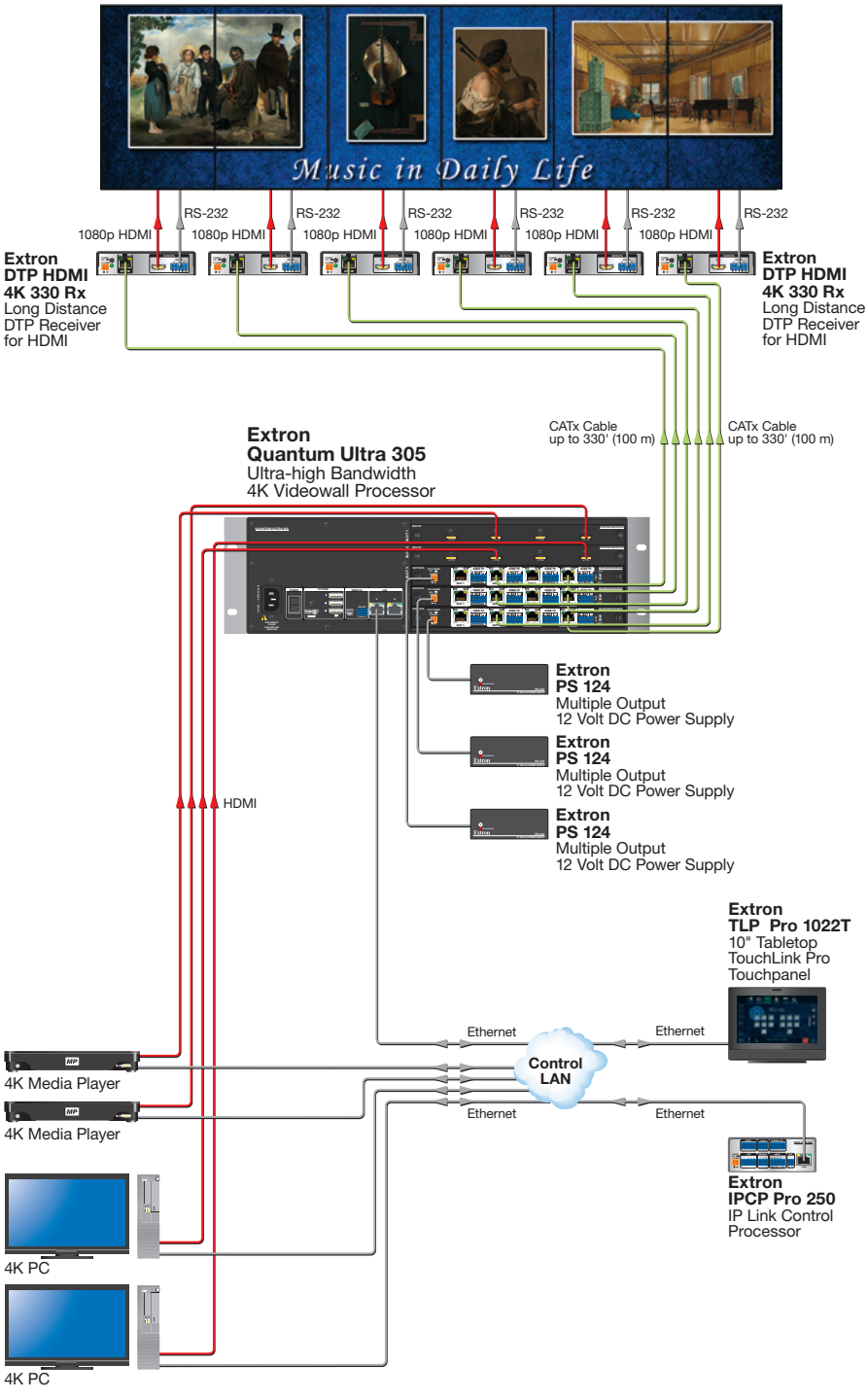
Command Center

A command center utilizes an eight-screen videowall to facilitate information sharing among operation staff. Quantum Ultra drives eight 1080p flat panel displays in a 24/7 operational environment. Two 4K/60 workstations deliver high resolution map information that can be displayed pixel-for-pixel on the videowall. Three satellite receivers tuned to news channels provide up to date status of world events, and prerecorded content can be sourced from the system's media player. Eight operator workstations connect directly to a pair of Quantum Ultra HDMI input cards, while four remote workstations running VNC servers share screen data with Quantum Ultra via VCN client connections. Time clocks, generated by Quantum Ultra, are displayed in multiple time zones with colored borders and titles. A TLP Pro 1022T touchpanel allows the shift manager to easily select the content displayed on the videowall, which may vary from a few map sources to more complex layouts containing all available map, workstation, and news content.



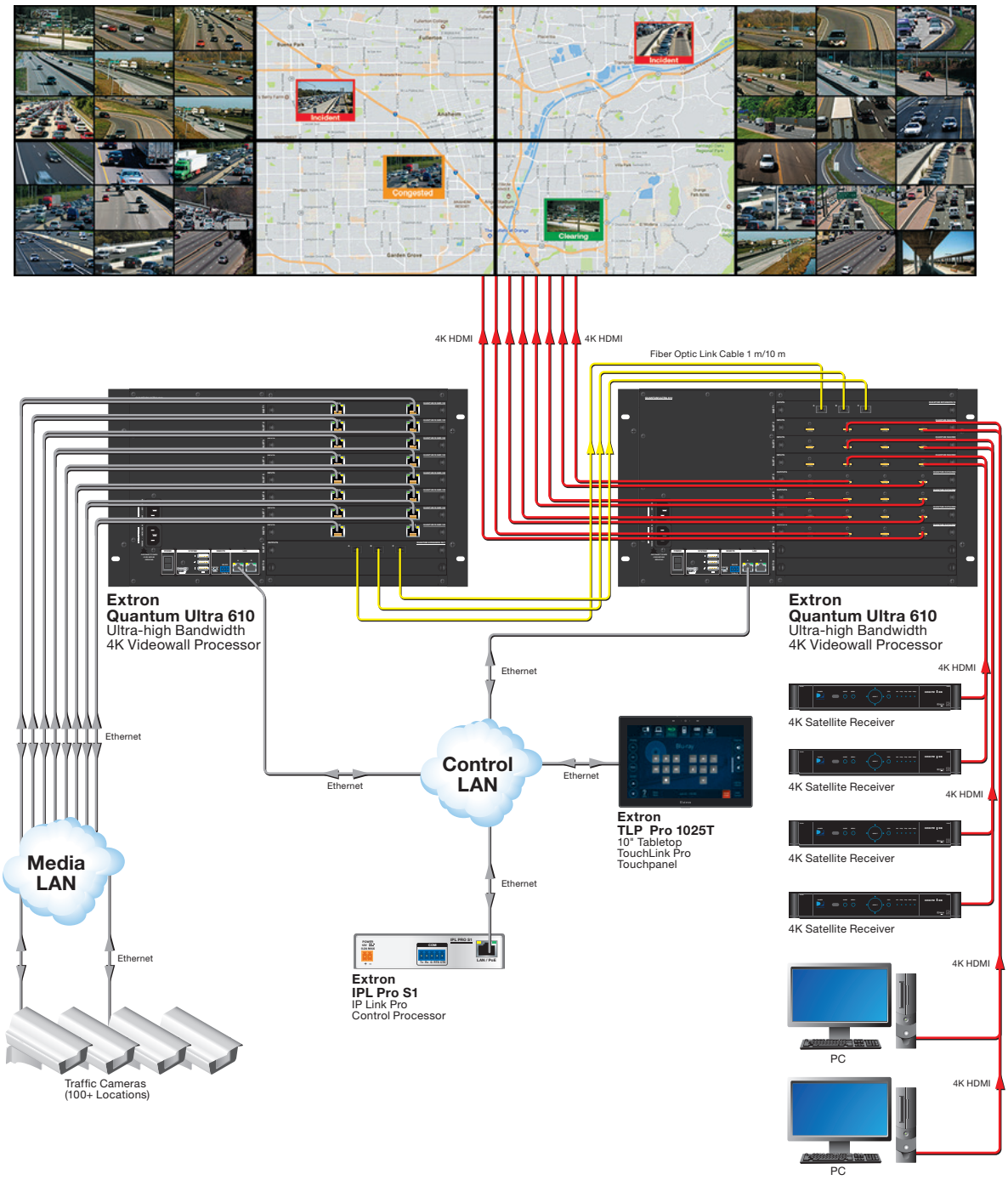
Museum

A museum incorporates a Quantum Ultra in a unique, interactive visual exhibit. Six portrait-oriented flat panel displays comprise the 1x6 videowall. 4k media players provide animated artwork centered around themes such as music, landscapes, and wildlife. Two 4K PCs provide animated graphics and museum information. Localized image files stored on the Quantum Ultra provide backgrounds for the source windows. Quantum OUT4DTP output cards are used to deliver video and control signals over twisted pair cabling to DTP HDMI 4K 330 Rx receivers located behind each display. The Quantum Ultra connects directly to the control network via Ethernet, with a TLP Pro 1022T TouchLink touchpanel allowing museum patrons to select from available artwork themes.



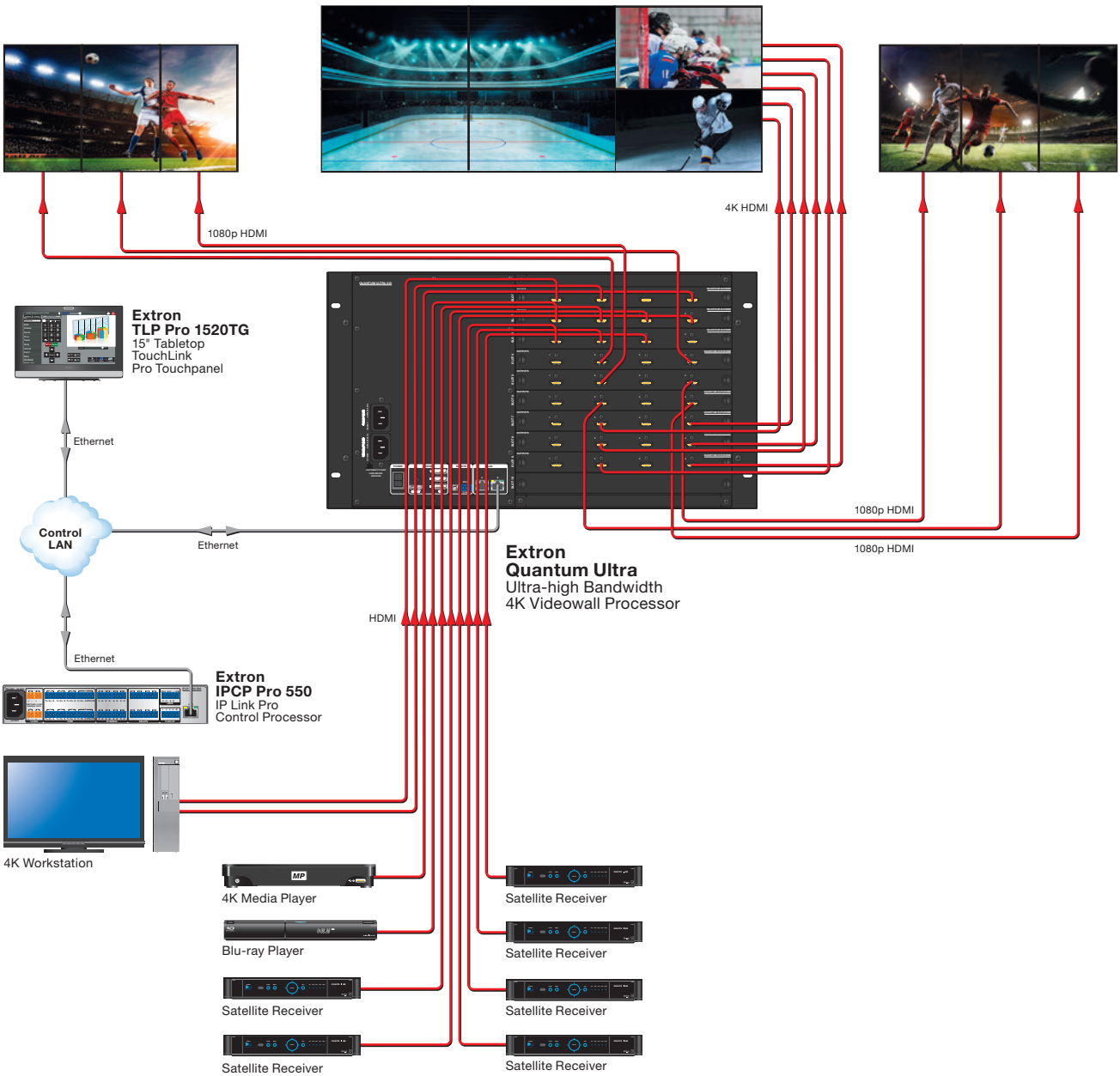
Traffic Management Center

A municipal traffic management center utilizes a 2x4 videowall driven by a pair of linked Quantum Ultra processors to present up-to-the-minute traffic information, maps, and breaking news to a traffic management team. The eight 4K flat panel displays receive signals from four Quantum OUT4HDMI output cards. Live traffic streams received from IP traffic cameras located throughout the city are decoded by eight Quantum IN SMD 100 cards. Three Quantum IN4HDMI input cards receive signals from four 4K satellite receivers and two workstation PCs that provide live broadcast feeds and graphical map content. Operators can highlight traffic feeds affected by congestion or emergency events using the videowall processor's dynamic window borders and labels feature. The linked Quantum Ultra processors connect directly to the control network via Ethernet, with a TLP Pro 1022T TouchLink touchpanel providing easy system control for operators.



Themed restaurant

A Quantum Ultra in a sports-themed restaurant drives three videowalls which present live broadcasts of sports events and other sports-themed media to its patrons. Six portrait-oriented flat panel displays comprise two 1x3 videowalls, each positioned on either side of six landscape-oriented 4K displays which comprise a 2x3 videowall. Live broadcast content is provided via six satellite receivers, while a Blu-ray player and 4K media player provide playback of pre-recorded content. Corporate messaging presented on the videowalls is sourced from a 4K workstation PC and image files stored locally on the Quantum Ultra. The Quantum Ultra connects directly to the control network via Ethernet. A TLP Pro 1520TG TouchLink touchpanel allows staff to easily select the content displayed on the videowalls.



SPECIFICATIONS

TRUE 4K

Max 4K Capabilities		
Resolution and Frame Rate	**Chroma Sampling**	**Max Bit Depth per Color**
4096 x 2160 at 30 Hz	4:4:4	8 bit
3840 x 2160 at 30 Hz		
4096 x 2160 at 60 Hz		
3840 x 2160 at 60 Hz		

Frame rate	24, 25, 30, 50, or 60 fps
Chroma sampling[1]	4:4:4 or 4:2:2
Color bit depth[1]	8 or 10 bits per color
Signal type	DVI 1.0, HDMI 1.4, and HDCP 1.4
Max. video data rate	10.2 Gbps (3.4 Gbps per color) per connection

NOTE: [1]Subject to the maximum data rate limit. Use our calculator at www.extron.com/4Kdatarate to determine video parameters supported by this data rate.

NOTE: This product requires two or four parallel connections to achieve 4K at 50 or 60 fps.

VIDEO INPUT — HDMI — IN4HDMI

Number/signal type	HDMI/DVI (HDCP 1.4 compliant)
Connectors	4 female HDMI
Maximum pixel clock	
Inputs 1 and 3	165 MHz
Inputs 2 and 4	300 MHz
Formats	RGB and YCbCr digital video
Horizontal frequency	15 kHz to 135 kHz
Vertical frequency	24 Hz to 120 Hz
Resolution range	640x480 to 3840x2400* 480i, 576i, 480p, 576p, 720p, 1080i, 1080p, 2048x1080, 4096x2160* *4K resolutions are supported up to 30 Hz refresh rate. 4K at 60 Hz is supported using two or four parallel connections.

NOTE: Pixel clocks up to 300 MHz are supported on input connectors 2 and 4 only.

Standards	DVI 1.0, HDMI 1.4, HDCP 1.4

VIDEO PROCESSING — HDMI — IN4HDMI

Digital pixel data bit depth	8, 10, or 12 bits per channel
Colors	1.07 billion (10-bit processing with full 4:4:4 sampling)

VIDEO INPUT — SMD — IN SMD 100

Number/signal type	Up to 30 H.264/AVC digital video over IP (quantity dependent on stream resolution)
Connectors	2 shielded RJ-45 (decoding capability distributed equally between connections)
Ethernet data rate	10/100/1000Base-T
Streaming protocols	
Pull streams	RTP/RTCP (RFC 3550), RTSP (RFC 2326), interleaved RTSP (RTP/RTSP), RTP/RTSP tunneled through HTTP
Push streams	MPEG-2 TS/UDP (ISO/IEC 13818-1), MPEG-2 TS/RTP (RFC 2250), Direct RTP (RFC 3984)
Stream discovery	SAP (RFC 2974), SDP (RFC 4145, RFC 4566)
Transport	TCP, UDP, multicast IGMPv2 (RFC 2236), IGMPv3 (RFC 3376), SSM (RFC 3569, 4607), or unicast (pull streams only)
Network protocols	ARP, DHCP, DNS, HTTP, HTTPS, ICMP (ping), SSH, SSC, Telnet, TLS
Container (if included)	MPEG-2 TS (MPEG-2 part 1 or ISO/IEC 13818-1 or ITU-T Rec. H.222.0) MP4 (MPEG-4 part 14 or ISO/IEC 14496-14)
Video coding	MPEG4 part 10 (AVC) H.264 BP, MP, HiP to level 4.2 (<25 Mbps over 1 second), MJPEG

VIDEO PROCESSING — SMD — IN SMD 100

Maximum average bit rates	25 Mbps per stream (1 second average)
Latency	1.0 second maximum
Digital sampling	24-bit, 8 bits per color, 165 MHz pixel clock maximum
Colors	16.78 million (8-bit processing)

VIDEO OUTPUT — HDMI — OUT4HDMI

Number/signal type	HDMI/DVI (HDCP 1.4 compliant)
Connectors	4 female HDMI
Peripheral device power	250 mA per output
Vertical frequency	23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 59.94, 60 Hz
Scaled resolutions	1024x768, 1280x768, 1280x800,1280x1024, 1360x768, 1366x768, 1440x900, 1680x1050, 1600x1200, 1920x1200, 2048x1200, 2048x1536*, 2560x1080*, 2560x1440*, 2560x1600*, 3840x2400*, 4096x2400**, CUSTOM 720p, 1080p, 2048x1080, 1920x2160, 2048x2160, 3840x2160*, 4096x2160* *Supported on connectors 2 and 4 only **Requires 4 parallel connections.
Standards	DVI 1.0, HDMI 1.4, HDCP 1.4

VIDEO OUTPUT — DTP — OUT4DTP

Number/signal type	4 DTP, XTP, or HDBaseT (configurable, HDCP compliant)
Connectors	4 female RJ-45
Termination standard	TIA/EIA T568B
Vertical frequency	23.98 HZ, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 59.94 Hz, 60 Hz
Scaled resolutions	1024x768, 1280x768, 1280x800,1280x1024, 1360x768, 1366x768, 1440x900, 1400x1050, 1680x1050, 1600x1200, 1920x1200, 2048x1200, 2048x1536*, 2560x1080*, 2560x1440*, 2560x1600*, 3840x2400*, 4096x2400**, CUSTOM 720p, 1080p, 2048x1080, 1920x2160, 2048x2160, 3840x2160*, 4096x2160* *Supported on connectors 2 and 4 only **Requires 4 parallel connections.
Standards	DVI 1.0, HDMI 1.4, HDCP 1.4

COMMUNICATIONS

External device (pass-through, unidirectional or bidirectional) (RS-232/IR over TP)

NOTE:

Protocol is mirrored between the connected TP endpoints and the "Over TP" ports on the OUT4DTP. Signals from a control device pass into each OUT4DTP "Over TP" port, are embedded with the TP signal, and sent to individual TP Rx endpoints for control of remote sink devices.

The "Over TP" ports are simple pass-through connections to TP endpoints. There is no IR insertion from any Quantum Ultra control port to the "Over TP" ports. RS-232 can be inserted from the Ethernet connection.

Serial control pass-through ports	
"Over TP" output	RS-232 via (4) 3.5 mm, 5-pole captive screw connectors (shared with IR ports)
Baud rates	9600, 19200, 38400, 115200 baud
Protocol	6 - 8 data bits 1 or 2 stop bits no parity (default), even or odd parity flow control = XON, XOFF, none
Serial control pin configuration	1 = Tx, 2 = Rx, 3 = Gnd
IR pass-through control ports	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz
"Over TP" output	(4) 3.5 mm, 5-pole captive screw connector (shared with RS-232 port)
IR control pin configuration	3 = Gnd, 4 = IR Tx, 5 = IR Rx

SPECIFICATIONS

COMMUNICATION — CONTROL	
Serial control port	1 RS-232 on 3-pole captive screw connector on rear panel
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity (default)
Pin configurations	1 = Tx, 2 = Rx, 3 = Gnd
Ethernet ports	2 female RJ-45
Ethernet default settings	Link speed and duplex level = autodetected LAN A IP address = 192.168.254.254 LAN B IP address = 192.168.1.254 Subnet mask = 255.255.255.0 Gateway = 0.0.0.0 DHCP = Off
Ethernet data rate	10/100/1000Base-T, half/full duplex with autodetect
Protocols	ARP, DHCP, ICMP (ping), TCP/IP, Telnet, HTTP, SMTP
USB control port	1 female USB mini-B on rear panel
Program control	Extron Videowall Configuration Software (VCS) for Windows® Extron Simple Instruction Set™ (SIS™) Telnet
COMMUNICATION — CHASSIS TO CHASSIS INTERCONNECTION	
Number/signal type	32 HyperLane channels
Connectors	3 female MPO (12 fibers per connector)
Data rate	Up to 15.7 Gbps per channel
HyperLane expansion limit	5 chassis
COMMUNICATION — SETUP	
Number/signal type	1 HDMI
Connector	1 female HDMI
Vertical frequency	24 Hz to 60 Hz
Resolutions	640x480 to 1920x1200
USB control ports	3 USB type A
USB standards	USB 2.0, USB 1.1, USB 1.0 compatible
USB data rates	Low speed (1.5 Mbps), full speed (12 Mbps)
GENERAL	
Power supply	
Quantum Ultra 610	Internal, primary and redundant*, hot-swappable Input: (2) 100-240 VAC, 50-60 Hz *A redundant power supply is standard.
Quantum Ultra 305	Internal Input: 100-240 VAC, 50-60 Hz
Remote power capability	OUT4DTP supports up to four endpoints if 48 watts of power is provided on DTP POWER connector (remote power not available in XTP and HDBaseT modes)
Power consumption	
Quantum Ultra 610	60-571 watts (varies with configuration)
Quantum Ultra 305	38-288 watts (varies with configuration)
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +95 °F (0 to +35 °C) / 10% to 90%, noncondensing
Cooling	Fans, right to left (as viewed from the front panel)
Thermal dissipation	
Quantum Ultra 610	208-1941 BTU/hr (varies with configuration)
Quantum Ultra 305	127-956 BTU/hr (varies with configuration)
Mounting	
Rack mount	Yes

Enclosure dimensions	
Quantum Ultra 610	10.5" x 17.5" W x 22.3" D (6U high, full rack wide) (267 mm H x 445 mm W x 566 mm D) (Depth excludes connectors and handles. Width excludes built-in rack ears.)
Quantum Ultra 305	5.25" H x 17.5" W x 19" D (3U high, full rack wide) (133 mm H x 445 mm W x 483 mm D) (Depth excludes connectors and handles. Width excludes built-in rack ears.)
Product weight	
Quantum Ultra 610	59.8 lbs (28 kg), fully populated
Quantum Ultra 305	35.9 lbs (16 kg), fully populated
Vibration	ISTA/NSTA 1A in carton (International/National Safe Transit Association)
Regulatory compliance	CE, c-UL, UL, PSE, RoHs, and WEEE
Product warranty	3 years parts and labor

NOTE: All nominal levels are at ±10%.

Model	Version Description	Part number
Quantum Ultra 610	6U, 10-slot Frame	60-1571-01
Quantum Ultra 305	3U, 5-slot Frame	60-1734-01
Quantum IN4HDMI	Four-channel HDMI Input Card	70-1117-01
Quantum IN SMD 100	Multi-Channel Streaming Decoder Card	70-1232-01
Quantum OUT4HDMI	Four-channel HDMI Output Card	70-1118-01
Quantum OUT4DTP	Four-channel DTP Output Card	70-1162-01
Quantum Expansion IN	Expansion Input Card	70-1270-01
Quantum Expansion OUT	Expansion Output Card	70-1271-01
S3 Product Commissioning	Product Commissioning Services	03-001-01

For complete specifications, please go to www.extron.com
Specifications are subject to change without notice.

S3 Videowall Commissioning

Extron Videowall Commissioning is a proactive, on-site service that ensures your Quantum® Ultra, Quantum Elite, or Quantum Connect processing system meets your customer's specifications for performance. An Extron Systems Design Engineer - SDE will provide personalized assistance, from conception to completion, to help you deliver a system that fully meets the expectations of your customer.

Extron Videowall Commissioning Includes:

- Pre-installation design review services
- Window layout optimization
- On-site processor and source optimization
- Validation of processor control
- Basic Quantum control software training for the system operator

Extron will assist you in developing a commissioning plan for the installation. Please contact your local Extron sales representative or sales office for further information.

WORLDWIDE SALES OFFICES

Anaheim • Raleigh • Silicon Valley • Dallas • New York • Washington, DC • Toronto • Mexico City
Paris • London • Frankfurt • Stockholm • Amersfoort • Moscow • Dubai • Tel Aviv • Sydney • Melbourne
Bangalore • Mumbai • New Delhi • Singapore • Seoul • Shanghai • Beijing • Hong Kong • Tokyo

www.extron.com

07-2021
68-3040-01
REV. B5
Letter - English - NP