# Quantum Ultra Connect

## ULTRA-HIGH BANDWIDTH 4K VIDEOWALL PROCESSOR


VECTOR 4K SCALING

4K UHD

HYPERLANE 400 Gbps

EVERLAST POWER SUPPLIES

## Videowall Processing for Small to Mid-Sized Systems

- Cost-effective 4K HDMI videowall processors for videowalls with up to eight screens
- Supports 4K signals using one, two, or four connections
- High-quality Vector™ 4K scaling engine
- 400 Gbps HyperLane® dedicated video bus
- RS-232, USB, and Ethernet interfaces provide direct connection for control
- Engineered for mission-critical, 24/7 applications with an Extron Everlast™ power supply
- Embedded operating system on a solid state storage drive

Extron

# Quantum Ultra Connect

Quantum® Ultra Connect 84 and Quantum Ultra Connect 128 are eight and twelve HDMI input videowall processors for systems with four or eight displays. They deliver the same high-quality scaling and real-time performance as Extron's flagship Quantum Ultra, featuring the Vector 4K scaling engine and HyperLane high-speed video bus technology. Features such as custom output resolutions, input and output image rotation, and bezel compensation provide compatibility with a wide variety of professional display technologies. Flexible window placement allows side-by-side, overlap, and picture-in-picture positioning of images.


4K UHD

Quantum Ultra Connect supports input and output signals up to 4K/60 with full 4:4:4 color sampling, delivering the highest quality images for video and computer sources. It integrates easily into a wide range of 4K environments.

The capability to set custom output resolutions maximizes compatibility with current and evolving display technologies, non-standard displays, and LED systems. This also eliminates the need for a display to perform internal scaling, increasing the quality of displayed content.

EVERLAST POWER SUPPLIES

Power supply failures in mission-critical AV products can cause significant disruption to signal distribution and facility operations. Quantum Ultra Connect provides uninterrupted 24/7 operation, using an Extron-engineered high-performance, no compromise Everlast power supply, which includes a seven-year warranty.

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.

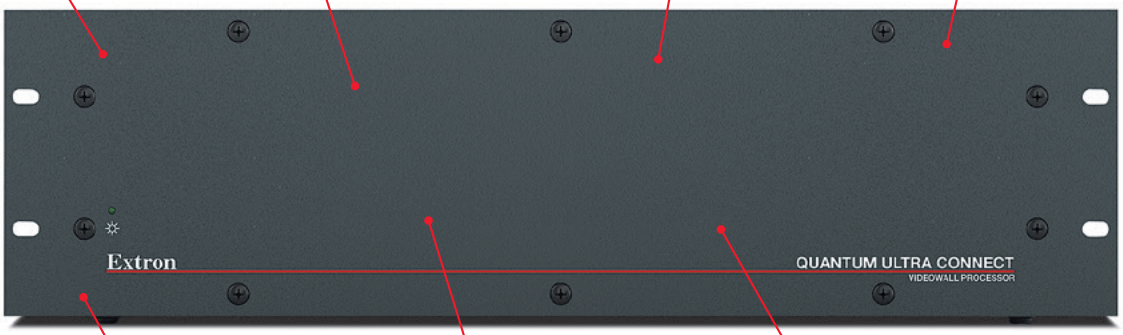
# OVERVIEW

**Vector 4K scaling technology**
Specifically designed for critical-quality 4K imagery, with best-in-class image upscaling and downscaling.

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

**Everlast power supply**
Provides worldwide power compatibility, with high-demonstrated reliability and low power consumption for reduced operating cost.

**Bezel compensation, custom output formats, and image rotation features support nearly every display type**




**3U, 5-slot card frame**
Supports videowalls up to eight screens.

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

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

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

**Dynamic Digital Input Detection**
Ensures fast, accurate capture of incoming signals, including unique resolutions used in specialized applications.

**Four-channel HDMI input card**
Accepts 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.


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

**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.

**Four-channel HDMI output card**
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.

## Feature Comparison

### Matching the Videowall Processor to the Application

The fixed configuration of the Quantum Ultra Connect is well suited for small to mid-sized videowalls and entry-level installations. For large videowalls and applications requiring future expansion in the field, Extron offers the modular Quantum Ultra. Both systems feature the same high-performance video scaling and windowing capabilities, with the Quantum Ultra providing additional design flexibility and source options. The table at the right details their differences.

| | Quantum Ultra Connect | Quantum Ultra |
|---|---|---|
| Supports up to 4K/60 @ 4:4:4 | X | X |
| HDMI Inputs | X | X |
| HDMI Outputs | X | X |
| H.264 and VNC Decoding | | X |
| Window Borders and Titles | | X |
| RSS and Text Windows | | X |
| Locally Stored Images | | X |
| Bezel Compensation | X | X |
| Custom Output Resolutions | X | X |
| Output Overlap | | X |
| Multiple Canvases | | X |

## Vector 4K Scaling

### 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. They 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.

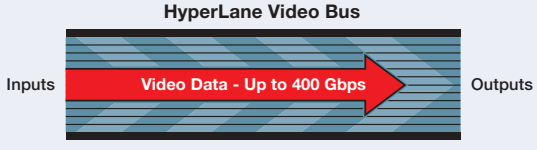
### Patented Scaling Technology for the Most Demanding 4K Applications

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 benchmark for 4K video processing.

VECTOR 4K
SCALING

## HyperLane Video Bus

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




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

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.

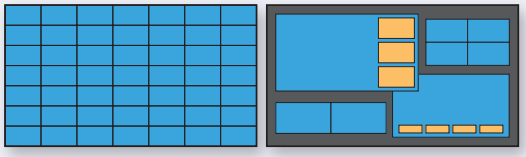
HYPERLANE
400 Gbps

### 4:4:4 Signal Processing

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

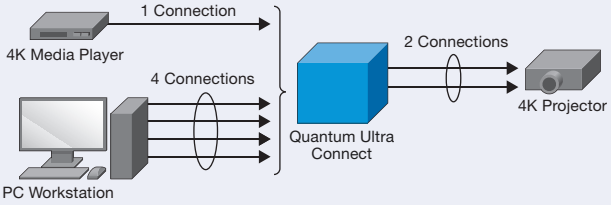


### Source Rotation

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

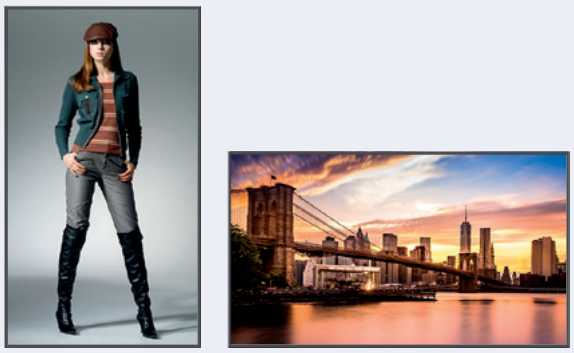
### 4K on 1, 2, or 4 Connections

Quantum Ultra Connect 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.




### Output Rotation

Output signals can be rotated clockwise or counterclockwise in 90-degree increments, accommodating displays arranged in both portrait and landscape orientations.



### Bezel Compensation

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

### 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.

### Solid State Storage

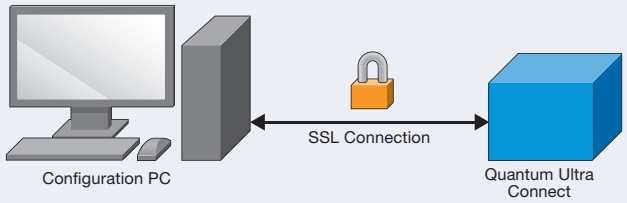
A solid-state drive provides security and stability for the embedded operating system. Solid-state drives are impervious to failure modes common with mechanical drives, such as failed bearings, motors, and read/write heads. An additional benefit of the solid-state drive is fast system startup, taking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

### Write-Protected Operating System

The operating system for the Quantum Ultra Connect is write-protected, preventing modifications to the file system without administrator password verification. The embedded operating system also allows no intrusive updates, ensuring consistent, stable operation.

### Encrypted Connection

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

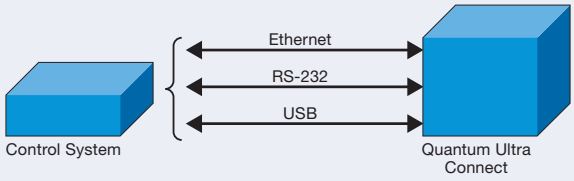



### Internal, Dynamic Test Patterns

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

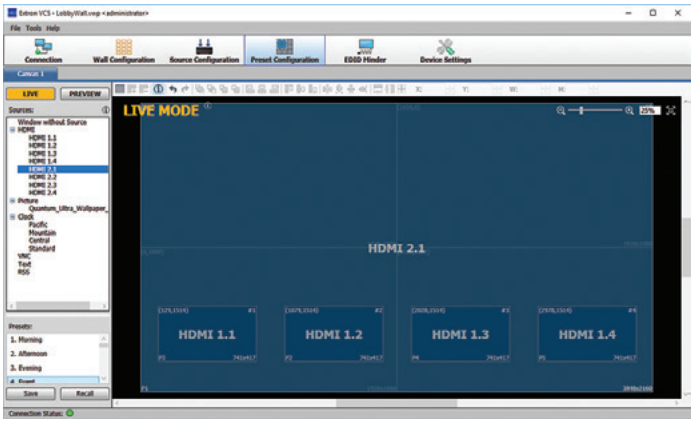
### Direct, Full-Featured Control

Control systems can connect directly to the Quantum Ultra Connect using RS-232, USB, and Ethernet. A locally-stored configuration file allows direct connection between the control system and the processor.



## VCS - Videowall Configuration Software

Extron VCS – Videowall Configuration Software is a universal application for configuring Extron 4K videowall processors. With this intuitive, time-saving software, Extron videowall products are configured using a common interface. System configuration is broken down into logical tasks, such as wall configuration, source setup, preset design, and EDID Minder for simplified integration. Online and offline editing allows creation and configuration of systems with or without an attached processor. Familiar editing controls streamline layering, aligning, and sizing of source windows. With an intuitive workflow and familiar interface, VCS provides efficient configuration of Quantum Ultra Connect.

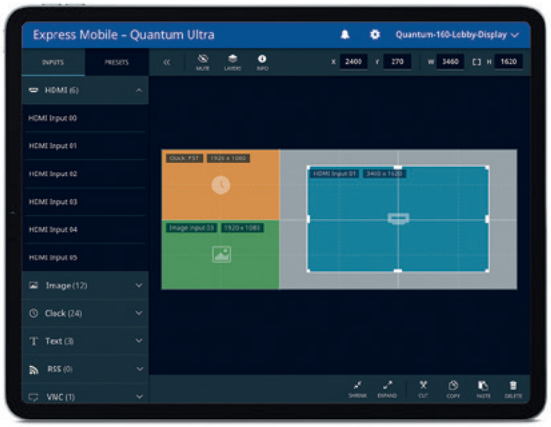



### Unique Features

- Provides a common user interface for configuring Extron 4K videowall processors, including Quantum Ultra Connect
- Welcome screen streamlines workflow when connecting to the processor
- Task-oriented workflow
- Configure systems while online or offline
- Undo/Redo edits to wall presets
- Live and Preview editing modes
- Create custom output resolutions based on connected display EDID
- Separate User, Administrator, and Designer credentials define operational roles
- Familiar tools and icons for window management
- Stores all configuration and preset parameters locally on the videowall processor

## EMS Express Mobile Software - Quantum Ultra

EMS Express Mobile Software - Quantum Ultra is an application designed to provide end-users with intuitive control of Quantum Ultra videowall processors. It is compatible with Apple® iOS®, Google® Android™, and Microsoft® Surface platforms. The software combines the freedom of wireless control with an easy to use application operated with familiar finger gestures, such as tap, drag and drop, swipe, and pinch/stretch. It facilitates preset selection, window size and position, source selection, and other common operational tasks, and can work in tandem with VCS and a control system. Up to 10 users can control the videowall. Separate User, Designer, and Administrator credentials define operational roles. EMS - Quantum Ultra is ideal for use with systems requiring one or more points of control through a user-friendly interface.

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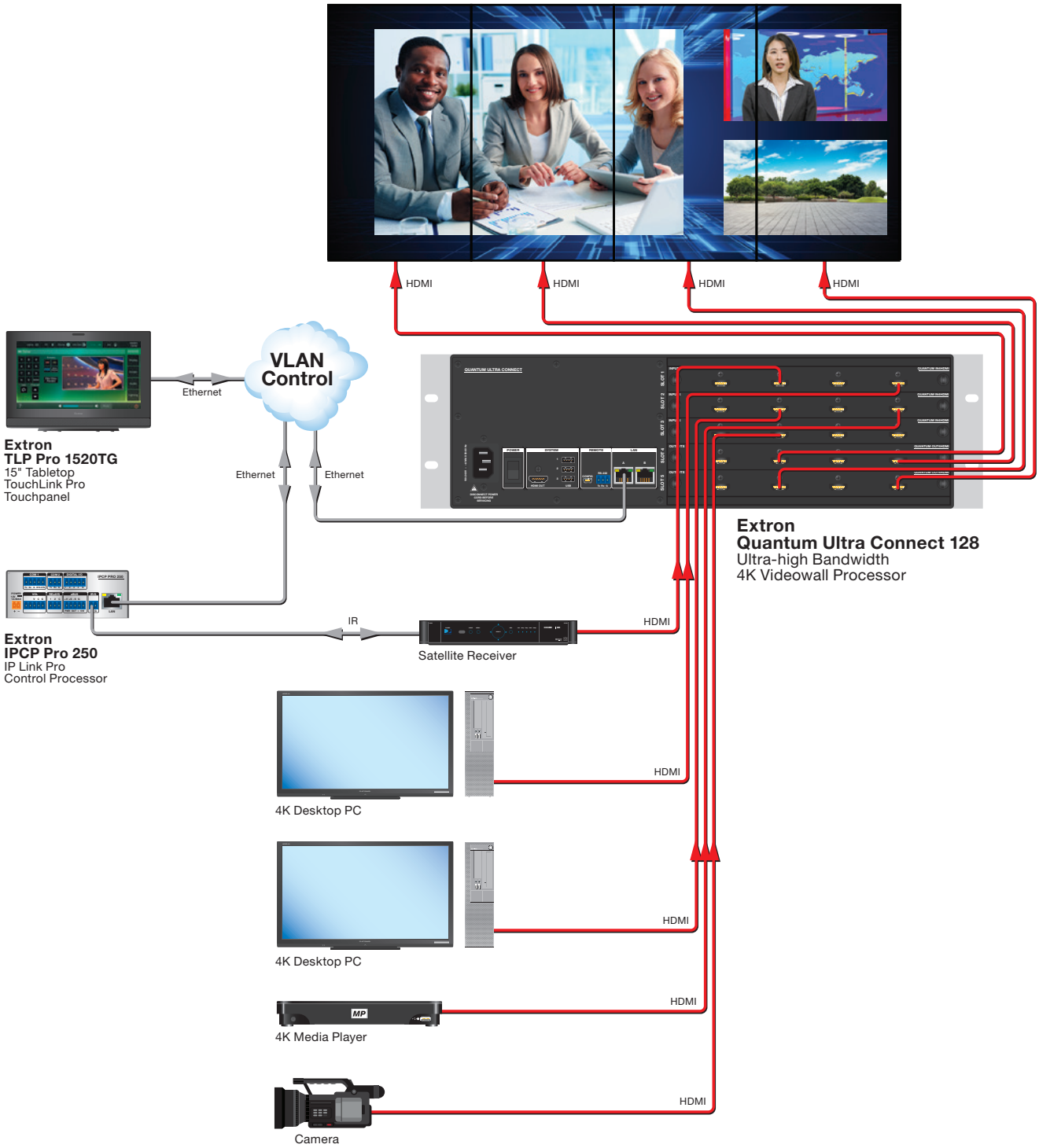
### Unique Features

- Provides convenient control of Extron Quantum Ultra Connect videowall processors from a mobile device
- Compatible with Apple® iOS®, Google® Android™, and Microsoft® Surface mobile devices
- Simplifies common operational tasks, such as preset selection, window management, and source switching
- Supports familiar operational gestures, including tap, drag and drop, swipe, and pinch/stretch
- Separate access credentials for Users, Designers, and Administrators
- Control a videowall from up to 10 mobile devices
- Easily preview presets prior to recalling
- Snap grid simplifies window placement
- Precise, pixel perfect editing of window size and position
- Create, save, and recall up to 128 window presets
- Requires videowall processor with LinkLicense® for EMS - Quantum Ultra

# APPLICATION

A corporate lobby utilizes a videowall to greet staff as well as visiting customers. A Quantum Ultra Connect 128 drives four 1080p flat panel displays in portrait orientation. Two 4K workstations deliver customizable high-resolution content used to present animated backgrounds, welcome messaging, new product information, and other data. A satellite receiver tuned to broadcast news provides current local and world events, while a 4K media player delivers promotional corporate content. To bring a bit of sunshine indoors, a camera mounted outside provides a view of the campus courtyard for presentation on the screens. A TLP Pro 1520TG TouchLink® Pro Touchpanel allows the receptionist to choose a window preset, select the displayed content, and control channel selection on the satellite receiver.



# SPECIFICATIONS

## TRUE 4K SPECIFICATION

| Max 4K Capabilities | | |
|---|---|---|
| **Resolution and Refresh Rate** | **Chroma Sampling** | **Max Bit Depth per Color** |
| 4096 x 2160 at 60 Hz<br>3840 x 2160 at 60 Hz<br>4096 x 2160 at 30 Hz<br>3840 x 2160 at 30 Hz | 4:4:4 | 8 bit |

| | |
|---|---|
| **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 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

| | |
|---|---|
| **Number/signal type** | |
| Quantum Ultra Connect 84 | 8 HDMI (HDCP compliant) |
| Quantum Ultra Connect 128 | 12 HDMI (HDCP compliant) |
| **Connectors** | |
| Quantum Ultra Connect 84 | 8 female HDMI |
| Quantum Ultra Connect 128 | 12 female HDMI |
| **Maximum pixel clock** | 165 MHz (connectors 1 and 3)<br>300 MHz (connectors 2 and 4) |
| **Horizontal frequency** | 15 kHz to 100 kHz |
| **Vertical frequency** | 24 Hz to 75 Hz |
| **Resolution range** | 640x480 to 3840x2400*, 480i, 576i, 480p, 576p, 720p, 1080i, 1080p 2048x1080, 4096x2160*<br><br>*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 connectors 2 and 4 only.

| | |
|---|---|
| **Formats** | RGB and YCbCr digital video |
| **Standards** | DVI 1.0, HDMI 1.4, HDCP 1.4 |

## VIDEO PROCESSING

| | |
|---|---|
| **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 OUTPUT

| | |
|---|---|
| **Number/signal type** | |
| Quantum Ultra Connect 84 | 4 HDMI/DVI (HDCP compliant) |
| Quantum Ultra Connect 128 | 8 HDMI/DVI (HDCP compliant) |
| **Connectors** | |
| Quantum Ultra Connect 84 | 4 female HDMI |
| Quantum Ultra Connect 128 | 8 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 Hz, 60 Hz |
| **Scaled resolutions** | 1024x768, 1280x768, 1280x800, 1280x1024, 1360x768, 1366x768, 1440x900, 1400x1050, 1680x1050, 1600x1200, 1920x1200, 2048x1200, 2048x1536*, 2560x1080*, 2560x1440*, 2560x1600*, 3840x2400*, 4096x2400**, CUSTOM<br>720p, 1080p, 2048x1080, 1920x2160, 2048x2160, 3840x2160*, 4096x2160*<br>*Supported on connectors 2 and 4 only<br>**Requires 4 parallel connections. |
| **Standards** | DVI 1.0, HDMI 1.4, HDCP 1.4 |

## 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 configuration** | 1 = Tx, 2 = Rx, 3 = ground |
| **Ethernet ports** | 2 female RJ-45 connectors |
| **Ethernet data rate** | 10/100/1000Base-T, half/full duplex with autodetect |
| **Ethernet protocols** | ARP, DHCP, HTTP, ICMP (ping), SMTP, TCP/IP, Telnet |
| **Ethernet default settings** | Link speed and duplex level = autodetected<br>LAN A IP address = 192.168.254.254<br>LAN B IP address = 192.168.1.254<br>Subnet mask = 255.255.255.0<br>Gateway = 0.0.0.0<br>DHCP = Off |
| **USB control ports** | 1 female USB mini B on rear panel |
| **Program control** | Extron Videowall Configuration Software (VCS)<br>Extron Simple Instruction Set (SIS™)<br>Telnet |

## COMMUNICATIONS — SETUP

| | |
|---|---|
| **Number/signal type** | 1 HDMI |
| **Connectors** | 1 female HDMI |
| **USB control ports** | 3 USB Type A connectors |

## GENERAL

| | |
|---|---|
| **Power supply** | Internal<br>100-240 VAC, 50-60 Hz |
| **Rack mount** | Yes |
| **Enclosure dimensions** | 5.25" H x 17.5" W x 19" D (3U high, full rack wide)<br>(133 mm H x 445 mm W x 483 mm D)<br>(Depth excludes connectors. Width excludes built-in rack ears.) |
| **Product warranty** | 3 years parts and labor |

**NOTE:** All nominal levels are at ±10%.

| Model | Version Description | Part number |
|---|---|---|
| Quantum Ultra Connect 84 | 8 Input, 4 Output | 60-1898-01 |
| Quantum Ultra Connect 128 | 12 Input, 8 Output | 60-1898-02 |

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