Specifications

Quantum Ultra

NOTE: The Quantum Ultra 610 has 10 slots for input or output cards, and the Quantum Ultra 305 has 5 slots.

TRUE 4K specifications

Max. 4K Capabilities

<table>
<thead>
<tr>
<th>Resolution and Refresh Rate</th>
<th>Chroma Sampling</th>
<th>Max. Bit Depth per Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>4096x2160 at 30 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3840x2160 at 30 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4096x2160 at 60 Hz</td>
<td>4:4:4</td>
<td>8 bit</td>
</tr>
<tr>
<td>3840x2160 at 60 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Frame rate¹........................................... 24, 25, 30, 50, or 60 fps
Chroma sampling¹................................. 4:4:4 or 4:2:2
Color bit depth¹................................. 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: ¹Subject to the maximum data rate limit. Use our calculator at www.extron.com/8Kdatarate 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* ¹4K resolutions are supported up to 30 Hz refresh rate. 4K at 60Hz is supported using two or four parallel connections.

NOTE: Pixel clocks up to 300 MHz are supported on input connectors 2 and 4 only. The unit disables adjacent input connectors 1 or 3 when configured to support 300 MHz.

Standards................................. DVI 1.0, HDMI 1.4, HDCP 1.4
### Video processing — HDMI — IN4HDMI

- **Digital pixel data bit depth**: 8 or 10 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 (RTSP/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 Hz, 60 Hz
- **Scaled resolutions**: 1024x768, 1280x768, 1280x800, 1280x1024, 1360x768, 1366x768, 1440x900, 1400x1050, 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.

**NOTE:** Pixel clocks up to 300 MHz are supported on output connectors 2 and 4 only. The unit disables adjacent output connectors 1 or 3 when configured to support 300 MHz.

### 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.

NOTE: Pixel clocks up to 300 MHz are supported on output connectors 2 and 4 only. The unit disables adjacent output connectors 1 or 3 when configured to support 300 MHz.

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

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

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
## Specifications • Quantum Ultra (Continued)

### Communication — Setup

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/signal type</td>
<td>1 HDMI</td>
</tr>
<tr>
<td>Connector</td>
<td>1 female HDMI</td>
</tr>
<tr>
<td>Vertical frequency</td>
<td>24 Hz to 60 Hz</td>
</tr>
<tr>
<td>Resolutions</td>
<td>640x480 to 1920x1200</td>
</tr>
<tr>
<td>USB control ports</td>
<td>3 USB type A</td>
</tr>
<tr>
<td>USB standards</td>
<td>USB 2.0, USB 1.1, USB 1.0 compatible</td>
</tr>
<tr>
<td>USB data rates</td>
<td>Low speed (1.5 Mbps), full speed (12 Mbps)</td>
</tr>
</tbody>
</table>

### 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

#### 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 type

- Metal

#### Enclosure dimensions

- **Quantum Ultra 610**: 10.5” H 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, KC, PSE, RoHs, and WEEE

#### Product warranty

- 3 years parts and labor  
- Everlast power supply warranty: 7 years

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

**NOTE:** Specifications are subject to change without notice.

**NOTE:** Shipping weights and dimensions are available at [www.extron.com](http://www.extron.com).