UltraMatrix AV Pro

4K UHD MODULAR MATRIX SWITCH

- Modular chassis with configurable 4-port I/O cards, scaling from 8×8, 16×16, 32×32, 64×64, up to 144x144 input/output ports
- Supports any mix of HDMI, HDBase-T, 3G-SDI, DVI, VGA video interface, optical fiber and audio
- True cross-point switching of any input to any output for video and audio signals
- Supports HDMI 1.4a, 3G and is HDCP compliant
- Controllable via RS-232, IR Remote and optional TCP/IP

Features and Benefits

- Multiple I/O cards, including HDMI, HDBaseT, SD/HD/3G-SDI, DVI, VGA (compatible with YUV, YC & CVBC) and fiber optic cards to configure any matrix
- 4K UHD resolution via HDMI & HDBaseT cards
- High-bandwidth up to 10.2Gbps, compliant with HDMI1.4a, can transmit 4K, 2K, 1080p and 3D signals
- Integrated digital audio, with options for analog audio and serial transmission
- Advanced HDCP, 3D & with EDID/DDC management
- Add I/O modular cards to the selected card chassis, 4 ports per card for system expandability
- Cross-point ultra-switching, any input port to any output port, regardless of the signal type
- Hot swappable chassis and card design with dual internal power supplies and front panel security lock
- Clear illuminated front panel buttons and LCD status display
- Control via IR, Ethernet TCP/IP & RS-232
- Save up to 10 preset commands
- Rack-mountable aluminum enclosure

Product Overview

The UltraMatrix AV Pro is a high-performance video and audio modular matrix switching engine supporting a maximum of 144-input signal sources and 144-output displays synchronously.

The switch simultaneously supports multiple different video signals with true cross-point switching capability of any input port switched to any output port. Every video or audio signal is transmitted and switched independently to decrease signal attenuation. The UltraMatrix AV Pro chassis supports various changeable cards including HMDI, DVI, VGA, SDI HDBaseT and fiber optic. The I/O connections to these cards are hot-swappable, providing for enhanced system configuration changes. Users can assemble the chassis as a fixed switching matrix or add and change cards depending on application requirements.

The UltraMatrix AV Pro has a power fail memory function and audio can be transmitted together or separate from each video signal. Serial device transmission is also available on the HDBase-T card.

Configuration and control of the switch can be managed using the included IR controller, by RS-232 serial port control for 3rd party controller devices and also via the Ethernet TCP/IP port.

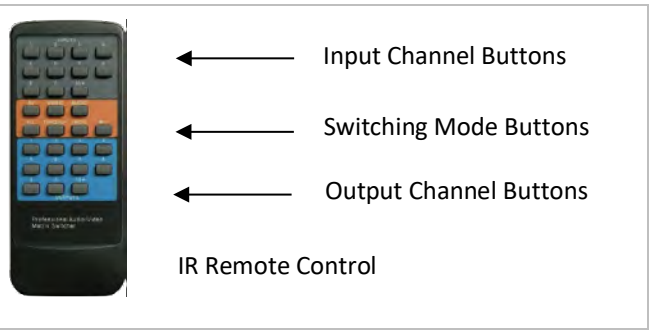
Typical Application

With its flexible design, the UltraMatrix AV Pro can be used for audio/visual signal management in multimedia conference rooms, control rooms, broadcasting rooms and shopping centers

All switch models have an RS232 port and one optional TCP/IP port for convenient external control. These switches can also be operated using the front panel control buttons and or by using 3rd party A/V controllers.

The UltraMatrix AV Pro switches handle all the audiovisual signal management, including the switching, driving, and scaling of video signals.

The IR Remote Controller shares the same function buttons as the front panel of the switch, so the operation and command of the switch is unified for local and remote control.



Models Available

Choose from 5 different models of UltraMatrix AV Pro depending on the potential matrix size. All models support the same set of changeable I/O cards including HMDI, DVI, VGA, SDI and HDBaseT.

UltraMatrix AV Pro 8×8

UltraMatrix AV Pro 8×8 – Front Panel

UltraMatrix AV Pro 8×8 – Rear Panel

UltraMatrix AV Pro 16×16

UltraMatrix AV Pro 16×16 – Front Panel

UltraMatrix AV Pro 16×16 – Rear Panel

UltraMatrix AV Pro 32×32

UltraMatrix AV Pro 32×32 – Front Panel

UltraMatrix AV Pro 32×32 – Rear Panel

UltraMatrix AV Pro 64×64

UltraMatrix AV Pro 64×64 – Front Panel

UltraMatrix AV Pro 64×64 – Rear Panel

UltraMatrix AV Pro 144×144

UltraMatrix AV Pro 64×64 – Front Panel

UltraMatrix AV Pro 64×64 – Rear Panel

UltraMatrix AV Pro – Input and Output Cards

Each UltraMatrix AV Pro chassis has a number of Input and Output slots for installation of any mix of the available Input/Output cards. Chassis are normally equipped with an equal number of Input and Output cards. Each Input/Output card supports 4 ports. The available cards are shown in the table below.

No.	Interface	UltraMatrix AV - Input Cards	UltraMatrix AV - Output Cards
1	**DVI**		
	DVI dual-link video card. Compatible with HDMI 1.3 and HDCP. No Audio and no DVI analog signals are supported. Embedded EDID management, supports DDC		
2	**Seamless DVI/DVI-I**		
	Supports seamless transmission for high definition DVI, HDMI, VGA, AV, YPbPr signals. The signal format can be modified using RS-232 commands to any of the following; 1024x768, 1280x720, 1600x1200, 1920x1080, 1920x1200. Compatible with HDMI 1.3 and HDCP. Supports DVI-I (VGA). Embedded EDID management, supports DDC. Auto recognizes input signal. Output signal is adjustable. Optional adapters are available for connection to VGA, YPbPr and C-Video signals.		
3	**HDMI**		
	HDMI card. Compliant with HDMI and DVI. Embedded EDID management, supports DDC.		
4	**Seamless HDMI**		
	Seamless HDMI card with auxiliary external audio channels for each port. Compliant with HDMI 1.3, HDCP 1.2 and DVI. Supported video resolutions are 1024x768, 1280x720, 1600x1200, 1920x1080, 1920x1200. Selectable audio sources are embedded HDMI and auxiliary audio supporting PCM. Built in video scaler handles various video resolutions, and the output resolution is adjustable by command.		
5	**VGA**		
	The VGA input card supports VGA (RGBHV), YPbPr, S-Video, C-Video and CVBS. The VGA output card only supports VGA, and 4 x stereo audio ports. Scales video input to 1080p or 1920x1200. Video bandwidth up to 350MHz (-3dB). Optional adapters are available for connection to YPbPr and C-Video signals.		
6	**VGA + Audio**		<no image>
	VGA input card with 4 x VGA and 4 x stereo audio ports. Same specification as the above VGA input card.		
7	**SDI**		
	Compatible with SD/HD/3G-SDI formats. Each input port has a loop-out port for local video. Each output port has 2 × BNC connectors.		

8	**Seamless SDI**		<no image>
	Seamless SDI input card only. Video resolution up to 1080p. Each input port has a loop-out port for local video. Card auto-detects the video input resolution and scales it up to 1080p @60Hz, default resolution, adjustable by command.		
9	**Twisted Pair**		
	This is a DVI/HDMI extender card that uses external HDBase-T Transmitter/Receiver boxes for extension over CATx cable. The card supports HDTV and is compatible with HDMI 1.2 and HDCP. Includes Power and Link LED indicators on each port for status monitoring. Support for auxiliary stereo audio and RS-232 is also included on the Input and Output cards.		
10	**HDBase-T**		
	This 4K twisted pair card supports HDTV, HDB-T 1.0, HDMI 1.4 and HDCP 1.4. Supported video resolutions include 480p up to 2K/4K, 1080p, and 3D. Embedded EDID management, supports DDC. The card extends HDBase-T up to 70 meters at 1080p, and 40 meters at 4K video. Bi-directional RS-232 and auxiliary stereo audio is also included. Each Input/Output port is paired with an optional HDBase-T transmitter or receiver box. If the video input is 4K and the output card does not support 4K video, then adjust the video output down to 1080p.		
11	**Optical Fiber**		
	This card supports Multimode fiber to 300m and Singlemode fiber to 2Km, using LC-type connectors. The card supports video resolutions to HDMI 1.4, 2K/4K, 1080p and 3D with a 10.2Gbps video bandwidth. Each Input/Output port is paired with an optional fiber optic transmitter or receiver box.		
12	**HDMI 4K**		
	HDMI 4K signal card, it is compliant with HDMI 1.4 and HDCP 1.4 and compatible with DVI video format. The card supports video resolutions to HD HDMI, 2K/4K, 1080p and 3D. Embedded EDID management, supports DDC. Bi-directional RS-232 and embedded HDMI audio is also included.		

Specifications

Chassis - General	8×8 Switch (2U)	16×16 Switch (3U)	32×32 Switch (5U)	64×64 Switch (10U)
Dimensions:(W×H×D)	19 × 3.38 × 12.6” 483 × 88 × 320mm	19 × 5.23 × 12.6” 483 × 133 × 320mm	19 × 8.74 × 12.6” 483 × 222 × 320mm	19 × 17.24 × 12.6” 483 × 438 × 320mm
Weight (chassis only)	6.6lbs (3.0Kg)	7.7lbs (3.5Kg)	11.0lbs (5.0Kg)	17.6lbs (8Kg)
Power Supply	100-240VAC, 50/60Hz, 60W max power usage	100-240VAC, 50/60Hz, 84W max power usage.	100-240VAC, 50/60Hz, 220W max power usage.	100-240VAC, 50/60Hz, 550W max power usage.
Optional Power Switch	[None]	110/230V selectable power switch	110/230V selectable power switch	110/230V selectable power switch
Temperature	14 - 104°F (-10 - +40°C)	14 - 104°F (-10 - +40°C)	14 - 104°F (-10 - +40°C)	14 - 104°F (-10 - +40°C)
Humidity	10% ~ 90%	10% ~ 90%	10% ~ 90%	10% ~ 90%
Serial Control Port	RS-232, DB9, (2, 3, 5)	RS-232, DB9, (2, 3, 5)	RS-232, DB9, (2, 3, 5)	RS-232, DB9, (2, 3, 5)
Front Panel and IR	Push buttons	Push buttons	Push buttons	Push buttons
TCP/IP (Optional)	TCP/IP Ethernet	TCP/IP Ethernet	TCP/IP Ethernet	TCP/IP Ethernet
Chassis	Rack-mountable 2U	Rack-mountable 3U	Rack-mountable 5U	Rack-mountable 10U

I/O Cards	The specification of each Input / Output card is shown in the table below	
DVI I/O	**Input**	**Output**
Connectors	4 × DVI-I(F) for DVI-D and HDMI	4 × DVI-I(F) for DVI-D and HDMI
Levels	TMDS 2.9V ~ 3.3V	TMDS 2.9V ~ 3.3V
Impedance	75Ω	75Ω
DVI - General		
Gain and Bandwidth	Gain: 0dB. Bandwidth: 340MHz (10.2Gbit/s)	
Video Signal	DVI 1.0/HDMI 1.3 full digital TMDS signal	
Switching Speed/Time-delay	Speed: 200ns (max). Time-Delay: 5ns (+/- 1ns)	
Crosstalk	< -50dB@5MHz	
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Channel Data (DDC) using DVI and HDMI standard. EDID and DDC signals are actively buffered.	
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards	
Seamless DVI/DVI-I I/O	**Input**	**Output**
Connectors	4 × DVI-I(F) for DVI-D and HDMI	4 × DVI-I(F) for DVI-D and HDMI
Levels	TMDS 2.9V ~ 3.3V	TMDS 2.9V ~ 3.3V
Impedance	75Ω	75Ω
Seamless DVI - General		
Gain and Bandwidth	Gain: 0dB. Bandwidth: 340MHz (10.2Gbit/s)	
Video Signal	DVI, HDMI, VGA, C-Video, YPbPr signals supported	
Switching Speed/Time-delay	Speed: 200ns (max). Time-Delay: 5ns (+/- 1ns)	
Crosstalk	< -50dB@5MHz	
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Channel Data (DDC) using DVI and HDMI standard. EDID and DDC signals are actively buffered.	
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards	
HDMI I/O	**Input**	**Output**
Connectors	4 × HDMI(F)	4 × HDMI(F)
Levels	TMDS 2.9V ~ 3.3V	TMDS 2.9V ~ 3.3V
Impedance	75Ω	75Ω

HDMI - General	
Gain and Bandwidth	Gain: 0dB. Bandwidth: (6.75Gbit/s)
Video Signal	DVI 1.0, HDMI 1.3, full digital TMDS
Switching Speed/Time-delay	Speed: 200ns (max). Time-Delay: 5ns (+/- 1ns)
Crosstalk	< -50sB@5MHz
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Channel Data (DDC) using DVI and HDMI standard. EDID and DDC signals are actively buffered.
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards

Seamless HDMI I/O	Input	Output
Connectors	4 × HDMI-A(F) and 4 × Audio (terminal block)	4 × HDMI-A(F) and 4 × Audio (terminal block)
Power Consumption	8W	12W
Color Depth	8, 10 and 12 bit	8 bit
Seamless HDMI - General		
Video and Audio Signal	Video: HDMI, DVI. Audio: PCM	
Bandwidth and Standards	Bandwidth: 6.75Gbps. Standards: HDMI 1.3 and HDCP 1.2	
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Channel Data (DDC) using DVI and HDMI standard. EDID and DDC signals are actively buffered.	
HDCP	Compliant with HDCP using HDMI 1.3 standards	

VGA I/O	Input	Output
Connectors	4 × VGA(F) 15-pin HD15	4 × VGA(F) 15-pin HD15
Levels	0.5V ~ 2.0Vp-p	0.5V ~ 2.0Vp-p
Impedance	75Ω	75Ω
Video Signal	VGA (RGBHV), YPbPr. S-Video, C-Video, CVBS	VGA
VGA - General		
Gain and Bandwidth	Gain: 0dB. Bandwidth: 350MHz (-3dB)	
Switching Speed & Crosstalk	Speed: 200ns (max). Crosstalk: < -50dB@5MHz	

VGA & Audio (Input Only)	Input Only
Connectors	VGA: 4 × VGA(F) 15-pin HD15. Audio: 4 × stereo audio on a 3-pin terminal block
Input Levels	VGA: 0.5 ~ 2.0Vp-p. Audio: >90dB@20Hz ~ 20KHz
Input Impedance	VGA: 75Ω. Audio: >10K Ω.
VGA & Audio - General	
Gain and Bandwidth	Gain: 0dB. Bandwidth: YPbPR: 170MHz, C-Video: 150MHz, VGA: 170MHz
Switching Speed & Crosstalk	Speed: 200ns (max). Crosstalk: < -50dB@5MHz
Video Signal	VGA (RGBHV), YPbPr. S-Video, C-Video, CVBS

SDI I/O	Input	Output
Connectors	4 × SDI(F) BNC and 4 × SDI(F) BNC-local output	8× SDI(F) BNC (2 x BNC per channel)
Input Levels	0.8Vp-p +/- 10%	0.8Vp-p +/- 10%
Input Impedance	75Ω	75Ω
SDI - General		
Gain and Max Data Rate	Gain: Unity. Max Data Rate: 4.95Gbps. Data Lock Rate = Auto	
Switching Speed & Crosstalk	Speed: 200ns (max). Crosstalk: < -50dB@5MHz	
Transmission Distance	985ft (300m) max.	
Input Return Loss	< -14dB@1MHz ~ 1.5GHz	
Video Standards	SMPTE 292M, SMPTE 259M, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120	
Data Type	8, 10 and 12 bit	
Audio bits per sample	18 bits per channel, 2 channels (L, R)	

Seamless SDI (Input Only)	Input Only
Connectors	4 × SDI(F) BNC and 4 × SDI(F) BNC-local output
Seamless SDI – General	
Video Signal and Bandwidth	Video Signal: SDI, HD-SDI, 3G-SDI. Bandwidth: 6.75Gbps
Max Resolution & Color Depth	Resolution: 1080P. Color Depth: 8, 10, 12 bit
Transmission Distance	1080p < 100 meters (328ft)
Power Consumption	8.7W
Temperature and Humidity	Temperature: 32 - 122°F (0 - +50°C). Humidity: 10% ~ 90%

Twisted Pair I/O	Input	Output
Connectors	UTP: 4 × RJ45(F) with Power and Link LED's Audio: 2 × 3.5mm stereo audio per channel RS232: 1 × 3-pin terminal block per channel	UTP: 4 × RJ45(F) with Power and Link LED's Audio: 2 × 3.5mm stereo audio per channel RS232: 1 × 3-pin terminal block per channel
Impedance	75Ω	75Ω
Twisted Pair - General		
Distance and Bandwidth	Transmission Distance: 1080p up to 230ft (70 meters) max. Bandwidth: 6.75Gbps	
Video Resolution Range	800×600 up to 1920×1200 (includes 1080p)	
Signal Noise Ratio	>70dB@100MHz ~ 100M	
Input Return Loss	<30dB@5KHz	
Differential Phase Error	+/- 10% @135MHz ~ 100M	
HDMI Standards Supported	HDMI 1.3 and HDCP	

4K HDBase-T I/O	Input	Output
Connectors	UTP: 4 × RJ45(F) with Power and Link LED's Audio: 1 × 3.5mm stereo audio per channel RS232: 1 × 3-pin terminal block per channel	UTP: 4 × RJ45(F) with Power and Link LED's Audio: 1 × 3.5mm stereo audio per channel RS232: 1 × 3-pin terminal block per channel
Video Levels	TMDS 2.9V ~ 3.3V	TMDS 2.9V ~ 3.3V
Impedance	Video: 100Ω (Differential). Audio: 75Ω	Video: 100Ω (Differential). Audio: 75Ω
Frequency Response	Audio: 20Hz ~ 20KHz	Audio: 20Hz ~ 20KHz
4K HDBase-T - General		
Control Signals	4 × RS232 on a 3-pin terminal block, on each card. Protocol is TCP/IP	
Gain and Bandwidth	Gain: 0dB. Bandwidth: 10.2Gbps	
Switching Speed & Crosstalk	200ns (max) and < -50dB@5MHz	
Max Resolution & Color Depth	2K/4K	
Transmission Distance	1080p < 230ft, (70 meters), 2K/4K < 130ft, (40 meters)	
Temperature and Humidity	Temperature: 32 - 122°F (0 - +50°C). Humidity: 10% ~ 90%	
Supported Audio Format	Embedded HDMI Audio, PCM, Dolby Digital, DTS, DTS-HD. Analog Audio: PCM	
EDID and HDCP	Supports Extended Display Identification Data (EDID) and compliant with HDCP 1.4	
HDMI Standard	HDMI 1.4a	

Optical Fiber I/O	Input	Output
Connectors	4 × SFP Optical Fiber, LC Connectors with LED	4 × SFP Optical Fiber, LC Connectors with LED
Fiber Type	LC Fiber, Singlemode or Multimode	LC Fiber, Singlemode or Multimode
Optical Fiber - General		
Data Rate and Color Depth	Data rate: 10.2Gbps. Color Depth: 8, 10, 12 and 16 bit	
Video Resolution	Up to 2K/4K	
Transmission Distance	Multimode Fiber using OM3 fiber cable up to 985ft (300 meters). Singlemode Fiber using OM3 fiber cable up to 1.25 miles (2.0Km)	
Temperature and Humidity	Temperature: 32 - 131°F (0 - +55°C). Humidity: 10% ~ 90%	

4K HDMI I/O	Input	Output
Connectors	4 × HDMI-A(F) and 4 × Audio (terminal block)	4 × HDMI-A(F) and 4 × Audio (terminal block)
Video Levels	TMDS 2.9V ~ 3.3V	TMDS 2.9V ~ 3.3V
Impedance	Video: 100Ω (Differential). Audio: 75Ω	Video: 100Ω (Differential). Audio: 75Ω
Frequency Response	Audio: 20Hz ~ 20KHz	Audio: 20Hz ~ 20KHz
4K HDMI - General		
Gain and Max Resolution	Gain: 0dB. Max Resolution: 2K/4K	
Transmission Distance	1080p < 230ft, (70 meters), 2K/4K < 130ft, (40 meters)	
Switching Speed	200ns (maximum)	
Signal Noise Ratio	>70dB@100MHz ~ 100M	
Input Return Loss	<30dB@5KHz	
Supported Audio Format	Embedded HDMI Audio, PCM, Dolby Digital, DTS, DTS-HD. Analog Audio: PCM	
EDID and HDCP	Supports Extended Display Identification Data (EDID) and compliant with HDCP 1.4	
HDMI Standard	HDMI 1.4a and DVI 1.0	
HDMI Standards Supported	HDMI 1.3 and HDCP	

Part Numbers

UMA-08Mx08M	UltraMatrix AV Pro 8×8 Chassis, includes 1 x internal PSU and RS232 serial
UMA-16Mx16M	UltraMatrix AV Pro 16×16 Chassis, includes 2 x internal PSU and RS232 serial
UMA-32Mx32M	UltraMatrix AV Pro 32×32 Chassis, includes 2 x internal PSU and RS232 serial
UMA-64Mx64M	UltraMatrix AV Pro 64×64 Chassis, includes 2 x internal PSU and RS232 serial
UMA-144Mx144M	UltraMatrix AV Pro 144x144 Chassis, includes 2 x internal PSU and RS232 serial
UMR-D4D	Input Card, 4x DVI-D ports
UMR-D4DX	Input Card, 4x Seamless DVI-I ports for DVI, HDMI, VGA, AV and YPbPr
UMR-D4H	Input Card, 4x HDMI ports
UMR-D4HX-4A	Input Card, 4x HDMI ports with auxiliary audio
UMR-V4	Input Card, 4x VGA ports
UMR-V4A	Input Card, 4x VGA ports with auxiliary audio
UMR-2SDI4	Input Card, 4x SDI ports, each with a local SDI output port
UMR-2SDI4X-2K	Input Card, 4x SDI ports, each with a local SDI output port, video resolution to 1080p
UMR-TPA4-4AS	Input Card, 4x RJ45 ports, each with stereo audio and RS-232
UMR-HDT4-4AS	Input Card, 4x RJ45 HDBase-T ports, each with 1x auxiliary audio and RS-232
UMR-1DFS4X	Input Card, 4x Singlemode optical fiber
UMR-1DFM4X	Input Card, 4x Multimode optical fiber
UMR-DTX0H4-4S-4K30	Input Card, 4x HDMI ports, 4K30 video, with embedded audio and RS232
UMR-D4D	Output Card, 4x DVI-D ports
UMR-D4DX	Output Card, 4x Seamless DVI-I ports for DVI, HDMI, VGA, AV and YPbPr
UMR-D4H	Output Card, 4x HDMI ports
UMR-D4HA	Output Card, 4x HDMI ports with auxiliary audio
UMR-V4	Output Card, 4x VGA ports
UMR-2SDI4	Output Card, 4x SDI ports, each with 2x BNC connectors
UMR-TPA4-4AS	Output Card, 4x RJ45 ports, each with stereo audio and RS-232
UMR-HDT4-4AS	Output Card, 4x RJ45 HDBase-T ports, each with 1x auxiliary audio and RS-232
UMR-1DFS4X	Output Card, 4x Singlemode optical fiber
UMR-1DFM4X	Output Card, 4x Multimode optical fiber
UMR-DTX0H4-4S-4K30	Output Card, 4x HDMI ports, 4K30 video, with embedded audio and RS232
/IP	TCP/IP option for external/remote control of the switch (add to the switch part number)
/SWX	Optional power switch on 16, 32 and 64 port models. Allows selection of 110V or 230V power