Technical Specification : Audio Video (AV) System for IC&SR Auditorium

1. **Item Description**:   8x6 AV Matrix Switcher

Quantity: 1 Number

Specification:

S.No	Description	Specification
1	**Video**	
	Video routing	8x6
	Maximum data rate	10 Gbps (3.3 Gbps per color)
	Maximum pixel clock	300 MHz (or) Higher
	Resolution	Up to 2560x1600@ 60 Hz or 4K (4096x2160) @ 30 Hz, UHD (3840x2160) @ 30 Hz 4K/UHD @ 60 Hz with 4:2:0 chroma subsampling
	Formats	RGB and YCbCr digital video
	Standards	DVI 1.0, HDMI 1.4, HDCP 1.4, CEA-861E
2	**Video input**	
	Number/signal type	6 HDMI digital video (HDCP compliant) 2 Digital TP (configurable)
	Connectors	6 female HDMI type A 2 female RJ-45
3	**Matrix video outputs (non scaled)**	
	Number/signal type	2 HDMI digital video (HDCP compliant)
	Connectors	2 female HDMI
4	**Scaled TP outputs**	
	Number/signal type	4 Digital TP, or HDBaseT (configurable) 2 buffered HDMI digital video (HDCP compliant)
	Connectors	4 female RJ-45 2 female HDMI
	Video processing - Digital pixel data bit depth - Colors	8, 10, or 12 bits per channel; 300 MHz pixel clock (HDMI) 10-bit processing
	Video input - Resolution range	640x480 , 1920x1200, 1600x1200 1080p & 2k through 4k @30Hz
5	**Shielded twisted pair interconnection**	
	Connectors	Female RJ-45
	Termination standard	TIA/EIA T568B
	Signal transmission distance	Up to 100 m using shielded twisted pair cable With resolution up to 1920x1200 & 1080p & 2k through 4k @30Hz

6	Audio system (mic/line input to line output)	
	Gain	Unbalanced output: -6 dB; balanced output: 0 dB
	Frequency response	20 Hz to 20 kHz, ±0.2 dB
	Input impedance	>10k ohms unbalanced, >20k ohms balanced
	THD + Noise	0.01% at 1 kHz nominal level
	S/N	>105 dB at maximum balanced output (unweighted)
	Crosstalk	<-90 dB @ 20 Hz to 20 kHz, fully loaded
	Stereo channel separation	>80 dB @ 20 Hz to 20 kHz
	Digital conversion	24-bit, 48 kHz
	Audio Routing	8 x 6 stereo switching matrix
7	Audio input	
	Number/signal type	6 stereo, analog line level, balanced or unbalanced 6 stereo, de-embedded from HDMI (PCM only) 2 Digital TP (de-embedded from HDMI [PCM only] and remote balanced/unbalanced analog), (embedded digital)
	Connectors	6 (3.5 mm) captive screw connectors, 5 pole for analog line level inputs 6 female HDMI type A 2 female RJ-45
	Analog audio - Nominal level - Maximum level - Input gain adjustment	+4 dBu, -10 dBV adjustable via input gain +21 dBu balanced, +15 dBu unbalanced -18 dB to +24 dB, 0.1 dB steps, adjustable per input
8	Audio output	
	Number/signal type	4 HDMI embedded 4 Digital TP (embedded digital and remote balanced/unbalanced analog), or HDBaseT (embedded digital) 4 stereo balanced/unbalanced analog (variable) 1 SPDIF
	Connectors	4 female HDMI 4 RJ-45 4 (3.5 mm) captive screw, 5 pole 1 RCA
	Impedance - Stereo audio - SPDIF	50 ohms unbalanced, 100 ohms balanced 75 ohms
	Gain error	±0.1 dB channel to channel
	Maximum level (Hi-Z)	>+21 dBu, balanced or +15 dBu unbalanced
	Output volume range	0 to -100 dB in 0.1 dB steps

2. Item Description: **Digital TP Transmitter for HDMI with Audio Embedding**

Quantity: **6 Numbers**

Specification:

S.No	Description	Specification
1		**Video**
	HDMI input - Maximum data rate - Maximum pixel clock - Formats - Standards	10 Gbps (3.3 Gbps per color) 300 MHz RGB and YCbCr digital video DVI 1.0, HDMI
	Resolution range	Up to 2560x1600@60Hz or 4K (4096x2160) @ 30 Hz, UHD (3840x2160) @ 30 Hz, 4K/UHD @ 60 Hz with 4:2:0 chroma subsampling
2		**Video input**
	Number/signal type - HDMI input - DisplayPort input	1 single link HDMI input
	Connectors - HDMI input	1female HDMI type A
3		**Interconnection between transmitter and receiver**
	Signal type	1 Digital TP (or) shielded twisted pair
	Connectors	1 female RJ-45 jack
	Termination standard	TIA/EIA T568B
	Signal transmission distance	Up to 100 m using shielded twisted pair cable with resolution up to 1920x1200 & 1080p & 2k through 4k @30Hz
4		**Audio**
	Frequency response	20 Hz to 20 kHz, ±0.5 dB
	THD + Noise	0.03% at 1 kHz nominal level
	S/N	>90 dB at maximum input (unweighted)
	Crosstalk	<-90 dB @ 20 Hz to 20 kHz, fully loaded
	Stereo channel separation	>80 dB @ 1 kHz
5		**Audio input**
	Number/signal type	2 stereo, unbalanced
	Connectors	2 (3.5 mm) stereo jack
	Impedance	>10k ohms, DC coupled
	Nominal level	-10 dBV (316 mVrms)
	Maximum level	+6 dBu, unbalanced

3. **Item Description**: Digital TP (or) shielded twisted pair Receiver for HDMI

Quantity: 8 Number

Specification:

S.No	Description	Specification
1		**Video**
	HDMI - Maximum data rate - Maximum pixel clock - Colour bit depth - Formats - Standards	10 Gbps (3.3 Gbps per color) 300 MHz 8, 10, or 12 bits RGB and YCbCr digital video DVI 1.0, HDMI 1.4, HDCP 2.2, CEA-861E
	Resolution range	Up to 2560x1600@60Hz or 4K (4096x2160) @ 30 Hz, UHD (3840x2160) @ 30 Hz, 4K/UHD @ 60 Hz with 4:2:0 chroma sub sampling
2		**Video input - Transmitter**
	Number/signal type	1 single link HDMI
	Connectors	1female HDMI type A
3		**Interconnection between transmitter and receiver**
	Signal type	HDMI 1.4, HDCP 2.2
	Connectors	1 female RJ-45 jack
	Termination standard	TIA/EIA T568B
	Signal transmission distance	Up to 100 m using shielded twisted pair cable with resolution up to 1920x1200 & 1080p & 2k through 4k @30Hz
4		**Video output - Receiver**
	Number/signal type	1 single link HDMI
	Connectors	1 female HDMI type A
5		**Audio**
	Gain	Unbalanced output: 0 dB; balanced output +6 dB
	Frequency response	20 Hz to 20 kHz, ±0.5 dB
	THD + Noise	0.03% at 20 Hz to 20 kHz at maximum output
	S/N	>90 dB at maximum output (15 dBu), balanced (unweighted)
	Stereo channel separation	>80 dB @ 1 kHz to 20 kHz

4. **Item Description**: Control Processor
   Quantity: 1 Number
   Specification:

1. Control Engine :
   Real-time, pre emptive multi-threaded/multitasking kernel; Transaction-Safe extended FAT file system; Should support up to 10 simultaneously running programs

2. Memory:
   SDRAM: 512 MB
   Flash: 4 GB
   Memory Card should support SD and SDHC cards up to 32 GB
   External Storage should support USB mass storage devices up to 1 TB

3. Communications:
   1. Ethernet: 10/100 Mbps, auto-switching, auto-negotiating, auto-discovery, full/half duplex, industry-standard TCP/IP stack, UDP/IP, CIP, DHCP, SSL, TLS, SSH, SFTP (SSH File Transfer Protocol), FIPS 140-2 compliant encryption, IEEE 802.1X, SNMP, BACnet™/IP, IPv4 or IPv6, Active Directory authentication, IIS v.6.0 Web Server, SMTP e-mail client
   2. USB : Should support USB mass storage class devices via rear panel; USB 2.0 host ports, supports computer console via front panel USB 2.0 device port
   3. RS-232/422/485: For 2-way device control and monitoring, all ports should support RS-232 up to 115.2k baud with software handshaking, one port also should support RS-422 or RS-485 and hardware handshaking
   4. IR/Serial: Should support 1-way device control via infrared up to 1.2 MHz or serial TTL/RS-232 (0-5 Volts) up to 115k baud

4. Connectors & Card Slots

   1. RELAY OUTPUT 1 – 8: (2) 8-pin 3.5mm detachable terminal block comprising (8) normally open, isolated relays; Rated 1 Amp, 30 Volts AC/DC; MOV arc suppression across contacts
   2. I/O 1 – 8: (1) 9-pin 3.5mm detachable terminal block comprising (8) "Versiport" digital input/output or analog input ports (referenced to GND);
   3. Digital Input: Rated for 0-24 Volts DC, input impedance 20k Ohms, logic threshold >3.125V low/0 and <1.875V high/1;
   4. Digital Output: 250mA sink from maximum 24 Volts DC, catch diodes for use with "real world" loads;
   5. Analog Input: Rated for 0-10 Volts DC, protected to 24 Volts DC maximum, input impedance 21k Ohms with pull-up resistor disabled; Programmable 5 Volts, 2k Ohms pull-up resistor per pin
   6. IR - SERIAL OUTPUT 1 – 8: (2) 8-pin 3.5mm detachable terminal block comprising (8) IR/Serial output ports; IR output up to 1.2 MHz; 1-way serial TTL/RS-232 (0-5 Volts) up to 115.2k baud

7. COM 1: (1) 5-pin 3.5mm detachable terminal block; Bidirectional RS-232/422/485 port; Up to 115.2k baud; hardware and software handshaking support
8. COM 2 – 3: (2) 3-pin 3.5mm detachable terminal blocks; Bidirectional RS-232 ports; Up to 115.2k baud; software handshaking support
9. MEMORY: (1) SD memory card slot; should accepts one SD or SDHC card up to 32 GB for memory expansion USB: (1) USB Type A female; USB 2.0 port for storage devices
10. LAN: (1) 8-wire RJ45 jack; 10Base-T/100Base-TX Ethernet port

Note:

1. Control Processor should have compatibility to control and operate the AV equipments through Apple I-Pad or other touch pannel.
2. Any additional accessories (including HDMI cables of different sizes) required for installation should be quoted separately.
3. Warranty: 3 Years.
4. Digital TP Cable or Shielded Twisted pair cables should be used for all transmitting and receiving components.
5. Installation and Commissioning should be done by supplier. Installation charges if any, should be quoted separately.
6. Per meter charges for cables should be quoted separately.