

**AMENDMENT TO THE TECHNICAL SPECIFICATIONS AFTER THE PRE-BID  
MEETING ON 19/12/2024.**

The amendments to the Tender Specifications as below are part and parcel of the Original Specifications and would stand modified to the extend amended. The last date for the bid submission is extended upto 17/01/2025.

Bid Query.

## M/S. CRESTRON

Annexure-11

### Technical Specification

**Supply, Installation, Testing and commissioning of 16x16 Fixed/Modular HDMI Matrix Switcher. Should provide minimum 16 no's HDMI 2.0 Inputs, 16 no's HDMI 2.0 outputs. Should Support 4096x2160@60Hz at RGB 4:4:4 (600MHz pixel clock) resolution and data rates up to 18 Gbps on all inputs and outputs. Should Support Audio Embedding and Audio Deembedding. Should Include redundant power source.**

Sr No.	Description	Specification Parameters	Queries / Suggestions	Response
3	HDMI Outputs	Minimum 16 no's HDMI 2.0 outputs	<p>Request to please modify as “<b>Minimum 16 no's HDMI 2.0 scaled outputs</b>”</p> <p>As the HDMI output of the switcher need to be connected to destinations (display/Projector/VC device etc.) which are of different formats and of different resolution. To get proper output as per destination we will be requiring scaled output, There is separate line item asked for this requirement, which can be achieved in the matrix switcher itself, at all the HDMI outputs. All the reputed OEM, have the product supporting the same.</p>	<p><u>Clause may be read as:</u></p> <p><b>No Change</b></p> <p>If the bidder opts for a switcher with scaled outputs, it will be acceptable, provided the scaled outputs deliver a resolution of 4K UHD @60Hz 4:4:4.</p>
4	Audio Inputs	Minimum 04 no's balanced audio Inputs	<p>Please note as HDMI Input signal already has video and audio embedded support, no separate Audio port is required for connecting on the input side like laptop. Request to please remove this or make this as optional, for us to comply.</p>	<p><u>Clause may be read as:</u></p> <p>Minimum 04 no's balanced audio Inputs (Optional)</p>
6	Resolution	Must support 4K UHD @60Hz RGB 4:4:4 on all inputs and outputs with RGB 4:4:4	<p>Request to please make resolution support as “<b>4096x2160@60Hz at 4:4:4</b>” as asked in the description above for HDMI switcher.</p> <p>To keep Switcher, Transmitter and Receivers signal in same format resolution.</p> <p>All the reputed OEM, have the product supporting the same.</p>	<p><u>Clause may be read as:</u></p> <p><b>“Must support 4K UHD @60Hz 4:4:4 on all inputs and outputs with data rate of 18 Gbps”</b></p> <p>The switcher must support 4K UHD @60Hz 4:4:4 resolutions across all input and output ports. All input and output ports must comply with a minimum data rate of 18 Gbps.</p>

13	Audio Sampling Rate	Up to 192 kHz	Request to please modify as “ <b>minimum Digital-To-Analog Conversion 24-bit 48 kHz</b> ” for us to comply	<u>Clause may be read as:</u>  “ <b>Minimum Digital-To-Analog Conversion 24-bit 48 kHz</b> ”
14	HDR Support	Should support HDR10, Dolby Vision, HLG	Request to please remove “Dolby Vision, HLG” for us to comply.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<u>Clause may be read as:</u>  “Should support HDR10/Dolby Vision/ HLG”
15	Signal Management	Should have built in signal re-clocking, cable equalization, Pixel Accurate Reclocking, and zero frame delay.	<b>Terms mentioned are proprietary to single OEM, please help to remove or make it as equivalent. Link below from the OEM page.</b>  <b>Proprietary Lightware technologies like Pixel Accurate Reclocking</b>  <a href="https://lightware.com/pub/media/lightware/filedownloader/file/Essentials_of_Proprietary_Lightware_Technologies-compressed.pdf">https://lightware.com/pub/media/lightware/filedownloader/file/Essentials_of_Proprietary_Lightware_Technologies-compressed.pdf</a>	<u>Clause may be read as:</u>  Should have built in signal re-clocking, cable equalization.
16	Control and Connectivity	Should have built in Ethernet (RJ45), RS-232, USB control interfaces	Please modify as “ <b>Should have built in Ethernet (RJ45) or RS-232, USB control Interfaces</b> ” As using LAN port to control the device is easy during installation and do not require special termination of cables.	<u>Clause may be read as:</u>  Should have built in Ethernet (RJ45)/RS-232, USB control interfaces



**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair transmitter with RS-232, IR, Ethernet and Bidirectional remote powering.  
Should support 4K UHD ® 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Queries / Suggestions	Response
2	Video resolution	4K UHD @60Hz RGB 4:4:4	Request to please make resolution support as <b>"4096x2160@60Hz at 4:4:4"</b> as mentioned in the HDMI switcher above. To keep Switcher, Transmitter and Receivers signal in same format resolution. All the reputed OEM, have the product supporting the same.	<b><u>Clause may be read as:</u></b>  "Must support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better"
7	HDR Support	Should provide HDR and Low Latency Dolby Vision support	Request to please remove "Low Latency Dolby Vision support" for us to comply. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Dolby Vision/HLG/HDR
8	120Hz 3D video signals.	The transmitter shall be compatible with 120Hz 3D video signals.	This is supported by single OEM, also this is not asked in the HDMI switcher, request to please make this as optional. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  "Transmitter should support 3D video signals."
9	HDCP compliance	Should support HDCP 2.3 or better	Request to please make this as <b>"HDCP 2.2 or better"</b> as HDCP 2.2 is asked in the HDMI switcher specification. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Should support HDCP 2.2 or better
11	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Please help on the requirement for 1x Ethernet port at Transmitter, in this scenario. Or Request to make this as optional.	<b><u>Clause may be read as:</u></b>  The specifications revised to: Should support extension of 1x Ethernet via RJ-45/ USB 2.0



**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair receiver with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD@ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Compliance	Response
2	Video resolution	4K UHD @60Hz RGB 4:4:4	Request to please make resolution support as “4096x2160@60Hz at 4:4:4” as mentioned in the HDMI switcher above. To keep Switcher, Transmitter and Receivers signal in same format resolution. All the reputed OEM, have the product supporting the same.	<b><u>Clause may be read as:</u></b>  “Must support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better.
7	HDR Support	Should provide HOR and Low Latency Dolby Vision support	Request to please remove “Low Latency Dolby Vision support” for us to comply. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Dolby Vision/HLG/HDR.
8	120Hz 30 video signals.	The receiver shall be compatible with 120Hz 3D video signals.	This is supported by single OEM, also this is not asked in the HDMI switcher, request to please make this as optional.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  The specification revised to: The receiver shall be compatible with 3D video signals.
9	HDCP compliance	Should support HDCP 2.3 or better	Request to please make this as “HDCP 2.2 or better” as HDCP 2.2 is asked in the HDMI switcher specification.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Should support HDCP 2.2 or better
10	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Please help on the requirement for 1x Ethernet port at Receiver, in this scenario. Or Request to make this as optional.	<b><u>Clause may be read as:</u></b>  The specifications revised to: Should support extension of 1x Ethernet via RJ-45/ USB 2.0

Supply, Installation, Testing and commissioning of Premium High-Speed HDMI 2.0b Hybrid optical active cable.				
Sr. No.	Description	Specification Parameters	Queries / Suggestions	Response
11	Manufacturer	Should be from the same manufacturer as the Matrix switcher	Request to please make this as optional, as this is not asked for other line items.	<p><b><u>Clause may be read as:</u></b></p> <p>Should be from the same manufacturer as the Matrix switcher (Optional). But the cables should have RoHS/WEEE/CE Certifications.</p>

Supply, Installation, Testing and commissioning of 8 port high voltage relay controller.				
Sr. No.	Description	Specification Parameters	Queries / Suggestions	Response
2	Control Interface	RS232C	Request to please modify as "RS-232C / LAN / Other as per OEM"	<p><b><u>Clause may be read as:</u></b></p> <p>RS232C/Ethernet/RS485</p>



## M/S. Gurusons

### Technical Specification

**Supply, Installation, Testing and commissioning of 16x16 Fixed/Modular HDMI Matrix Switcher. Should provide minimum 16 no's HDMI 2.0 Inputs, 16 no's HDMI 2.0 outputs. Should Support 4096x2160@60Hz at RGB 4:4:4 (600MHz pixel clock) resolution and data rates up to 18 Gbps on all inputs and outputs. Should Support Audio Embedding and Audio Deembedding. Should Include redundant power source.**

Sr No.	Description	Specification Parameters	Queries / Suggestions	Response
3	HDMI Outputs	Minimum 16 no's HDMI 2.0 outputs	<p>Request to please modify as <b>“Minimum 16 no's HDMI 2.0 scaled outputs”</b></p> <p>As the HDMI output of the switcher need to be connected to destinations (display/Projector/VC device etc.) which are of different formats and of different resolution. To get proper output as per destination we will be requiring scaled output, There is separate line item asked for this requirement, which can be achieved in the matrix switcher itself, at all the HDMI outputs.</p> <p>All the reputed OEM, have the product supporting the same.</p>	<p><u>Clause may be read as:</u></p> <p><b>No Change</b></p> <p>If the bidder opts for a switcher with scaled outputs, it will be acceptable, provided the scaled outputs deliver a resolution of 4K UHD @60Hz 4:4:4.</p>
4	Audio Inputs	Minimum 04 no's balanced audio Inputs	<p>Please note as HDMI Input signal already has video and audio embedded support, no separate Audio port is required for connecting on the input side like laptop.</p> <p>Request to please remove this or make this as optional, for us to comply.</p>	<p><u>Clause may be read as:</u></p> <p>Minimum 04 no's balanced audio Inputs (Optional)</p>
6	Resolution	Must support 4K UHD @60Hz RGB 4:4:4 on all inputs and outputs with RGB 4:4:4	<p>Request to please make resolution support as <b>“4096x2160@60Hz at 4:4:4”</b> as asked in the description above for HDMI switcher.</p> <p>To keep Switcher, Transmitter and Receivers signal in same format resolution.</p> <p>All the reputed OEM, have the product supporting the same.</p>	<p><u>Clause may be read as:</u></p> <p><b>“Must support 4K UHD @60Hz 4:4:4 on all inputs and outputs with data rate of 18 Gbps”</b></p> <p>The switcher must support 4K UHD @60Hz 4:4:4 resolutions across all input and output ports. All input and output ports must comply with a minimum data rate of 18 Gbps.</p>



13	Audio Sampling Rate	Up to 192 kHz	Request to please modify as <b>“minimum Digital-To-Analog Conversion 24-bit 48 kHz”</b> for us to comply	<b><u>Clause may be read as:</u></b>  <b>“Minimum Digital-To-Analog Conversion 24-bit 48 kHz”</b>
14	HDR Support	Should support HDR10, Dolby Vision, HLG	Request to please remove “Dolby Vision, HLG” for us to comply.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  “Should support HDR10/Dolby Vision/ HLG”
15	Signal Management	Should have built in signal re-clocking, cable equalization, Pixel Accurate Reclocking, and zero frame delay.	<b>Terms mentioned are proprietary to single OEM, please help to remove or make it as equivalent. Link below from the OEM page.</b>  <b>Proprietary Lightware technologies like Pixel Accurate Reclocking</b>  <a href="https://lightware.com/pub/media/lightware/filedownloader/file/Essentials_of_Proprietary_Lightware_Technologies-compressed.pdf">https://lightware.com/pub/media/lightware/filedownloader/file/Essentials_of_Proprietary_Lightware_Technologies-compressed.pdf</a>	<b><u>Clause may be read as:</u></b>  Should have built in signal re-clocking, cable equalization.
16	Control and Connectivity	Should have built in Ethernet (RJ45), RS-232, USB control interfaces	Please modify as <b>“Should have built in Ethernet (RJ45) or RS-232, USB control Interfaces”</b> As using LAN port to control the device is easy during installation and do not require special termination of cables.	<b><u>Clause may be read as:</u></b>  Should have built in Ethernet (RJ45)/RS-232, USB control interfaces

**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair transmitter with RS-232, IR, Ethernet and Bidirectional remote powering·  
Should support 4K UHD ® 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Queries / Suggestions	Response
2	Video resolution	4K UHD @60Hz RGB 4:4:4	Request to please make resolution support as “4096x2160@60Hz at 4:4:4” as mentioned in the HDMI switcher above. To keep Switcher, Transmitter and Receivers signal in same format resolution. All the reputed OEM, have the product supporting the same.	<b><u>Clause may be read as:</u></b>  “Must support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better
7	HDR Support	Should provide HDR and Low Latency Dolby Vision support	Request to please remove “Low Latency Dolby Vision support” for us to comply. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Dolby Vision/HLG/HDR
8	120Hz 3D video signals.	The transmitter shall be compatible with 120Hz 3D video signals.	This is supported by single OEM, also this is not asked in the HDMI switcher, request to please make this as optional. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  “Transmitter should support 3D video signals.”
9	HDCP compliance	Should support HDCP 2.3 or better	Request to please make this as “HDCP 2.2 or better” as HDCP 2.2 is asked in the HDMI switcher specification. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Should support HDCP 2.2 or better
11	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Please help on the requirement for 1x Ethernet port at Transmitter, in this scenario. Or Request to make this as optional.	<b><u>Clause may be read as:</u></b>  The specifications revised to: Should support extension of 1x Ethernet via RJ-45/ USB 2.0



**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair receiver with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD@ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Compliance	Response
2	Video resolution	4K UHD @60Hz RGB 4:4:4	Request to please make resolution support as "4096x2160@60Hz at 4:4:4" as mentioned in the HDMI switcher above. To keep Switcher, Transmitter and Receivers signal in same format resolution. All the reputed OEM, have the product supporting the same.	<b><u>Clause may be read as:</u></b>  "Must support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better.
7	HDR Support	Should provide HOR and Low Latency Dolby Vision support	Request to please remove "Low Latency Dolby Vision support" for us to comply. To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Dolby Vision/HLG/HDR.
8	120Hz 30 video signals.	The receiver shall be compatible with 120Hz 3D video signals.	This is supported by single OEM, also this is not asked in the HDMI switcher, request to please make this as optional.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  The specification revised to: The receiver shall be compatible with 3D video signals.
9	HDCP compliance	Should support HDCP 2.3 or better	Request to please make this as "HDCP 2.2 or better" as HDCP 2.2 is asked in the HDMI switcher specification.  To keep specification of Switcher, Transmitter and receiver same, to avoid any mismatch.	<b><u>Clause may be read as:</u></b>  Should support HDCP 2.2 or better
10	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Please help on the requirement for 1x Ethernet port at Receiver, in this scenario. Or Request to make this as optional.	<b><u>Clause may be read as:</u></b>  The specifications revised to: Should support extension of 1x Ethernet via RJ-45/ USB 2.0



Supply, Installation, Testing and commissioning of Premium High-Speed HDMI 2.0b Hybrid optical active cable.				
Sr. No.	Description	Specification Parameters	Queries / Suggestions	Response
11	Manufacturer	Should be from the same manufacturer as the Matrix switcher	Request to please make this as optional, as this is not asked for other line items.	<p><b><u>Clause may be read as:</u></b></p> <p>Should be from the same manufacturer as the Matrix switcher (Optional). But the cables should have RoHS/WEEE/CE Certifications</p>

Supply, Installation, Testing and commissioning of 8 port high voltage relay controller.				
Sr. No.	Description	Specification Parameters	Queries / Suggestions	Response
2	Control Interface	RS232C	Request to please modify as "RS-232C / LAN / Other as per OEM"	<p><b><u>Clause may be read as:</u></b></p> <p>RS232C/Ethernet/RS485</p>

## M/S. CTAP Systems

S. No.	Revised Technical specifications	Item Detail's	Quantity	Response
1	Supply, Installation, Testing and Commissioning of 16x16 Digital Matrix Switcher with Integrated Controller, redundant power supplies Should have capability to perform 16 in x16 Out of multiformat digital video matrix switching; should have 4K60 4:4:4 HDMI Input Card, 4K60 4:4:4 HDMI Output Card. The enclosure chassis unit should have 4 in + 4 out card slots for required 16 nos. of input & output;	16x16 Fixed/Modular HDMI Matrix Switcher	1	May Kindly refer the modified / updated Specifications.
2	SITC of HDBaseT 4K60 HDMI Transmitter Module, HDMI 2.0 4K60 4:4:4 Over Distance, High Dynamic Range (HDR) and Deep Color Support, HDCP 2.2 - Supports, High-speed USB 2.0, Resolution Support Up to 4096 x 2160p @ 60 Hz, 4:4:4, Resolution Support Up to 4096 x 2160p @ 60 Hz, 4:4:4, Compatible Formats: HDMI2.0, HDCP2.2, DVI, Twisted Pair Cable Type & Length Distances up to 328 ft (100 m) supported; etc.	Twisted Pair Transmitter	4	May Kindly refer the modified / updated Specifications.
3	SITC of HDBaseT 4K60 HDMI Reciever Module, HDMI 2.0 4K60 4:4:4 Over Distance, High Dynamic Range (HDR) and Deep Color Support, HDCP 2.2, USB 2.0, HDBaseT Compatible, Compatible Formats: HDMI2.0, HDCP2.2, DVI, Resolution Support Up to 4096 x 2160p @ 60 Hz, 4:4:4, HDMI Audio Audio Resolution: 16 bit to 24 bit; Audio Sample Rate: 32 kHz, 44.1 kHz, 48 kHz, 96 kHz, 192 kHz, HDCP2.2, Distances up to 328 ft (100 m) supported; etc.	Twisted Pair Receiver	4	May Kindly refer the modified / updated Specifications.
4	SITC of 4K60 4:4:4 Video Scaler with 1 x HDMI input and 1 x HDMI Output; should have HDCP 2.2 Support; should support Automatic Scaling etc.	4K HDMI scaler	2	May Kindly refer the modified / updated Specifications.
5	SITC of Integrated Controller should be powerful, secure and reliable device that can simultaneously process a virtually unlimited number of scripts written in JavaScript, Python, or Groovy and can also natively support a Flow-based programming environment; Controller should be engineered on a secure Linux or better platform; Controller should have status indicators. Controller without status indicators to indicate the system is communicating properly will not be accepted; Hardware / Software should be Built for 24/7/365 Operation, The controller must have 4GB of on-board DDR3 RAM; Controller must have a industrial grade 8GB eMMC non-volatile memory storage chip or better; Controller must have a USB-A Host port available for use with mass storage devices for convenient logging capabilities as well as to connect other devices such as the FLIRC IR receiver to add IR Hand Controls as an input to the	AV Control Processor	1	May Kindly refer the modified / updated Specifications.



	system; Controller must have a USB-C port allowing the programmer to connect directly to find and configure properties like the IP address, known devices, running programs, and many more; Controller must have standardised port numbering throughout the manufacturers controller family portfolio; Controller must have one LAN port for 10/100 BASE-T or better for ethernet communication; Controller must have one ICSLAN port in order to create an isolated network for controlled devices; Controller should have two 10 position serial port, six 5 position serial port, eight infrared/serial ports, eight contact closure ports, eight relay ports; should be supplied with external power supply adapter; etc.			
6	SITC of 10" - 12" or above Touch Panel; Should be fully configurable; Should have IPS LCD based Capacitive Multi-Touch with LED backlighting; Should support Any-Color Side LEDs; Ambient Light Sensor; Should have Built-in Zoom Rooms Controller, Should support Book Scheduling, Web Kiosk; Adjustable Security Modes, Resolution (WH) Landscape: 1920x1200 or better, Aspect Ratio (WH) Landscape: 16:10, Brightness 350 cd/m2 or better, Contrast Ratio 800:1 or better, RAM 4GB or better, storage 16GB or better, Ethernet RJ-45, POE 802.3af, 15.4W, Speakers 2 x 2 Watt, Compliance: UL, CE, CB, FCC Class B (-5dB); should be supplied along with angle tabletop stand for desktop operations; and PoE Injector; etc.	10 in. Tabletop (Touch Panel)	1	May Kindly refer the modified / updated Specifications.
7		16 port Gigabit Ethernet POE switch	1	May Kindly refer the modified / updated Specifications.
8		1.8 meters length Premium High-Speed HDMI Cable	18	May Kindly refer the modified / updated Specifications.
9		CAT 6A Shielded twisted pair cable	100 mtr.	May Kindly refer the modified / updated Specifications.
10		CAT 6 Unshielded twisted pair cable	300 mtr.	May Kindly refer the modified / updated Specifications.
11		Premium High-Speed HDMI 2.0b Hybrid optical active cable 15 meter	1	May Kindly refer the modified / updated Specifications.
12		Premium High-Speed HDMI 2.0b Hybrid optical active cable 20 Meter	3	May Kindly refer the modified / updated Specifications.



13		Premium High-Speed HDMI 2.0b Hybrid optical active cable 30 Meter	2	May Kindly refer the modified / updated Specifications.
14		8 port high voltage relay controller	1	May Kindly refer the modified / updated Specifications.
15		27U Equipment Rack	1	May Kindly refer the modified / updated Specifications.

## M/S. Electronics Junction

Supply, Installation, Testing and commissioning of 16x16 Fixed/Modular HDMI Matrix Switcher. Should provide minimum 16 no's HDMI 2.0 Inputs, 16 no's HDMI 2.0 outputs. Should Support 4096x2160@60Hz at RGB 4:4:4 (600MHz pixel clock) resolution and data rates up to 18 Gbps on all inputs and outputs. Should Support Audio Embedding and Audio De-embedding. Should Include redundant power source.

Sr No.	Description	Specification Parameters	Revised Specification	Response
1	Architecture	Fixed/Modular 16 input to 16 output, non-blocking architecture.	Modular architecture 16 input to 16 output, Matrix switcher	<u>Clause may be read as:</u>  No Change
6.	Resolution	Must support 4K UHD @60Hz RGB 4:4:4 on all inputs and outputs with RGB 4:4:4	Must support 4K @60Hz RGB 4:4:4 on all inputs and outputs with RGB 4:4:4	<u>Clause may be read as:</u>  "Must support 4K UHD @60Hz 4:4:4 on all inputs and outputs with data rate of 18 Gbps"  The switcher must support 4K UHD @60Hz 4:4:4 resolutions across all input and output ports. All input and output ports must comply with a minimum data rate of 18 Gbps.
9	Audio embedding and deembedding	Should support analog audio embedding to HDMI outputs and analog audio de-embedding from HDMI stream	Should support analog audio embedding to HDMI outputs and analog audio de-embedding from HDMI stream, shall support audio breakaway switching for independent routing of audio.	<u>Clause may be read as:</u>  Should support analog audio embedding to HDMI outputs and analog audio de-embedding from HDMI stream with or without breakaway Switching.
10	HDCP compliance	Should be minimum HDCP 2.2 compliant	Should be minimum HDCP 2.3 compliant	<u>Clause may be read as:</u>  HDCP 2.2 compliant or better.
13	Audio Sampling Rate	Up to 192 kHz	Request to remove this	<u>Clause may be read as:</u>  "Minimum Digital-To-Analog Conversion 24-bit 48 kHz"
14	HDR Support	Should support HDR10, Dolby Vision, HLG	Should support HDR10, Dolby Vision,	<u>Clause may be read as:</u>  "Should support HDR10/Dolby Vision /HLG"
15	Signal Management	Should have built in signal re-clocking, cable equalization, Pixel Accurate Reclocking, and zero frame delay	Should have built in signal re-clocking, cable equalization.	<u>Clause may be read as:</u>  Should have built in signal re-clocking, cable equalization.

18	Front panel control	should have Front panel LCD display for configuration and cross point control	should have Front panel LED's for Signal status and buttons for control	<u>Clause may be read as:</u> Should have Front panel LCD display for cross point control. (Optional)
19	Power Redundancy	Should have built-in redundant power supply	Should have built-in redundant power supply	<u>Clause may be read as:</u>
			Supplied Input and output cards should be hot swappable for easy operation and maintenance	No Change



**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair transmitter with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD @ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Revised Specification	Response
1	Transmission	Should Transmit HDMI 2.0, audio, Ethernet, RS-232 signal to 100m over one CAT6 cable	Should Transmit HDMI 2.0 and RS-232 signal to 100m over one CAT6 cable	<u>Clause may be read as:</u>  Should Transmit HDMI 2.0, audio, Ethernet/USB, RS-232 signal to 100m over one CATx cable.
2	Video resolution	4K UHD @60Hz RGB 4:4:4	4K @ 60Hz RGB 4:4:4	<u>Clause may be read as:</u>  "Must Support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better.
6	Digital Audio Formats	Should Support 7.1 HDMI embedded audio, Dolby TrueHD and DTS-HD Master Audio 7.1 formats.	Should Support HD lossless audio formats or multi-channel audio	<u>Clause may be read as:</u>  Device should support HD lossless /Multi channel audio"
8	120Hz 3D video signals.	The transmitter shall be compatible with 120Hz 3D video signals.	The transmitter shall support 3D signal	<u>Clause may be read as:</u>  "Transmitter should support 3D video signals."
11	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Request to Remove this	<u>Clause may be read as:</u>  Should support extension of 1x Ethernet via RJ-45/ USB 2.0
12	Control	Should provide RS232 and IR Extension via the same CATx cable.	Should provide RS232 or IR Extension via the same CATx cable.	<u>Clause may be read as:</u>  Should provide RS232/IR Extension via the same CATx cable.
13	Cable Equalization	Should provide automatic twisted pair cable equalization.	Request to Remove this	<u>Clause may be read as:</u>  Device shall support 4K resolution of 18 Gbps bandwidth upto 100 mtr over CATx cable.

**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair receiver with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD @ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Revised Specification	Response
1	Transmission	Should receive HDMI 2.0, audio, Ethernet, RS-232 signal to 100m over one CAT6 cable	Should Transmit HDMI 2.0 and RS-232 signal to 100m over one CAT6 cable	<u>Clause may be read as:</u> Should Receive HDMI 2.0, audio, Ethernet/USB, RS-232 signal to 100m over one CATx cable.
2	Video resolution	4K UHD @60Hz RGB 4:4:4	4K @60Hz RGB 4:4:4	<u>Clause may be read as:</u> "Must Support 4K UHD @60Hz 4:4:4 resolutions with a minimum data rate of 18 Gbps or better.
6	Digital Audio Formats	Should Support 7.1 HDMI embedded audio, Dolby TrueHD and DTS-HD Master Audio 7.1 formats.	Should Support HD lossless audio formats or multi-channel audio	<u>Clause may be read as:</u> Device should support HD lossless /Multi channel audio"
8	120Hz 3D video signals.	The receiver shall be compatible with 120Hz 3D video signals.	The receiver shall support 3D signal	<u>Clause may be read as:</u> "Transmitter should support 3D video signals."
10	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.	Request to Remove this	<u>Clause may be read as:</u> Should support extension of 1x Ethernet via RJ-45/ USB 2.0
11	Control	Should provide RS232 and IR Extension via the same CATx cable.	Should provide RS232 or IR Extension via the same CATx cable.	<u>Clause may be read as:</u> Should provide RS232/IR Extension via the same CATx cable.
12	Cable Equalization	Should provide automatic twisted pair cable equalization.	Request to Remove this	<u>Clause may be read as:</u> Device shall support 4K resolution of 18 Gbps bandwidth upto 100 mtr over CATx cable.



Supply, Installation, Testing and commissioning of 4K HDMI scaler having one or more HDMI inputs, One or more HDMI outputs.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
7	HDCP compliant	Should be HDCP 2.2 compliant or better.	Should be minimum HDCP 2.3 compliant or better	<u>Clause may be read as:</u> HDCP 2.2 compliant or better.
12	Built-in Web page	The unit should be controllable through a standard web browser, allowing for monitoring, troubleshooting, and firmware updates via a web interface.	The unit should be controllable through a standard web browser, allowing for monitoring, troubleshooting, and firmware updates via a web interface/ software .	<u>Clause may be read as:</u> The unit should be controllable through a standard web browser, allowing for monitoring, troubleshooting, and firmware updates via a web interface/ software

Supply, Installation, Testing and Commissioning of AV Control Processor having 3x COM ports, 8 x IR/serial ports, 8 x I/O ports, 8 x relay ports and Gigabit Ethernet port.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
3	Memory Expansion	Should support SD cards up to 32 GB and USB mass storage devices up to 1 TB	Remove this	<u>Clause may be read as:</u> Removed.
4	Software Architecture	Should provide modular programming architecture that allows programmer to develop and run independent and device-specific programs. Should have integrated development environment (IDE) from the same manufacturer.	Should provide programming architecture that allows programmer to develop and run independent and device-specific programs. Should have integrated development environment (IDE) from the same manufacturer.	<u>Clause may be read as:</u> Should provide programming architecture that allows programmer to develop and run independent and device-specific programs. Should have integrated development environment (IDE) from the same manufacturer.
6	IR/SERIAL Ports	Minimum 8 x IR/1-way serial Ports.	Minimum 2 x IR/1-way serial Ports.	<u>Clause may be read as:</u> Minimum 2 x IR/1-way serial Ports.
7	I/O Ports	Minimum 8 x I/O ports configurable as digital input/output or analog input ports.	Minimum 4 x I/O ports configurable as digital input/output or analog input ports.	<u>Clause may be read as:</u> Minimum 4 x I/O ports configurable as digital input/output or analog input ports.
8	Relay Ports	Minimum 8 x relay ports rated @1 A, 30 VAC/VDC	Minimum 4 x relay ports rated @1 A, 24 VAC/VDC	<u>Clause may be read as:</u> Min 4x Relay ports rated @1 A, 24 VAC/VDC



14	Security	Should provide enterprise-class network security and authentication	Should provide enterprise-class network security and authentication	
			Device shall support dual network for customer network segregation	<u>Clause may be read as:</u> No Change.

Supply, Installation, Testing and commissioning of 10 in. Tabletop capacitive touch screen display for controlling of AV System.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
2	Resolution	Minimum 1920 x 1200 or higher	Minimum 1280x800 or higher	<u>Clause may be read as:</u> Minimum 1280x800 or higher
5	Touch Screen	Projected capacitive, minimum 5-point multi-touch capable	Projected capacitive touch screen	<u>Clause may be read as:</u> Capacitive Touch screen
6	Memory	Minimum 2 GB LPDDR3, 16 GB eMMC.	Minimum 2 GB RAM, 8 GB Storage or more	<u>Clause may be read as:</u> Minimum 2 GB RAM, 8 GB Storage or more
8	Proximity sensor	Should have built-in proximity sensor to wake up the screen without requiring any user interaction, and automatic brightness control for optimal visibility under varying lighting conditions.	Should have built-in proximity/Motion sensor to wake up the screen without requiring any user interaction, and automatic brightness control for optimal visibility under varying lighting conditions.	<u>Clause may be read as:</u> Should have built-in proximity/Motion sensor to wake up the screen without requiring any user interaction, and automatic brightness control for optimal visibility under varying lighting conditions.
9	Zoom Rooms and Microsoft Teams App	Should support conferencing control applications such as Zoom Rooms App and Microsoft Teams App	Remove this as proprietary terms	<u>Clause may be read as:</u> Removed
10	Speaker and Microphone	Should have built-in speakers and microphone	Should have built-in speakers for touch feedback	<u>Clause may be read as:</u> Should have built-in speakers for touch feedback
12	Ethernet	Should provide 100 Mbps Ethernet connectivity over RJ45, half/full duplex with AutoDetect	Should support 1000Base-T, half/full duplex with AutoDetect	<u>Clause may be read as:</u> Should support 100Base-T or better, half/full duplex with AutoDetect
13	Security	Should support 64 and 128-bit WEP, WPA and WPA2-PSK with TKIP and AES	Should support HTTPS, IEEE 802.1x, SFTP, SSH	<u>Clause may be read as:</u> Should support HTTPS, IEEE 802.1x, SFTP, SSH

Supply, Installation, Testing and commissioning of 1.8 meters length Premium High-Speed HDMI cable.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
4	Signal transmission	Should support transmission of High Dynamic Range (HDR10), Dolby Vision video.	Remove this	<u>Clause may be read as:</u> "Should support transmission of High Dynamic Range or better "
5	EMI protection	Should have shielding for EMI protection	Remove this	<u>Clause may be read as:</u> Optional
7	Bending Radius	Should have bend radius of 20 mm or lower	Should have bend radius of 20.3 mm or lower	<u>Clause may be read as:</u> Should have bend radius of 20.3 mm or lower

Supply, Installation, Testing and commissioning of Premium High-Speed HDMI 2.0b Hybrid optical active cable.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
3	Resolution support	Should support 4K@60Hz, (4:4:4) 3D and Deep color	Should support 4K@60Hz, (4:4:4)	<u>Clause may be read as:</u> Should support 4K@60Hz, (4:4:4), 3D and Deep color (Optional)
4	Signal transmission	Should support transmission of HDCP, EDID, CEC, DDC, HEC, ARC, HDR	Should support transmission of HDCP, EDID, CEC, HDR	<u>Clause may be read as:</u> Should support transmission of HDCP, EDID, CEC, HDR
8	Material	OM3 Fiber and copper wire	Fiber and copper wire	<u>Clause may be read as:</u> Fiber and copper wire

Supply, Installation, Testing and commissioning of CAT6A shielded twisted pair cable.				
Sr No.	Description	Specification Parameters	Revised Specification	Response
1	Cable Construction	4-Pair, 23 AWG Solid Bare Copper conductors, S/FTP LSZH	4-Pair, 23 AWG Solid Bare Copper conductors, S/FTP.	<u>Clause may be read as:</u> 4-Pair, 22 AWG or better Solid Bare Copper conductors, S/FTP
4	Conductor	23 AWG Solid copper	22 AWG Solid copper	<u>Clause may be read as:</u> 22 AWG or better
6	Bandwidth	10GBase-T	Remove this	<u>Clause may be read as:</u> Ensure signal integrity of uncompressed HDMI 2.0



### **Scope of Work:**

The bidder is responsible for supplying, installation, testing and commissioning (SITC) of the items as per technical specifications/details enclosed at Annexure I and II. The vendor is to do the site visit for estimations of laying and conducting the cables.

The bidder is requested to supply, install and commission the items as per Annexure I and II. He is also requested to visit the site (if required) for estimations of laying and conducting the cables etc. The supplied product needs to be compatible with the existing VC infrastructure installed at CSIR Hqrs. and CSIR laboratories such as Video Conferencing endpoints Group 500 and Group 700 Polycom Video Conference Device for IP & Cloud VC (G7500), X50, X70, Clarity 2.0 (RMX 2000, DMA 7000, RPRM) and display devices like Samsung, Panasonic, LG, Sony etc. However, bidder needs to arrange the HDMI cables, Data cables, Audio cable, connector, converter, active adapter etc. (HDMI to DP, HDMI to DVI, Audio Cables and connectors etc.,) required for integration of the devices.

The vendor needs to complete the overall SITC of the equipment's specified in Annexure –I and II with complete Accessories, Cables (HDMI, DVI, DP, C-Port, LAN cables, Audio Cables, Power cord) and all type of connectors etc. or any other accessory required to make the system integration functional. The cables supplied with the equipment's should be 4K compatible.

### **Qualification criteria/Eligibility Criteria: -**

This bid is open for firms/companies eligible to do business in INDIA, under relevant Indian Law as in force; except those who have been declared by Govt. of India/ Govt. of NCT Delhi, to be ineligible to participate, for Fraud, Corrupt, Fraudulent practices, for the period for which such ineligibility is declared. The bids can be submitted by the Firms/companies, who fulfil the following qualification/Eligibility criteria (Documentary Proofs must be submitted along with the Technical part of the bid).

1. The Bidder should be in similar business for last 3 years for supply, installation, testing and commissioning of Audio / Video devices.
2. The Bidder should have a minimum annual turnover of Rs. 30 Lakhs (Rs. 30 Lakhs) for last three consecutive years 2021-22 and 2022-23, 2023-2024. (Documentary proof of needs to be submitted).
3. The bidder should have executed at least three orders for similar nature i-e of Video Conferencing Devices/Audio Visual Integration for any Govt./Public sector/Autonomous body/Financial Institution /Academics instt. in last 3 years.
4. The bidder should have valid authorization certificate from OEM for equipment's quoted in Annexure – I for S. No. 1 for providing services (Valid documentary Proof may be attached).



5. The bidder should have presence in NCR/New Delhi, with service/ Maintenance Centre and service engineers. (Details of Service Centre's and Service engineers may be submitted).
6. The bidder should have valid ISO 9001:2015 or revised/higher certificate (Valid documentary proof may be attached).
7. The bidder should have valid documentary proof for GST No./Service Tax registration number. Income Tax registration (PAN).
8. Undertaking on Company's Letterhead stating that all the tender conditions are acceptable to the bidder.

The Bidder should supply the latest items as per the list mentioned in Annexure –I and the Life Cycle of Items should be upto 5 to 7 years the as on date of purchase.

CSIR reserves the right to verify/seek confirmation of all original documentary evidence submitted by vendors in support of above-mentioned clauses of eligibility criteria in case any information furnished by the bidder is found to be false /incorrect at any stage, the bid shall be summarily rejected and no correspondence on the same shall be entertained.

The bidder will have bear all costs associated with preparation and submission of the bid.

The vendor must fulfil the above eligibility criteria/ pre-qualification conditions. Technical bid of vendors fulfilling the pre-qualification conditions will only be evaluated by the duly constituted technical evaluation committee. Bid of vendors not fulfilling the Eligibility – criteria given above will be summarily rejected. Undertaking for subsequent submission of any of the above documents will not be entertained under any circumstances.

### **Deliverables**

The contractor will be responsible for Supply, Installation, Testing and Commissioning (SITC), which will include the complete interfacing of AV equipment with all existing audio-visual & VC system. Detail of existing system is annexed at Annexure – VI.

- a) The bidder needs to ensure that the resolution of any display device should not drop due to signal loss in HDMI/Fiber cable.
- b) The vendor shall address the problem (if any) within 24 hours and in case of replacement of part /system/subsystem of the AV system shall rectify the problem within minimum 48 hours, after getting report of problem either through phone/fax/email. The contractor shall sign Service Level Agreement (SLA) as per the (Annexure-V) to provide smooth and seamless AV system services at CSIR. The penalty clause may be invoked by CSIR, if any equipment under contract remains faulty and non-functional beyond 48 hours of reporting of the problem.
- c) The contractor shall undertake preventive maintenance on quarterly basis. This would involve cleaning of AV system /sub-systems, upgradation of firmware/ patches/

software released by OEM from time to time for equipment's commissioned at CSIR during the entire warranty period.

- d) In emergency cases, the Contractor might be asked to provide services beyond normal working hours and on holidays at no extra cost.
- e) The Contractor shall make changes in the hardware system as per the reliability improvement notice, logic improvement notice, engineering improvement notice issued by manufacturer from time to time in the existing system.
- f) The vendor needs to supply all accessories like HDMI cables, Cat 6 cable, Active converter, connectors, IR probe, relays and wireless access point etc. for installation and commissioning.

The major responsibilities of the bidder shall include Supply, Installation, Acceptance Testing, Commissioning, and integration with existing system installed at CSIR Hq (Annexure – VI), Documentation, handholding and three years On-Site Comprehensive Warranty Maintenance of installed items and its components. The bidders need to provide the cables along with converter for connecting the display unit to codec & Matrix Switcher for all the ports (HDMI to DVI, HDMI to DP etc)

Annexure-IList of Item's

S. No.	Item Detail's	Quantity
1	16x16 Fixed/Modular HDMI Matrix Switcher	01
2	Twisted Pair Transmitter	04
3	Twisted Pair Receiver	04
4	4K HDMI scaler	02
5	AV Control Processor	01
6	10 in. Tabletop (Touch Panel)	01
7	16 port Gigabit Ethernet POE switch	01
8	1.8 meters length Premium High-Speed HDMI cable	18
9	CAT 6A Shielded twisted pair cable	100 mtr.
10	CAT 6 Unshielded twisted pair cable	300 mtr.
11	Premium High-Speed HDMI 2.0b Hybrid optical active cable 15 Meter	01
12	Premium High-Speed HDMI 2.0b Hybrid optical active cable 20 Meter	03
13	Premium High-Speed HDMI 2.0b Hybrid optical active cable 30 Meter	02
14	8 port high voltage relay controller	01
15	27U Equipment Rack	01



**Annexure-II**

Technical Specification				
Supply, Installation, Testing and commissioning of 16x16 Fixed/Modular HDMI Matrix Switcher. Should provide minimum 16 no's HDMI 2.0 Inputs, 16 no's HDMI 2.0 outputs. Should Support 4096x2160@60Hz at RGB 4:4:4 (600MHz pixel clock) resolution and data rates up to 18 Gbps on all inputs and outputs. Should Support Audio Embedding and Audio Deembedding. Should Include redundant power source.				
Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Architecture	Fixed/Modular 16 input to 16 output, non-blocking architecture.		
2	HDMI Inputs	Minimum 16 no's HDMI 2.0 Inputs		
3	HDMI Outputs	Minimum 16 no's HDMI 2.0 outputs		
4	Audio Inputs	Minimum 04 no's balanced audio Inputs		
5	Audio Outputs	Minimum 04 no's balanced audio Outputs		
6	Resolution	Must support 4K UHD @60Hz RGB 4:4:4 on all inputs and outputs with RGB 4:4:4		
7	Data Rate	Should support minimum 18 Gbps on all HDMI Input and output ports		
8	EDID	Should provide comprehensive EDID Management with customizable EDID tables and ability to import and export EDID from/to a PC.		
9	Audio embedding and deembedding	Should support analog audio embedding to HDMI outputs and analog audio de-embedding from HDMI stream		
10	HDCP compliance	Should be minimum HDCP 2.2 compliant		
11	Digital Audio Formats	Should Support PCM, Dolby Digital, DTS, Dolby TrueHD, DTS-HD Master Audio		
12	Audio Channels	Up to 8 channels		
13	Audio Sampling Rate	Up to 192 kHz		
14	HDR Support	Should support HDR10, Dolby Vision, HLG		
15	Signal Management	Should have built in signal re-clocking, cable equalization, Pixel Accurate Reclocking, and zero frame delay		
16	Control and Connectivity	Should have built in Ethernet (RJ45), RS-232, USB control interfaces		
17	Web Interface	Should have Built in Web Interface		
18	Front panel control	should have Front panel LCD display for configuration and cross point control		
19	Power Redundancy	Should have built-in redundant power supply		

**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair transmitter with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD @ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Transmission	Should Transmit HDMI 2.0, audio, Ethernet, RS-232 signal to 100m over one CAT6 cable		
2	Video resolution	4K UHD @60Hz RGB 4:4:4		
3	Signal Type	Should support HDMI 2.0, HDMI 1.4, Single-Link DVI		
4	Data rate	Should support Data rate of minimum 18 Gbps		
5	Pixel clock	Minimum 600 MHz or higher		
6	Digital Audio Formats	Should Support 7.1 HDMI embedded audio, Dolby TrueHD and DTS-HD Master Audio 7.1 formats.		



7	HDR Support	Should provide HDR and Low Latency Dolby Vision support		-
8	120Hz 3D video signals.	The transmitter shall be compatible with 120Hz 3D video signals		
9	HDCP compliance	Should support HDCP 2.3 or better		
10	EDID	Should support both pass-through EDID from connected device and stored EDID		
11	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45.		
12	Control	Should provide RS232 and IR Extension via the same CATx cable.		
13	Cable Equalization	Should provide automatic twisted pair cable equalization.		
14	Power	The transmitter must have an option for selecting local or remote power functions. Also has the function of remote powering the connected receiver. Extension must be provided by a single CAT cable.		

**Supply, Installation, Testing and commissioning of 4K HDMI 2.0 twisted pair receiver with RS-232, IR, Ethernet and Bidirectional remote powering; Should support 4K UHD @ 60Hz RGB 4:4:4, data rate: 18 Gbps.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Transmission	Should receive HDMI 2.0, audio, Ethernet, RS-232 signal to 100m over one CAT6 cable		
2	Video resolution	4K UHD @60Hz RGB 4:4:4		
3	Signal Type	Should support HDMI 2.0, HDMI 1.4 Single-Link DVI		
4	Data rate	Should support Data rate of minimum 18 Gbps		
5	Pixel clock	Minimum 600 MHz or higher		
6	Digital Audio Formats	Should Support 7.1 HDMI embedded audio, Dolby TrueHD and DTS-HD Master Audio 7.1 formats.		
7	HDR Support	Should provide HDR and Low Latency Dolby Vision support		
8	120Hz 3D video signals.	The receiver shall be compatible with 120Hz 3D video signals.		
9	HDCP compliance	Should support HDCP 2.3 or better		
10	Ethernet	Should support extension of 1x 1000Base-T (1 Gbps) Ethernet via RJ-45		
11	Control	Should provide RS232 and IR Extension via the same CATx cable.		
12	Cable Equalization	Should provide automatic twisted pair cable equalization.		
13	Power	The receiver must have an option for selecting local or remote power functions. Also has the function of remote powering the connected transmitter. Extension must be provided by a single CAT cable.		

**Supply, Installation, Testing and commissioning of 4K HDMI scaler having one or more HDMI inputs, One or more HDMI outputs.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	HDMI Input	Minimum 1 x HDMI 2.0 or higher		
2	HDMI Output	Minimum 1 x HDMI 2.0 or higher		
3	Input Resolution	Should accept HDMI video input from 480i to 4096x2160 @ 4:4:4 or higher		
4	Scaled output resolution	Should support selectable scaled HDMI output resolutions from 640x480@60Hz up to 4096x2160p@60Hz (4:4:4, 8-bit)		
5	Data Rate	Should support minimum 18Gbps or higher on input and output		



6	Signal Processing	Should support 30 bits per pixel video processing and 4:4:4 chroma sampling.		
7	HDCP compliant	Should be HDCP 2.2 compliant or better.		
8	EDID	Should have integrated EDID management feature with stored and custom EDID.		
9	Scaling features	Should support frame rate conversion, motion adaptive de-interlacing, and automatic 3:2/2:2 pull-down detection.		
10	HDCP authorization	The unit should have user-selectable HDCP authorization feature, allowing it to appear as either HDCP compliant or non-HDCP compliant to the connected source.		
11	Aspect ratio	The unit should provide selectable options for full-screen output or maintain the original aspect ratio of the input signal.		
12	Built-in Web page	The unit should be controllable through a standard web browser, allowing for monitoring, troubleshooting, and firmware updates via a web interface.		

**Supply, Installation, Testing and Commissioning of AV Control Processor having 3x COM ports, 8 x IR/serial ports, 8 x I/O ports, 8 x relay ports and Gigabit Ethernet port.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Hardware Architecture	Rack-mountable AV control system with a multicore CPU and integrated control ports		
2	Memory	Minimum 2 GB or higher SDRAM, minimum 8GB or higher Flash		
3	Memory Expansion	Should support SD cards up to 32 GB and USB mass storage devices up to 1 TB		
4	Software Architecture	Should provide modular programming architecture that allows programmer to develop and run independent and device-specific programs. Should have integrated development environment (IDE) from the same manufacturer.		
	Driver Support	Should provide and support device drivers for AV Devices from leading manufacturers.		
5	COM Ports	Minimum 1x Bidirectional RS-232/422/485 port. 2x Bidirectional RS-232 ports.		
6	IR/SERIAL Ports	Minimum 8 x IR/1-way serial Ports.		
7	I/O Ports	Minimum 8 x I/O ports configurable as digital input/output or analog input ports.		
8	Relay Ports	Minimum 8 x relay ports rated @1 A, 30 VAC/VDC		
9	Ethernet	Should provide 10/100/1000Base-T port over RJ45, half/full duplex with AutoDetect		
10	BUS	Should provide 4 Wire low voltage BUS connectivity to connect devices from same family.		
11	Ethernet monitoring and control	Should be able to manage, monitor, and control AV devices using a standard Ethernet network.		
12	BMS Support	Should support BACnet, and DALI natively or via additional modules		
13	App Control	Device must support iOS app based control, Android app based control and web based control without any additional software license		
14	Security	Should provide enterprise-class network security and authentication		



**Supply, Installation, Testing and commissioning of 10 in. Tabletop capacitive touch screen display for controlling of AV System**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Touchscreen	Minimum 10 in. or bigger widescreen active-matrix color display with capacitive touch		
2	Resolution	Minimum 1920 x 1200 or higher		
3	Brightness	Minimum 400 nits (cd/m <sup>2</sup> ) or higher		
4	Viewing Angle	±80° horizontal, ±80° vertical		
5	Touch Screen	Projected capacitive, minimum 5-point multitouch capable		
6	Memory	Minimum 2 GB LPDDR3, 16 GB eMMC.		
7	Programming	Must be custom-programmable to have control buttons and support for HTML5-based User interfaces.		
8	Proximity sensor	Should have built-in proximity sensor to wake up the screen without requiring any user interaction, and automatic brightness control for optimal visibility under varying lighting conditions.		
9	Zoom Rooms and Microsoft Teams App	Should support conferencing control applications such as Zoom Rooms App and Microsoft Teams App		
10	Speaker and Microphone	Should have built-in speakers and microphone		
11	Power	Should support PoE (Power over Ethernet).		
12	Ethernet	Should provide 100 Mbps Ethernet connectivity over RJ45, half/full duplex with autodetect		
13	Security	Should support 64 and 128-bit WEP, WPA and WPA2-PSK with TKIP and AES		

**Supply, Installation, Testing and commissioning of minimum 16 port Gigabit Ethernet POE switch.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Ports	Minimum 16 x Gigabit Ethernet RJ-45 ports		
2	Number of PoE Ports	Minimum 8 x PoE Ports with total power budget of 64W or higher.		
3	Switching capacity	Minimum 16 Gbps or higher.		
4	MAC table	Should support 2K addresses		
5	Quality of Service (QoS)	Should support 802.1p priority based, priority queuing and Weighted Round-Robin (WRR)		
6	Loop detection	Should support loops discover in the network to avoid broadcast storms		
7	LEDs	Should have LEDs indications for power, link/activity, PoE		
8	Mounting	Should be rack mountable		
9	Scaling features	Should support frame rate conversion, motion adaptive de-interlacing, and 3:2/2:2 pull-down detection.		

**Supply, Installation, Testing and commissioning of 1.8 meters length Premium High-Speed HDMI cable.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Length	Minimum 1.8 Mtrs or higher		
2	Cable Construction	HDMI 2.0 Male to Male flexible cable		
3	Resolution support	Should support 4096x2160@60Hz at RGB 4:4:4 or higher		



4	Signal transmission	Should support transmission of High Dynamic Range (HDR10), Dolby Vision video.		
5	EMI protection	Should have shielding for EMI protection		
6	Bandwidth	Minimum 18Gbps or higher		
7	Bending Radius	Should have bend radius of 20 mm or lower		
8	Connectors	Should have Gold-plated pin in the connectors		

**Supply, Installation, Testing and commissioning of CAT6A shielded twisted pair cable.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Cable Construction	4-Pair, 23 AWG Solid Bare Copper conductors, S/FTP LSZH		
2	Data Category:	Category 6A		
3	Nominal Impedance	100 Ohm or lower		
4	Conductor	23 AWG Solid copper		
5	Shielding	Cable should have tinned copper braid shield, each pair with foil shield		
6	Bandwidth	10GBase-T		

**Supply, Installation, Testing and commissioning of CAT6 unshielded twisted pair cable.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Cable Construction	4-Pair, 23 AWG Solid Bare Copper conductors, U/UTP		
2	Data Category:	Category 6		
3	Nominal Impedance	100 Ohm or lower		
4	Conductor	23 AWG Solid copper		
5	Bandwidth	100BaseTX		

**Supply, Installation, Testing and commissioning of Premium High-Speed HDMI 2.0b Hybrid optical active cable.**

Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Length	Lengths: 15 Meters, 20 Meters, 30 Meters		
2	Cable Construction	HDMI 2.0 Hybrid optical active cable		
3	Resolution support	Should support 4K@60Hz, (4:4:4) 3D and Deep color		
4	Signal transmission	Should support transmission of HDCP, EDID, CEC, DDC, HEC, ARC, HDR		
5	Audio Signal	should support multi-channel audio, Dolby True HD, DTS-HD Master Audio		
6	EMI protection	Should have shielding for EMI protection		
7	Datarate	Minimum 18Gbps or higher		
8	Material	OM3 Fiber and copper wire		
9	Connectors	Should have Gold-plated pin in the connectors		
10	Power	Should not require any external power source		
11	Manufacturer	Should be from the same manufacturer as the Matrix switcher		

Supply, Installation, Testing and commissioning of 8 port high voltage relay controller.				
Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Power rating	230V/7A, 8 Relay (AC)		
2	Control Interface	RS232C		

Supply, Installation, Testing and commissioning of 27U Equipment Rack. Dimension: 600 x 800.				
Sr No.	Description	Specification Parameters	Compliance	Deviation (Yes/No)
1	Dimension	Height: Minimum 27U or higher, Width: 600mm or higher, Depth: 800mm or higher.		
2	Frame	Frame structure made of aluminium powder coated with powder coating		
3	Top and button cover	Top and button cover should be made of CRCA sheet with powder coating		
4	Front door	Should provide front glass door made up of minimum thickness of 4mm glass with metal frame		
5	Protection against solid objects	should provide protection against solid objects larger than 12.5mm in diameter		
6	Corrosion Resistance	Should be corrosion resistant		
7	Powder coating	Should have thickness of minimum 60 micron or higher. Should provide resistance to cleaning agents		
8	Electrical Continuity	All the electrical components and main metal parts such as Top Cover, Doors, Side Panels should be connected to earthing		
9	Cable manager	Should be provided with required cable managers		
10	Castor	Should be provided with 4 castors of 3 inch dia, 2 of which should have brakes		
11	Power Distribution Unit	Should be provided with Horizontally/vertically mounted Power Distribution Units as per requirement and 5 extra socket		
12	Cooling Fan	Should be provided with 2x top cover mounted cooling fans.		
13	Accessories	Should be provided with required accessories such as mounting hardware, Tray etc. as per requirement.		



## Annexure – III

Price Bid

S. No.	Item Detail's	Quantity (a)	Price per Unit (b) (in Rs.)	Total Price $c=(a*b)$ (in Rs.)	Taxes (if any) (d) (in Rs.)	Total price (in Rs.) $e= (c+d)$
		A	B	C	D	E
1	16x16 Fixed/Modular Matrix Switcher					
2	Twisted Pair Transmitter					
3	Twisted Pair Receiver					
4	4K HDMI scaler					
5	AV Control Processor					
6	10 in. Tabletop or more (Touch Panel)					
7	16 port Gigabit Ethernet POE switch					
8	1.8 meters length Premium High-Speed HDMI cable					
9	CAT 6A Shielded twisted pair cable					
10	CAT 6 Unshielded twisted pair cable					
11	Premium High-Speed HDMI 2.0b Hybrid optical active cable 15 Meter					
12	Premium High-Speed HDMI 2.0b Hybrid optical active cable 20 Meter					
13	Premium High-Speed HDMI 2.0b Hybrid optical active cable 30 Meter					
14	8 port high voltage relay controller					
15	27U Equipment Rack					
	Total (In amount and Words)					

**NOTE:-** 1) The quantity mentioned above are indicative, however payments would be made on actual basis.

2) The overall L1 would be decided on the Total price of Column. E of the Price bid.

3) In case of any discrepancy in Numeric and words, the words would be considered as final Quote.

## Annexure- IV

Check list

S No.	Documents submitted with Technical Bid (Part – 1)	Compliance Yes /no	Remarks/ deviation, if any
1.0	Have you submitted the EMD?		
2.0	Eligibility /pre- qualification Conditions		
a	The Bidder should be in similar business for last 3 years for supply, installation, testing and commissioning of Audio / Video devices.		
b	The Bidder should have a minimum annual turnover of Rs. 30 Lakhs (Rs. 30 Lakhs) for last three consecutive years 2021-22 and 2022-23, 2023-2024. (Documentary proof of needs to be submitted).		
c	The bidder should have executed at least three orders for similar nature i.e of Video Conferencing Devices/Audio Visual Integration for any Govt./Public sector/Autonomous body/Financial Institution /Academics instt. in last 3 years.		
d	The bidder should have valid authorization certificate from OEM for equipment's quoted in Annexure – I for S. No. 1 for providing services (Valid documentary Proof may be attached).		
e	The bidder should have presence in NCR/New Delhi, with service/ Maintenance Centre and service engineers. (Details of Service Centre's and Service engineers may be submitted).		
f	The bidder should have valid ISO 9001:2015 or revised/higher certificate (Valid documentary proof may be attached).		
g	The bidder should have valid documentary proof for GST No./Service Tax registration number, Income Tax registration (PAN)		
h	Undertaking on Company's Letterhead stating that all the tender conditions are acceptable to the bidder.		
g	Have you attached the life cycle/Roadmap details of Quoted Items as per Annexure-I		



**SLA (Service Level Agreement)**

The successful bidder has to enter into a SLA as per the terms and conditions as mentioned below: -

**Purpose**

The purpose of this Service Level Agreement (SLA) will be to formalize an agreement between CSIR and the vendor to provide the Warranty and services, at agreed-upon cost. This document will be intended to provide warranty and support services with general terms & conditions as mentioned here under: -

**Time Frame to rectify faults, replacement of parts/subsystem and Penalties**

- Comprehensive Maintenance Service calls, for all the equipment shall be attended to within 2 (Two) hours of receipt of the service call, either over phone or in person in case the parts get faulty.
- In case the complaint is not addressed within 24 hours of raising the complaint the Bidder has to provide a standby system within 48 hours for satisfactory operation, failing which a penalty may be charged @0.25% of the contract value per day subject to a maximum of 10% of the warranty charges of that system/item for delayed period.
- The contractor shall ensure that the equipment is in good working condition and is with full configuration while handing over at the end of the contract period.

**Vendor warranty and represents to the CSIR that:**

- There shall be no limitation of liability in case of any damages for bodily injury (including death) and damage to real property and tangible personal property, consequent to jobs undertaken by the contractor.
- Neither this Agreement nor the SLA grants or creates any rights, benefits, claims, obligations or causes of action in, to or on behalf of any person or entity other than between the respective Parties to this Agreement or the SLA, as the case may be.

**Excusable Calls:**

- Any Failure, which is agreed due to uncontrollable parameters, like Power, Network Jam, etc...
- Downtime planned for prescheduled changes / Maintenance activities
- Any failure that is due to end user operational errors, non-standard products

- Unavoidable natural / unnatural calamities, accidents etc...

#### **Contract Period:**

- The contract can be terminated at any point of time, without any notice Period, if the performance is found to be unsatisfactory.
- CSIR reserves the right to change of resources if not found capable or Competent to perform the assigned functions.

#### **Preventive Maintenance & Breakdown in services**

- Regular preventive maintenance visits shall be made by the firm at least once in three months to ensure upkeep of the equipment. This would involve cleaning of the Matrix Switcher and other equipment's (Transmitter, Receiver, Scaler, etc.) upgradation of Firmware/Software version. Any fault brought to the firm's notice either during such routine calls or otherwise informed by CSIR officials, shall be arranged to be responded.
- The preventive maintenance of the system should be carried out in the presence of the CSIR's personnel.
- A schedule for preventive maintenance will be drawn by the contractor and submitted to the IT Division well in advance. It will be in such a manner that all the equipment falling within the purview of the contract is covered in a systematic manner every three months.
- Unscheduled on-call corrective and remedial maintenance services are to be given to rectify the malfunctioning of the system. This will include supply and replacement of parts.

#### **Other General term & Conditions**

- CSIR also reserve the right to upgrade the equipment to meet its changing needs, as and when required. The system and accessories, being assets of CSIR may be subjected to intra-departmental transfer of assets including relocating them at a different place. The bidder should extend the service to install the system at the new location without additional cost. The tenderer should undertake such up-gradation/ replacement/ transplantation of such components without additional cost. In case of replacement the replaced device should be of the same make (if available) as of faulty device otherwise feature of the device either be of equivalent or higher.
- **Quantities:** The quantities of various items given in the Schedules (Annex- I) for provision of warranty are only indicative and are for the guidance of the contractor. As far as possible, they have been assessed correctly but are likely to vary during the execution of the work. However, the allied services to be provided is independent of the number / type / make of the equipment's available at the locations mentioned in



the schedule and shall also include all the equipment's to be added in the future, during the currency of the contract. No increase in the service charges is permissible for such addition of equipment

- **Safety Norms:** The Following Safety Norms must be followed by the Contractor
  - (a) The contractor should take all precautionary measures in order to ensure the protection of his own personnel moving about or working on the CSIR premises and should conform to the rules and regulations of the CSIR.

The Contractor should abide by all CSIR regulations in force from time to time and ensure that his representatives, agents or sub-contractors or workmen follow the same.

The contractor should ensure that unauthorized, careless or inadvertent operation of installed equipment, which may result in accident to staff, and / or damage to equipment does not occur.

The Contractor should indemnify and keep the purchaser indemnified and harmless against all actions, suits, claims, demands, costs, charges or expenses arising in connection with any accident, death or injury, sustained by any person or persons within the CSIR premises and any loss or damage to property belonging to the CSIR, sustained due to the acts or omissions of the contractor irrespective of whether such liability arises under the workmen's compensation act or the fatal accidents act or any other statute in force from time to time.

## Annexure- VI

Detail of existing system						
S.no.	Description	Make	Model	Qty.	Compliance Yes /no	Remarks/ deviation, if any
1.	Integrated digital wired microphone chairman unit with loop cables.	Bosch	DCNM-D + DCNM-HDMIC+DCNM-CB02-I	2		
2	Integrated wired Digital delegate microphone unit with loop cables.	Bosch	DCNM-D+DCNM-HDMIC+DCNM-CB02-I	10		
3.	Central control unit with required connecting cables.	Bosch	DCNM-APS2+DCNM-CB10-I_DCNM-CB15-I	1		
4.	Intel@ Xeon@ Processor (E3-1225 v5), 16 GB RAM, 1TB HDD, DVD Writer, Onsite NBD With Keyboard & Mouse with Dell Monitor 22.5", Keyboard & Mouse and Bosch Software.	Dell	Dell Power Edge T30+DCNM-LSYS	1		
5.	Wireless handheld Mic with supercardiod polar pattern.	Bosch	EV R333-HA	2		
6.	Wireless lapel mic with omnidirectional polar pattern	Bosch	EV R333-LA	1		
7.	Media Plate with 4 nos. XLR and 4 nos. Phone connector & 4 nos. 3.5 mm audio jacks complete with audio mixer complete etc. as required	Custom	Custom	1		
8.	Digital signal processor with 8 Mic/Line inputs having 8 AEC	BSS	BLU103	1		
9.	Amplifier with 2 x 200w at 8 ohm & 70/100 V Line	Bosch	EVPA2250T	1		
10.	30W ceiling mounted speakers	JBL	Control 16C/t	8		
11.	Multimedia projector having WUXGA (1920X1200 Pixels), 5000 ANSI Lumens, Laser light source having 20000 hours life, inputs i.e. HDMI, HDBT, VGA, LAN, automatic filter cleaning etc complete as required	Sony	VPL-PHZ10	1		
12.	Wireless presentation plug suitable for upto two USB Dongles.	Barco	Clickshare CSE 200 with Clickshare tray R98615	1		
13.	D-Link DGS-1008 A	D-Link	DGS-1008 A	1		
14.	D-Link Router AC-1200	D-Link	Router AC-1200	1		



5.	HDMI recorder to record all kind meeting i.e. normal presentation meeting or video conferencing meeting with HDMI In & Out, composite I component with audio in ports, 1 TB HOD, USB port etc. complete as required	VSTOR	Premium AVR HD-P	1		
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## LOCAL CONTENT CERTIFICATE

Dear Sir,

It is certified that items offered by M/s. \_\_\_\_\_ for \_\_\_\_\_ as per  
Technical Specifications \_\_\_\_\_ has local content of \_\_\_\_%

Further, it is also certified that the local % certified above is in line with the definition of local  
content given in Public Procurement (Preference of Make in India), order 2017-revision, and  
M/s. \_\_\_\_\_ qualify as Class \_\_\_\_\_ supplier.

### Land Border sharing certificate

I have read the clause regarding restriction on procurement from a bidder of a country which  
shares a land border with India; I certify that M/s. \_\_\_\_\_ is not from  
such a country,

Or

If from such a country has been registered with the competent authority.

I hereby certify that M/s. \_\_\_\_\_ fulfil all requirements in this regard and is  
eligible to be considered for procurement on GeM

(Where applicable, evidence of valid registration by the competent authority shall be  
attached)

Director/Proprietor/Partner  
M/s. \_\_\_\_\_

### **Bid-Securing Declaration Form**

Date: \_\_\_\_\_  
Bid No. \_\_\_\_\_

To (insert complete name and address of the purchaser)

I/We. The undersigned, declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing



Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

- (a) have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
- (b) having been notified of the acceptance of our Bid by the purchaser during the period of bid validity (i) fail or reuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown) in the capacity of (insert legal capacity of person signing the Bid Securing Declaration).

Name: (insert complete name of person signing the Bid Securing Declaration)

Duly authorized to sign the bid for and on behalf of : (insert complete name of Bidder)

Dated on \_\_\_\_\_ day of \_\_\_\_\_ (insert date of signing)

Corporate Seal (where appropriate)

(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid)