

**Bid Number: GEM/2024/B/4585198**  
**CORRIGENDUM- I**

We refer to our GeM Bid Number: GEM/2024/B/4585198 dated 06.02.2024 for “Tender for Supply, Installation, Testing & Commissioning of Audio- Video System at Baroda Apex Academy Building, Law Garden, Ahmedabad, Gujarat” and pre-bid meeting held on 16.02.2024. In this regard, we issue clarification on certain queries raised by Vendors which is given as under:

SI No.	Point / Section	Page No.	Tender clause	Bidder's Query	Bank's Response
1	Additional Pre-qualification/ Eligibility Criteria A General	Page 1 # Buyer Added Bid Specific ATC	Bidder must be a Government Organization / PSU / PSE / Partnership firm / LLP or Private / Public limited company in India at least for the last 5 years (As on Bid date).	The bidder or its Parent company (incase bidder is wholly owned subsidiary of the parent company) must be a Government Organization / PSU / PSE / Partnership firm / LLP or Private / Public limited company in India at least for the last 5 years (As on Bid date).	No Change
2	Additional Pre-qualification/ Eligibility Criteria C Technical	Page 3 # Buyer Added Bid Specific ATC	The bidder should have implemented minimum two Audio Video (AV) Projects in any organization having at least -2- meeting/conference rooms and Auditorium after April 2022.	<p>1) The bidder or its Parent company (incase bidder is wholly owned subsidiary of the parent company) should have implemented minimum two Audio Video (AV) Projects in any organization having at least -2- meeting/conference rooms and/or Auditorium after April 2022.</p> <p>2) Kindly Allow last 5 year Audio Video (AV) Projects as per CVC guidelines , Also consider the smart class work for similar nature of works , as</p>	The Bidder must have experience of successfully completed similar jobs i.e. SITC of Audio Video (AV) Projects in any organization having at least -2- meeting/conference rooms and Auditorium during last -5- years from 31.01.2024 satisfying any of the following conditions : a) Three similar completed works for each job (single job or combined offer from one

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				elements of the smart class are purely Audio-Video system. And project's major scope of work is Teaching class room system.	<p>party) costing not less than Rs.88 lacs (or)</p> <p>b) Two similar completed works for each job (single job or combined offer from one party) costing not less than Rs.1.10 Crs (or)</p> <p>c) One similar completed works for each job (single job or combined offer from one party) costing not less than Rs. 1.76 Crs</p>
3	Additional Pre-qualification/ Eligibility Criteria C Technical	Page 3 # Buyer Added Bid Specific ATC	Bidder should have their own full- fledged office/service center within 150km from the place of installation i.e Ahmedabad	The bidder or its Parent company (incase bidder is wholly owned subsidiary of the parent company) should have their own full-fledged office/service center within 150km from the place of installation i.e Ahmedabad"	No Change
4	GeM ATC Delivery & Installation Period	Page 14 # Buyer Added Bid Specific ATC	The equipment(s) shall be delivered and commissioned within 90 days from the date of placing the order/contract. However, delivery of all the items should be completed in 72 days and installation & commissioning should be completed in another 18 days.	Request to consider extension of delivery and installation timelines as: The equipment(s) shall be delivered and commissioned within 180 days from the date of placing the order/contract. However, delivery of all the items should be completed in 90 days and installation & commissioning should be completed in another 90 days.	No Change

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5	Specification Document	Page 5 # 7. Ceiling Speaker	Max output power - 240 Watts Dispersion angle - 180 deg conical	During operation only RMS output should be considered. This point should be removed Dispersion angle -120 degree to be amended, as 120 degree technically is accepted for classroom scenario	No Change
6	Specification Document	Page 5 # 8. 1ch X 120-Watt Mixing Amplifier & Page 6 # 9. 1ch X 240-Watt Mixing Amplifier	1ch X 120-Watt Mixing Amplifier & 1ch X 240-Watt Mixing Amplifier	Need to change as Mixer + Amplifier	Bidders can Quote Mixer + Amplifier, however all the technical specifications and our requirement should be fulfilled as per tender.
7	Specification Document	Page 5 # 8. 1ch X 120-Watt Mixing Amplifier & Page 6 # 9. 1ch X 240-Watt Mixing Amplifier	Number of Inputs - Emergency (line level with contact): 1 Paging Mic (mic level with contact): 1 Mic/Line (balanced): 2 Stereo Line (unbalanced): 4"	Number of inputs emergency (Line level with contact) : 1 - Not applicable for classroom should be deducted Paging Mic (mic level with contact): 1 - Not applicable for classroom should be deducted?	Number of Inputs Emergency (line level with contact) - clause Removed  Other all Specs remains same. (As per tender)
8	Specification Document	Page 5 # 8. 1ch X 120-Watt Mixing Amplifier & Page 6 # 9. 1ch X 240-Watt Mixing Amplifier	Four priority levels for audio routing, 24V priority output overrides local volume controls	This point is for PA Application not for classroom speech application request to deduct the same  Four priority levels for audio routing, 24V priority output overrides local volume controls. Kindly remove the Specifications	<b>No Change.</b> This Feature may be required to integrate Building PA System to Classroom Audio System.  Speakers work on 70V / 100V Line not on 4Ω Value.

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			Compliances - CE marked, UL listed, and RoHS compliant	As per solution requirement and schematics the solution asked is for classroom, where audio routing doesn't seem to be the actual requirement,	
9	Specification Document	Page 19 # MAKE LIST		Add QSC in make for DSP, FOH Speaker	Kindly refer make list section of Annexure A
10	Specification Document	Page 14 # 32. FOH Speaker	Rated Max Output Power : 2400W Rated output power : 600W Dispersion angle 90x60	Max Wattage does not define the efficiency of a speaker, Sensitivity and SPL does, Kindly deduct the same. Lesser Wattage with complied SPL means better efficient loudspeaker. Kindly accept 300 Watts RMS	No Change
11	Specification Document	Page 14 # 33. Subwoofer	Max output power 5600W	Max Wattage does not define the efficiency of a speaker, Sensitivity and SPL does, Kindly deduct the same	No Change
12	Specification Document	Page 19 # MAKE LIST		Request you to consider newline make in required tender make , Request :(NEWLINE ,SAMSUNG, LG, PANASONIC) Request you to consider newline make in required tender make , Newline Interactive are pioneer & market leader for interactive display ,request you to add newline make Request : (NEWLINE , SAMSUNG, LG, PANASONIC)	Kindly refer make list section of Annexure A
13	Specification Document	Page 3 #	Interfaces : HDMI IN X 3Nos, HDMI Out X1, USB Type C X 2nos,	EMC and Interfaces Kindly change as" Minimum interfaces required:	To be read as: - Interfaces : HDMI IN X 3Nos, HDMI Out X1, USB Type C X

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		3. 86" inch Interactive Display	USB Type A X 4Nos, USB Type B X 2 Nos, OPS Slot, RJ45 X 2 Nos, Microphone In, Camera Module. - Should have Minimum Interface: USB Type-C x 1, HDMI IN 2.0 x 2, USB Type-B (Touch) x 2, USB (3.0) Type-A x 2, HDMI OUT 2.0 x 1, RS232 x 1, RJ45 (Gigabit) x 1, OPS x 1, Audio Line out x 1. Certifications: Safety, EMC, CE, BIS	USB 3.0 : 1,USB 2.0 : 3,TOUCH : 1,HDMI IN : 2,VGA : 1,AUDIO IN : 1,RS232 : 1,RJ45 IN : 1,EARPHONE : 1,OPS Slot : 1 ",Kindly remove "EMC" from certification and Include FCC, ROHS Asked Interfaces are repeated, also there are multiple interfaces mentioned which are favouring to specific OEM  EMC is European origin certificate, We have BIS which covers most of the parameters which comes under EMC	1nos, USB Type A X 4Nos, USB Type B X 2 Nos, OPS Slot, RJ45 X 2 Nos, Microphone In, Camera Module, USB Type-C x 1, USB Type-B (Touch) x 2, USB (3.0) Type-A x 2, HDMI OUT 2.0 x 1, RS232 x 1, Audio Line out x 1. Certifications: Safety, EMC, CE, BIS"
14	Specification Document	Page 4 # 4.Interactive Display OPS Module	Should have min. i5 - 7200U/10th Generation,2 cores, 4 threads, 4G network (optional), 2GB DDR4	We suggest OPS should have 11th Gen or higher generation , OEM of of the OPS manufacturer should be intel/AMD partner, same should be reflected on Intel /AMD website	No Change
15	Specification Document	Page 5 # 8. 1ch X 120-Watt Mixing Amplifier & Page 6 # 9. 1ch X 240-Watt Mixing Amplifier	Compliances - CE marked, UL listed, and RoHS compliant	UL Listed Kindly Change as" CE marked, ROHS and FCC. UL is European origin certificate, We have CE, FCC, ROHS which covers most of the parameters which comes under EMC	To be read as - Compliances - CE marked, ROHS, FCC.
16	Specification Document	Page 10 # 24. 20X Full HD PTZ Camera	Should have Field of View for PTZ Camera should be min. 70	Should have Field of View for PTZ Camera should be min. 70 Degree and	No Change

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			Degree and for Panoramic Camera min. 100 Degree or better.	for Panoramic Camera min. 100 Degree or better.  Kindly Change As"" Should have Field of View for PTZ Camera should be min. 58 Degree and for Panoramic Camera min. 85 Degree or better.  Kindly Add "" CE, FCC, ROHS and BIS""  Optical zoom cameras are designed to capture distant subjects, and typically, the user is positioned at a distance from the camera. Hence, it's common for cameras with higher zoom capabilities to offer a narrower field of view."	
17	Specification Document	Page 10# 22. 12 X 8 Audio DSP	Support for VoIP Conferencing up to Five SIP Phones in a single DSP with compatibility to major PABX platforms such as Cisco, Avaya, ShoreTel, Mitel etc..	Support for VoIP Conferencing up to Five SIP Phones in a single DSP with compatibility to major PABX platforms such as Cisco, Avaya, ShoreTel, Mitel etc.. Kindly remove the clauseAs per solution asked in the RFP there is no such VOIP solution integration required kindly remove the clause , Although the solution will be compatible with any Unified Communications solutions	No Change
18	Specification Document	Page 10# 22. 12 X 8 Audio DSP	PSTN [POTS] Line Connectivity for Analog Conferencing Application	PSTN [POTS] Line Connectivity for Analog Conferencing Application Kindly remove the clause  As per solution asked in the RFP there	No Change

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				is no such PSTN solution integration required kindly remove the clause, Although the solution will be compatible with any Unified Communications solutions	
19	Specification Document	Page 10# 22. 12 X 8 Audio DSP	Software Dialer for VoIP and PSTN connections shall be provided for Windows PC, iOS, Android platforms	Software Dialer for VoIP and PSTN connections shall be provided for Windows PC, iOS, Android platforms Kindly remove the clause  As per solution asked in the RFP there is no such VOIP/PSTN solution integration required kindly remove the clause, Although the solution will be compatible with any Unified Communications solutions	No Change
20	Specification Document	Page 10# 22. 12 X 8 Audio DSP	Ethernet, RS232 and GPIO ports for control and monitoring functions	GPIO Kindly Change As" Ethernet/RS232 ports for control and monitoring functions  Ethernet, RS232 are sufficient for control and monitoring feature	No Change
21	Specification Document	Page 10# 22. 12 X 8 Audio DSP	Digital Processing Unit should have  • 4 balanced mic inputs, 2 balanced Mic/Line inputs and 1 stereo unbalanced input;	4 X 4 DSP Digital Processing Unit should have • 4 mic/line level inputs with AEC, 4 mic/line level outputs and SIP VoIP interface via RJ-45 connector; • RS-232 serial por; • USB audio interface, • 4-pin GPIO • CE marked, UL listed, and RoHS compliant	The Mentioned Specification are minimum criteria, Bidder can propose models which fulfill the given criteria.

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			<ul style="list-style-type: none"> <li>• 1 stereo and 2 mono outputs;</li> <li>• 2-channel USB audio interface,</li> <li>• 6-channel Smart Mix (gate or gain sharing),</li> <li>• Onboard acoustic echo canceler (AEC) processing</li> </ul>	<ul style="list-style-type: none"> <li>• Compliant with the US Trade Agreement Act (TAA)</li> </ul> <p>Otherwise – Kindly Add Audio-Technica in preferred brand for 4 x 2 DSP - In the tender specifications, it is stated that a 4x2 DSP is required. Typically, DSPs come with input-output matrices such as 4x4, 8x6, 8x8, or 12x8. However, it seems that no OEM listed in the tender documentation manufactures this particular configuration.</p> <p>Considering this information, we kindly request your guidance on how to proceed. If you are aware of any OEMs that manufacture this specific type of DSP, we would greatly appreciate it if you could provide us with the names of three such manufacturers. Otherwise kindly change the tender spec 4 x 4 instead of 4 x 2.</p>	
22	Specification Document	Page 7# 14. 4 X 4 Universal Matrix Switcher	Should have four HDMI outputs with mirrored HDBaseT certified outputs.	Should have four HDMI outputs with mirrored HDBaseT certified outputs." - Please clarify as most of the switcher comes with one or 2 HDMI output with mirrored HDBaseT output with 4 Analog Input.	To be read as: Should have <b>two HDMI</b> outputs with mirrored HDBaseT certified outputs Please refer Annexure A
23	Specification Document	Page 7# 15. Cable Cubby	Should have Swivelling dog mounting system accommodates .....	Should have Swivelling dog mounting system accommodates surfaces up to 1-3/4-inch (44 mm) thick; should Fits a 3-1/4 x 7 inch (83 x 178 mm) size" and "Should be Square in shape"- Please clarify as mentioned dimensions are for Rectangular shape	Can be square or rectangle. However color should be with Architect's Approval required for aesthetic purpose.

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24	Specification Document	Page 13# 31. Wireless Presentation System	Should support two sources on a single screen simultaneously and should have possibility to extend up to nine sources.....	Should have possibility to extend up to nine sources" - This specs pointing towards specific OEM Please make it generic to compete other participates	To be read as: Should have possibility to extend up to Minimum <b>four sources</b> .
25	Specification Document	Page 13# 31. Wireless Presentation System	Should support two sources on a single screen simultaneously and should have possibility to extend up to nine sources.....		Please refer Annexure A
26	Specification Document	Page 9# 21. 8 X 2 Matrix Switcher	Should have 8X2 4K60 4:4:4 HDR Presentation System .....	The specifications belongs to the single brand and no other two brand fully complies to the given technical specification.Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of "JITC is a US Based defense certification & Bureau Veritas Listed for US and Canada, IC, CE, FCC Part 15 Class B digital device". "Why the cloud management option should be from same OEM justify".	Please refer Annexure A
27	Specification Document	Page 4# 6. AV Decoder	Should have 4K60 4:4:4 HDR Network AV Decoder.....		
28	Specification Document	Page 11# 27. AV Encoder	Should have 4K60 4:4:4 HDR Network AV Encoder .....	Should have an easy openable retractable lid which disappears with a single tap of a button. Should have Swivelling dog mounting system accommodates surfaces up to 1-3/4-inch (44 mm) thick; should Fits a 3-1/4 x 7 inch (83 x 178 mm) size.	
29	Specification Document	Page 13# 30. 4K HD Base T Transmitter	4K60 4:4:4 Receiver for HDMI Signal Extension over CATx Cable.....	• Should have front module connectors with engraved Symbol for different types of Cables & Connectors	
30	Specification Document	Page 9# 20. 4K HD Base T Receiver	4K60 4:4:4 Receiver for HDMI Signal Extension over CATx Cable.....	• Should have 10xRJ-45 I/O modules for LAN connectivity through the Cable Manager	

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31	Specification Document	Page 16# 41.Control Processor	Automation Control Processor Should min. have.....	<ul style="list-style-type: none"> <li>• Why HDCP 2.3 is required ?? “As you had mentioned Cat 5e cable &amp; resolution you had mentioned minimum HD 1080p, WUXGA, and 2K at up to 230 ft (70 m) or better”</li> <li>• Why DVI &amp; DP Port is required as the major active output devices are HDMI so please let us know the use of DVI &amp; DP ports</li> <li>• Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of” Intertek Listed for US and Canada, CE, IC, FCC Part 15 Class B digital device”</li> <li>• The specifications belongs to the single brand and no other two brand fully complies to the given technical specifications.</li> <li>• Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of “UL® Listed, IC, CE, FCC Part 15 Class B”</li> <li>• “Why the cloud management option should be from same OEM justify”</li> </ul> <p>The specifications belongs to the single brand and no other two brand fully complies to the given technical specification.Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of “JITC is a US Based defense certification &amp; Bureau Veritas Listed for US and Canada, IC, CE, FCC Part 15 Class B digital device”.“Why the cloud management option should be from same OEM justify”.</p> <ul style="list-style-type: none"> <li>• Why HDCP 2.3 is required ?? “As you had mentioned Cat 5e cable &amp; resolution you had mentioned minimum HD 1080p, WUXGA, and 2K at up to 230 ft (70 m) or better”</li> <li>• Why DVI &amp; DP Port is required as the major active output devices are HDMI so please let us know the use of DVI &amp; DP ports</li> </ul>	Please refer Annexure A
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				<ul style="list-style-type: none"> <li>• Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of" Intertek Listed for US and Canada, CE, IC, FCC Part 15 Class B digital device"</li> <li>• It should support 2 sources or more please clarify??</li> <li>• Bank of Baroda being an Indian Bank then why the certifications that are asked for hardware are of "UL Listed for US and Canada, CE, IC, FCC Part 15 Class B digital device"</li> <li>• "Why the cloud management option should be from same OEM justify"</li> <li>• SDRAM :2 GB • Flash: 8 GB</li> <li>• Memory Card: Supports SD and SDHC cards up to 32 GB.</li> <li>• CE marked &amp; UL / C-UL listed</li> </ul> <p>Request to remove NEC &amp; keep all cables 4K 4:4:4 as we are taking all active 4K 4:4:4 solution</p> <p>Make generic Specification. So generic bidding procedure can be possible. In this case particularly one brand is supporting and maximum chance of case locking.</p>	
32	Specification Document	Page 1 & 2# Technical specification for Display Unit	Should have Android 11 or above OS, 2 GB DDR3 RAM" & "with HDR 10, Dolby Audio"	Pretended Technical Specifications are only single approved Make; Requesting here to consider common Specification with match with all three Make.	No Change
33	Specification Document	Page 17 # 49. Audio Visual Cable	Specification required	Request to remove NEC & keep all cables 4K 4:4:4 as we are taking all active 4K 4:4:4 solution	NEC is removed from all specs of cable.

34	ATC	Room wise AV schematics & General Queries	<ol style="list-style-type: none"> <li>1) As per the video schematic shown, only the decoder is connected to the touch display. But the input source is not captured in the schematic or BOQ. Kindly advise us on the functionality of these areas.</li> <li>2) By referring to the AV BOQ, only the touch display is considered. But the wall mount bracket is not captured in the BOQ. We presume that Wall mount kit of screen will under client scope or existing at site. Kindly clarify us.</li> <li>3) As per the Audio schematic, 2 channel mixer amplifier was shown. But in the Specification sheet and BOQ only one channel mixer amplifier is considered. Kindly advise us.</li> <li>4) As per the video schematic shown, one HDMI output of the 86" display is directly connected to two of the 55" displays. Kindly advise us on the functionality of these areas.</li> <li>5) As per the Audio schematic, 2 channel mixer amplifier was shown. But in the Specification sheet and BOQ only one channel mixer amplifier is considered. Kindly advise us.</li> <li>6) By referring to the AV BOQ, only the 86" touch display &amp; 2nos of 55" Display is considered. But the wall mount bracket is not captured in the BOQ. We presume that Wall mount kit of screen will under client scope or existing at site. Kindly clarify us.</li> <li>7) By referring to the AV schematic, the video conferencing unit was shown in the drawings. But the VC unit is not captured in the BOQ. Kindly share the functionality of these areas (VC or local presentation).</li> <li>8) Requesting you to consider the required Storage for AV equipment. Please confirm</li> <li>9) By referring to the AV schematic and BOQ, ceiling speakers quantity is not matching the BOQ and Schematic layouts. Kindly clarify us.</li> </ol>	<ol style="list-style-type: none"> <li>1) All Decoders will be connected to Encoder considered in the Virtual Class Room.</li> <li>2) Wall Mount Kit needs to be considered for all types of display in same Line item as per site requirement which is already mentioned in Specification.</li> <li>3) One channel mixer amplifier is to be considered</li> <li>4) To Mirror Application from main display unit.</li> <li>5) One channel mixer amplifier is to be considered.</li> <li>6) Wall Mount Kit needs to be considered for all types of display in same Line item as per site requirement which is already mentioned in Specification</li> <li>7) VC will provide by Bank (Cisco or equivalent make) and Bidder has Integrate and Commission the same.</li> <li>8) Storage / Rack will be provide by other contractor engaged.</li> <li>9) Consider all quantities as per Tender Quantity only.</li> </ol>
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			<p>10) Requesting you to share the AutoCAD layout to calculate the cable length and to for better understanding on the equipment locations.</p> <p>11) Requesting you to consider the required mounting for kit for transmitter, and receiver. Please confirm</p> <p>12) We presumed that all the AV Conduits, Raceways, Electric Works. Civil Works, Network Works, Scaffolding under client scope.</p> <p>13) Query on legal or SLA terms</p>	<p>10) Will be provided to L1 Bidder during execution.</p> <p>11) Not Required</p> <p>12) Necessary Scaffolding and other required infrastructure for installation shall be in the scope of bidder. Other works such as electric &amp; civil works will be carried out by respective Contractor. However, necessary coordination to be done.</p> <p>13) No Change in any of the clause on Legal or SLA terms</p>
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1. Bidders are advised to consider and confirm the above points while submitting the bids.
2. The above shall be complementary in contents with the existing terms and conditions of the Tender/Bid unless otherwise explicitly superseded. All other terms and conditions of the Tender/Bid shall remain unchanged.
3. This Corrigendum – I shall form part of the Bid/Tender dated 06.02.2024.
4. The bidders have to submit “Unconditional Bid”. Conditional bids are liable to be rejected.
5. The last date of the bid submission shall be extended upto 04.03.2024 upto 3:00PM

**Date: 23.02.2024**

**Place: Gandhinagar**

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## Annexure A Revised Specs

### 6. AV Decoder (MAF Required)

- Should have 4K60 4:4:4 HDR Network AV Decoder
- Should have capacity of decoding up to 4K@60Hz, 4:4:4 colour sampling video overstandard 1 Gigabit / 10 Gigabit Ethernet.
- Should have copper Ethernet connectivity.
- Should have minimum 1xHDMI Output or better.
- Should handles resolutions Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 Video.
- **Should have HDR (High Dynamic Range) video support HDR10, or better;**
- Should support Dolby Vision and Deep Color Video Content.
- Should supports audio formats of Dolby Digital, Dolby Digital EX, Dolby Digital Plus, DolbyTrueHD, Dolby Atmos, DTS, DTS ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, **LPCM up to 7.1 channels.**
- Should have Analog audio port for a balanced stereo output.
- Should have analog audio de-embedding & AES67 audio embedding or de-embedding;
- Should have JPEG 2000 video compression technique.
- Should have configurable bitrates option from minimum **200 to 850 Mbps or better.**
- Should have **No/Low latency** penalty for real-time video performance in either of the operation.
- Should be **HDCP compliant**
- Should support streaming **protocols like RTP.** Should use MPEG-2 transport stream and Session Initiation with Multicast via RTSP.
- Should have minimum 1xRJ45 LAN port for addressing and delivering/transferring content over ethernet.
- Should have 100/1000 Mbps, auto-switching, **auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, DHCP, IEEE 802.1X, IPv4, variable Multicast TTL, HTTPS web browser setup.**
- Should have compatibility with control systems of the same OEM.
- Should be adhere to Enterprise-grade security to protect integrity of the content.
- Should employ advanced security features and protocols like 802.1x authentication, AES-128 encryption, and HTTPS.
- Should have **RTSP, IGMPv2, IGMPv3**
- Should have minimum 1xRS-232 and **USB** ports or better for remote control through automation controller.
- Should have CEC device control gateway.

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- Should have HTTPS web browser base setup and control option.
- Should be a Compact, surface-mountable form factor.
- Should handle minimum temperature of 32° to 104° F or better.
- Should handle minimum humidity of 10% to 90% RH (non-condensing) or better.
- Should be Bureau Veritas Listed for US & Canada, IC, CE, FCC Part 15 Class B digital device compliant.
- Should be capable of Powered via a local power pack or a PoE+ compliant Ethernet switch or any approved third-party PSE.
- **Should have an option of Cloud/Centralized management platform**

## 27. AV Encoder (MAF Required)

- Should have 4K60 4:4:4 HDR Network AV Encoder.
- Should have capacity of encoding up to 4K@60Hz, 4:4:4 colour sampling video over standard 1 Gigabit / 10 Gigabit Ethernet.
- Should have copper Ethernet connectivity.
- Should have minimum 1xHDMI Output or better.
- Should handle resolutions Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 Video.
- **Should have HDR (High Dynamic Range) video support HDR10, or better;**
- Should support Dolby Vision and Deep Color Video Content.
- Should support audio formats of Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS, DTS ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, **LPCM up to 7.1 channels.**
- Should have Analog audio port for a balanced stereo output.
- Should have analog audio de-embedding & AES67 audio embedding or de-embedding;
- Should have JPEG 2000 video compression technique.
- Should have configurable bitrates option from minimum **200 to 850 Mbps or better.**
- Should have **No/Low latency** penalty for real-time video performance in either of the operation.
- Should be **HDCP compliant**
- Should support streaming **protocols like RTP.** Should use MPEG-2 transport stream and Session Initiation with Multicast via RTSP.
- Should have minimum 1xRJ45 LAN port for addressing and delivering/transferring content over ethernet.
- Should have 100/1000 Mbps, auto-switching, **auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, DHCP, IEEE 802.1X, IPv4, variable Multicast TTL, HTTPS web browser setup.**
- Should have compatibility with control systems of the same OEM.
- Should adhere to Enterprise-grade security to protect integrity of the content.
- Should employ advanced security features and protocols like 802.1x authentication, AES-128 encryption, and HTTPS.

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- Should have **RTSP, IGMPv2, IGMPv3**
- Should have minimum 1xRS-232 and **USB** ports or better for remote control through automation controller.
- Should have CEC device control gateway.
- Should have HTTPS web browser base setup and control option.
- Should be a Compact, surface-mountable form factor.
- Should handle minimum temperature of 32° to 104° F or better.
- Should handle minimum humidity of 10% to 90% RH (non-condensing) or better.
- Should be Bureau Veritas Listed for US & Canada, IC, CE, FCC Part 15 Class B digital device compliant.
- Should be capable of Powered via a local power pack or a PoE+ compliant Ethernet switch or any approved third-party PSE.
- **Should have an option of Cloud/Centralized management platform**

### 21. 8 X 2 Matrix Switcher / Audio Visual Switcher cum Scaler (4K) (MAF Required)

- Should have 8X2 4K60 4:4:4 HDR Presentation System.
- Should be 4K60 4:4:4 digital AV presentation system.
- Should have Six HDMI® inputs with HDR10, HDR10+, and Dolby Vision® video format support.
- Should also have two HDBaseT inputs to connect with suitable transmitter to support a maximum resolution of 4K60 4:4:4 up to 130 ft (40 m).
- Should support Automatic Switching of Inputs or output priority assigned to each input
- Should have two HDMI outputs with mirrored HDBaseT certified outputs.
- **Should support HDR10, and Dolby Vision® video formats.**
- Should have 4K60 4:4:4 video scaler for each mirrored outputs.
- Should support transport of audio formats like Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® True HD, DTS®, DTS-ES, DTS 96/24, DTS-HD High Res, DTS-HD Master Audio™, **LPCM up to 7.1 channels.**
- **Should be HDCP 2.2 compliant.**
- Should have EDID Management.
- Should have eight mono analog audio inputs with at least two with Mic/Line In support.
- Should support 9-channel Audio mixing with audio embedding and de-embedding on each of the two Audio Outputs Volume and mute control should be configurable for each mirrored output independently.
- Should have simplified setup through the Web browser.
- Should have push buttons for control and LED colour indicators for showing signal status and power.
- Should be working Out-of-the-Box with no programming requirement.

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- Should have a Gigabit Ethernet port.
- Should support Enterprise-grade security like 802.1X authentication, PKI authentication and HTTPS.
- Should have API (application programming interface) support for controls.
- Should be Surface-mountable design to mount onto a wall or other flat surface.
- Should have universal 100-240V AC Power with IEC 60320 C14 mains power inlet; removable power cord included.
- **Should have an option of Cloud/Centralized management platform**
- **Should be UL® Listed, CE certified**

## 20. 4K HD Base T Receiver (MAF Required)

- 4K60 4:4:4 Receiver for HDMI Signal Extension over CATx Cable.
- Should have minimum 1xHDMI output or better.
- Should have minimum 1xCatX Input or better.
- Should enables extension of HDMI video and audio signals over a CAT5e or higher cable.
- Should support minimum 4K and UHD at up to 130 ft or better.
- Should handles resolutions Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 Video i.e. 4K604:4:4 Capability.
- **Should have HDR (High Dynamic Range) video support HDR10 or better.**
- Should support minimum HD 1080p, WUXGA, and 2K at up to 230 ft (70 m) or better.
- Should support Dolby Vision and Deep Colour Video Content.
- **Should supports audio formats of Dolby Digital, Dolby Digital EX, Dolby Digital Plus, DolbyTrue HD, Dolby Atmos, DTS, DTS ES, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 7.1 channels.**
- **Should support minimum HDCP 2.2 or better.**
- Should support CEC signals. Should support management of EDID.
- **DVI and Dual-Mode DisplayPort Video signals or better -Optional.**
- Should be compact in size & have an option for Freestanding or surface mounting.
- Should have power adapter supplied with the unit.
- Should be CE compliant
- The switcher, Transmitter and receiver and central control system should be from the same OEM

## 30. 4K HD Base T Transmitter (MAF Required)

- 4K60 4:4:4 Transmitter for HDMI Signal Extension over CATx Cable.

- Should have minimum 1xHDMI output or better.
- Should have minimum 1xCatX Input or better.
- Should enables extension of HDMI video and audio signals over a CAT5e or higher cable.
- Should support minimum 4K and UHD at up to 130 ft or better.
- Should handles resolutions Up to 4096x2160@60Hz (DCI 4K60), 4:4:4 Video i.e. 4K604:4:4 Capability.
- **Should have HDR (High Dynamic Range) video support HDR10 or better.**
- Should support minimum HD 1080p, WUXGA, and 2K at up to 230 ft (70 m) or better.
- Should support Dolby Vision and Deep Colour Video Content.
- **Should supports audio formats of Dolby Digital, Dolby Digital EX, Dolby Digital Plus, DolbyTrue HD, Dolby Atmos, DTS, DTS ES, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 7.1 channels.**
- **Should support minimum HDCP 2.2 or better.**
- Should support CEC signals. Should support management of EDID.
- **DVI and Dual-Mode DisplayPort Video signals or better -Optional.**
- Should be compact in size & have an option for Freestanding or surface mounting.
- Should have power adapter supplied with the unit.
- Should be CE compliant
- The switcher, Transmitter and receiver and central control system should be from the same OEM

### 31. Wireless Presentation System (MAF Required)

- Wireless Presentation System with Wi-Fi Network Connectivity.
- Should be ideal for conference rooms, huddle rooms, lounges, lobbies, or almost any space to establish a productive meeting environment.
- Should support secure wired and wireless presentation.
- Should have an HDMI output supporting resolution up to 4K, and multiple USB interfaces touch interactivity display.
- Should have dedicated **LAN port for network**, also the device should be able to generate its own built in Wi-Fi® network for guest content sharing, or a suitable external Wi-Fi Router unit to be provided.
- Should have option for user to present content from Mac, desktop or laptop computers using client software or airplay, extension for the Google Chrome™ web browser, or Miracast® screen mirroring technology (Windows® 10 computers only). Present content from Android™ and iOS® mobile devices with the app/Screen mirroring Should have balanced audio output for de-embedding audio.
- Should support two sources on a single screen simultaneously and should have possibility to extend up to **four sources**, layout should be configured automatically based on the number of active sources, the type of sources, and their aspect ratios.
- Should be able to display a customizable welcome screen on the room display with simple instructions for connecting and presenting,

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when no source is connected Should have integration with Appspace digital signage software platform for content display when system is not in use, or a suitable external hardware unit to be provided.

- Should have built-in native integration with Microsoft 365, Outlook, Google Calendar, and other calendaring applications for Displaying space availability, meeting details, and other messaging on screen, or a suitable external room scheduling unit to be provided Should periodically indicate the time left in the meeting on Display if the calendar integration is incorporated, or a suitable external room scheduling unit to be provided.
- Should have customizable welcome screen provides clear instructions for presenters, displaying space availability, meeting details, and other messages onscreen Should comply to standard network security protocols such as 802.1x network access control, Active Directory® authentication, AES content encryption.
- **Should support minimum 100/1000 Mbps, auto-switching, auto negotiating, auto discovery, full/half duplex, TCP/IP, UDP/IP, DHCP.**
- Should supports an option for management of HDCP and EDID.
- Should support HTTPS web browser setup.
- Should support Wi-Fi Dual-band 802.11a/b/g/n (2.4 GHz & 5 GHz), Up to 100 ft (30 m) range at 80 Mbps, subject to site-specific conditions.
- **Should support HDCP compliant**
- Should be capable of Powered via PoE+ compliant Ethernet switch or a PoE+ Injector.
- **Should be CE certified**
- **Should have an option of Cloud/Centralized management platform**

#### 14. 4 X 4 Universal Matrix Switcher (MAF Required)

- 4x4 4K60 4:4:4 HDR Presentation System.
- Should be 4K60 4:4:4 digital AV presentation system.
- Should have Four HDMI® inputs with HDR10, HDR10+, and Dolby Vision® video format support.
- Should support Automatic Switching of Inputs or output priority assigned to each input.
- **Should have two HDMI outputs with mirrored HDBaseT certified outputs.**
- Should support HDR10, HDR10+, and Dolby Vision® video formats.
- Should have 4K60 4:4:4 video scaler for each mirrored output.
- **Should support transport of audio formats like Dolby Digital®, Dolby Digital EX, Dolby Digital Plus, Dolby® True HD, DTS®, DTS-ES, DTS-HD High Res, DTS-HD Master Audio™, LPCM up to 7.1 channels. Should be HDCP 2.2 compliant.**
- Should support CEC signals passthrough.
- Should have EDID Management.

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- Should have four mono analog audio inputs with at least two with Mic/Line In support.
- Should support 5-channel Audio mixing with audio embedding and de-embedding on each of the two Audio Output Volume and mute control should be configurable for each mirrored output independently.
- Should have simplified setup through the Web browser.
- Should have push buttons for control and LED colour indicators for showing signal status and power.
- Should be working Out-of-the-Box with no programming requirement.
- Should have a Gigabit Ethernet port.
- Should support Enterprise-grade security like 802.1X authentication and HTTPS Should support Text overlay, image overlay, and background image for on-screen display Should have API (application programming interface) support for controls.
- Should be Surface-mountable design to mount onto a wall or other flat surface.
- Should have universal 100-240V AC Power with IEC 60320 C14 mains power inlet; removable power cord included.
- **Should have an option of Cloud/Centralized management platform**
- **Should be CE certified**

#### 41. Control Processor (MAF Required)

Automation Control Processor Should min. have

- Inbuilt interfaces includes Minimum 4 X IR, 4 X I/O, 4 X Relay, 2 X RS232 ports, 1 X RJ45
- **SDRAM : min. 512 MB**
- **Flash: min. 4 GB**
- Memory Card: Supports SD and SDHC cards up to 32 GB.

**REVISED MAKE LIST AUDIO VISUAL SYSTEM**

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SR NOS.	ELV SERVICE ITEM DISCRIPTION	SPECIFIED BRAND/MAKE/MANUFACTURER
1	PROJECTOR	PANASONIC, EPSON, SONY
2	MOTORIZED PROJECTOR SCREEN	LIBERTY, DRAPPER, SUVIRA
3	AV SWITCHER & SCALER & OTHER EQUIPMENT	CRESTRON, EXTRON, KRAMER
4	WIRELESS PRESENTATOR	CRESTRON, EXTRON, KRAMER
5	PTZ RECORDING CAMERA	LUMENS, SONY, AVER
6	RECORDER & STREAMING DEVICE	LUMENS, QSC, AVER
7	DIGITAL PODIUM	UNIVERSO, AHA, TECOM
8	AUDIO VISUAL CABLE MANAGER / POP UP BOX	KRAMER, CRESTRON, EXTRON
9	PROFESSION ANROID DISPLAY	SAMSUNG, LG, PANASONIC, <b>NEWLINE</b>
10	INTERACTIVE DISPLAY	SAMSUNG, LG, PANSONIC, <b>NEWLINE</b>
11	OPS MODULE	INTEL, XSIGN, SPECTRA BLACK
12	DISPLAY TROLLY	LUMI, MX, PROLEGEND
13	AUDIO DSP	BIAMP, SYMMETRIX, XILICA
14	AUDIO VISUAL CABLE	KRAMER, EXTRON, CRESTRON
15	PROFESSIONAL AUDIO SPEAKER FOR CLASSROOM, VC ROOM, BOARDROOM	BIAMP, CRESTRON, MARTIN AUDIO, <b>QSC</b>
16	PRODESSIONAL AUDIO AMPLIFIER FOR CLASSROOM, VC ROOM, BOARDROOM	BOSCH, BIAMP, QSC
17	AUDIO MICROPHONE FOR CLASSROOM, VC ROOM, BOARDROOM	EV, SENNHEISER, SHURE
18	PROFESSIONAL AUDIO SPEAKER FOR AUDITORIUM	BIAMP, EAW, MARTIN AUDIO, <b>QSC</b>

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19	PROFESSIONAL AUDIO AMPLIFIER FOR AUDITORIUM	DYNACORD, BIAMP, LABGRUPPEN, <b>QSC</b>
20	RETRACTABLE MONITOR LIFT	ARTHURHOLM, KEETOUGH, SOLTEC
21	AUDIO MIXER	DYNACORD, ALLEN HEATH, YAMAHA
22	NETWORK POE SWITCH	NETGEAR, CISCO, HP ARUBA