THE HEAD OF THE DEPARTMENT DEPT OF CIVIL ENGINEERING, IIT MADRAS CHENNAI – 600 036.

Tender Ref. No. CE/HOD/2022/1001/AVC SYSTEM

Date: 23.06.2022

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, Tenders are invited in two bid system from Class-1 local suppliers and Class II local suppliers, for "**Supply and Installation of Audio & Video Conferencing System**" conforming to the specifications given in **Annexure-A** with the following terms and conditions:

Manual Bids will be accepted: All tender documents including Technical and Financial bids should be submitted in hard-copies only to the above address

Last Date for receipt of Tender: 19.07.2022 @ 5 pm Date & Time of opening of Tender: 20.07.2022 @ 4 pm

For Site Visit: Bidders will be allowed to visit the dept for site seeing from 29.06.2022 to 01.07.2022 @ 10.00 am to 5.00 pm to the Civil Engineering Dept, IIT Madras, Chennai – 600 036, Contact No. 044-2257 5284.

Concessional GST: Certificate for availing concessional GST @ 5% on IGST and @ 2.5% for CGST and SGST as per Notification No. 47/2017-Integrated Tax (Rate) dt.14.11.2017 and Notification No. 45/2017- Central Tax (Rate) dt.14.11.2017, Notification No. 45/2017 Union Territory Tax (Rate) dt. 14.11.2017, for procurement of Equipment and Consumables for research purpose will be provided.

Delivery: Items should be delivered and installed within **30 days** from the date of Purchase Order.

PRE-QUALIFICATION CRITERIA:

- The bidder shall not be from a country sharing land border with India and if the bidder is from a country sharing land border with India the bidder should have been registered with the competent authority as per orders of DIPP OM No. F. No. 6/18/2019-PPD dated 23rd July 2020, and MoCI Order No. P-45021/112/2020-PP (BE II) (E-43780) dated 24th August 2020. A declaration as per format given in **Annexure – D** shall be submitted with the bid.
- 2. Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16th September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Self-declaration for Class-I and Class-II local suppliers should be submitted in the prescribed proforma as per Annexure-E. Non-submission of self-declaration will lead to rejection of bid out rightly and the bidder will be treated as non-local supplier.

Evaluation of Bids:

Bid Evaluation will take place in two stages.

Stage I: Technical Bid evaluation

- 1. Bidder will be evaluated first for conformity with Pre-qualification Criteria and those bidders who have complied with pre-qualification criteria alone will be evaluated further.
- 2. In the 2nd stage, the details of technical specification offered by the bidders will be evaluated by the technical committee for compliance. Only those bidders who have fully complied with Pre-Qualification Criteria and technical specification will be considered for the opening of financial bid.

Stage II: Financial Bid Evaluation

The price bid evaluation will be based on price quoted by the bidder.

WARRANTY	:	12 Months
PRICE VALIDITY	:	90 days

PRICES:

• The prices quoted should be considering all terms & conditions and as per the technical specification mentioned in **Annexure A**.

PAYMENT: No Advance Payment will be made. Payment will be made only after supply and satisfactory installation.

CIVIL ENGINEERING DEPARTMENT, IIT MADRAS Technical Specification for Supply and Installation of Audio and Video Conferencing System Tender Ref. No. CE/HOD/2022/1001/AVC SYSTEM

SI.	Description		Specification
			Specification
Audio	conferencing system	– 1 No	Τ
		Coverage	Up to 7.6m x 7.6m
		Туре	Low-noise omnidirectional MEMS
1	Virtual Microphone	Frequency response	
	•	at 94 dB SPL	100Hz to 5 kHz
		I otal harmonic	
		distortion (THD)	
		Acoustic output	
2	SPEAKERS	(nardware capable)	
		distortion (THD)	-3%
		Eroquoney response	50Hz to 16 kHz
		Amplifier Class	
		Interface to computer	Single USB 2.0. type B
		Auxiliary out	3.5 mm single-ended stereo jack x1
	CONNECT	Auxiliary in	3.5 mm single-ended stereo jack x1
3	MODULE	Connection to	
		microphone and	
		speaker	RJ-45 x2
			Windows® 7, Windows 8, Windows 10,
			Mac® OS X® 10.14 and 10.15 (Mojave
4	Operating systems	OS	and Catalina)
5	POWER	Power rating	100-240V AC, 50Hz
	GENERAL	Should have	Acoustic echo cancellation, position-based
	•=	Advanced audio	gain control
		Wall-mount installation	Built-in wall mount
			Should work seamlessly with leading
		LIC&C compatibility	UC&C platforms, including Microsoft®
			Teams, Zoom, GoToMeeting®, Cisco
			Webex [®] and StarLeaf
Dual W	/ireless Receiver – 1 N	lo	
1	Output Impedance		XLR connector – 200 Ω
			6.35 mm (1/4") connector – 50 Ω
			XLR connector = -27 dBV (into 100 k Ω
2	Audio Output Level		load)
2			6.35 mm (1/4") connector = -13 dBV (into
			100 kΩ load)
3	RF Sensitivity		(-105) dBm for 12 dB SINAD, typical.
4	Image Rejection		>50 dB, typical
Wirele	ss Receiver with Hand	lheld Microphone – 1 N	0
	Output Impedance		XLR connector – 200 Ω
1			6.35 mm (1/4") connector – 50 Ω
2	Audio Output Level		XLR connector = -27 dBV (into 100 kΩ load)

		6.35 mm (1/4") connector = -13 dBV (into 100
		kΩ load)
3	RF Sensitivity	(-105) dBm for 12 dB SINAD, typical
4	Image Rejection	>50 dB typical
		dB = -20 dBV maximum
5		(-10 dB) = -10 dBV maximum
Handhe	ld Transmitter (Microphone) – 1 No	
		0dB = -20 dBV maximum
1		(-10dB) = -10 dBV maximum
2	Gain Adjustment Range	10 dB
3	RF Transmitter Output	10 mW, typical
Headwo	orn Microphone – 1 No	
1	Туре	Condenser microphone
2	Frequency Response	40 Hz to 20,000 Hz
3	Polar Pattern	Unidirectional (Cardioid)
4	Output Impedance	100 Ω, @ 1 kHz
5	Sensitivity	(-57.8 dBV/Pa) @ 1 kHz, 1000 Ω load
6	Signal-To-Noise Ratio	59.2 dB, @ 1 kHz, 1000 Ω load
Bodypa	ck Transmitter – 1 No	· · · ·
4	Audio Input Level	max = (-16 dBV) maximum
1		min (0 dB) = +10 dBV maximum
2	Input Impedance	1 ΜΩ
3	RF Transmitter Output	10 mW, typical
Mixer –	1 No	
1	Channel	6
	Input Impedance	"Mic: 1,600 ohms Line: 10,000 ohms
2		ST (L/R): 10,000 ohms"
з	Output Impedance	"Balanced: 150 onms Unbalanced: 150 ohms"
4	Frequency Response	20 Hz to 20 kHz
5	Dynamic Range	110 dB or higher, A-weighted/ST
6	Signal-to-noise ratio	90 dB or higher, A-weighted/ST
7	Total Harmonic Distortion	0.03% or less, 1 kHz unity
8	Microphone Phantom Power	(+48V) DC
Audio C	cable – 30 Mtrs	
		"Material: Tinned Copper
1	Conductors	Size: 2x20AWG
		Diameter: 0.916mm"
		Diameter: 1.8±0.09mm
2	Insulation	Average Thickness: 0.442mm
		Color: As color code"
3	Screening	"Material: AL-toil/mylar Overlan: 25% min"
		"Temperature rating: 75°C
1	Electrical	Insulation resistance: DC–500V 100M Ω /KM
4		Conductor resistance: 20AWG–34.6Ω/KM
		Impedance: 40~100Ω"

CAT6A	Video Cable – 30 Mtrs	
	Conductors	"Size: 4x2x23AWG
		Material: Annealed copper
		Diameter: 0.56mm ±0.01mm"
	Insulation	"Material: Skin/Foam/Skin HDPE
		Diameter: 1.33mm ±0.10mm
		Color Code: White/Blue, White/Orange,
		White/Green, White/Brown"
	Screening	Material: Alu/PET per pair (Alu side out)
	Electrical	"Impedance: 1–100MHz: 100Ω ±15Ω,
		100–250MHz: 100Ω ±20Ω,
		250–500MHz: 100Ω ±25Ω
		Propagation Velocity (NVP): 76%
		Voltage Rating: 60V
		Delay Skew: <45ns
		Mutual Pair Capacitance: ≤42pF/m
		Conductor DC Resistance: <79.8Ω/km
		Pair Resistance Unbalance DC: <1.5%
		Dielectric Strength: 2.5kV DC (2s)
		Insulation Resistance (500V): >5000MΩ/km"
RJ45 Co	onnector – 4 Nos	
1	Maximum current / Voltage:	1.5A
2	Contact resistance:	<20mΩ
3	Insulation resistance:	>500MΩ
	Mechanical dimensions compliance:	IEC 60606-7/FCC 68.500 22.5*11.68*8.0+0.00-
		0.15
4		
5	Cable-to-plug tensile strength:	20LBs(89N) min.
6	Durability:	2000 mating cycles
7	Housing material:	UL 94V-2
8	Shield material:	Brass, Ni-plated
9	Contact material:	Phosphor bronze
10	Contact plating:	50u, gold plated
11	Conductor structure:	Stranded/Solid
12	Conductor AWG:	AWG26-AWG22
Require	ed AV Connectors – 1 Lot	
With Installation and Commissioning		

CIVIL ENGINEERING DEPARTMENT, IIT MADRAS Technical Compliance for Supply and Installation of Audio and Video Conferencing System

ical complia	ance for Suppry and instantion of Audio and video conferen	icing System
	Tender Ref. No. CE/HOD/2022/1001/AVC SYSTEM	

No. Description Specification Not-Compty Audio conferencing system - 1 No Coverage Up to 7.6m x 7.6m	SI.	Description		Cussifientien	Comply /
Audio conferencing system – 1 No 1 Virtual Microphone Coverage Up to 7.6m x 7.6m 1 Virtual Microphone Type Low-noise omnidirectional MEMS 2 SPEAKERS Total harmonic distortion (THD) 0.25% (typical) 2 SPEAKERS Wattage & Number 2 20W x2 4 Acoustic output (hardware capable) 291 dB-SPL @ 1 m 4 Total harmonic distortion (THD) -3% 5 Frequency response Acoustic output 3.5 mm single-ended stereo jack Auxiliary out 4 Operating systems OS 5 POWER Power rating 100-240V AC, 50Hz 5 POWER Power rating 100-240V AC, 50Hz 6 Should have Advanced audio Acoustic ocho caputer (hardware adultion) Should have position-based gain control 6 E Should have Advanced audio Acoustic ocho caputer (hardware adultion) Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, zoom, GoToMeeting®, Cisco Webex® and Start.eaf 1 Output Impedance XLR connector = -03 (B3 mm (1/4") connector = -13 (BV (into 100 kΩ load) 2 Audio Output Level XLR connector = -13 (BV (into 100 kΩ load) 3 RF Sensitivity YLR connector = -13 (BV (into 100 kΩ load)	NO.	Description		Specification	Not-Comply
1 Virtual Microphone Coverage Up to 7.6m x 7.6m 1 Virtual Microphone Frequency response at 94 dB SPL 100Hz to 5 kHz 2 SPEAKERS Wattage & Number ≥ 20W x2 1 Wattage & Number ≥ 20W x2 1 Type 4" aluminum cone Acoustic output (hardware capable) ≥91 dB-SPL @ 1 m 1 Total harmonic distortion (THD) <3% 1 Frequency response frequency response 50Hz to 16 kHz 3 MODULE Interface to computer MoDULE Sin m single-ended stereo jack x1 4 Operating systems OS Sin m single-ended stereo jack x1 4 Operating systems OS Sin m single-ended stereo jack x1 4 Operating systems OS Sin m single-ended stereo jack x1 4 Operating systems OS Sin m single-ended stereo jack x1 5 POWER Power rating 10.240V AC, 50Hz 6 Should work seamlessty with leading UC&C ophatibility Costic echo cancellation, position-based gain control Windowush Should work	Audio	conferencing system	– 1 No		
1 Virtual Microphone Type MEMS 1 Virtual Microphone Frequency response at 94 dB SPL 100Hz to 5 kHz 7 Total harmonic distortion (THD) 0.25% (typical) 200 2 SPEAKERS Type 4" aluminum cone Acoustic output (hardware capable) 291 dB-SPL @ 1 m 7 Total harmonic distortion (THD) -3%			Coverage	Up to 7.6m x 7.6m	
1 Virtual Microphone Type Frequency response distribution (THD) MEMS Image: matrix of the second se				Low-noise omnidirectional	
1 Virtual microprione Frequency response at 94 4d SPL 100Hz to 5 kHz 2 Prequency response (microprione) 0.25% (typical) 100Hz to 5 kHz 3 SPEAKERS Wattage & Number (nardware capable) 220W x2 100Hz 4 Operating systems CONNECT MODULE 4" aluminum cone (nardware capable) 291 dB-SPL @ 1 m 3 CONNECT MODULE Frequency response 50Hz to 16 kHz 100Hz 4 Amplifier Class D 100Hz 3.5 mm single-ended stereo jack x1 5 POWER Auxiliary in Connection to microphone and speaker 3.5 mm single-ended stereo SX® 10.14 and 10.15 (Mojave and catalina) 5 POWER Power rating 100-240V AC, 50Hz 6 GENERAL Should have Advariced audio Accustic echo cancellation, Advarced audio 5 POWER Vere rating Built-in wall mount 100-240V AC, 50Hz 1 UC&C compatibility UC&C compatibility Built-in wall mount 100-240V AC, 50Hz 2 Audio Output Level UC&C compatibility Sortion-based gain control 200 (Sortion-based gain control 1 Output Impedance XLR connector - 200 Ω		Virtual Mienerskerne	Туре	MEMS	
$\frac{1394 \text{ db } SPL}{100\text{Hz to 5 kHz}} 100\text{Hz to 5 kHz}}{100\text{Hz to 5 kHz}} \\ \frac{1394 \text{ db } SPL}{100\text{Hz to 5 kHz}} 100\text{Hz to 5 kHz}}{100\text{Hz to 5 kHz}} \\ \frac{1300 \text{ distortion (THD)}}{100\text{ kave 6 a pable}} 220\text{ W x2} \\ \frac{1}{7\text{ ype}} 4^{\circ} \text{ a luminum cone}}{4^{\circ} \text{ a luminum cone}} \\ \frac{1}{4} \text{ coustic output}} \\ \frac{1}{70\text{ tal harmonic}} \\ \frac{1}{70 ta$	1	virtual Microphone	Frequency response		
2 SPEAKERS Vartage & Number Type 2 20W x2			at 94 dB SPL		
2 SPEAKERS Wattage & Number Type 20W x2 Type 4" aluminum cone Acoustic output (hardware capable) 291 dB-SPL @ 1 m Total harmonic distortion (THD) -3% Frequency response 50Hz to 16 kHz Amplifier Class D Auxiliary out 3.5 mm single-ended stereo jack x1 Auxiliary in MODULE 3.5 mm single-ended stereo jack x1 Auxiliary in microphone and speaker 3.5 mm single-ended stereo jack x1 Auxiliary in Module 3.5 mm single-ended stereo jack x1 Auxiliary in Module X1 Operating systems OS CONRECT Windows® 7, Windows 8, Windows 10, Mac® OS X® 10.14 and 10.15 (Mojave and Catalina) S POWER Power rating 100-240V AC, 50Hz GENERAL Should have Advanced audio Vindows 8, Windows 8, Windows 8, Windows 10, Mac® OS X® 10.14 and 10.15 (Mojave and Catalina) UC&C compatibility UC&C compatibility UC&C compatibility Should work seamlessly with leading UC&CS platforms, installation Multi-Invelt Should work seamlessly with leading UC&CS platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Quiput Impedance XLR connector – 200 Ω 4 Output Impedance 2 Audio Output Level			I otal narmonic	0.25% (typical)	
2 SPEAKERS Type Type Acoustic output (hardware capable) 291 dB-SPL @ 1 m 3 SPEAKERS Frequency response Amplifier Class 50Hz to 16 kHz 3 CONNECT MODULE Interface to computer Single USB 2.0, type B 4 Operating systems 0.5 mm single-ended stereo jack Auxiliary in Connection to microphone and speaker X1 5 POWER Power rating 100-240V AC, 50Hz 5 POWER Power rating 100-240V AC, 50Hz 6 Should have Advanced audio Advanced audio position-based gain control 6 Wall-mount installation Built-in wall mount Should have Advanced audio 7 Output Impedance XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -13 dBV (into 100 kQ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical.			Wattage & Number	220% (typical)	
2 SPEAKERS Acoustic output (hardware capable) 291 dB-SPL @ 1 m 7 Total harmonic distortion (THD) <3% Frequency response 50Hz to 16 kHz Amplifier Class D Auxiliary out 3.5 mm single-ended stereo jack Auxiliary out Auxiliary out 3.5 mm single-ended stereo jack Auxiliary out Auxiliary in Connection to microphone and speaker 8.1-45 x2 Vindows® 7, Windows 8, Windows® 7, Windows 8, Windows 10, Mac® OS X® 4 Operating systems 5 POWER Power rating 100-240V AC, 50Hz GENERAL Should have Advanced audio Advanced audio position-based gain control Wall-mount installation Built-in wall mount UC&C compatibility UC&C compatibility UC&C compatibility Should work seamlessly with leading UC&C platoms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf 1 Output Impedance XLR connector - 200 Ω 6.35 mm (1/4") connector - 50 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical.					
2 SPEAKERS Interface to computer in the second se			Acoustic output		
2 SPEAKERS Total harmonic distortion (THD) column -3% 3 CONNECT MODULE Interface to computer MODULE Single USB 2.0, type B			(hardware capable)	≥91 dB-SPL @ 1 m	
distortion (THD) <3%	2	SPEAKERS	Total harmonic		
3 CONNECT MODULE Interface to computer Single USB 2.0, type B 3 CONNECT MODULE Interface to computer Single USB 2.0, type B 4 Auxiliary out x1 Connection to microphone and speaker RJ-45 x2 yindows 0, Mac@ OS X@ 10.14 and 10.15 (Mojave and Catalina) 5 POWER Power rating GENERAL Should have Acoustic echo cancellation, Advanced audio position-based gain control Wall-mount installation Built-in wall mount UC&C compatibility UC&C compatibility Vulteless Receiver - 1 No XLR connector - 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical 4 Image Rejection >50 dB, typical			distortion (THD)	<3%	
Amplifier Class D 3 Amplifier Class D 3 Interface to computer Single USB 2.0, type B 3.5 mm single-ended stereo jack X1 4 Auxiliary out X1 4 Operating systems Connection to microphone and speaker S.5 mm single-ended stereo jack X1 5 POWER Over rating 10.14 and 10.15 (Mojave and Catalina) 5 POWER Power rating 100-240V AC, 50Hz 6 GENERAL Should have Advanced audio Wall-mount Acoustic echo cancellation, position-based gain control Wileless Receiver – 1 No UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webe@ and StarLeaf 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			Frequency response	50Hz to 16 kHz	
3 Interface to computer Module Single USB 2.0, type B 3.5 mm single-ended stereo jack x1 Auxiliary out x1 3.5 mm single-ended stereo jack x1 Auxiliary in x1 Connection to microphone and speaker RJ-45 x2 Windows® 7, Windows 8, Windows 0, Mac® OS X® 10.14 and 10.15 (Mojave and Catalina) 5 POWER Power rating 100-240V AC, 50Hz Should have Advanced audio Acoustic echo cancellation, position-based gain control Wall-mount installation Built-in wall mount UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV ((into 100 kΩ load)) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			Amplifier Class	D	
3 CONNECT MODULE Auxiliary out 3.5 mm single-ended stereo jack x1 4 Auxiliary in 3.5 mm single-ended stereo jack x1 Connection to microphone and speaker RJ-45 x2 4 Operating systems OS 5 POWER Power rating 9 POWER Power rating 4 Operating systems OS 5 POWER Power rating 4 Mual-mount installation Built-in wall mount 9 Wal-mount installation Built-in wall mount 1 UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf 1 Output Impedance XLR connector - 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			Interface to computer	Single USB 2.0, type B	
3 Auxiliary out x1 3 Auxiliary out x1 4 Auxiliary in x1 Connection to microphone and speaker RJ-45 x2 4 Operating systems OS 5 POWER Power rating 6 POWER Power rating 6 GENERAL Should have Acoustic echo cancellation, position-based gain control 8 Wall-mount installation Built-in wall mount 9 UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco 1 Output Impedance XLR connector – 200 Ω 1 Output Impedance XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			· · ·	3.5 mm single-ended stereo jack	
3 CONNECT MODULE Auxiliary in Connection to microphone and speaker 3.5 mm single-ended stereo jack x1 4 Connection to microphone and speaker RJ-45 x2 4 Operating systems OS 5 POWER OS 6 POWER Power rating 7 GENERAL Should have Advanced audio 8 Advanced audio position-based gain control 9 Well-mount installation Built-in wall mount 1 UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			Auxiliary out	x1	
$\begin{array}{ c c c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c c } \hline \begin{tabular}{ c c c c } \hline \begin{tabular}{ c c } \hline \hline \begin{tabular}{ c c } \hline \begin{tabular}{ c c } \hline \begin{tabular}{ c c c } \hline \hline \begin{tabular}{ c c } \hline \hline \begin{tabular}{ c c c c } \hline \hline \begin{tabular}{ c c c c } \hline \hline \begin{tabular}{ c c c } \hline \hline \begin{tabular}{ c c c } \hline \hline \begin{tabular}{ c c c } $	3	CONNECT		3.5 mm single-ended stereo jack	
$\begin{array}{ c c c c } & \begin{tabular}{ c c c } & \begin{tabular}{ c c c } Connection to microphone and speaker & RJ-45 x2 & & & & & & & & & & & & & & & & & & $	5	MODULE	Auxiliary in	x1	
$\begin{array}{ c c c c } \hline \mbox{microphone and speaker} & RJ-45 x2 & & & & & & & & & & & & & & & & & & $			Connection to		
4 Operating systems OS Windows 0, Mac® OS X® 10.14 and 10.15 (Mojave and Catalina) 5 POWER Power rating 100-240V AC, 50Hz 6 GENERAL Should have Advanced audio Acoustic echo cancellation, position-based gain control Will-mount installation Built-in wall mount Built-in wall mount Wereless Receiver - 1 No VC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft®, Cisco 1 Output Impedance XLR connector - 200 Ω 6.35 mm (1/4") connector - 50 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load) 3 RF Sensitivity -50 dB, typical >50 dB, typical			microphone and		
$\begin{array}{ c c c c } & & & & & & & & & & & & & & & & & & &$			speaker	RJ-45 x2	
$\frac{4}{4} \begin{array}{c} \text{Operating systems} \\ \text{Operating systems} \\ \text{OS} \\ \text{Catalina} \\ \hline 0.14 and 10.15 (Mojave and Catalina) \\ \hline 0.14 and 10.15 (Mojave and Catal$				Windows® 7, Windows 8,	
4 Operating systems OS Catalina) 5 POWER Power rating 100-240V AC, 50Hz GENERAL Should have Advanced audio Acoustic echo cancellation, position-based gain control Wall-mount installation Built-in wall mount Wall-mount installation Built-in wall mount UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω Audio Output Level KLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical				10 14 and 10 15 (Maiave and	
5 Power Power rating 100-240V AC, 50Hz 6 GENERAL Should have Advanced audio Acoustic echo cancellation, position-based gain control Wall-mount installation Built-in wall mount Built-in wall mount Wall-mount installation Built-in wall mount Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical	4	Operating systems	05	Catalina)	
generation Fortext Fortext <th>5</th> <th>POWER</th> <th>Power rating</th> <th>100-240V AC 50Hz</th> <th></th>	5	POWER	Power rating	100-240V AC 50Hz	
GENERAL Should have Advanced audio position-based gain control Wall-mount installation Built-in wall mount Built-in wall mount Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level KLR connector = -27 dBV (into 100 kΩ load) 2 Audio Output Level KLR connector = -13 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical	5		Should have	Acoustic acto cancellation	
$\frac{1}{1} \qquad \begin{array}{ c c c } \hline Wall-mount \\ installation \\ \hline Wall-mount \\ \hline Built-in wall mount \\ \hline Built-in wall $		GENERAL		nosition-based gain control	
Built-in wall mount Built-in wall mount Built-in wall mount Built-in wall mount Built-in wall mount Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical	-		Wall-mount		
μ UC&C compatibility Should work seamlessly with leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			installation	Built-in wall mount	
μ UC&C compatibility leading UC&C platforms, including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level 6.35 mm (1/4") connector – 50 Ω 3 RF Sensitivity XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical				Should work seamlessly with	
UC&C compatibility including Microsoft® Teams, Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level XLR connector = -27 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical				leading UC&C platforms,	
Image Rejection Zoom, GoToMeeting®, Cisco Webex® and StarLeaf Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level 6.35 mm (1/4") connector – 50 Ω 3 RF Sensitivity 6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical			UC&C compatibility	including Microsoft® Teams,	
Dual Wireless Receiver – 1 No XLR connector – 200 Ω 1 Output Impedance XLR connector – 200 Ω 2 Audio Output Level 6.35 mm (1/4") connector – 50 Ω 3 RF Sensitivity 6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load) 3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical				Zoom, GoToMeeting®, Cisco	
Dual Wireless Receiver – 1 No1Output ImpedanceXLR connector – 200 Ω2Audio Output Level6.35 mm (1/4") connector – 50 Ω2Audio Output LevelXLR connector = -27 dBV (into 100 kΩ load)3RF Sensitivity6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load)4Image Rejection(-105) dBm for 12 dB SINAD, typical.4Image Rejection>50 dB, typical				Webex® and StarLeaf	
1Output ImpedanceXLR connector – 200 Ω2Audio Output Level6.35 mm (1/4") connector – 50 Ω2Audio Output LevelXLR connector = -27 dBV (into 100 kΩ load)3RF Sensitivity6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load)3RF Sensitivity(-105) dBm for 12 dB SINAD, typical.4Image Rejection>50 dB, typical	Dual Wireless Receiver – 1 No				
$\frac{1}{2}$ Audio Output Level $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ Audio Output Level $\frac{1}{2}$ $\frac{1}{$		Output Impedance		XLR connector – 200 Ω	
2Audio Output LevelXLR connector = -27 dBV (into 100 k Ω load)2Audio Output Level $\frac{100 \text{ k}\Omega \text{ load}}{100 \text{ k}\Omega \text{ load}}$ 3RF Sensitivity $(-105) \text{ dBm for 12 dB SINAD,} \text{ typical.}$ 4Image Rejection>50 dB, typicalWireless Receiver with Handheld Microphone – 1 No	1			6.35 mm (1/4") connector – 50 Ω	
$\begin{array}{c} 2 \\ 2 \\ 3 \end{array} \begin{array}{c} \text{Audio Output Level} & 100 \text{ k}\Omega \text{ load} \\ \hline 6.35 \text{ mm} (1/4") \text{ connector } = -13 \\ \text{dBV (into 100 \text{ k}\Omega \text{ load})} \end{array} \\ \hline (-105) \text{ dBm for } 12 \text{ dB SINAD,} \\ \text{typical.} \end{array} \\ \hline 4 \text{Image Rejection} & >50 \text{ dB, typical} \end{array}$				XLR connector = -27 dBV (into	
2 6.35 mm (1/4") connector = -13 dBV (into 100 kΩ load) 3 RF Sensitivity 4 Image Rejection 4 Image Rejection	2	Audio Output Level		100 kΩ load)	
dBV (into 100 kΩ load) 3 RF Sensitivity 4 Image Rejection Vireless Receiver with Handheld Microphone – 1 No				6.35 mm (1/4") connector = -13	
3 RF Sensitivity (-105) dBm for 12 dB SINAD, typical. 4 Image Rejection >50 dB, typical				dBV (into 100 kΩ load)	
3 two series 4 Image Rejection 50 dB, typical		RF Sensitivity		(-105) dBm for 12 dB SINAD,	
4 Image Rejection >50 dB, typical Wireless Receiver with Handheld Microphone – 1 No	3			typical.	
Wireless Receiver with Handheld Microphone – 1 No	4	Image Rejection		>50 dB, typical	
	Wireless Receiver with Handheld Microphone – 1 No				

	XLR connector – 200 Ω	
1	Output Impedance	
		6.35 mm (1/4") connector – 50 Ω
		XLR connector = -27 dBV (into 100
		kΩ load)
2	Audio Output Level	6.35 mm (1/4'') connector = -13
		dBV (into 100 kO load)
3	RF Sensitivity	(-105) dBm for 12 dB SINAD,
4	Image Rejection	typical.
5	Audio Input Level	UdB = -20 dBV maximum
		(-10dB) = -10 dBV maximum
Handhe	eld Transmitter (Microphone) – 1 No	
	Audio Input Level	OdB = -20 dBV maximum
1		(-10dB) = -10 dBV maximum
2	Gain Adjustment Range	10 dB
3	RF Transmitter Output	10 mW, typical
Headwo	orn Microphone – 1 No	
1	Туре	Condenser microphone
2	Frequency Response	40 Hz to 20,000 Hz
3	Polar Pattern	Unidirectional (Cardioid)
4	Output Impedance	100 Ω, @ 1 kHz
	Sensitivity	(-57.8 dBV/Pa) @ 1 kHz, 1000 Ω
5		load
6	Signal-To-Noise Ratio	59.2 dB, @ 1 kHz, 1000 Ω load
Bodypack Transmitter – 1 No		
1	Audio Input Level	max = (-16 dBV) maximum
		min (0 dB) = +10 dBV maximum
2	Input Impedance	1 ΜΩ
3	RF Transmitter Output	10 mW, typical
Mixer –	1 No	
1	Channel	6
		"Mic: 1,600 ohms Line: 10,000
2	Input Impedance	ohms
2		ST (L/R): 10,000 OIIIIS "Balanced: 150 obms
3	Output Impedance	Unbalanced: 150 ohms"
4	Frequency Response	20 Hz to 20 kHz
5	Dynamic Range	110 dB or higher, A-weighted/ST
6	Signal-to-noise ratio	90 dB or higher, A-weighted/ST
7	Total Harmonic Distortion	0.03% or less, 1 kHz unity
8	Microphone Phantom Power	(+48V) DC
Audio	Cable – 30 Mtrs	
		"Material: Tinned Copper
1	Conductors	Size: 2x20AWG
		Diameter: 0.916mm"
2	Insulation	"Material: PP

		Diameter: 1.8±0.09mm	
		Average Thickness: 0.442mm	
		Color: As color code"	
0	Scrooning	"Material: AL-foil/mylar	
3	Screening	Overlap: 25% min"	
		"Temperature rating: 75°C	
		Insulation resistance: DC–500V	
4	Floatrical	100ΜΩ/ΚΜ	
4		Conductor resistance: 20AWG–	
		34.6Ω/ΚΜ	
		Impedance: 40~100Ω"	
CAT6A	Video Cable – 30 Mtrs		
	Conductors	"Size: 4x2x23AWG	
		Material: Annealed copper	
		Diameter: 0.56mm ±0.01mm"	
	Insulation	"Material: Skin/Foam/Skin HDPE	
		Diameter: 1.33mm ±0.10mm	
		Color Code: White/Blue,	
		White/Orange, White/Green,	
		White/Brown"	
	Screening	Material: Alu/PET per pair (Alu side	
	-	out)	
	Electrical	"Impedance: 1–100MHz: 100Ω	
		±15Ω,	
		100–250MHz: 100Ω ±20Ω,	
		250–500MHz: 100Ω ±25Ω	
		Propagation Velocity (NVP): 76%	
		Voltage Rating: 60V	
		Delay Skew: <45ns	
		Mutual Pair Capacitance: ≤42pF/m	
		Conductor DC Resistance:	
		<79.8Ω/km	
		Pair Resistance Unbalance DC:	
		<1.5%	
		Dielectric Strength: 2.5kV DC (2s)	
		Insulation Resistance (500V):	
		>5000MΩ/km"	
RJ45 Co	nnector – 4 Nos		
	Maximum current / Voltage:	1.5A	
1			
2	Contact resistance:	<20mΩ	
2	Insulation resistance:	>500MO	
3		20011122	
	Mechanical dimensions compliance:	IEC 60606-7/FCC 68.500	
		22.5*11.68*8.0+0.00-0.15	
4			
5	Cable-to-plug tensile strength:	20LBs(89N) min.	
5	Durability:	2000 mating cycles	
6			
_	Housing material:	UL 94V-2	
7			
8	Shield material:	Brass, Ni-plated	
0	Contact material:	Phosphor bronze	
9			

10	Contact plating:	50u, gold plated	
11	Conductor structure:	Stranded/Solid	
12	Conductor AWG:	AWG26-AWG22	
Required AV Connectors – 1 Lot			
Installation and Commissioning			
Land Border Sharing Certificate as per format Annexure-D			
Local Content Certificate as per format Annexure-E			
Warranty – 12 Months			
Delivery period – 30 days			
Price Validity – 90 days			

Signature of the Tenderer

ANNEXURE – C

CIVIL ENGINEERING DEPARTMENT, IIT MADRAS Supply and Installation of Audio and Video Conferencing System Tender Ref. No. CE/HOD/2022/1001/AVC SYSTEM

FINANCIAL BID (PROFORMA)

SI. No.	Description of Work	Qty	Units	Basic Rates in INR	GST 5%	Total Amount with taxes in INR
01.	Supply and Installation of Audio & Video	1	No.	Rs.	Rs.	Rs.
	Conferencing System					
	Grand Total					Rs.

Total Amount/Rupees in words ______

Signature of the Tenderer

ANNEXURE D

(To be given on the letter head of the bidder)

Tender No.

Dated: _____

CERTIFICATE

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am not from such a country.

OR

(Bidders from Country which shares a land border with India)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am from ________ (Name of Country) and have registered with the Competent Authority. I also certify that I fulfil all the requirements in this regard and am eligible to be considered. *(Copy/ evidence of valid registration by the Competent Authority is to be attached)*

Place: Date: Signature of the Bidder Name & Address of the Bidder with Office Stamp

ANNEXURE – E

FORMAT FOR AFFIDAVIT OF SELF-CERTIFICATION UNDER PUBLIC PROCUREMENT POLICY (PREFERENCE TO MAKE IN INDIA) 2017

Tender Reference Number:	
Name of the item / Service:	

Date: _____

I/We	_S/o, D/o, W/o,
Resident of	

hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Policy vide Gol Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P- 45021/102/2019-BE-II-Part(1) (E-50310) Dt.4th March 2021 and any subsequent modifications/Amendments, if any and

That the local content for all inputs which constitute the said item/service/work has been verified by me and I am responsible for the correctness of the claims made therein.

Tick (✓) and Fill the Appropriate Category	
	I/We[name of the supplier] hereby confirm in respect of quoted items
	thatLocal Content is equal to or more than 50% and come under "Class-I Local Supplier" category.
	I/We[name of the supplier] hereby confirm in respect of quoted items
	that Local Content is equal to or more than 20% but less than 50% and come under "Class-II Local
	Supplier" category.
	I/We[name of the supplier] hereby confirm in respect of quoted items
	that Local Content is less than 20% and come under "Non Local Supplier" category.

The details of the location (s) at which the local value addition is made and the proportionate value of local content in percentage

:_____%**

Percentage of Local content

Location at which value addition done

For and on behalf of (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

[Note: In case of procurement for a value in excess of Rs. 10 Crores, the bidders shall provide this certificate fromstatutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.]

This letter should be on the letterhead of the quoting firm and should be signed by a competent authority.

** Services such as transportation, insurance, installation, commissioning, and training and after sales service support like AMC/CMC cannot be claimed as local value addition