Specifications for the VoIP Intercom unit

Sl No	Description	Parameter	Vendor Compliance		
			Compliance status (Yes/ No)	Offered specifications	Remarks / Reference
1	**Objective**				
1.1	Proposals	ISRO Telemetry Tracking and Command Network (ISTRAC),here by termed as the "Purchaser", is issuing this Tender / Bid Enquiry document for purchase of VoIP Intercom unit and related services			
1.2	Scope / Objective	Supply, Installation and post-delivery on-site maintenance support for the realization of "VoIP Intercom unit" as an "Integrated Solution" of IP based digital voice communication system for ISTRAC. The detailed technical specifications are provided in Section-15.			
2	**Introduction of System**				
2.1	Introduction	An IP based Digital Software based Voice Intercommunication system called "VoIP Intercom" is proposed to be installed for two-way communication on LAN & WAN networks. The units are intended to be deployed at mission control centres and TTC ground stations for enabling voice communication. The voice communication is very important for supporting mission operations.			
2.2	Major elements	VoIP Intercom system comprises of major elements such as computing systems in SBC (single board computer) form factor with Linux Ubuntu OS, touch screen display, audio devices, internal speakers, termination of various interfaces, Power supply, external PTT Microphone, Headset, Accessories and compact package / enclosure unit as an integrated solution as per requirements provided by ISTRAC.			
2.3	Unit operation	The unit uses a VoIP Client application software along with			

		other audio accessories that allows it to operate in Listen mode and enabled to transmit / talk mode with PTT (press- to talk) switch through Handheld microphone or GUI software based touch button.			
2.4	Over view	The overview of various elements of the VoIP Client Unit along with scope of work is shown in figure-1 (annexure-A).			
3	**Technology**				
3.1	Current system	Currently, ISTRAC is using an analog voice communication system which is on the verge of obsolescence. It is proposed to replace existing system with an IP based digital voice communication Intercom system.			
3.2	Requirements	This requirement summarizes the functional features including the hardware and software elements towards an Integrated VoIP intercom client unit. Accordingly the requirements logically are arranged to make customized product as: a) Functions & features required by both hardware and software b) Requirements of hardware specifications -and software (OS & drivers) c) Proof of Concept (POC) d) General instructions e) Terms & Conditions			
4	**Overview of the Unit**				
4.1	Components	The VoIP Intercom Unit primarily includes the following components: a) Hardware Components b) Software Components			

		c) Package systems / Enclosure for housing the hardware components			
		d) The conceptual hardware components, software elements and enclosure box are indicated in the figures-1 to 5 (annexure-A).			
		e) Block diagram / over view of the system is shown in figure-2 (annexure-A)			
5	**Hardware Components**				
5.1	Primary hardware components	The primary hardware components of an Intercom unit comprises of Compute processing system in Single Board Computer (SBC) of a small form factor, audio device, touch screen display, Internal speakers, customized keypad, volume control, Power ON/Off, Power divider/ breakout board, audio IO interfacing Board, termination for IO interfaces like PTT Mic, Ethernet, Headsets, Power barrel jack, external speakers and other accessories.			
5.2	Accessories	Accessories for the VoIP Intercom Unit are Press-to-talk (PTT) Handheld Microphone, Headset, Power adapter and accessories.			
5.3	Enclosure Box	Package unit / Box with mounting kit.			
6	**Software Components**				
6.1	Operating system	The unit shall work on preloaded Operating systems (OS) Linux Ubuntu of version 20.04LTS or latest.			
6.2	Unit compatibility	The unit compatibility shall be tested with open source voice communication applications such as Mumble / TeamSpeak software.			
6.3	Preloaded OS	OS shall be preloaded with all the necessary hardware device			

		drivers for the intended voice communication.			
6.4	API support for internal hardware & interfaces	ISTRAC is in the process of developing in-house GUI software for the front end application for user friendly operations. The GUI will be on top of the VoIP Client application software. The Vendor shall provide the necessary drivers/API & support for ensuring the compatibility of hardware elements with GUI.			
7	**Package systems / Enclosure for housing the hardware components**	The drawing indicates the conceptual design of the VoIP package unit. Refer figure -3 (annexure-A).			
8	**Description of the hardware elements / components**				
8.1	Compute systems in SBC small form factor	Compute processing systems is a mini computing module with complete function of small computer comprises of Microprocessor / CPU, Memory, Ethernet interfaces, software, I/O ports, device drivers etc. Compute system design should be robust, modular and reliable to operate on 24x7 basis.			
8.2	Touch Screen Display Panel	A touch screen (size between 7 to 8 inches) is the assembly of both an input ('touch panel') and output ('display') device. The touch panel shall be layered on the top of the compute system. The touchscreen shall enable the user to interact directly with what is displayed by the compute system / SBC through display signal (HDMI/DP out), rather than using a mouse, touchpad or other such devices. A user shall give input or control the compute system / SBC through simple or multi-touch gestures. In the VoIP Intercom unit, the touch screen panel shall be connected to the compute system / SBC via HDMI/DP and the user can interact with the GUI of the SBC via the touch interface.			

8.3	Customizable keypad	The unit shall include user defined configurable keys interface with SBC. The functionality of these keys shall be tested with open source voice communication application software such as Mumble / TeamSpeak. Compatibility will be tested by assign different functions (like selection of channels, mute/unmute, SOS/Paging and others) to different keys.			
8.4	Volume Control Key and Power ON/OFF	Volume control keys shall be provisioned in the package unit for volume control of the internal speaker. The volume levels of the internal speakers shall also be controllable. Power On/Off switch shall be a soft switch with indicator to turn the unit ON or OFF.			
8.5	Audio IO Interfacing breakout board with amplifier & internal speakers	The Internal speaker shall have excellent sound quality, high fidelity as part of solution. The sound needs to be loud and clear. There shall be two speakers configured for stereo audio of each two (min.) wattage power. Audio IO breakout board shall have built in drivers to interface with compute system / SBC and speaker and for the volume control. Audio IO Interfacing breakout board and audio amplifier device board shall be powered with a separate power source from the Power Distribution board enclosed within the chassis to ensure isolation in the Audio signal.			
8.6	Audio amplifier device for External Speaker	Provision shall be made within the Audio IO Interfacing breakout board to provide audio signals for the external speakers to drive through Line-output in stereo mode to connect two speakers. The audio IO Interfacing breakout board shall include the interfacing hardware to support Handheld PTT Microphone and Headsets using lockable type connectors.			

8.7	Handheld Microphone	The Handheld Microphone shall be a microphone with press-to-talk (PTT) switch and coiled cord. This handheld microphone shall operate as "PRESS & HOLD" to talk and release to mute. The microphone should have good sensitivity. It shall be interface with the VoIP Intercom client unit using XLR type connector. The indicative picture and appearance of the handheld microphone is shown in figure-4 (annexure-A).			
8.8	Headset	The Headset / Earphone comprises of earphones (speakers) and microphone with a cord / cable and a XLR connector. It is used for hands-free "Talking" and "Listening". While talking, the user should use the "Press-To-Talk" switch / button on the customized key pad. The indicative picture and appearance of the headset is shown in figure-5.			
8.9	Power supply	The power supply unit shall comprise of External Power Adaptor (AC to DC) and Internal DC-DC Power board. A Suitable power supply / adapter shall be supplied to drive all the devices with efficiency rating of at least 80%. Detail design requirements of the power source to drive all the devices / components are indicated in the specifications. The DC power source shall be highly reliable and efficiency. There shall be power splitter / divider to deliver isolated power to the SBC and audio devices to avoid the loading and interference.			
8.10	Package unit / Box	The package unit shall be sleek, slim, compact, elegant, and aesthetic as these units will be deployed in mission control operations. Thus the dimensions shall not exceed the maximum boundary dimensions as mentioned in specifications. Enclosure case shall comprise of Process unit (SBC), Power supply/ Power splitter, audio IO interfacing			

		breakout board, internal speaker with amplifier, interface cables, Touch Panel Display, connectors, terminations, Volume Control, Power Switch, power status indicator, Customizable key pad etc. The power and network interface connectors shall be located at rear side and function keys, indicators and Audio Interface connectors shall be positioned in the front as shown in the figure-3 (annexure-A). The unit shall be designed keeping in mind the mounting kit assembly suitable for a standard 19 inch instrument racks. The drawings provided are only indicative for the understanding the requirements and vendor shall produce the design drawings as per requirements.			
8.11	Integration & Accessories	All the modules, components and cables are to be tested individually and integrated in a package unit / box to realize fully functional unit. Highly professional / skill resources with excellent soldering techniques to be used to avoid any dry soldering and loose contacts. All the cables, components, connectors etc. are to be labelled for easy identification and trace.			
9	**Proof of Concept (PoC)**				
9.1	Demonstration	It is mandatory for the vendor to demonstrate the capabilities through a proof of concept (PoC). The PoC shall demonstrate operational functions and performance of the unit.			
9.2	Evaluation criteria	The following criteria/parameters are the benchmark to evaluate the prototype product.			
9.2	a)	Overall aesthetic and elegance			
9.2	b)	Functional performance			
9.2	c)	Package unit size and compactness for less than 8 Inch touch			

		panel display			
9.2	d)	Type of PTT Handheld Microphone, suitability to operate and quality of voice signal pickup from mouth (at distance of 6 Inch)			
9.2	e)	Type of Headset and quality of microphone to pickup of voice signal from the mouth and fidelity / loudness of hearing through ear phone			
9.2	f)	Clarity / Fidelity & loudness of the Speaker and volume control operations			
9.2	g)	Interface connectors termination position and their finish			
9.2	h)	Type of Indicators and operations			
9.2	i)	Design of power adapter and isolated power the SBC & other devices.			
9.2	j)	Workmanship towards integration of components & cable assembly			
9.2	k)	Network interface to communicate via LAN & WAN			
9.2	l)	Touch display screen interaction with SBC and display quality			
9.2	m)	Performance of OS software, client application software and drivers for the devices & peripherals			
9.2	n)	Overall System performance			
9.3	Suggestion & improvements	The suggestion made by ISTRAC towards improving the performance of unit shall be duly incorporated by the vendor			
10	**Design Consideration and Improvements**				

10.1	System improvement	The requirements are addressed in the above paragraphs & specifications are indicative. Vendor should consider all the specified parameters / specifications/ requirements and can design & provide equivalent or a better product.			
10.2	Minor changes / modifications during PoC	Vendor shall bring out the improvements / enhancement in design of the product during demonstration / PoC. Vendor shall accept any minor changes / modifications / improvements suggested during PoC should incorporate without any price implication.			
11	**Bidder's Scope**				
11.1	Consideration for product development	Design, develop, manufacture, POC, testing, delivery, installation and support for post-delivery maintenance of the delivered items. Vendor shall consider all the specified parameters / specifications/ requirements and can design and offer a technically suitable product ensuring specified performance, reliability, durability and aesthetics.			
11.2	Assembly	Manufacture / assemble of all the devices & peripherals			
11.3	Loading of OS	Loading of operating software (OS) of Linux Ubuntu with version 20.04LTS or latest for long term support with necessary drivers of the devices / peripherals			
11.4	Prototype unit	Shall demonstrate the functioning of the prototype unit in line with specifications provided in this document.			
11.5	Firmware updates	Providing the firmware updates of the OS & drivers as and when releases new versions during the warranty period			
11.6	O & M manual	Providing operation & maintenance (O & M) manual including schematic, functional block drawings, mechanical drawings of			

		enclosure box, procedures, fault tracing etc.			
11.7	Test reports	Testing at factory in all respects and providing test reports / documents			
11.8	Supply, installation & Acceptance	Supply & installation and acceptance test at site			
11.9	Minor changes	Shall accept to carry out any minor changes in the designs / development for improvement in the system performance during the design & production of the units			
11.10	Post-delivery support	Vendor shall provide Post-delivery On-Site maintenance support during the warranty period as described in warranty clause.			
12	**Scope of ISTRAC**				
12.1	Network & Configuration	Providing Network connectivity, configuration, definition and management			
12.2	Client application software	The VoIP client application software over the OS (Ubuntu v20.04LTS or latest) for the voice communication (such as Mumble, Teamspeak)			
12.3	Channels configuration	Requirements of channel grouping & configuration			
12.4	GUI software	GUI software for the user friendly operations & configuration			
12.5	Deployment at different locations	ISTRAC is responsible for deployment at different locations like Lucknow, Shriharikota, Trivandrum and outside country.			
13	**Evaluation Criteria of PoC / Prototype**				
13.1	POC is mandatory	It is mandatory for the vendor to demonstrate the capabilities and operational functions and performance of the unit through			

		the PoC.			
13.2	Demonstration at ISTRAC	Vendor shall demonstrate the proper functioning of the product at site as part of technical evaluation / qualification. The prototype product should be demonstrated within 15 days of bid submission date or intimation from ISTRAC. Non submission of the demo / prototype product by bidders for evaluation is liable to reject and leads to non-compliances.			
13.3	Evaluation criteria	The criteria / parameters which are the benchmark to evaluate the prototype products are provided in Annexure-B.			
14	**General Terms & Conditions and Instructions**				
14.1	Past experience & installations	Vendors shall have past experience in development and realization of similar compute systems / SBC and electronic packaged products. Documentary proof in terms of work completion certificate and Purchase order for successful completion of the same shall be submitted along with offer.			
14.2	Quality System	Vendor / OEM shall have certification towards product realization in accordance with the requirements of ISO-9001:2015 Quality Management System or equivalent. Vendor shall submit the documentary proof of the same.			
14.3	Site visit	If vendor wish to visit ISTRAC for understanding the requirements, it is permissible during tender within 20 days from the date tender published. Vendor shall provide prior information to PURCHASE, ISTRAC at least two working days in advance for enabling the entry permission.			
14.5	Miscellaneous charges	All transportation / miscellaneous charges are the responsibility of the vendor.			

14.6	Clarifications	During technical evaluation and comparison of bids, ISTRAC may, at its discretion, ask the vendor for clarification based on submitted offer.			
14.7	Delivery period	Shall deliver minimum 250 numbers within 8 weeks and remaining within 12 weeks from the date of release of purchase order.			
14.8	Tender submission in two part	The tender is to be submitted in Two Bid System. The "Techno - Commercial Bid" and "Price Bid" prepared by the vendor.			
14.9	**Technical Evaluation**				
14.9.1	Evaluation of technical offer	Vendor is required to submit a detailed technical/techno-commercial compliance statement. Evaluation of the technical compliance statement will be done for validating the offered specifications / parameters based on the submitted documents & data sheets. Any disclosure of price information in techno-commercial bid will result in disqualification of the offer.			
14.9.2	Commercial bids	Technically suitable & qualified offers will be considered for the price bid opening.			
14.9.3	Computation of commercially Lowest-1 offer	Lowest-1 offer will be derived based on the total solution which includes deliverables (VoIP package unit, PTT Microphone, Headset & Accessories) with Warranty.			
14.10	**Delivery schedules**	Vendor shall comply with the delivery schedule as per below mentioned points			
14.10.1	a)	Date of demonstration of the prototype during technical evaluation, should provide for testing & evaluation within 15 days from the date of bid / tender submission date or intimation from ISTRAC.			

14.10.2	b)	Delivery schedule of the all items with in stipulated period of 8 to 12 weeks (250 numbers within 8 weeks & remaining within 12 weeks) from the date of receipt of Purchase order by vendor. It is mandatory in view of supporting very critical ISRO mission operations.			
14.10.3	Sample unit before actual supply	Delivery of the sample unit for test & qualify within 30days from the date of placement of Purchase Order for qualifications before actual supply of all the units. Vendor shall accept any improvements / modifications suggested by ISTRAC based on the sample unit for actual units.			
14.11	**Terms and conditions for on-site Warranty**				
14.11.1	Period	Vendor shall provide minimum **3 years** 24x7, with advanced replacement comprehensive warranty, including **onsite** service, labour and replacement of faulty parts at no cost to ISTRAC from the date of acceptance of delivered items.			
14.11.2	Service level agreement				
14.11.2	a)	Warranty of three year shall start from the date of acceptance of total configuration.			
14.11.2	b)	Vendor preferably ensure availability of service center with required skill set **at Bangalore**.			
14.11.2	c)	Vendor should attend the fault within 01 Hour of reporting of the fault either at Peenya or Byalalu.			
14.11.2	d)	Vendor should support all Sites at ISTRAC, Bangalore including Peenya (Pin code 560058) and Byalalu (pin code 562130) Campuses.			

	e)	Service engineer should be a qualified engineer with min. 01 year of experience.			
14.11.3	Scope of Work				
14.11.3	a) Details of on-site system maintenance / repair services	Shall provide on-site system maintenance / repair services at all the campuses of ISTRAC, Bangalore for systems repair, replacement, fault trace, trouble shooting, network configuration, monitoring the systems status, logging the information and maintenances to ensure 100% availability of the systems for 24x7 operations			
14.11.3	b) Hardware and Software troubleshooting	The On-site system maintenance team shall be aware of the Hardware and general Software troubleshooting, audio, network elements, interfaces and accessories of the system.			
14.11.4	Malfunction	In case of any malfunction of the system during the warranty period due to fabrication / manufacture / component defects / failures, vendor has to repair/replace the system without any additional cost.			
14.11.5	Transportation & repair charges	Transportation cost for sending defective parts for repairs and return back or replaced at ISTRAC site, shall be borne by vendor itself.			
14.11.6	Details of compliant / service center	The vendor shall provide the details of its Compliant / service Center meant for booking the complaints along with the contact numbers like mobile / phone number, mail address and names etc. of its service engineers.			
14.11.7	No cost for on-site services	Vendor shall not quote any additional cost for the deployment of manpower (if required to meet the SLA-Service Level Agreement) at both campuses for on-site maintenance /			

		services during warranty period.			
14.12	**Confidentiality**				
14.12.1	ISTRAC Property	All documents supplied by ISTRAC are the exclusive property of ISTRAC and shall not be used for any purpose other than agreed upon. Any changes carried out in the design, drawings or documents during the contract tenure, done by vendor or ISTRAC shall be exclusive property of ISTRAC and shall not be used for any purpose other than agreed upon.			
14.12.2	Prohibition	The party is prohibited from further utilizing or passing on any of the design details or details of the drawing in whatever form to any third party for use by them for any exploitation, commercial or otherwise without written permission from ISTRAC. If any digression from confidentiality will be found at any stage, agreement will no longer be valid and appropriate action against vendor will be initiated			
14.13	**Inspection and Reviews**	Inspection can be carried out by ISTRAC team at any stage of design & production, to ensure adherence to the guidelines, quality levels and procedures, if required. After Acceptance of Purchase Order, ISTRAC Will conduct Technical Reviews/Meetings as and when required at various stages of development and realization.			
14.14	**Acceptance Tests**				
14.14.1	Acceptance & functional tests	Vendor shall submit the functional, performance, power drawing and quality assurance (QA) test reports to ISTRAC. System will be accepted only after successful completion of functional tests by ISTRAC.			

14.14.2	Test acceptance duration	ISTRAC will be the final authority for acceptance of the VoIP package unit. After successful completion of functional testing at ISTRAC, all the units will be subjected to Burn-in test for 120 hours (5 days) under room temperature. In case of any failure during Burn-in test, vendor has to repair/replace component/card without any additional cost.			
14.15	**Compliance Statement**				
14.15.1	Filled compliance statement	The vendor shall submit detail point-by-point compliance statement (for all specs & clauses) of this tender mentioning full detail with reference Para, Clause and reference page number for each parameter along with reasons for compliance/ non-compliance, if any.			
14.15.2	Non-compliance	Silence on any paragraph or simply making a statement 'complied' without proper justification or reference will be considered as non-compliance.			
14.15.3	Support document	All the claims with respect to any specification shall be supported by document along with bid document otherwise same may be treated as non- compliance. Compliance matrix should be filled in at all points of tender document individually.			
14.16	**Submissions along with Bid**				
14.16.1	Design drawings	Shall provide the Design drawings in 2D & 3D form (Isotropic) for better understanding and technical validation. Both 2D & 3D rendering drawings should be submitted along with offer for technical validation.			
14.16.2	Completely filled compliance statement	Shall Submit the completely filled compliances, it is mandatory for technical validation otherwise liable to non-compliances			

14.16.3	Demo unit for technical evaluation	Shall submit the prototype demo unit for testing & technical validation for the technical suitability during technical evaluation.			
14.16.4	Completed projects documents	Documentary proof in terms of work completion certificate for successful completion of the projects			
14.17	**Rejection Clause**				
14.17.1	Rejection of unit	If Supplied VoIP Intercom unit has any of the following issues, then it will result in rejection of that unit:			
14.17.1	a)	Non-conformance in terms of workmanship / EMI-EMC standards etc.			
14.17.1	b)	Non-conformance of functionality			
14.17.1	c)	Any deviation from the provided specifications of the system			
14.17.1	d)	Any violations/non-compliance from this tender/bid document			
14.17.2	Replacement for faulty unit	The root cause of rejection shall be analyzed and corrective action shall implement by vendor. Rejected units shall be re-fabricated by the vendor without any extra cost and to be supplied within 30 days after receiving information from ISTRAC. The rejected material will be handed over to the vendor against replacement.			
14.18	**Delivery Location**	The delivery of items shall be at ISRO Telemetry Tracking and Command Network (ISTRAC), Peenya, Bangalore.			
15	**Technical Specifications of VoIP Intercom Package Unit**				
15.1	Introduction				
15.1.1	Intercom Client System	: This system shall be used for 24x7 mission critical operations.			

		The system consists of: a) Hardware based on SBC, running Linux platform and required interfaces b) Software based Intercom Client application such as Mumble/TeamSpeak c) Required accessories and device drivers. Point (a) and (c) shall be provided by the vendor to ensure high fidelity audio input and output for smooth operations of the overall system as per the detailed specifications provided in this document. However point b. will be provided by ISTRAC using open-source software			
15.1.2	**Item Description**				
15.1.2	a) System	: A Small form factor (Tablet), touch enabled display, compact, reliable, 24x7 operations, mission critical Linux based System.			
15.1.2	b) Accessories	: Power Adaptor, Push-To-Talk (PTT) Hand Held Microphone, Headset with Microphone, Mounting assembly kit for both Table top and rack mount			
15.1.2	c) Interfaces type	: Shall be of lockable XLR / Circular type (as indicated in respective interfaces)			
15.1.2	d) Aesthetics	: Premium finish (with powder coating), robust design of box & fixtures, Design shall be for desktop & rack mountable			
15.2	**Primary Components**				
15.2.1	Single Board Computer (SBC)	: Small form factor Printed Circuit Board (PCB) including all the necessary components like CPU, Integrated Graphics, memory, storage, expansion slots, network interfaces, etc.			

15.2.2	Touch enabled display	: Responsive multi touch enabled display with resolution support as per specification number 15.3.15			
15.2.3	Audio Components	: High fidelity stereo internal Speakers, PTT hand held microphone connected using lockable XLR connector, Headsets with microphone connected using XLR connector			
15.2.4	Customizable Keys	: Four user defined configurable keys that shall be accessible in the software based intercom client application which is provided by ISTRAC.			
15.2.5	Enclosure & Mounting accessories	: All the electronics shall be integrated and enclosed in a aesthetically pleasing, light weight, premium finish, sturdy and minimal designed functional metal casing. It shall support table top and rack mounting using mounting accessories with suitable thermal management.			
15.2.6	Power Supply and Heat Management	: Shall be sufficient to drive all the components ensuring isolation, over-current protection, short-circuit protection, RF & EMF interference protection			
15.2.7	Accessories	: Power Adaptor, Mounting Kit and required fixtures			
15.3	**Single Board Computer (SBC)**				
15.3.1	**Processor**				
15.3.1	a) CPU	: Celeron N5105 / Pentium Silver N6005 or better			
15.3.1	b) Frequency	: Base Frequency: 2.0 GHz or higher : Burst Frequency 2.6 GHz or higher			
15.3.1	c) L2 Cache	: min. 4 MB			
15.3.1	d) Chipset	: Integrated in SoC			
15.3.2	**Memory**				
15.3.2	a) Technology	: Dual-channel Memory DDR4 or better			
15.3.2	b) Required Memory Capacity	: 8 GB or Higher			

15.3.2	c) Scalability	: Up to 32 GB or more			
15.3.2	d) Socket	: min. 2 x SO-DIMM slot			
15.3.3	**Display**				
15.3.3	a) Controller	: Intel UHD Graphics			
15.3.3	b) HDMI Port	: min. 1x HDMI 2.0			
15.3.3	c) DP Port	: min. 1x DP 1.2			
15.3.3	d) Multiple Display driving capability	: min. two independent display driving capacity			
15.3.4	**Ethernet Ports**	: min. 2 x 1Giga bit Ethernet ports			
15.3.5	**Audio out**	: min. 2-Pin Audio Out			
15.3.6	**Smart Fan**	: min. one number of noiseless smart fan for active heat management shall be provided as per device peak load requirements			
15.3.7	**TPM controller**	: TPM enabled			
15.3.8	**I/O Interface**				
15.3.8	a) USB	: min. 2 x USB 2.0 Type A : min. 2 x USB 3.0 Type A			
15.3.8	b) Serial	: min. 1 x UART			
15.3.8	c) GPIO	: min. 2 x 12 pin IO Ports			
15.3.9	**Expansion Slot**	: min. 1 x 128GB M.2 NVMe storage			
15.3.10	**Storage**				
15.3.10	a) SATA	: min. 2 x SATA 3.0 ports			
15.3.10	b) eMMC Capacity	: Shall support eMMC up to 128 GB			
15.3.11	**Power Supply**				
15.3.11	a) DC	: max. 60W or better efficiency			
15.3.11	b) Connector Type	: Barrel			
15.3.12	**Environment**				
15.3.12	a) Operating Temperature	: 5 to 45 deg. C			
15.3.12	b) Operating Humidity	: 10 to 90%, non-condensing			
15.3.12	c) Storage Temperature	: -10 to + 60°C			
15.3.12	d) Storage Humidity	: 10 to 90%, non-condensing			

15.3.13	**Certification (EMC)**	: FCC/CE/RoHS or equivalent as per GoI guideline as applicable			
15.3.14	**Software Platform (OS)**	: Linux Ubuntu 20.04 LTS or latest LTS release			
15.3.15	**Touch Enabled Display**				
15.3.15	a) Display Type	: 2 in 1 touch plus display combo			
15.3.15	b) Touch panel Type	: 5 finger capacitive touch input			
15.3.15	c) Resolution	: 1024x600 (Hardware resolution), configurable by software (Upto 1920 x 1080) with min. 190 ppi or better			
15.3.15	d) Screen Dimensions (W x H x D)	: not more than 200 x 190 x 30 mm including buttons and connectors			
15.3.15	e) Wide Viewing angle (in degree)	Left :- 75 degree, Right :- 75 degree, up :- 75 degree, Down :- 75 degree or better			
15.3.15	f) Power consumption	: 800 mA / 5 Volt or less than 5W			
15.3.16	**Internal Speakers**				
15.3.16.1	Frequency Response	: 50 Hz - 20 KHz			
15.3.16.2	Amplifier	: Shall include a Built-in audio amplifier with an audio breakout board/PCB that drives the internal speakers and other audio components.			
15.3.16.3	Isolation	: The amplifier/ Audio breakout board shall be powered with a separate power source from the Power Distribution board enclosed within the enclosure to ensure isolation in the Audio amplifier			
15.3.16.4	Stereo / dual channel	: Amplifier shall have the dual channel amplifications to support stereo input & stereo speakers			
15.3.16.5	Form Factor of speaker	: Small & miniature firmly placed within the enclosure			
15.3.16.6	Quality of speaker	: Delivery audio/speech very clearly with good fidelity and loud			

15.3.16.7	Type of speaker	: Stereo Speaker			
15.3.16.8	Output of speaker	: min. 2 watts each			
15.3.16.9	Volume Control	: Shall support volume control from the OS level as well as the volume up down keys			
15.4	**PTT Hand held Microphone**				
15.4.1	Type	: Omnidirectional Handheld Push-To-Talk Microphone			
15.4.2	Application	: shall be suitable for close talking applications			
15.4.3	Speech	: shall have an excellent speech reproduction			
15.4.4	Body Construction	: shall have rugged metallic body construction and easy to handle			
15.4.5	Connector	: shall have XLR-5 connector for interfacing with the processing system			
15.4.6	Microphone drivers	: shall be plug-and-play with Linux and windows based OS for the offered processing system			
15.4.7	Switch	: An ON/OFF Switch acting as a Push-To-Talk Switch			
15.4.8	Polar Pattern	: Omnidirectional			
15.4.9	Frequency range	: 300 Hz to 6 KHz or better			
15.4.10	Sensitivity	: 3.1 mV/Pa (+/- 4dB) or better			
15.4.11	Rated output impedance	: 500 ohm or suitable with XLR interface audio device			
15.4.12	Cable type	: Coiled			
15.4.13	Cable length	: min. 1 Meter			
15.4.14	Mounting	: Clip Type mounting bracket			
15.4.15	Certifications	: CE/FCC or equivalent			
15.5	**Headsets with Microphone**				
15.5.1	Type	: Stereo (dual band) Professional corded headset. Comfortable light weight padded headband with ear cushion and on-ear design for long duration comfort.			
15.5.2	Headset form factor	: On-ear headband for Fit & Comfort			
15.5.3	Microphone type	: Noise cancelling unidirectional microphone			
15.5.4	Microphone Boom Arm	: Mic boom arm rotation of minimum 270 degrees or more			

15.5.5	Microphone frequency range	: 100 Hz-10.000 Hz or equivalent or better			
15.5.6	Speaker size	: min. 25mm and not more than 35mm (diameter) / suitable to on-ear design			
15.5.7	Speaker sensitivity	: Better than 93.6 dB			
15.5.8	Speaker impedance	: 32 +/- 5.0 Ω or equivalent			
15.5.9	Speaker bandwidth	: 100 Hz- 20 KHz or better			
15.5.10	Distortion	: less than 3%			
15.5.11	Material	: Headband cushion ultra-soft foam and ear cushion soft audio foam covered			
15.5.12	Connectivity	: XLR-4/5 lockable connector, no converters shall be used in the Cable, compatible with the connector provided on the Intercom Unit			
15.5.13	USB cord length	: min. 1 Meter			
15.5.14	Certifications	: Regulatory approvals CE / FCC and Industrial certifications or equivalent			
15.6	**Customizable Key Pad**				
15.6.1	Number of keys	: minimum Four			
15.6.2	Key Type	: Tact switch			
15.6.3	Drivers	: Drivers shall be implemented such that the key strokes are recognised in intercom client application software provided by ISTRAC			
15.6.4	Configurable	: The key pad shall be configurable via the intercom client application software provided by ISTRAC			
15.6.5	Compatibility	: To ensure appropriate functionality and compatibility with the Intercom client application software. Vendor will be provided with the open source version of the same Intercom client application software such as Mumble/TeamSpeak for compatibility checks			
15.6.6	Key Labelling	: Key Surface shall be blank and shall be permanently labelled			

		as per ISTRAC requirements at the time of delivery.			
15.6.7	Test Report	: Vendor shall provide the test report demonstrating following functionalities of the keys while configuring it via open source version of the Intercom Software: 1. Key strokes for all the keys being uniquely recognised in the Intercom client application 2. All the Key strokes can be registered in the Intercom client application 3. Each key can be customised to perform different Intercom actions like Mute, Unmute, Channel Change, Paging (SOS). 4. Four keys configured with different Intercom actions			
15.7	**Enclosure & Mounting Kit**				
15.7.1	Enclosure Case	: Enclosure case shall comprise of Process unit (SBC) , Power supply/ Power splitter, audio breakout board, internal speaker, interface cables, Touch Panel Display, connectors, terminations, Volume Control, Power Switch, power status indicator, Customizable key pad etc.			
15.7.2	Mounting Kit	: The mounting kit & enclosure shown in drawing is indicative. Vendor shall provide designs and drawings for the Casing, Table top & Rack mounting assembly. Fitting mechanism of the Intercom Unit with mounting assembly kit shall be compatible with standard 19 inch Instrument Rack.			
15.7.3	Design of enclosure box	: Design of package units shall be sleek, slim, compact, elegant, and aesthetic as these units will be deployed in mission control operations. Thus the dimensions shall not exceed the maximum boundary dimensions provided in specification			

		number 15.7.7 and 15.7.8			
15.7.4	Tilt mount mechanism	: The unit shall be designed along with an adjustable type of rack mounting kit that support adjustment mechanism upto 10 degrees tilt adjustment or more to adjust the unit mounting angle on the standard 19 inch rack .			
15.7.5	Finish	: The product shall be finished with powder coating and colours as per specification 15.7.9 to 15.7.11			
15.7.6	Termination of Interface connectors	: All terminations of interface connectors & power connector shall be at rear side while the microphone and headset interfaces shall be in the front			
15.7.7	Dimensions For Screen Bezel Frame (W x H x D)	: Max. 300 x 200 x 50 mm (considered up to 8 Inch display)			
15.7.8	Dimensions for Base Electronics Mounting Chassis (W x H x D)	: Max. 300 x 50 x 200 mm (considered up to 8 Inch display)			
15.7.9	**Material**	: Electronics Grade Aluminium - Aluminium 6061-T6 , equivalent or better			
15.7.10	Coating	: Powder coating 45-60 microns as per ISO 8130			
15.7.11	Colour	: Grey or black as per ISTRAC Clearance from ISTRAC			
15.7.12	**Accessories**	: All necessary accessories required for full functionality of the entire solution for rack mount units or table-top units along with user manual shall be provided by the vendor			
15.8	**Power Supply and Heat management**				
15.8.1	**Power Supply**	: Within the chassis/ client unit only DC-DC conversion shall be done to power the components like SBC, Display Touch panel			

		combo, audio breakout board, IO breakout board, internal speakers and others. Whereas the AC-DC conversion shall be done using the external power adaptor			
15.8.2	External Power Adaptor				
15.8.2.1	Input Voltage Range	: The power supply shall accept input voltages within the range of 230V AC (+/- 10V) making it compatible with Indian power outlets			
15.8.2.2	Output Voltage	: Vendor shall size the output voltage such that it is able to provide stable DC output voltage suitable for powering the SBC, Touch-Display panel, Audio breakout board, IO breakout board, Internal speakers and other components			
15.8.2.3	Output Current	: The power supply should be capable of delivering sufficient current to power the SBC, touch display panel, internal speakers, and any other peripherals. Calculate the total current requirement by summing up the individual current requirements of each component.			
15.8.2.4	Efficiency	: The vendor shall aim for high efficiency to minimize power loss and maximize energy savings. An efficiency rating of at least 80%.			
15.8.2.5	Adaptor to VoIP Intercom Unit Connector	: Adaptor to VoIP Intercom Unit Connector shall be using the barrel jack connector that powers the DC-DC conversion board that is included within chassis of the VoIP Intercom Unit			
15.8.3	**Internal DC-DC Power Board**				
15.8.3.1	Input Voltage Range	: Vendor shall size the required input voltage range such that it is able to provide stable DC output voltage suitable for			

		powering the SBC, Touch-Display panel, Audio breakout board, IO breakout board, Internal speakers and other components			
15.8.3.2	Output Voltage	: Vendor shall design the DC-DC power board in such way that it shall power the internal components like SBC, Touch-Display panel, Audio breakout board, IO breakout board, Internal speakers and other components as per their Individual requirements			
15.8.3.3	Output Current	: The DC-DC power board shall be capable of delivering sufficient current to power the SBC, touch display panel, internal speakers, and any other peripherals. Calculate the total current requirement by summing up the individual current requirements of each component.			
15.8.3.4	Efficiency	: The vendor shall aim for high efficiency to minimize power loss and maximize energy savings. An efficiency rating of at least 80% is desirable.			
15.8.3.5	DC-DC board to component Connector	: The DC-DC power board shall designed in such a way that it will have individual compatible connectors connecting it with the SBC, touch display panel, internal speakers, and any other peripherals.			
15.8.3.6	Protection Features	: Vendor shall include overvoltage protection, overcurrent protection; short-circuit protection, and over-temperature protection to safeguard both the power supply and the connected devices from damage.			
15.8.3.7	Size and Form Factor	: The power supply shall be compact and lightweight, suitable for integration into the tablet form factor without adding excessive bulk or weight.			

15.8.3.8	Cooling	: Vendor shall ensure effective thermal management to prevent overheating, especially during extended operation conditions and shall be Noise free			
15.8.3.9	Noise level	: Vendor shall minimize electromagnetic interference (EMI) and audible noise to ensure a quiet operation.			
15.8.4	Certifications	: CE/FCC/CB/ EMC/TUV/UL or equivalent Indian certification compliance to ensure regulatory compliance and safety standards.			