ANNEXURE -A

RFP FOR THE SUPPLY, INSTALLATION, COMMISSIONING, OPERATIONS AND MAINTENANCE OF IP-PBX WITH SERVER GATEWAY ARCHITECTURE IN LPSC, VALIAMALA

1.0. SCOPE OF WORK

The Scope of work includes Supply, Installation, Commissioning, Operations and Maintenance of IP-based Private Branch Exchange (IP-PBX) with Server-Gateway architecture and hot redundant servers in LPSC Valiamala on turnkey basis equipped with 1450 analog extensions and 50 IP phone connectivity from day one. The system shall be capable to meet future augmentation up to of 2000 connections in analog & IP mode. The existing Telephone Exchange and the detailed scope of work are mentioned in the following sections.

The supplier shall carry out the following activities:

2.1. SUPPLY AND INSTALLATION OF IP-PBX

2.1.1. Supply, Installation and commissioning of IP-based Private Branch Exchange with Server-Gateway Architecture which has to be positioned at LPSC, Valiamala capable of supporting existing 1450 analog telephone connections. The System shall have expandability of up to 2000 Analog/IP connections. The required telecommunication equipment/s shall be supplied and installed in the same Telephone Exchange room in LPSC Valiamala.

2.1.2. PRI line interface- minimum 6 Nos., E&M Interface- minimum 2 Nos., minimum 12 Trunk line interface, 50 IP Licenses, Gateway supporting 1450 analog connections, GSM/3G/4G interface and L3/L2 Network Switches has to be supplied

2.1.3. Supply & Installation of minimum 2000 port Main Distribution Frames (MDF) supporting both field side and exchange side, Krone modules, Interconnecting cables, Equipment Racks, and all the related equipment/Systems for the Exchange

2.1.4. Supply and installation of sufficient numbers of Computers/Laptops for Administration, Operations and Maintenance of the Exchange. (Core i5 7th Gen, 3.2GHz/8GB, DDR-IV/1TB SATA HDD/NIC/19” LCD Monitor)
2.1.5. The system shall be fully modular and fully non-blocking type with distributed architecture. It shall have all the features as mentioned in Section 2.2 & 2.3

2.1.6. The IP-PBX must be highly available ensuring an uptime of at least 99.99% as per the Section 2.4

2.1.7. Necessary power supply units, FCBC and UPS of sufficient capacity shall be supplied. Power supply and UPS requirements are detailed in Section 2.5

2.1.8. Supply & Installation of lightning protection as per Section 2.6

2.1.9. Supply, Installation & Configuration of Management & Call billing Software as per Section 2.7

2.1.10. Installation, Testing & Commissioning of IP-PBX shall be carried out as per the details in Section 2.8 & 2.9

2.1.11. Comprehensive Warranty for 3 years from the date of Commissioning of the facility shall be provided.

2.1.12. Comprehensive Annual Maintenance Contract for subsequent 5 years after the warranty period also shall be quoted separately. More details as per Section 2.10

2.2. SYSTEM FEATURES

2.2.1. The system shall be of Server-Gateway architecture with redundancy server with redundant hot swappable power supply

2.2.2. The server shall be 19” rack mountable type sufficient to handle the exchange.

2.2.3. The Server-Gateway connection shall be on a standard interface like Ethernet

2.2.4. The Exchange shall be able to switch simultaneously voice, data and images without any degradation of service quality

2.2.5. The system shall automatically changeover to redundancy server in case of failure of primary server without call drop

2.2.6. The proposed system shall have Automatic Route Selection (ARS), Least Cost Routing (LCR), Automatic Call Distribution, Unified Communication, Encryption, FAX Support and QoS support

2.2.7. Exchange level switching shall be purely IP-based and Media Gateways shall be used for interfacing between with analog devices and sufficient licenses needs to be supplied if required.

2.2.8. Media gateway shall be modular with web managing interface, SNMPv1, V3, Telnet, Fax and modem over IP, IP v4/V6 and routing & switching functionalities
2.2.9. Sufficient numbers of Layer 3 and Layer 2 Networking devices needs to be supplied.
2.2.10. The IP-PBX should be able to integrate with public telecom network infrastructure (PSTN/ISDN/E1), Mobile Network (GSM / 3G/ 4G) and legacy interfaces (like E&M)
2.2.11. The system shall support sufficient number of analog extensions, digital extensions, trunk lines, PRI lines and E&M lines
2.2.12. The system shall support wide range of terminals including Analog Phone, Digital Phone, IP phones (Hard, Soft & Wireless), SIP Extensions and soft phone including third party phones from day one. All necessary hardware should be provisioned for this from day one.
2.2.13. Support for SIP and H.323 Signaling protocols
2.2.14. The system shall support IPv4 and IPv6. Documentary evidence from OEM shall be submitted for the same.
2.2.15. In case of failure of any external trunk line connectivity, internal telephone communications within LPSC shall not be affected and automatic switch over to the redundant trunk line shall be ensured.
2.2.16. All existing phone numbers which are allotted by M/s BSNL shall be retained as such. It shall be the responsibility of the supplier to interact with M/s BSNL and make provision for the same
2.2.17. Existing 4-digit Direct Inward Dialing (DID) level has to be retained for Closed User Group (CUG) Calling
2.2.18. Hotline facilities through 2 Nos. of E&M and 1 no PRI with other ISRO Centers shall be retained
2.2.19. Existing campus-wide telephone network and telephone instruments shall be retained and interconnected to the proposed exchange.
2.2.20. System should ensure the compatibility with the existing analog phones available in the centre.
2.2.21. Even though the currently proposed Telephone Exchange is centralized architecture, in future there may be necessity for distributed telephone exchange in various locations of Valiamala. The proposed system shall have the flexibility to establish the distributed exchange.
2.2.22. In case of distribution of Exchange is necessitated later, Supplier shall carry out all activities related to its Installation & Operations.
2.2.23. The system should adhere communication security standards and approvals in Network, Call sever and management in accordance with the guidelines made by Dept. of Telecommunications & Dept. of Electronics & IT, Govt. of India

2.3. TELEPHONY FEATURES

Following services shall be available:

2.3.1. **Voice Mail** application allowing callers to leave messages. It shall have proper methods to alert users about the presence of voice mail and also easy way to listen to those voice mails. Simultaneous usage of minimum 16 ports and minimum 8 Hours of data storage is required. Voice mail to email option and support unified messaging with compliant email applications like Outlook, Domino etc. The System should support voice mail access through web browser and external Fax server integration.

2.3.2. **Auto Attendant** shall greet incoming calls, announce service message and interactively assist the external callers to reach their destination easily with distinct message options.

2.3.3. **Call Forwarding** - To redirect the incoming calls to an extension to another phone.

2.3.4. **Call Recording** – Minimum 10 telephone numbers have to be simultaneously recorded with storage for retaining at least one-month data. The numbers/calls to be recorded (including PSTN) shall be selectable and dynamically changeable through software interface with proper authentication.

2.3.5. **Automatic Call Transfer**

2.3.6. **Consultation Hold**

2.3.7. **Call Park** - This allows to put an Ongoing call on hold and then retrieve the same call from any other phone on the system.

2.3.8. **Conference Call** – The system shall have minimum 10-party simultaneous voice conferencing in any combination of external and internal parties.

2.3.9. **STD locking feature**

2.3.10. **Caller Line Identification and Presentation (CLIP)** - CLIP coming in from ISDN PRI and CO trunks should be displayed on Analog Telephones (with CLI), Digital Telephones and IP Telephones.

2.3.11. **Ring back when free**

2.3.12. **Discriminate Ringing** - The offered system to provide distinctive ringing for internal calls, external calls, auto call back calls and certain emergency services.
2.3.13. **Music on hold** – The system should support MOH (Music on hold), which should be uploaded using the .wav file and shall have an audio input port for external MOH connectivity.

2.3.14. **Boss–Secretary feature** - The incoming call to the officer shall ring on secretary’s phone with option of ring on both telephones. It should be possible to activate the Boss/Secretary telephone for enabling the telephone for above features. It should be possible for the Boss/Secretary to contact each other using one touch key on digital telephone and by dialing one or two-digit code on analog telephone.

2.3.15. **IP Telephony** Licenses for connecting 50 IP phones from day one.

2.3.16. **Video Conferencing Services** – Capable of conducting video conferencing with minimum 4 parties and simultaneously at least 5 such video conferencing sessions shall be conducted with hard and soft IP phones. (H.323 & SIP support)

### 2.4. HIGH AVAILABILITY AND REDUNDANCY

2.4.1. There shall be hot redundancy at server, Gateway and power to ensure high availability of 99.99%

2.4.2. The facility shall automatically changeover to redundant server in case of failure of primary server without call drop

2.4.3. Required spares of all critical equipment shall be kept inside Valiamala campus to ensure system availability. The details of critical spares shall be furnished.

2.4.4. The hot redundancy and high availability has to be configured demonstrated before commissioning the facility.

### 2.5. POWER SUPPLY REQUIREMENTS

2.5.1. The supplier will be responsible for the supply, installation and commissioning of the online UPS with required capacity to maintain the telephone exchange proposed to supply including all servers and computers, FCBC, Gateways, Networking devices and other active devices.

2.5.2. Float cum Booster charger (FCBC) of appropriate capacity for supporting the IP-PBX system with sufficient DC supply and SMF batteries supporting at least 2 Hrs. backup time in case of a power loss, shall be supplied. Input Voltage 230V/50 Hz +/- 10% (Single Phase), proper protection mechanism from input/load fluctuations.
2.5.3. FCBC shall have proper monitoring - display LCD panel for voltage, current and other required parameters.

2.5.4. The UPS shall have minimum 4 hours backup time with full load in case of power failure

2.5.5. UPS & FCBC shall have N+1 redundancy

2.5.6. The UPS system shall have 3 Phase input with IGBT rectifier & inverter, DSP Online Double Conversion System, output THD <5%, and output power factor 0.8 or better

2.5.7. All the required racks for battery, cabling and accessories shall be provided by the supplier. LPSC will provide only the raw power (three phase input)

2.5.8. In case of a power failure automatic change over to the UPS and alert has to be generated.

2.5.9. Provision to monitor parameters of the UPS through Ethernet interface shall be provided.

2.6. LIGHTNING PROTECTION & EARTHING

2.6.1. Valiamala is a highly lightning prone area. Supplier shall be responsible for providing adequate lightening protection for the Exchange side as well as the MDF side (telephone equipment level) including independent earthing.

2.6.2. There shall be provision for providing safety to the system from high voltage or voltage fluctuations

2.6.3. All extensions shall have IPM line protection modules and the supplied racks shall have EMI/RFI protection

2.7. SOFTWARE: - CENTRALIZED MANAGEMENT, BILLING & CALL LOGGING

2.7.1. Supply, Installation & Maintenance of Web-based Centralized software with GUI for configuring, administering and monitoring of the system with facility for enabling & disabling features online with user authentication

2.7.2. Provision for sending Event notifications and alerts via E-mail /SMS to Administrators.

2.7.3. Software shall have provision to generate alerts and necessary status reports

2.7.4. Call billing and accounting software for external and internal calls

2.7.5. All Software supplied should have valid perpetual license and shall be customizable for the requirements of LPSC. OEM support for this has to be ensured.

2.7.6. Support for selective incoming/outgoing call recording
2.7.7. Soft IP phone client software for different platforms
2.7.8. All application software/Database package required for the completion of the project shall be supplied with valid perpetual licenses.

2.8. INSTALLATION & MIGRATION TO NEW IP-PBX

2.8.1. Smooth Migration from existing Exchange to the new within minimum downtime shall be ensured. Supplier shall also provide the details of migration plan. Down time period will be the time mutually agreed by the supplier & LPSC. As part of this all existing telephone connections shall be made operational in the first phase itself.

2.8.2. Installation of IP-PBX system and cabling from system to MDFs (System side as well as Field side) has to be done by the supplier. Current Industry standards needs to be followed for the wiring of Telephone exchange.

2.8.3. All necessary interconnecting cables and accessories required for the installation such as CAT 6 UTP cable, RJ45 Jacks, CAT 6 Information Outlets, RJ 11 jacks, UTP Jack panels fully loaded with I/O modules, patch cords, casings, conduits, Krone modules etc. needs to be supplied.

2.8.4. All cabling laying works required for the installation to be done by the party.

2.8.5. Supplier shall demonstrate all the features of the equipment mentioned in the tender as part of technical acceptance evaluation.

2.8.6. One official from LPSC will be identified as the focal point who will be in charge for the overall supervision of the installation and commissioning of the proposed exchange.

2.8.7. The decommissioning of the existing EPABX shall be done only after installation, commissioning and testing of the new IP-PBX system and with the concurrence of Focal point of LPSC.

2.8.8. Dismantling of existing EPABX Systems, transportation to LPSC stores, removal of debris, cleaning up the place and restoring the site to original condition when work was undertaken shall be the responsibility of the supplier.

2.9. TRAINING & DOCUMENTATION

2.9.1. The supplier shall submit the installation report including the configuration & as built connectivity diagrams, operation and maintenance manuals, test certificates, brochures, original media and licenses of the softwares etc.
2.9.2. Onsite training shall be provided directly from the OEM/OEM certified engineer to nominated team of LPSC staff in Administration, Operations, Fault identification, Troubleshooting and Maintenance of the installed telephone exchange. Training shall be provided for at least three LPSC Officials at LPSC premises.

2.9.3. The Bidder shall make available adequate training material of the proposed system in the form of demos and help document for various functions carried out in the system.

2.10. COMPREHENSIVE WARRANTY & COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (AMC)

2.10.1. The Bidder should provide 3 years Onsite Comprehensive Warranty support for the total exchange including all the supplied items, from the date of commissioning.

2.10.2. The Bidder shall also quote for comprehensive AMC for subsequent five years applicable after the completion of warranty period. However, award of AMC will be made through a separate Purchase order at the end of satisfactory completion of warranty period.

2.10.3. The party shall ensure the maintenance support for the service call within 4 hours at site. In the event of breakdown call is not attended, down–time compensation will be imposed, as applicable.

2.10.4. Monthly preventive maintenance shall be carried out includes cleaning and testing and the supplier will be responsible for up-keeping the facility for 24X7 Hour service.

2.10.5. Supplier shall maintain adequate spares for the up-keeping, maintenance and smooth functioning of all the equipment at LPSC premises.

2.10.6. Necessary upgradation of the Exchange in case of obsolescence as well as maintenance & supply of necessary spares shall be the responsibility of the supplier during the warranty and subsequent AMC period.

2.10.7. The supplier shall be responsible for all the upgrades and updates of the firmware and application software during the warranty period as well as the comprehensive AMC period. A declaration from the Supplier/OEM certification for up-keeping the telephone exchange during the 3 Year warranty period and subsequent 5 Year AMC period shall be submitted, even in case of the items are obsolete during the contract period.

2.10.8. The quarterly payment of the AMC shall be made on submission of the duly certified bill along with quarterly status report.
2.11. **ONSITE RESIDENTIAL SUPPORT**

2.11.1. The Supplier shall position one Onsite Residential Official in Valiamala for regular up-keeping, Administration & Operations of the IP-PBX, power plant and its operations.

2.11.2. Onsite Residential official shall have minimum qualification of Diploma in Electronics/Electrical/Computer Science and shall have expertise in up-keeping telephone exchanges.

2.11.3. Residential official shall strictly adhere to the disciplines and IT security policies being followed by LPSC/ISRO and have to produce Police Verification certificate in accordance with administrative guidelines.

2.11.4. The residential official will be reporting and working under the Supervision of LPSC focal point.

2.11.5. Exchange services shall be ensured on 24X7 basis with minimum 99.5% availability.

2.11.6. All reported issues shall be attended and resolved within maximum 4 hours on a working day.

2.11.7. Residential official shall be available not only during office hours but also during holidays and late office hours whenever needed.

2.11.8. It will be the responsibility of the supplier to meet transportation, food, medical and any other requirements in respect of the manpower deployed in LPSC and LPSC will have no liabilities in this regard.

2.11.9. The residential official shall maintain records and registers such as Log book, Daily fault register etc.

2.12. **OTHERS**

In addition to the above the unit rates for the following also shall be quoted:

2.12.1. The buyback option for the existing EPABX also shall be offered.

2.12.2. CLIP Phones 300 Nos. as per specifications in Annexure – B.1

2.12.3. IP Phones 50 Nos. as per specifications in Annexure – B.2

2.13. **TERMS AND CONDITIONS**

2.13.1. The tender to be submitted in Two-Part mode. Techno-commercial bid (Part-I) and Price bid (Part-II) shall be submitted in separate sealed covers.
2.13.2. This project has to be executed on turnkey basis. Equipment / material not covered in this proposal but essential for the completion of the project shall be included in the Techno-Commercial bid. The bidder shall quote for all such items with unit rates in the price bid. The offer shall be for complete scope of work as specified in the tender document. Part/Split offer is NOT acceptable.

2.13.3. All items of the equipment/accessories in this tender shall be new and complete in all respect.

2.13.4. All IP devices supplied as part of this project shall be IP V4/ IPv6 compatible.

2.13.5. The offered system should have a valid TEC (Telecommunication Engineering Center, Govt. of India) approval. TEC approval certificate copies should be enclosed along with the offer. The TEC Certification should be in the name of the OEM participating in the tender. The TEC Certification should be applicable for the offered products in specific.

2.13.6. During the tender evaluation phase, supplier may be asked to explain in person in the form of presentation and documents to satisfy their technical capability and plan for execution and they have to comply the same within the time schedule provided to them.

2.13.7. LPSC will provide the required space, Air conditioning and KSEB power.

2.13.8. The Supplier shall ensure that all the precautions for the safety of the labourers are taken during the execution of works. The supplier shall be responsible for injury to persons and for damages to the properties which may arise from omission or neglect of the Supplier and their employees whether such injury or damages arise from carelessness, accident or any other cause whatsoever, in any way connected with the carrying out of work.

2.13.9. Vendor has to strictly follow the Guidelines of Dept. of Telecommunications & Dept. of Electronics & IT, Govt. of India wherever applicable.

2.13.10. The OEM shall provide undertaking to provide technical support and spares for particular system up to next 8 years even though if particular model is discontinued or its association with bidder / dealer is discontinued.

2.13.11. The Supplier shall provide all necessary licenses for integrating any SIP compliant IP phones from any manufacturer or soft phone as decided by the tenderer during the warranty/AMC period.

2.13.12. The vendors should be ready to demonstrate the offered product if demanded.
2.14. ELIGIBILITY CRITERIA (To be included in the Technical Bid (Part-I) of the Tender)

Suppliers who fulfill the following eligibility criteria only will be considered for the technical evaluation.

2.14.1. Supplier shall have at least five years of experience in the field of telecommunication industry. Certificate to this regard shall be enclosed in the bid.

2.14.2. Supplier shall have carried out at least two similar installations of IP-PBX systems with minimum 1000 connections in the last five years. They shall also produce the documentary evidence for the placement of Purchase orders, operations and maintenance support related to such ongoing contracts.

2.14.3. Details of previous installations of IP PBX with minimum 1000 lines IP exchange carried out by the bidder within last five years in the following format. Documentary evidence regarding the same shall be submitted and is mandatory.

2.14.4. The OEM should be appearing in the latest Gartner Magic Quadrant for corporate telephony/Unified communication. (Documentary Proof should be attached).

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Customer Name</th>
<th>Year of Installation</th>
<th>No. of connections</th>
<th>Details furnished</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.14.5. The supplier must be an Original Equipment Manufacturer (OEM) or should produce an undertaking from OEM that the bidder is authorized to quote for this tender and will provide support (back to back) and spares directly for the offered system. The authorization shall be tender specific.

2.14.6. Supplier should have ISO:9001 certificate and a copy of the certificate should be enclosed along with the offer.

2.14.7. The OEM should have ISO:9001 and ISO:14001 certificates and their copies must be enclosed along with the offer.

2.14.8. The supplier shall not have been de-listed from business by any PSU/Government Department during last three years. Self-declaration in this regard shall be provided.
In case the declaration is found wrong, at any time during the processing of the tender, their offer won't be considered for further processing.

2.0. TECHNICAL COMPLIANCE SHEET

2.1. Bidder shall provide line by line Technical Compliance for each of the specifications mentioned in the tender (Sections 2.1 to 2.13), as per the following format

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>LPSC Specification</th>
<th>Offered Specification</th>
<th>Compliance (Yes / No)</th>
<th>Remarks, in case of any deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

2.2. In case, the offered item deviates from the required specifications, the bidder shall indicate that clearly in the **Remarks** column of Technical Compliance Sheet

2.3. Bidder shall submit technical Brochure/Data Sheet for each of the offered item along with the technical bid. All the required/relevant specifications shall be highlighted in the data sheet.

2.4. For all items make and Model of the offered products has to be mentioned. Makes and models of offered products has to be mentioned separately in the following format

2.5.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Item</th>
<th>Make &amp; Model</th>
<th>Data Sheet attached? (Yes / No)</th>
<th>Remarks in case of any deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Make:</td>
<td>Model:</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2.6. Bids without Technical Compliance Sheet are liable to be rejected.

3.0. PRE-BID VISIT

Before the submission of bid, bidders can make site visit for better understanding of existing Exchange in LPSC, Valiamala. However, advance intimation shall be made to Purchase so that entry pass shall be arranged and LPSC officials shall be co-ordinating with the respective teams for site visit.
4.0. DETAILS TO BE FURNISHED

In addition to the documents mentioned earlier in the other sections the supplier also shall provide along Techno-Commercial Bid (Part-I)

- Details of the proposed system with as built Architecture Diagram. The diagram shall clearly depict all the system components, redundancy details, cable connectivity and interfacing with MDF.
- Time Schedule for Delivery, Installation & Commissioning of the System

5.0. DETAILS OF EXISTING TELEPHONE EXCHANGE & SERVICES

The present Telephone Exchange in LPSC Valiamala is Ericsson make MD110 EPABX system which was procured in the year 2001 with 1000 lines and was upgraded to Ericsson BC12 model with support for 1250 lines in the year 2005. The Telephone Exchange is now under maintenance by private agency whereas the telephone services and telephone numbers are provided by M/s BSNL, Trivandrum. From the telephone exchange individual telephone connectivity is established through Campus-wide Telephone network with copper cable. Hotline facilities are established through M/s BSNL for providing local calling facility with ISRO Centers, which are terminated at the exchange

5.1. EXISTING TELEPHONE EXCHANGE AND CIRCUIT DETAILS

At present the Telephone Exchange supports following lines:

- 4 x 2 Mbps PRI Streams (30 lines per stream)
- 1 x 2Mbps PRI hotline
- 2x 64 Kbps E&M Circuits
- 12 Voice circuits for Local calling
- 11 direct lines from Nedumangadu BSNL Exchange
A schematic diagram of the currently existing lines is shown in Fig 1.0

![Diagram showing existing telephone network connections]

**Fig 1.0 Circuit Details of Existing Telephone Network at LPSC Valiamala**

### 5.2. EXISTING TELEPHONE SERVICES

The following are the telephone services available presently with LPSC, Valiamala:

<table>
<thead>
<tr>
<th>SL No</th>
<th>Facility</th>
<th>No. of Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ISD Facility</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>STD Facility</td>
<td>204</td>
</tr>
<tr>
<td>3</td>
<td>Zero Dialing Facility (including local landline and local mobile numbers)</td>
<td>563</td>
</tr>
<tr>
<td>4</td>
<td>ISRO CENTRE CALLING FACILITY (VSSC, IPRC &amp; SHAR)</td>
<td>38</td>
</tr>
<tr>
<td>5</td>
<td>INTERNAL CONNECTIONS</td>
<td>356</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL CONNECTIONS</strong></td>
<td><strong>1180</strong></td>
</tr>
</tbody>
</table>
• Caller Display LCD with backlit
• Minimum 50 incoming calls memory and minimum 10 outgoing calls memory Phonebook
• Alphanumeric Keypad
• Display of incoming numbers, repeat calls and total calls
• Conversation time display
• Ringer volume control switch
• Ringer melodies: 8 or more tones
• Speaker with Digital volume control
• Hands free Dialing
• LCD contrast adjustable
• Two-way speaker phone
• In-use LED Indication
• Tone/pulse switchable through soft switch
• Visual indication for ringer
• Mute (Toggle), flash and redial function
• 16-digit LCD display for name and number
• Calendar
• Alarm
• Wall or Deck Mountable
• Comprehensive Warranty: 3 years
1. LCD Display with Backlit
2. Support SIP / H.323 protocol
4. Full Duplex Dual Ethernet Ports (10/100 Mbps)
5. PoE Class (IEEE 802.3af) registers as class 1 (or higher) device
6. IP phone shall be powered via external power adapter, power patch panel or in line power of the switch
7. Hard button for Hold, Mute, Conference, Drop, Transfer, Speaker, Redial, Volume control, Messages, Menu, Contacts, Headset
8. Wideband audio for both headset and handset
9. Full duplex speaker phone
10. Support for minimum 100 call log entries
11. Omni direction microphone and echo cancellation
12. Desk / wall mountable support
13. Comprehensive Warranty: 3 Years