



Institute of Infrastructure, Technology, Research And Management

(An Autonomous University Established by Government of Gujarat)

IITRAM Campus, Near Khokhra Circle,
Maninagar (East), Ahmedabad – 380026, Gujarat.

Contact No.: 079-67775430

E-mail: purchase@iitram.ac.in

Website: www.iitram.ac.in

TENDER NO.: 2024/49

Date: 30/12/2024

NOTICE INVITING TENDER

Important Information:

Name of Item(s)	Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory
Date of Issue of Tender	30/12/2024
Tender Fee	Rs.1770/- (Including 18% GST) <i>(Non-Refundable)</i>
Earnest Money Deposit (EMD)	Rs.21,300/- <i>(Refundable)</i>
Last date and time for online bid / offer submission	30/01/2025 till 06.00 PM
Last date and time for bid / offer physical document submission	31/01/2025 till 05:00 PM
Date & Time for opening of technical bid / offer	03/02/2025 at 11:30 AM
Date & Time for opening of financial bid / offer	To be informed later through email <i>(Will be informed only technically qualified bidders)</i>
Tender Inviting Authority and Address	The Registrar Institute of Infrastructure, Technology, Research And Management Near Khokhara Circle, Maninagar (East), Ahmedabad – 380026, Gujarat, India. Phone: - 079-67775430 e-Mail: purchase@iitram.ac.in

Institute of Infrastructure, Technology, Research And Management

NOTICE INVITING TENDER

Subject: Inviting bids through e-Tender format for Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory

Institute of Infrastructure, Technology, Research And Management (IITRAM), Ahmedabad invites bids for “Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory” under “TWO BID SYSTEM IN E-TENDER FORMAT”. Interested parties/bidders who wish to participate in this e-Tender may obtain/download the tender documents from IITRAM website i.e. www.iitram.ac.in or from (n)Procure portal i.e., <https://educationtender.nprocure.com/>. After submission of online bid on (n)Procure portal, the bidder(s) have to submit the technical bid/offer documents through RPAD, Speed Post or in Person till the last date and time prescribed for submission. Tender sent by other means will not be accepted in any case. Hardcopy of Technical Bid Documents, Tender Fee, EMD and other essential documents should be submitted on or before **31/01/2025 till 05:00 PM** in the office of the IITRAM Room No. G2, Near Khokhara Circle, Maninagar (East), Ahmedabad-380026, Gujarat. Financial bid is to be submitted in electronic form only on (n)Procure portal i.e., <https://educationtender.nprocure.com/>.

1. Eligibility Criteria:

- 1.1 The bidder should have valid PAN Card. Copy of PAN Card to be submitted.
- 1.2 The bidder should have valid GST Registration. Copy of GST Registration to be submitted.
- 1.3 The bidder has to submit (Photocopies) last three years Income Tax Returns.
- 1.4 The bidder has to submit (Photocopies) the Firm Registration Certificate.
- 1.5 The bidder has to submit the Undertaking by Original Equipment Manufacturer (OEM) on OEM's letterhead (in original) as per **Annexure-VI**.
- 1.6 Tender Fee of **Rs.1,770/- (Rupees One Thousand Seven Hundred Seventy Only)** and Earnest Money Deposit (EMD) of **Rs.21,300/- (Rupees Twenty One Thousand Three Hundred Only)**.

2. General Terms and Conditions (GTC):

- 2.1 The quoted price shall include taxes (if any), other levy payable, all freight, packing & forwarding, transportation, loading & unloading, custom duty, excise duty & other duties, other charges (if any) to supply the item(s)/goods at our site.
- 2.2 The rates quoted also shall include training, installation, commissioning, erection and demonstration of item(s)/goods at our site.
- 2.3 The items for which quotation have been submitted must be in accordance with the specifications given in **Annexure-I**.
- 2.4 The rates quoted by the firm shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- 2.5 The offer shall be valid up to 90 (ninety) days from the date of opening of Technical bid/offer.
- 2.6 The tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the scheduled tender are not fully filled in. Particular attention must be paid to delivery date and also to the particulars referred to in the condition of the contract.
- 2.7 Financial bids will be opened in online format of technically qualified bidders only.

- 2.8 Tender not complying with the above conditions are liable to be rejected at the sole discretion of IITRAM without any further reference/ communication.
- 2.9 This tender is not transferable.
- 2.10 IITRAM reserves its right to choose, accept or reject any or all requests/deviations/offers, in full or part and also reserve the right at any stage to reduce or increase the quantity and split the order.
- 2.11 The bidder has to submit duly signed & stamped photocopy of following documents:
- PAN Card of the firm
 - GST Registration Certificate
 - Last three years Income Tax Return (ITR) of their firm
 - Valid Firm Registration Certificate
 - Undertaking by Original Equipment Manufacturer (OEM) on OEM's letterhead (in original) as per Annexure-VI
 - Warranty certificate from Original Equipment Manufacturer (OEM) on OEM's letter head (in original)
 - All relevant Annexure(s)
- 2.12 **Performance Security:** The successful bidder shall be required to deposit Performance Security in form of (i) Account Payee Demand Draft (ii) Fixed Deposit Receipt from a Nationalized bank (iii) Bank Guarantee from a Nationalized bank, at the rate of 5% of the total cost of contract, for the duration of warranty period plus additional two months, in favor of **"Institute of Infrastructure, Technology, Research And Management"** from the date of installation of ordered item(s)/goods. No payment shall be released without performance security.
- 2.13 This Performance Security will be returned (without any interest) within 30 working days after satisfactorily completion of warranty period.
- 2.14 The successful bidder shall have to enter into the Agreement (Contract Form) in the prescribed Performa provided by IITRAM. (on Rs.300 Stamp Paper). The said agreement should be submitted by the respective bidder within 30 (thirty) days after the receipt of the contract/purchase order.
- 2.15 **Inspection:** Pre-dispatch inspection at Bidders site or inspection after the delivery of goods, as the case may be.
- 2.16 **Inspection Charges** @0.5% within Gujarat State and Inspection Charges @1% for outside Gujarat State of the total order value, if required, should be borne by the bidder.
- 2.17 All or any Claim(s), dispute(s) or difference(s) arising out of or in with connection with this agreement shall be subject to the jurisdiction of the Courts at Ahmedabad only.
- 2.18 If any civil work is required to be done for installation and commissioning of the ordered item(s)/goods, then the supplier shall arrange the essential drawing. For this, prior permission of IITRAM's authority is required. The cost of such work is to be borne by the supplier.
- 2.19 Any loss or damage caused to the article in transit/installation/testing is to be made up by the firm free of cost within period of 30 days.
- 2.20 Standard toolkit required for the item(s)/goods to be supplied.
- 2.21 If the firm is blacklisted by Central Government or State Government or any other Government body, then the submitted tender will be rejected. It is essential for firm to submit **Annexure- V** duly filled, signed, sealed & stamped manner in hardcopy, failing which the tender will be summarily rejected.
- 2.22 The bidder should give a declaration as per **Annexure- VII** that none of his / her near relative, as defined below, is working / employed in IITRAM. In case of proprietorship firm declaration will be given by the proprietor, for partnership firm declaration will be given by all the partners and in case of limited company by all the Directors of the company excluding Government of India / Financial institution nominees and independent non-Official part time Directors appointed by Govt. of India or the Governor of the state and full time Directors of PSUs both state and central. Due to any breach of these conditions by the bidder, it will result in the rejection of the bidder's tender and forfeiture of the bidder's EMD at any stage whenever it is noticed. IITRAM will not pay any damage as well as will debarred the concerned bidder for further participation.
- The near relative for this purpose are defined as: -
 - (i) Member of Hindu Undivided family.

- (ii) They are husband and wife.
- (iii) The one is related to the other in the manner as father, mother, son(s) & son's wife (daughter in law), daughter(s), daughter's husband (son in law) & brother(s) & brother's wife, sister(s) & sister's husband (brother in law).
- 2.23 If there happens to be a holiday on any date indicated in this tender notice, the transaction shall be performed on the next working day.
- 2.24 In case the tender is cancelled, the tender fee will not be refunded to the concerned bidder.
- 2.25 The tender/bid (i.e. technical bid/offer) will be opened on **03/02/2025, 11:30 AM** at IITRAM Ahmedabad Premises. No separate information shall be given to individual bidders.
- The bidders or their authorized representative may remain present during the opening of the Technical bid, if they desire so, at their own expenses. The required technical specifications for the cited item(s)/goods is mentioned in Annexure-I.
 - Only those financial bids will be opened whose technical offers/bids are found suitable by the expert panel/committee appointed for the concerned item(s)/goods. The respective dates for opening of financial bid shall be informed to the technically qualified bidder(s) through email only.
 - In incomparable situation, the committee may negotiate price with the technically and financially qualified bidder before awarding the offer.
 - The tender committee reserves its right to select or reject any or all of the item(s) mentioned above without assigning any reasons.
- 2.26 If the bidder fails to meet any of the above eligibility criteria/ fails to submit the adequate testimonials in support of the above mentioned requirement will be disqualified.
- 2.27 Any effort by a bidder to influence IITRAM's tender evaluation, tender comparison or contract/order award decisions may result in the rejection of the bidder's tender and forfeiture of the bidder's EMD.
- 2.28 After opening of bids, information relating to the examination, clarification, evaluation and comparisons of bids and recommendations concerning the award of contract shall not be disclosed to bidders or other persons not officially concerned with such process.
- 2.29 In the event of any dispute or difference(s) between the vendee (IITRAM Ahmedabad) and the bidder(s) arising out of non-supply of material or supplies not found according to the specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to the concerned authority of IITRAM Ahmedabad who may decide the matter himself or may appoint arbitrator(s) under the arbitration and conciliation Act 1996. The decision of the arbitrator shall be final and binding on both the parties.
- 2.30 No firm shall withdraw their rates after the Tender is opened. If a firm does so, their tender related deposit/s shall be forfeited and such firm shall be considered ineligible for work/contract in future.

3. Submission of bid:

- 3.1 The Tender documents can be downloaded from Institute's website i.e., www.iitram.ac.in or (N)Procure portal i.e., <https://educationtender.nprocure.com/>. The bidder(s) are required to submit the Tender Acceptance Letter (**Annexure - IV**) endorsed by seal and signature as acceptance of terms and conditions of this tender. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.
- 3.2 The fully filled in and complete in all respect tender must be submitted with Tender Fee and EMD through Electronic Transfer / Demand Draft. Bank/DD details are as follows:

For Electronic Transfer, Bank Account details are as follows:

Account Name: Institute of Infrastructure, Technology, Research And Management
Account No.: 923010019592531
Bank Name: AXIS BANK LTD
IFSC Code: UTIB0002645
Branch Name: Hatkeshwar Ahm GJ, Ahmedabad – 380026.

Note: Kindly submit Electronic Transfer advise with UTR details along with bid document.

OR

Demand Draft in favor of the “INSTITUTE OF INFRASTRUCTURE, TECHNOLOGY, RESEARCH AND MANAGEMENT” payable at Ahmedabad. Please mention Tender number and name of the firm on back side of DD.

- 3.3 Bidders registered with Micro and Small Enterprises (MSEs) and having valid MSE Certificate will be considered for relaxation of EMD. In view of the above, if the bidder will claim for EMD exemptions, the bidder should meet all the criteria for Micro and Small Enterprises. The bidder must submit the supporting document i.e. MSME registration certificate issued by competent government bodies (i.e. issued by Government of Gujarat & Government of India only) to become eligible for the EMD exemptions. The registration certificate (MSE) of the bidder must cover the items tendered to get EMD exemptions.
- 3.4 The EMD is refundable (without any interest) within 30 (thirty) working days after successful award of Purchase Order:
- EMD of unsuccessful bidder(s) will be returned within 30 (thirty) working days from the date of award of offer / contract.
 - EMD of successful bidder(s) will be returned within 30 (thirty) working days after submission of a Performance Security.
 - The EMD shall be forfeited:
 - If bidder(s) withdraws their bid during the period of bid validity specified in this tender notice; and/or
 - In case of a successful Bidder fails, (i) To sign the contract agreement and (ii) To furnish a performance security.
- 3.5 The firm has to submit the Tender in two parts viz., (a) Technical bid/offer in *envelop No. (1)* and (b) Tender Fee & EMD in *envelope No. (2)*; both these envelopes should be sealed and put together in a *main covering envelope*, super scribed with – Please Don't Open, Bid for **“Tender for Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory”** with due date, Tender Number and complete address along with contact number and email id.
- 3.6 **The bidder has to specify the make, model, and detailed technical specifications of the quoted/offered item and attach a separate compliance sheet if any deviation compares to the technical specifications mentioned in Annexure-I. Mere copying of the expected technical details into the product details will not be entertained and may even lead to disqualification of the bidder.**
- 3.7 **The bidder must produce the brochure, model and the make of the product being offered.**
- 3.8 It is essential for firm to submit **ANNEXURE(s), Tender documents and other essential documents** as mentioned in this tender notice **with duly filled, signed, sealed & stamped manner in hardcopy**, failing which that bidder's/firm's tender will be summarily rejected.
- 3.9 The “**Financial Bid**” to be filled as per **ANNEXURE – ‘II’** and **should be submitted online only at (n)Procure Portal** as ‘Financial Bid’. Rates quoted ‘ONLINE’ will only be considered.

4. Evaluation of Quotations:

The tender evaluation committee of the IITRAM will evaluate and compare the received quotations/bids to determine the substantially responsive tender i.e. (i) tender is complete (ii) properly signed (iii) confirm the terms/conditions and specifications. Further, the financial evaluation will be done only for the substantially responsive tender based on the following parameter(s):

- Total price quoted (ONLINE) at (n)Procure portal

5. Award of Contract:

- 5.1 IITRAM will award the contract to the firm who has offered lowest price.

- 5.2 Notwithstanding the above, IITRAM reserves the right to accept or reject any quotation and to cancel the bidding process and reject all quotations at any time prior to the award of contract without giving any reason.
- 5.3 The firm whose bid is accepted will be notified of the award of contract by the IITRAM prior to expiration of the bid validity period. The terms of the accepted offer shall be incorporated in the Purchase Order.

6. Delivery Period & Penalty:

- 6.1 **Delivery Period:** The item(s)/goods are to be delivered within a maximum time limit of 90 days from the issue date of Purchase Order. However, in case of imported item(s)/goods can be delivered within a maximum time limit of 120 days from the issue date of Purchase Order.
- 6.2 After the receipt of ordered item(s)/goods in acceptable condition at IITRAM, Ahmedabad bidder has to install item(s)/goods within 30 (thirty) days.
- 6.3 **Penalty:** Penalty of 1% per week of order value will be charged after duration specified above individually. Further, 06 weeks or above delay from above mention days may lead to cancellation of order at the discretion of the university and forfeiting the Performance Security or EMD or Maximum penalty shall be applicable @10%.

7. Warranty:

- 7.1 Minimum one (01) year complete warranty from the date of complete installation, commissioning and erection of all item(s)/goods at our site. During the warranty period i.e. 01 (one) year, the services should have to provide by the supplier onsite.
- 7.2 Warranty certificate should be provided from Original Equipment Manufacturer (OEM) on OEM's letter head.

8. Terms of Payment:

- 8.1 **Payment:** 100% payment shall be released within 30 (thirty) working days on satisfactory receipt, installation, testing and commissioning of the ordered item(s)/goods at our site, submission of clear tax-invoice(s) and supporting documents.
- 8.2 Advance payment will not be made under any circumstances.
- 8.3 Recoveries as per the Institute's norms shall be made while making payment (if any) without prior intimation to the supplier.

9. Address for the submission of bid/offer documents:

The Registrar
Institute of Infrastructure, Technology, Research And Management
Room No. G2,
Near Khokhara Circle, Maninagar (East),
Ahmedabad- 380026, Gujarat, INDIA.
Email: purchase@iitram.ac.in

**Sd/-
Registrar**

(Schedule of Quantity)

Name of Item(s): Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory

Sr. No.	Item Description	Tender Specification	Required Qty.
01	Basic Digital Communication Training System	<p>Digital Communication System should be a single board system based on VLSI technology for the study of basic digital communication techniques.</p> <p>The Board should have various test points for the students to view intermediate signals on an Oscilloscope.</p> <p>It should be accompanied with a Learning Resource Software consisting of Animations explaining various Digital Modulation Techniques like Sampling, PCM, ASK,FSK,PSK etc and Experiments for the Students to understand the basic concepts of Digital Communication.</p> <p>Specifications: Clock & Signal generation section:</p> <ul style="list-style-type: none"> • Sine Wave: <ul style="list-style-type: none"> ▪ Fixed Frequency : 250Hz approx., 500Hz approx., 1 KHz approx. approx., 2KHz approx. ▪ Variable Frequency : 1Hz approx. to 30Hz approx., 0 - 2 Vpp • Sampling clock: <ul style="list-style-type: none"> ▪ Frequency : 2 KHz approx. approx., 4 KHz approx. approx., 8 KHz approx. approx., 16 KHz approx. approx., 32 KHz approx. approx., 64 KHz approx. approx., 128 KHz approx. approx. ▪ Duty Cycle : 10 - 90% Selectable in steps of 10% ▪ D.C. Signal : 0 - 5 V ▪ Tx Clock Frequency : 240 KHz approx. approx. Fast Mode • Tx Frame Frequency : 8 KHz approx. approx. • Carrier Sine Waves : 500 KHz approx. approx. (0 deg), 1 MHz approx. approx. (0 deg), 1 MHz approx. approx.(180 deg) • Data Pattern : 8 bit variable NRZ-L pattern • PRBS generator : 14 bit <p>Transmitter Section and Receiver Section</p> <ul style="list-style-type: none"> • Analog signal sampling: Sample & Hold, Natural Sampling, Flat-top Sampling • 4-Channel Analog Time Division Multiplexing & Demultiplexing • Odd, Even Parity & Hamming Code Generator • Pulse Code Modulation & Demodulation • Data Encoding & Decoding of NRZ(L), NRZ(M), NRZ(S), Bi-phase (Manchester), Bi-phase (Mark), Bi-phase (Space), URZ, Alternate Mark Inversion (AMI), Unipolar to Bipolar & Bipolar to Unipolar • ASK, FSK, PSK Modulation & Demodulation 	02 Nos.

		<ul style="list-style-type: none"> • Delta / Adaptive Delta /Sigma Delta / CVSD Modulation & Demodulation • PAM / PPM / PWM Modulation & Demodulation <p>Audio Preamplifier with microphone interface</p>	
02	Advanced Digital Communication Training System	<p>Advance Digital Communication System should be a single board system based on VLSI technology for the study of basic digital communication techniques.</p> <p>The Board should have various test points for the students to view intermediate signals on an Oscilloscope.</p> <p>Various Digital Modulation Techniques like PSK, QPSK, QAM, MSK, DPCM, ADPCM etc Experiments should be possible</p> <p>Specifications:</p> <p>Clock and signal generation</p> <p>Sine wave</p> <ul style="list-style-type: none"> • Fixed frequency 1KHz with 0 ~ 2V <p>Carrier</p> <ul style="list-style-type: none"> • Synchronized carrier of 00 phase • Synchronized carrier of 900 phase • Synchronized carrier of 1800 phase • Synchronized carrier of 2700 phase <p>Data pattern</p> <ul style="list-style-type: none"> • 8-Bit, 16-Bit and 24-Bit <p>PRBS generator</p> <ul style="list-style-type: none"> • 16-bit with switch selectable <p>Noise</p> <ul style="list-style-type: none"> • White noise 0 ~ 2V p-p <p>Transmitter clocks</p> <ul style="list-style-type: none"> • 16KHz, 32KHz, 64KHz, 128KHz, 256KHz, 512KHz and 1.024MHz <p>Output</p> <ul style="list-style-type: none"> • 4 digit, 7 segment, LED bank <p>Input</p> <ul style="list-style-type: none"> • Three 8-bit switch banks for data generation <p>Transmitter section</p> <ul style="list-style-type: none"> • Differential encoder • Dibit encoder • Tribit encoder • Scrambler • BPSK, DPSK modulation • QPSK modulation • QAM modulation • MSK modulation • DPCM and ADPCM modulation <p>Receiver section</p> <ul style="list-style-type: none"> • Differential decoder • Dibit decoder • Tribit decoder • Un-scrambler • BPSK, DPSK demodulation • QPSK demodulation • QAM demodulation • MSK demodulation • DPCM and ADPCM demodulation 	02 Nos.

		<ul style="list-style-type: none"> • Digital PAM • Error bit adder and inter symbol interference • Low pass Butterworth filters 	
03	Analog Communication System	<p>The Analog Communication Training equipment should complement all the Teaching goals mentioned below.</p> <p>Module 1: Linear Modulation</p> <ul style="list-style-type: none"> ▪ Amplitude modulation, frequency spectrum of AM, Generation of AMsignal, SSB-SC, DSB-SC, AM demodulation - Envelope and square law demodulation <p>Module 2: Frequency Division Multiplexing</p> <ul style="list-style-type: none"> ▪ FDM <p>Module 3: Angle Modulation</p> <ul style="list-style-type: none"> ▪ Principle of frequency and phase modulation – Relation between FM and PM waves, Frequency deviation, Bandwidth of FM, Spectrum of FM <p>Module 4: Demodulation of Angle Modulated Signals</p> <ul style="list-style-type: none"> ▪ FM detectors – slope detectors, Phase discriminators, Ratio detectors, The Phase Locked Loop, Pre-emphasis and de-emphasis. <p>Module 5: Receivers and Noise in Analog Communication</p> <ul style="list-style-type: none"> ▪ Super-heterodyne receiver (AM and FM), Effect of Noise on Analog Systems, <p>The Transmitter Module should have all the Blocks on a Single Board/PCB with following</p> <p>Specifications</p> <p><u>GENERATOR BLOCK</u></p> <p>Function Generator1: Waveform: Sine, Square & Triangular Frequency: 1KHz to 100 KHz , Variable Amplitude: 0 to 2V, Variable</p> <p>Function Generator2: Waveform: Sine, Square & Triangular Frequency: 1KHz to 100 KHz , Variable Amplitude: 0 to 2V, Variable</p> <p>Carrier Generator 1: Waveform: Square wave Frequency: 1 KHz to 20 KHz , Variable Amplitude: 2V, Fixed</p> <p>Carrier Generator 2: Waveform: Square wave Frequency: 1 KHz to 30 KHz , Variable</p>	02 Nos.

Amplitude: 2V, Fixed

Voltage Controlled Oscillator (VCO) & FM Modulator:

Frequency: 400 KHz to 1300 KHz , Variable

Amplitude: 0 to 2V, Variable

Voltage Controlled Oscillator (VCO2):

Frequency: 400 KHz to 1300 KHz , Variable

Amplitude: 0 to 2V, Variable

MODULATOR BLOCK

Balance Modulator 1:

- Modulation : Amplitude modulation, Double sideband, single sideband (USB and LSB)
- Carrier Input : 1-1000 KHz
- Modulation Input: 0.1 - 100 KHz
- Carrier Null : Adjustable
- Output Amplitude: Adjustable

Balance Modulator 2:

- Modulation : Amplitude modulation, Double side band, Single side band (USB and LSB).
- Carrier Input : 1 MHz
- Modulation Input : 400-500 KHz
- Carrier Null : Adjustable
- Output Amplitude : Adjustable

Colpitt's Oscillator: 1 MHz Sine Wave with variable amplitude 0 to 2V

Ceramic Filter: Central Frequency 460KHz Bandwidth 10 KHz +/- 3 KHz

Band Pass Filter: Central Frequency 1.455MHz Bandwidth 10 KHz +/- 3 KHz

FDM Transmitter:

Input 1 Band Pass Filter: 7 KHz to 11 KHz $F_c = 9$ KHz

Input 2 Band Pass Filter: 18 KHz to 22 KHz $F_c = 20$ KHz ,

Pilot Carrier 256KHz

Pre-emphasis: Time Period with 50us

Phase Modulator: Adjustable to 400 KHz to 500 KHz

Reactance Modulator: Reactance modulator with variable amplitude

FILTER BLOCK

Sweep Generator: Sweep frequency-10Hz, Sweep depth - Adjustable

Output for oscilloscope -X axis

RF/Spectrum Detector: Minimum. Input - 100mVpp, Adjustable

Band Pass Filter: Frequency Range 7 KHz to 13 KHz

High Pass Filter: Cut off Frequency 3.4 KHz
Band Reject Filter: Frequency Range 7 KHz to 13 KHz
Matched T Filter: Cut off Frequency 20 KHz
Matched II Filter: Cut off Frequency 20 KHz

TRANSMISSION via ANTENNA and APPLICATION BLOCK

- Antenna: Ferrite Rod & MW coil
- Output Amplifier: 600 KHz to 1650 KHz with adjustable gain
- Audio Pre-amplifier: Audio pre-amplifier with Microphone and adjustable gain

The Receiver Module should have all the Blocks on a Single Board/PCB with following

Specifications

RF AMPLIFIER BLOCK

- RF Amplifier: 600 KHz to 1650 KHz with adjustable gain

LOCAL OSCILLATOR BLOCK

- Output signal: Sine wave for local oscillator input
- Frequency: 900 KHz to 2.1MHz variable
- Amplitude : Adjustable from 0 ~ 2Vp-p
- Output Impedance: 50 Ohms (Delete)

MIXER BLOCK

- Dual gate MOSFET IN
- Inputs : Local oscillator and RF Signal
- Output Frequency : 455KHz adjustable
- Filter : Dual tune LC

IF AMPLIFIER & FILTER BLOCK

1st IF and 2nd IF amplifier

- Central frequency : 455KHz
- Load impedance : Variable R-L-C
- Gain : 32dB with automatic gain control
- Filter 1 & Filter 2: Cut off Frequency of 3.4KHz

DEMODULATOR BLOCK

Beat Frequency Oscillator:

- Central Frequency: Adjustable to 457KHz
- Amplitude: 0 to 2V variable

Diode Envelope Detector:

- Detection of Positive & Negative envelope with variable RC filter DSB

Limiter:

- 455 KHz central Frequency 1.5V output amplitude

Quadrature / Product Detector:

- Operating frequency : Adjustable from 400KHz ~ 500KHz SSB
- Input amplitude : 1Vp-p

	<p>Foster Seeley / Ratio Detector:</p> <ul style="list-style-type: none"> • Operating frequency : Adjustable from 400KHz ~ 500KHz SSB • Input amplitude : 1Vp-p <p>PLL Detector:</p> <ul style="list-style-type: none"> • Operating frequency : Adjustable from 400KHz ~ 500KHz SSB • Input amplitude : 1Vp-p <p>Detuned Resonance Detector:</p> <ul style="list-style-type: none"> • Operating frequency : Adjustable from 400KHz ~ 500KHz SSB • Input amplitude : 1Vp-p <p>De-emphasis: Time Period with 50us</p> <p>FDM Receiver:</p> <ul style="list-style-type: none"> • Band Pass Filter: 7 KHz to 11 KHz , Fc = 9 KHz , • Band Pass Filter: 18 KHz to 22 KHz , Fc = 20 KHz <p>RECEPTION via ANTENNA and APPLICATION BLOCK</p> <p>Antenna: Ferrite Rod & MW coil</p> <p>Audio Amplifier: Audio Amplifier with headphone and adjustable gain.</p> <p>Switch Fault: Switch Faults are provided to simulate fault condition in various parts of the Circuit.</p> <p>Power Supply: GND, +5V, + 12V, -12V</p>	
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FINANCIAL BID

(Format for Submission of Financial Details)

(Data Sheet to be submitted ONLY Online at (n)Procure Portal)

Sr. No.	Name of Item(s)	Unit	Qty.	Rate <i>(Without GST)</i>	Total Amount <i>(INR)</i>	GST Slab Rate (%)
A	B	C	D	E	F = (D*E)	G
1.	Basic Digital Communication Training System	Nos.	02.00			
2	Advanced Digital Communication Training System	Nos.	02.00			
3	Analog Communication System	Nos.	02.00			
TOTAL AMOUNT (WITHOUT GST)						---

This table of Financial Bid is stated for reference purpose only and please do not disclose any price here at the time of submission of this document.

Declaration:

I/We hereby declare and affirm that I/We have read and understood the terms and conditions of the contract as stipulated in this tender notice.

Signature of Bidder with Seal

Date: _____

Place: _____

(To be printed on firm's letterhead)

Annexure – III

Name of Item(s): **Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory**

FORMAT FOR SUBMISSION OF BIDDER'S INFORMATION

1	Registered Name of the Bidder:	
2	Registered Office Address: Contact Number Fax Number E-Mail	
3	Correspondence Address: Contact Number Fax Number E-Mail	
4	Details of the authorized person: (Name, Designation, Address) Contact Number Fax Number E-Mail	
5	Bidder Registration Type - <ul style="list-style-type: none">• Proprietary Firm• Partnership Firm (if yes, give partnership deed)• Company or LLP• Government/ Public Sector Undertaking• Member of a group of companies (if yes, give name, address & details of group companies)• Subsidiary of a large corporation (if yes, give the name & address of the parent organization) If the company is subsidiary, state what involvement will the parent company have in the project.	
6	Permanent Account Number (PAN):	
7	Goods & Service Tax Number (GST):	
8	<u>Particulars of Bank Account</u> Name of the Bank: Name of the Branch: Branch Code: Address & Contact Details: IFSC Code: Type of Bank Account: Bank Account No.:	

Signature of Bidder with Seal

Date: _____

Place: _____

(To be printed on firm's letterhead)

Annexure - IV

TENDER ACCEPTANCE LETTER

To,
The Registrar
Institute of Infrastructure, Technology, Research And Management
Near Khokhra Circle, Maninagar (East),
Ahmedabad – 380026, Gujarat.

Subject: Acceptance of Terms & Conditions of the Tender

Tender Reference No:

Name of Tender / Work: **Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory**

Dear Sir,

1. I/We have downloaded/obtained the tender document(s) for the above mentioned “Tender/Work” from the web site(s) namely: _____
2. I/We hereby certify that I/we have read the entire terms and conditions of the tender documents (including all documents like annexure(s), schedule(s), etc.), which form part of the contract agreement and I/we shall abide hereby by the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by your department / organizations too have also been taken into consideration, while submitting this acceptance letter.
4. I/We hereby declare that I/We have carefully studied the conditions of contract, specifications and other tender documents of this work and unconditionally accept the tender conditions of above-mentioned tender document(s) / corrigendum(s) in its totality / entirety.
5. I/We do hereby declare that our Firm has not been blacklisted/ debarred by any Govt. Department/Public sector undertaking/Govt. Autonomous organizations.
6. I/We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason therefore can summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full EMD/SD absolutely.

Yours faithfully,

(Signature of Bidder with Seal)

Date: _____

Place: _____

(To be printed on firm's letter head)

Annexure - V

Name of Item(s): **Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory**

UNDERTAKING

I, _____ hereby declare that Firm / Company / Agency / Organization / Partnership firm / Proprietary firm titled as _____ has not been blacklisted or banned or debarred at any stage from inception till this date by any of the NITs / IITs / IIITs / Central Universities / IISERs / CSIR Labs Central and State Government body / PSUs / Autonomous Institute or any Other Government Organization. In case of the any fraudulency, the Firm / Company / Agency / Organization / Partnership firm / Proprietary firm is fully aware that the tender / contract will be rejected / cancelled by IITRAM and EMD / Performance Security or any deposited amount shall be forfeited.

In addition to above, IITRAM will not be responsible to pay the bills for any completed / partially completed / supplied work.

Signature of Bidder with Seal

Date: _____

Place: _____

UNDERTAKING BY ORIGINAL EQUIPMENT MANUFACTURER (OEM)

To,
The Registrar
Institute of Infrastructure, Technology, Research And Management
Near Khokhra Circle, Maninagar (East),
Ahmedabad – 380026, Gujarat.

Subject: Undertaking by Original Equipment Manufacturer (OEM)

Tender Reference No:

Name of Tender / Work: **Supply, Installation, Testing & Commissioning of Basic Digital Communication Training System and other equipments for Communication System Laboratory**

Sir,

We, M/s. _____ (*Name of the OEM*) having registered office at _____ (*address of the OEM*) by virtue of being original equipment manufacturer for _____ (*Name of the product/s*), hereby authorize M/s. _____ (*Name of the bidder*) having their office at _____ (*Address of bidder*) to submit quote, supply, install and provide after sales support for our range of products quoted by them to meet the above mentioned tender requirements.

M/s. _____ (*Name of the OEM*) within the scope of requirement as per the tender mentioned above undertake to provide technical & other support towards fulfilling the requirements of installation, commissioning, benchmarking, acceptance criteria and product warranty services of the tendered item(s)/goods to be supplied and installed at IITRAM.

We will support M/s. _____ (*Name of the bidder*) on regular basis with all related issues, technology and product updates and extends comprehensive support during the entire warranty period.

The undersigned is authorized to issue such authorization on behalf of M/s. _____ (*Name of the OEM*).

For M/s. _____ (*Name of the OEM*)

Signature & Company Seal

Name :

Designation :

Email :

Mobile No. :

DECLARATION REGARDING NEAR RELATIVES

I, _____, authorized signatory of M/s. _____ hereby declare that none of our near relative(s) as defined in the tender documents is / are working / employed in IITRAM. In case at any stage, it is found that the information given by us is false / incorrect; IITRAM shall have the absolute right to take any action as deemed fit without any prior intimation to us.

Near Relative for this purpose are defined as: -

- (i) Member of Hindu Undivided family.
- (ii) They are husband and wife.
- (iii) The one is related to the other in the manner as father, mother, son(s) & son's wife (daughter in law), daughter(s), daughter's husband (son in law) & brother(s) & brother's wife, sister(s) & sister's husband (brother in law)

Signature of Bidder with Seal

To be signed by: -

- (a) Signature of Proprietor in case of Proprietorship Firm

.....

- (b) Signature of all partners in case of Partnership Firm

i.

ii.

iii.

- (c) Signature of all Directors of Company in case of Ltd. or Pvt. Ltd. Company

i.

ii.

iii.