

 <p>IIT PALAKKAD</p>	<p>भारतीय प्रौद्योगिकी संस्थान पालक्काड Indian Institute of Technology Palakkad अहलिया एकीकृत कैम्पस, कोज़िपारा Ahalia Integrated Campus, Kozhipara पालक्काड- 678557 Palakkad – 678 557</p>	<p>दूरभाषसंख्या/ Phone no: 04923 – 226 300/590/586</p> <p>ईमेल/ Email : purchase@iitpkd.ac.in</p>
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Prof. Job Kurian
Registrar i/c

Ref : Manual RF Probe Station
Date : 22.12.2017

Open Tender No: IITPKD/CIF/RP/092/2017

Due Date: 12.01.2018 AT 2.30 PM

Dear Sir/Madam,

On behalf of the **Indian Institute of Technology, Temporary campus, Palakkad, Quotations are invited for “Manual RF Probe Station”**. The Specifications are given in the Annexure.

Pre-bid meeting – The pre-bid meeting is scheduled to be held on 27.12.2017 at 11.00 AM at Conference Room, Academic Block, IIT Palakkad.

Technical bid Opening: The Technical bid will be opened on 12.01.2018 at 2.30 PM at Academic Block, IIT Palakkad.

Instructions to the Bidder

- (i) **Preparation of Bids:** - The tenders should be submitted **under two-bid system (i.e.) Technical bid and Financial bid in separate envelopes**. The technical bid should consist of all technical details along with commercial terms and conditions. No prices should be included in technical bid. Financial Bid should indicate item – wise prices for the items mentioned in the technical bid. The technical and the financial bids should be put in separate covers and sealed. Both sealed covers should be put into a bigger cover. **Bids must either be spiral bound / stapled together. No loose sheets will be accepted. All pages must be numbered.**
- (ii) The Quotations duly sealed and superscribed on the envelope **with the reference No. and due date, should be addressed to the undersigned so as to reach on or before the due date stipulated above.**
- (iii) **Delivery of the tender:** - The tender shall be sent to the below-mentioned address either by post or by courier so as to reach this office before the due date and time specified in the Schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule. **The tender box is kept in the office of the Academic Block, IIT Palakkad, Ahalia Integrated Campus, Kozhipara, Palakkad-678 557.**

- (iv) **Opening of the tender:** - The offer/Bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and will be examined by a technical committee which will decide the suitability of the bid as per our specifications and requirements. The bidders will be invited for opening of Technical bids. **The Bidder's representative should carry authorization letter from their company empowering them to participate in the Pre-bid and tender opening meetings.** In respect of opening of financial bid, those bidders who are technically qualified only will be called.
- (v) **Prices:** - The price should be quoted in nett per unit (after breakup) and must include all packing and delivery charges indicated separately for each item. **The price indicated should be CIF/CIP Kochi.** The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. The price should be quoted without custom duty. **The custom duty will be paid at concessional rate against duty exemption certificate.**
- (vi) **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. **Terms of Delivery:** - The item should be supplied to our Institute as per Purchase order. The installation and commissioning should be completed as specified **by us in the attached schedule.**
- (vii) **Acceptance & Rejection:** IIT Palakkad reserves the full right to accept / reject any tender at **any** stage without assigning any reason.

Yours sincerely,

Registrar, IIT Palakkad

SCHEDULE

Important Conditions:

- 1) The due date for the submission of the tender is **12.01.2018 AT 2.30 PM**
- 2) The offers / bids should be submitted in two-bids systems (i.e.) Technical bid and financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes (separately), transportation, packing & forwarding charges, installation, guarantee, payment terms, pricing terms etc. The Technical bid and financial bid should be put in separate covers **superscribed clearly as "Technical Bid" and "Financial bid"** and sealed. Both the sealed covers should be put in a bigger cover. Open Tender for **"Manual RF Probe Station"** should be written on the left side of the Outer bigger cover and sealed.
- 3) **EMD: -EMD should be at 2% (two percent) of the tender value quoted by the bidder.** The EMD should be enclosed with the financial bid which will not be opened for Technical evaluation. Enclosing the EMD in the Technical bid will automatically DISQUALIFY the tenderer. EMD should be in the form of DD in favour of **"Indian Institute of Technology Palakkad" and payable at Palakkad"**. The tender without EMD would be considered as UNSOLICITED and will be REJECTED. Photo/FAX copies of the Demand Draft/Banker's pay orders will not be accepted. No interest will be paid for the EMD and the EMD will be refunded to the successful bidder on receipt of Performance Security.
- 4) **Performance Security:-** The successful bidder will be asked to submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD or FD Receipt from the commercial bank or Bank Guarantee from any nationalized bank of India. **Only after submission of Performance Security, Purchase Order/Work Order will be released / L.C will be opened.**
- 5) **Performance Security in the form of Bank Guarantee:-** In case the successful bidder is a foreign company and wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.
- 6) The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

If an Indian agent is involved, the following documents must be enclosed:

- Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent.
 - Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business.
- 7) The offer/bids should be sent only for a system or equipment that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.
 - 8) Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.
 - 9) Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.
 - 10) **Validity:** Validity of Quotation not less than 90 days from the due date of tender.
 - 11) **Delivery Schedule:-** The tenderer should indicate clearly the time required for delivery of the item. In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.
 - 12) **Risk Purchase Clause:-** In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
 - 13) **Payment:-** No Advance payment will be made for Indigenous purchase. 100% Payment after supply and successful installation and commissioning and certification by the end user. In case of import supplies the payment will be made only through **100% Letter of Credit i.e. (50% payment will be released against shipping documents and 50% after successful installation and meeting acceptance criteria wherever the installation is being done).**
 - 14) **On-site Installation:** - The equipment or machinery has to be installed and commissioned by the successful bidder within 15 to 20 days from the date of receipt of the **item at site of IIT Palakkad.**
 - 15) **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately. (For more details please refer our Technical Specifications).

16) Late offer: - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.

17) Loading and unloading charges will be borne by the bidder/Supplier.

18) Acceptance and Rejection: - I.I.T. Palakkad has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

19) Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.

20) Disputes and Jurisdiction: - Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Palakkad in Kerala.

21) All Amendments, time extension, clarifications etc., will be uploaded on the institute website only and will not be published in newspapers. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

Acknowledgement:- It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER
ALONG WITH SEAL OF THE
COMPANY WITH DATE**

Technical Specifications for Manual RF Probe Station

1. Overview:

- a) The probe station should be able to:
 - i. make RF measurements upto 40 GHz or more.
 - ii. mate with vector network analyzer of any company. The vector network analyzer (VNA) will also operate upto 40 GHz or more.
 - iii. Allow seamless calibration and inter-operability with VNAs from major vendors, and integration with standard characterisation instruments from different manufacturers, for a wide range of device and circuits measurement test setups.

2. Detailed Specifications:

Sl. No.	Feature	Specifications	
1.	Mechanical performance specifications of the probe system:		
	(a)	Chuck stage movement	Manual
	(b)	Chuck stage	Independent X and Y axes control of chuck stage
		i. X-Y stage travel range	≥ 150 mm (both, X and Y axes)
		ii. X-Y travel resolution	0.5 mm/turn, or better (higher resolution)
		iii. Z-height adjustment range	≥ 10 mm
		iv. Theta-stage travel range	$\geq \pm 5^\circ$ fine adjustment
	(c)	Platen:	
		i. Platen lift system control	for ease of loading and unloading wafer
		ii. Platen lift range	≥ 20 mm
		iii. Platen lift repeatability	≤ 1 μ m
		iv. Maximum no. of positioners	≥ 12
		v. Separation lift	≥ 200 μ m
(d)	Loading and unloading of wafers/substrates	System should support front loading and unloading of wafers, with a clear view of wafers/substrates.	
2.	Wafer chuck system:		
	(a)	RF wafer chuck	non-thermal
	(b)	Substrate/wafer size	i. atleast 10-mm-diameter (or smaller) to 150-mm-diameter (or larger).

		ii. Chuck vacuum should be sufficient to hold samples of 10-mm-diameter (or smaller) to 150-mm-diameter (or larger).	
(c)	Chuck diameter	≥ 150 mm	
(d)	Chuck surface flatness/planarity	$\leq \pm 10$ μm	
(e)	Chuck vacuum actuation	Manual switch between central zone and zones approximately at 22 mm, 44 mm, 66 mm, 88 mm, 110 mm, 132 mm.	
(f)	Chuck electrical performance	Devices under test will be drawing bias current in the range of 10 pA to 1 A from the source.	
(g)	Auxiliary chuck (optional)	2 auxiliary chucks, for securing of calibration substrate and for accurate on-wafer RF calibration (price for each chuck should be mentioned)	
(h)	Auxiliary chuck material	i. <u>Mandatory:</u> RF absorbing material ii. <u>Optional:</u> microwave transparent material	
(i)	Auxiliary chuck vacuum control	Independent vacuum switch control, separate from the main chuck	
3.	Microscope system:		
	(a)	Microscope system mount	Boom stand for quick and easy movement
	(b)	Microscope Parameters:	
		i. Total magnification	$\geq 150X$
		ii. Illumination	LED source with external intensity control unit
		iii. TV port (C-Mount)	i. 1X magnification ii. provide USB mount
	(c)	Digital camera for image capturing and live view:	
		i. Camera resolution	≥ 3 mega pixels
		ii. Video capture resolution	1080p High Definition Standard
		iii. Video output	USB and HDMI
		iv. Software	Camera to come with image capturing software & distance measurement capabilities
	(d)	Monitor to view and connect with digital camera for live view:	
		i. Monitor size	Minimum 21 inches
ii. Monitor type		LED or LCD only	
iii. Resolution		$\geq 1920 \times 1080$ pixel	

	iv. Input	HDMI and DVI/VGA input		
4.	RF positioners, probes, accessories, and calibration software:			
	RF positioners: 4 numbers (and scope to increase in the future)			
	(a)	i. Micropositioner XYZ travel range	≥ 12 mm	
		ii. Micropositioner feature resolution	3 μ m, or better (higher resolution)	
		iii. Micropositioner screw resolution	≥ 250 μ m/turn	
		iv. Micropositioner mounting	Magnetic	
		v. RF positioner frequency support	DC to 40 GHz, or higher	
	(b) Probe arm	<ul style="list-style-type: none"> i. Universal RF and microwave probe mount ii. Accurate RF probe planarity control by micrometer screw iii. RF cable guide compatible with micropositioners 		
	RF probes and cables		4 sets of probes and cables	
	I. Frequency range		DC to 40 GHz, or higher	
	II. RF probe tip configuration		GSG probe with following features: <ul style="list-style-type: none"> i. Maximum insertion loss: ≤ 1 dB ii. Maximum DC current: ≥ 0.5 A iii. Operating temperature: atleast 0 $^{\circ}$C (or lower) to 150 $^{\circ}$C (or higher) iv. Maximum RF power at 2 GHz: ≥ 4 W v. Contact resistance on Al: ≤ 200 mΩ vi. Non-oxidizing nickel alloy tips 	
	(c)	III. RF probe pitch		150 μ m
		IV. RF probe body style		angled
		V. RF cable length		600 mm and 900 mm
		VI. RF cable insertion loss		< 3.5 dB/m upto 40 GHz
		VI. RF cable connector type (internally ruggedized, flexible RF)		<ul style="list-style-type: none"> i. K 2.92 mm (M) - K 2.92 mm (F): 4 numbers ii. K 2.92 mm (M) - 2.4 mm (F): 4 numbers iii. K 2.92 mm (M) - 2.4 mm (M): 4 numbers
		VII. Calibration probe pitch range		100 μ m to 250 μ m

		RF calibration hardware (microstrip substrate as well as any required hardware for 150 μm probe pitch) and software	<ul style="list-style-type: none"> i. Standalone GUI-based calibration software matched with probe station ii. calibration software to work with the probe station iii. Automatic calibration feature iv. Feature to measure S-parameters v. Calibration method must support minimum short open load thru (SOLT) and multiline thru reflect line (TRL) calibration vi. All software and hardware required for calibration of the equipment has to be quoted
5.	DC positioners and accessories:		
	(a)	DC micropositioners	4 numbers
		I. Micropositioner XYZ travel range	<ul style="list-style-type: none"> i. $\geq 8\text{-}10$ mm in X-axis ii. $\geq 6\text{-}10$ mm in Y-axis iii. $\geq 10\text{-}25$ mm in Z-axis
		II. Micropositioner feature resolution	$\leq 5 \mu\text{m}$
		III. Micropositioner screw resolution	<ul style="list-style-type: none"> i. $\leq 350\text{-}500 \mu\text{m}$ in X axis, per turn ii. $\leq 500 \mu\text{m}$ in Y axis, per turn iii. $\leq 70\text{-}500 \mu\text{m}$ in Z axis, per turn
		IV. Micropositioner mounting	Magnetic
	(b)	No. of coaxial probe arms	4
	(c)	DC Probe tips:	
		i. Material	tungsten
		ii. Tip radius	$12 \mu\text{m}$ or less
(d)	Cables for measurement setup	The system should be equipped with all coaxial cables and connectors.	
6.	Vibration isolation table:		
	(a)	frequency (vertical & horizontal)	≤ 3.5 Hz
	(b)	Maximum load capacity	≥ 200 kg
(c)	Accessories	provide CDA pump of appropriate capacity	
7.	Vacuum pump and tools		<ul style="list-style-type: none"> i. Provide low noise vacuum pump (pressure $\leq 10^{-3}$ torr) that is compatible with the system

		<ul style="list-style-type: none"> ii. Provide all the necessary accessories, including vacuum tubing iii. Wafer tweezer & tool box should be included iv. All electrical cables should be included
8.	Power requirement for all equipments	As per Indian electrical standards (230 V, ac, 50 Hz)
9.	Acceptance criteria	<ul style="list-style-type: none"> i. All the components of the probe station and the accessories are to be checked. ii. Demonstration of conversion losses for RFIC and MMIC based mixers with accuracy of 2% of the datasheet values. iii. Should be inter-operable with vector network analyzer (operating upto 40 GHz) of any major company.

Who can participate in the bid?

Only those bidders fulfilling the following criteria should respond to the tender.

1. The bidder should be either an Original Equipment Manufacturer (OEM) of manual RF probe station or should be an authorized representative (provide documentary proof) of an OEM.
2. The bidder should be a company registered under the Companies Act, 1956/2013 OR a Limited Liability Partnership/a registered partnership firm OR a sole-proprietorship entity. Appropriate Registration incorporation certificate must be submitted.
3. The bidder must have a registered office in Karnataka/Tamil Nadu/Telangana/Andhra Pradesh/Maharashtra or Kerala. Certificate of registration for the offices to be provided.
4. The bidder must also have a service center in Karnataka/Tamil Nadu/Telangana/Andhra Pradesh or Kerala. Certificate of registration for the centers to be provided. Details about scope of service activities provided by the service centres must be provided. The contact details of the service engineers must be provided.
5. The bidder must be in existence in the business of manual RF probe station or allied fields for a minimum period of 5 previous financial years (before or since 01 April 2012). Documentary evidences of experience must be provided.
6. The bidder should have implemented orders of manual RF probe station worth exceeding INR 10 lakhs during previous three financial years (01 April 2014 – 31 March 2017). Copies of the most recent purchase orders and certificates of successful implementation must be included. Copies of financial statements or evidence of turnover must be furnished.
7. The bidder should have documentary evidence of having supplied at least 4 no. of probe stations to a Centrally Funded Technical Institution (e.g., IIT, NIT, IISc, IISER, etc.) in the recent past. The bidder must provide a certificate of satisfactory performance of the supplied equipment from the institute to which they have recently supplied. Contact details of the faculty-in-charge of the installed setup must also be provided.
8. The bidder must provide detailed specification of each equipment/item. Model numbers, data sheets and brochures must be included for each quoted equipment/accessories/item. Specifications corresponding to quoted model number must be available publicly via OEM's website for scrutiny. If not, bid can be disqualified on technical grounds.
- 9. Compliance sheet for the technical specification and OEM Brochure have to be attached along with the Technical bid. Vendor has to fill the compliance sheet and mention page number or reference number in OEM brochure. Unfilled/partially filled sheets lead to disqualification.**
- 10. Service and warranty for a minimum period of three years for the equipments from the date of installation, must be provided. AMC for additional three years must be quoted separately.**