

Dated: 22nd April 2024

To whom it may concern

This is a **Request for quote (RFQ) from domestic (India-based) manufacturers only** for procurement of *4 nos. of intensity modulator systems consisting of an intensity modulator, RF amplifier and modulator bias controller* to be purchased at the department of Electrical Communication Engineering (ECE), Indian Institute of Science, Bangalore.

All interested vendors shall submit a response demonstrating their capabilities to produce the requested equipment to the primary point of contact listed below. Quotation should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor. The quotations should be on FOR-IISc Bangalore basis in INR only.

With respect to this tender, the rules laid out by the Government of India in order No. P45021/2/2017-pp-BE-II issued by the Public Procurement Section, Department or Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, dated 4th June 2020 will be followed. As per this order, the government has defined a 'Class-I local supplier' as "a supplier or service provider whose goods, services or work offered for procurement, has local content equal to or more than 50%". A 'Class-II local supplier' is "a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%". Only Class-I and Class-II local suppliers are eligible to participate in this open domestic tender. Any "Non-local supplier" i.e. "a supplier or service provider, whose goods, services or works offered for procurement, has local content less than 20%" is ineligible to participate in this tender.

Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.

Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to the Class-1 supplier.

MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

The deadline for submission of proposals is **13th May 2024 by 5:00 PM**. Proposals should arrive at the office of **Dr. Varun Raghunathan, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore, Karnataka 560012, India**.

Direct all questions concerning the acquisition to **Dr. Varun Raghunathan** at: **varunr@iisc.ac.in**.

General Terms and Conditions:

1. The bid should be submitted in the two-cover system, i.e. technical bid and commercial bid separately in sealed covers. The technical bid should contain all commercial terms and conditions, except the price.
2. The technical bid must contain a point-by-point technical compliance document. The technical proposal should contain a compliance table that should describe your compliance in a "yes" or "no" response against each of the items in the table listed in this RFQ. If "no" the second column should state the extent of deviation. The third column should state the reason for the deviation, if any. The fourth column can be used to compare your tool with that of your competitors or provide details as requested in the technical requirement table below.
3. In the commercial bid, the price should be inclusive of all discounts.
4. The vendor should have qualified technical service personnel for the equipment based in India (preferably in Bangalore).
5. The covering letter should clearly state the whether the vendor is a Class-I or Class-II local supplier. Failing this the bid will be automatically rejected.
6. The vendor to state the percentage of the local content and provide self-certification that the item offered meets the minimum local content requirement. They should also give details of the location(s) at which the local value addition is made.
7. The lead time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order. It should be clearly mentioned in the technical and commercial bids.
8. All the quotations must be valid for at least 90 days at the time of submission.
9. List of customers and references: The Bidder should have supplied similar equipment in Central Universities preferably in centrally Funded Technical Institutes (IITs, IISc, IISERs, NITs, government labs etc.) . Please provide the details and contact information.
10. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect should be provided.
11. Items in addition to that listed in the technical table that you would like to bring to the attention of the committee, such as data sheets, technical plots etc. can be listed at the end of the compliance table.
12. Vendors are encouraged to highlight the advantage of their tools over comparable tools from the competitors.
13. If needed, a meeting for any technical clarifications can be scheduled with the undersigned by sending an email.
14. The Institute reserves the right to accept or reject any bid, or to annul the bidding process and reject all bids, at any time prior to the award of contract without thereby incurring any liability of the affected bidder or bidders.
15. Warranty terms and additional warranty options is a must for all the components. Please specify the service plan like whether the local distributor will address the issue or the parent company.
16. Terms and conditions for the annual maintenance contract beyond the warranty period should be mentioned.
17. After the award of purchase order, the vendor must provide an Order Acknowledgement within 30 days from the receipt of the Purchase Order.
18. Please quote the price of each optional line item, separately.

Technical requirements:

Please note that the requirements and options listed below are only guidelines. It does not disbar bids that do not meet the criteria listed. Vendors are requested to quote for equipment that meet the criteria to the best extent possible and list deviations. Deviations are NOT an automatic reason for disqualification. They will be discussed by the technical committee prior to making an informed decision.

Technical Specifications	Values/ Range
Intensity Modulator System:	Consisting of: [1] Intensity Modulator [2] RF amplifier [3] Modulator Bias Controller
Quantity	Four
[1] Description	Intensity Modulator
Crystal Type	Lithium Niobate Cut and Propagation directions to be specified Waveguide type to be specified
Wavelength range of operation	1530 to 1625 nm
Insertion Loss	≤ 4.0 dB (connectorized)
Extinction Ratio	≥ 30 dB (Specify DC and RF extinction ratio)
Optical Return Loss	≥ 45 dB
Chirp Parameter	0
Maximum Optical Input Power	Up to 100 mW
Modulation Bandwidth	≥ 10 GHz
Operating Frequency Range	0 to 12 GHz
Rise and Fall Time	≤ 30 pico-seconds
$V\pi$ (at 10 GHz)	≤ 6.5 V (specify wavelength of operation)
$V\pi$ (at DC)	≤ 6.5 V (specify wavelength of operation)
$V\pi$ (at 1 KHz)	≤ 5.5 V (specify wavelength of operation)
Electrical Return Loss (S11)	≤ - 12 dB
Ripples (ΔS_{21})	0.5 dB (specify frequency range)
Maximum RF power	Up to 28 dBm
Bias voltage Range	-20 to +20 V
RF impedance matching	To 50 Ohms
DC input impedance	To 1 M-Ohm
Fiber Types	Polarization maintain fibers for input and output 900 micron loose-tube
Fiber connectors	FC/APC at input and output (specify alignment of axis)
Monitoring Photodiode	Not required
RF connector type	K-RF (SMA compatible)
Operating Temperature	0 to 70°C
Storage Temperature	-40°C to +80°C
Pin-out	To be specified

Package Dimensions	To be specified
[2] Description	RF amplifier
Frequency Range	16 KHz to 11 GHz
Output voltage	≥ 8 V peak-to-peak
Small signal Gain	Atleast 33 dB
Gain Ripples	+/- 1.5 dB (specify the frequency)
Output 1 dB compression point	≥ 20 dBm (Specify the frequency range of operation)
Saturated output power	23 dBm (specify the frequency and input voltage)
Maximum input power	0 dBm
Noise figure	≤ 4 dB
Delay Time	≤ 450 pico-seconds (specify the frequency)
Input Pulsed width range	70 psec – 300 nsec
Input pulse repetition frequency range	10 Hz – 1 GHz
Input pulse amplitude	Atleast 0.18 V peak-to-peak
Rise and fall time	Better than 25 pico-seconds
Input and Output Return loss	≤ -10 dB (specify the frequency)
Isolation	Better than -60 dB (specify the frequency)
Bias voltage	12 Volts
Current consumption	450 mA maximum
Power dissipation	≤ 7 W
Operating temperature range	0 – 40°C
Heat sink	To be included
Input and output Connector type	SMA- RF connectors
Bias input connector type	To be specified
[3] Description	Modulator Bias Controller
Center Wavelength	1550 nm
Wavelength bandwidth	+/- 20 nm
Input optical power	Maximum up to 20 dBm (To specify typical input power)
DC bias voltage range	-10 to +10 Volts
Bias voltage step-size range	1-100 mVolts
Auto set modes	Minimum, Maximum, Quadrature +/- points (specify other operating points)
Locking range	Up to 360°
Locking accuracy	90 +/- 0.5° (at Quadrature point)
Locking stability	+/- 0.1° (over 2 hours of operation)
Extinction Ratio	50 +/- 0.5 dB (at Minimum point)
Frequency dither range	400-1400 Hz (specify frequency step)
Voltage dither range	5-1000 mV (specify amplitude step)
Auto-test scan time	≤ 30 seconds
Initialization time	≤ 10 seconds
Start-up time	≤ 30 seconds
Photodiode input and coupler input type	FC/APC connector

Bias output type	BNC connector
Computer interface	USB
Computer operating system requirement/ configurations	Windows OS, configuration to be provided
Software Drivers for bias controller interfacing	To be included
Power Supply Voltage	220-240 V, 50-60 Hz
Form factor	Board-level module
Dimensions	To be specified

Other requirements:	
1.	Detailed test report supporting the above required specifications to be included with the equipment at the time of delivery
2.	Expected performance data sheets to be included with the technical bid
3.	Compatibility among the intensity modulator, RF amplifier and modulator bias controller to be tested and results of the test to be provided.
4.	Please include other options currently available which can be added
5.	Cost of shipping to Indian Institute of Science, Bangalore should be included
6.	Warranty terms to be specified in the commercial proposal and is subject to negotiations
7.	Payment terms to be specified in the commercial proposal and is subject to negotiations
8.	List of acceptance tests for on-site (vendor) inspection and after installation at IISc
9.	A set of basic experiments for performing routine checks of acceptable operation with clear instructions to be provided
10.	Please provide details of the number of trained personnel in India, number in southern region or in Bangalore who can service the instrument
11.	Service credentials: The supplier should have at least five similar installation in India. Customer list with contact details mandatory to prove your credential
12.	Authorisation letter from OEM manufacturer to be included
13.	Vendor must provide complete compliance statement against each technical point

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