

Department of Electrical Engineering Indian Institute of Technology Delhi

NIQ no. IITD/EE/PLN03-BEEN/IEC/MS3

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Notice inviting quotations for DSP Lockin Amplifier

Sealed quotations are invited for a DSP Lockin Amplifier. The required specifications are given below. The purchase will be made through a two part bidding process. Technical and Financial bids have to be made separately. Complete technical information should be provided along with the Technical bid. Please refer to the Terms and Conditions on the next page for details on how and when to submit Technical and Financial bids.

Required specifications for DSP Lockin Amplifier

1. Dual phase DSP Lockin amplifier capable of measuring amplitude and phase shift of output from (internal as well external) reference signal, with auto gain, auto phase, auto reverse and auto offset capability, and compatible with single ended and differential voltages.
2. Range of internal oscillator 1 mHz to 100 kHz (or more).
3. Voltage inputs – Sensitivity: 2 nV to 1 V or better. Input impedance > 10 M Ohm + 25 pF. Noise < 10 nV/sqrt Hz at 1 kHz.
4. Current input (gains): At least two: 1 million and 0.1 billion Ohms (accuracy: +/- 1% or better). Input impedance: 1 kOhm to virtual ground. Noise < 0.2 pA/sqrt Hz, 0.02 pA / sqrt Hz, respectively.
5. Line filters: Line frequency and 2 x line frequency.
6. CMRR: 100 dB at 10 kHz.
7. Dynamic reserve: > 100 dB (without prefilters).
8. Stability: 5 ppm/deg C or better.
9. Reference Channel: frequency range: 0.001 Hz to 100 kHz or better. Input: TTL/Sine. Input impedance: 1 M Ohm, 25 pF. Phase resolution=0.01 deg or better. Absolute phase error < 1 deg. Relative phase error < 0.001 degree. Orthogonality: within 0.001 degree of 90 degree.
10. Harmonic detection: n x detection frequency, n = 2 to 4000 (at least). Limited by max frequency above.
11. Demodulator: Harmonic rejection -90 dB. Time constants: 10 micro seconds to 30 kilo seconds (with 6, 12, 18, 24 dB/octave rolloff). Sync filters below 200 Hz.
12. Internal (synthesized) oscillator: frequency range above (reference channel). Sine / TTL output. Amplitude stability: 50 ppm/ degree C. Phase noise < 0.00001 degree at 1 kHz.
13. Outputs: Two channels: X/Y, X/Y noise, R, theta. Sine/TTL. Aux. D/A.
14. Inputs: Trigger in, Aux. A/D.
15. Data buffer: Two, at least 16 K points.

16. IEEE Bus implementation. Talk only and Addressible. SCPI (IEEE-488.2) compliant. RS-232. Front panel operations should be programmable (including power on).
17. Net weight < 11 kg.
18. Quote must include all test leads / cables needed to do the above measurements (banana plugs / coaxes / triaxes / etc.) in a triggered configuration.
19. Warranty: 5 year comprehensive on-site warranty is required
20. Delivery and installation: Within 1 month of placed order

Dr. Madhusudan Singh
(Chairman, purchase committee)

Terms and Conditions

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and "Financial Bid" respectively. Both the sealed envelopes should be sent in a single sealed envelope, clearly marked as "Quotation for DSP Lockin Amplifier". The quote should reach the following address on or before **Jan 29, 2014, 2 PM**.
Dr. Madhusudan Singh
Department of Electrical Engineering
Block II, Room 236, IIT Delhi, Hauz Khas, New Delhi 110016, India
2. Please quote prices in INR inclusive of all taxes, freight, delivery, installation and onsite training charges. The quotation should provide the total price of the system including all taxes and transportation charges.
3. Quote should be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India. The vendor must have a website with a credible domain name that has existed prior to the floating of this tender and the specifications, manuals and any other relevant documentation for this equipment must be free to download from that website, independent of the supplied literature.
5. If the quote is being submitted by a representative of the manufacturer, a valid agency-ship or dealership certificate authorizing the agent to quote to IIT Delhi, specific to this tender, on behalf of the manufacturers should be enclosed.
6. Either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
7. Complete set of manuals for the operation of the equipment should be provided.
8. Clearly specify the installation requirements - such as space, power, frequency, environment etc.
9. If the item quoted is proprietary in nature, please enclose proprietary certificate from the principals stating: "Certified that is a proprietary item of M/s and no other manufacturer makes this item."
10. Please specify all of your terms and conditions clearly, including delivery period.
11. For all purchases, payment is after installation, as per IIT Delhi norms.
12. IIT Delhi is exempted from paying Excise Duty and necessary Excise Duty Exemption Certificate will be provided for which following information are required.
 - a. Quotation with details of Basic Price, Rate & Amount on which ED is applicable.
13. The Institute reserves the right to accept or reject any or all quotations without assigning any reasons thereof.

Dr. Madhusudan Singh (Chairman, purchase committee)
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