NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA-769008 (ODISHA)
An Institute of National Importance under Ministry of HRD, GOI

NOTICE INVITING TENDER

Tender Notification No: NITR/PW/PH/2019/90 **Dated: 06/02/2019**

The National Institute of Technology, Rourkela invites bids from the eligible bidders for procurement of **Research grade lock-in amplifier** at NIT Rourkela.

Last date of Submission of Bid **: 06/03/2019 at 11:00 AM**

Date of opening of technical Bid **: 07/03/2019 at 11:00 AM**

For Details:
http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx
Contact: Dr. Prakash Nath Vishwakarma , PH; Ph: +91-661-2462728;
Email: prakashn@nitrkl.ac.in
Bidding through: https://eprocure.gov.in/eprocure/app

sd/-
REGISTRAR

NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA-769008, ODISHA

(TENDER NOTICE NO.: NITR/PW/PH/2019/90 dated: - 06/02/2019)

(Procurement of research grade lock-in amplifier)

Item No	DESCRIPTION	Quantity
1	**Research grade lock-in amplifier**	1 Unit

1. Quantity required **: As mentioned above (All information regarding technical specification provided in the Annexure-I**)
2. Delivery **:** Within **90 days** from the date of purchase order
3. **Last Date of submission of Tender : 06/03/2019 at 11:00 AM**
4. **Date of opening of technical bid** : **07/03/2019 at 11:00 AM**
5. The firm should not have been black listed at any time.
6. The submission of following bids by the tenderer should be through https://eprocure.gov.in/eprocure/app. Please follow the guidelines as per the portal.

Procurement of Research grade lock-in amplifier

(Tender Notice No.: NITR/PW/PH/2019/90 dated: 06/02/2019) Due on 06/03/2019 at 11:00 AM

7. **Liquidated damage clause** will be charged for any delay in supply of goods.
8. The validity of the tender shall be **90 days** from the date of opening of the bids.
9. Detailed advertisement including all tender documents is also available in our website at http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx .
10. NIT reserves the right to qualify or deny prequalification of any or all applicants without assigning any reasons.

(REGISTRAR)
NIT, Rourkela
Fax No- 0661-2462022
Ph. No -0661-2462021

Annexure-I

Specifications for Research grade lock-in amplifier

Item No	DESCRIPTION
1.	**1. General:** The lock-in amplifier should be of research grade. This point must be supported by providing a list of the journal research papers published using this equipment. A copy of best selected papers should also be attached along with the technical bid. The system should be based on digital signal processing technique and should be able to simultaneously display the magnitude and phase of a signal.

2. Signal Channel

Voltage inputs	Single-ended and differential
Sensitivity	2 nV to 1 V
Current input	10^6 or 10^8 V/A
Input impedance	
Voltage	10 MΩ + 25 pF, AC or DC coupled
Current	1 kΩ to virtual ground
Gain accuracy	±1 % or better
Noise	6 nV/√Hz at 1 kHz
	0.13 pA/√Hz at 1 kHz (10^6 V/A)
	0.013 pA/√Hz at 100 Hz (10^8 V/A)
Line filters	50Hz and 100Hz
CMRR	100 dB up to 10 kHz, decreasing by 6 dB/oct above 10 kHz
Dynamic reserve	>100 dB
Stability	<5 ppm/°C

3. Reference Channel

Frequency range	1 Hz to 100 kHz (At least)
Reference input	TTL or sine
Input impedance	1 MΩ, 25 pF
Phase resolution	At least 0.01°
Absolute phase error	<1°
Relative phase error	<0.001°
Orthogonality	90° ± 0.001°
Phase noise	
Internal ref.	<0.0001° rms at 1 kHz
External ref.	0.005° rms at 1 kHz
Harmonic detection	2F, 3F, ... nF to 102 kHz (n < 19,999)
Acquisition time	50 ms or lesser

4. Demodulator

Stability	Should be no drift in Digital outputs and <5 ppm/°C for Analog outputs.
Harmonic rejection	−90 dB
Time constants	10 µs to 30 ks (6, 12, 18, 24 dB/oct roll off). Synchronous filters should be available below 200 Hz.

5. Internal Oscillator

Range	1 Hz to 100 kHz (at least)
Frequency accuracy	25 ppm + 30 µHz
Frequency resolution	4½ digits or 0.1 mHz, whichever is greater
Distortion	−80 dBc (f <10 kHz), −70 dBc (f >10 kHz) @ 1 Vrms amplitude
Amplitude	4mV to 5 Vrms (2 mV resolution), 50 Ω output impedance.
Amplitude accuracy	1 %
Amplitude stability	50 ppm/°C
Outputs	Sine, TTL

6. Displays

Channel 1 & 2	4½-digit digital display separately for Channel 1 and 2, displaying. (X,Y), (R, θ), (X-noise, Y-noise), Aux 1/Aux 2/ Aux 3/Aux 4..
Offset	Provision of offset in X, Y, R up to ±105 % of full scale should be there.
Expand	Provision for expanding X, Y, R by 10/100 times should be present.
Reference	The reference signal should be displayed at least in 4½-digit display

7. Inputs and Outputs

CH1, CH2 output	Output via BNC port for (X,Y), (R,θ) and (Xnoise,YNoise) should be there either in the front or rear panel.
X, Y outputs (rear panel and front panel)	Should have X, Y outputs (BNC) both in the rear and front panel. Data should be refreshed at 256 kHz at least.
Aux. A/D inputs and D/A outputs	Should have at least 4 nos of inputs and outputs respectively, of ±10 V, 1 mV resolution.
Internal oscillator	The instrument should have in built sine wave oscillator.
External Oscillator	Provision of using external oscillator in association with this lock-in should be available
Data buffer	Input data should be sampled at rates of 512 Hz or better and read through the computer interfaces.
Remote preamp	The Instrument should have provision for adding pre-amplifier. The Pre-amplifier unit may be quoted as optional.

8. Interfaces

The instrument should be compatible with IEEE-488.2 and RS-232 interfaces standard and equipped with the required ports for interfacing.

	9. Circuitry The circuit should be board/card based, having separate boards/cards for power supply, signal processing, signal in, etc. The structure should be such that repairing of the unit can be under taken by the user himself/herself, on the remote guidance of company technical. The unit manual should list all the electronic components used in it with clear schematic diagrams. **10. Available power supply at NIT Rourkela:** 220-240Volts, 50 Hz, i.e, system should compatible with Indian power standards. **11. Warranty** Standard one year warranty for the system from the date of installation and commissioning at NIT Rourkela. Only reputed original equipment manufacturers (OEM) of international standard should submit tender with supported document. The system being supplied should meet international standards. Vendor shall provide a list of customers along with their names, addresses, e-mail addresses where similar systems are installed. Resell or refurbished equipment would not be acceptable. **Details of the configuration and deviation must be provided along with technical bid.**

Other Qualification Criteria:

1. At least five user names and contacts from NIT/IIT/reputed Indian institute/Govt. R&D organizations must be provided where the above equipment and accessories (**Annexure-I**) have been supplied in last five years. Scan copies of the minimum five purchase orders of the above equipment and accessories (**Annexure-I**) must be enclosed along with the technical bid.
2. There must be a local maintenance center with availability of the spares in India.
3. Scanned copies of the technical brochure of the above equipment and accessories (**Annexure-I**) given in the quotation must be included in the technical bid.
4. Web references must be provided along with the technical bid.
5. Point wise technical compliance along with any deviation of the mentioned specifications (**Annexure-I**) must be indicated along with technical documents.
6. Customized equipment and accessories (as per **Annexure-I**) will not be accepted. The standard equipment and accessories (as per **Annexure-I**) will only be accepted.
7. Make and model no. should be mentioned in the technical bid.

* *