

**INDIAN INSTITUTE OF TECHNOLOGY DELHI**  
**HAUZ KHAS, NEW DELHI-110016 (INDIA)**

**DATED: October 29, 2013**

**DUE DATE: 13<sup>th</sup> November 2013, 5PM**

**NOTICE INVITING QUOTATION**

NIQ NO.: **IITD/PHY/2014/HCG/LA**

Quotations are invited for procuring **ONE Lock-in Amplifier** compatible with IEEE-488.2 and RS232 interfaces having technical specification as given below

**Technical Specifications of the Lock-in Amplifier**

**SIGNAL CHANNEL**

Input:	Both current as well as voltage
V-Input	Single-ended (A) as well as differential (A-B)
Sensitivity	1-2 nV to 1-10 Volts
Input Impedance	
Voltage	$\geq 10 \text{ M}\Omega$ with 20-25pF, AC or DC coupled.
Current	$\sim 1 \text{ k}\Omega$ to virtual ground.
Gain Accuracy	$\pm 0.2 \%$ (Typical).

**REFERENCE CHANNEL**

Frequency Range:	1 mHz to 100kHz
Reference Input	Sine wave (AC coupled), minimum $\sim 0.2 \text{ V}$ (rms value).
Phase Resolution	$0.01^\circ$ or better
Phase Drift	$< 0.01$
Harmonics	$N_f < 100 \text{ kHz}$ .
Acquisition Time	$\sim 40 \text{ ms}$

**INTERNAL OSCILLATOR**

Frequency	1 mHz to 100 kHz.
Frequency Resolution	$\leq 0.1 \text{ mHz}$ ,
Output Impedance	$50 \Omega$
Amplitude	4 mVrms to 5 Vrms (into a high impedance load) with at least 2 mV resolution.
Amplitude Accuracy	$\sim 1\%$
Amplitude Stability	$50 \text{ ppm}/^\circ\text{C}$ or better
Sine output	available on front panel

**DISPLAYS:**

**2 channel display** (4 1/2 digit LED display with bar graph).

Channel 1: Typically X, R, X Noise, Aux Input 1 or 2 should be there.

Channel 2: Typically Y,  $\theta$ , Y Noise, Aux Input 3 or 4.

Offset features of X, Y and R: upto 105 % of full scale

Expand feature for X, Y and R ( $\sim$ by 10 or 100).

Display for Reference: 4 1/2 digit LED display.

**Data Buffer** for Internal Storage feature needed. The buffer should be accessible over the computer interface.

### INPUTS AND OUTPUTS

**Channel 1/2 Output** : Proportional to the displayed X, Y, R or theta, with output voltages of  $\pm 10$  V full scale; or  $\sim 10$  mA max output current.

Separate Rear panel X and Y Outputs: Rear panel outputs of cosine (X) and sine (Y) components.

**Aux. Outputs** : Minimum 4 BNC Digital to Analog outputs. Approx.  $\pm 10$  V full scale, 1 mV resolution, about 10 mA max output current.

**Aux. Inputs**: Minimum 4 BNC Analog to Digital inputs.

**Trigger Input**: TTL trigger input triggers stored data samples.

**INTERFACES**: Both IEEE-488.2 and RS232 interfaces so that all instrument functions can be controlled through these interfaces.

**Line Input**: 220-240 V AC, 50 Hz.

### NOTE:

1. **Detailed specifications on each of the above points together with the description of other features MUST be clearly indicated in the quote. THESE MUST BE SEPARATELY SUPPORTED BY LEAFLETS AND WEBSITE LINKS FOR MORE CLARITY/DETAILS.**
2. **ALSO, indicate the PRICES for the any other OPTIONAL ACCESSORIES, if necessary.**
3. **Vendors are requested to provide the list of Indian customers with e-mail ID and phone number, to whom the quoted items have been supplied in last three years.**

### TERMS & CONDITIONS COVERING SUBMISSION OF QUOTATIONS

- |                                    |   |
|------------------------------------|---|
| <b>1. DELIVERY</b>                 | The rates quoted must be <b>F.O.B.</b>  |
| <b>2. TERMS OF PAYMENT</b>         | Payment terms with necessary details should be provided with the offer.   |
| <b>3. INSTITUTE'S RIGHTS</b>       | Institute reserves the rights of acceptance or rejection of any or all quotations without assigning any reason(s). The discretion for increasing the quantities demanded also vests with the Institute. |
| <b>4. VALIDITY OF QUOTATIONS</b>   | Quotations will be considered <b><u>valid for 3 months</u></b> from the date of receipt unless otherwise stated.  |
| <b>5. CORRESPONDENCE</b>           | No correspondence regarding acceptance/rejection of a quotation will be entertained.  |
| <b>6. SUBMISSION OF QUOTATIONS</b> | Quotations may be sent through either by post through a sealed envelope while mentioning the <b>N.I.Q. REFERENCE AND DUE DATE FOR OPENING</b> as the subject.   |

**7. REJECTION**

Quotation not conforming to the set procedure as above will be rejected.

**8. DISCOUNT**

Special discount/rebate wherever admissible, keeping in view that the supplies are to be made for Educational purpose in respect of Public Institution of National importance, may please be indicated.

**9. AUTHORISED  
SALES AGENCYSHIP**

In case the quotation is being submitted by authorized agent of the principal manufacturing company, the **AUTHORISED SALES AGENCYSHIP** certificate from the PRINCIPALS should be furnished along with the quotation.

**10. OTHERS**

**(a) Necessary information may also be provided in respect of**

- Warranty
- Delivery period
- Penalty clause for delay in delivery

**(b)** In case the quoted item is **proprietary** in nature, the necessary document indicating so may be submitted along with the quotation.

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