

NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

POST SRINIVASNAGAR, MANGALORE – 575 025 (D K)
A DEEMED UNIVERSITY

Phone: (0824) 2474000.

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Fax: (0824) 2474033

Website: <http://www.nitk.ac.in>



TENDER DOCUMENT

Tender Notification . No. NITK/EED/ EKCSL / 7138 /2018 Date: 17/12/2018

Name of Goods: Experimental Kits for Control System Laboratory (DC speed control, position control, AC position control, PID trainer, Time response kit, RPS)

Estimated amount put to Tender : Rs 4.26 Lakhs

E M D Amount : Rs. **8,520/-**

Time for Supply of item : 30 Days.
after release of Purchase order

Last Date for submission of tender : 17/01/2019 **before 3.00 PM**

Address for Submission of Tender :
Dr. Debashisha Jena, Associate Professor,
Department of Electrical and Electronics Engineering,
NITK Surathkal, Srinivasnagar, Mangalore-575025
Karnataka, India, Ph: +91-824-2473466extn

Date of opening of technical bid : 18/01/2019. at 3.30 PM (if possible)



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NOTICE INVITING TENDER (NIT)

The National Institute of Technology Karnataka, Surathkal (in short – NITK, Surathkal) is an autonomous body under Ministry of HRD Govt of India , a Deemed University , imparting Technical Education and engaged in Research Activities. It is proposed to procure the items for the departmental academic/research activities.

Sealed Tenders are invited for the following items in **two cover system** (i.e., Technical bid and financial bid) subject to the following terms and conditions, from the reputed manufacturers or its authorised dealers so as to reach this office on or before scheduled date and time. The tender (Technical bid) will be opened on the same day if possible in the presence of bidders or their authorized agents who may choose to be present. The financial bid of only such bidders whose technical bid is accepted shall be opened on the same day or later pre-informed date.

1. Name of Goods : Experimental Kits for Control System Laboratory (DC speed control, position control, AC position control, PID trainer, Time response kit, RPS)

2. Estimated Cost : Rs 4.26 lakhs (**Rupees Four lakh twenty six thousand only**)

3. E M : **Rs 8,520/- (Rupees Eight thousand five hundred and twenty only)**

4. Time for completion of Supply after Placing Purchase Order : **30 Days**

5. Last date at time for submission of Tender : **17/01/2019 before 03:00 PM**

6. Tender to be submitted at the following address :

Dr. Debashisha Jena, Associate Professor,
Department of Electrical and Electronics Engineering,
NITK Surathkal, Srinivasnagar, Mangalore-575025
Karnataka, India, Ph: +91-824-2473466extn

7. Place, Date and Time of opening of technical bid:

Date : 18/01/2019 Time : 3:30 PM

VENUE:EEE seminar hall

Note: Institute shall not be responsible for any postal delay about non-receipt /non delivery of the bids or due to wrong addressee.

[Signature of HOD With Seal]

ASSOC. PROFESSOR AND HEAD
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA
SRINIVASNAGAR, SURATHKAL, MANGALORE - 575 025

SECTION 1 : INSTRUCTION TO BIDDER (ITB)

1. The bid should be submitted in two cover system-Technical Bid and Financial Bid:

1.1 Envelope No.1 – Technical Bid: The agencies should give details of their technical soundness and provide list of customers of previous supply of similar items to Universities, Institutes or Government Departments/ Undertakings/ public sectors with contact details. The details of the agency/ profile should be furnished along with the copy of all related documents. This envelope should be sealed and duly super-scribed as “**Envelope No. 1 – Technical Bid**”. Full name and address of the agency should also be mentioned on envelope and should be addressed to The Director, NITK, Surathkal.

1.2. Documents to be submitted in the technical bid :

- a) The agency should possess Licence certificate for manufacture /supply of the item.
- b) List of Owner/partners of the firm and their contact numbers
- c) The agency should possess Income tax PAN number.
- d) The agency should possess VAT registration and TIN number.
- e) Catalogue of the Product with detailed product specifications.
- f) List Service Centres
- g) List of customers with contact details.
- h) The average annual turnover should not be less than 30% of the estimated cost put to tender/quotation for the job work. The copy of the Balance sheet, Profit & Loss A/c., Trade or Manufacturing A/c for the last 3 years should be enclosed
- i) **Warranty Period Offered for the tendered item to be specified. If the Warranty period is not conforming with the schedule of requirements given in section 3 of the document, the bid is liable to be treated as non-responsive and rejected.**
- j) **EMD in original form valid for minimum six months, through Bank Guarantee only drawn on any scheduled bank in favour of “Director NITK, Surathkal”, payable at Surathkal should be submitted. EMD shall bear no interest. Any bid not accompanying with EMD is liable to be treated as non-responsive and rejected.**
- k) **Contract form given in section 5 need to be submitted.**

The above documents should be furnished in the technical bid envelope.

2. Envelope No.2 – Financial bid: The agencies should submit their financial bid as per the format given in Section 4 of the Notice Inviting Tender in this cover. The rate should be quoted both in words and figures. All the pages of the financial bid should be signed affixing the seal. All corrections and overwriting should be initialled. This envelope should be duly superscribed as “**Envelope No. 2 – Financial bid**”. Full name and address of the agency should also be mentioned on the envelope and should be addressed to The Director, NITK, Surathkal.

Both the Envelope No. 1 and 2 should be kept in another separate envelope duly superscribed with the following details.

(i) Tender Notification Number (ii) " Tender for the supply of.....", (iii) Not to Open before (Date and Time)

Mention “Kind Attention : Contact Person’s Name and Phone Number ” , and submit at the address given in the Notice Inviting Tender.

- 3 The tender will be acceptable only from the **manufacturers or its authorised supplier.**
- 4 The Institute **reserves the right to visit to the factory** before or after issue of supply order to satisfy itself regarding quality of production . In case of any remarks /default noted, the EMD will be forfeited even if pre-qualified.
- 5 **The Financial bid shall be in the format of Price Schedule given in Section 4. The Contract form as per format given in section 5 shall be submitted. Incomplete or conditional tender will be rejected.**
- 6 Details of item to be carried out, approximate quantity and the specifications are mentioned in **“Section 3 ”** appended to this Notice Inviting Tender.
- 7 **The item to be used is strictly according to the specification and subject to test by the institute/concerned authorities. It must be delivered and installed in good working condition.**
- 8 The Institute **reserves the right to cancel or reduce the quantity** included in the schedule of requirements at any time after acceptance of the tender with a notice. The Contractor/Supplier shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work/supply in full but he did not derive in consequence of the foreclosure of the whole or part of the works.
- 9 **Performance Security of 5 % of contract value in terms of Bank Guarantee by scheduled banks shall be given by the successful bidder for the total period of Warranty.**
9. **Release of EMD :** The EMD shall be released after receipt of performance security from successful bidder.
- 11 **Validity of bids:** The rate quoted should be valid for a minimum of 90 days.
No claim for escalation of rate will be considered after opening the Tender.
12. **Imports : In case, Goods are to be Imported, the Indian agent should furnish authorisation certificate by the principles abroad for submission of the bid in response to this Notice Inviting Tender.**
13. Clarification of Tender Document:
A prospective bidder requiring any clarification of the Tender Document may communicate to the contact person given in this notice inviting tender. The contact person will respond to any request for clarification for the Tender Document received not later than 5 working days prior to the last date for the receipt of bids
14. Amendment of Tender document: At any time prior to the last date for receipt of bids, Institute may for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder, modify the Tender document by an amendment.
15. **Institute may at its own discretion extend the last date for the receipt of bids.**

16. The bids shall be written in English language and any information printed in other language shall be accompanied by an English translation, in which case for the purpose of interpretation of the bid , the English translation shall govern.
17. The Institute reserves the right of accepting any bid other than the lowest or even rejecting all the bids. The decision of the Institute Purchase Committee is final in all matters of tender and purchase.
18. The bidder should give the following declaration while submitting the Tender.

DECLARATION

I/we have not tampered/modified the tender forms in any manner. In case , if the same is found to be tampered/modified, I /we understand that my/our tender will be summarily rejected and full Earnest money deposit will be forfeited and I /we am/are liable to be banned from doing business with NITK, Surathkal and / or prosecuted.

Signature of the Bidder : _____

Name and Designation : _____

Business Address : _____

Place :

Seal of the Bidder's Firm

Date :

19. Any other details required may be obtained from the contact person given in the notice inviting tender during the office hours.

SECTION 2 : CONDITIONS OF CONTRACT.

1. The rates should be quoted for preferably FOR destination from supply within India.
2. In case of import both CIF and/ or FOB rate should be quoted . All components of expenditure to arrive at Bangalore need to be explicitly specified.
- 3 The bidder shall indicate the excise duty exemption for the goods if applicable.
- 3 The institute is eligible for customs duty exemption, excise duty exemption, issuance of form D.
4. The rate quoted should be on unit basis. Taxes and other charges should be quoted separately, considering exemptions if any.
5. Rate quoted should be inclusive of Testing, commissioning and Installation of equipment and Training.
6. Payment: No advance payment will be made. Payment will be made only after the supply of the item in good and satisfactory condition and receipt of performance security by supplier.
In case of Imports, the payment will be made through LC / Sight Draft / After Installation, and performance security need to be submitted at the time of LC commitment / issue of sight draft.
7. Guarantee and Warrantee period should be specified for the complete period conforming to the section 3 of this tender document.
8. Period requirement for the supply and installation of item should be specified conforming to the section 3 of this tender document.
9. In case of dispute, the matter will be subject to Mangalore Jurisdiction only.

SECTION 3 : SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS

[To be filled up by the Department / Center of NITK, Surathkal]

Item(s) Name to be Procured : Experimental Kits for Control System Laboratory (DC speed control, position control, AC position control, PID trainer, Time response kit, RPS)

Type (Equipment / Software / Furniture / Others) : Equipment

Brief Specifications of the Item(s) : Given in Annexure-I
(Attach Additional Sheet if necessary)

Quantity : 08 (Each equipments two)

Any other details / requirement : None

Warranty Period required : 5 years

Delivery Schedule expected
after release of Purchase order
(in Weeks) : 4 weeks

EMD (in Rupees) : **Rs . 8,520/-**

Performance Security to be given
by Successful Bidder after release of
Purchase Order (in Rupees) : Rs 21,300/-

SECTION 4 : PRICE SCHEDULE

[To be used by the bidder for submission of the bid]

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- | | | |
|-----|---|---|
| 1. | Item Name | : |
| 2. | Specifications (Conforming to Section 3 of Tender document- Enclose additional sheets if necessary) | : |
| 3. | Currency and Unit Price | : |
| 4. | Quantity | : |
| 5. | Item Cost (Sl No. 3 * Sl. No. 4) | : |
| 6. | Taxes and Other Charges (i) Specify the type of taxes and duties in percentages and also in figures. (ii) Specify Other Charges in figures. | : |
| 7. | Warranty Period (Conforming to the Section 3 of Tender document- This should be mentioned in technical bid also in order to get qualified for financial bid) | : |
| 8. | Delivery Schedule (Conforming to the Section 3 of Tender document | : |
| 9. | Name and address of the Firm for placing purchase order | : |
| 10. | Name and address of Indian authorized agent (in case of imports only) | : |

Signature of the Bidder : _____

Name and Designation : _____

Business Address : _____

Place :

Date :

Seal of the Bidder's Firm

SECTION 5 : CONTRACT FORM

[To be provided by the bidder in the business letter head]

1. (Name of the Supplier's Firm) hereby abide to deliver the by the delivery schedule mentioned in the section 3 tender document for supply of the items if the purchase order is awarded.
2. The item will be supplied conforming to the specifications stated in the tender document without any defect and deviations.
3. Warranty will be given for the period mentioned in the tender document and service will be rendered to the satisfaction of NITK, Surathkal during this period.

Signature of the Bidder : _____

Name and Designation : _____

Business Address : _____

Place :

Seal of the Bidder's Firm

Date :

ANNEXTURE I: TECHNICAL SPECIFICATIONS

| s/no | Equipment | Specifications | Qty |
|------|---|--|-----|
| 1 | D.C. Motor Speed Control Trainer Kit | <p>FEATURES:</p> <ul style="list-style-type: none"> • One F/V converter provided to convert the pulses to voltage output, • Speed controller provided to select # Proportional circuit # Proportional plus integral circuit • One 3½ digit display to display the speed of the DC Servo motor / set value • A Switch provided to select the reference or the actual Speed. • All Important signals are terminated at sockets so that the student can monitor / measure the signals using CRO, DVM, Frequency counter etc. <p>POWER AMPLIFIER:</p> <ul style="list-style-type: none"> • PWM based MOSFET <p><u>Power Amplifier</u></p> <ul style="list-style-type: none"> • One MOSFET as power device • Rating: 500V @ 8 Amp • Control circuitry with opto-coupler Isolation. • One potentiometer provided to control the duty cycle of the chopper • Provision to feed the control voltage to vary the duty cycle from the Personal computer / Microprocessor / Microcontrollers. <p>DC SERVO MOTOR WITH EDDY LOAD:</p> <ul style="list-style-type: none"> • One 12V, PM DC Motor, mounted on a open frame • Speed Range: 0 to 1500 RPM • Speed Sensor fixed on the frame # Photon interrupter with optical Encoders. • Eddy Current Magnetic Loading Arrangement. <p>POWER SUPPLY: Input 230V +10%, 50Hz, Single phase AC * +15V at 0.5A DC regulated output for control circuitry</p> | 02 |
| 2 | DC Motor Position Control System | <p>CONTROLLER:</p> <ul style="list-style-type: none"> • Analog PI controller provided for position control with cascaded feedback (Position & Speed) • PI controller provided with Front panel variable setting for, • # Variable gain for Proportional controller (P) • # Variable Integral Time for Integral controller (I) <p>CONVERTER:</p> <ul style="list-style-type: none"> • 4 Quadrant MOSFET chopper provided for forward & reverse direction • MOSFET driver provided <p>MECHANICAL SETUP:</p> <ul style="list-style-type: none"> • One PMDC 12 volt with Gear provided • Motor speed 1500rpm • Gear ratio 30: 1 to run 50rpm speed • One Servo potentiometer provided at the low speed shaft for position setting. <p>OTHER FEATURES: One Tacho generator is provided cascaded feedback. One 3 ½ digit display can be used to display the actual & reference position (3 digit)</p> | 02 |
| 3 | A.C. Position Control System | <p>DESCRIPTION</p> <p>The AC Servo Motor / AC Position Control System Trainer kit is designed to demonstrate the position control with AC servomotor. The AC servomotor is used to adjust output / feedback potentiometer position. When the input / control potentiometer position is changed, the same change is followed by feedback pot. AC servo position control system</p> | 02 |

| | | | |
|----------|---|---|-----------|
| | | <p>controller & AC servomotor achieve this control action.</p> <p>FEATURES</p> <ul style="list-style-type: none"> • One 230/12V AC Servo Motor with gear, fixed on a mechanical frame with position dial indication • One position Servo pot is fixed with motor gear side for position sensing • Two nos. Line synchronized firing circuits for TRIAC • One Op-Amp PI Controller for control circuit • One 16/4 LCD display to indicate the set position and actual position in degree (0-355°) • One potentiometer is provided to vary the motor position up to 355° • +15V DC, 9V AC for control circuit, 230/12V AC for Power Circuit • One 4 Mfd/230V AC Capacitor is provided for Motor • Controller • Dspic 4011 Micro Controller Based PID Control System • Operating Voltage 5v & Operating Frequency 20MHZ <p>MECHANICAL SETUP</p> <ul style="list-style-type: none"> • One 12V two phase ac servo motor with Gear provided • Motor speed 1500rpm • One Servo potentiometer provided at the low speed shaft for position setting. • To study the Operation of AC servomotor position control with PI controller. <p>TECHNICAL SPECIFICATION</p> <p>Kit Working voltage : (220-240)VAC Input Voltage : 24V AC Input Frequency : 50Hz Output Voltage : 0 TO 24V AC Output Current : 0.5 Amps</p> <p>BUNDLE CONTENTS</p> <p>Ac position control system Patch cards 6A power supply card 1A Fuse Manual</p> | |
| 4 | PID Trainer System, For Laboratory | <p>FEATURES:</p> <ul style="list-style-type: none"> • Built-in Function Generator (Square wave) • Self contained power supplies and power ON/OFF switch • Full mimic diagrams in the front panel • The simulated process # Simple integrator of 10ms, 2 lags of the time constant 10ms • The simulated PID controller # Integral action control scaled in integral action time as per our requirement. # Derivative action control scaled in derivative action time as per our requirement. # Proportional band control scaled in % proportional band as per our requirement <p>SPECIFICATIONS:</p> <p>PROCESS:</p> <ul style="list-style-type: none"> • Time constant of simple lags - 10ms (fast) • Time constant of Integrators - 10ms (fast) • Set Value Range - (0-5) V | 02 |
| 5 | Compensation Design Trainer | <p>Futures</p> <ul style="list-style-type: none"> * Study of lag, lead and lag-lead * Second order simulated systems * Study of All pass filter | 02 |

| | | | |
|----------|---|--|---------------|
| | | <ul style="list-style-type: none"> * Lag, lead and lag - lead compensating circuits * Gain compensating amplifier with calibrated dial * Signal sources * Sine wave : Continuously variable in two decades (10-1000 Hz) with 0-8 V_{pp} amplitude * Digital phase angle meter 0-180 degree (optional) * Complete with patch cords and detailed literature, 220V mains operated | |
| 6 | Temperature Control Trainer and Control System Trainer | <p>FEATURES:</p> <ul style="list-style-type: none"> • Three potentiometers provided to vary proportional gain, integral time and derivative time of the process • To vary the overlap in ON/OFF controller, one sleek potentiometer is provided • Provision to select ON/OFF, P, PI & PID Controller • Adjustment provided to vary the overlap and maximum heater power by using two Individual potentiometers. • Thermistor as a temperature sensor • SCR firing circuit with 2 Nos. of SCRs, provided to vary the power to the Heater. • In-built error detector to compare the set value and the measured value • One Hot air blower provided with a PVC tube with 3 provisions for inserting thermistor to study transport lag, 2 step controller and PID controller etc. • The volume of air flow is controlled by a shutter on the fan inlet. • In-built IC regulated power supply • Display: # 2 No's of Digital panel meters provided to monitor the set value and measured value. • All the components are housed in an attractive sleek cabinet with mimic diagram and Suitable termination connector • Detailed Documentation | 02 |
| 7 | Time Response of Second Order System Kit | Time Response of second order system+ validation for simulink experiments | 02 |
| 8 | RPS(30V/2A)-1No RPS(30V/5A)-1No | <ul style="list-style-type: none"> • Fully Metallic Construction to Stop Radiated EMI • DC Output ON / Off on Each Main Output • Voltage & Current Output Preset Facility for Safety • 3 Digit DPM V and A • Overload Protection • Regulation Line: | Each 1 |