

INDIAN INSTITUTE OF TECHNOLOGY GOA

At Goa Engineering College Campus

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TAN: BLRI08261B

Enquiry No: IITGOA/2018-19/053

Date: 26/12/2018

IIT Goa invites sealed quotations in two bid format for the supply of below mentioned items;

Sl. No.	Description of Items	Qty
1	PC based workstation for Magnetic Levitation experiment (Detailed Specifications Attached)	02 Nos.

Terms and conditions:

1. Quotation must be valid for at least 90 days.
2. The GSTIN should invariably be mentioned in your offer.
3. Kindly attach a compliance certificate along with the technical quote.
4. Supplier should provide free delivery and installation at IIT Goa.
5. The Bidder must be an Original Equipment Manufacturer (OEM) or his Authorized Dealer/Authorized Distributor/ Authorized Stockist/ Channel Partner having a Direct Purchase and Support agreement with the OEM. In case, if the Bidder is a Dealer/Distributor, a valid LETTER OF AUTHORIZATION from the Original Equipment Manufacturer for Dealership should be produced.
6. The Average Annual Turnover of the Bidder for the last three years should be at least Rs.25 lacs. (Rupees Twenty-Five lacs). A Printed copy of the Annual Accounts duly audited and certified by the Chartered Accountants must be enclosed with the technical bid.
7. The Bidder should provide a list of customers of previous supply of a similar/ same range of equipment to IIT's / NIT's / Universities with contact details. Copies of orders received from the reputed firms on bidding firm need to be submitted.
8. The Bidder should furnish Minimum 5 satisfactory performance certificate from the parties concerned to whom supplies were affected in case such supplies were made.
9. The Successful bidder shall provide Min 1 Years warranty after the completion of installation.
10. The bidder should produce the Certificate of incorporation of the organization
11. Certificate/Undertaking on the letterhead of the Company to the effect that the bidder/ Manufacturer had not been blacklisted anywhere in India or abroad by any organization.
12. The bidder should have ISO 9000 certification.

13. Prices should be quoted in Indian Rupees inclusive of any shipping/transportation charges.
14. Delivery and installation must be made within 6-8 weeks of getting a confirmed order.
15. Payment: Within 30 days after the delivery and successful installation.
16. The suppliers shall provide the banking details along with their quote on their letterhead duly signed and stamped.
17. IIT Goa reserves the right to accept and/or reject any/all bids without assigning any reason.
18. For any clarification, you may kindly contact Dr. Sheron Figarado (e-mail: sheron@iitgoa.ac.in) and Stores & Purchase Department (email: purchase@iitgoa.ac.in) till 14/01/2019.
19. Quotations shall be submitted in two parts;
 - 1) **Part – I (Technical)** should contain all the technical details and specification of the product. It should contain unpriced bid along with terms and conditions, compliance certificates, Proprietary certificates (if applicable), other certificates etc. This envelope should be marked as “Technical Bid”
 - 2) **Part -II (Financial)** The financial bid of the above item should be in a sealed envelope marked as “Financial Bid” and should contain financial terms and conditions.
- 20) All sealed quotations must reach to the Assistant Registrar (Stores & Purchase), IIT Goa, at Goa College of Engineering Campus, Farmagudi, Ponda - Goa by 17:00 Hrs on or before 16th January, 2019.

Sd/-

Asst. Registrar (S&P)

Specifications for PC based workstation for Magnetic Levitation experiment

Magnetic Levitation experimental set up is an electromagnet-based system that allows users to levitate a ball/disc vertically up and down. This system is highly non-linear and introduces the students to control design for linearized model of the system, which may be unstable. The setup should be fully compatible with MATLAB/Simulink. A detailed course material, connecting the laboratory experiments with the classical and advanced control theory is expected to be supplied along with the system. The control is expected to be done through a computer using MATLAB interface.

Scope of supply

Magnetic levitation setup, analog interface (amplifiers and signal conditioning for sensors etc) and Data Acquisition System, software compatible to MATLAB, connecting cables, Power supply units for electromagnet, amplifiers, and DAQ modules, Manuals, Detailed Course materials including sample Simulink files.

List of Experiments

- Study of dynamic model: Derivation of dynamic model from physics, Linearization
- Current control loop design for the electromagnet.
- Position control : PID, Feed-forward, advanced control methods

Necessary Features

- One degree of freedom (1-DOF) system.
- Table top/ compact unit for portability: set-up should weigh less than 5kg
- Highest dimension of the set-up should not exceed 40cm
- Operating power supply voltage: less than 24 V
- Power supply connection to AC mains should be rated for 230V,50Hz
- Electromagnet(s) made up of a solenoid coil and steel core with adequate force to levitate the ball/disc.
- Levitation ball/disc made of permanent magnets or magnetic materials such as steel.
- High resolution position feedback for the ball position.
- Provision to calibrate the ball position sensor.
- Current sensor to measure electromagnet coil current for current control
- Default initial calibration point (rest position).
- Real-time control interface software Fully compatible with MATLAB®/Simulink®: Full compatibility for Simulink® external mode, including scopes, floating scopes, displays, to workspace, online parameter tuning, etc.
- Software interface should allow open architecture design, such that users are able to design their own controllers, not just preset controllers.
- PC connectivity: USB 2.0 or higher.
- OS compatibility: Windows 10
- Fully documentation for system model and parameters should be available for MATLAB®/Simulink® to enable comparative study by simulation and experiment.
- Hardware and Software interface should support networking mode to allow the set up to be configured as a remote laboratory experimental set-up.

Desirable features

- Analog controller mode which can be monitored using the MATLAB environment.
- Fully compatible with LabVIEW™
- Support for model referencing, allowing modular object-oriented model design and incremental compilation and linking for accelerating the development of large models
- Ability to interface controllers with MATLAB GUIs, LabVIEW panels, Java GUIs, c/C++ etc.
- Native support of TCP/IP, UDP, serial, shared memory, named pipes, SPI, I2C, CAN, ARCNET and other protocols
- Support for MATLAB running on Linux based PCs.