



**Indian Institute of Technology Madras**  
**Chennai – 600 036, India**

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Due date: 30/08/2019

1. Quotations are invited for the items shown below/overleaf/enclosed list (Annexure I).
2. Two bid system: Technical bid and Commercial bid.
3. Vendors should give the technical presentation/demonstration on the equipment before the department purchase committee if required.
4. The quotations duly sealed and superscribed on the envelope with reference no. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above
5. A brochure detailing technical specifications and performance, a list of industrial and educational establishments where the items enquired have been supplied must be provided.
6. Fax and Email quotations are not acceptable.
7. Quotations should be valid for 60 days from the due date and period of delivery required, warranty terms, etc. should also be clearly indicated. A minimum of one year warranty is required from the date of commissioning.
8. Imported supplies should be quoted for CIF Madras.
9. Local firms to quote for free delivery to this Institute. If quoted for Ex-Godown delivery charges be indicated separately.

10. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples/machine/equipment if called for should be submitted/demonstrated at free of charges and collected back at the supplier's expense. Compliancy certificate is to be provided indicating conformity to the technical specifications

11. Sales Tax/General Taxes/ED if applicable and such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. If this is not indicated no such claim will be admitted at any stage. The taxes leviable should take into consideration that we are entitled to have concessional Sales Tax applicable to Non-Government Educational Institutions run with no profit motive for which a concession is given. Sales Tax Certificate will be issued at the time of final settlement of the bill.

12. Goods should be supplied carriage paid and insured.

13. Goods shall not be supplied without an official supply order.

14. If the item is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send a copy of the RC.

15. The Guarantee period of the item may be indicated clearly.

16. In the case of LC. Payment, 90% of the payment will be made after completion of the supply. The balance of 10% of the payment will be made after the satisfactory installation of the equipment.

17. IIT Madras is exempt from payment of Excise Duty and is eligible for the concessional rate of customs duty. The necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.

18. Acceptance and Rejection: I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

## Annexure I

### **Specifications of the inertial measurement unit with accessories for ship models in wave basin:**

1. Measurement - The device would be used for measuring motions in 6 DOF of a ship model in indoor environment. The device must be capable of measuring Roll, pitch and yaw angles and corresponding angular rates. It should also be capable of measuring surge, sway and heave accelerations, velocity, positions.
2. Heave measurement- The device must be capable of measuring heave at different locations of the ship
3. Resolution -Resolution of the device must be less than  $0.02^\circ$  in roll, pitch and yaw axes
4. Accuracy - The device should have an accuracy of
  - i.  $< 1^\circ$  in yaw angle and  $< 0.2^\circ$  in roll and pitch angular measurements.
  - ii.  $< 0.4$  m/s accuracy in velocity measurements and  $< 0.02^\circ/\text{s}$  accuracy in angular rate measurements.
  - iii.  $< 0.1$  m/s<sup>2</sup> accuracy in acceleration measurements
5. The instrument should have a vessel tracking module of good accuracy with respect to the horizontal and vertical position. Therefore, a GNSS with more than 50 channels and with a good update rate is desirable.
6. Output range of the device should be  $\pm 180^\circ$  in angular measurements,  $\pm 50^\circ/\text{s}$  in rate gyro and  $\pm 10$  m/s<sup>2</sup> in acceleration.
7. Units- Output measurements of the device to be preferably in SI units
8. The device can be mounted in any orientation and it should have quick response.
9. Disturbance- The measured data from the device should be reliable even in the presence of transient accelerations, vibrations and any other source of disturbance.
10. Outputs of the device to be on RS-232, RS-422, RS485 and Ethernet, high output rate of up to 200 Hz
11. Communication- Device should support wireless communication.
12. The device should be equipped with Micro electro-mechanical systems (MEMS) based gyros
13. The device should possess excellent vibration rejection characteristics.
14. Software - The device software must be compatible with any operating system (OS), i.e. Windows or Linux
15. Application programming interface of the device should be easy to program with basic languages like C, C++, Matlab etc.
16. Input voltage- input voltage of the device should be between 12V-48V DC
17. Power consumption- device should consume less power. (Up to 5 watts)
18. Operational temperature range- The device should work well in the temperature range of  $-5^\circ$  Celsius to  $60^\circ$  Celsius. It should also be capable of being in operation for long hours without any excessive heat generation.

19. Device should have bidirectional, configurable ports and data transfer speed to be as high as 150 Mbps
20. Company should provide a warranty of minimum 2 years.

**Additional Requirements:**

1. Vendors should provide continuous technical support and maintenance of equipment.
2. Vendors must have sufficient experience in supplying equipment in reputed organizations for research purposes. They must provide references of the end-users whom we can contact for their experience with the supplied machine. Experience of the end-users may also be used as a criterion for the selection of bids that meet technical requirements.
3. Vendors must provide detailed documentation for the equipment.
4. Vendors must provide training to our technical staff for using the equipment.
5. All the expenses for installation, training and post-sales technical support will be borne by the vendor.