

## INVITATION FOR TENDER FOR SUPPLY OF EQUIPMENT

Sealed tender offers are invited in two separate sealed covers (Technical and Commercial offers) from eligible manufacturers/suppliers or their direct Indian agents for the supply of the following equipment.

### **Supply of accelerometers, inclinometers, gyros, displacement sensors, speed sensor and tachometers**

Please send offers, ALONG WITH DESCRIPTIVE CATALOGUE/BROCHURES and DATA SHEETS FOR QUOTED ITEMS. Please mention if you can COMPLY or NOT to specifications mentioned in following pages. Validity of bid should be four months (120 days) or more from tender opening date. Please ensure that your quotation reaches above address by 20th Oct, 2017, 15:00 Hrs:

**Prof. Vikranth Racherla,**  
**Associate Professor, Mechanical Engineering Department,**  
**Indian Institute of Technology Kharagpur – 721 302, West Bengal, India**

Earnest money deposit (EMD) of Rs. 15,000/- must be sent along with commercial and technical offers. EMD must be in the form of account payee demand draft in favour of “IIT Kharagpur”, payable at “Kharagpur, India”. Any bid not accompanied with an EMD will be rejected. EMD of unsuccessful bidders will be returned. No interest will be paid on the earnest money of the unsuccessful bidders. EMD will be forfeited if tenderer withdraws or amends its tender or impairs or derogates from tender in any respect within period of validity of its tender.

<b>Tender Reference</b>	<b>IIT/SRIC/ CRR / BRE/VR/ 2017-18/EQ-2, Dated: 22.09.2017</b>
<b>Price of Tender Document</b>	<b>NIL</b>
<b>Last Date and Time for submitting the tender document</b>	<b>20.10.2017 at 15:00 Hrs (Indian time)</b>
<b>Time and Date of Opening of Technical Bids</b>	<b>20.10.2017 at 16:00 Hrs (Indian time)</b>
<b>Place of Opening Tender</b>	<b>Center for Railway Research, Indian Institute of Technology Kharagpur – 721 302, West Bengal, India</b>
<b>Address of Communication</b>	<b>As stated above</b>
<b>Contact Telephone Numbers</b>	<b>+91- 3222 – 282900 (Prof Racherla) / 282400 (CRR)</b>
<b>E-mail</b>	<b>vikranth.racherla@mech.iitkgp.ernet.in</b>

**Supply of accelerometers, inclinometers, displacement sensors and tachometers**

BRIEF TECHNICAL SPECIFICATIONS (see following pages for detailed specifications)			Comply (Yes/No)	Remarks
S. No	Component	Material Description		
1	IEPE, piezoelectric triaxial accelerometers	04 NOS		
2	IEPE, piezoelectric uniaxial accelerometers	06 NOS		
3	Dual-axis inclinometers and accessories	04 NOS		
4	Tri-axial gyros and accessories	4 NOS		
5	Linear potentiometers and accessories	15 NOS		
6	Non-contact speed sensor	1 NOS		
7	Laser tachometers and accessories	5 NOS		
8	Warranty	Minimum 3 years		
9	User Manual	Detailed user manuals of each of sensors mentioned in the tender		
10	Commissioning	Will you be able to help or answer queries during commissioning		
<p><b>NOTE:</b> THE FIRM SHALL TEST AND CALIBRATE THEIR SENSORS BEFORE SUPPLYING THEM TO IIT KHARAGPUR. IIT KHARAGPUR SHALL BE INVOLVED TO EXTENT POSSIBLE IN THE TESTING AND CALIBRATION STAGE.</p> <p>DATA SHEETS MUST BE PROVIDED FOR ALL SENSORS. INFORMATION IN DATA SHEETS MUST SATISFY TECHNICAL REQUIREMENTS SPECIFIED IN THE TENDER.</p>				

DETAILED TECHNICAL SPECIFICATIONS

SL NO:	Parameter	Specifications	QTY	Comply (Yes/No)
1	IEPE, piezoelectric, tri-axial accelerometer and accessories	<ul style="list-style-type: none"> <li>● Force balance accelerometers in a single module with output for one vertical (Z) and two horizontal components (N-S and E-W) orthogonal to each other</li> <li>● <b>Range:</b> ±50g</li> <li>● <b>Frequency response:</b> 0.5 Hz to 5,000 Hz or better</li> <li>● <b>Shock protection:</b> 1000g or better</li> <li>● <b>Sensitivity:</b> 100mV/g or better</li> <li>● <b>Hermetic, titanium construction or better</b></li> <li>● <b>Supply Voltage:</b> &lt; 30 V DC</li> <li>● <b>Supply current:</b> 2 mA</li> <li>● <b>Mounting:</b> Preferred options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li> <li>● <b>Mounting accessories:</b> Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li> <li>● <b>Cable:</b> Low-loss shielded cable of 15 meters length or more with 4-PIN connectors at both ends</li> </ul> <p><b>Make:</b> MEGGITT/ISOTRON/RION/KISTLER/EQUIVALENT</p>	04 NOS	

2	IEPE, piezoelectric, uniaxial accelerometer and accessories	<ul style="list-style-type: none"> <li>● Force balance uni-axial accelerometer in cube form.</li> <li>● <b>Range:</b> ±50g</li> <li>● <b>Frequency response:</b> 0.5 Hz to 5,000 Hz or better</li> <li>● <b>Shock protection:</b> 1000g or better</li> <li>● <b>Sensitivity:</b> 100mV/g or better</li> <li>● <b>Hermetic, titanium construction or better</b></li> <li>● <b>Supply Voltage:</b> &lt; 30 V DC</li> <li>● <b>Supply current:</b> 2 mA</li> <li>● <b>Mounting:</b> <i>Preferred</i> options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li> <li>● <b>Mounting accessories:</b> Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li> <li>● <b>Cable:</b> Low-loss shielded cable of 15 meters length or more with 4-PIN connectors at both ends</li> </ul> <p><b>Make:</b> MEGGITT/ISOTRON/RION/KISTLER/EQUIVALENT</p>	06 NOS	
3	Dual axis inclinometers and accessories	<ul style="list-style-type: none"> <li>● <b>Measuring range:</b> ± 30°</li> <li>● <b>Accuracy :</b> 0.01° or better</li> <li>● <b>Resolution:</b> 0.001° or better</li> <li>● <b>Supply Voltage:</b> &lt; 30 V DC</li> <li>● <b>Shock protection:</b> 100g or better</li> <li>● <b>Vibration protection:</b> 20g or better</li> </ul>	04 NOS	

		<ul style="list-style-type: none"> <li>● <b>Mounting:</b> <i>Preferred</i> options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li> <li>● <b>Mounting accessories:</b> Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li> <li>● <b>Cable:</b> Low-loss shielded cable of 15 meters length with end connectors</li> </ul> <p><b>Make:</b> MEGGITT/BOSCH/RION/EQUIVALENT</p>		
4	Tri-axial gyros and accessories	<ul style="list-style-type: none"> <li>● <b>Dynamic Range:</b> <math>\pm 150</math> °/s</li> <li>● <b>Shock protection:</b> 1000g or better</li> <li>● <b>Sensitivity:</b> 20mV/°/s or better</li> <li>● <b>Supply Voltage:</b> &lt; 30 V DC</li> <li>● <b>Mounting:</b> <i>Preferred</i> options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li> <li>● <b>Mounting accessories:</b> Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li> <li>● <b>Cable:</b> Low-loss shielded cable of 15 meters length or more with end connectors at both ends</li> </ul> <p><b>Make:</b> MEGGITT/ISOTRON/RION/KISTLER/EQUIVALENT</p>	04 NOS	
5	Linear potentiometers	<ul style="list-style-type: none"> <li>● <b>Range:</b> 0 to 100 mm</li> <li>● <b>Rod eye center to center distance:</b> ~ 200 mm</li> <li>● <b>Input Voltage:</b> &lt; 30 V</li> </ul>	15 NOS	

		<ul style="list-style-type: none"> <li>● <b>Accuracy</b> : 0.01 mm or better</li> <li>● <b>Shock protection</b> : 50g or better</li> <li>● <b>Vibration protection</b>: 20g or better</li> <li>● <b>Repeatability</b>: 0.01 mm or better</li> <li>● <b>Cable</b>: Low-loss shielded cable of 15 meters length with end connectors</li> <li>● <b>Make</b>: MEGGITT/BOSCH/RION/EQUIVALENT</li> </ul>		
6	Non-contact speed sensor and accessories	<ul style="list-style-type: none"> <li>● <b>Range</b>: 0 to 200 km/h (vehicle speed)</li> <li>● <b>Distance resolution</b>: ~ 10 mm or better</li> <li>● <b>Measurement accuracy</b>: &lt; 0.2% FSO</li> <li>● <b>Input Voltage</b>: &lt; 30 V</li> <li>● <b>Working distance</b>: ~ 300 mm</li> <li>● <b>Shock protection</b> : 50g or better</li> <li>● <b>Vibration protection</b>: 20g or better</li> <li>● <b>Cable</b>: Low-loss shielded cable of 15 meters length with end connectors</li> <li>● <b>Mounting</b>: <i>Preferred</i> options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li> <li>● <b>Mounting accessories</b>: Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li> </ul>	01 NOS	
7	Non-contact laser tachometers	<ul style="list-style-type: none"> <li>● <b>Range</b>: 0 to 2000 rpm</li> <li>● <b>Resolution</b>: 0.01 rpm or better</li> <li>● <b>Measurement accuracy</b>: 0.01 rpm or better</li> </ul>	05 NOS	

		<ul style="list-style-type: none"><li>● <b>Input Voltage:</b> &lt; 30 V</li><li>● <b>Working distance:</b> ~ 100 mm</li><li>● <b>Shock protection :</b> 50g or better</li><li>● <b>Vibration protection:</b> 20g or better</li><li>● <b>Cable:</b> Low-loss shielded cable of 15 meters length with end connectors</li><li>● <b>Mounting:</b> <i>Preferred</i> options: (1) Magnetic, (2) Adhesive, and (3) Screw mounted</li><li>● <b>Mounting accessories:</b> Magnetic mounts rated for 100g force (i.e. it must not come off even for 100g acceleration), bee wax/relevant adhesive (sufficient for 50 times use), and other relevant accessories</li></ul>		
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## **GENERAL TERMS & CONDITIONS**

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDER ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPS CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPS SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOP.

### **THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:**

1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE INDIAN AGENT.

1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.

1.3 PLEASE ENCLOSE THE DOCUMENT(S) RELATED TO THE ENLISTMENT OF THE INDIAN AGENT WITH DIRECTOR GENERAL OF SUPPLIES & DISPOSALS (DGS & R) UNDER THE COMPULSORY REGISTRATION SCHEME OF MINISTRY OF FINANCE.

2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.

3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.

4. **PRICE BIDS FOR FOREIGN FIRMS:** PRICES ARE TO BE QUOTED ON 'EX-WORKS' DULY PACKED OR ON "FCA/FOB" INTERNATIONAL PORT" BASIS AND ALSO INCLUDING AGENCY COMMISSION PAYABLE TO YOUR INDIAN AGENTS, IF ANY SHOWING CLEARLY THE FOLLOWING BREAK UP:-

- I) EX-WORKS PRICE
- II) PACKING & FORWARDING
- III) FREIGHT
- IV) ANY OTHER RELEVANT EXPENSES.
- V) TAXES PAYABLE BY THE INSTITUTE

INSURANCE WILL BE PAID BY OUR INSTITUTE SEPARATELY AND SHOULD NOT FORM PART OF THE QUOTED PRICE.

**PRICE BIDS FOR INDIAN FIRMS:** PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS CLEARLY SHOWING THE BREAK UP.

5. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.

6. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN FE). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO WITH YOUR PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.

7. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED

WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).

8. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND COMMISSIONING

9. **PAYMENT TERMS FOR FOREIGN FIRMS**

**The offer will be made on a single currency and only one PO will be issued for the entire scope of the supply.**

A) 90% PAYMENT THROUGH SIGHT DRAFT/FORIGN DEMAND DRAFT/LC (EXCEPTIONAL CASES)/SWIFT TELE TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION AND 10% AFTER SUCCESSFUL INSTALLATION & COMMISSIONING.

B) BANK CHARGES ON LC/SD (WITHIN INDIA APPLICANT ACCOUNT AND OUTSIDE INDIA TO BENEFICIARY ACCOUNT).

**PAYMENT TERMS FOR INDIAN FIRMS**

A) 100% PAYMENT THROUGH CROSSED ACCOUNT PAYEE CHEQUE / ELECTRONIC TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER & CONDITION AND SUCCESSFUL INSTALLATION & COMMISSIONING.

B) ENSURE MENTIONING

i) BANK DETAILS OF THE BENEFICIARY, GST NO. AND PAN NUMBER

ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM ORDER HAS TO BE PLACED

10. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.

11. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.

12. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXEMPTION IN TERMS OF GOVT. NOTIFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.

13. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IF THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.

14. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.

15. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.

16. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.

17. CONDITIONAL OFFER WILL NOT BE ACCEPTED.

18. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.

19. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-

A) CURRENT INCOME TAX AND SALES TAX CLEARANCE CERTIFICATES (GST No.), AND PAN NO.

B) BANKER'S SOLVENCY CERTIFICATE

C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

DESCRIPTION	JAN. TO MARCH	APRIL TO JUNE	JULY TO SEPT.
GROSS REVENUE			
PROFIT BEFORE TAX			
PROFIT AFTER TAX			
RETURN ON INVESTED			
CAPITAL (ROIC)			

D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.

E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.

20. **WARRANTY / GUARANTEE:** THIS COMPREHENSIVE WARRANTY / GUARANTEE SHALL REMAIN VALID FOR 36 MONTHS AFTER THE GOODS (OR ANY PORTION THEREOF AS THE

CASE MAY BE) HAVE BEEN DELIVERED AND COMMISSIONED TO THE FINAL DESTINATION.

21. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

22. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **DR. VIKRANTH RACHERLA, ASSOCIATE PROFESSOR, MECHANICAL ENGINEERING, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR - 721 302** AND ACKNOWLEDGEMENT TO BE OBTAINED.

## IMPORTANT

1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.
3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Dr. Vikranth Racherla, Associate Professor** at the address mentioned above.

### LAST DATE FOR SUBMISSION OF SEALED BIDS: 20.10.2017

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
  - 2) Fax, e-mail Tender will not be accepted.
  - 3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
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