

**Civil Engineering Department**  
**IIT Delhi, Hauz Khas, New Delhi -16**

February 5, 20014

Sealed Quotations are invited in Indian Rupees (INR)/USD/GBP from well-known companies/distributers or their authorized Indian representatives for supply of following equipment's conforming the technical specifications and prescribed terms & conditions as given hereunder. Interested parties are required to submit their quotations.

The bid should be addressed to Dr D R Kaushal and submitted/sent by post at Department of Civil Engineering, IIT Delhi, Hauz Khas, New Delhi – 110016 latest **by 3:00 PM on February 21, 2014.**

S.No.	Product	Technical Description
1	<b>Laser Doppler Velocity meter/ Laser PIV System</b>	<ul style="list-style-type: none"> <li>• Particle Image Velocimetry System, should comprising a laser light sheet projector, a camera system and processing software.</li> <li>• 200 mW (Class 3b) 660 nm laser, with variable pulse width and pulse spacing.</li> <li>• 45° light sheet optics as standard with optional optics to produce a 22° sheet.</li> <li>• Real-time 2D display of flow velocity vectors updated at up to 16 Hz.</li> <li>• Data can be recorded in video (avi), bitmap (bmp), text (csv) and Matlab (mat) formats.</li> <li>• Option of submersible light sheet projector.</li> </ul> <p><b>Laser:</b></p> <ul style="list-style-type: none"> <li>- Solid-state air-cooled 200 mW, 660 nm laser diode (Class 3b).</li> <li>- Standard optics produce a c. 3 mm thick, 45° light sheet (c. 200 mm wide at 250 mm).</li> <li>- Interchangeable 22° light sheet optic available.</li> <li>- Pulse separation of between 100 µs - 5 s (in steps of 10 µs).</li> <li>- Pulse width of between 10 µs - 32 ms (in steps of 10 µs).</li> </ul> <p><b>Camera:</b></p> <ul style="list-style-type: none"> <li>- Super-sensitive VGA CMOS sensor: 640 * 480, 6.0 µm pixels (1/3" format); ~50% quantum efficiency at 660 nm; 75 - 110 dB dynamic range; 4.8 V/lux·sec sensitivity.</li> <li>- Trigger input enables image pair acquisition to be synchronized with external events.</li> <li>- Accepts standard CS- or C-mount lenses (12.5mm f/1.4 lens supplied).</li> <li>- Camera exposure can be linked to the laser's pulsing, thereby enabling operation in a lit room.</li> </ul> <p><b>Software Processing:</b></p> <ul style="list-style-type: none"> <li>- Data refresh and recording rate up to 16Hz (dependent on the computer speed, the selected acquisition and PIV analysis parameters and the recording taking place).</li> <li>- Real-time or offline, 2-component vector calculation.</li> <li>- Single pass or adaptive multi-pass cross-correlation with 8, 12, 16, 24, 32 or 64 pixel window sizes.</li> <li>- 0% or 50% window overlap (i.e. maps of up to 19,000 vectors).</li> <li>- <b>Optional vector interpolation and filtering based on:</b> <ul style="list-style-type: none"> <li>• User-supplied velocity limits;</li> <li>• RMS of neighbouring vectors' values.</li> </ul> </li> <li>- <b>Calculation of the following derived scalars:</b> <ul style="list-style-type: none"> <li>• Vector angle and magnitude;</li> <li>• Vorticity and swirl;</li> <li>• Time-averaged mean velocity;</li> <li>• RMS and turbulence intensity.</li> <li>• Where applicable, vector component and statistical sample number are user-defined.</li> </ul> </li> </ul>

		<p><b>With following optional Accessories &amp; Consumables:</b></p> <ol style="list-style-type: none"> <li>1. 22° Light sheet Optics for nanoLase: The standard 45° light sheet optics should be replaced with this product in order to produce a narrower 22° fan angle. It should be useful in cases, where the nanoLase needs to be placed further away from the measurement area.</li> <li>2. 1.5 m tripod for rtCam.</li> <li>3. Snakearm with magnetic base for nanoLase.</li> <li>4. Snakearm with G-Clamp base for nanoLase.</li> <li>5. High Power Version of the nanoLase for measuring large area or faster flow.</li> </ol> <p><b>Consumables:</b></p> <ol style="list-style-type: none"> <li>1. Seeding particles, suitable for water flows (200g).</li> </ol>
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**Terms and Conditions:**

1. The **Technical Bid** with detailed specifications and **Commercial Bid** for financial details should be in two separate sealed envelopes marked as “**Technical Bid**” and “**Financial Bid**”, put into one larger envelope and marked as “Quotation for Laser Doppler Velocimeter/Laser PIV System”. All envelopes should bear the title of the item quoted and the content, failing which the quotation shall be rejected.
2. Vendor should attach a letter from the manufacturer/their product principal permitting to quote for this tender at IIT Delhi for authenticity of dealership/agency and the dealer should be an authorized service provider. Quotations without authorized service provider certificate will be rejected.
3. Vendor should provide a certificate from their product principal clearly mentioning on-site comprehensive warranty at least for two years for the equipment and software to be delivered. Vendor may also quote for third year additional warranty charges separately as an optional item.
4. The Company/Manufacturer should be registered for ISO certificate. The Company/Vendor should attach a copy of the certificate.
5. The Vendor should have minimum annual turnover of Rs.10.0 crore and minimum experience for selling similar kind of equipment should be at least for 5 years.
6. If the item quoted is proprietary in nature, please enclose proprietary certificate from the principals stating, “Certified that \_\_\_\_\_ is a proprietary of M/s \_\_\_\_\_ and no other manufacturer makes this item.”
7. Special discount/rebate wherever admissible keeping in view that the supplies are being made for educational purpose in respect of Public Institution of national importance may please be indicated.
8. Validity of the quotation should be at least 90 days from the closing date of this tender.
9. Applicable taxes, duties, delivery period, payment Terms and Conditions should be clearly mentioned.
10. Preferred modes of payment for foreign agents are through Letter of Credit (L/C) or as payment on delivery. For Indian agents, typically payment is on delivery. The payment will be made on the norms and conditions of IIT Delhi.
11. All prices quoted should be FOB/CIF New Delhi.
12. Vendor should attach the relevant product brochure/leaflet for the model quoted.
13. A signed, stamped compliance sheet should be provided along with the technical bid, the specifications format for compliance sheet should be similar to the given specification sheet.
14. Supplier/Vendors will do the installation of Equipment at IIT Delhi without any additional cost.
15. The power cables, power plug used for equipment supplied should be compatible as per Indian power supply standards i.e Single phase 220 - 240 Volts AC, 50Hz.
16. In case a Computer System is required for processing of observed data of the equipment to be supplied, the required Computer System would be made available by us. The price for computer system should not be included in the equipment's cost but the software for data acquisition should be compatible with MS Windows environment i.e all version of MS Windows 7 / Windows 8 Operating Systems.
17. **The institute authority /purchase committee reserves the right to accept or reject any bid or all quotations without assigning any reasons whatsoever. The purchase committee also has the right to increase/decrease quantity of items/optional accessories/consumables as per the requirement and available budget.**