Phone: (0512) 2597582, 2597403 E-mail: head_ce@iitk.ac.in FAX: (0512) 2597395

INDIAN INSTITUTE OF TECHNOLOGY KANPUR

DEPARTMENT OF CIVIL ENGINEERING

PO. IIT KANPUR-208016 (UP), INDIA

Enquiry number: *CE/STR/FIST/2015-16/02*

06 November 2015

Subject: *Supply and installation of* ***INSTRUMENTATION AND DATA ACQUISITION SYSTEM FOR PSEUDO DYNAMIC TESTING FACILITY***

Note: ***(a)*** The Real Time Data Acquisition (DAQ) System should consist of both software and hardware (processing & I/O hardware and corresponding software). It should be based on suitable hardware (PXI or with equivalent performance characteristics).

(b) The development software should enable application development on a PC for acquiring data from multiple sensors (e.g. strain gauges, LVDT's, Potentiometers, Accelerometers, and Video Cameras etc.).

(c) The system should be capable of storing data (strain, displacement, acceleration, video etc.) being acquired at different sampling rate with precise time stamping for the purpose of post processing. For example, the video signals captured at slow framing rate should have time synchronization with strain data at a particular time instant recorded at much higher speed.

(d) The connectivity between DAQ system and PC/Server in Control Room should be through Gigabit Ethernet as well as WiFi (reliable without any packet loss). The system should be able to meet real time requirements imposed on it by the application and the Real time OS running on the system controller. Each component of the system Hardware and Software should be from the same OEM to ensure compatibility and scalability.

(e) The proposed system should be compatible with existing data acquisition systems (National Instruments's PXI based & PXI/SCXI, and CDAQ systems) at the department of civil engineering, IIT Kanpur.

With reference to the subject mentioned above, you are invited to submit the quotation in a sealed cover in order to reach us by **30 November 2015** in the form of a hard copy to the address mentioned below. If you have any questions please call Dr. K.K. Bajpai at 0512-2597859, email: kunwar@iitk.ac.in with copy to head_ce@iitk.ac.in.

The desired technical specifications of the major parts of about equipment are enclosed (please see the Annexure).

The prospective suppliers should be having a ***minimum of 10 years experience*** of manufacturing large channel data acquisition systems for dynamic strain, load, displacement etc.

The suppliers are required to send quotation in ***two parts in sealed envelopes, as*** "***Technical Bid***" and "***Financial Bid***". The Technical Bid should contain detailed technical specification of the product being offered and should not mention any prices.

The Financial Bid should include the detailed price quotation clearly including the cost of the equipment, packing and installation & commissioning charges, if any.

The cost for imported equipment should be mentioned in foreign currency. The customs clearance/duty etc. charges will be paid by IIT Kanpur against customs duty exemption certificate.

The two separate and sealed envelopes should be clearly marked appropriately as "***Technical Bid***" and "***Financial Bid***". Kindly write the inquiry no on the top of envelop.

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Terms and Conditions:-

1. Maximum discount that may be applicable to premier educational institute should be offered.
2. Validity of quotation should be at least for **90 days**
3. Prices should be mentioned on both CIF IIT Kanpur and FOB basis separately (for imported equipment)
4. The prices for optional items should be mentioned separately.
5. The ***Technical Bid*** should contain compliance/deviation from the item wise desired technical specifications, if any for different major parts (please see Annexure for more details about).
6. Financial bid will be open only for those, who meet tender technical specifications.
7. Normal payment terms for the Institute will be applicable (through letter of credit: 90% on delivery/shipment of the items and the remaining 10% after satisfactory installation/inspection).
8. Quotation should carry proper certifications like agency certificate, proprietary certificate, etc.
9. Delivery (FOB) should be made within **06 weeks** after the receipt of purchase order.
10. ***Installation& Training:*** *Vendor should provide the complete installation of the system. The training shall be on site after complete installation.*
11. ***Warranty & Maintenance Program***: 1 year (12 months) after completion of installation works
12. ***Maintenance/trouble shooting/service support***: after warranty
13. ***Performance guarantee***: Performance of hardware and software is to be checked as per desired technical specifications (see Annexure for details).
14. The ***ISO 9001*** series certification
15. The supplier should provide OEM certificate.
16. The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.

Dr. Purnendu Bose
Professor and Head
Department of Civil Engineering
I.I.T. Kanpur PIN 208016

Enclosure: **TECHNICAL SPECIFICATIONS OF MAJOR PARTS**

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ANNEXURE TO ENQUIRY NUMBER CE/STR/FIST/2015-16/02 dated 04 November 2015

TECHNICAL SPECIFICATIONS

INSTRUMENTATION AND DATA ACQUISITION SYSTEM FOR
PSEUDO DYNAMIC TESTING FACILITY, DEPARTMENT OF CIVIL ENGINEERING, IIT KANPUR

1.1. SYSTEM CONTROLLER

1.1.1. Embedded controller with integrated CPU, hard drive, memory, Ethernet, Video, USB etc.
1.1.2. Interface connect with input modules (for details please see sections 1.2 to 1.5) based on PXI or equivalent/superior back plane with choice of Windows or Real-Time operating systems.
1.1.3. System Bandwidth: 20 GB/s or better
1.1.4. Processor speed: 2.3 GHz or better with sufficient DDR4 RAM (16 GB or more) standard
1.1.5. Ports: 2 x USB 3.0, 4 x USB 2.0, 2 x Gigabit Ethernet LAN, Display Port, GPIB and trigger
1.1.6. The number of controllers should be based on input channels to be supported (for more details please see sections 1.2 to 1.5)
1.1.7. The connectivity of DAQ system (controller and input modules) with PC/Server in control room should be through Gigabit Ethernet as well as WiFi (reliable without any packet loss).
1.1.8. CE compliance equivalent to 2006/95/EC; Low-Voltage Directive (safety)
1.1.9. Safety compliance equivalent to IEC 61010-1, EN 61010-1, UL 61010-1, CSA 61010-1

1.2. STRAIN GAGE MODULES

1.2.1. Total number of high speed bridge input channels: **96**
1.2.2. Integrated data acquisition and signal conditioning for dynamic strain based measurements.
1.2.3. Separate ADC (24 bit or better) per channel
1.2.4. Sampling rate: Minimum 10 kS/s/channel
1.2.5. Selection of excitation voltage: 0-10 V DC (Software selectable)
1.2.6. Built-in programmable quarter/half and full-bridge completion and shunt calibration options per channel
1.2.7. Synchronization with other input channels
1.2.8. TEDS support

1.3. ANALOGUE VOLTAGE INPUT MODULES

1.3.1. Total number of channels: **16** Differential/**32** Single Ended
1.3.2. Separate ADC (16 bit or better) per channel
1.3.3. Input range +/- 10 V (programmable)
1.3.4. Sampling rate: Minimum 10 kS/s/channel
1.3.5. Synchronization with other input channels

1.4. MODULES FOR VIDEO CAMERAS

1.4.1. Total number of channels for video recording: **04**
1.4.2. PXI or equivalent hardware based modules to transfer images at gigabit Ethernet bandwidth
1.4.3. To transmit video signals from cameras in synchronization with other input channels with proper time stamping
1.4.4. Compatible video acquisition software

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1.5. DESIRABLE ADD/ON FUNCTIONALITY ON MODULES

1.5.1. Analog Outputs +/- 10 V (up to 08 channels)
1.5.2. Digital I/O lines
1.5.3. Counter/timer for encoder, frequency, event counting
1.5.4. Option of fast unload in case of emergency

1.6. GIGABIT ETHERNET COLOUR VIDEO CAMERAS

1.6.1. Total number of GigaE Video Cameras: **04**
1.6.2. Resolution: 1280X1024 or better
1.6.3. Framing Rate: > 20 FPS
1.6.4. 1 Gbit/s GigE Vision Interface
1.6.5. Compatibility with PXI or equivalent hardware and software (e.g. GigE Vision Frame Grabber) of DAQ system
1.6.6. All lenses and accessories should be included

1.7. GRAPHICAL PROGRAMMING SOFTWARE

1.7.1. Windows-based (Windows 8/7) and should provide graphical programming on Windows (Windows 8/7), and deploy the developed software in Windows & Real Time OS.
1.7.2. The programming software should have user-friendly Graphical Development Environment for rapid GUI development framework and it should have rapid user interface development for displaying live data.
1.7.3. The software must integrate with hardware modules flawlessly
1.7.4. Provision of signal processing/analysis and extensive math functionality
1.7.5. Multiple communication protocols
1.7.6. Must be equipped with Professional Development System and other toolkits such as: Database Connectivity, Drivers for Ethernet communication, PID and Fuzzy Logic, Advanced Signal Processing, Digital Filter Design, Sound and Vibration, Image Processing, Control, design and simulation etc.
1.7.7. Should support device driver for the hardware (PXI or equivalent)

1.8. ONSITE TRAINING

1.8.1. Onsite training for Graphical Development Environment