INDIAN INSTITUTE OF TECHNOLOGY-KANPUR

(DEPARTMENT OF MECHANICAL ENGINEERING)

Subject: Request for Uploading the Tender Document on institute web site.

Enquiry NO: *NSV/ME/L&T/2013-2014-01* *closing date: 11th November 2013*

Through: *Head, Mechanical Engineering*

Name of Item: Welding Data Acquisition System

Expressions of interest in a sealed envelope in a two bid systems (Separate Envelopes for Technical & Price Bid) are invited by the undersigned for Welding Data Acquisition System under a Project sponsored by Department of Science & Technology at IIT Kanpur in collaboration with and L&T, Powai-Mumbai, as per following specifications & terms.

The requirement of work /system is to design & develop a suitable rugged Data Acquisition System with Real Time Operating System to acquire and log data from multiple sensors during a Welding operation. The acquired data throughout the welding process should be further analyzed to correlate the quality of the welding. The scope of work shall be to develop a Modular, Rugged and user friendly Welding Data Acquisition System with graphical user interface software to configure, collect & present the data. The system should be connected to sensors including Microphones, Camera, Temperature sensors, Voltage and Current sensors in order to measure the various critical parameters during Welding Process.

The Data Acquisition System should have been used for measurement and control applications for at least last 10 years including such Industrial Welding Environmental conditions. Proof of executing at least one similar Welding Data Acquisition System for their Welding parameter data logging application should be provided along with Data Acquisition System OEM's Manufacturers Authorization Certificate.

The Welding Data acquisition system (DAQ) should be of PXI express platform. It should be an Independent unit having a Real time operating system to ensure reliable data acquisition in harsh conditions. The DAQ system should communicate with the Laptop or PC through standard Ethernet Communication (TCP/IP). The Data Acquisition Controller should feature at least a 2.3 GHz quad-core Intel Core i7 processor for deterministic, reliable real-time applications and should have at least 4 GB of DDR3 RAM & 250 GB of non volatile storage for logging data.

The Data Acquisition system controller & its module should be housed in a rugged chassis of PXI platform and should have a minimum of four-slots with 1 GB/s per-slot dedicated bandwidth. It should have at least 3 GB/s system bandwidth backplane to acquire high speed data from multiple sensors and also meet a wide range of high-performance test and measurement application needs.

The Data Acquisition System Modules should include

- 1 unit of Multifunction Data Acquisition Module with appropriate number of differential analog inputs of range of ±10 V with a minimum 18-bit resolution and a maximum sampling rate of upto 625 kS/s. It shall also have appropriate number of analog outputs & Digital I/Os.
- 1 unit of Dynamic Signal Acquisition Module with at least four dynamic signal acquisition channels for making high-accuracy audio frequency measurements and shall have software-selectable AC/DC coupling and IEPE signal conditioning for microphones. The input channels should be able to simultaneously digitize signals at rates up to 204.8 kHz per channel with built-in anti aliasing filters that automatically adjust to the user's sampling rate.
- 1 unit of Frame Grabber Module to Transfer images at full gigabit Ethernet bandwidth on the Dual-port gigabit Ethernet controller simultaneously.

The Data Acquisition software for real time configuration, acquisition and recording of data using the supplied system should be provided.

The following sensors should be integrated with the Data Acquisition System. All suitable Mounting arrangements, cabling should be designed considering the operating conditions of the System

1. Microphones – to acquire the Sound Signature during the Welding process - two numbers
2. Camera – To acquire images/video during the Welding process - one number
3. Temperature sensors – To measure the temperature of the welding region - four numbers
4. Voltage and Current sensors – To measure the Voltage and current signatures during welding process. - one each

Specifications of Data Acquisition Software:

The DAQ software, application software for testing and validation of hardware and real time configuration, acquisition and recording of data using the supplied system should be provided. It should be possible to vary the sampling and logging rate and also use the available filters on signal conditioning modules.

Scope of Work:

The following are the scope of work to be carried out by the agency provided with the contract

1. Installation of system at L&T Powai Works
2. Data collection of healthy welding system
3. Data collection with simulated faults in the welding system (the simulation of faults will be done L&T in consultation/coordination with IIT Kanpur)
4. Transfer of data collected to IIT Kanpur for further analysis of data
5. Carryout further test and collect data based on the analysis done by IIT Kanpur and feedback from IIT Kanpur

6. The warranty of the system shall be for a period of one year after installation of the system at L&T Powai works
7. The data collection work is expected to go on for three to four months .

Terms

1. Payment: As IITK standard terms.
2. Taxes: as applicable
3. Delivery: earliest possible time
4. Validity of quotation: 60 days.
5. Inspection: to be carried out at our place.
6. Please attach proprietary certificate if it is applicable.
7. Warranty one year.

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