

	BHARAT HEAVY ELECTRICALS LIMITED	Enquiry No. :
	HEAVY POWER EQUIPMENT PLANT	Due Date :
	RAMACHANDRAPURAM,	Supplier Qtn. No.:
	HYDERABAD - 502 032	Date :

**TENDER DOCUMENTS TO BE FILLED BY THE SUPPLIER FOR SUPPLY OF
DATA ACQUISITION SYSTEM**

The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.

ADDRESS OF THE SUPPLIER :

TELEPHONE NOS.:

FAX NOS.:

E-MAIL ADDRESS :

Sl. No.	Description for BHEL Requirement	To be Specified / Confirmed by Vendor	Offered	Deviations	Remarks
1.0	Purpose of the Equipment:	Vendor to confirm			
1.1	The intent of specification is to procure a Data Acquisition system for automatic measurement of parameters through field instruments during performance testing of Frame-5, Frame-6 & Frame-9E Gas Turbines	Vendor to confirm			
1.2	Data Acquisition system shall be capable of signal conditioning, excitation, multiplexing, digitizing and communicating with the interface work station on LAN	Vendor to confirm			
2.0	General Description:				
2.1	Proposed Data Acquisition system shall primarily consist of the following components:	Vendor to confirm			
2.2	Main Data Acquisition controllers for Frame-5, Frame-6 & Frame-9E test beds	Vendor to confirm			
2.3	Data Acquisition system servers / work stations	Vendor to confirm			
2.4	Hardware for communication interface between controller and Work station on LAN	Vendor to confirm			
2.5	Data Acquisition software	Vendor to confirm			
2.6	Cabinet for housing controllers	Vendor to confirm			
2.7	Accessories and Spares	Vendor to confirm			
3.0	Technical Requirements:				
3.1	Main Data Acquisition controller:				
3.1.1	Main data acquisition controllers must have the following salient features:	Vendor to confirm			
3.1.2	Signal conditioning the input signal as per the system requirement	Vendor to confirm			

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3.1.3	Digitizing 16 bit A/D conversion.	Vendor to confirm			
3.1.4	Communication interface with the Data Acquisition server	Vendor to confirm			
3.1.5	Programming, parameter display and diagnostic facility through a local display and keypad	Vendor to confirm			
3.1.6	Data update rate for total configured channels in each controller shall be less than 500 milliseconds	Vendor to confirm			
3.1.7	Operating Condition: 5 to 55 deg C, Shop floor environment.	Vendor to confirm			
3.1.8	Three (3) Independent Data Acquisition controllers shall be supplied for Frame-5 , Frame-6 & Frame-9E test beds respectively	Vendor to confirm			
3.1.9	Main data acquisition controllers shall be placed near rotating equipment on respective test beds	Vendor to confirm			
3.1.10	Main data acquisition controllers shall be housed in respective individual, rugged and portable weather proof RITTAL make cabinet and must be able to withstand vibration and shock	Vendor to confirm			
3.1.11	All wiring terminations on the controller cards must be brought out and terminated in DIN rail mounted ELMEX/WAGO terminals of respective RITTAL make cabinet	Vendor to confirm			
3.1.12	Data acquisition system must provide excitation(24V DC) for the pressure transmitters, preamplifiers and other instrument devices with the help of external power supply module.	Vendor to confirm			
3.1.13	Please refer Annexure-1 for Typical arrangement and channel requirements for Fr5, Fr6 & Fr9E Data Acquisition controllers.	Vendor to confirm			
3.2	Data Acquisition server / Work Station				
3.2.1	Two(2) Nos of Data Acquisition servers shall be supplied for installation in local control room and main control room.	Vendor to confirm			
3.2.2	Data Acquisition server / Work Station shall primarily consists of server grade computer with the following minimum specification	Vendor to confirm			
3.2.3	500GB Hard disk	Vendor to confirm			
3.2.4	4GB RAM	Vendor to confirm			
3.2.5	24" TFT monitor	Vendor to confirm			

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3.2.6	Operating system - Windows 7 or higher version	Vendor to confirm			
4.0	Data Acquisition Software				
4.1	Data Acquisition software shall have the following features:	Vendor to confirm			
4.1	Data Acquisition software shall cater to the data acquisition, control, alarm management, communication, graphics and other requirements.	Vendor to confirm			
4.1	All softwares used for Data acquisition shall be based on Windows 7 or higher	Vendor to confirm			
4.1	Spreadsheet like channel configurations page	Vendor to confirm			
4.1	Scaling in engineering units & Gain/offset selection for each channel in Y=mX+c form	Vendor to confirm			
4.1	Selection of alarm and danger set points for each channel	Vendor to confirm			
4.1	Channel OK/Not OK display	Vendor to confirm			
4.1	Real time and Historical data display in graphical form and tables	Vendor to confirm			
4.1	Automatic updation of test data in a respective separate data bases for Fr5, Fr6 & Fr-9E machines	Vendor to confirm			
4.1	Data retrieval from data base for overview and printing	Vendor to confirm			
5.0	Hardware Specification:				
	The data acquisition hardware shall meet the following requirements:	Vendor to confirm			
5.1	Thermocouple Input Module				
5.1.1	Field Instrument type - K type Thermocouple	Vendor to confirm			
5.1.2	Channel Accuracy - ± 1.0 degC for 0-800 degC range	Vendor to confirm			
5.1.3	On-board cold-junction compensation	Vendor to confirm			
5.1.4	Open thermocouple detection	Vendor to confirm			
5.1.5	Channel over voltage protection	Vendor to confirm			
5.1.6	System shall work reliably with either floating or grounded thermocouples.	Vendor to confirm			
5.2	RTD input module				
5.2.1	Field Instrument type - 4 wire resistance temperature detectors (Pt100)	Vendor to confirm			
5.2.2	Channel Accuracy - ± 0.1 degC	Vendor to confirm			
5.2.3	Current source for excitation	Vendor to confirm			
5.2.4	Channel over voltage protection	Vendor to confirm			
5.3	Pressure input modules				
5.3.1	Field Instrument type - 2 wire, 4 - 20 mA output with 24 volts DC excitation	Vendor to confirm			
5.3.2	Channel Accuracy - $\pm 0.05\%$	Vendor to confirm			

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5.3.3	Over voltage protection	Vendor to confirm			
5.3.4	System shall work reliably with either floating or grounded transmitter	Vendor to confirm			
5.4	Pulse measurement				
5.4.1	Field Instrument type - Turbine type Flowmeters or Magnetic pickup speed sensors	Vendor to confirm			
5.4.2	Channel Accuracy - $\pm 0.01\%$ for 40Hz to 200kHz range	Vendor to confirm			
5.4.3	Programmable offsets and ranges	Vendor to confirm			
5.4.4	Programmable threshold and hysteresis adjustment	Vendor to confirm			
5.5	Analogue I/O modules				
5.5.1	Field Instrument type - Process variable signals from vibration monitors and other control system (4-20 mA, 0 to ± 10 volts)	Vendor to confirm			
5.5.2	Channel Accuracy - $\pm 0.01\%$	Vendor to confirm			
5.5.3	Programmable offsets and ranges	Vendor to confirm			
6.0	Accessories and Spares:				
6.1	Essential spares for five years of trouble free operation should be supplied	Vendor to confirm			
6.2	All softwares used for acquisition shall be genuine and original/	Vendor to confirm			
6.3	Data Acquisition software, Operating system and other softwares used for installation of data acquisition software shall be supplied in DVD form	Vendor to confirm			
6.4	Documentation for data acquisition system and software shall be supplied in DVD form	Vendor to confirm			
6.5	Cabinet wiring schedule/diagrams shall be supplied in DVD form	Vendor to confirm			
6.6	Interconnecting, power, communication and interface cables for all peripherals and modules required for data acquisition are in supplier's scope	Vendor to confirm			
7.0	Pre-qualification Criteria				
	Vendor should have supplied, installed and commissioned data acquisition systems of same technology /platform for at least three different installations in India in last five years. Vendor shall submit the references of the previous installations in India	Vendor to confirm			
8.0	General Requirements:				
8.1	Supply, Installation and commissioning of the entire data acquisition system is in the scope of the supplier.	Vendor to confirm			
8.2	After successful installation and commissioning the supplier shall provide on-site training to the operating personnel and easy to understand course material.	Vendor to confirm			
8.3	Necessary detailed technical literature, catalogues, write ups, references etc. shall be furnished with the offer.	Vendor to confirm			

Annexure-1

Channel requirements for Fr5, Fr6 & Fr9E Data Acquisition Controllers

Channel description	Signal type	No of Channels		
		Fr-9E	Fr-6B	Fr-5
Thermocouple	K Type	60	50	50
RTD	4 wire	30	30	30
Pressure	4-20 mA	60	50	50
Flow	4-20 mA / TTL	6	6	6
Vibration	4-20 mA	20	20	20
Speed	pulse/counter	2	2	2

Typical arrangement for Fr5, Fr6 & Fr9E Data Acquisition controllers

