



INDIAN INSTITUTE OF TECHNOLOGY KANPUR
DEPARTMENT OF MECHANICAL ENGINEERING
KANPUR-208016, INDIA

Dr. Avinash Kumar Agarwal,
Poonam and Prabhu Goyal Chair Professor

Tel: + 91 512 2597982 (O), + 91 512 2598682 (R)

Fax: + 91 512 259 7408

Email: akag@iitk.ac.in

<http://home.iitk.ac.in/~akag>

Enquiry no.: ME/ERL/2013-14/October/02

Enquiry date: October 26th, 2013

Extended Last Date: November 15th, 2013

Enquiry for Supply of Crank Angle based Cylinder Pressure Data
Acquisition and Combustion Analysis Systems (Two Nos.) on a Buy-Back
Mode

Sealed quotations are invited for the purchase of Data Acquisition System for combustion analysis and crank angle based measurement of cylinder pressure, fuel line pressure and other engine condition signals (upto 8 or higher number of channels) (Two Nos). In this enquiry, we would like the supplier to buy-back old AVL Indimeter data acquisition systems (Two nos.). It will be the responsibility of supplier to accept these old systems in their current state from Engine Research Laboratory, IIT Kanpur in 'as is, where is' basis. The detailed specifications of the required data acquisition and combustion analysis system are:

1. The data acquisition systems should have at least 8 analogue differential inputs channels with necessary signal conditioning capabilities for handling piezo-electric pressure sensors, piezo-resistive pressure sensors, voltage and current based signals. These analogue differential inputs should have individual 14 Bit, 800 kHz ADC per channel or higher resolution.
2. Required angle measurement resolution: 0.025 to 1.0 crank angle degree or higher. The system supplied should be compatible with the existing angle encoders of the old system namely (1) AVL Angle Encoder 364, (2) AVL Angle Encoder 365 (3) AVL Angle Encoder 333.
3. Required time-based measurement resolution: 0.00125 ms – 5000 ms or Higher.
4. Combustion analysis software should be able to calculate variation of pressure rise rate, heat release rate, mass fraction burn, cumulative heat release rate with crank angle. Combustion analysis system should provide IMEP, engine rpm, maximum pressure, maximum pressure rise rate, start of combustion, end of combustion etc. for at least 2000 engine cycles at 5000 rpm engine speed. It should be able to provide these data for individual cycles as well as average of cycles to facilitate statistical analysis. Detailed analysis capability and offered flexibility in the hardware and software will be an important criteria for technical evaluation of the proposal. The software should support the user during parameterization,

measurement, and data processing. Real time data acquisition system with extensive on-line combustion analysis for:

- Crank angle based data acquisition with simultaneous real-time evaluation of indicating and knock results.
 - Oscilloscope mode and single measurement in real-time, multi-channel digital voltmeter.
 - Continuous or single measurement on time base (Recorder Function) event monitoring.
 - Event triggered measurement with pre and post history.
 - Channel individual measurement windows and measurement resolutions.
 - Remote control from a automation system via serial link (RS 232) or TCPIP.
 - Delta-T measurement for rotational and torsional vibration analysis.
 - Calculation of the combustion noise in dB.
5. Offered system should have other basic additional analysis capabilities of combustion analysis.

Terms & Conditions:

- (i) Provide “Authorization certificate” from the manufacturer, if representing an international supplier.
- (ii) Prices should include delivery and installation at IITK.
- (iii) Validity of quotation should be at least for 90 days
- (iv) Delivery period should be less than 60 days after the PO.
- (iv) Warranty should be for one year (preferably longer).

Kindly send your best offer (Techno-Commercial offer in a single document) so as to reach us on or before November 15th, 2013 (**Extended deadline**) to the following address:

Prof. Avinash Kumar Agarwal
Department of Mechanical Engineering,
IIT Kanpur, Kanpur – 208016, India