



Department of Metallurgical and Materials Engineering
Indian Institute of Technology, Madras, Chennai – 600 036

Enquiry No.

MET	Uday	002	2017
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Date: 26.6.18

Due Date: 11.7.2018

Dear Sirs,

1. Quotations are invited in **duplicate** for the various items shown below / overleaf / enclosed list.
2. The Quotations duly sealed and superscribed on the envelope with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The Quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
4. If the item is under DGS & D Rate contract, Rate Contract Number and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price. If so, please send copy of the R.C. (Please note that we are not Direct Demanding Officers).
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples if called for, should be submitted free of charges, and collected back at the supplier's expenses.
6. **Local Firms:** Quotations should be for free delivery to this Institute. If Quotations are for Ex-Godown, delivery charges should be indicated separately.
7. **Firms Outside Chennai :** Quotations should be for F.O.R Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.
8. The rate of Sales / General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for Sales / General Taxes will be admitted at any stage and on any ground whatsoever. **The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax applicable to non-Government Educational Institutions run with no profit motive for which a concession. Sales Tax Certificates will be issued at the time of final settlement of the bill.**
8. Goods should be supplied carriage paid and insured.
9. Goods shall not be supplied without an official supply order.
10. Payment: Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.

Yours faithfully,

for **The Head of the Department**
The Project Co-ordinator
Met. & Materials Engineering
IIT Madras, Chennai – 600 036

1) (DAQ) Data Acquisition System
— One no.
As per Specification enclosed.

Specifications

date 26.6.18

due date 11.07.2018

Overview

A multi-slot PXI Express system with voltage input, bridge input and thermocouple input as per the below specifications is required. The system needs to be programmable with graphical programming environment such as LabVIEW for which there is a campus license at IITM. The system should include all the necessary accessories such as terminal blocks and cables.

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1) PXI Express Controller

- a) Controller should be capable of running Windows based OS and a Real Time OS if needed.
- b) Controller should have a processing capability equal or higher to intel i3 2.6 GHz dual core.
- c) 2 GB (1 x 4 GB DIMM) dual-channel 1600 MHz DDR3L RAM standard expandable up to 8 GB maximum.
- d) 320 GB SATA Hard Drive.
- e) Peripheral ports such as Display port, 2 Super Speed USB 3, 2 Hi-Speed USB 2, 1 Gigabit Ethernet, SMB connector for triggers need to be available.
- f) The product should meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
 - IEC 61010-1, EN 61010-1
 - UL 61010-1, CSA 61010-1

2) PXI Express Chassis

- a) The chassis should be PXI Express bus based with a minimum of 4 slots of 3U form factor. (One slot may be occupied by the controller).
- b) The chassis bandwidth should be 3 GB/s or more.
- c) Multi Chassis Support should be possible through daisy chaining in case of future expansion
- d) Auto/high temperature-controlled fan speed based on air intake temperature to minimize audible noise.
- e) Operating Temperature Range – 0 to 50 C.
- f) Per slot cooling capacity should be 38.25 W or higher.
- g) The product should meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
 - IEC 61010-1, EN 61010-1
 - UL 61010-1, CSA 61010-1

3) Voltage Input Module

- a) At least 32 differential analog voltage input channels.
- b) Simultaneous sampling should be supported in the card, i.e. each channel must have a dedicated ADC, with a sampling rate of up to 5k S/s per channel.
- c) ADC resolution should be 24 bits or higher.
- d) Input voltage range should be up to -42V to 42V.
- e) CMRR should be at least 80 dB or higher.
- f) On-board FIFO buffer size for data acquisition and transfer should be equal to or greater than 1023 samples.
- g) Typical Gain error must be less than or equal to 0.027% of reading.
- h) Hardware timed single point filtering should be supported.

- i) Multiple timing engines should be supported for different acquisition rates for different channels.
- j) Analog and Digital trigger need to be supported.
- k) The product should meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
 - IEC 61010-1, EN 61010-1
 - UL 61010-1, CSA 61010-1
- l) Appropriate accessories should be included.

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4) Thermocouple Input

- a) Capable of handling minimum of 32 temperature measurement channels (thermocouple).
- b) The ADCs should be of at least 24-bit resolution.
- c) The module should support simultaneous sampling, i.e. each channel must have a dedicated ADC.
- d) Built-in Cold Junction Compensation
- e) Open Thermocouple Detection (Software Selectable)
- f) Sampling Rate of at least 5kS/second per channel should be supported.
- g) Input impedance should be equal to or greater than 1 G Ohm.
- h) CMRR in 100 mV range should be greater than 120 dB.
- i) On-board FIFO buffer size for data acquisition and transfer should be equal to or greater than 1023 samples.
- j) 30V Protection between any two points.
- k) Analog and Digital triggers should be available
- l) The product should meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
 - IEC 61010-1, EN 61010-1
 - UL 61010-1, CSA 61010-1
- m) Appropriate accessories should be included.

5) Bridge Input

- a) At least 8 input channels at a minimum of 24-bit resolution.
- b) The module should support simultaneous sampling in all channels, i.e. each channel must have a dedicated ADC.
- c) Sampling rate of up to 25.6 kS/s per channel has to be supported.
- d) Supported and software selectable Voltage Input ranges - ± 100 mV, ± 200 mV, ± 500 mV, and ± 10 V.
- e) CMRR should be 72 dB or higher.
- f) On-board FIFO buffer size for data acquisition and transfer should be equal to or greater than 1023 samples.
- g) 30V Protection between any two points.
- h) Full bridge, half bridge and quarter bridge configurations should be supported and this setting needs to be software selectable.

- i) 120 Ohm, 350 Ohm and 1k Ohm Bridge Resistance should be supported.
- j) The excitation voltage per channel must be software selectable and should be possible in the following ranges - 0.625 V, 1 V, 1.5 V, 2 V, 2.5 V, 2.75 V, 3.3 V, 5 V, 7.5 V, 10 V
- k) Maximum excitation current should be at least 30 mA per channel.
- l) The typical gain error should be 0.02% of reading.
- m) Hardware timed single point filtering should be supported.
- n) TEDS sensors need to be supported in all channels.
- o) Buffered Analog output channels need to be provided.
- p) Analog and Digital trigger should be supported.
- q) The product should meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
- IEC 61010-1, EN 61010-1
 - UL 61010-1, CSA 61010-1
- r) Appropriate accessories should be included.

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6) Software

- a) All the hardware must be completely programmable using LabVIEW.
- b) The interfacing drivers need to be provided.
- c) Troubleshooting software should be provided to check the health and functionality of the input modules.


Project Coordinator / MME.