

TENDER ENQUIRY FORM
Viava-Bharati, Santiniketan

Enquiry No. - BRNS/Physics/2017-2018/Equipment-I

Date: 26/10/2017

Last date of Submission: 14/11/2017 up to 11 AM

Date of Opening: 14/11/2017

Dear Sir,

I intend to procure one unit of detection system related to Gamma Ray Spectroscopic Measurement as per the specifications given below from the Manufacturer or their authorized dealers/distributors/vendors and invite quotations in accordance with the terms and conditions detailed in the attached sheet. Kindly send your offer with precise and complete terms within the time mentioned above.

Yours faithfully,

Anagha Chakraborty

Dr. Anagha Chakraborty
Assistant Professor
Department of Physics
Siksha-Bhavana, Visva-Bharati
Santiniketan – 731 235, West Bengal, India

Dr. Anagha Chakraborty
Principal Investigator (PI)
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One Unit of Desktop Dual Channel Digital Gamma Spectrometer with NaI Detector
(Complete with High Voltage & Preamplifier Power supply)

The dual channel digital Gamma Spectrometer MCA should have following essential features.

- It should have 250 MS/s 12-bit Waveform Digitizer
- Should have two input channels for accepting signals from two different detectors so that the coincidence measurement can be carried out.
- Should be suitable for detectors based on Organic, Inorganic and Liquid Scintillators
- Should provide 2 x HV bias outputs for detector driving up to - 4 kV, 3 mA, (4 W)
- Should provide 2 x Low Voltage bias outputs for preamps driving (± 12 V, ± 24 V)
- Should offer On-line Digital Pulse Processing for Charge Integration and Pulse Shape Discrimination
- Should have Oscilloscope operating mode for an easy setup and signal monitoring
- Should provide Energy histograms and 2-D Scatter plots of PSD parameter
- Should provide Waveform or lists of energy & time stamp events
- Should have Synchronization, coincidences & anti-coincidences capabilities
- Should support Windows and Linux, 32 and 64 bit OS
- Should have Control Software to control acquisition, data plot and saving, HV parameters
- Should contain C/C++ and LabVIEW libraries for an easy interface to custom DAQ systems
- Should have USB and Optical Link communication interfaces
- Should be upgradeable Firmware

Detector: NaI(Tl) assebly - 51 mm diameter, 51 mm high NaI(Tl) crystal mounted in aluminium housing read out by an 51 mm diameter ET 9266 PMT (or equivalent) surrounded by a solid mu metal shield. The PMT should be equipped with a built-in Voltage Divider wired for negative high voltage with separate ANODE and DYNODE outputs

Number of Detector: 1 (One)

Cable: BNC/BNC cable, 5mtr 2 in number
 SHV to SHV cable, 6kV, 5mtr 1 in number

Technical Specifications

Analog Input	Input Features -BNC connector -Single-ended, DC coupled -Input range: 2 Vpp -Impedance: 50 Ω -Positive and negative signals should be accepted -Bandwidth: DC to 125 MHz -Programmable DC offset adjustment on each input in the full scale range -Number of Inputs 2
ADC	Resolution: 12 bits


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	Sampling Rate: 250 MS/s simultaneously on each channel
Digital Signal Processing	<ul style="list-style-type: none"> -Input baseline calculation and subtraction -Manual trigger threshold adjustment -Dual gate charge integration -Pile-up detection and rejection -Online PSD calculation -Configurable PSD threshold for Neutron Gamma discrimination -Time Stamp: 4 ns resolution, 32 bit
Preamplifier Power Supply	<p>Preamp Features</p> <ul style="list-style-type: none"> -DB9 connector -± 12 V, 100 mA output -± 24 V, 50 mA output <p>Extra Features</p> <ul style="list-style-type: none"> -Aux. analog input: 0 – 10 V -Ext. input for detector's temperature readout <p>Preamp Outputs 2</p>
High Voltage Power Supply	<p>HV Features</p> <ul style="list-style-type: none"> -SHV connector + 4 kV Vset, 3 mA Iset -Vset, Vmon resolution: 0.1 V -Iset, Imon resolution: 0.05 μA -User configurable Ramp-Up/Ramp-Down rates independently for each channel: 1– 500 V/s range in steps of 1 V/s -User configurable HV parameters independently for each channel <p>HV Outputs 2</p> <ul style="list-style-type: none"> -OverVoltage/UnderVoltage alarms -Overcurrent/OverTemperature alarms (Kill or Ramp selectable esc modes) -Channel Inhibit on DB9 and dedicated BNC connectors, configurable logic by panel switch <p>Voltage Ripple</p> <p>3 mVpp (Typ.), 5 mVpp (Max.) @ 1 kV/500 μA 3 mVpp (Typ.), 5 mVpp (Max.) @ 2 kV/1 mA 10 mVpp (Typ.), 15 mVpp (Max.) @ 4 kV/1 mA</p>
Operating Modes	<ul style="list-style-type: none"> -Pulse Shape Discrimination (PSD): histogram of Total Charge (16k) and 2-D Scatter Plot of PSD parameter (built at SW level) -List Mode: Total Charge, Prompt Charge and Time Stamp for each event -Oscilloscope mode: input and internal filters waveforms
Trigger Modes	<ul style="list-style-type: none"> -Uncorrelated: each channel should operate independently (based on channel self-trigger) -Correlated: coincidences & anti coincidences among channels AND/OR an external trigger -External: channels should be triggered by external trigger only

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Digital I/Os	CLK-IN: LVDS, ECL, PECL, LVPECL, CML TRG-IN: External trigger Input: NIM/TTL, Zin = 50 Ω General Purpose Output: NIM/TTL, Zin = 50 Ω General Purpose Input: NIM/TTL, Zin = 50 Ω
Communication Interface	1) Optical Link Daisy-chain capability: Should be possible to connect up to 8 or 32 ADC modules to a single Optical Link Controller 2) USB
Firmware	Firmware should be upgradeable via USB/Optical Link
Software	-Should be Controlled by the suitable PSD Control Software -For developers: general purpose C libraries with demo samples should be available

TERMS & CONDITIONS FOR SUBMISSION QUOTATION FOR SUPPLY OF STORES

1. (a) **Rate:** The rate quoted must be exclusive of Excise Duty, Packing & Forwarding charges, Sales Tax, Freight charges and Insurance charges. All the charges like Excise Duty, Sales Tax, Freight, Insurance, Handling charges etc. as applicable must be shown separately. The stores are required to be dispatched by passenger train F. O. R. Bolpur or by Road Transport or delivered at this University under the Suppliers' own arrangement, free of additional charges. The risk of damage or loss in transit if any will be that of the suppliers. Manufacturer's price list, Technical leaflet, samples, catalogue, whenever applicable, should invariably be submitted.
- (i) **Excise Duty:** It may please be noted that the University is exempted from the payment of excise duty for scientific instruments/equipments for which necessary certificate shall be provided by the University, on request.
- (ii) **Sales Tax/ Vat:** Extra as applicable.
- (iii) **Way Bill:** This is issued against Consignment Note in and a copy of invoice. University does not issue any C or D form.
- (iv) **EMD:** Earnest Money Deposit be paid by Demand Draft in favour of "Visva-Bharati, Santiniketan", payable at any Nationalised Bank at "Santiniketan". The EMO will be refunded after successful completion and execution of the work/supply. The University reserves the right to withhold or confiscate the EMO in the event of failure to supply the items in part or full, once

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the Purchase Order is accepted.

(v) 10% Performance Security in the form of Performance Bank Guarantee (PBG) covering the warranty period is to be obtained from the bidder to ensure the interest of the University.

2. (a) **Consignee:** All stores are to be consigned in the name of Principal Investigator Dr. Anagha Chakraborty, Department of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan, West Bengal -731 235, India

(b) **Disposal of Dispatch Documents:** The Railway Receipt/PWB/Consignment Note along with the relevant bill and three priced challan each in triplicate, should be dispatched to Dr. Anagha Chakraborty, Department of Physics, Siksha Bhavana, Visva-Bharati, West Bengal – 731 235, India immediately on completion of dispatch. If these documents do not reach the principal investigator Dr. Anagha Chakraborty, Department of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan, West Bengal – 731 235, India in time all wharfage /demurrage incurred, if any, will be recoverable from the suppliers.

3. **Delivery Period:** The stores are required to be delivered / dispatched within the delivery period mentioned in the order. All offers of delivery should be made ex-stock, and a clear note should be inserted in case ex-stock delivery is not possible. No mobilization advance is payable against the Purchase Order. University does not bind itself to accept any ordered material after expiry of delivery period if the same has not been extended on the written request of the supplier before the delivery after expiry of the delivery date.
4. **Quality & Specification of Stores:** The stores offered should be of the best quality available, unless otherwise specified, confirming strictly to the National/International specification. The Institute reserves the right to reject such stores if found unacceptable on these grounds. The guarantee and warranty offered be specifically mentioned.
5. **Liquidated Damages:** If a firm accepts an order and fails to execute the same, in full or part, as per the terms and conditions stipulated therein, it will be open to this Institute to recover liquidated damages from the firm at the rate of 1% of the value of the undelivered stores per month or part thereof, subject to a maximum of 5% of the value of the undelivered stores. It will also be open to this Institute alternatively, to arrange procurement of the required stores from any other source at the risk and expense of the firm which accepted and then failed to execute order according to stipulation agreed upon.
6. **Submission of Quotation:** All quotations must be forwarded in sealed cover addressed to the sender of this Enquiry so as to reach within the specified period. The reference to the Enquiry No. and the last date of submission must clearly be superscribed on the sealed envelope. If no


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- counter offer is made in the quotation, it will be taken for granted the offer is strictly in accordance with the specification and terms and conditions laid down in the tender notice.
7. **Opening of the Quotation:** Every quotation will be opened at the concerned Department/Centre/School/Section of this Institute at the time and on the date indicated on the tender form. Unless otherwise specified, quotation will not be opened in Public and in presence of representative of bidders.
 8. **Period of Validity:** A quotation shall remain valid for acceptance at least for a period of 90 days from the date of opening.
 9. **Income Tax Clearance:** Current Income Tax and GST clearance certificates or returns must be submitted to the Principal Investigator, Dr. Anagha Chakraborty, Dept. of Physics, Siksha Bhavana, Visva-Bharati, Santiniketan, West Bengal – 731 235, India as per existing guidelines in vogue, before submission of final bill for payment, if not supplied earlier. Submission of PAN and Photocopy of the PAN card is must.
 10. **Payment:** Payment will be made after successful supply by a crossed a/c payee cheque on the S.B.I. Santiniketan, normally within 30 days from the date of receipt of bill or of the stores in good order and condition, whichever is later. Payments will however be made electronically by e-transfer, for which the supplier must provide their bank account number, bank address/branch details/branch code and IFSC code. Payment is made only on receipt of supply of all ordered materials. No short supply is acceptable unless specifically approved and agreed upon by the competent authority of the university in writing in advance.
 11. **Rejection of Offer:** The University reserves the right to ignore or reject any offer including the lowest without assigning any reason. The University does not bind itself to accept the lowest offer.
 12. **Dispute:** In case of dispute, the matter shall be settled mutually, failing which the decision of the Vice-Chancellor, Visva-Bharati shall be final and binding on the bidders.


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