



CENTRE FOR MATERIALS FOR ELECTRONICS TECHNOLOGY,
(A Scientific Society, Under Dept. of Information Technology, Govt. of India)
SHORANUR ROAD, M.G. KAVU, P.O. ATHANI, THRISSUR 680 581
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TENDER NOTICE

Sealed Tenders are invited in two parts; technical bid and financial bid, from the reputed Indian / foreign manufacturers/ authorized distributors / authorized dealers OR their authorized Indian Agents for the supply, installation, commissioning and demonstration of stores mentioned below :-

SI No.	Tender No	Brief description of Stores
1	TR/PUR/SP/05/2012	Supply and installation of Computer Controlled Electrochemical Workstation coupled with EIS - 1 No (as per specifications given in Annexure-II.)

The General terms and conditions shall be as per the **Annexure -I** attached herewith

The technical and financial bid shall be kept in separate covers and put in a single cover superscribing the **enquiry reference number and name of the equipment**. It is requested that the quotations along with literature, if any, may please be sent so as to reach The Administrative Officer, C-MET at the address given above, on or before the due date of **27th Feb., 2012**

Sd/-
ADMINISTRATIVE OFFICER

General Terms and Conditions

1. The specifications for the items quoted should be explicitly clear and all available technical literature, catalogues and other data in support of the specification of the items should be furnished along with the quotation.
2. Only one quotation should be sent in one envelope for a specified equipment/instrument.
3. Quotation should be valid for a minimum period of Ninety Days from the due date.
4. The quotation should reach on or before **27th Feb, 2012** to the Administrative Officer, Centre for Materials for Electronics Technology, Shoranur Road, Mulagunnathukavu, P.O. Athani, Thrissur- 680 771, Kerala State, India super scribing **Quotation for Computer Controlled Electrochemical Workstation coupled with EIS - 1 No.**
5. It should be specifically mentioned whether the price quoted includes all taxes and duties. Sales Tax and / or other duties and levies where legally leviable and intended to be claimed should be distinctly shown separately in the tender.
6. Short listed vendors may be called for discussion at C-MET, Thrissur before placing order.
7. C-MET takes no responsibility for delay, loss or non-receipt of quotations / documents send by post and reserve the right to accept or reject any party of the tender without assigning any reasons.
8. Corrections if any, must be attested. All rates shall be indicated both in words as well as in figures. Where there is a difference between rates quoted in words and figures, rate quoted in words will prevail.
9. The authority of the person signing the tender, if called for, should be produced.
10. Terms and conditions for the contract to be signed for the supply of items should be provided along with the quotation.
11. Tenders should submit along with their quotation, details of similar equipment /machineries supplied to Scientific / Technical Institutions during the past 3 years in India and the reference to that effect may be clearly mentioned.
12. Delivery period of the items quoted should be clearly mentioned.
13. In case you can arrange supply of the items, please forward your quotation **F.O.R DESTINATION, THRISSUR ONLY.**
14. Packing, forwarding and handling charges, etc., if any, to be quoted separately.
15. **Payment shall be made only after receipt and inspection of the item.**
16. We won't be able to provide "C" or "D" forms. Hence quote for the taxes actually leviable.
17. We are exempted from Excise Duty and Customs duty as per Notification No.16/2007 –Central Excise dt. 1.3.2007 and No. 24/2007-Customs, dt. 01.03.2007 respectively
18. **On selection, the supplier shall required to provide security deposit as performance guarantee for an amount of 10% of the value of the equipment in the form of Demand Draft, Fixed Deposit Receipt or Bank Guarantee from the Nationalized bank, which shall be valid for entire performance guarantee period plus 60 days.**

**Sd/
Administrative Officer**

Annexure - II

DETAILED TECHNICAL SPECIFICATIONS FOR THE ELECTROCHEMICAL WORKSTATION & ACCESSORIES FOR SUPERCAPACITOR TESTING

Basic Equipment:

It is proposed to procure fully computer controlled Electrochemical workstation (EWS) coupled with Potentiostat / Galvanostat and Electrochemical Impedance Spectroscopy (EIS) for the evaluation/testing of electrochemical and electrical properties of supercapacitors. Therefore, EWS system must consist of following basis units (a) Potentiostat / Galvanostat having the working voltage range of ± 20 V and measuring current range of ± 10 nA to ± 1 A (in-built) and upto ± 10 A@ ± 20 V with high current booster; (b) Frequency Response Analyser (FRA) for electrochemical impedance spectroscopic measurement of supercapacitors in frequency range of 10 μ Hz to 1 MHz, (c) Standard electrochemical cell system including electrodes, and (d) dedicated PC with latest configuration & color laser printer with required interfacing hardware & Software for system control, data acquisition, analysis and printing. The required electrochemical workstation (EWS) shall be modular type system, in which addition of more module/channel, such as high current booster and module for sequential measurement of multiple cells is possible and system can be upgraded in future with additional modules without any difficulties. The offered model/system & the software features should meet the following technical specifications.

- (1) The Potentiostat / Galvanostat should incorporate suitable electrometer with input impedance $>10^{12}$ Ohms (in parallel <20 pF) with input bias current of <10 pA at 25°C and potentiostat bandwidth of 1 MHz. The maximum applied voltage of the electrometer should be ± 20 V with potential accuracy of 0.2% or ± 2 mV.
- (2) Current range should be ± 10 nA to ± 1 A (in-built) with femto-ampere range current resolution. The applied and measured current resolution of the system shall be 0.015% and 0.004% of FSR respectively.
- (3) A High Current booster of ± 10 A @ ± 20 V with required chassis, & communication interfaces shall be provided along with the system for electrochemical and impedance spectroscopic measurement of supercapacitors at specified current & voltage range.
- (4) System should consist of a high resolution Frequency Response Analyser (FRA) for performing Electrochemical Impedance Spectroscopic (EIS) measurements of supercapacitors in the frequency range of 10 μ Hz to 1 MHz.

- (5) System should provide the electrochemical analysis using 2-(two), 3-(three) and 4-(four) Electrode connection facilities to measure sample with a DC voltage scan in the range of ± 20 V.
- (6) Additional module/channel along with required interfaces shall be provided for sequential electrochemistry and impedance spectroscopic measurement of multiple cells (at least for 16 cells). Suitable sample mounting arrangements and cell holders shall be provided.
- (7) Standard electrochemical cell setup consisting of 90 ml cell, base-plate with cell stand, two-way purge tube, Ag/AgCl reference electrode, Pt rod counter electrode (ϕ : 2 mm, L: 50 mm), Pt-mesh counter electrode (size: 35 x25 mm/80 mesh), Glassy carbon working electrode, connection pins and cables, electrode polishing kits, etc. shall be provided.
- (8) System should possess 10 MHz fast two channel ADC module for ultra-fast sampling with automatic data sampling feature at the rate of 10 MSamples/sec or more and possess synchronous A/D Input, as well as non-Synchronous Inputs for collecting DC voltage inputs (± 5 V) from other devices, such as Temperature probes.
- (9) System should be provided with full featured software and communication interfaces to control the instrument, monitor various set parameters, real-time data display, data logging, etc. Upgraded version of software shall be installed and also the same shall be provided in CD. Provided software must include following software features for complete electrochemical & impedance spectroscopic measurement/analysis techniques, as stated below.
 - **Electrochemistry:** [OCV, CV, CVA, CA, CP, true linear scan CV, high-speed linear scan CV, linear/cyclic polarization, chrono methods (normal chronomethod ($\Delta t > 1$ ms), high speed chrono methods ($\Delta t > 100$ ns), current pulsing methods].
 - **Impedance Spectroscopy:** Potentio EIS, Galvano EIS, Staircase potentio/galvano EIS, Mott-Schottky, IR compensation].
 - **Supercapacitor testing:** Galvalostat cycling, potentio-dynamic cycling, constant load discharging, charge/discharge cycling, measurement of ESR (equivalent series resistance), measurement of self discharge/leakage current, determination of cell capacitance, specific capacitance, power & power density of the supercapacitor, & energy & energy density of the specimens, etc.
 - The software shall be windows based user friendly and should include the options to import/export data into MS excel or ASCII and allow to transfer of images to other applications, say MS Word or MS Powerpoint, etc.

- (10) **Computer & Printer:** Instrument should be supplied with a branded PC (HP or Lenovo) having latest configurations, such as Core 2 Duo 2.8 GHz, 320 GB HDD, 4 GB RAM, DVD R±RW, 6-USB ports (at least 2 USB port in front side), Flat screen TFT color monitor (17 inch), keyboard, optical scrawl mouse and HP color laser printer. PC shall include following pre-loaded software: Operating software (Windows XP/Windows 7), MS office 2003, Adobe acrobat reader, Antivirus, etc. and all software backup shall be provided in CD.
- (11) **Accessories:** Cost of following accessories shall be offered separately, which we may/may not procure based on the budget availability.
- Controlled Temp chamber for performing the sample analysis at temp range from –25°C to +100°C along with necessary connection pins/cables/cell holder with suitable mounting arrangements for multiple.
 - List of essential accessories to be required for the system shall be specified and offered separately.

Note: Cost of above mentioned accessories will not be considered for financial comparison of tenders.

- (12) **Others**
- System shall be designed to work at line voltage of 220-240 V AC (50/60 Hz). All necessary safety features including over voltage/over current protections, etc. shall be provided.
 - The Party must arrange installation/commissioning of the instrument including training & demonstration of the system at C-MET, Thrissur
 - Essential tool kits for operation & working with instrument including detailed instruction / operation manual / software package (in CD) are to be provided
 - A **Warranty** of 12 months from the date of installation at C-MET shall be provided. An extended warranty or AMC for next 24 months shall be offered separately under **‘Option – I’**