

ExTeM-CAPEX-010- Electrochemical Potentiostat/Galvanostat/Impedance analyzer

Technical Specifications for Electrochemical Potentiostat/Galvanostat/Impedance analyzer

PC controlled electrochemical workstation (Potentiostat/Galvanostat/Impedance analyzer)

Sl.No.	Description	Specification
I. Hardware requirement		
1	Electrode configuration	2, 3, and 4 terminals
2	Max. applied voltage	± 15 V or more
3	Compliance voltage	± 20 V or more
4	Voltage Accuracy	0.1% or better
5	Max. Current	± 5 A
6	Current range	10 nA or less & 5 A or more – minimum 5 ranges should be provided
7	Current resolution	0.007% or better
8	Current Accuracy	0.1% of the range or better
9	Scan rate	0.1 mV/s
10	EIS frequency range	10 μ Hz – 5 MHz or better
11	Amplitude	10 μ V to 5 Volt or better
12	Bias current	50 pA
13	External current booster option	Yes for upgradation.
14	Computer interface	USB/Ethernet
Additional voltage recording input (ADC) for 0-10 V range. Input received in this channel should be scalable and interpretable to control the software measurement protocols. (e-g: recording optical sensor info, LED light source info etc..)		
II. Software requirement along with analysis tool		
1	Fundamental electrochemistry	CV, LSV, ASV, CA, CP, Pulse deposition, SV etc.
2	Corrosion	EVT, LP, GC, CPP,CPT, PR etc
3	Electrochemical noise analysis	SD, PSD etc.
4	Energy storage applications	Charge/Discharge Constant potential/Current/Power, GITT, PITT, Dynamic capacitance, Solar cell efficiency
<ul style="list-style-type: none"> • Software should be capable of doing cyclic voltammetry single and multiple cycles, chronoamperometry, chronopotentiometry, electrochemical impedance measurement and analysis. • It is mandatory for the software to allow series of experiments to be carried out with one programming. For example, it should be possible to carry out series of cyclic voltammetry experiments with various scan rates, followed EIS with various applied 		

DC bias, and CV again. If the bidder's product is capable of doing only one experiment at a time, they won't be considered.

- Software should have programs to carry out standard electrochemical studies, corrosion studies, battery/supercapacitor testing, solar cell characterization, and fuel cell testingd.
- Software should have EIS analysis software for fitting EIS data with electrical circuit.
- Complete analysis software for CV, EIS circuit fitting facility

III. Accessories

1	Saturated calomel electrode	01 No. + 01 No. (Optional)
2	Ag/AgClreference electrode	01 No. + 01 No. (Optional)
3	Corrosion cell (500 ml)	01 No. + 01 No. (Optional)
4	Platinum counter electrode	01 No. + 01 No. (Optional)
5	Glassy carbon electrode	01 No. + 01 No. (Optional)
6	Three electrode electrochemical cell	01 No. + 01 No. (Optional)

Other reference electrodes/electrochemical components from the manufacturer shall also quoted.

Warranty: The whole set up (Incl. of all Hardware and software) should be guaranteed to work satisfactorily for a period of two years from the date of successful installation.

It is preferred to have a built-in calibration with internal standard routine calibration check.

The instrument should be installed in two different computers using the individual software platform.

Should provide a laptop/desktop computer supplied along with the equipment:

- Processor: 10th Gen Intel® Core™ i7-10700F processor (8-Core, 16M Cache, 2.9GHz to 4.8GHz)
- Operating System: Windows 10 Home Single Language, English
- Graphics/Video Card: NVIDIA® GeForce® GT™ 730 2GB GDDR5
- RAM Memory: 8GB, 8Gx1, DDR4, 2933MHz
- Keyboard: Wireless Keyboard (US/International: Reputed make)
- WLAN SRV driver: Intel 3165 Wireless Card Driver
- Hard Drive: 512 GB M.2 PCIe NVMe Solid State Drive for software applications and additional 2.5 inch 1TB 7200rpm SATA Hard Disk Drive for data storage.
- Mouse: Optical Mouse wireless
- Optical Drive: DVD
- Wireless: 802.11ac 1x1 WiFi and Bluetooth
- Power Cord (India)
- UPS for minimum 45 min back up power.
- Monitor: LED 24 inch Screen Full HD (1080p) 1920 x 1080 resolution, IPS Panel Connectivity Port: HDMI, VGA, DisplayPort, etc.

It is preferred to have service engineer located around Chennai/Bangalore/Hyderabad area.

The vendor should have supplied at least one similar instrument in India in the past two years. List of their contact details should be provided. IIT-Madras shall inquire the bidder's customers about the quality of product/service. If the testimonial from their customers is not satisfactory, IIT-Madras reserves to reject the bid based on the technical grounds.

Necessary training should be provided to of IITM after installation of the instruments.