



CORRIGENDUM

REFERENCE NO. : - P/NC/31/NCP/DB(SO)/OTE/24-25

DATE: 17/10/2024

NAME OF EQUIPMENT: "SUPPLY, INSTALLATION, COMMISSIONING & TRAINING OF MULTI CHANNEL SUPERCAPACITOR CELL TESTING SYSTEM" [CPPP PORTAL TENDER ID: 2024_CSIR_209164_1]

NOTE: The Bids must be submitted in the Central Public Procurement Portal (URL: <https://etenders.gov.in/eprocure/app>) only. Manual/Offline bids shall not be accepted under any circumstances. Bidders should quote in INR only.

CONSEQUENT TO THE PRE-BID MEETING HELD ON 04/10/2024, THE REVISED SPECIFICATION IS GIVEN BELOW:-

Technical Specifications for the Multichannel Supercapacitor Cell Testing System (Revised)

Name of Item: Multichannel Supercapacitor Cell Testing System (SCTS)

Intended use: Testing and evaluation of electrical parameters of Supercapacitor cells/modules for its charge/discharge at constant current/power at current range of 1 mA ~ 10A over test voltage range of 100 mV ~ 20V..

Sl. No.	Technical specifications and features
1)	a) System configuration: Modular type Multichannel configuration having four or more channels for testing supercapacitor cells and modules b) Plug and play type configuration with channels and auxiliary modules for easy expansion and maintenance to allow users more flexibility during measurement
2)	a) No. of channels: 8 (Eight) or more b) Channel operation & Control mode: Independent and simultaneous operation and control for each /respective Channel c) Channel grouping: Ability to group channels together to increase the current capability of the channel, when the Channels are securely attached / connected in parallel to the test device for higher test current/power
3)	Channel voltage range: 100 mV ~ 20 V (for all Channels) <ul style="list-style-type: none">• Measurement accuracy: $\pm 0.02\%$ FSR for respective channel• Measurement precision: $\pm 0.01\%$ FSR for respective channel• Measurement Resolution: ≤ 24 bits• Control Resolution: ≤ 24 bits• Input Impedance: 100 Giga Ohm
4)	Channel Current range: 1 mA ~ 10A or more (for each channels) a) Current Measurement modes: <ul style="list-style-type: none">a) 10 A \pm 4 mA (High current mode),b) 500 mA \pm 0.2 mA (Medium current mode),c) 20 mA \pm 8 μA (Low current mode) andd) 1 mA \pm 0.4 μA (Ultra-low current mode) for each channel b) Current measurement precision: $\pm 0.01\%$ FSR for all channels c) Current measurement Accuracy: $\pm 0.02\%$ FSR for all channels d) Current raising time: 400 μ S or lower (for current output of 10% to 90% of FSR) e) Current measurement resolution: ≤ 24 bits f) Current control resolution: ≤ 24 bits
5)	Time measurement: <ul style="list-style-type: none">• Minimum Step-time: ≤ 5 mS• Time measurement resolution: ≤ 400 μS• Charge-discharge transition time: ≤ 0.1 mS• Current Pulse capability: ≤ 5 mS
6)	System Power: <ul style="list-style-type: none">a) Max. channel power: 200 W or more per channelb) Total power of the system: 1200 W or more

7)

Data Logging & Security:

- Data Logging: Automatic data logger for real-time data logging at faster rates (data logging rate: ≤ 5 mS). Log-data shall be based on the primary variants of time, current & voltage
- System also shall have the facility to export data in Excel /ASCII format for analysis & plotting
- Data should be logged in real time in an SQL or other robust database.

8)

Testing Features and its Capability: Instrument Hardware shall support for following testing/ measurement capability/features

- Constant current charge-discharge Cycling: Constant current charge/discharge cycling for Supercapacitor / Battery cells/modules at defined current/voltage ranges in all channels
- Constant Power charge-discharge Cycling: Constant power charge/discharge cycling for Supercapacitor / Battery cells/modules for its cycling efficiency at defined current/voltage ranges in all channels
- Constant rate voltage-sweeping: Constant rate voltage-sweeping for charge/discharge cycling for Supercapacitor cells/modules for testing its cycling efficiency at constant voltage-sweeping /scan rates
- Constant Current Pulsing for ESR: Constant current Pulsing or other technique for measuring the DC-ESR (equivalent series resistance, ESR) of the Supercapacitor Cell/Module.
- Leakage Current (LC) /Self-discharge leakage (SDL): Measurement of LC and/or SDL of a fully charged Supercapacitor Cell/Module through OCV (open circuit voltage) and/or under zero-applied current technique.
- Software features shall also include direct measurement/calculation of following electrical parameters:
 - ↳ Cell Capacitance and Specific Capacitance of the Supercapacitor
 - ↳ Leakage Current (LC)/Self-discharge leakage (SDL): Recording of discharge profile of Supercapacitor Cell/module under zero-current/no-load conditions
 - ↳ Cell Energy & Energy density of Cell/module
 - ↳ Cell Power and Power density of the cell/module
 - ↳ Summary Report for all above-mentioned parameters

9)

Cables & Interfaces:

- Instruments shall be supplied with Main I/V Cable (length: ~ 12 ft, max. 10A) for respective Test channels
- PT 100 sensor cable for measurement of Temperature, cable length of 12 ft

10)

Software Features: Instrument should be supplied with full-featured latest version of Software for all hardware/software engineering, calibration, configuration, testing including instrument operation, control & testing features for data analysis and evaluation of following electrical parameters for Supercapacitor & Battery

- **Software Controls:**
 - ↳ Constant Voltage, Current, Power, and Load;
 - ↳ Current and Voltage ramps and staircase;
 - ↳ Use of Mathematical Formulas for controlling the test;
- **Testing features:** Capacitance, specific capacitance of test cell/module, DC-ESR, Leakage current, Self-discharge leakage, Various set variable (Perform loops, cycles, reset capacity values, etc.), current & voltage ramp (Generate a current and voltage ramp with specified scan rate), Simulation control (Current control: Time-vs.-Current data may be input directly from a text file and Power control: Time vs. Power data may be input directly from a text file)

	<ul style="list-style-type: none"> ○ Real-time data/plot watch/monitoring. Import/export of data into MS excel or ASCII and allow to transfer of images to other applications, say MS Word or MS Power point, etc. ○ Instrument Computer: Offered SCTS should be fully computer controlled system and the system operation & control shall be through windows based PC with latest version of software to run standard/ customized test profiles. Suitable PC with latest configurations (Processor: Intel Core i7 or higher, RAM: 16 GB DDR4 RAM, storage: 1 TB SSD, Monitor: 15" LED monitor, Keyboard, optical scrawl mouse, USB 3.0/2.0 ports, 2nd NIC card, Ethernet Cable, Windows 11 Professional or compatible Operating system, Microsoft Office 2019 Professional and Flash Drive) ○ Software Back-up Copy: Software back-up should be provided in case re-installation or installation on new PC's, if required
11)	<p>Instrument Safety:</p> <ul style="list-style-type: none"> ↳ Apart from standard voltage, current, power safety limits, system should have behavioural safety limits such as unusual behaviour of voltage or capacity readings ↳ Safety features including global safety limits for test & specific safety limits for each steps ↳ Safety limits can stop a test or trigger periods of rest or cool down and then resume. ↳ Offered instrument should contain a redundant microcontroller to monitor safety limits ↳ Watchdog circuit should be provided to monitor internal system communication and look for errors.
12)	<p>Power Supply available at purchaser's site</p> <ul style="list-style-type: none"> • Line supply available at CSIR-CGCRI: Single phase (220 V AC, 50 Hz) • Offered instrument must comply with Indian standard i.e. 1-Phase, 220 V AC, 50 Hz.
13)	<p>Installation/Commissioning: Instrument shall be supplied, installed and commissioned at CSIR-CGCRI, Kolkata</p>
14)	<p>Training: Vendor shall provide On-site familiarization training to CSIR-CGCRI Officials after the initial Setup/commissioning of the instrument.</p>
15)	<p>Acceptance: Report on satisfactory installation & Commissioning of the instruments</p>
16)	<p>Warranty: One-year Standard Warranty form the date of commissioning/ installation</p>
17)	<p>Documents to be submitted along with Bid:</p> <ul style="list-style-type: none"> a) The party has to mention details technical specification of offered equipment/ instruments in their technical bid, which shall be supported with relevant documents, like technical brochure, catalogue, factory data sheet or equivalent. In case of tailor made equipment, the party shall clearly indicate the same in their offer. b) The party has to submit compliance statement on all those points, indicated in tender specifications and also clearly mention the deviation (if any) with proper justification. c) The supplier must submit a comprehensive list of users of similar instruments in India along with full contact details of the users in India

All other Tender terms and conditions remain unchanged.

(Bodhisattwa Dhar)
Stores & Purchase Officer

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