

# Global Tender notification for Electrical Characterization System

(Tender date: 7<sup>th</sup>June2024)

This is an RFQ (Request for Quote) for procurement of electrical characterisation system for current-voltage and capacitance-voltage measurement of semiconductor devices for the Centre for Nano Science and Engineering (CeNSE) at IISc, Bangalore. CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by more than 100 faculty members from various disciplines at IISc. CeNSE also runs a program called Indian Nano electronics Users Program (INUP) which has allowed 8000 participants and 1500 faculty from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any utility/facility at CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are requested to factor in the value of this exposure into their quotes. Details of existing facilities are available at:

<http://mncf.cense.iisc.ac.in/>

<http://nnfc.cense.iisc.ac.in/>

## Section 1 - The Process

1. **This order is open to all global Original Equipment Manufacturer (OEM) or their Indian authorized distributor".**
2. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Quotes in violation of this will be rejected.
3. **The deadline for submission of proposals is June 28<sup>th</sup>, 2024, 5:30 pm Indian Standard Time.** Proposals should arrive at the CeNSE office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, by the above deadline. Please mention **"Tender for Electrical Characterisation system"** on the envelopes.
4. The technical proposal should have:
  - a. Relevant technical datasheets. The committee reserves the right to cross-check the information in these datasheets with publicly available information.
  - b. A compliance table with 5 columns. The first column must list the technical requirement, in the order that they are given below. The second column should describe the capability of the tool for that specific requirement. Please be quantitative and consistent with the technical datasheets. In case the technical requirement is a text, second column must provide a technical answer. In case the requirement is a number, please provide a number. Third column must specify whether the technical requirement is met with a "Yes", "No", or "Partially". If the response is "Partially" or "No" the third column, the fourth column must explain the extent of the deviation and, if possible, the reasons for the deviation. The fifth column is for other "Remarks". You can

- use it to compare your tool with that of your competitors or provide more details/justifications.
- c. Technical capabilities of any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
  - d. Any additional capabilities or technical details, which you would like to bring to the attention of the purchase committee. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
5. If multiple systems fulfil the requirement, vendors can offer multiple bids.
  6. The technical proposal will be evaluated against the technical requirement. Only vendors who meet the technical requirement will be considered for the commercial comparison and negotiation.
  7. The lowest bid L1 will be calculated based on the total price of all items tendered for Basic equipment along with accessories selected for installation, selected optional items, recommended spares and warranty.
  8. The commercial bid must conform to the following:
    - a. The quotations should be CIP Bangalore with validity of 90 days.
    - a. Mention itemized cost of the system, optional items and *required* accessories, such as software, power supply, etc.
    - b. Mention itemized cost, as an option, for any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy, or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
    - c. Mention the warranty provided with the tool.
      - i. Warranty of 1 year is mandatory. Warranty of 3 years or more is preferred.
      - ii. All electronics and instrumentation must be covered under the warranty. Clearly indicate any part that is not included in the warranty.
  9. Free of cost Maintenance and service of the measurement units for a period of at least 3 years or more
  10. The firm must guarantee technical and service support for the entire system and supply spares for a minimum period of 10 years or more from the installation date.
  11. The decision of the purchase committee on the execution and evaluation of the tender, is absolute and final.
  12. The RFQ must include references of 5 previous installations, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.

13. We encourage vendors to give technical presentations, physically or online, so that we can better understand the technical capabilities of their tools and vendors can better understand the requirements.
14. To schedule the presentations or for technical questions, please contact Dr. Suresha, COO Micro and Nano Characterization Facility (MNCF), Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India.  
([sureshasj@iisc.ac.in](mailto:sureshasj@iisc.ac.in))

## Section 2 - Technical Specification

### **A. We are looking for two Source Measuring Unit (SMU) with the below mentioned technical Specifications:**

1. Two independent SMU channels Triaxial connections for each channel
2. Easy to use user interface.
3. API, software, and hardware to be controlled via an external computer.
4. Voltage Source and measure capability:  $\pm 100$  V.
5. Voltage Source and measure range: 2 mV – 100 V.
6. Voltage measure resolution:  $\pm 1\mu$ V.
7. Voltage source resolution:  $\pm 5\mu$ V.
8. Current sourcing and measurement Ranges: 100 pA to 100 mA.
9. Current Source resolution: 100 fA.
10. Current Measure resolution: 0.1 fA.
11. System should have built in TRX connector option for 2 wire and wire connection per channel.
12. System should able have GPIB, Ethernet, RS 232 communication.

### **B. We are looking for two LCR meters:**

System should measure small signal impedance with following features:

1. Four-probe measurements
2. Coax-connections.
2. DC drive voltage: -30 V to +30 V or better.
3. Circuit modes: series and parallel.
4. Measure modes: Z, C, D, G, L, R, X
5. AC drive voltage: 10 mV to 1 Vrms.

6. Frequency Range: 1 kHz to 2 MHz or better.
7. Sample capacitance range: 1 pF to 1 F
8. Sample inductance range: 1  $\mu$ H to 1 MH
9. Samples resistance range: 1 m $\Omega$  to 200 M $\Omega$
10. The instrument should support voltage sweeps.
11. In-built calibration routines.
12. Open/short tests to subtract parasitics.