

CSIR- NATIONAL PHYSICAL LABORATORY

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From: Director, CSIR-NPL

No. 14-VIII/MK(755-GTE)22PB/T-77

Dated: 11.01.2023

CORRIGENDUM

With reference to NPL's Global Tender No. 14-VIII/MK(755-GTE)22PB/T-77 Pre-Bid Conference (PBC) was concluded on 28/12/2022 for "AFM system". Consequent upon the outcome of PBC, **it is found that there is change in the technical specification of captioned tender. Revised specifications are as follows:**

Atomic force microscope (AFM) system should be capable of measuring resistivity, photocurrent in a manner such that every pixel is co-related with topography and current map data. The system should have all the necessary accessories which include computer, software and hardware.

1. Performing contact, non-contact (tapping), phase contrast, magnetic force microscopy (MFM, lift mode capability), scanning kelvin probe microscopy (SKM) and conductive AFM.
2. Tip navigation: The AFM feedback mechanism must have diode in the infrared/visible region. The AFM feedback laser alignment must be motorized/manual and automated through software control or pre-aligned system. AFM tip holder must be removable with/ without having to remove the full head from the system and automatic tuning of the cantilever.
Sample navigation: The system should allow navigation around the sample surface using preferably manual control (step size for manual movement along x, y and z axis 25µm or better) / computer controlled (acceptable if there is no option of manual control), over a range of 20x20x15mm (xyz) or better. Maximum sample size 1inch x 1inch.
3. The optical colour image of the sample should be visible on the screen to select the location on the sample, must have a camera 1.2 megapixel or better resolution.(as suggested point 3 include only the camera specification)
4. A system capable of performing electrical measurements with a high-performance lock in preamplifier, with a range of 4pA to 10µA is preferred. Kindly mention the rms noise and preamplifier bandwidth.
5. System preferably should have XYZ closed loop piezo scanner with scanning range of 90µm x90µm x5 µm or better.
6. The system should have z piezo scan accuracy ≤ 0.3nm (thickness accuracy) or better with the same scanner.
7. System must have 24 bit or more converters (ADC/DAC) for better performance of scan control in X, Y and Z. The system should be capable of displaying / showing various modes simultaneously.
8. The data acquisition system must be capable of recording individual "image sizes of 4000x4000 pixel or more". Kindly mention scan rate (along x, y and z axis) and thermal drift.
9. AFM tips/probes/cantilevers necessary to show the required demonstration. Additionally system must have 100 cantilevers for non-contact mode/tapping mode imaging, 60 cantilevers for conductive and 50 cantilever for MFM.
10. Certified reference material (CRM) for XYZ calibration of the instrument with certificate issue date < 2 years from the supplier who follows ISO 17025 (2017) or a NMI of a country e.g NIST USA, PTB Germany etc. CRM should not show any charging effects. Include calibration reference material for tip and scanner.
11. The system must have software controlled thermal tuning of the cantilever option with 2MHz or more.
12. System should contain a port to illuminate laser light (spot size 1mm or better) on the sample and must have power tuneable laser light sources of 532 nm, 1064 nm and 1550nm with power range 1 - 10 mW or more with step size of 1mW, atleast. The acceptable angle variation for laser source is 30-90° (considering the vertical laser illumination on sample surface from the top as 90°).
13. IR visualizing lens or camera or goggles to align the NIR light sources.
14. Ultra low noise vibration isolation platform must be integral part of the system.
15. The power requirement must be as per Indian standard specifications and as per requirement it must have UPS support with minimum one hour backup for smooth functioning of the instrument.
16. Computer programmed data acquisition system must have intel i7 or better processor, USB ports, 32 GB RAM and 2 TB hard drive, monitor/monitors (27inch or more) or more with dual display, mouse and keyboards as per requirement. Data processing software must be preloaded on the AFM system as well as on the additional PC specifically for data storage and analysis. AFM data analysis software separately.

17. On-site training and demonstration of the AFM system for all the modes or capabilities. Calibrations should be performed using systems calibration kit and appropriate standard reference materials having valid certification date.
18. All the pre installation requirement for the onsite installation must be specified e.g. space, electricity etc.
19. All the spare parts that may be required later on should be made available for next 10 years.
20. AFM system must have two year's comprehensive onsite warranty (after commissioning) which should include all the parts of the system.

Therefore, following extension in due date of submission & date of opening of the said tender may be read exactly as follows:

For: Due date & time of tender submission
Read as: 17.01.2023 up to 3:00 PM (IST)

For: Date & Time of Tender Opening
Read as: 24.01.2023 at 3:00 PM (IST)

All other terms & conditions of said tender will remain the same.



Stores & Purchase Officer