श्री चित्रा तिरुनाल आयुर्विज्ञान एवं प्रौद्योगिकी संस्थान, जैवचिकित्सकीय प्रौद्योगिकी स्कंध
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY
BIO MEDICAL TECHNOLOGY WING
(एक राष्ट्रीय महत्व का संस्थान, विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार)
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No. **SCTIMST/BMT/GTE/8193-PMD/2023-24/01** Date: **10.01.2024**

CORRIGENDUM - 02

Tender No. & Date: SCTIMST/BMT/GTE/8193-PMD/2023-24/01 dated 11.12.2023

Name of Item: ATOMIC FORCE MICROSCOPE (AFM)

We hereby amend the above Global Tender to the extent indicated below:

CRITICAL DATE SHEET

Particulars	Existing	To be read as
Bid Submission End Date & Time	15.01.2024, 05.00 PM	22.01.2024, 05.00 PM
Submission of Hard Copy of EMD & Techno-Commercial Bid End Date & Time	20.01.2024, 05.00 PM	29.01.2024, 05.00 PM
Techno-Commercial Bid Opening Date & Time	22.01.2024, 11.30 AM	30.01.2024, 11.30 AM

AMENDMENTS IN TENDER CONDITIONS/SPECIFICATIONS

#	Tender Ref.	Existing	To be read as
01.	Terms & Conditions Sl. No. 32 Performance Guarantee/ Security Deposit [Page No. 08]	For all supplies/contract above rupees one lakh, the successful tenderer should furnish a Performance Guarantee/ Security Deposit @ 10 percent of purchase order value excluding GST against the item with warranty in the form of Fixed Deposit or Bank Guarantee from a nationalized	For all supplies/contract above rupees one lakh, the successful tenderer should furnish a Performance Guarantee/ Security Deposit @ 5 (five) percent of purchase order value excluding GST against the item with warranty in the form of Fixed Deposit or Bank Guarantee from a nationalized

		/scheduled bank having a validity period of 60 days beyond the completion of all contractual obligations including warranty obligation of the supplier. The format for bank guarantee is given in 'Appendix-3'.	/scheduled bank having a validity period of 60 days beyond the completion of all contractual obligations including warranty obligation of the supplier. The format for bank guarantee is given in 'Appendix-3'.
02.	Terms & Conditions Sl. No. 40 (a) Mode of Payment for Foreign Currency [Page No. 09]	i. 70% against negotiation of documents through irrevocable Letter of Credit. 30% against successful installation and commissioning. (As a pre-condition to open LC, the successful tenderer should furnish Performance Guarantee / Security Deposit @10% of the total assignment value (purchase value) in the form of Fixed Deposit or Bank Guarantee from the nationalised/ scheduled bank which would be valid for a period of 60 days beyond the completion of all contractual obligations of the supplier including warranty). ii. Wire Transfer will be applicable only after the receipt of the items, Bank Guarantee and original documents such as Invoice, Certificate of Origin, Air Way Bill, Insurance etc.	i. 80% against negotiation of documents through irrevocable Letter of Credit. 20% against successful installation and commissioning. (As a pre-condition to open LC, the successful tenderer should furnish Performance Guarantee / Security Deposit @5% of the total assignment value (purchase value) in the form of Fixed Deposit or Bank Guarantee from the nationalised/ scheduled bank which would be valid for a period of 60 days beyond the completion of all contractual obligations of the supplier including warranty). ii. Wire Transfer will be applicable only after the receipt of the items, Bank Guarantee and original documents such as Invoice, Certificate of Origin, Air Way Bill, Insurance etc.
03.	Annexure-1 Sl. No. 1 (a) AFM Scanning Configuration [Page No. 12]	XYZ tip-scanning configuration	Tip-scanning or sample scanning configuration

04.	Annexure -1 Sl. No. 1 (b) Essential Features [Page No. 12]	i. Inbuilt active vibration isolation, airflow protection, scanner, CCD camera, and micrometer translation stages and all these come in as an integrated single unit. ii. The AFM should come as a standalone system, and not an additional/optional/ extension feature of other microscopy/spectroscopy techniques.	i. Active vibration isolation, airflow protection, scanner, CCD camera / optics, and micrometer translation stages. ii. The AFM should come as a standalone system, and not an additional/optional/ extension feature of other microscopy/ spectroscopy techniques.
05.	Annexure - 1 Sl. No. 1 (c) Sample Size [Page No. 12]	accommodate sample sizes ≥ 100 mm in diameter and height ≤ 40 mm	accommodate sample sizes ≥ 50 mm in diameter and height ≥ 20 mm
06.	Annexure - 1 Sl. No. 1 (e) Integrated manual sample positioning translation stage size: [Page No. 12]	≥ 20 mm x 20 mm travel in XY.	≥ 10 mm x 10 mm travel in XY.
07.	Annexure - 1 Sl. No. 1 (g) Anti-vibration table [Page No. 12]	Inbuilt active anti-vibration table (min. 25 dB (94.0%) at 5 Hz, 40 dB (99.0%) above 10 Hz) with detection of non-adjustable external vibrations and consequent automatic re-measurement of the current scan line.	Active anti-vibration table (min. 25 dB (94.0%) at 5 Hz, 40 dB (99.0%) above 10 Hz) comes part of the AFM system.
08.	Annexure - 1 Sl. No. 1 (h) Mode of Operation [Page No. 12 & 13]	i. Contact mode AFM – Height/Topography, deflection and Friction imaging. ii. Tapping/intermittent mode AFM – Height/Topography, Phase, amplitude imaging iii. Lateral Force Microscopy iv. Force Modulation microscopy v. Magnetic Force Microscopy	i. Contact mode AFM – Height/Topography, deflection and Friction imaging. ii. Tapping/intermittent mode AFM – Height/Topography, Phase, amplitude imaging iii. Lateral Force Microscopy iv. Force Modulation microscopy v. Magnetic Force Microscopy

		vi. Force-Distance spectroscopy vii. Electrostatic Force Microscopy viii. Lithography ix. AFM Nanoindentation x. Imaging in liquid	vi. Force-Distance spectroscopy vii. Electrostatic Force Microscopy viii. Lithography ix. AFM Nanoindentation x. AFM Imaging in liquid
09.	Annexure - 1 Sl. No. 2 (a) Principle [Page No. 13]	Flexure-based XY scanner and decoupled piezo-based Z-scanner. Piezo tube scanners are not acceptable.	Flexure-based XY scanner and decoupled piezo-based Z-scanner, or Piezo tube scanner designs.
10.	Annexure - 1 Sl. No. 2 (b) XY axes Scanning range [Page No. 13]	≥ 100 µm	≥ 80 µm
11.	Annexure - 1 Sl. No. 2 (c) Z-axis scanning range [Page No. 13]	≥12 µm.	≥10 µm.
12.	Annexure - 1 Sl. No. 2 (d) The noise levels of Z-measurement [Page No. 13]	≤ 40 pm (RMS, dynamic mode in air).	≤ 100 pm (RMS, dynamic mode in air).
13.	Annexure - 1 Sl. No. 2 (f) Modes of operation [Page No. 13]	Option for selecting Z-scanner operation in open and closed loop mode.	Selection of Z-scanner operation in open and closed loop mode.
14.	Annexure - 1 Sl. No. 3 (b) Operating wavelength AFM laser [Page No. 13]	Range: ≥ 645 nm and ≤ 655 nm.	Range: ≥ 630 nm and ≤ 850 nm.
15.	Annexure - 1 Sl. No. 4 (b) Direct Optical Video Access by CCD [Page No. 13]	The AFM must include top and side view optics and a camera. Optical images of the surface of the scanning AFM cantilever/probe as well as that of the sample surface should be	The AFM must include top or side view optics and a camera. Optical images of the surface of the scanning AFM cantilever/ probe as well as that of the sample surface should be

		viewable from top and side view in real-time.	viewable from top, and optionally from side view in real-time.
16.	Annexure - 1 Sl. No. 5 (a) [Page No. 14]	Analogue to Digital Converter (ADC) and Digital to Analogue Converter: ≥24 Bit ADC and DAC for Zoom-In and precise acquisition.	Deleted
17.	Annexure - 1 Sl. No. 5 (b) [Page No. 14]	Processor: Field Programmable Gateway Array (FPGA) Module & Embedded Processor ALTERA FPGA, 32Bit NIOS-CPU.	Deleted
18.	Annexure - 1 Sl. No. 5 (c) [Page No. 14]	Operating system: ≥256 MB RAM, 80MHz, multitasking operating system.	Deleted
19.	Annexure - 1 Sl. No. 5 (d) [Page No. 14]	Excitation & Modulation Outputs: ≥4 x 16Bit DAC, 20MHz	Deleted
20.	Annexure - 1 Sl. No. 5 (e) [Page No. 14]	X/Y/Z-Axis Scan & Position Controller: ≥ 3 x 24Bit DAC, 200kHz	Deleted
21.	Annexure - 1 Sl. No. 5 (f) [Page No. 14]	X/Y/Z-Axis Position Measurement: ≥ 3 x 24Bit ADC, 200kHz	Deleted
22.	Annexure - 1 Sl. No. 5 (g) [Page No. 14]	Analog signal input bandwidth: DC to 5MHz	Deleted
23.	Annexure - 1 Sl. No. 5 (h) [Page No. 14]	Main Input Signal capturing: ≥ 2 x 16Bit ADC, 20MHz, 2 x 24Bit ADC, 200kHz	Deleted
24.	Annexure - 1 Sl. No. 5 (i) [Page No. 14]	Additional User Signal Outputs: ≥ 3 x 24Bit DAC, 200kHz	Deleted
25.	Annexure - 1 Sl. No. 5 (j) [Page No. 14]	Additional User Signal Inputs: ≥ 3 x 24Bit ADC, 200kHz	Deleted
26.	Annexure - 1 Sl. No. 5 (k) [Page No. 14]	Additional Monitor for Signal Outputs: ≥ 2 x 24Bit ADC, 200kHz	Deleted

27.	Annexure - 1 Sl. No. 5 (l) [Page No. 14]	Digital Synchronization: ≥ 2 x Digital Out, 2 x Digital In, 2 x I2C Bus	Deleted
28.	Annexure - 1 Sl. No. 5 (m) [Page No. 14]	Communication to PC: USB 2.0 Hi-Speed or better	Deleted
29.	Annexure - 1 Sl. No. 5 (n) [Page No. 14]	System synchronization: 10MHz internal quartz or external clock	Deleted
30.	Annexure - 1 Sl. No. 5 (o)	Nil	Operational modes with AFM controller: AFM system controller should have suitable electronics and sufficient number of lock-in amplifiers capable of uninterrupted operation of AFM modes such as: Contact mode AFM – Height/Topography, deflection and Friction imaging, Tapping/intermittent mode AFM – Height/Topography, Phase, amplitude imaging , Lateral Force Microscopy, Force Modulation microscopy, Magnetic Force Microscopy, Force-Distance spectroscopy, Electrostatic Force Microscopy, Lithography, and AFM Nanoindentation.
31.	Annexure - 1 Sl. No. 5 (p)	Nil	Operational noise level: The AFM control electronics should be capable of meeting the required minimum noise level of AFM operation as specified in 2 (d) and 2(e).
32.	Annexure - 1 Sl. No. 5 (q)	Nil	Cantilever tuning: The AFM control unit should have electronics capable for performing cantilever frequency sweep for finding cantilever resonance frequency, Q-control, as well as have electronics that can perform thermal tuning of cantilever for

			determining cantilever spring constant.
33.	Annexure - 1 Sl. No. 5 (r)	Nil	AFM Data acquisition: AFM control unit should have electronics capable of simultaneous acquisition of minimum three number of imaging data channels. For example, in Tapping or intermittent mode, there should be simultaneous acquisition of Topography, phase and amplitude images in 3 separate channels. In the case of contact mode imaging, simultaneous acquisition of Topography, deflection and friction images. In addition to the acquisition of images, the AFM control unit should have electronics capable of performing Force-distance spectroscopy measurements on selected points in the AFM images.
34.	Annexure - 1 Sl. No. 6 Quality Certificate: Compliance of the Quality management system of the AFM manufacturer to International Standard valid for the development, manufacturing and sales of high-precision measurement equipment. [Page No. 14]	The manufacturer of the AFM system should be ISO 9001: 2015 certified.	The manufacturer of the AFM system should have an International Quality certification e.g. ISO 9001: 2015.
35.	Annexure - 1 Sl. No. 8 (a) AFM control and Image acquisition software	i. Licensed software package for AFM control and operation of all modes of the instrument, laser and photodiode detector	i. Licensed software package for AFM control and operation of all modes of the instrument, laser and photodiode detector

	[Page No. 15 & 16]	alignment, cantilever tuning for phase contrast imaging, cantilever spring constant calibration, image acquisition, and image processing. ii. Acquisition software has to be compatible with Microsoft Windows 10 /11 Professional. iii. Provision for software-controlled manual AFM tip approach, automatic Tip engagement, and Tip retraction. iv. In case a scan is disturbed along a line, there should be an option for rescanning the disturbed line. v. Sample Navigator: Assistant for localized pan and zooming within a large area scan. vi. Acquisition of Scan and Retrace images. vii. Force-spectroscopy measurement. viii. Option for Defection sensitivity calibration of AFM cantilever.	alignment, cantilever tuning for phase contrast imaging, cantilever spring constant calibration, image acquisition, and image processing. ii. Acquisition software has to be compatible with Microsoft Windows 10 /11 Professional. iii. Provision for software-controlled manual AFM tip approach, automatic Tip engagement, and Tip retraction. iv. In case a scan is disturbed along a line, there should be an option for rescanning the disturbed line. v. Sample Navigator: Assistant for localized pan and zooming within a large area scan. vi. Acquisition of Scan and Retrace images. vii. Force-spectroscopy measurement. viii. Option for Deflection sensitivity calibration of AFM cantilever, cantilever spring constant calibration, adhesion Force measurement, modulus and stiffness measurement.
36.	Annexure - 1 Sl. No. 8 (b) Image analysis software [Page No. 16]	i. Separate software has to be provided for AFM data analysis. ii. Acquisition and analysis software has to be compatible with Microsoft Windows 10 /11 Professional. iii. AFM analysis software should have the following minimum features:	i. In addition to AFM data acquisition software, suitable offline AFM data analysis software has to be provided by the AFM supplier that can be used to analyze the acquired AFM data file format. ii. Acquisition and analysis software has to be compatible with Microsoft

		iv. 2D and 3D visualization, analysis –surface roughness RMS measurement, line profile, measure length and angles, step height measurement, Region of interest selection, image flattening, color scale, cantilever spring constant calibration, adhesion Force measurement, modulus and stiffness measurement, reporting/exporting options,Spatial and Fourier Low-Pass Filtering, Histogram Equalization, Zooming, Contrast enhancement, noise removal, and Slope Correction.	Windows 10 /11 Professional. iii. AFM data analysis software should have the following minimum features:- 2D and 3D visualization, analysis – surface roughness RMS measurement, line profile, measure length and angles, step height measurement, Region of interest selection, image flattening, color scale, analysis of AFM force distance curves, reporting/ exporting options, Spatial and Fourier Low-Pass Filtering, Histogram Equalization, Zooming, Contrast enhancement, noise removal, and Slope Correction.
37.	Annexure - 1 Sl. No. 9 Accessories: Accessories for the smooth operation of the instrument. [Page No. 16]	Calibration sample for XYZ scanner calibration, Minimum of 10 numbers of contact and Tapping mode AFM tips, Tweezers for handling AFM tips and samples, and minimum 10 number of AFM sample support magnetic stainless steel disc ($\leq$ 10 mm diameter $\leq$ 15 mm).	Calibration sample for XYZ scanner calibration, Minimum of 20 numbers of contact and Tapping mode AFM tips, Tweezers for handling AFM tips and samples, and minimum 10 number of AFM sample support magnetic stainless steel disc (diameter $\geq$ 10 mm and $\leq$ 15 mm).
38.	Annexure - 1 Sl. No. 12 Warranty and Support [Page No. 16]	i. A total of 10 years of support including warranty of 3 years and AMC & CMC for 7 years. ii. The software updates shall be provided free of cost throughout the normal lifetime of the product.	i. 7 Years AMC and 7 Years CMC post warranty period of 3 years shall be quoted separately. It will be the choice of user to go for AMC or CMC after warranty. ii. The software updates shall be provided free of cost throughout the normal lifetime of the product.

39.	Annexure - 1 Sl. No. 13 [Page No. 16 & 17]	Optional Upgrades - Provision for future upgradation. i. The capability of integrating with a single objective digital inverted microscope for combined AFM and Fluorescence imaging of cells. ii. Option to upgrade to Fluid manipulation using AFM tips with aperture for injecting or extraction of fluids on single cells. iii. Upgradation for cell manipulation works such as insertion, extraction, lithography in liquid, and colloidal probe microscopy by using hollow cantilevers.	Upgrades - Provision for future upgradation. i. The AFM supplier should provide an AFM system that should be compatible for upgradation in the future, with accessories such as Digital Inverted Microscope for combined AFM and fluorescence or phase contrast or differential interference contrast imaging of cells. ii. AFM should be compatible for upgradation, in the future, to perform advanced fluid cell operations such as AFM imaging & force-spectroscopy measurements under flow or perfusion of liquids.

The Compliance Statement in Excel Format is also modified to accommodate the above changes. Bidders are advised to ensure that they upload the modified version of Compliance Statement along with their bid.

All other terms and conditions of the original tender notice shall remain unchanged.

Sd/-
DIRECTOR

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