

## *Warranty*

We are pleased to submit the information of **NAMA-STM** system, specification and our latest price and sales conditions as you inquired about.

Description of good :																								
<p><b>NAMA-STM SS3 SL</b> is an advanced scanning tunneling microscope capable of providing clear, accurate and reproducible 2D and 3D images in nano meter-scale.</p> <p><i>Now with New Advantages :</i></p> <ol style="list-style-type: none"> <li>1-Constant Current and Constant Height mode</li> <li>2- <u>Different Spectroscopy Options</u></li> <li>3-<u>Different -STM Lithography options</u></li> <li>3-<u>Camera Motorized</u></li> <li>4-<u>Adjust Sample Conservator Table electronically</u></li> <li>5- <u>Micrometer Dement ion and controlled Table movement capability</u></li> <li>6- <u>Electronic control PID Steps.</u></li> <li>7- <u>Camera Turn on &amp; turn off electronically</u></li> </ol> <p>Main parts of each system includes:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>Consisting of:</b></th> <th style="text-align: right;"><b>Qty</b></th> </tr> </thead> <tbody> <tr> <td>1- Electronic control system</td> <td style="text-align: right;">1</td> </tr> <tr> <td>2- Special box for isolation of electrical and mechanical noi</td> <td style="text-align: right;">1</td> </tr> <tr> <td>3- STM Head, camera and light inside the isolation box</td> <td style="text-align: right;">1</td> </tr> <tr> <td>4- Interface boards</td> <td style="text-align: right;">1</td> </tr> <tr> <td>5- Software CD</td> <td style="text-align: right;">1</td> </tr> <tr> <td>6- Connection cables and related connectors</td> <td style="text-align: right;">10</td> </tr> <tr> <td>7- Interface cable</td> <td style="text-align: right;">1</td> </tr> <tr> <td>8- Computer Case</td> <td style="text-align: right;">1</td> </tr> <tr> <td>9- Key board</td> <td style="text-align: right;">1</td> </tr> <tr> <td>10- Mouse</td> <td style="text-align: right;">1</td> </tr> <tr> <td>11- LCD monitor 17"</td> <td style="text-align: right;">1</td> </tr> </tbody> </table>	<b>Consisting of:</b>	<b>Qty</b>	1- Electronic control system	1	2- Special box for isolation of electrical and mechanical noi	1	3- STM Head, camera and light inside the isolation box	1	4- Interface boards	1	5- Software CD	1	6- Connection cables and related connectors	10	7- Interface cable	1	8- Computer Case	1	9- Key board	1	10- Mouse	1	11- LCD monitor 17"	1
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**L-type Frame**

Consisting of a two column precision aligned, high stiffness structure with a fixed lower T-slot table and locking handle. Absolute thermal drift balance is achieved by appropriate material and dimensional selection. All mechanical parts are assembled on the L-type frame with modular designs for easy maintenance and repair.

**Z -Approach Module**

Consisting of a precision aligned sliding mechanism and high accuracy linear pizoemotor:

Z movement resolution = 0.045 nm  
= 0.0045 nm in zoom mode

High mechanical stability is achieved through rigid structural components accompanied by zero-backlash mechanism.

**Tip- Holder Module**

Consisting of a precision aligned 3-D of freedom mechanism and high accuracy 3 axes pizeotube:

Range of X,Y Tip deflection = 8 μm  
Range of Z (vertical) Tip movement = 3 μm  
X,Y scanning resolution = 0.12 nm  
= 0.012 nm in zoom mode

High mechanical stability is achieved through rigid structural components accompanied by zero-backlash mechanism. Ergonomic considerations are implemented for easy and fast tip replacement.

**X-Y Table**

Consisting of motorized clamp, a precision aligned 2-D motorized sliding mechanism and sample holder. Ergonomic considerations are implemented for easy and fast sample replacement.

**Digital Electronics**

Includes tunneling current measurement with very low noise signal amplification achieved due to the advanced transmission and filtering techniques.

Includes position controllers for all microscope functions through keyboard, mouse and trackball.

**Specifications include:**

Maximum X,Y line scan frequency = 20 Hz  
Sample Bias Voltage range = ± 10 V

Sample Bias resolution = 0.3 mV  
 Current Set point range =  $\pm 100$  nA  
 Current set point resolution = 3 pA  
 Maximum equivalent intrinsic Current noise = 10 pA Rms  
 Controller cut off frequency  
 Normal mode= 1 Hz – 10 Hz – 100 Hz –500-Hz- 1000 Hz-2000 Hz  
 Zoom mode = 0.1 Hz – 1 Hz – 10 Hz –50 Hz-100 Hz - 200 Hz  
 Maximum data sampling rate = 100 Hz  
 Maximum X,Y step frequency = 100 Hz  
 Power consumption:  
 Input: 220V 50-60 Hz – 0.7A  
 Scanning speed: adjustable; 20 lines/ second max.  
 Scan size and positions: adjustable  
  
 Bumpless transfer function providing delicate transfer of control from computer to automatic electronic control and vice versa.  
  
 Ultra Phase logarithmic converter used for loop linearization  
  
**Windows-Based Software**  
 User friendly windows-based software provides full control over the hardware and a wide range of image processing facilities:  
 Image size, resolution and live image all adjustable.  
 Scan in both constant height and constant current modes.  
 Ability to show various views of different images simultaneously  
 View images in 2D and 3D  
 Using different palettes  
 Edit palettes  
  
 Select  
 View each scan line in the image  
 Flexible coloring  
 Different filters:  
 - Median  
 - Low pass Average  
 - Low pass Gaussian  
 - High pass  
 - High boost  
 - Plane adjust  
 - Log  
 - Scale

<ul style="list-style-type: none"> <li>- Negative</li> <li>- Resample</li> <li>- Crop</li> <li>- Line adjust</li> </ul> <p>Show images as icons</p> <p>Automatic and manual tip approach</p> <p>Select the tip speed to move</p> <p>Live display of tip during approach</p> <p>Select scan area</p> <p>Scan with selectable resolution</p> <p>Scan with selectable frequency</p> <p>Different PID configurations</p> <p>Zoom capability</p> <p>Manual Tip movement</p> <p>Select CSP and sample Bias</p> <p><b>Computer specifications</b></p> <p>P5K ASUS, 4 GB Ram, HDD 160 GB, CPU Core2duo 6550 Intel, DVD-RW, Vga 512 MG 8500GT, AV/PV Maker Capture.</p> <p>The Manufacturer reserves the right to change the computer specification according to topical situation in the computer market.</p> <p><b>Monitor specification</b></p> <p>17" LCD display monitor</p> <p><b>Camera and Cold beam</b></p> <p>Camera and Cold beam inside the isolation box for monitoring the tip</p> <p>position and movement:</p> <p>Camera resolution is approximately x100.</p> <p>Cold beam for preventing any thermal drift.</p> <p><b>Spare parts:</b></p> <ul style="list-style-type: none"> <li>- HOPG sample</li> <li>- Samplers</li> <li>- Conductive silver paint</li> <li>- Small mechanical tool box</li> <li>- STM Tips</li> <li>- Checking sample</li> </ul>	<p><b>Qty</b></p> <p>1</p> <p>4</p> <p>1</p> <p>1</p> <p>10</p> <p>2</p>
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**Installation by Local agents product Engineer**

**Training:** One person may attend the operator training course during 3 days according to the schedule (Appendix 1) at NATSYCO site in Tehran.

**Terms and conditions:**

Guaranty:

12 months from installation completion or 15 months from ex-work dispatch according to Appendix 2.

Service support:

Spare parts are guaranteed to be available for a minimum period of 10 years. Installation and service support is available from local agent in Iran- Tehran.

Time of Delivery:

4-5 months from confirmed order and receive 50% cash in advance.

Terms of Delivery:

CIP Tehran

Terms of Payment:

50 % cash in advance

50 % cash on delivery

Bank Account: 104-2-2522915-1, Eghtesad E Novin Bank, Kargar Shomali Branch, Tehran. Iran.

In favor of Nano System Pars.

Validity:

This Performa Invoice is valid for 30 days.

Export packing:

Pack in 7 boxes Gross weight approximately: 55 Kg.