

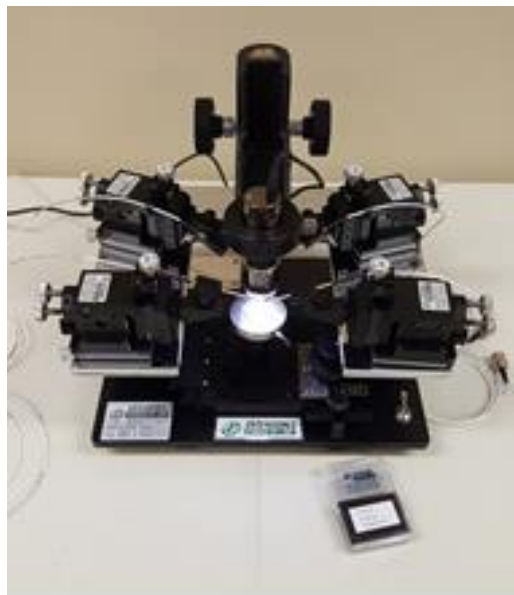


EVERBEING Model C-2 Portable Probe Station

Setup Guide

*ICI-361
CMC-00200-05333
V1.0*

October 5, 2017



EVERBEING Model C-2 Portable Probe Station

NOTICES

License

Read the following license agreement (“**Agreement**”) carefully, which is a legal agreement between You and the Canadian Microelectronics Corporation / Societe Canadienne de Micro-Electronique operating as CMC Microsystems (“**CMC**”) regarding Your use of the Licensed Material (as defined below).

DEFINITIONS: In this Agreement, the following terms shall have the following meanings:

“**Licensed Material**” means this setup guide.

“**You**” (or “**Your**”) means an individual or legal entity exercising permissions granted by this Agreement.

GRANT OF LICENSE: As a post-secondary academic institution (“**Academic User**”), You are granted a license to use this material for non-commercial, scholarship, research and teaching purposes only. As an Academic User You may reproduce the Licensed Material for such approved purposes without CMC’s prior written consent provided that any reproduction, transmission or distribution of the Licensed Material: (i) contains the copyright notice set out below; and (ii) remains within the Academic User’s institution. The copyright holders must also be acknowledged in any publication describing work which involved use of the Licensed Material.

Except for the license expressly granted in this Agreement, CMC and its licensors retain all right, title, and interest in and to the Licensed Material.

NO REPRESENTATIONS OR WARRANTIES: The Licensed Material, which includes all Open Source Software included in the Licensed Material, is being provided to You “as is”. CMC does not represent or warrant that the Licensed Material will (1) meet Your requirements, (2) operate in a continuous or error free manner, (3) operate in all the combinations, which may be selected for use by You. Other than as expressly set out herein there are no representations, warranties or conditions of any kind whatsoever, express or implied, statutory or arising otherwise in law, including but not limited to merchantable quality and fitness for a particular purpose in connection with the Licensed Material or use thereof. To the maximum extent permitted by law, in no event shall CMC (or any of its officers, directors, employees, agents, contractors or representatives) be liable or responsible for damages of any kind arising out of Your use or inability to use the Licensed Material or otherwise in connection with this Agreement. Your sole and exclusive remedy is to discontinue use of the Licensed Material.

MISCELLANEOUS: CMC may terminate this Agreement and the license granted in this Agreement at any time in its sole discretion. CMC may modify or amend the terms of this Agreement at any time by providing notice of such change on its website (www.cmc.ca) or through the Licensed Material. If any provision is invalid or unenforceable under applicable law, it shall to that extent be deemed omitted and the remaining provisions shall continue in full force and effect. This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable in Ontario and both parties submit to the exclusive jurisdiction of the courts of the Province of Ontario.

Copyright

© 2017 CMC Microsystems. All rights reserved.

Building 50, Innovation Park at Queen's University,
945 Princess St., Kingston, Ontario Canada K7L 3N6

Trademark

Trademarks are the property of their respective owners.

Table of Contents

1. Introduction.....	5
1.1. Items Included.....	5
1.2. System Specifications	5
2. Setting up the Everbeing Model C-2 Portable Probe Station.....	6
3. Packing up the Station.....	13
4. Acknowledging CMC.....	13

List of Figures

Figure 1: Opening the Pelican Case.....	6
Figure 2: Probe Station and Positioners Ready to Be Configured (Microscope Installed, Vacuum Pump and Hex Keys Not Shown)	7
Figure 3: Probe Tilt Adjustment and Height Adjustment Thumbscrews, and Cable Holder Clamp	8
Figure 4: a) Microscope Installation b) Probe Tips Off-Center to Allow Close Placement.....	8
Figure 5: a) Positioner Arrangement, b) Magnetic Lock on Positioners	9
Figure 6: a) Remove a Needle Probe from the Case; b) Install the Probe into the Coaxial Holder	10
Figure 7: a) Probes Centered at the Microscope Spotlight Center; b) Probes Leveled Above Chuck	11
Figure 8: Stage and Chuck Movement and Vacuum Controls	12

1. Introduction

This guide provides instructions for the unpacking, setup, and repacking of the EVERBEING Model C-2 Portable Probe Station borrowed from the CMC Microsystems' Test Equipment Lending Pool.

The C-2 Portable Probe Station, with a 12.5" square footprint, is ideal for DC and RF applications for samples of 2" or less. The probe station stands on four vibration-absorbing feet and is suitable for portable use at a desk or workbench or placement into an environmental chamber. The station is equipped with a USB microscope and vacuum pump for the vacuum chuck. Currently, the station is supplied with DC needle probes and four positioners and it is set up for DC I-V measurements, diode and transistor characterization, and 4-point probe impedance measurements. Options are available from the manufacturer to equip the probe positioners for RF measurements, but this is not currently supported at CMC.

1.1. Items Included

- EVERBEING Model C-2 Probe Station
- Dino-Lite Edge USB microscope and software
- 4x EB-050E Micropositioners with Coaxial Tip Holder and 1 m cable
- Two cases Tungsten T20-50 probe tips
- Low Noise Vacuum Pump
- Set of Hex Key Wrenches
- Pelican Shipping Case

1.2. System Specifications

Probe Station

- 2" Stainless Steel Vacuum Chuck
- Vacuum rings for wafer and single die
- Chuck Stage Travel: 2" in X & Y with 10 μm positioning resolution
- Chuck Theta: ± 15 degrees
- Dimensions: Width, Length, Height: 320mm (12.6")
- Weight: 15 kg total, with microscope and positioners

Positioners

- EB-050E positioner
- Vacuum rings for wafer and single die
- X-Y knobs in line with Linear 12 mm Travel in X, Y, & Z
- Stainless Steel Lead Screw with 80 Thread/Inch for 1 μm positioning resolution
- Lever-actuated magnetic base for quick-release locking to platen
- Coaxial tip holder with 1.5 m cable with BNC male connector

Microscope

- Dino-Lite: 200x magnification

2. Setting up the EVERBEING Model C-2 Portable Probe Station

Because the C-2 probe station is portable, it is shipped in a small Pelican Case, with all accessories inside. Proper unpacking when received and packing for shipping are imperative to ensure the safe transportation and longevity of the probe station.

To unpack the case:

1. Open the case and carefully lift out the items on the first layer of foam.
In Figure 1a), these are the probe positioners. However, the layers may vary, and the microscope and pump may be on the top layer.

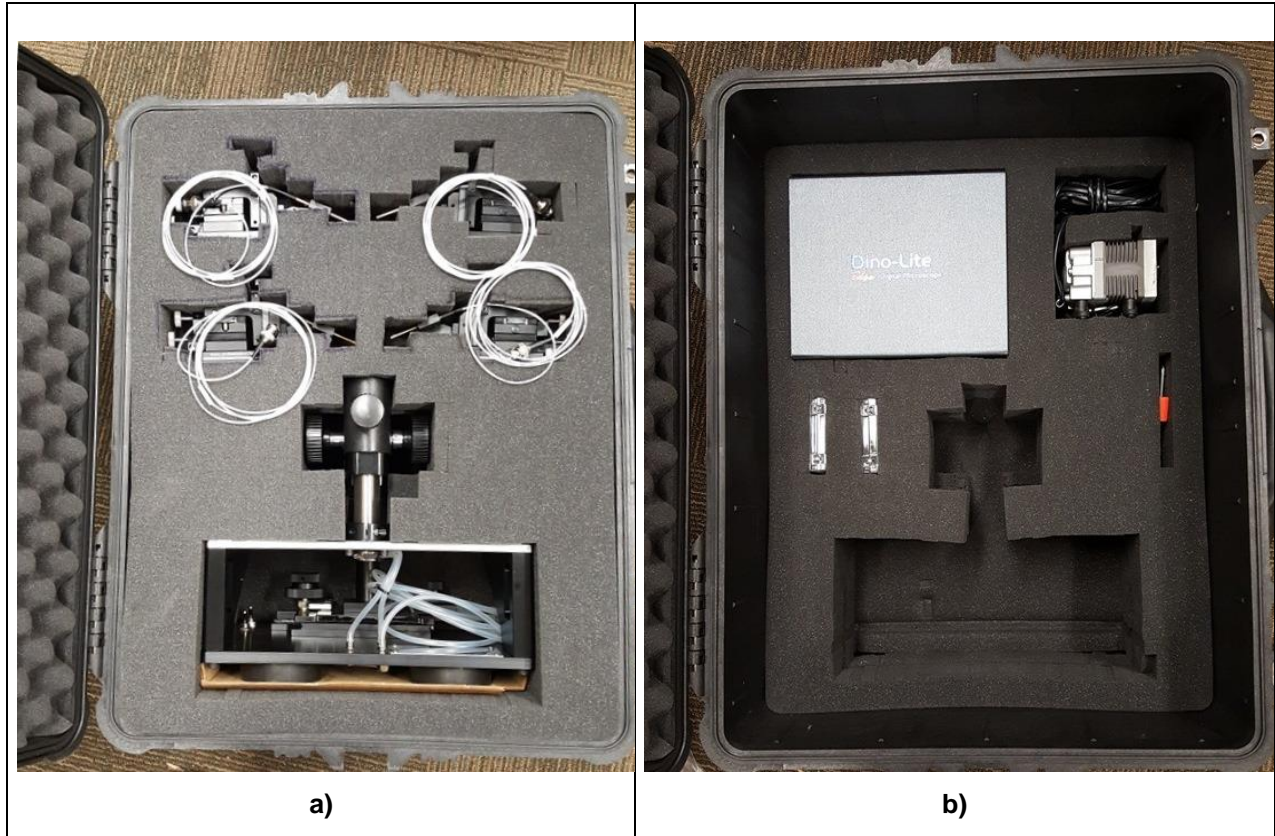


Figure 1: Opening the Pelican Case

2. Place the items on your workbench, leaving room for the probe station.
3. Carefully lift out the foam layer.
4. Hold the probe station by the black sides, carefully lift it out of the case, and place it on the workbench.

5. Remove the remaining accessories and place them on the workbench. (Figure 2).



Figure 2: Probe Station and Positioners Ready to Be Configured (Microscope Installed, Vacuum Pump and Hex Keys Not Shown)

6. Replace the foam layer, close the case, and store it for return shipping.
Note: The vacuum hose is coiled and stored in the probe station cavity between the base and the platen.
7. Remove the vacuum hose and roll it out to where the pump will sit.
8. Plug the hose into the pump.

While inspecting the probe station, note that the chuck/stage does not have Z-height adjustment. Probe tip to Device Under Test (DUT) sample spacing is set using the probe holder tilt thumbscrew, and the positioner height adjustment thumbscrew (see Figure 3).

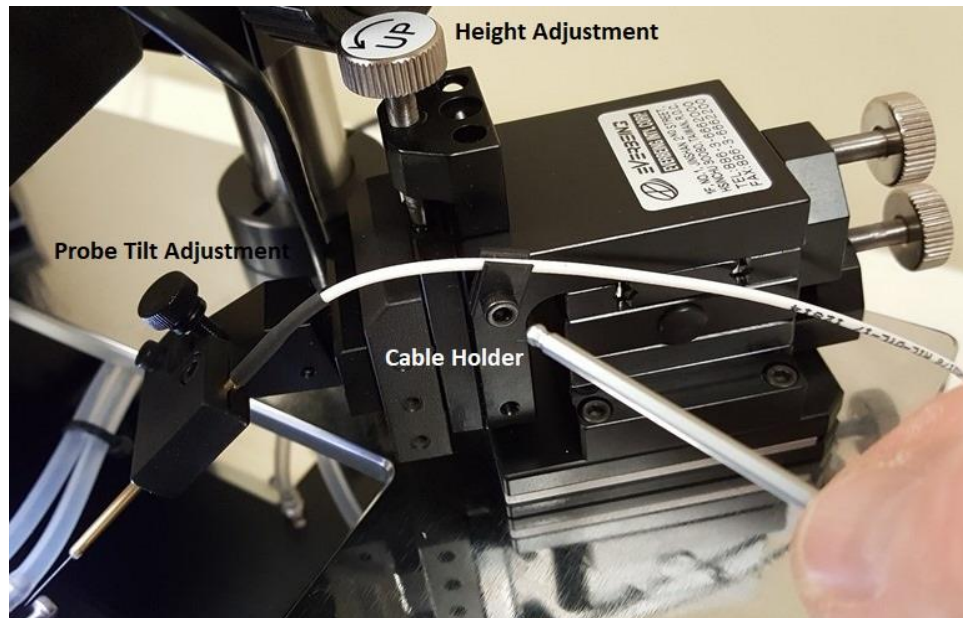


Figure 3: Probe Tilt Adjustment and Height Adjustment Thumbscrews, and Cable Holder Clamp

To assemble the microscope and positioners onto the probe station:

1. Unpack the microscope and install it into the focus block mounting ring, as shown in Figure 4a).

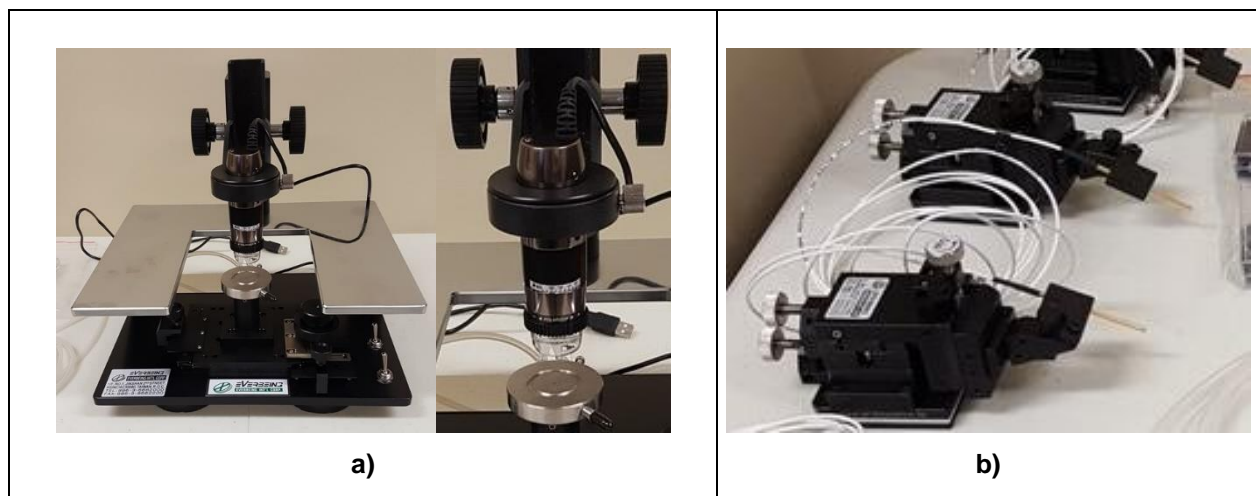


Figure 4: a) Microscope Installation b) Probe Tips Off-Center to Allow Close Placement

2. Ensure that the focus control on the microscope faces forward and tighten the ring thumbscrew.

3. Install the software on a computer and connect the microscope using the USB cable.

Note: The positioners have probe holders that are off-centre. This allows for the probes to be placed side-by-side on the platen, having the probe tips as close as possible. (Figure 4b)

4. Place the probe positioners on the platen and lock them in place, as shown in Figure 5.

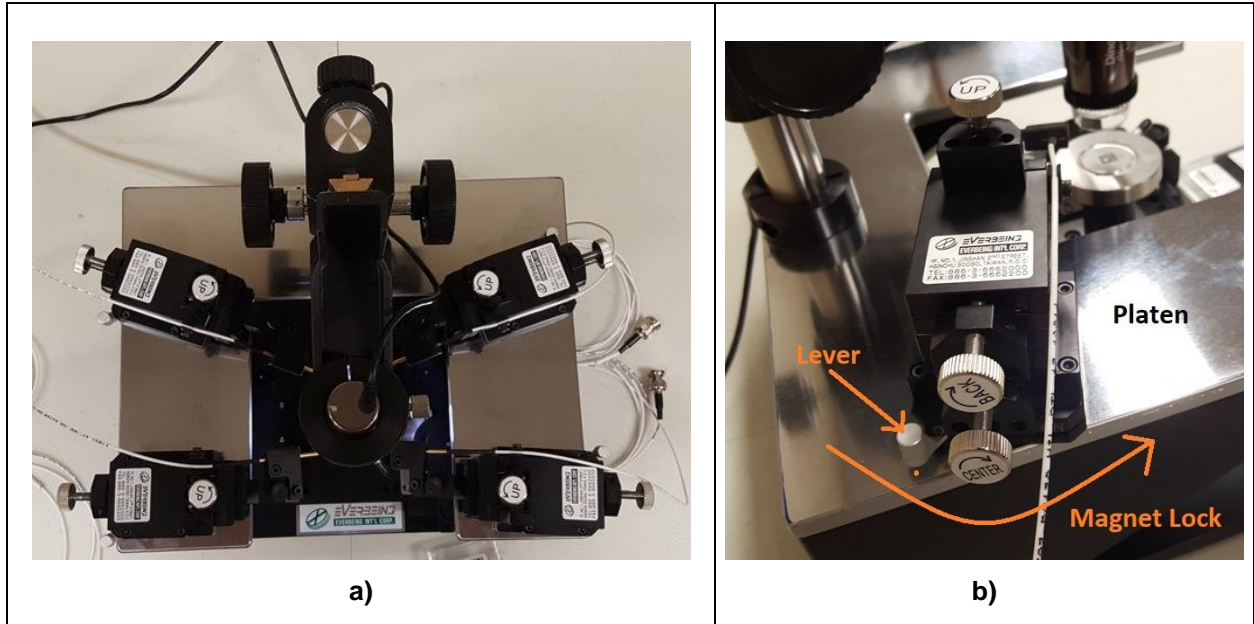


Figure 5: a) Positioner Arrangement, b) Magnetic Lock on Positioners

5. For each positioner, carefully remove a needle probe from the probe case and place the probe tip into the coaxial probe holders.

Note: Take care when removing the probe from the case as they are very sharp and the tips can be damaged or collect debris very easily. The coaxial probe tips are a friction fit and the probes can be carefully inserted by hand. See Figure 6 for reference.

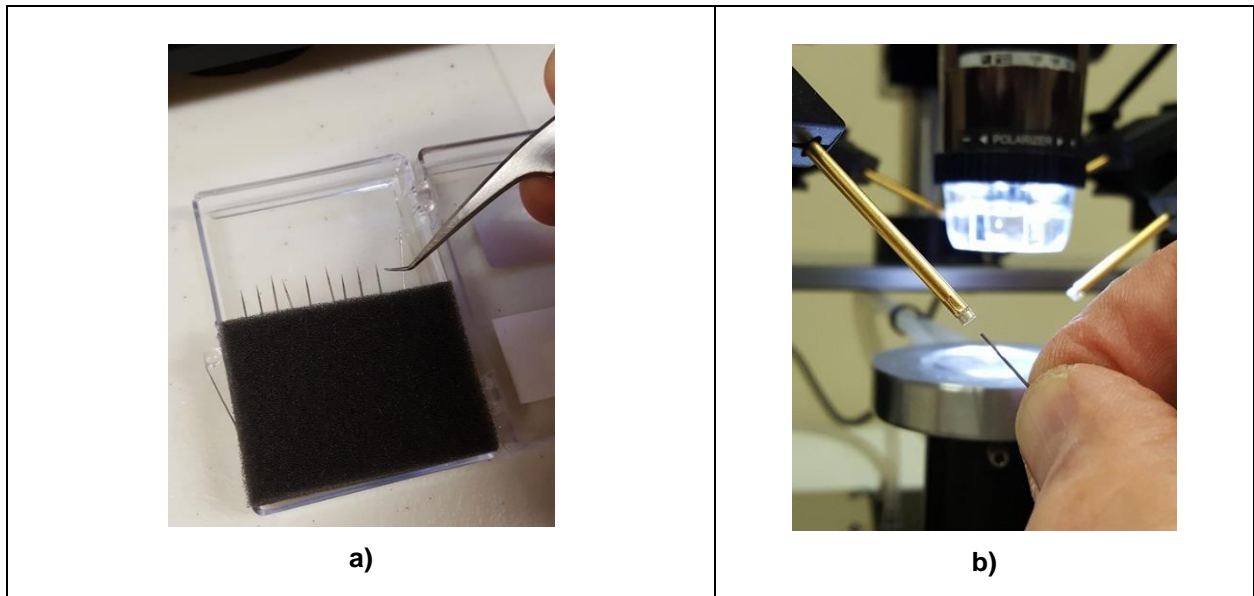


Figure 6: a) Remove a Needle Probe from the Case; b) Install the Probe into the Coaxial Holder

Note: If a probe has been damaged, it is placed upside down in the holder. The probes press into the coaxial tip holder. The tilt of the probe holder may have to be adjusted use the thumbscrew, as shown in Figure 3.

6. Ensure that the probe tips are high above the chuck and position the positioners so that the probes are close to the center of the microscope light.
This is because the microscope focus block has only Z-height adjustment. The stage position can be adjusted to put the chuck center-hole in the center of the microscope spotlight, as shown in Figure 7a), using the stage and chuck movement controls, as shown in Figure 8.

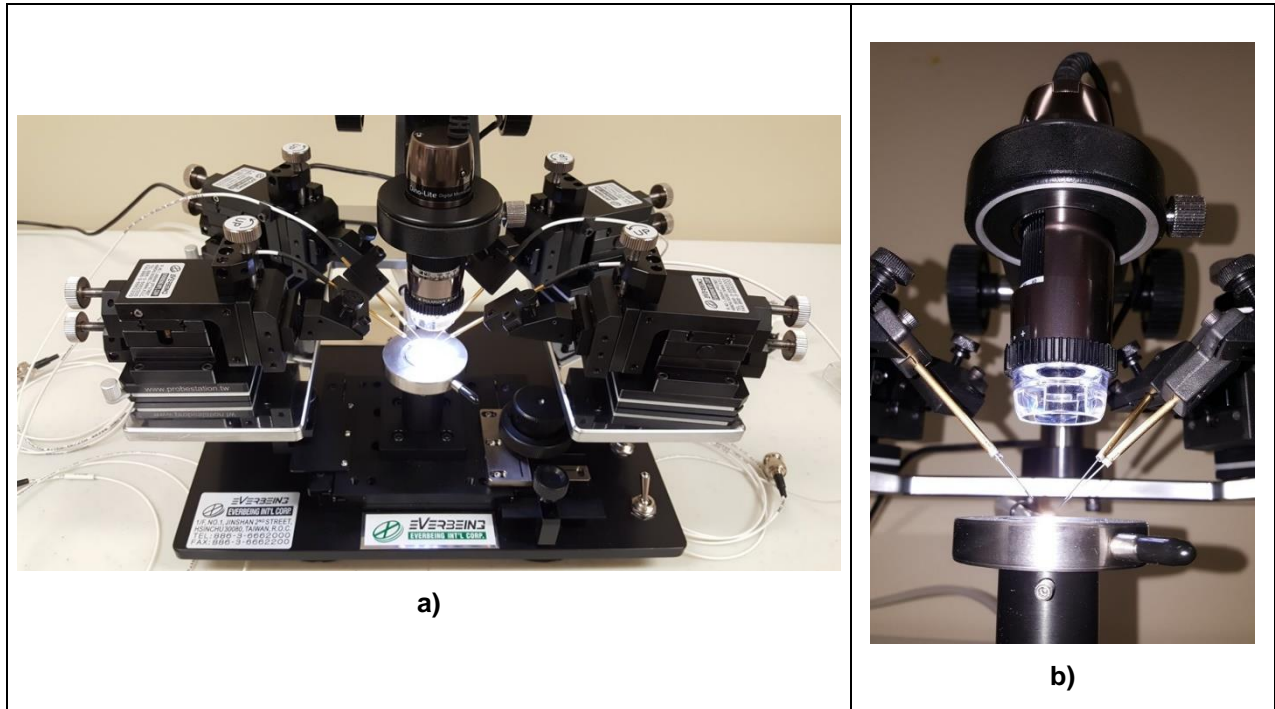


Figure 7: a) Probes Centered at the Microscope Spotlight Center; b) Probes Leveled Above Chuck

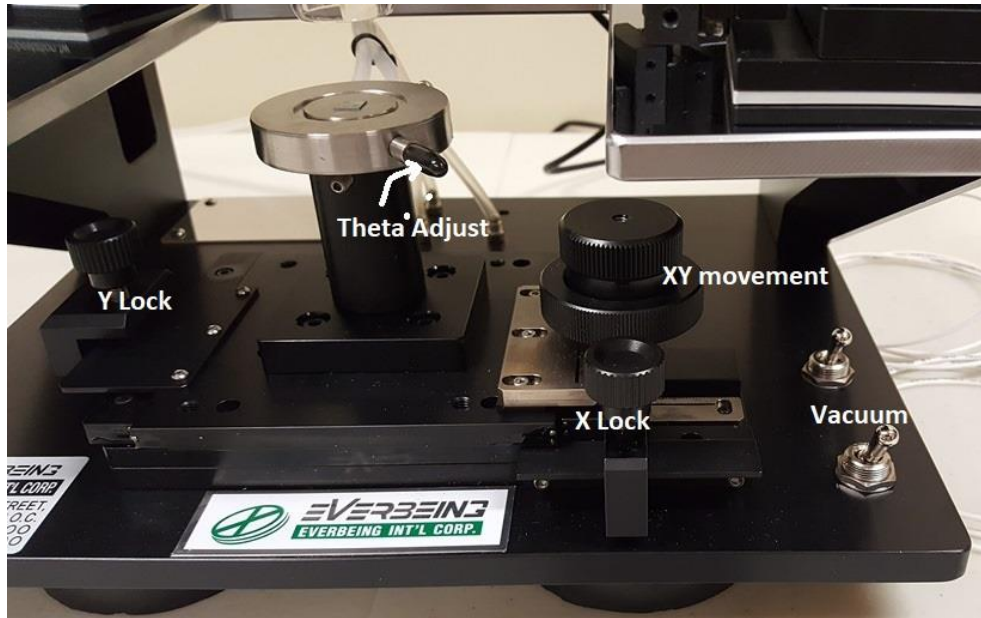


Figure 8: Stage and Chuck Movement and Vacuum Controls

7. Loosen the cable holder screws on each positioner.
8. Adjust the probe holder tilt and the probe height thumbscrews to level the probes above and close to the chuck, as shown in Figure 7b).
9. Roll the stage forward using the XY-movement thumbscrew, insert the DUT, and turn on the vacuum pump and the switch for one or both vacuum rings on the chuck.
10. Position the stage back so that the DUT is under the center field of view of the microscope and lock the stage.
The X & Y stage locks only need to be gently tightened. Do not overtighten.

3. Packing up the Station

To pack up the station into the Pelican Case:

1. Loosen the cable holder clamps and gently tighten the X & Y stage lock screws.
2. Starting with the front probes, unlock the positioner, rotate it forward, and lock it.
3. Remove the probe tip and replace it into the container bottom first.
If the probe tip is damaged, put it into the foam tip first.
4. Unlock the positioner and remove it from the platen.
5. Raise the probe tilt and height so that the positioner can sit on the workbench with the coaxial tip holder above the bench.
6. Complete step 5 for each positioner.
7. Remove the microscope and pack it into its box.
8. Disconnect the vacuum pump.
9. Coil the vacuum hose and place it on the stage under the platen.
10. Put the probe station front-first into its place in the Pelican Case.
11. Put the positioners into the foam in the bottom layer of the Pelican Case.
12. Put the next layer of foam into the Pelican Case and place the microscope box, the vacuum pump, the probe tip cases, and the hex keys into their places in the foam.
13. Close and secure the lid.
The packing of the station is complete.
14. Follow the instructions received in the email to return the probe station to CMC by UPS.

4. Acknowledging CMC

If your research benefits from products and services provided by CMC Microsystems, please acknowledge this support in any publications about your work. Publications may include journal articles, conference papers, scientific posters, presentations, thesis, and other documents that feature your research. For more information, please visit:

<http://www.cmc.ca/en/WhatWeOffer/AcknowledgeCMC.aspx>.

Thank you for your support!