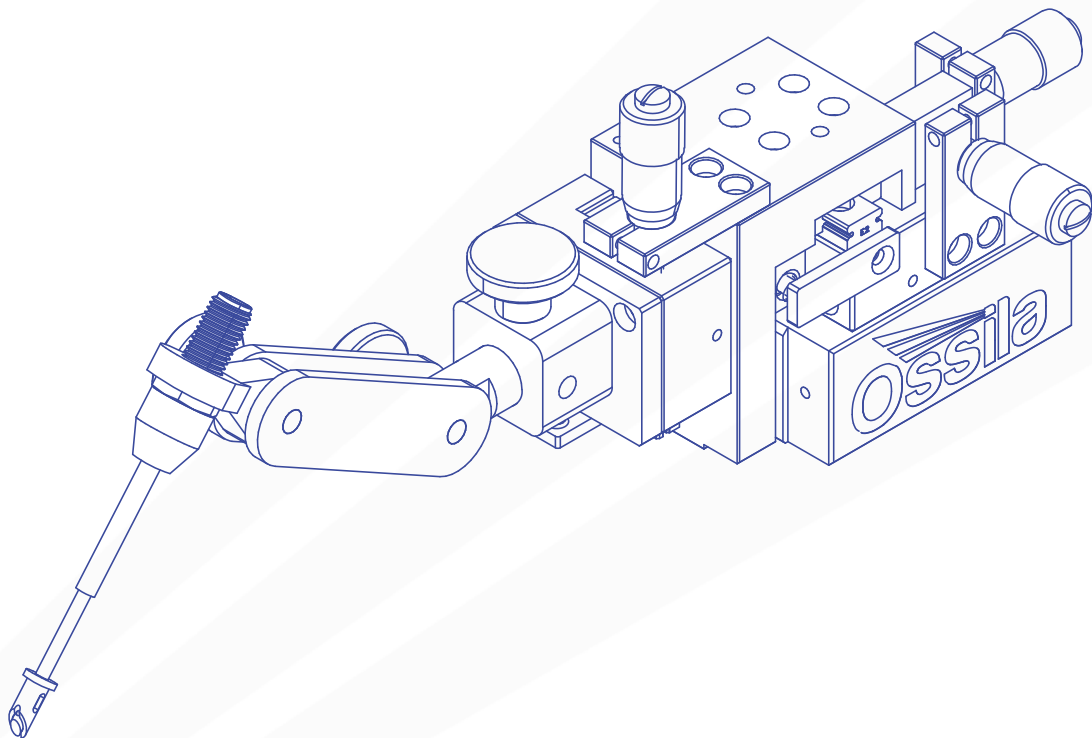




MICROMANIPULATOR

USER MANUAL

Manual version: 1.0.0
Product code: T2007
Product Version: 1.0



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1. EU Declaration of Conformity

We

Company Name: Ossila BV

Postal Address: Biopartner 3 building, Galileiweg 8

Postcode: 2333 BD Leiden

Country: The Netherlands

Telephone number: +31 (0)71 3322992

Email Address: info@ossila.com

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product: Micromanipulator (T2007L1, T2007R1, T2007P1)

Serial number: T2007L1-xxx, T2007R1-xxx, T2007P1-xxx

Object of declaration:

Micromanipulator (T2007L1, T2007R1, T2007P1)

The object of declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

Signed:



Name: Dr James Kingsley

Place: Leiden

Date: 24/01/2025

Декларация за съответствие на ЕС

Производител: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Декларира с цялата си отговорност, че посоченото оборудване съответства на приложимото законодателство на ЕС за хармонизиране, посочено на предходната(ите) страница(и) на настоящия документ.

[Čeština] Prohlášení o shodě EU

Výrobce: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Prohlašujeme na vlastní odpovědnost, že uvedené zařízení je v souladu s příslušnými harmonizačními předpisy EU uvedenými na předchozích stranách tohoto dokumentu.

[Dansk] EU-overensstemme I seserklæring

Producent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Erklærer herved, at vi alene er ansvarlige for, at det nævnte udstyr er i overensstemmelse med den relevante EU-harmoniseringslovgivning, der er anført på den/de foregående side(r) i dette dokument.

[Deutsch] EU-Konformitätserklärung

Hersteller: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Wir erklären in alleiniger Verantwortung, dass das aufgeführte Gerät konform mit der relevanten EU-Harmonisierungsgesetzgebung auf den vorangegangenen Seiten dieses Dokuments ist.

[Eesti keel] ELi vastavusavaldus

Tootja: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Kinnitame oma ainuvastutusel, et loetletud seadmed on kooskõlas antud dokumendi eelmisel lehelküljel / eelmistel lehekülgedel ära toodud asjaomaste ELi ühtlustamise õigusaktidega.

[Ελληνικά] Δήλωση πιστότητας ΕΕ

Κατασκευαστής: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Δηλώνουμε υπεύθυνα ότι ο αναφερόμενος εξοπλισμός συμμορφώνεται με τη σχετική νομοθεσία εναρμόνισης της ΕΕ που υπάρχει στις προηγούμενες σελίδες του παρόντος εγγράφου.

[Español] Declaración de conformidad UE

Fabricante: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Declaramos bajo nuestra única responsabilidad que el siguiente producto se ajusta a la pertinente legislación de armonización de la UE enumerada en las páginas anteriores de este documento.

[Français] Déclaration de conformité UE

Fabricant: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Déclarons sous notre seule responsabilité que le matériel mentionné est conforme à la législation en vigueur de l'UE présentée sur la/les page(s) précédente(s) de ce document.

[Hrvatski] E.U izjava o sukladnosti

Proizvođač: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Izjavljujemo na vlastitu odgovornost da je navedena oprema sukladna s mjerodavnim zakonodavstvom EU-a o usklađivanju koje je navedeno na prethodnoj(nim) stranici(ama) ovoga dokumenta.

[Italiano] Dichiarazione di conformità UE

Produttore: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Si dichiara sotto la propria personale responsabilità che l'apparecchiatura in elenco è conforme alla normativa di armonizzazione UE rilevante indicata nelle pagine precedenti del presente documento.

[Latviešu] ES atbils tības deklarācija

Ražotājs: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Ar pilnu atbildību paziņojam, ka uzskaitītais aprīkojums atbilst attiecīgajiem ES saskaņošanas tiesību aktiem, kas minēti iepriekšējās šī dokumenta lapās.

[Lietuvių k.] ES atitikties deklaracija

Gamintojas: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

atsakingai pareiškia, kad išvardinta įranga atitinka aktualius ES harmonizavimo teisės aktus, nurodytus ankstesniuose šio dokumento

[Magyar] EU-s megfelelőségi nyilatkozat

Gyártó: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Kizárólagos felelősségünk mellett kijelentjük, hogy a felsorolt eszköz megfelel az ezen dokumentum előző oldalán/oldalain található EU-s összehangolt jogszabályok vonatkozó rendelkezéseinek.

[Nederlands] EU-Conformiteitsverklaring

Fabrikant: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Verklaart onder onze uitsluitende verantwoordelijkheid dat de vermelde apparatuur in overeenstemming is met de relevante harmonisatiewetgeving van de EU op de vorige pagina('s) van dit document.

[Norsk] EU-samsvarserklæring

Produsent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Erklærer under vårt eneansvar at utstyret oppført er i overholdelse med relevant EU-harmoniseringslovverk som står på de(n) forrige siden(e) i dette dokumentet.

[Polski] Deklaracja zgodności Unii Europejskiej

Producent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Oświadczamy na własną odpowiedzialność, że podane urządzenie jest zgodne ze stosownymi przepisami harmonizacyjnymi Unii Europejskiej, które przedstawiono na poprzednich stronach niniejszego dokumentu.

[Por tuguês] Declaração de Conformidade UE

Fabricante: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Declara sob sua exclusiva responsabilidade que o equipamento indicado está em conformidade com a legislação de harmonização relevante da UE mencionada na(s) página(s) anterior(es) deste documento.

[Română] Declarație de conformitate UE

Producător: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Declară pe proprie răspundere că echipamentul prezentat este în conformitate cu prevederile legislației UE de armonizare aplicabile prezentate la pagina/paginile anterioare a/ale acestui document.

[Slovensky] Vyhlásenie o zhode pre EÚ

Výrobca: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Na vlastnú zodpovednosť prehlasuje, že uvedené zariadenie je v súlade s príslušnými právnymi predpismi EÚ o harmonizácii uvedenými na predchádzajúcich stranách tohto dokumentu.

[Slovenščina] Izjava EU o skladnosti

Proizvajalec: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

s polno odgovornostjo izjavlja, da je navedena oprema skladna z veljavno uskladitveno zakonodajo EU, navedeno na prejšnji strani/prejšnjih straneh tega dokumenta.

[Suomi] EU-vaatimusten mukaisuusvakuutus

Valmistaja: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Vakuutamme täten olevamme yksin vastuussa siitä, että tässä asiakirjassa luetellut laitteet ovat tämän asiakirjan sivuilla edellisillä sivuilla kuvattujen olennaisten yhdenmukaistamista koskevien EU-säädösten vaatimusten mukaisia.

[Svenska] EU-försäkran om överensstämmelse

Tillverkare: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

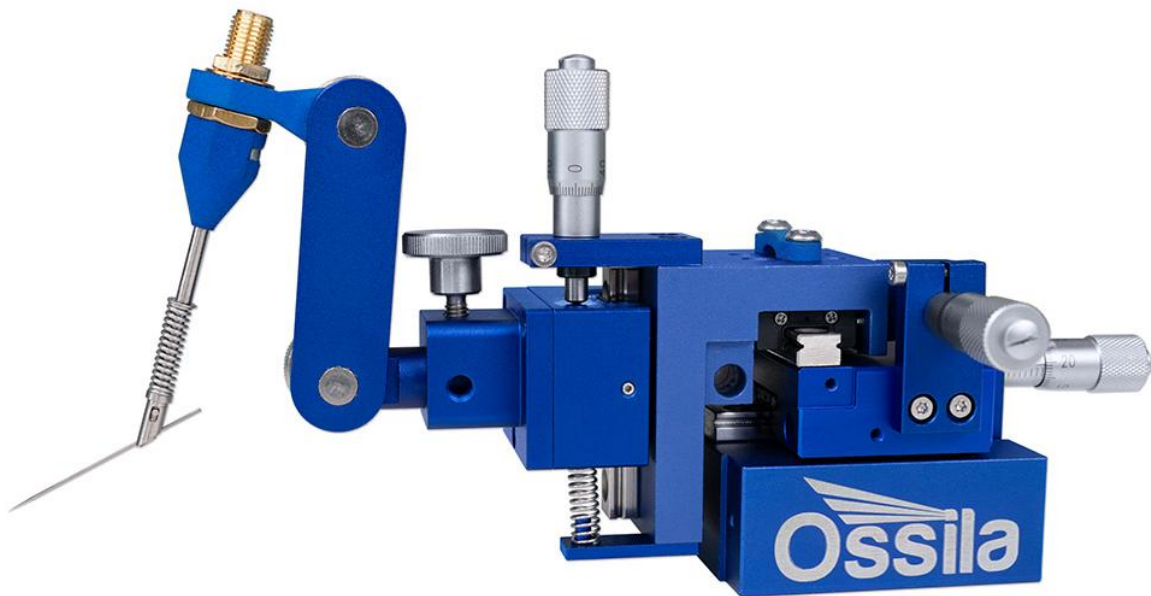
Vi intygar härmed att den utrustning som förtecknas överensstämmer med relevanta förordningar gällande EU-harmonisering som finns på föregående sidor i detta dokument.

2. Overview

The Ossila Micromanipulator has been designed to accurately and precisely position a probing tool while viewing under a microscope. It is ideal for I-V or C-V probing of wafer fragments and semiconductor components. The device incorporates 10 mm travel along three rectilinear axes, X/Y/Z. The micrometer heads allow accurate positioning, down to 10 μm resolution.

The Micromanipulator is supplied with a DC voltage probing tool. The probe tip and holder (shank) is electrically conductive and connected to the central pin of the SMA connector. Fine point tips are easily replaceable using the spring-loaded mechanism. The device is supplied with a 1 m coaxial cable, SMA connectorized, for easy incorporation into a test setup.

The Micromanipulator is supplied either as Left- or Right-handed arrangement, but the user can easily change handedness as required with the provided Torx key.



3. Safety

3.1 Warning

- The Micromanipulator is supplied with a very sharp tungsten probe tip. Take extra precautions while handling to prevent accidental needlestick injuries.
- When the SMA connector is biased, the entire probe tip and holder should be assumed to be biased. Take care when handling to avoid shock or accidental discharge.

3.2 Use of Equipment



The Ossila Micromanipulator is designed to be used as instructed. It is intended for use under the following conditions:

- Indoors in a laboratory environment (Pollution Degree 2)
- Altitudes up to 2000m
- Temperatures of 5°C to 40°C; maximum relative humidity of 80% up to 31°C.

3.3 Hazard Icons



The following symbols can be found at points throughout the rest of the manual. Note and read each warning before attempting any associated operations associated with it:

Table 3.1. Hazard warning labels used in this manual.

| Symbol | Associated Hazard |
|---|-------------------------|
|  | Electrical shock (W012) |
|  | Sharp implement (W022) |

3.4 General Hazards

Before installing or operating the Ossila Micromanipulator there are several health and safety precautions which must be followed and executed to ensure safe installation and operation.

| | |
|---|--|
|  | <p>When the SMA connector is biased, the entire probe shank should be assumed to be biased. Take care when handling to avoid shock or accidental discharge.</p> <p>Power down and disconnect the SMA cable prior to handling the probe shank or tip.</p> |
|  | <p>The tungsten probe tip is extremely sharp. Practice extra caution when handling and manipulating the tip to avoid needlestick injuries or damage to equipment.</p> |

3.5 Servicing

If servicing is required, please return the unit to Ossila Ltd. The warranty will be invalidated if:

- Modification or service has been carried out by anyone other than an Ossila engineer, beyond what is specified in this manual.
- The Unit has been subjected to chemical damage through improper use.
- The Unit has been operated outside the usage parameters stated in the user documentation associated with the Unit.
- The Unit has been rendered inoperable through accident, misuse, contamination, improper maintenance, modification, or other external causes.

3.6 Health and Safety – Servicing



Servicing should only be performed by an Ossila engineer. Any modification or alteration beyond the guidance in this manual may damage the equipment, cause injury, or death. It will also void your equipment's warranty.

4. Unpacking

4.1 Packing List

The standard items included with the Ossila Micromanipulator are:

- The Ossila Micromanipulator.
- 1 Tungsten probe tip, 20 μm diameter.
- 1 m coaxial cable, SMA connectorized.
- 1 T6 Torx key
- Documentation

4.2 Damage Inspection

Examine the components for evidence of shipping damage. If damage has occurred, please contact Ossila directly for further action.

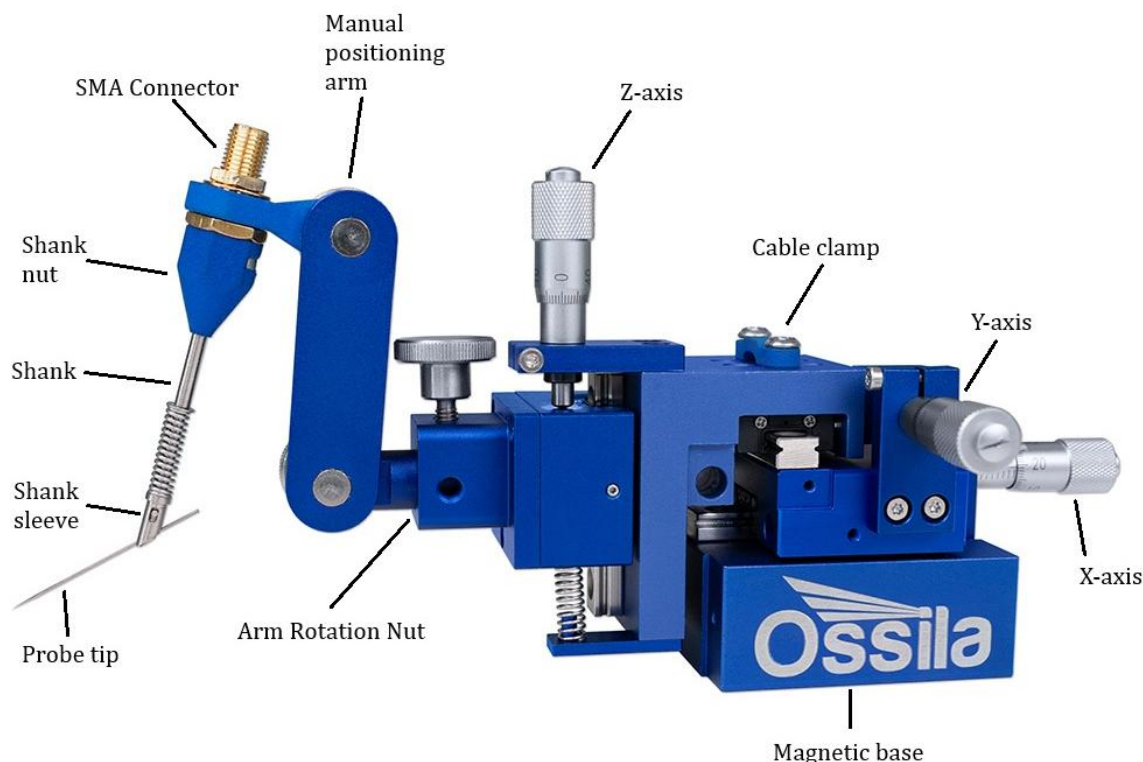
5. Specifications

The Ossila Micromanipulator specifications are shown in **Table 5.1**.

Table 5.1. Ossila Micromanipulator specifications.

| | |
|--|-------------------------------------|
| Drive Axes | X/Y/Z |
| Drive Fine Movement | 50 TPI micrometer |
| X/Y/Z Axis Travel, maximum | 10 mm |
| X/Y/Z Axis Travel, graded | 6.5 mm |
| X/Y/Z Axis Resolution | 10 μm |
| Arm Coarse Movement | Thumb-screw, M4 |
| Base Type | Magnetic |
| Probe Type | Tungsten, 20 μm diameter |
| Probe Connection | SMA |
| Probe Leakage Current | <100 pA at ± 75 VDC |
| Probe Path Resistance | $\leq 0.3 \Omega$ |
| Dimensions (L x W x H) | 155 x 74 x 78 mm |
| Extended Dimensions (L x W x H) | 231 x 77 x 84 mm |
| Weight | 400 g |

6. Description



The Micromanipulator is built upon a foundation of serially stacked linear stages, enabling precise three-dimensional movement. It begins with a base designed for magnetic attachment to a work surface. Directly mounted onto this base is the first linear stage, providing movement along the X-axis. Crucially, the moving carriage of this X-stage then serves as the mounting platform for the next stage, which controls movement along the Y-axis. This pattern repeats once more: the carriage of the Y-stage supports the final Z-stage. This cascading arrangement allows each stage to build upon the positioning of the previous one, achieving highly localized and controlled movement in the X, Y, and Z directions. Finally, a manually adjustable mechanical arm is attached to the carriage of the Z-stage, providing additional degrees of freedom for manipulation.

On the end of the arm is mounted an SMA connector. On the probe side, a conductive shank is mounted to the connector by a custom threaded nut to isolate the shaft from the earth. During a device test, a voltage or current is supplied to the SMA connector by a cable (provided), while reading the voltage or current by a Source Measure Unit.



Warning: When the central pin of the SMA connector is powered, the entire probe and shank is powered as well. Power down and disconnect the SMA cable prior to handling the shank or probe tip.

The difference between the Left- and Right-handed variants is the orientation and placement of the Y axis micrometer head on the body of the micromanipulator unit.

7. Operation

7.1 Probe Tip Installation



Warning: The supplied probe tip is extremely sharp. Use suitable personal protective equipment (PPE) and exercise caution when handling.

1. Pull back on the spring-loaded shank sleeve to open probe tip channel.
2. While pulling back, carefully insert the probe tip into the channel. To avoid damage to the tip, insert the tip from the dull end.
3. Release the spring-loaded shank sleeve to secure the tip in place.

7.2 Positioning the Probe Tip

1. Place the micromanipulator onto a magnetic probe station surface.
2. Adjust the probe arm using the thumb-screws to position the tip within 10 mm of the desired probing location.
3. Using the micrometers, adjust each axis until the probe tip is in the desired position.

Note: When positioning, take care to avoid over-extending each axis beyond the intended range. This may lead to damage to the micrometers or the micromanipulator body components.



Warning: When power is supplied to the central pin of the SMA connector, the entire probe tip and shank is powered. Take care to avoid accidental shock or discharge by contact with the shank.

7.3 Modifying the Handed-ness of the Micromanipulator

The micromanipulator is provided with a particular handed-ness, Left or Right. This refers specifically to the Y-axis micrometer location. The X and Z axes do not require any adjustments for left-handed or right-handed operation. You will need a T6 Torx key (provided) for these steps.

Note: Performing these steps requires removing, handling, and replacing very small screws, springs, and metal brackets. Ensure your workspace is clear and take care when handling to avoid loss of parts.

If you encounter any problems, contact Ossila for assistance or advice.

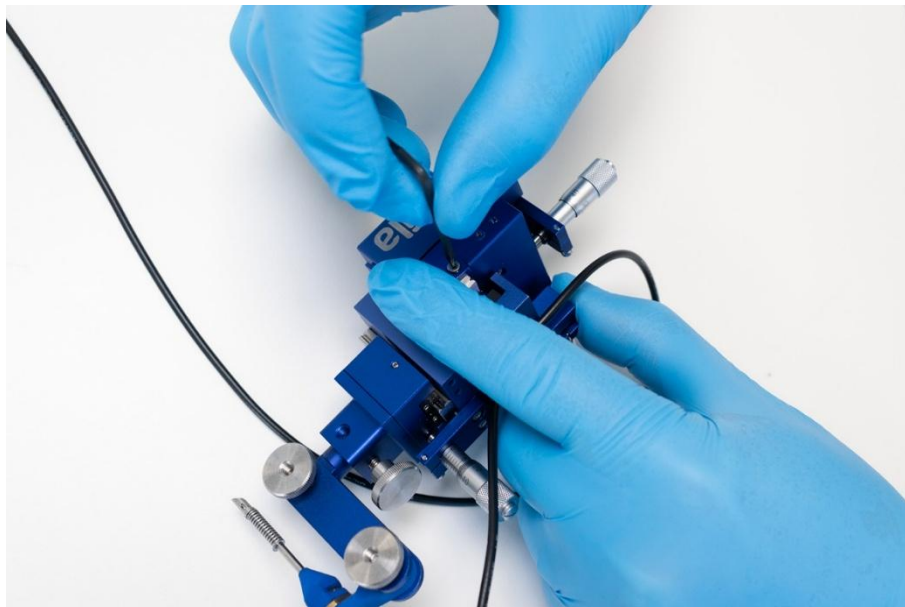


Warning: Power down the probe and isolate the micromanipulator from any power supply prior to handling to prevent accidental shock.



Warning: Remove probe tip prior to handling to prevent accidental needlestick injury or damage to the sharp tip.

1. Spring Removal:
 - I. Apply light pressure on the Y-axis spring holder plate to prevent quick release of tension.



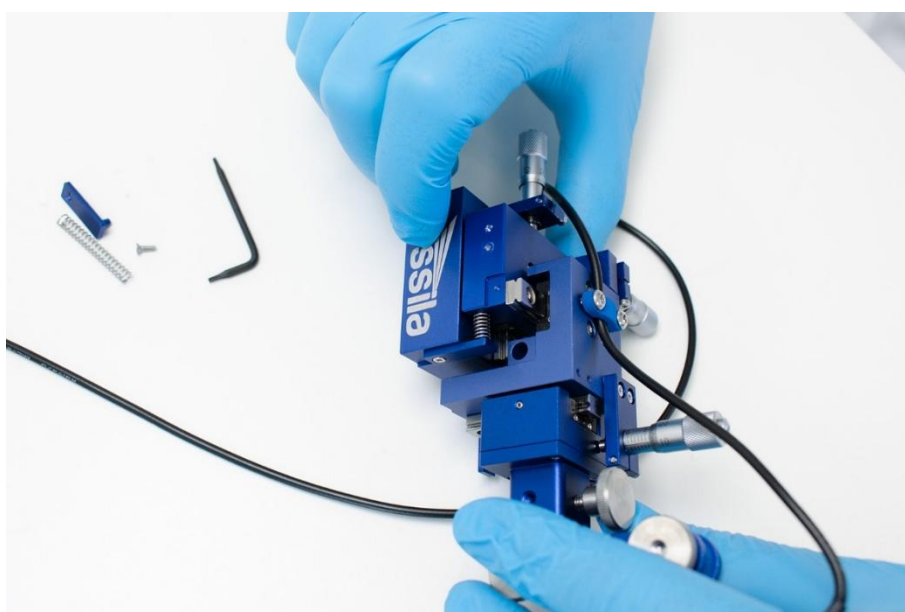
- II. Using the T6 Torx tool provided, carefully remove the screw securing the Y-axis spring holder.

Note: The spring will have tension. Exercise caution to prevent sudden release and potential loss of small parts.



- III. Gently remove the spring holder, screw, and spring.

Note: When the Y-axis spring holder is detached, the Y-axis carriage may become loose on the linear rail. If the carriage dislodges, carefully re-install it, ensuring all precision bearings remain in place.

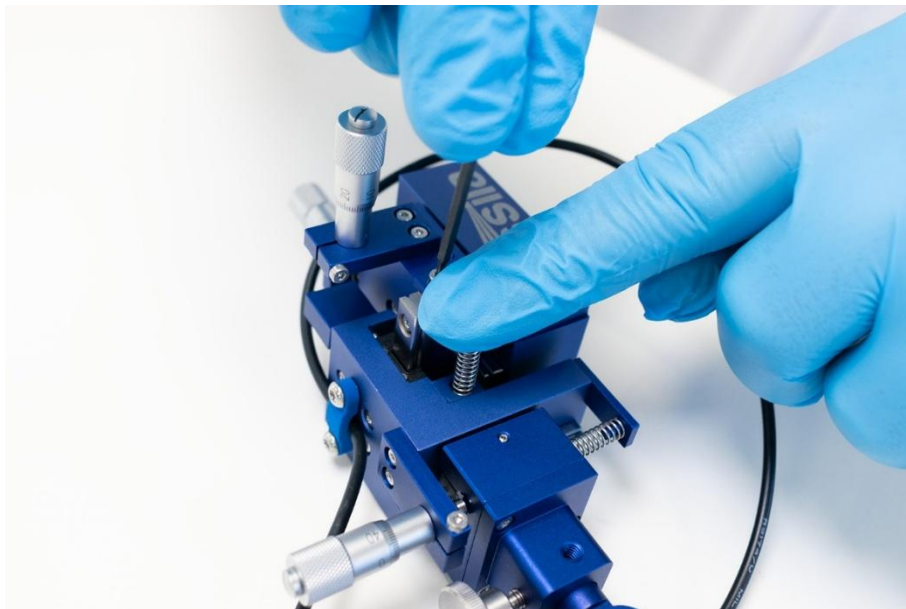


2. Spring Installation:

- I. On the other side of the micromanipulator, insert the spring into the 4.5mm hole on the Y-axis carriage.
- II. Place the spring holder pin on the spring and carefully compress, holding the entire assembly securely.



- III. Secure the spring holder with the previously-removed screw.



3. Micrometer Mount:

- I. Remove the screws securing the Y-axis micrometer mount to the side of the micromanipulator.

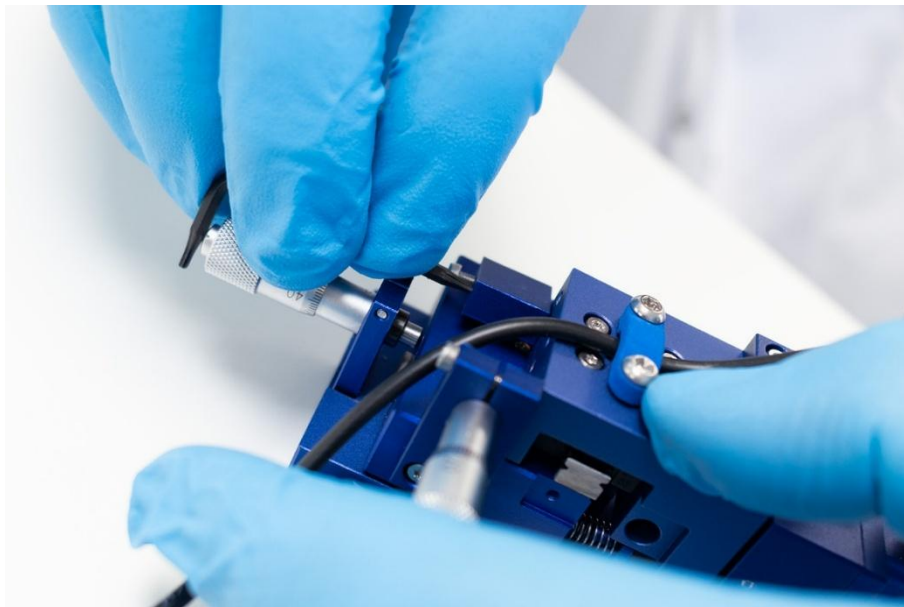
Note: When the Y-axis micrometer mount is detached, the Y-axis carriage may become loose on the linear rail. If the carriage dislodges, carefully re-install it, ensuring all precision bearings remain in place.



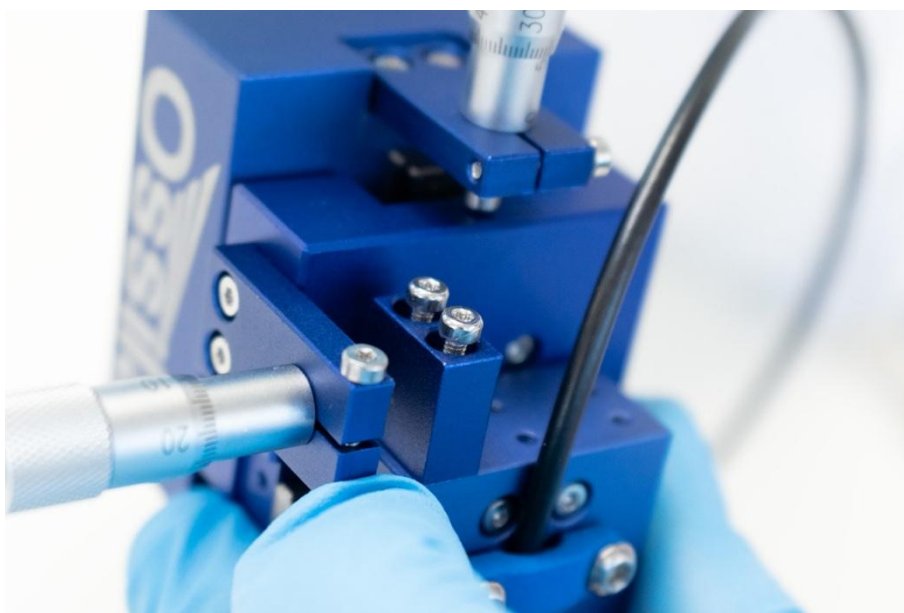
- II. Re-install the mount on the other side, ensuring the screws are tightened securely.



4. Push Plate:
 - I. Remove the screws securing the Y-axis push plate.



- II. Re-install the push plate on the other side, ensuring the screws are tightened securely.



8. Troubleshooting

Most of the issues that may arise will be detailed here. However, if you encounter any issues that are not detailed here, then contact us by email at info@ossila.com. We will respond as soon as possible.

| Problem | Possible Cause | Action |
|---|--|---|
| An axis does not move | The minimum or maximum range of the axis is reached. | Reposition the micromanipulator on the magnetic base closer to the desired location or manually adjust the probe arm. |
| | There is an object impeding movement. | Reposition the micromanipulator or the impeding object so they do not clash. |
| | The stage or micrometer is damaged. | Contact Ossila. |
| Electrical signals are not detected when expected | The cable is not properly connected. | Check the SMA connection on the probe shank is tight. Check the cable connection on the instrument side is properly inserted and locked into place. |
| | The cable or measurement device are faulty. | Try another cable or troubleshoot the external equipment as recommended in the product Manual. |
| | The electrical connection between the shank and the SMA connector is faulty. | Remove shank nut from SMA connector, inspect for debris and clean if necessary, reinstall shank nut. If problem persists, contact Ossila. |

9. Related Products

9.1 Related Consumables



ITO Coated Substrates

Our range of ITO substrates for OPV, OLED, and sensing applications.

Product codes: S111 / S101 / S211 / S281 / S171



Flat Tip Tweezers

Provides a good substrate grip without scratching.

Product code: C121



FTO Coated Substrates

Designed to be used as transparent electrodes for thin-film photovoltaics.

Product codes: S301 / S302 / S303 / S304



Substrate Cleaning Rack

Holds 20 substrates for a variety of processing techniques.

Product code: E101

9.2 Related Equipment



Spin Coater

Produce high-quality coatings without any substrate warping. Perfect for busy labs with limited space.

Product code: L2001A3



Syringe Pump

High-precision, programmable single and dual syringe pumps for automatic dispensing of solutions.

Product codes: L2003S1 / L2003D1



Four-Point Probe

Fast and accurate sheet resistance measurements for a wide range of materials

Product code: T2001A4



Source Measure Unit

Source voltage, measure current, get data. Simplify and accelerate your data collection!

Product code: P2005A2