

# SolsTiS

## PIK Module Cleaning Guide

28<sup>th</sup> Jan 2021



**WARNING:** The actions within this section fully expose the pump beam. Laser safety procedures should be followed strictly.

The SolsTiS laser head is a sealed, maintenance-free design and the laser head must never be opened, nor must any optic in the SolsTiS system be removed from its mount.

Please Idle the pump laser and closer its shutter before cleaning any optics.

Required Items:

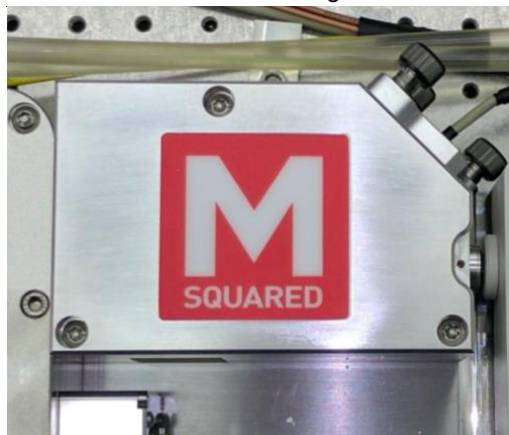
- Anhydrous methanol , assay >99.8% recommended (ideally from an unopened bottle)
- Lens tissue
- Nylon/ plastic tipped tweezers or hemostats

If you discover or suspect that the Pump Integration Kit (PIK) optics are contaminated, please follow these instructions:

1. Place a powermeter head (rated up to 10W) at the SolsTiS output. Or set the VIRPO to maximum reflection and measure output power at the VIRPO output
2. Check SolsTiS' output power is optimised at 780nm by making small ( $\leq \pm 1/4$ ) turns of the X and Y adjusts of the second PIK mirror, one at a time and observing SolsTiS' output power on the power meter
3. Record the SolsTiS output power and Output PD value (found on the web interface) at 780nm at operating pump power

Note: To verify manual adjustment is optimised, press "one-shot" on SolsTiS interface if available.

4. Idle the pump laser and close the shutter so no light is emitted from the pump laser.

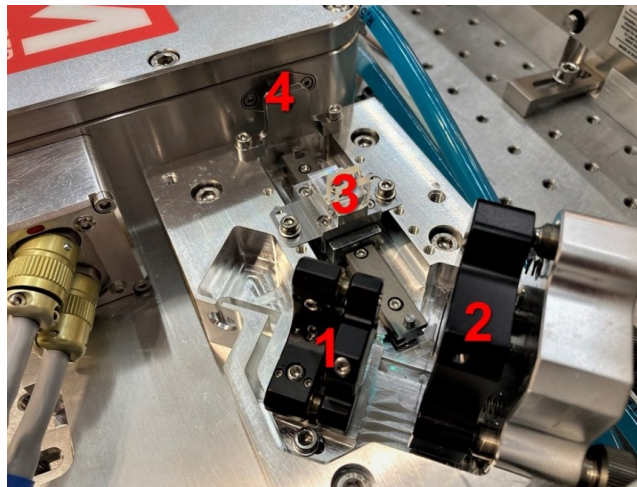


*Figure 1 -Top view of the PIK module*

5. Using a 1.5mm hex key, loosen the grub screw on the PIK beam tube, retract the tube from the PIK until it is clear from the pump laser. Tighten the grub screw to hold securely in place
6. Unscrew the 3 Torx 25 bolts of the PIK module lid and carefully lift the PIK lid straight up and place it in a safe place (on its side to prevent contamination)
7. **Figure 2** shows the optics which may be cleaned; PIK mirror 1, PIK Mirror 2, lens pair and input window (The SolsTiS output window may also be cleaned).

Note: In order to clean the input window, you will have to remove the steel aperture protecting the window (using 2.5mm hex key), replace this after cleaning, **do not operate the laser with this aperture removed.**

Note: The lens pair is particularly difficult to clean. Only clean the lenses if absolutely necessary (i.e any surfaces brighter than the others). Only clean the accessible surfaces (front face of lens 1, rear face of lens 2). **Do not separate the lenses without contacting the M Squared service team.** Only apply a very small amount of pressure when cleaning the lenses. Applying too much pressure may cause the lenses to detach from their mount. If concerned about the cleanliness of the inner surfaces, include a photograph of the lenses evidencing the uncleanliness in an email to M Squared Services



*Figure 2 - PIK Module Optics; 1- PIK Mirror 1, 2- PIK Mirror 2, 3- PIK Lens pair, 4- Input Window*

8. Turn the pump laser on at low power (Idle) and check the optic surfaces for scattered light. If there is a lot of scatter, this may indicate dust/contamination on the optic surfaces. (This can also be done using an inspection torch.)
9. Close the pump laser shutter to ensure no hazardous exposure to laser radiation during the cleaning process
10. Clean any optics which appear to be contaminated. Usually starting with PIK mirror 1, working towards the SolsTiS. If you experience power loss after cleaning PIK M1, this may indicate poor cleaning technique or compromised methanol source. You may attempt to clean this optic again. If power loss persists, do not continue to clean subsequent optics before contacting M Squared Services
11. Using gloves carefully fold up a clean piece of lens tissue into a **small tight pad**, small enough to fit the area on the optic to be cleaned, large enough to clean the area over which the pump beam is incident



*Figure 3 - Folded lens tissue held securely with nylon tipped tweezers*

12. Place one or two drops of fresh, reagent-grade methanol along the cleaning edge of the lens tissue pad
13. Place the wet portion of the lens tissue on the optic surface and slowly drag it across the optic

Ensure the only the lens tissue makes contact with the optic, tweezers or hemostats may damage the optical surface

14. Inspect the surface of the optic using an inspection torch or very low pump power (Idle).
15. If streaks or contamination can be seen on the surface, repeat the cleaning process using a fresh piece of lens tissue and fresh methanol

Do not repeatedly drag the same piece of tissue across the optic

16. Replace the PIK lid (with the pump idle, shutter closed) after cleaning one optic, increase the pump to operating power and record the output power and output PD after checking the power is optimised using the second PIK mirror (if the input window aperture has been removed, replace this before closing the lid to check the power)
17. Repeat the cleaning process for each PIK optic with suspected contamination
18. After cleaning complete replace the lid, extend and secure the beam tube and lid screws
19. Send the recorded power values to [services@m2lasers.com](mailto:services@m2lasers.com)

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