

Optical Multi-Function Probe (OMFP)

(V725, D725, P725)

The newly designed **Optical Multi-Function Probe (OMFP)** offers unprecedented versatility that allows you to conduct photonic, quantum optics and correlative microscopy experiments within the variable temperature and magnetic field environments of the PPMS[®], DynaCool[™] and VersaLab[™]. The OMFP features a room temperature wired access port with integrated optical breadboard for mounting optical components such as lenses, turning mirrors, filters, diffusers, beam splitters, prisms, waveplates, fiber bundles and electrical wiring. The open modular design of the probe provides easy access to the axial ports and connectors which can be configured to route electrical, single fibers, fiber bundles and miniature waveguides to the sample space. In addition, a central optical access port allows free-beam optics experiments in the cryostat. A 0.5 inch standard optical thread mount makes aligning and focusing lens assemblies fast and easy.

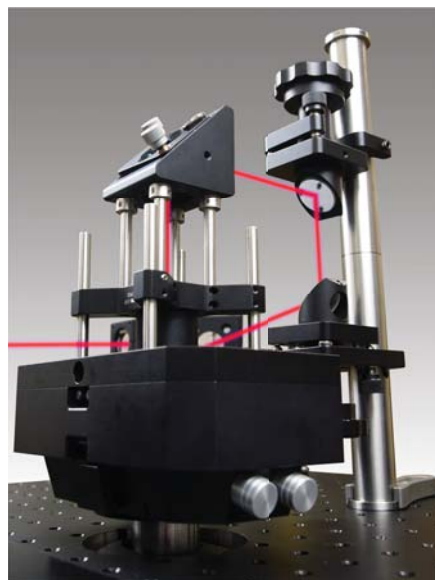
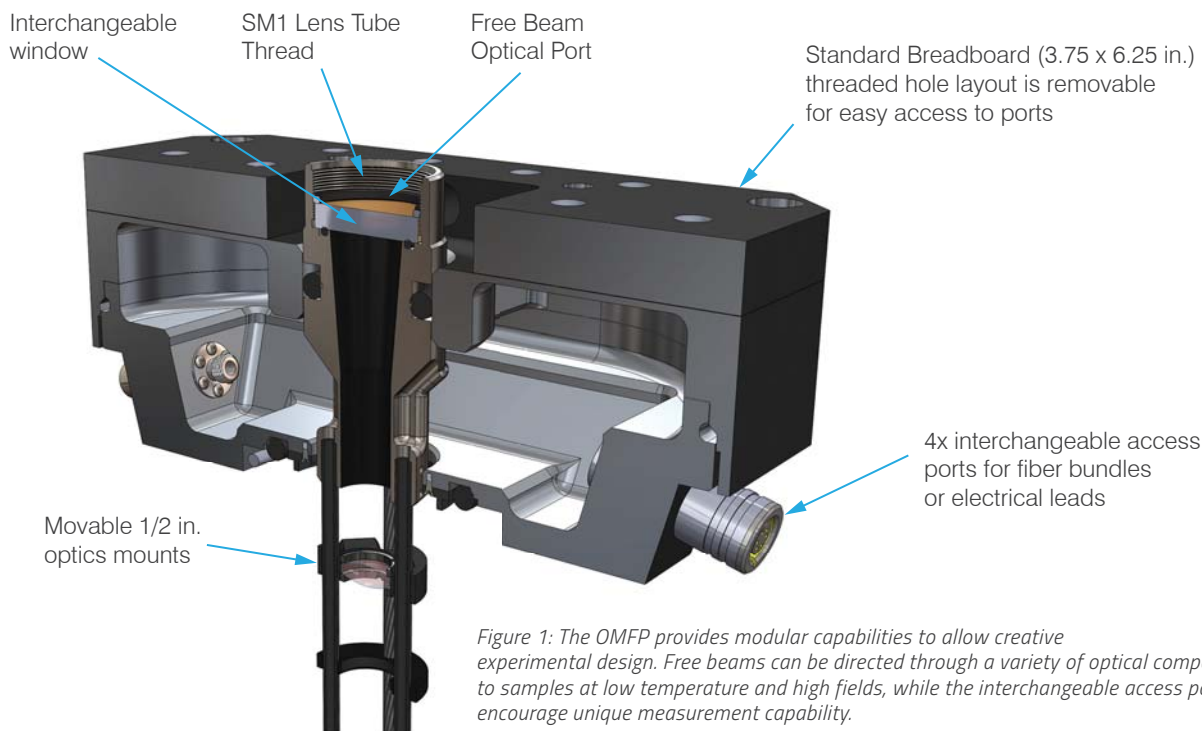


Figure 4: (Left) Optical Positioner Capsule with sample boards and extraction tool. (Middle) XYZ Cartesian Positioning Controller. (Right) Optical Positioner Capsule mounted on the OMFP, showing the cold objective lens.



Combining electro-transport and magneto-optic measurement techniques has never been easier! A swappable sample PCB interface allows samples to be easily mounted for electrical resistivity, Hall effect, and Van der Pauw configurations under a conventional optical microscope. Once the sample is mounted, the sample board can then be mounted on the OMFP capsule. Cold objective lens mounting, coupled with motorized positioning of the sample, allows for convenient and accurate focusing of the excitation beam even on thin film samples that can be only a few hundreds angstrom in thickness.

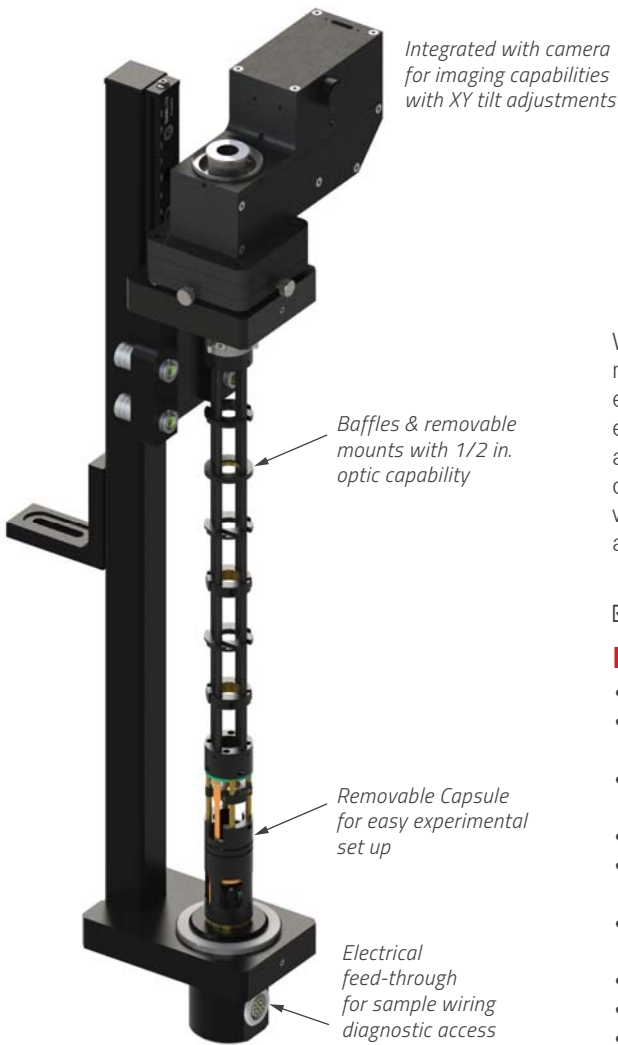


Figure 6: External optics probe stand to set up and test optical and electrical experiments.

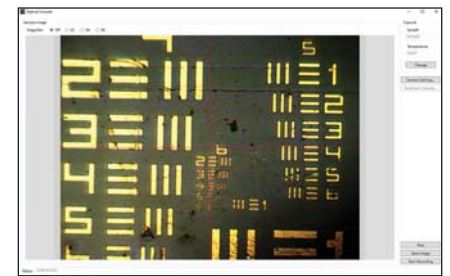


Figure 5: 1951 US Air Force Target mounted on a sample board and image of target taken using optical positioner software integrated into MultiVu.

When collecting small optical signals from a sample it is of paramount importance to maximize the collection efficiency of the photons emitting from the sample in the cold environmental space. To this end, the experiment design and configurability is made easy with the OMFP mounting station. The mounting station can be used to mount and align cold objectives, collimating lenses and filters throughout the cryogenic length of the OMFP. A puck mounting electrical interface is integrated into the OMFP stand which allows for verification of electrical connection to the sample, stages and optical alignment of laser and monochromatic free space beams.

PPMS EverCool DynaCool VersaLab

Features

- Available for VersaLab, DynaCool and PPMS
- 1 inch (SM1) free-beam access port and internal 1/2 inch (SM05) optical mounts along optical path
- Direct axial electrical, SMA and other ports to sample stage provided to install light pipes, fiber optics cables, and/or electrical leads
- 2 sets of 4 electrical leads on sample PCB interface for electrical transport experiments
- Multiple measurement capability (e.g., electrical resistivity, Hall effect, Van der Pauw, magnetometry and optical measurements)
- Integrated wiring for optional motorized Cartesian positioning system (3 x 3 x 3 mm movement capability)
- Sample stage with integrated thermometer
- Multi-Position filter and lens mounts for cold region of probe
- 300 K to 50 K, ± 3 T (VersaLab); 300 K to 1.8 K, ± 14 T (DynaCool); 300 K to 1.9 K, ± 16 T (PPMS)

Applications

- Free optics studies
- Thermal-Optical properties
- Fiber optics measurements
- Magneto-Optical properties