New Product Announcement

Rapid Thermal Stage (X140)

Maintain focus on your sample while making large temperature changes

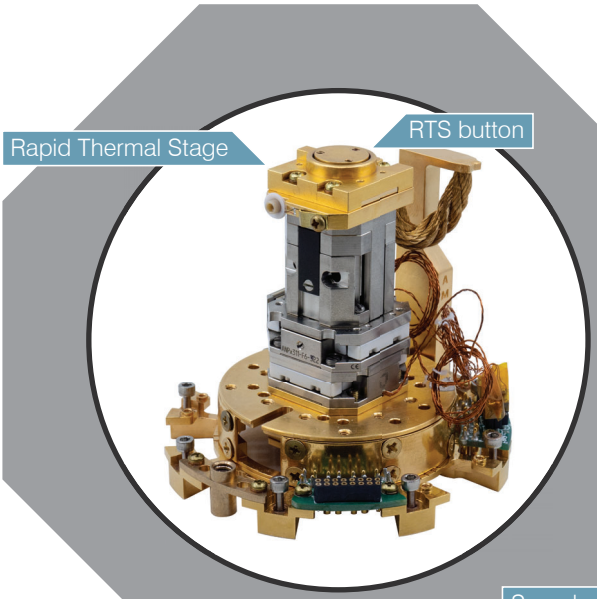
Many experiments in OptiCool require x-y positioning of the sample to locate a region of interest, and z positioning to focus a microscope objective lens on the sample. However, often it is difficult to maintain focus when changing sample temperature. There are two reasons for this. First, the vertical length of components that change temperature (sample column, pod, and positioner stack) is quite large, resulting in thermal expansion that is hundreds of times the typical depth of field of a microscope objective (≲1 micron). Second, some of those components, especially nanopositioners, have long internal time constants. This results in very long equilibration times (typically many hours) after a temperature change. The X140 Rapid Thermal Stage (RTS) solves both problems by controlling the temperature of a small button where the sample is mounted, while maintaining the rest of the components at low temperature. This results in focus shift of < 30 micron over the temperature range 1.8 – 350 K. And when the RTS temperature is stable, the focus position is too.

In addition to helping you maintain focus, the RTS changes temperature very quickly due to its small size. Temperature changes that would normally take hours are accomplished in < 30 minutes.

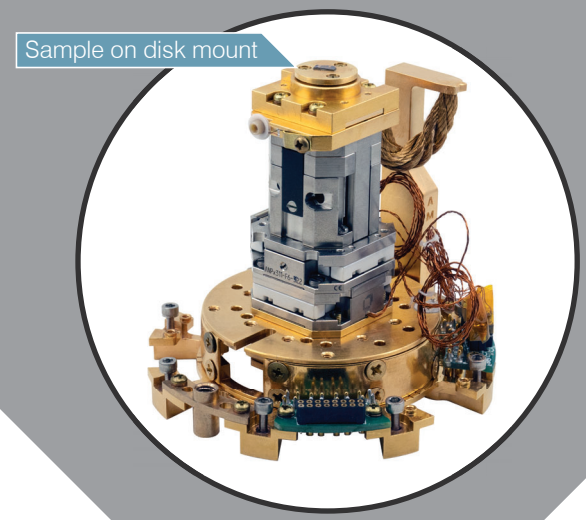
The Rapid Thermal Stage includes an integrated thermometer and heater located directly under the sample button for accurate temperature measurement and control. When the RTS is activated in the OptiCool MultiVu software you control and read this temperature through MultiVu just like normal. And you can control and read it from third-party software as well.

You can mount samples directly to the Rapid Thermal Stage button or to one of the included Disk Mounts. Disk Mounts can be quickly installed and removed, allowing you to change samples even if they are permanently mounted.

The Rapid Thermal Stage is designed to be cooled by the Quantum Design X132 Thermal Link, which could be part of the X130 Integrated Nanopositioners option or could be part of user-installed nanopositioners. The RTS may be compatible with other thermal links (although each case would need to be determined individually).



* Specifications when mounted to Quantum Design X132 Thermal Link:	
• Temperature range:	1.8 K – 350 K
• Focus shift over temperature range:	< 30 microns (sample mounted directly to button) < 35 microns (sample mounted to 1.4 mm thick disk mount)
• Temperature sweep times (disk mount installed):	2 K to 300 K: < 6 minutes 300 K to 2 K: < 30 minutes



Rapid Thermal Stage mounted on Thermal Link plate

New Product Announcement

Wired Sample Mount Kit (X150)

Make electrical contact to your sample while keeping it cold on a nanopositioner stack

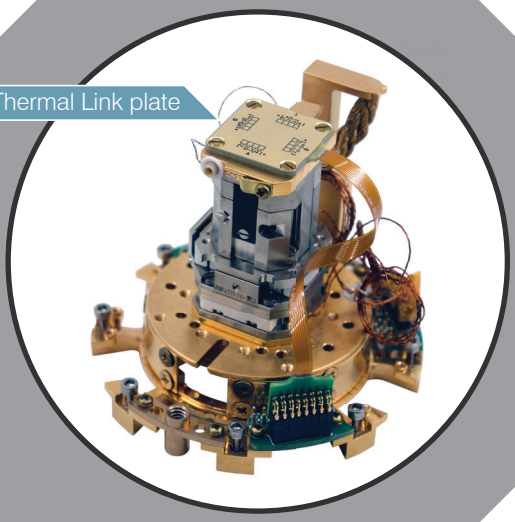
Optical measurements often require electrical contact (for gating and transport measurements) while focusing a microscope objective on the sample. Standard chip carriers are convenient because they allow you to use wire bonds to make contact to your sample and maintain a low optical working distance. However, standard chip carriers do not provide adequate thermal contact to maintain samples at low temperatures. Also, having to wire connections from a chip carrier on top of a nanopositioner stack to the OptiCool pod flange can be tedious and error-prone.

The Wired Sample Mount solves this problem by providing a gold-plated copper plane that is thermally connected to the X132 Thermal Link plate and provides 16 pre-wired pads for connecting electrical leads to your sample. Unlike standard chip carriers, the mount's copper plane makes metallic contact through solid copper to the Thermal Link plate. Simply attach your sample with grease or glue to the surface of the Wired Sample Mount, and it will typically be cooled to within < 50 mK of the Thermal Link temperature.

An integrated flexible circuit carries the 16 wires to the pod flange, so there is no need to hand-wire these connections. The Wired Sample Mount is designed to be used with OptiCool's Standard Sample Wiring (X300). Twisted pairs in this wiring are carefully routed on the flexible circuit to minimize electrical pickup.

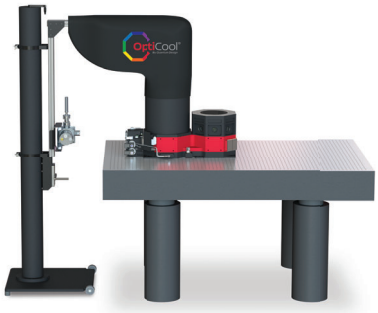
The Wired Sample Mount Kit includes everything you need to get started: 4 Wired Sample Mounts, the mating PC board that goes on the Pod flange, and the associated mounting screws.

Wired Sample Mount attached to Thermal Link plate



* Specifications:	
• Compatible with full OptiCool temperature and magnetic field range	
• Mounts to X132 Thermal Link Plate (not compatible with X140 Rapid Thermal Stage)	
• Electrical connections:	16 connections (8 pairs) Pads for wire bonding or soldering Pads arrange in 4 four-probe sets Automatic connections from pads to OptiCool front panel (no manual wiring)

* Specifications subject to change without notice (March 2024)



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