



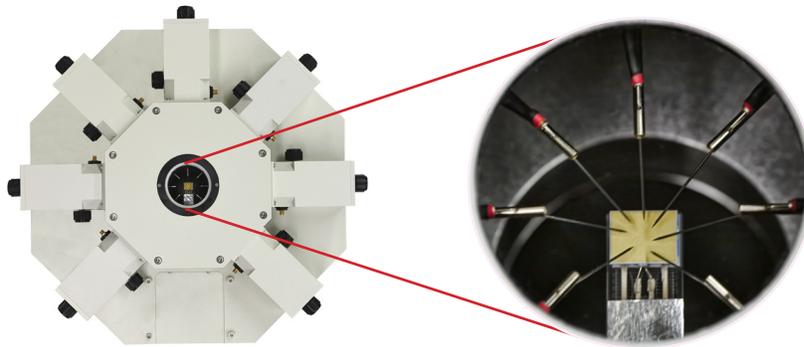
VARIABLE TEMPERATURE MICROPROBE STATION

The Variable Temperature Microprobe System

The variable temperature microprobe system VTMP or (LTMP Low temperature microprobe system) is designed to provide measurements of semiconductor materials such as gallium arsenide, amorphous silicon, mercury cadmium telluride or others across a wide temperature range as low as 70K to as high as 730K. The VTMP systems are a precisely controlled temperature environment, free of vibration and microphonics. The Microprobe system can be configurable to between one (1) and seven (7) independently controlled probes. Each probe is capable of moving on three axes, with orthogonal travel, and with positioning accuracy of better than 50 microns to provide a unique platform capable of performing a wide variety of measurements and experiments, including electrical characterization of materials and deep level transient spectroscopy.

The patented Joule-Thomson temperature stages provide both a cryogenic cooling and heating system to enable automated and high precision control of the temperature of the sample stage over a wide range of temperatures.

There are many options available with the VTMP system including top down optics, turbo pumps, a transmission (bottom) window, fiber optic probe manipulators, and vibration isolation tables. This is truly a system that provides any laboratory with a nearly unlimited range of experimental capabilities and opportunities.



MMR Microminiature Refrigerators

When adding temperature control to a VTMP/LTMP system the following temperature ranges are possible:

- ◆ Room temperature (300K)
- ◆ 70K to 580K
- ◆ 300K to 730K

(See 'Joule Thomson Temperature Stages' for more information)

K2000 Temperature Controller

MMR Technologies unique Programmable Temperature Controller is exclusively intended for use with our patented JT cooling and thermal stage systems. This controller provides accurate temperature measurement, precise and very stable temperature control, and easy-to-use data acquisition functions over the temperature range from 70K to 730K. Controlled cycling, temperature ramping and changing temperature operation under software control gives the user a valuable tool for solid state characterization studies.





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Applications

MMR Technologies Variable Temperature Microprobe system is one of the more flexible instruments for solid state characterization. There are many possible applications for these systems, including but not limited to:

- ◆ Optical experiments
- ◆ Deep level transient spectroscopy studies
- ◆ Micromanipulation
- ◆ Electrical measurements
- ◆ Fiber optic probe illumination and optical studies
- ◆ Material studies
- ◆ IC testing
- ◆ Testing of IR detectors
- ◆ MEMS
- ◆ Environmental control chamber studies

These systems are flexible, modular, and highly adaptable to integrate with a wide variety of experiments through SMA or triaxial connectors on each manipulator.

Options Available

- ◆ Vibration isolation table
- ◆ Turbo molecular pump
- ◆ High frequency probes and SMA connectors up to 300MHZ at 14dB
- ◆ Additional probes/manipulators up to 7



Features and Benefits

The variable temperature microprobe systems are noted for their unique benefits and features, making these systems easy to use and inexpensive additions to research facilities:

- ◆ Modular - you can build the systems up over time to meet your budget and experimental needs.
- ◆ Bench-top configuration: small and compact in size
- ◆ Excellent temperature setting, stability, and reproducibility.
- ◆ Absence of mechanical, acoustic, or electrical noise.
- ◆ Fast cool down and warm up times, with frost free operation.
- ◆ Wide range of operation: 70K to 730K
- ◆ Non-magnetic electrical feed thru's facilitate electrical connections directly to samples on the thermal stage.
- ◆ Low cost of operation: \$0.50/hour
- ◆ On the Joule-Thomson stages there are no liquid cryogenes to handle.
- ◆ Very low power consumption - less than 12 watts on any stage.
- ◆ Designed for stereo zoom microscope integration - providing easy observation of probe placement and operation.