MPMS™ compatible

Sub-two-kelvin Magnetic Measurement System

*i*Helium3

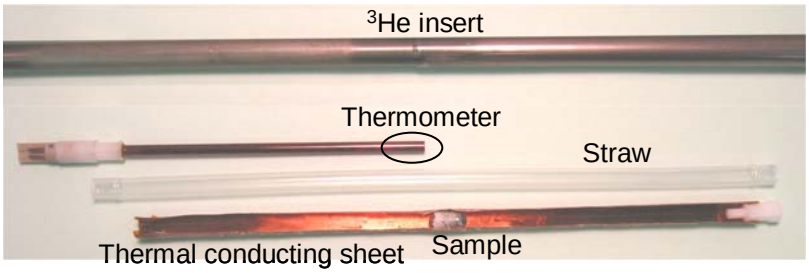
IQUANTUM

*i*Helium3 - Magnetic-measurement solution for $T < 2$ K

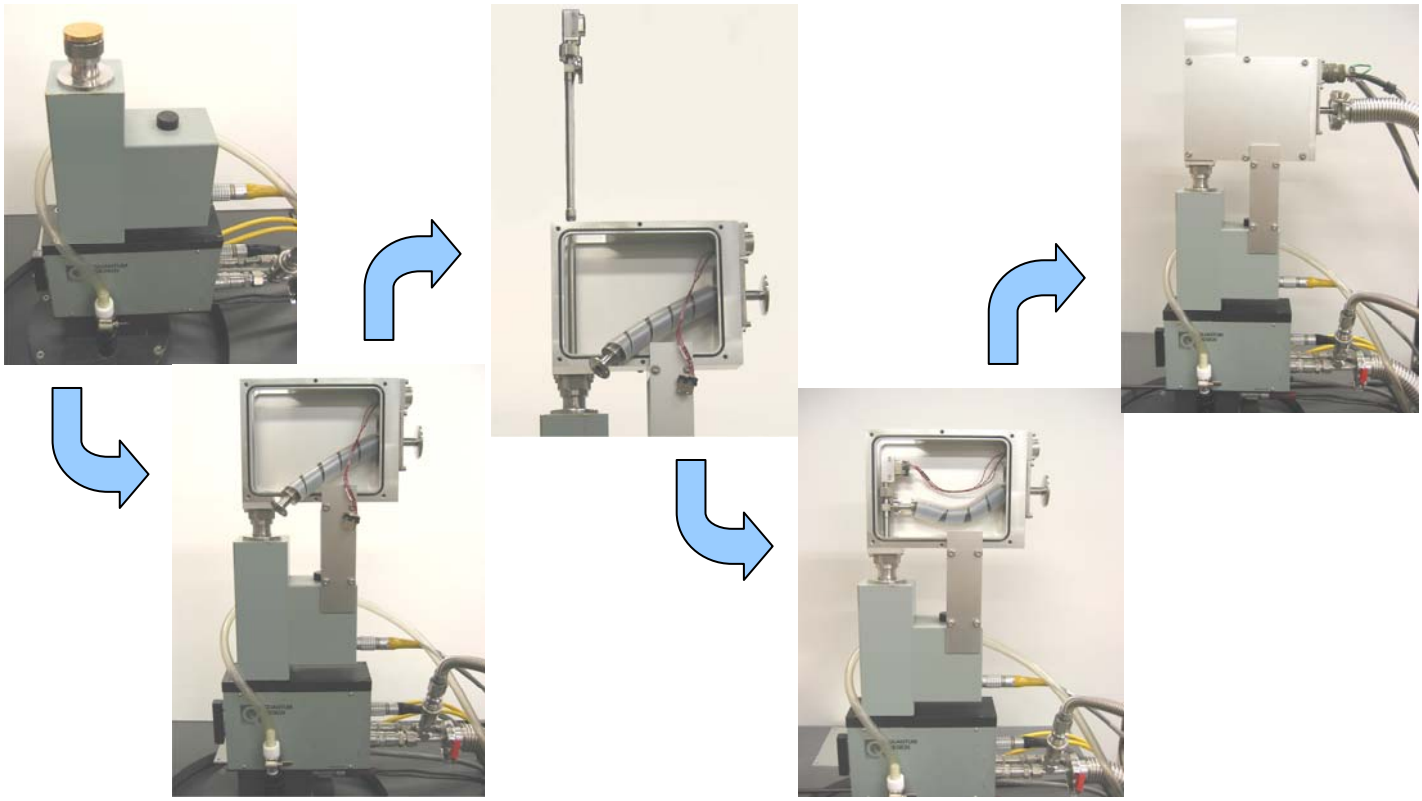
Have you ever wanted to study magnetic properties of organic magnets, single-molecule magnets, organic superconductors, heavy-fermion systems, Sr_2RuO_4, etc. below 2 K?
*i*Helium3 was developed to satisfy these research needs.
*i*Helium3 is easily attachable to the de facto standard MPMS™ from Quantum Design, Inc. without any modifications to the MPMS, extending the minimum temperature for magnetization measurements to less than 0.5K.

^{3}He insert & the sample space

The vacuum jacket and sample space are ingeniously accommodated within an 8.6 mm diameter probe that mounts within the MPMS sample space. The inner diameter of the ^{3}He insert is 6.4 mm, allowing the standard MPMS straws to be used for sample mounting.



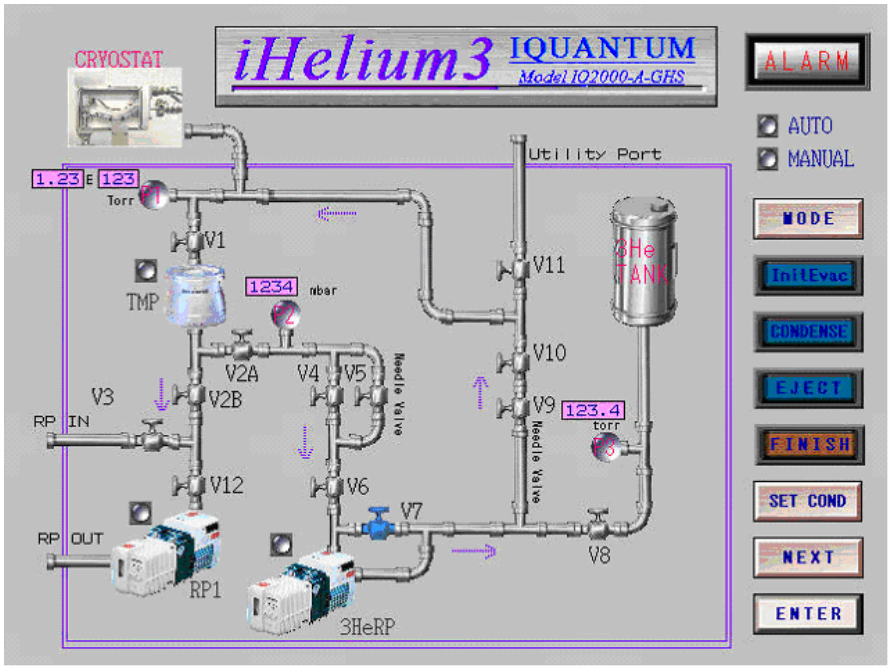
Set-up procedure



Installation or removal of the entire *i*Helium3 system takes less than 15 minutes.
A model that is compatible with the standard (DC) transport is also available.

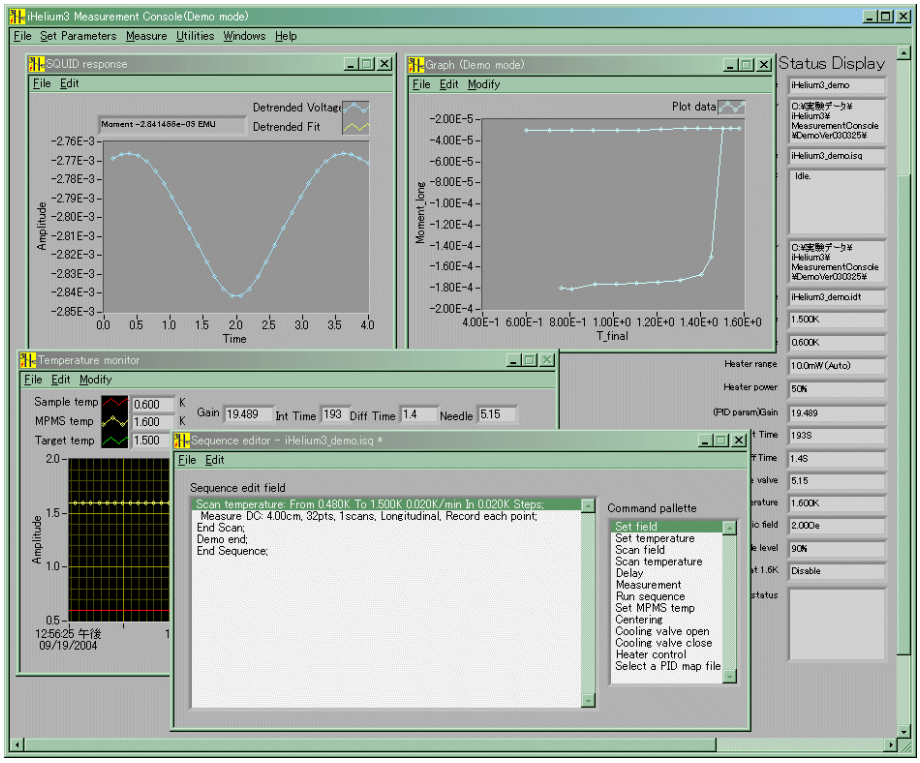
Automated ^{3}He-gas handling system

The newly-designed ^{3}He gas handling system is very compact yet does not compromise on functionality; it enables a fully automatic cool-down to below 0.5 K via convenient menu items on the integrated touch screen monitor.
All valve states are displayed on the touch screen panel. In addition to the fully automatic mode described above, the valves can be manually controlled through virtual switches on the touch screen monitor.
The gas handling system contains a high-vacuum system with a turbo molecular pump and a hermetically-sealed rotary-vane pump for automated ^{3}He gas recovery. The built-in temperature controller simultaneously controls two temperatures; that of the sample and that of the charcoal for sorption pumping. All these features make this system a versatile ^{3}He cooling station for your sub 2-K lab applications.

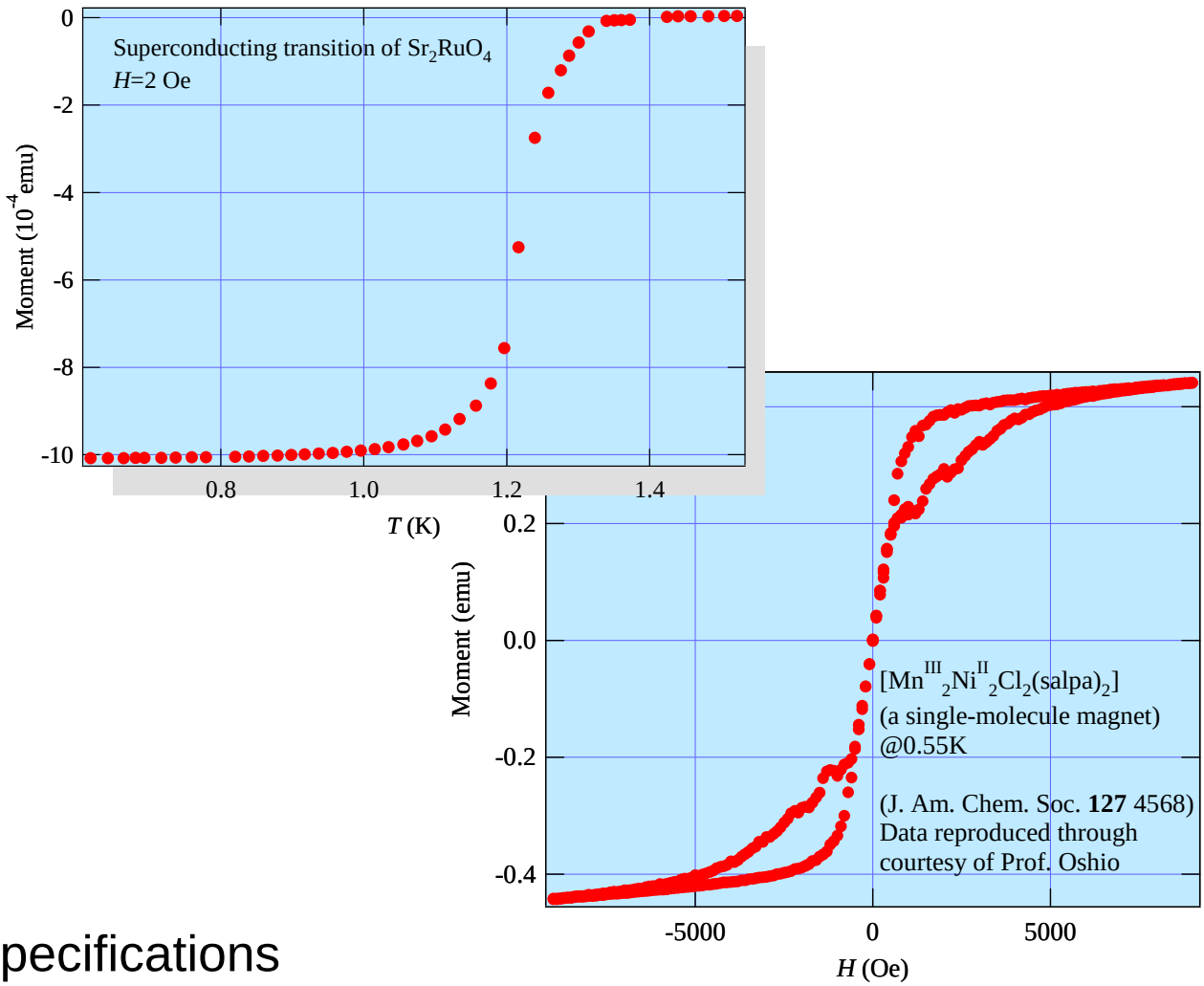


Automated measurement software

The LabVIEW^{TM}-based measurement software, called *i*Helium3 Measurement Console, enables fully-automated data acquisition. This program runs simultaneously with MPMS MultiVu^{TM} software. While controlling the sample temperature within the ^{3}He cryostat, *i*Helium3 Measurement Console instructs MPMS MultiVu^{TM} to make standard magnetization measurements.



Measurement results



Specifications

- Requires Continuous Low Temperature Control capability on the MPMS
- EverCool™ compatible
- Temperature range: 0.48 (0.50 for a system with EverCool) to 1.8 K
- Temperature stability: 0.5%
- Cooldown time < 6 hours
- ^{3}He run time > 5 hours
- ^{3}He insert's background (typical): 2×10^{-4} emu at 5 T

IQUANTUM Corporation

A-212-2, Main Bldg., AIST Central-2
1-1-1 Umezono, Tsukuba
Ibaraki 305-8568, Japan

E-mail: info@iquantum.jp

Mission

IQUANTUM was founded by the researchers at the National Institute of Advanced Industrial Science and Technology (AIST) of Japan. Based on AIST's long history of low-temperature and precision-measurement research, IQUANTUM offers creative products and services. In addition to iHelium3, we offer a palm-top AC/DC transfer standard and a cryogen-free programmable Josephson voltage standard.