

CryoComplete™

Electrical measurements in cryogenic environments



CryoComplete™
Spanning the cryogenic ecosystem
77 K to 500 K

Everything you need
to start making
temperature-dependent,
low-level electrical
measurements



The image shows the CryoComplete system components: a monitor displaying the CryoComplete logo and Lake Shore Cryotronics logo, a base unit with a digital display showing measurement data (e.g., 100.000 nA, 274.046 nV, 1.00000 kHz, 765.474 fA), and a vertical cryogenic probe with various valves and connectors.

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Focus your research with CryoComplete

With CryoComplete™, you can start making cryogenic electrical measurements as soon as it lands in your lab. From the simple-to-use, pour-fill LN₂ Dewar to the prewritten I-V (resistance) measurement routines, CryoComplete produces results right out of the box.

While easy to use, the system's performance doesn't disappoint. Its industry-leading measurement electronics promote low-level DC measurements and three full channels of lock-in AC capability—the keys to unlocking difficult measurements. Best of all, our cryogenic experts have designed CryoComplete from top to bottom, using cryogenic best practices, to deliver end-to-end system specifications.



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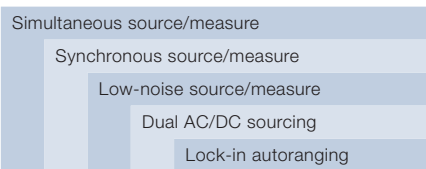
Electrical measurements in cryogenic environments

Applications and capabilities

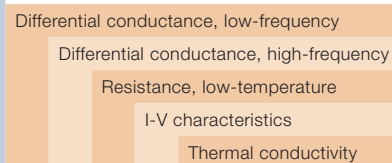
From setup to measurement, CryoComplete enhances your cryogenic experimentation.

- Complete measurement system
- Optimized signal path
- Quick lead times

Measurement benefits



Common measurements



| | | | | | | | | | | | |
|-----------------------|---|---|---|---|--|--|---|---|---|---|---|
| Thermal transport | 1D materials, thermoelectric materials | ✓ | ✓ | | | | ✓ | | | | ✓ |
| Materials research | Nanodevices, superconducting devices, nonlinear devices | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| Materials development | Linear systems, sensors | | | ✓ | | | | | ✓ | ✓ | |

Standard system capabilities

VPF-100 cryostat/335 temperature controller/calibrated silicon diode

Operating temperature range: 77 K to 500 K

Cryogen: Liquid nitrogen

Sample environment: Sample in vacuum

Temperature stability: 50 mK

Pour-fill reservoir capacity: 1.2 L LN₂

Cooldown time: 15 min to 77 K

Working time: 8 h

Optical ports: 4 quartz windows

Electrical sample mount: Pre-wired mounting plate with 8 contact pins

Resistance/I-V measurements

M81-SSM-6 with balanced current source and voltmeter modules

Measurements: 100 $\mu\Omega$ to 1 G Ω *

Source modes: DC, sine, triangle, square

Source ranges: 1 pA to 100 mA

Source frequency: 100 μ Hz to 100 kHz (square <5 kHz)

*Upper impedance range limited to DC

Measurement limit: 10 V maximum

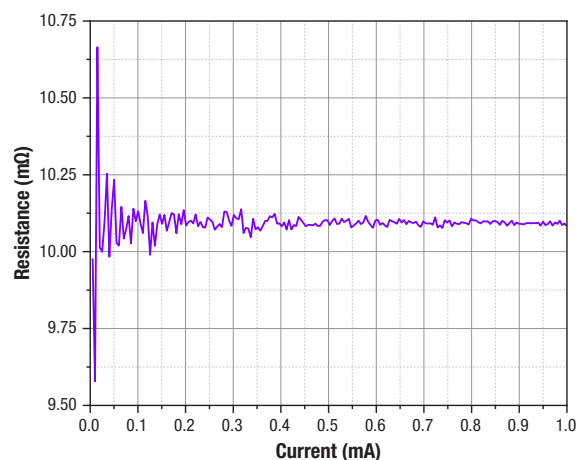
Input impedance: >10 G Ω (differential)

Leakage current at sample: 50 pA at 10 V for coaxial or 50 fA at 10 V for guarded triaxial

Voltage noise at sample: <5 nV/ $\sqrt{\text{Hz}}$ at 83 Hz

Measure noise at sample (1/f): <100 nV

BCS-10 versus VM-10, 10 m Ω resistor, 4-probe, 2TX and 2CXLIA at 83 Hz, FIR = 3, τ = 200 ms



Ordering information

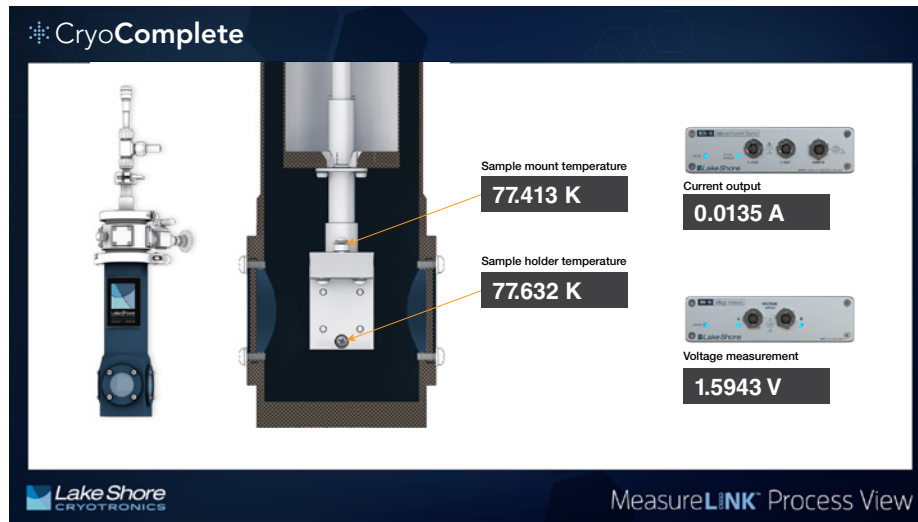
CryoComplete-LN2-V

CryoComplete 77 K to 500 K cryogenic characterization system

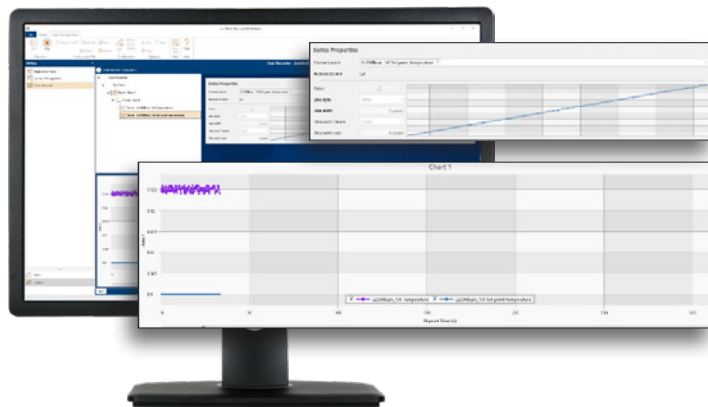
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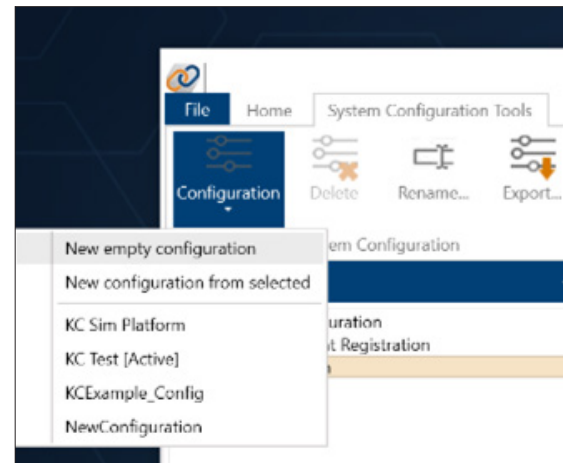
Easily control and monitor your system with **MeasureLINK™** software



◀ **Process view** shows a representation of the cryostat internals with the appropriate temperatures highlighted for a better understanding of internal temperature variations (shown is an internal view of a VPF-100 application)



Log all system variables using the chart recorder utility so you can keep a close eye on experiment temperature trends in real-time; it also helps determine when steady-state conditions have been reached

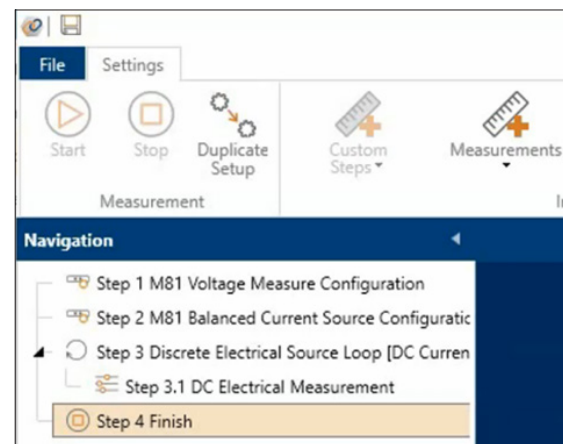


Create multiple measurement configurations



Monitor pane

The monitor pane allows easy access to monitor temperature and change control setpoints



Create nested, multi-level measurement loop sequences with drag-and-drop controls, and coordinate the cryostat environment with electrical source sweeps and multi-channel data collection