



# CryoComplete™

Spanning the cryogenic ecosystem

77 K to 500 K

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



environment by  JANIS

# 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 LN<sub>2</sub> 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.



## PC with MeasureLINK™

A PC with MeasureLINK provides the user interface to control your cryogenic system. MeasureLINK enables a wide range of capabilities, including data charting, instrument control, and system monitoring with a cryostat-specific process view.

## LN<sub>2</sub> cryostat

The Environment by Janis VPF-100 sample in vacuum cryostat provides a variable-temperature sample environment from 77 K to 500 K. The pour-fill design allows quick and easy LN<sub>2</sub> refills.

## Source + measure + lock-in

Run ultra-low-noise AC/DC measurements with the MeasureReady™ M81-SSM synchronous source measure system. In addition to the M81-SSM-6 instrument, it includes a BCS-10 balanced current source module and a VM-10 DC/AC/lock-in voltmeter module with a combined noise performance (differential) of 4.1 nV/√Hz.

## Temperature control

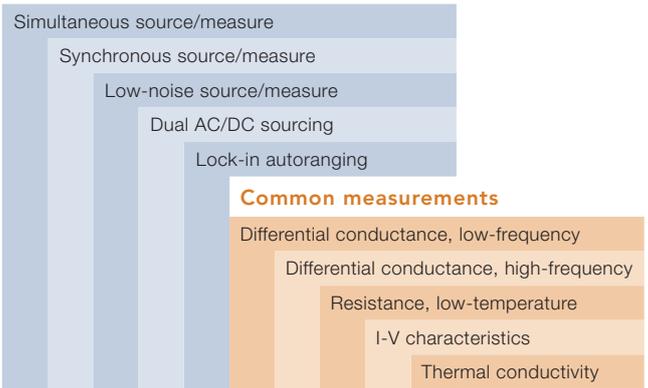
Control temperature within 50 mK with a Lake Shore Model 335 temperature controller, a Lake Shore precision-calibrated silicon diode, and a pre-wired heater. Advanced PID autotuning, pre-programmed sensor calibration, and default cryostat tuning enable fast setup and operation.

# Applications and capabilities

From setup to measurement, CryoComplete enhances your cryogenic experimentation.

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

## Measurement benefits



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:** 0.4 L LN<sub>2</sub>

**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 μΩ to 1 GΩ\*

**Source modes:** DC, sine, triangle, square

**Source ranges:** 1 pA to 100 mA

**Source frequency:** 100 μHz to 100 kHz (square <5 kHz)

\*Upper impedance range limited to DC

**Measurement limit:** 10 V maximum

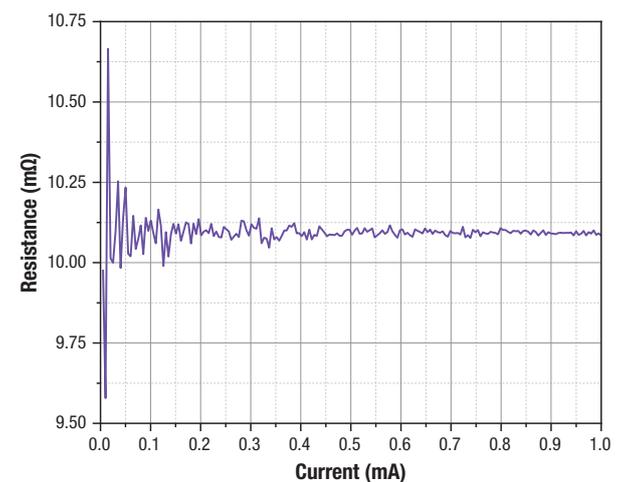
**Input impedance:** >10 GΩ (differential)

**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/√Hz at 83 Hz

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

## BCS-10 versus VM-10, 10 mΩ 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

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

**CryoComplete**

Sample mount temperature: **77.413 K**

Sample holder temperature: **77.632 K**

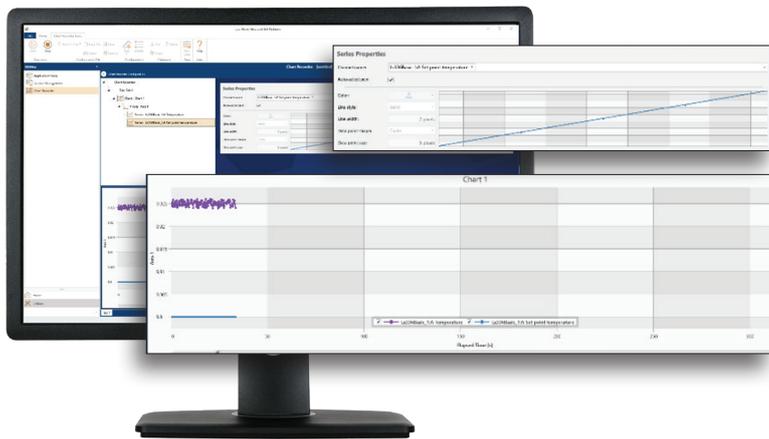
Current output: **0.0135 A**

Voltage measurement: **1.5943 V**

Lake Shore CRYOTRONICS

MeasureLINK™ Process View

◀ **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)



Create multiple measurement configurations

- New empty configuration
- New configuration from selected
- KC Sim Platform
- KC Test [Active]
- KCExample\_Config
- NewConfiguration

Expand all Collapse all Keep on top

System Status

Execution state: Idle

335 Temperature Controller ("LS335Basic")

Ok **77 K <A>**

ALL OFF

A: INPUT A **77 K** B: INPUT B **80 K**

M81 Source/Measure System ("M81")

Connected

M81 BCS Current Source ("M81Bcs") M81:S1

DC amplitude **0.0000 A**

Range Auto **10.000 nA** Shape DC Output Sync Src None

M81 VM Voltage Measure ("M81Vm") M81:M1

OK **2.9406 mV**

Mode DC Range Auto **10 mV** Coupling DC Config AB



## 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

- Step 1 M81 Voltage Measure Configuration
- Step 2 M81 Balanced Current Source Configuratic
- Step 3 Discrete Electrical Source Loop [DC Curren
- Step 3.1 DC Electrical Measurement
- Step 4 Finish