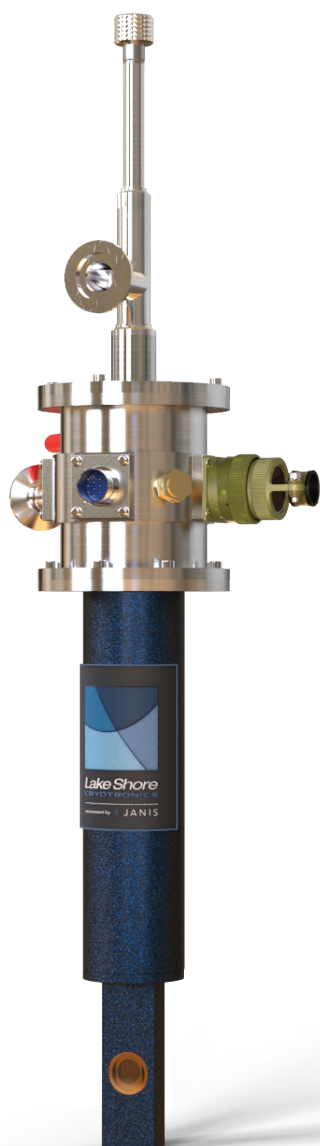


SuperTran cryostats

ST-300-MS



SuperTran Cryostats

ST-300-MS sub-compact optical microscopy cryostat

Designed as a more compact alternative to the **ST-500** microscope cryostat, the Lake Shore **ST-300-MS** combines short working distance with the convenience of the continuous flow SuperTran cryostat design. It is intended for use in experiments with space restrictions and is available with a compact round or ultra-compact rectangular window block. The ST-300-MS provides a variable temperature sample environment for optical imaging from <math><2\text{ K}</math> (with LHe) or 77 K (with LN_2) to 500 K. It can be combined with the RGC4 recirculating cooler for cryogen-free operation.

SuperTran cryostats

ST-300-MS



ST-300-MS sub-compact optical microscopy cryostat

The Lake Shore SuperTran ST-300-MS cryostat is intended for use in optical microscopy applications when space restrictions do not permit the use of the ST-500, and sub-micron vibration levels are sufficient. Offering operating temperatures from <2 K to 500 K, the ST-300-MS uses a high-efficiency transfer line to deliver LHe or LN_2 to the sample mount for cooling the user sample. A built-in heater and sensor provide precision variable temperature capability. Temperatures below 4.2 K are achieved by reducing the venting helium gas pressure using a mechanical vacuum pump.

Two different configurations are offered: the standard round vacuum shroud is compatible with most optical microscopes, while the ultra-compact rectangular shroud is suitable for use in restricted geometries. The sample holder position can be adjusted to accommodate varying sample thicknesses while maintaining the desired short working distance. Cryogenic-service wiring (single conductor, twisted-pair, or coaxial cables) is offered for use in electrical applications. Standard windows are UV-grade fused silica offering transmission from the UV to near-IR regions. Optional window materials can be installed to span the spectral range from UV to near/mid-IR to far-IR for a variety of spectroscopic measurements.

The ST-300-MS can be combined with the RGC4 recirculating gas cooler for fully cryogen-free operation throughout the entire temperature range. The RGC4 enables unattended cryostat operation, ideal for extended duration measurements.

Typical applications for the ST-300-MS include spectroscopy (photoluminescence, UV-visible), materials characterization (resistivity, Hall effect), as well as low-temperature imaging and microscopy. When mounted to an electromagnet, magneto-electric and magneto-optical measurements including MOKE are possible.

Key features

Sample-in-vacuum configuration

Continuous flow design, using a high-efficiency transfer line to deliver a steady stream of LHe or LN_2 from a storage Dewar to the sample mount

Variable temperature sample mount and sample holder, with temperature regulated via internal heater and calibrated silicon diode sensor (and external temperature controller)

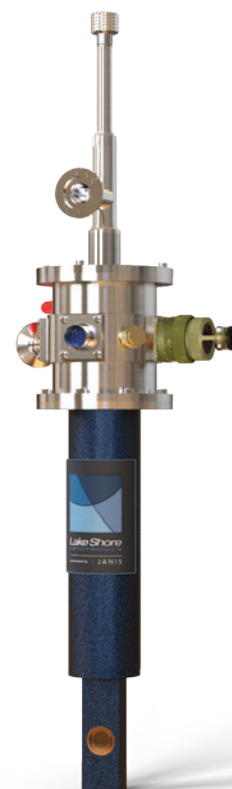
The vacuum shroud configuration (compact round or ultra-compact rectangular) is selectable at time of order

Sample to objective lens working distance is minimized, and can be adjusted to match samples of varying thickness

Continuous temperature range from <2 K to 500 K (LHe) or 77 K to 500 K (LN_2)

Compatible with RGC4 recirculating gas cooler for cryogen-free operation

Optional DC and RF wires and cables for electrical measurements



SuperTran cryostats

ST-300-MS

ST-300-MS

Featured components

Copper sample mount with removable sample holder

Integrated control heater and calibrated silicon diode control sensor

Compact round or ultra-compact rectangular optical vacuum shroud with epoxy-sealed window port(s) and short working distance, for integration with most commercial optical microscopes

Polished aluminum thermal radiation shield

Instrumentation adapter with 10-pin electrical feedthrough, three spare o-ring sealed ports, evacuation valve, and safety pressure relief valve

High-efficiency liquid helium/liquid nitrogen transfer line with needle valve flow control

Selections

Maximum temperature

500 K: standard, using calibrated silicon diode sensor

420 K: replaces standard silicon diode sensor with calibrated field-independent Cernox

Vacuum shroud configuration

Round vacuum shroud with top window

Rectangular vacuum shroud with top and bottom window

Easily add DC, AC, and mixed DC+AC measurement capabilities to your cryostat with an M81-SSM

This modular, multichannel system provides highly synchronized DC, 100 kHz AC, and mixed DC + AC sourcing and measuring — including both voltage and current lock-in measurement capabilities — for low-temperature material research performed in your cryostat. It supports up to three remote-mountable source and three measure modules per a single M81-SSM-6 instrument and, owing to its modularity, allows signal and source amplifiers to be located as close as possible to the sample being characterized. This minimizes the signal wiring to the sample, reduces noise, and increases measurement sensitivity. The modules also leverage patent-pending MeasureSync™ real-time sampling technology to ensure synchronous sourcing and measuring across all channels. Plus, by having both DC and AC sourcing and measurement in one instrument, the M81-SSM can eliminate the need for mixed-instrument setups, greatly simplifying the setup of complex characterization configurations.



Real-time sampling architecture for synchronous sourcing/measuring

All source and measure channels are capable of DC and AC to 100 kHz signals

100% linear circuitry for the lowest possible source/measure noise

Optimized for fundamental, harmonic, and phase AC plus DC biased measurements

Unique, flexible instrument/distributed module architecture

Provides the absolute precision of DC plus the detection sensitivity performance of AC instrumentation

Uses a clean, simple UI and common programming API for fast setup

Included MeasureLINK software enables full end-to-end measurement and cryostat temperature control

MeasureLINK™

SuperTran cryostats ST-300-MS



Options

Windows

All window options for the ST-300-MS are custom. They can include UV-grade fused silica, sapphire, ZnSe, CaF₂, and others. Contact Lake Shore for more information.

Mounting stand

Black anodized aluminum cryostat support stand
[consult Lake Shore](#)

Re-entrant bottom window

Permits use of objective lens on both sides of the sample; applies only to round vacuum shroud configuration [consult Lake Shore](#)

Sample holders

Custom sample holders are available. Contact Lake Shore for more information.

For total control of measurements performed in a cryostat, add our MeasureLINK software

Our optional MeasureLINK software enables a wide range of capabilities including charting and logging, system monitoring with a cryostat-specific process view, and even controlling Lake Shore equipment as well as some third-party instrumentation, in a non-programming environment. You can also create unlimited functionality using the scripting development environment.

Create multiple configurations to support separate measurements

Monitor temperature and change setpoints with the monitor pane

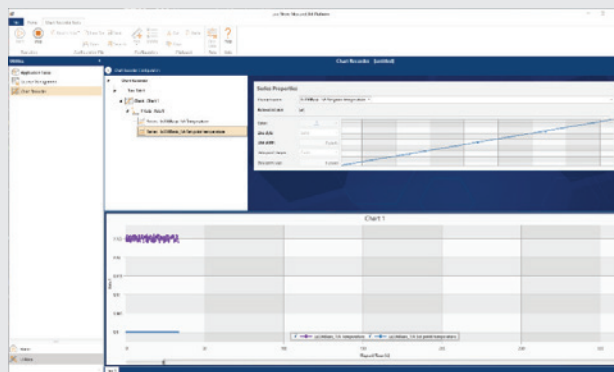
Easily create nested, multi-level measurement loop sequences

See real-time internal cryostat temperatures in Process View

Charts and log all system variables with Chart Recorder

No programming required — drag and drop to create temperature sweeps, access measurements, and add third-party instruments

Custom scripting function allows you to construct new and edit existing measurement scripts



The chart recorder utility enables charting and logging of all system variables, for example, so you can keep a close eye on temperature trends in a cryostat experiment in real-time; it also helps you determine when steady-state conditions have been reached.

MeasureLINK
Monitor Pane

Expand all Collapse all Keep on top			
System Status			
Execution state: Idle			
336 Temperature Controller (T3.150Base)			
Ok: 1.500 K <A>			
All Off			
A: INPUT A	B: INPUT B		
1.499 K	77.351 K		
SPI: 1.500 K 0.4% HIGH	SPI: 0.000 K 0.0% HIGH		
C: INPUT C	D: INPUT D		
295.001 K	330.001 K		

MeasureLINK™

SuperTran cryostats

ST-300-MS

Options

Electrical feedthroughs

- (1) BNC grounded [EF-BNC-1-B-AL](#)
- (2) BNC grounded [EF-BNC-2-S-AL](#)
- (6) BNC grounded [EF-BNC-6-G](#)
- (1) BNC insulated [EF-BNC-1-B-NC](#)
- (2) BNC insulated [EF-BNC-2-S-NC](#)
- (6) BNC insulated [EF-BNC-6-I](#)
- (1) triaxial grounded [EF-TRIAX-1-B-AL](#)
- (6) triaxial grounded [EF-TRIAX-6-G](#)
- (1) triaxial insulated [EF-TRIAX-1-B-NC](#)
- (6) triaxial insulated [EF-TRIAX-6-I](#)
- (2) SMA grounded [EF-SMA-2-B-AL](#)
- (6) SMA grounded [EF-SMA-6-G](#)
- (2) SMA insulated [EF-SMA-2-B-NC](#)
- (6) SMA insulated [EF-SMA-6-I](#)
- 10-pin [10P-ASSEMBLY](#)
- 19-pin [19P-ASSEMBLY](#)
- 26-pin [26P-ASSEMBLY](#)
- 32-pin [32P-ASSEMBLY](#)

Additional temperature sensors

One Lake Shore calibrated diode is now included on every cryostat as the control sensor

- Silicon diode, calibrated [DT-670-CU-HT-1.4L](#)
- Cernox® magnetic field independent, calibrated [CX-1050-CU-HT-1.4M](#)

Installed wiring

- (1), (2), or (6) coaxial cables, SMA [CABLEASSY-63340](#)
- (1), (2), or (6) coaxial cables, BNC [CABLEASSY-63342](#)
- (1) or (6) triaxial cables [CABLEASSY-63341](#)
- (10), (19), (26), or (32) PhBr wires [WIRE-PHBR](#)

Accessories

Available at www.lakeshore.com

- LHe storage Dewar [CF-100](#)
- LN₂ storage Dewar [LN-50](#)
- Vacuum pumping station [10RVP](#), [10DDP](#), or [TS-85-D](#)
- Temperature controller [336](#), [335](#), or [325](#)



336 temperature controller



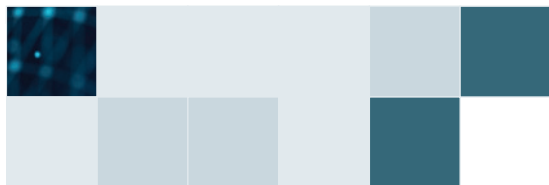
335 temperature controller



325 temperature controller

SuperTran cryostats

ST-300-MS



ST-300-MS

Specifications

Initial cooldown time (LHe to 5 K)	15 min
Temperature range	<2 K to 500 K
Typical temperature stability ¹	±50 mK
Orientation ²	Any
Cryogen consumption (LHe room to base temp)	0.4 L
Cryogen consumption (LHe at 5 K)	0.6 L/h
Cryogen consumption (LN ₂ at 80 K)	0.1 L/h
Initial vacuum level requirement ³	~10 ⁻³ Torr
Typical base pressure during operation	~10 ⁻⁵ Torr

Size

Height	583 mm (23 in)
Inner diameter (at sample region)	29 mm (1.13 in)
Sample mount diameter	22 mm (0.88 in)
Weight (excluding transfer line, approximate)	4.6 kg (10 lb)
Shipping weight (cryostat only)	8.6 kg (19 lb)
Shipping weight (transfer line)	9.1 kg (20 lb)
Shipping dimensions (cryostat only)	762 × 508 × 508 mm (30 × 20 × 20 in)
Shipping dimensions (transfer line)	2057.4 × 660.4 × 127 mm (81 × 26 × 5 in)

¹ Measured with temperature controller

² Cryogen consumption may be higher during non-vertical operation

³ Pressure measured at room temperature prior to adding cryogens

SuperTran cryostats

ST-300-MS

Ordering information

Options

Windows

All window options for the ST-300-MS are custom. They can include UV-grade fused silica, sapphire, ZnSe, CaF₂, and others. Contact Lake Shore for more information.

CONSULT Custom windows

Mounting stand

CONSULT Black anodized aluminum support stand

Reentrant bottom window

Permits use of objective lens on both sides of the sample; applies only to round vacuum shroud configuration

CONSULT Reentrant window

Sample holders

Custom sample holders are available. Contact Lake Shore for more information.

CONSULT Custom sample holder

Electrical feedthroughs

EF-BNC-1-B-AL	(1) BNC grounded
EF-BNC-2-S-AL	(2) BNC grounded
EF-BNC-6-G	(6) BNC grounded
EF-BNC-1-B-NC	(1) BNC insulated
EF-BNC-2-S-NC	(2) BNC insulated
EF-BNC-6-I	(6) BNC insulated
EF-TRIAX-1-B-AL	(1) triaxial grounded
EF-TRIAX-6-G	(6) triaxial grounded
EF-TRIAX-1-B-NC	(1) triaxial insulated
EF-TRIAX-6-I	(6) triaxial insulated
EF-SMA-2-B-AL	(2) SMA grounded
EF-SMA-6-G	(6) SMA grounded
EF-SMA-2-B-NC	(2) SMA insulated
EF-SMA-6-I	(6) SMA insulated
10P-ASSEMBLY	10-pin
19P-ASSEMBLY	19-pin
26P-ASSEMBLY	26-pin
32P-ASSEMBLY	32-pin

Additional temperature sensors

DT-670-CU-HT-1.4L	Silicon diode, calibrated (one included with cryostat)
CX-1050-CU-HT-1.4M	Cernox® magnetic field independent, calibrated

Installed wiring

CABLEASSY-63340	(1), (2), or (6) coaxial cables, SMA
CABLEASSY-63342	(1), (2), or (6) coaxial cables, BNC
CABLEASSY-63341	(1) or (6) triaxial cables
WIRE-PHBR	(10), (19), (26), or (32) PhBr wires

Accessories

M81-SSM electronic synchronous source measure system

Contact us for standard/optical sample mounts or for interface cables/adapters for M81-SSM system/cryostat integration.

Also available: specially priced preconfigured M81-SSM/cryostat packages for certain cryostat models—contact Sales for details.

M81-SSM-2 M81-SSM instrument with 1 source and 1 measure channel, including M81-SSM accessory kit (USB-A to USB-C adapter, USB-A male to USB-B male cable, terminal connectors for digital I/O, terminal connectors for chassis ground, quick-start guide) and a 2 m (6.6 ft) LEMO to BNC adapter cable

M81-SSM-4 M81-SSM instrument with 2 source and 2 measure channels, including M81-SSM accessory kit (USB-A to USB-C adapter, USB-A male to USB-B male cable, terminal connectors for digital I/O, terminal connectors for chassis ground, quick-start guide) and a 2 m (6.6 ft) LEMO to BNC adapter cable

M81-SSM-6 M81-SSM instrument with 3 source and 3 measure channels, including M81-SSM accessory kit (USB-A to USB-C adapter, USB-A male to USB-B male cable, terminal connectors for digital I/O, terminal connectors for chassis ground, quick-start guide) and a 2 m (6.6 ft) LEMO to BNC adapter cable

ML-MCS MeasureLINK-MCS software with scripting development license. Includes complete MeasureLINK installation with Lake Shore instrument drivers, chart recorder functionality and drag-and-drop measurement sequences. Some application packs sold separately.

Other accessories

CF-100	100 L LHe storage Dewar
LN-50	50 L LN ₂ storage Dewar
10RVP	Vacuum pumping station
10DDP	Vacuum pumping station
TS-85-D	Turbomolecular pumping station
336	Model 336 temperature controller
335	Model 335 temperature controller
325	Model 325 temperature controller

SuperTran cryostats ST-300-MS

