

# MDS600 / MDSG600 / MDBCS196

Stages with Motorised Sample Manipulation



MDS600

## Heating and Freezing

Stages covering a temperature range from  $< -195^{\circ}\text{C}$  up to  $600^{\circ}\text{C}$

## Sample Manipulation

Precision motorised travel up to 15mm in XY directions

## Sample Mapping

Use with LINK software to create a composite image of the whole sample

# Introducing the Motorised Stages

Linkam's MDS series of motorised stages is based on the THMS600, one of the most widely used precision heating/freezing stages. They provide unrivalled temperature accuracy and micron-level position resolution in both X and Y via the precision micro-stepped motors. They also feature a pure silver heating element that is held by transverse stainless steel tubes to ensure a high level of stability in the Z-plane, which is critical to confocal applications.

When used in conjunction with our LINK software and a camera, a composite image map of the whole sample can be produced, even when using high magnification objectives. Sample navigation is simplified, requiring just a click on the live video feed or composite mapped image to bring a feature into the centre of view. LINK can also be used to record the entire experiment and associated images, which can then be displayed as a chart or exported for further analysis.

Three standard stages are available:

- **MDS600** provides precision temperature and environment control alongside motorised sample manipulation with a temperature range from  $< -195^{\circ}\text{C}$  \* up to  $600^{\circ}\text{C}$ .
- **MDSG600** is modified specifically for geological applications and has a temperature range from  $< -195^{\circ}\text{C}$  \* up to  $600^{\circ}\text{C}$ .
- **MDBCS196** is our biology-specific motorised stage. It has a temperature range from  $< -195^{\circ}\text{C}$  \* up to  $125^{\circ}\text{C}$ , with an isolated seeding point enabling ice crystal seeding through the sample, and a quenching post to facilitate high-speed cooling by motorising the sample from the post onto the pre-cooled silver block.

A system requires both an MDS600 series stage and a T96-S LINK temperature controller, which is supplied with LINK software for computer control. An optional LinkPad touch screen is also available, providing a "soft joystick" functionality.

\* For cooling below ambient temperatures, an optional LNP96-S liquid nitrogen pump is also available.



## Features

### WIDE TEMPERATURE RANGE

The temperature range spans from  $< -195^{\circ}\text{C}$  (using the optional LNP96-S) up to  $600^{\circ}\text{C}$  ( $125^{\circ}\text{C}$  for the MDBCS196), accommodating a versatile range of experimental conditions. The stage body is water-cooled for work above  $300^{\circ}\text{C}$ .

### RAPID HEATING /COOLING RATES

The powerful T96-S controller allows the stage to heat samples at a maximum rate of  $150^{\circ}\text{C}/\text{minute}$ .

### MOTORISED XY MANIPULATION

Control of sample position over 15mm of travel in X and Y directions via precision micro-stepped motors. Use software to set and control XY position ("go to position") and movement speed.

### HIGH DEGREE OF ACCURACY AND STABILITY

The embedded high quality Pt100 platinum sensor guarantees high accuracy and stability throughout the temperature range.

### QUICK-RELEASE GAS PORTS

Simple and easy stage purging to allow atmospheric composition control.

### CUSTOM OPTIONS

Please contact us with details of your requirements.

# Application Examples

Linkam's MDS series, with their widely customisable features, are suited for a wide range of applications including the following:

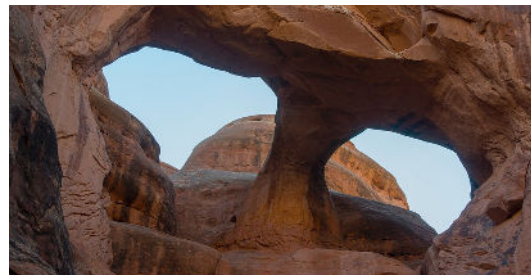
## Earth Sciences and Geology

Thermal and environmental control experiments are used in geological research, such as studies of dissolved gases or mineral content in geological fluids. The MDSG600 adds atmospheric control in combination with many microscopy and spectroscopic techniques.

Fluid Inclusions

Oxidation Studies

Thermal Maturation



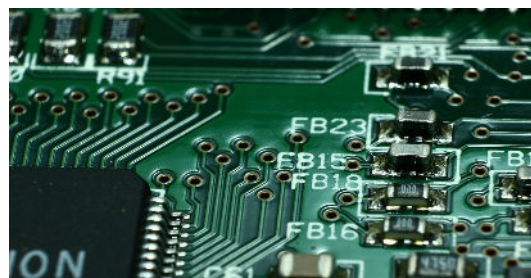
## Semiconductor and Electrical

Temperature control and atmospheric chemical characterisation via microscopy and spectroscopy are commonly used for analysis of semiconducting materials. The MDS600 can be used across many research fields, from LEDs and photovoltaic devices to energy storage and renewable energy materials.

Photovoltaics

Liquid Crystals

Molecular Structure



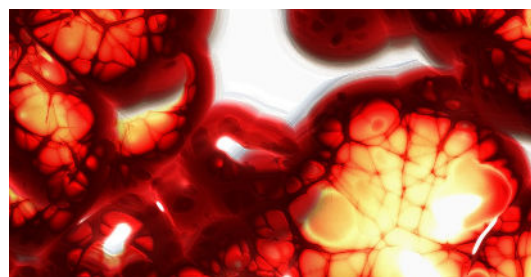
## Life Sciences

The MDBCS196 is ideally suited for biological applications where temperature must be critically controlled and maintained. It can non-invasively provide information on the thermal and in vivo stability and structure of many chemical and biological compounds.

Tissue Analysis

Coagulation

Andrology



# Technical Specification

	MDS600	MDSG600	MDBCS196
Temperature Range	< -195°C to 600°C	< -195°C to 600°C	< -195°C to 125°C
Heating/Cooling Rates	0.01°C to 150°C/min	0.01°C to 150°C/min	0.01°C to 150°C/min
Temperature Stability	< 0.01°C	< 0.01°C	< 0.01°C
XY Manipulation	Max 15mm motorised travel	Max 15mm motorised travel	Max 15mm motorised travel
Sample Size	22mm diameter	22mm diameter	22mm diameter
Position Repeatability	< 3µm	< 3µm	< 3µm
Water Cooling	Yes	Yes	No
Objective Lens Working Distance	4.7mm	4.7mm	4.7mm

## Discover More...

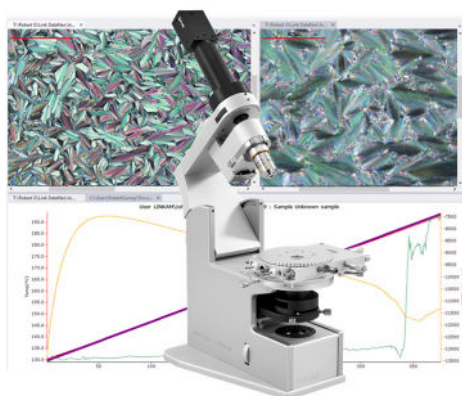


### Control Options

Take control of your experiment with LINK software, or the stand-alone LinkPad touch screen, alongside the T96 temperature controller.

Both LINK software and LinkPad share a unified user interface that can control and monitor temperature and many other parameters including vacuum, humidity, tensile and shear force (dependent on system). The LinkPad provides an easy-to-use interface to the T96, for total control without a PC. Profiles with up to 100 ramps can be programmed, allowing simulation of complex processes.

LINK software enhances this with data-logging functions and real time graphical feedback. Optional modules to enhance your system include the LINK Imaging Module for synchronised image capture, the LINK Extended Measurements module to measure key image features, the LINK 21CFR11 Module for data regulatory compliance, and LINK TASC providing image-based thermal analysis.



### Imaging Station

The Imaging Station provides a digital imaging platform compatible with Linkam temperature and environmental control systems. Use our high-resolution camera to capture images and videos of your samples while controlling the temperature and environmental conditions.

The Imaging Station has been specially designed with a pivoted mechanism to allow greater access to your Linkam stage, making it quick and easy to access the chamber and change samples. It has a built-in LED light source for transmitted light with further options available for reflected light, polarisation and phase contrast imaging.

The Imaging Station is also compatible with a range of long working distance objective lenses which can be easily switched with the quick-release mechanism.



### MFS — Modular Force Stage

The MFS provides an ideal platform for analysing the tensile properties of materials in relation to temperature and other environmental conditions, including humidity control (when combined with our RH95), or in situ submerged measurements with our liquid cell.

A number of modular options are available, facilitating temperature control from <-195°C up to 350°C, force ranges from 0 up to 600N, humidity control, and grips enabling a wide variety of sample types to be tested.

The MFS can be used for precise mechanical and optical characterisation including modulus analysis, single fibre strength tests, failure mode and fracture analysis, peel adhesion tests, compression and three-point bend testing, and many more with our custom-designed grips.

## Contact Details

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We make scientific instruments that help characterise materials from polymers to biological tissue and metals to composites. Our instruments are used for research by the world's most advanced scientific organisations and companies. Each of our instruments are designed and manufactured in-house by our team of highly experienced electronics, software and mechanical design engineers. We design and develop solutions for sample characterisation by collaborating with the best scientists in the world. Will you be next?

Linkam products are constantly being improved, hence specifications are subject to change without notice.  
TASC products are a family of techniques developed by Prof. Mike Reading (Cyversa) and Linkam.



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