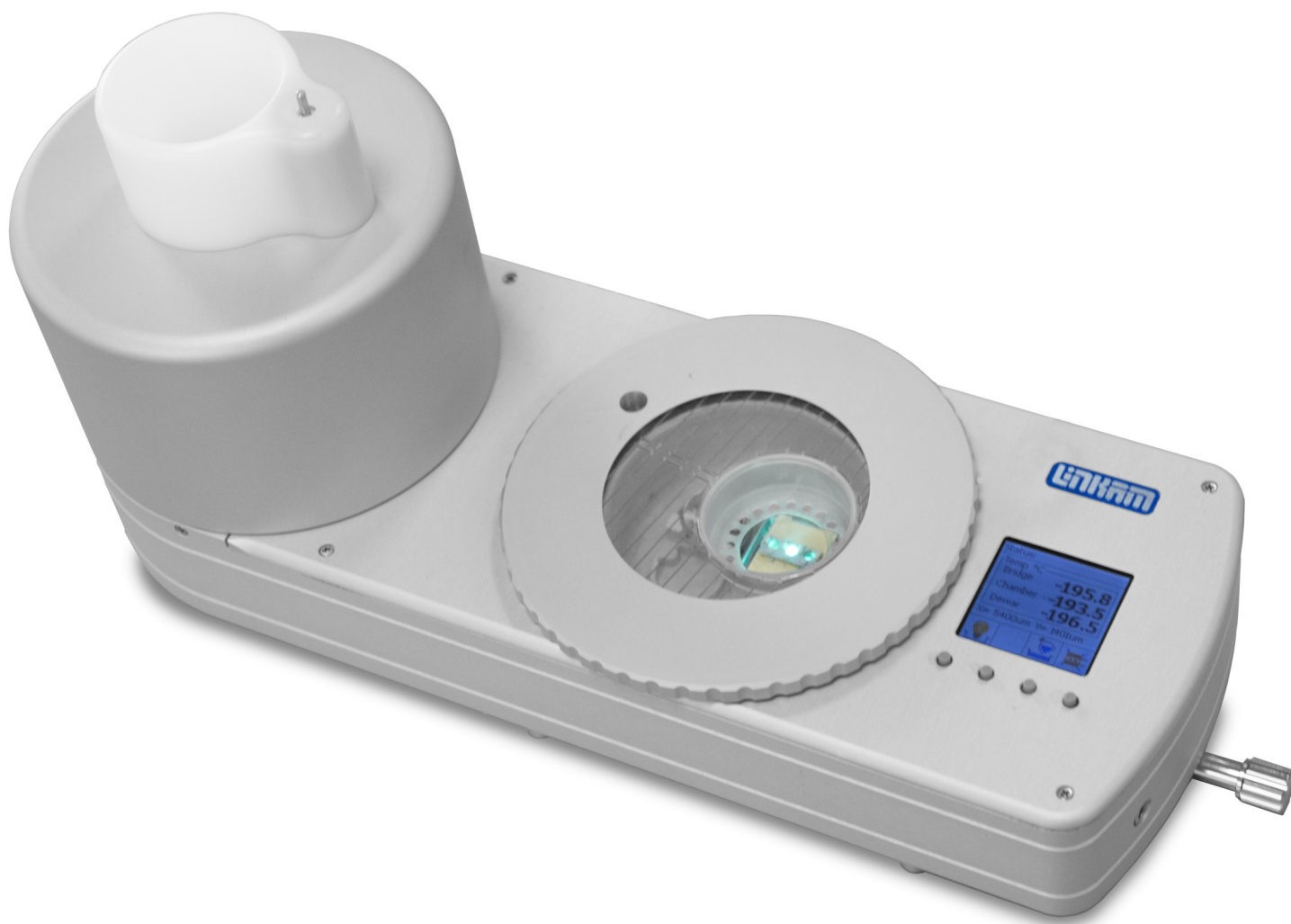


CMS196 V³

Cryo-Correlative Microscopy — Vitrified Sample Characterisation



Automatic Liquid Nitrogen Top Up
Keeps samples vitrified at -196°C

Self-Contained Cryo-Chamber
Ensures contamination free sample handling

Encoded Motorised XY
High precision, automated mapping of the whole grid at high resolution

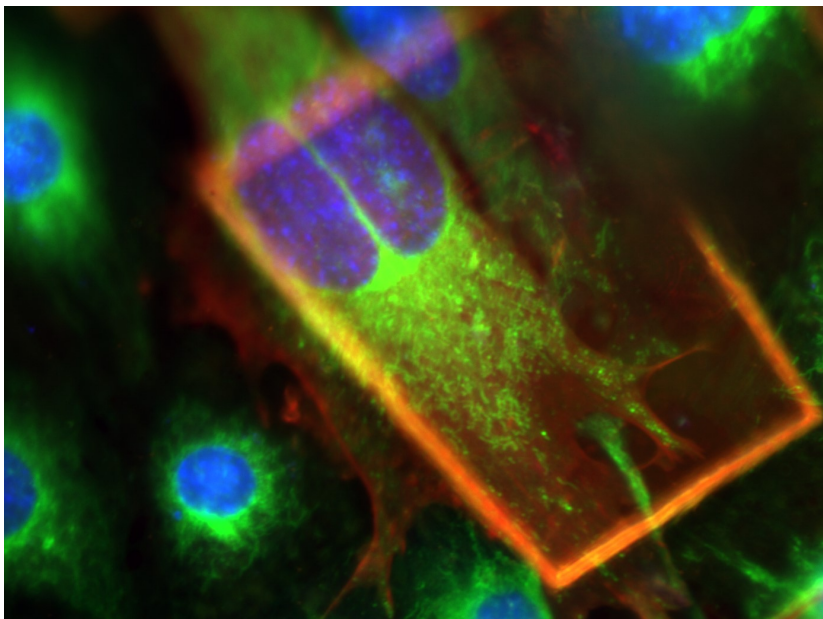
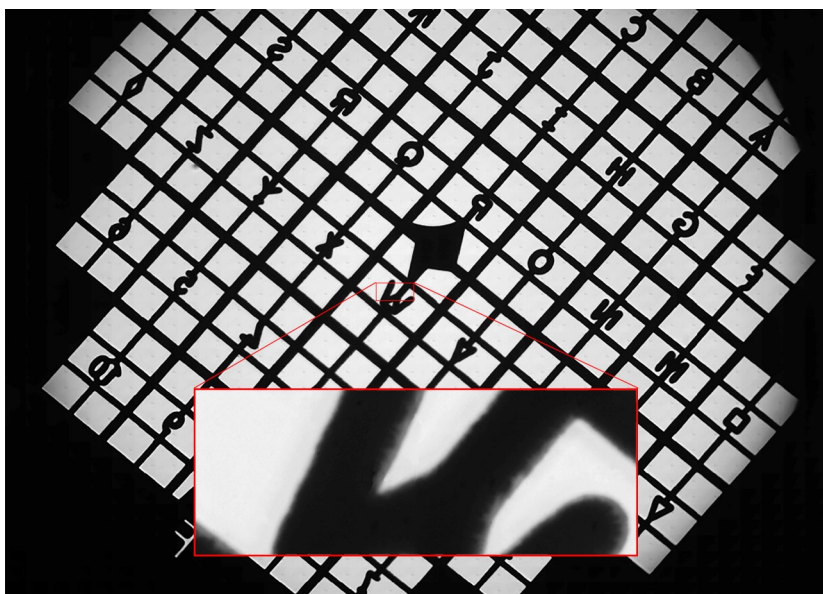
Introducing the CMS196V³

The CMS196V³ is a Cryo-Correlative Microscopy system enabling the full workflow of Correlative Light and Electron Microscopy (CLEM). While electron microscopy (EM) provides structural information at very high resolution, it can give only restricted insight into biological and chemical processes due to limitations in staining and sample preparation processes. Fluorescence microscopy on the other hand is a very sensitive method to detect biological, chemical and genetic processes and events inside living cells.

Cryo-CLEM brings it all together: combining the individual advantages from both low temperature Fluorescence and Cryo EM by imaging the same sample location with both techniques and superimposing the complementing information.

The CMS196V³ maintains the vitrified state of the sample by means of liquid nitrogen cooling and provides proven capabilities to safely handle and transfer your cryo samples and image them with optical microscopy while keeping them free of contamination at all times. The integrated, encoded, motorised XY stage enables coordinate mapping required to locate the same sample position in the fluorescence microscope as well as in the EM.

Features



SELF-CONTAINED AUTOMATED LIQUID NITROGEN TOP UP

The chamber top-up keeps samples vitrified constantly at -196°C , reducing photo bleaching and maintaining structural detail of samples.

INTEGRATED ENCODED MOTORISED XY STAGE

The encoded, motorised stage provides a highly stable platform allowing high precision automated mapping of the complete EM grid with better than $1\mu\text{m}$ resolution.

SAMPLE CASSETTE HOLDER

The holder ensures contamination free sample loading, storage and transfer. The cassette can hold up to 3 grids, saving time. Cassettes are available for different grid types including FEI, Planchette, Bessey, Polara and custom designs.

INTEGRATED LED CONDENSER FOR TRANSMITTED LIGHT

The integrated LED condenser allows bright field transmitted light. Ideal for initial viewing of the grid and location of the sample

LINK SOFTWARE

The LINK software gives full system control and monitoring. Add the optional Linkam Imaging Module for fully automated mapping of samples.

AUTOFILL

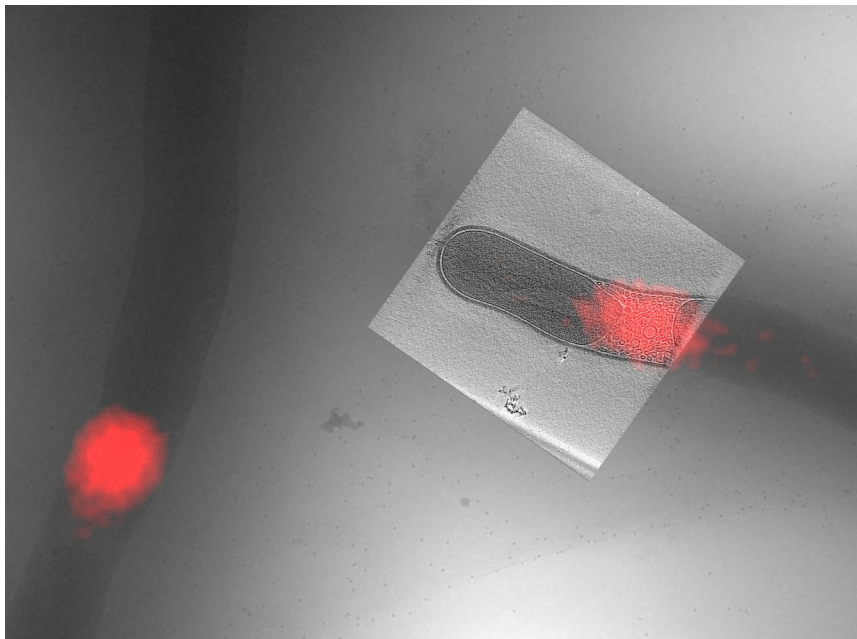
Optional Liquid Nitrogen autofill can extend the use of the system for up to 6 hours, unattended.

MICROSCOPE COMPATIBILITY

The CMS196V³ is compatible with a wide range of research grade upright microscopes and high NA objectives.

Application Examples

The CMS196V³ is the perfect solution for the correlation of high resolution structural information with biochemical processes within cells.



Correlative cryo-fluorescent light microscopy and cryo-electron tomography of WGA stained *Streptomyces* bacteria targeting cross-membrane lipid structures (image courtesy of Roman Koning, Leiden University Medical Centre).

References

Celler K, Koning RI, Willemse J, Koster AJ, van Wezel GP. Cross-membranes orchestrate compartmentalization and morphogenesis in *Streptomyces*. *Nat Commun.* 2016 Jun 13;7:ncomms11836. doi: 10.1038/ncomms11836.

Yagüe P, Willemse J, Koning RI, Rioseras B, López-García MT, Gonzalez-Quiñonez N, Lopez-Iglesias C, Shliha PV, Rogowska-Wrzesinska A, Koster AJ, Jensen ON, van Wezel GP, Manteca Á. Sub-compartmentalization by cross-membranes during early growth of *Streptomyces* hyphae. *Nat Commun.* 2016 Aug 12;7:12467. doi: 10.1038/ncomms12467.

Testimonial

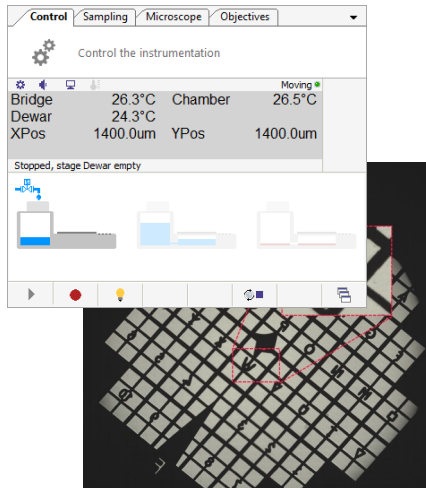
Dr Roman Koning, Netherlands Centre for Electron Nanoscopy & LUMC

"The Linkam cryo-stage was crucial for investigating the ultrastructure of *Streptomyces* bacteria. The CMS196 was indispensable to efficiently localize with fluorescent microscopy the cross-membranes for structural investigation of their intricate structures with cryo electron tomography. Without it this study would not have been possible".

Technical Specification

Temperature Range	Hold temperature at -196°C
EM Grids Supported	Standard EM grids including FEI, Planchette, Bessy, CryoCapCell and Polara as well as options for custom designs
Motorised XY Resolution	Better than $1\mu\text{m}$, encoded
Integrated LED Condenser	For transmitted light brightfield
Integrated LN Dewar Hold Time	30 minutes
Optional LN Autofill (3L) Hold Time	6 hours
Microscope Compatibility	Compatible with a wide range of research grade upright microscopes

Discover More...



Software Options

LINK

The LINK software for the CMS196V³ provides complete control and monitoring of the system.

LINK Imaging Module

When combined with our optional high sensitivity camera and imaging module LINK enables fully automated, tiled, image capture. The system produces a single, tiled, image of the full EM grid at high resolution. This can then be used to navigate the sample as well as save co-ordinates of areas of interest. Linkam provides a simple and easy to use co-ordinate translation tool for correlating Light and EM images.

LINK SDK

A full SDK is available for users to develop and integrate control of the CMS196V³ into their own applications.



Cassette & Cassette Transport Options

The CMS196V³ is a flexible platform with cassettes available for the most popular types of EM grids, including: standard EM, FEI, Planchette, Bessy, Polara and more. Linkam can also develop custom cassettes for other ME grid types, to meet your needs.



3L Autofill Dewar Option

Add the optional liquid nitrogen 3L autofill Dewar to extend the use of the system up to 6 hours, unattended.


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?



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