MECWINS TECHNOLOGY

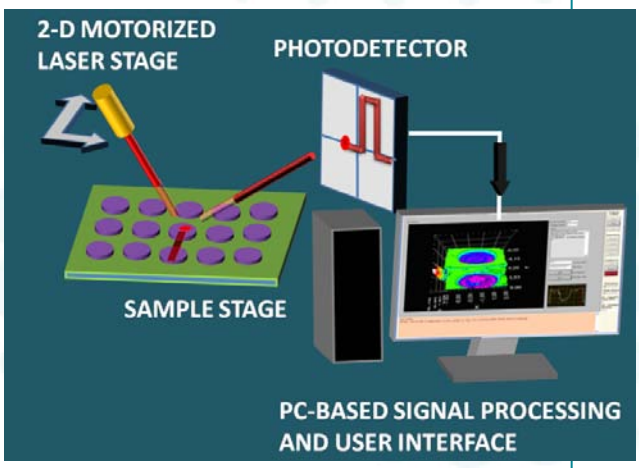
Mecwins® offers an optical platform for MEMS characterization using its proprietary technology.

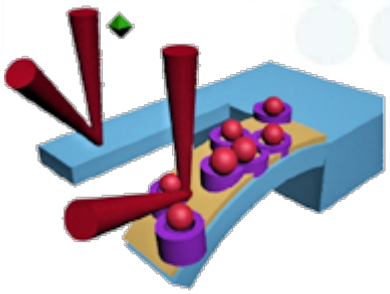
SCALA is a complete tool to characterize your devices (cantilevers, bridges, membranes, etc.) in air, liquid, and vacuum environments. Importantly, measurements can be taken in both static and dynamic modes. Additionally, SCALA can deliver 3D images with topographic information of your MEMS.

The main goal of Mecwins® is to offer a robust and ultrasensitive technology to be applied to the evolving field of mechanical based sensor devices.

TECHNOLOGY PRINCIPLES

Mecwins® technology consists of sweeping an object's surface with a laser while the reflected beam is registered by a position sensitive detector (PSD). The laser is above two motors which move it along the surface in the XY plane. The PSD collects the position of the spot and intensity. The combination of the laser sweep with the signal received in the PSD allows for the reconstruction of the surface topography.





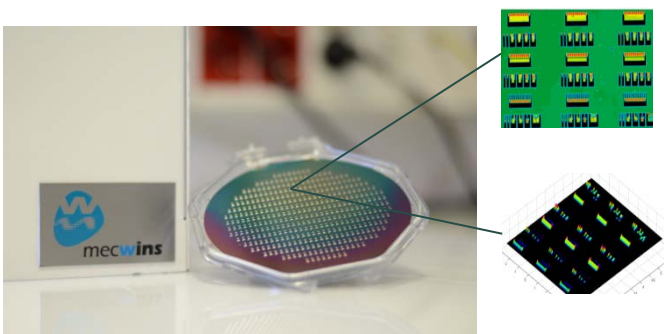
SENSING PRINCIPLE

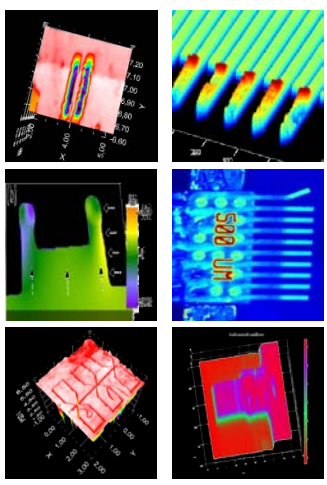
Cantilevers are the most typical MEMS currently being studied as sensors. They are generally operated in either the **static** (deflection mode) where binding on one side of a cantilever causes an unbalanced **surface stress** resulting in a measurable deflection up or down, or the **dynamic** (resonant mode) where binding on the cantilever increases mass and thus changes the **resonant frequency**, thus creating a measurable phase shift.

Cantilever-based devices have been demonstrated as highly versatile sensors to detect gases, chemicals or biological entities.

3D OPTICAL READOUT

In the Mecwins® platform, the displacement of the read-out laser beam provides a fast acquisition and the capability to follow the **full 3D profile** of MEMS of any size, shape and design and in real-time.





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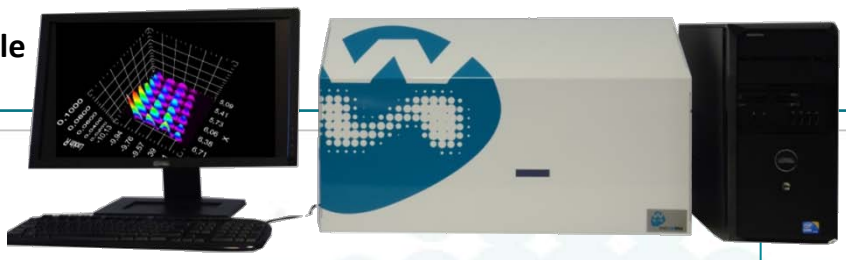
SCALA

SCALA is a modular platform. The basic platform consists of an optical scanner with a climatic chamber (temperature and humidity control). Static characterization of 2D profiles, resonant frequency determination through thermal noise, and single-point measurements are all possible with the basic platform.

In addition to the basic platform, SCALA can be equipped with 3 modules:

- **dynamics module**
- **liquids measurements module**
- **3D imaging module**

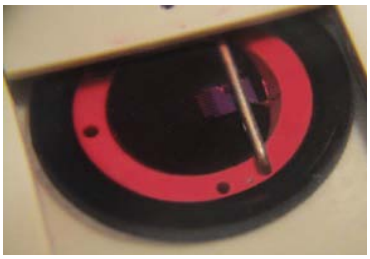


DYNAMICS MODULE

The dynamic behavior of the mechanical sensors (**cantilevers**, **bridges**, etc.) can be measured in a simple and user-friendly manner.

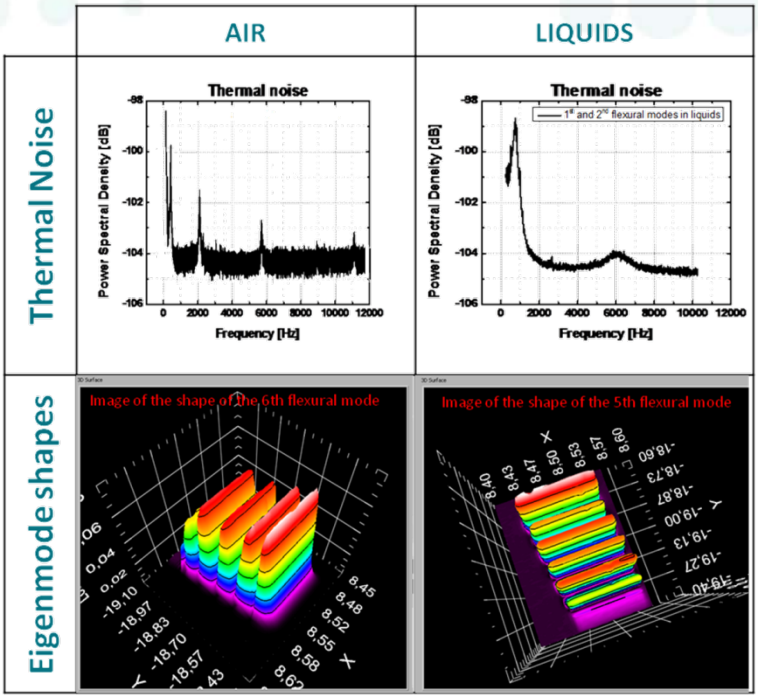
This module is capable of detecting the spectral response of any vibrating device, both relying solely on thermal excitation or with an external force (driven by a piezo stack). **SCALA** also provides real-time imaging of the mechanical vibration

MODULE FOR LIQUIDS MEASUREMENTS



SCALA offers the possibility to characterize statically and dynamically MEMS sensors in a liquid environment, even in **coloured** liquids like blood.

The volume of the measurement chamber can be adapted to the customer's requirements. The PEEK liquid cell has inlet and outlet ports to deliver liquids using the external delivery system of your choice



3D IMAGING

Taking advantage of the scanning laser capabilities, the technology is able to obtain reflectivity and topographic images with sub-nanometric accuracy in the z-axis.

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