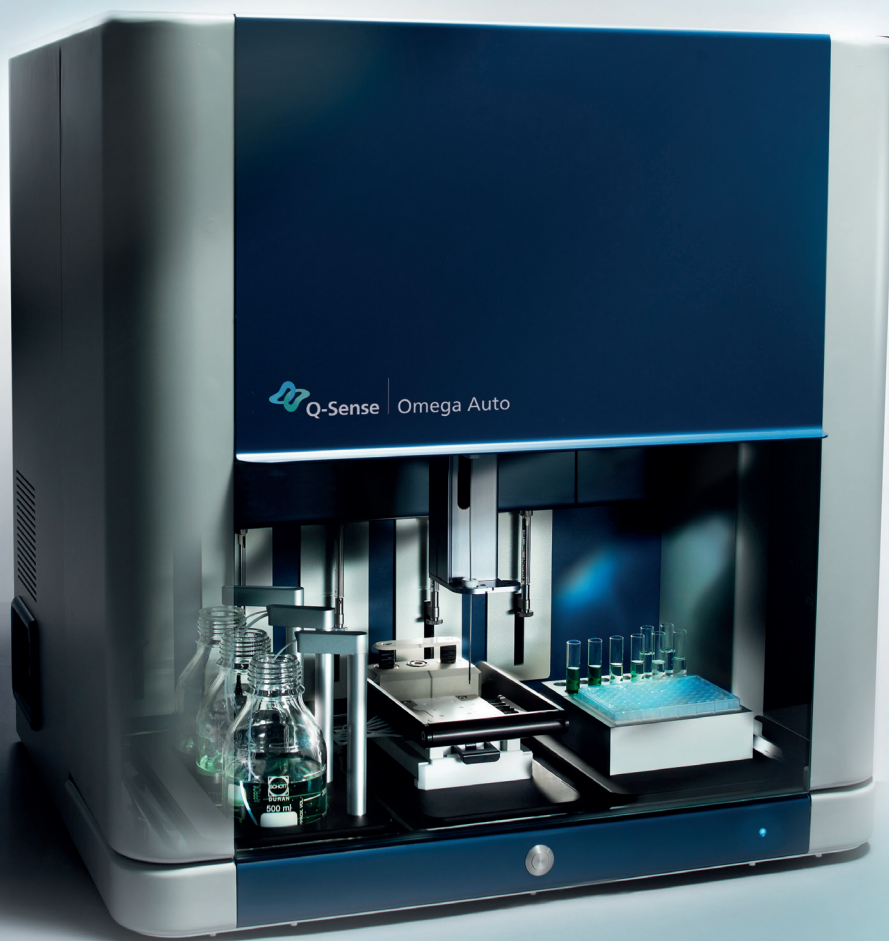




Omega Auto

## Real-time interface characterization



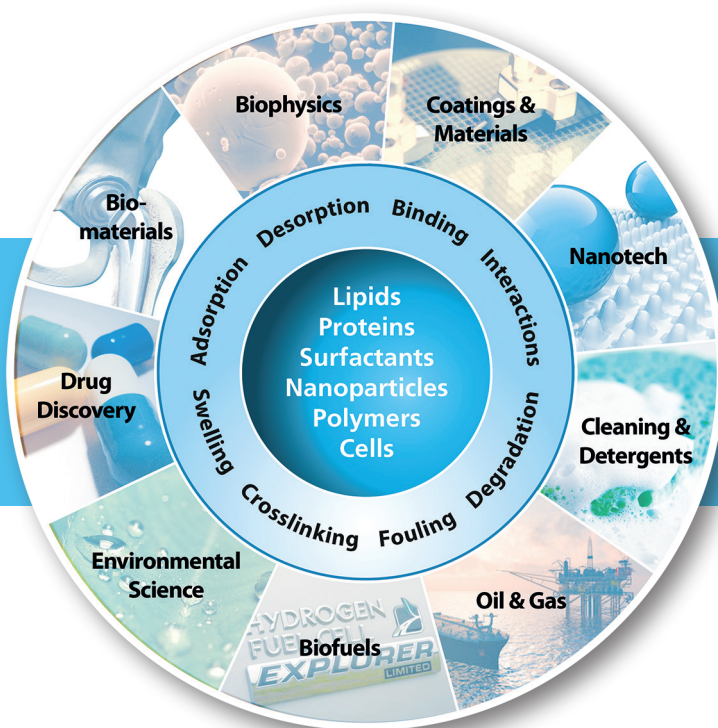
- Analyze surface interactions and reactions
- Real-time, label free technology
- Automated, easy to use system
- Mass, thickness and structural properties
- QCM-D combination measurements
- Wide range of sensor surfaces

# Tracking changes at the surface

Q-Sense instruments are analytical tools for surface interaction studies at the nanoscale. The instruments are based on the Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D) technology which enables real-time monitoring of mass, thickness and structural changes of molecular layers. This provides thorough understanding of events such as molecular adsorption and desorption as well as swelling or cross-linking of a thin film.

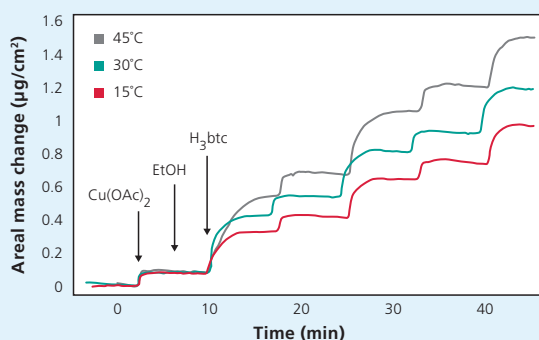
The **Q-Sense Omega Auto** is the most advanced QCM on the market with full automation enabling enhanced efficiency and reproducibility. Measurements are easily programmed in the software and high precision flow-control ensures effective sample use. The ease of use, versatility of the technology and the broad range of sensor surfaces enable endless possibilities with the Q-Sense Omega Auto. Enjoy!

## Q-SENSE OMEGA AUTO Quantify the Nanoscale World



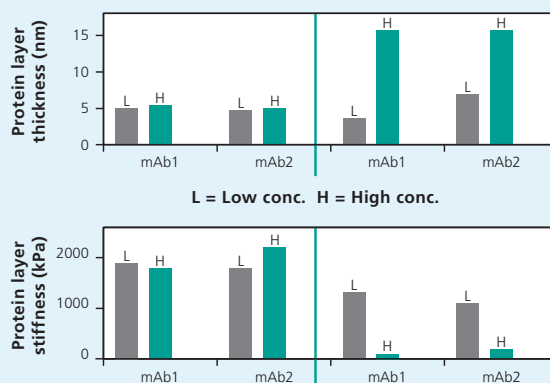
## [ APPLICATIONS EXAMPLES ]

### Build-up of layer-by-layer films



Study of buildup rate and thickness of a multilayer film.  
Stavila et al. Chem. Sci. 3 (2012), 1531-1540

### Investigating protein adsorption pathways



Quantification of thickness and structure of adsorbed protein layer.  
Oom et al. J Pharm Sci. (2012), 101(2):519-29

# Sense the difference: Q-Sense Omega Auto

- **Fully automated turn-key system**

An easy to use system with integrated sample handling and intuitive software. Pre-programming of measurements allows the instrument to run without any need for supervision.

- **Down to 50 µl sample per sensor**

Q-Sense Omega Auto enables precise sample handling, ensuring effective use of samples.

- **High efficiency**

The 8-sensor module enables 8 measurements to be programmed in advance which reduces hands-on time and increases throughput.

- **FlexiFlow feature and high reproducibility**

High precision flow-control is ensured by using syringe pumps that work separately and enable 4 channels to be used independently. Programming automated mixing including concentration gradients of samples ensures high reproducibility.

- **Built-in temperature control**

In the software, working temperatures can be set between 4 and 70 °C enabling stable temperature control. Pre-cooling or heating of sample racks is possible.

- **Combine QCM-D with other technologies**

Q-Sense Omega Auto is compatible with the Q-Sense Accessory Chamber. This enables you to simultaneously combine your QCM-D experiments with e.g. ellipsometry, electrochemistry or microscopy.

- **Wide range of sensors**

Q-Sense offers sensors ranging from basic elements and alloys to polymers and functional surfaces to enable your measurement.

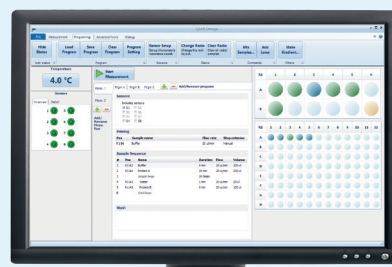
## USE Q-SENSE OMEGA AUTO IN 4 SIMPLE STEPS



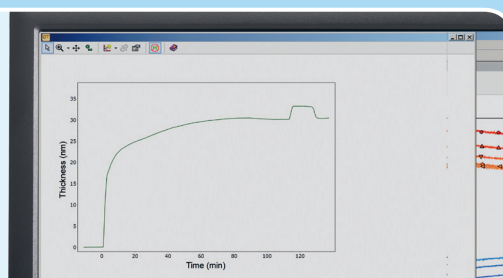
**1** Mount up to 8 sensors of choice in the Q-Sense Omega Auto Flow module and place the module inside the instrument chamber.



**2** Place your sample vials in the holders and fill the flask with solvent.



**3** Use QSoft Omega to program your desired sample sequence and press Start. The instrument will now run the experiment without any need for attendance or supervision.



**4** Use QTools software to analyze your data and acquire information about mass, thickness, softness/visco-elastic properties, kinetic constants and adsorption phases.

## [ SPECIFICATIONS ]

### SENSORS AND SAMPLE HANDLING SYSTEM

Number of sensors	8 (up to 4 parallel measurements in flow mode)
Volume above each sensor	~ 15 µl
Minimum sample volume	~ 50 µl
Working temperature	4 to 70 °C, controlled via the software, stability $\pm 0.02$ °C <sup>A</sup>
Typical flow rates	20-100 µl/min
Minimum dispense/aliquot volume	1 µl <sup>B</sup>
Sensors <sup>C</sup>	5 MHz, 14 mm diameter, polished, AT-cut, gold electrodes
Number of samples	Racks with up to 3 x 12 vials of Ø 13, 16 or 18 mm; or up to 3 x 24 of 2.0 ml microtubes; or 1 x 96 microtiter plate + one of the above racks

### FREQUENCY AND DISSIPATION CHARACTERISTICS

Frequency range	1-70 MHz (allows 7 frequencies, up to the 13th overtone, 65 MHz for a 5 MHz sensor)
Maximum time resolution, 1 sensor, 1 frequency	~ 200 data points per second
Maximum mass sensitivity in liquid <sup>D</sup>	~ 0.5 ng/cm <sup>2</sup> (5 pg/mm <sup>2</sup> )
Normal mass sensitivity in liquid <sup>E</sup>	~ 1.8 ng/cm <sup>2</sup> (18 pg/mm <sup>2</sup> )
Maximum dissipation sensitivity in liquid <sup>D</sup>	~ 0.04 x 10 <sup>-6</sup>
Normal dissipation sensitivity in liquid <sup>E</sup>	~ 0.1 x 10 <sup>-6</sup>
Typical noise peak to peak (rms) in liquid <sup>F</sup>	~ 0.16 Hz (0.04 Hz)

### SOFTWARE

PC requirements	USB 2.0, Windows 7, Intel Core i5 processor (or eqv.) w. 8 GB RAM or better 22" PC Monitor with 1680x1050 pixels resolution recommended
Output data, analysis software	Modeled values of viscosity, elasticity, thickness and kinetic constants
Import/export	Excel, BMP, JPG, WMF, GIF, PCX, PNG, TXT

### DIMENSIONS

	Height (cm)	Width (cm)	Depth (cm)
Instrument	70	67	57

A The temperature stability depends on variations in how the ambient temperature affects the warming or cooling of the chamber.

B Smallest sample volume to pick up and dispense. Note that the smallest volume needed for measurement is 50 µl.

C Many sensor materials are available, for example, SiO<sub>2</sub>, Titanium, Stainless steel, Polystyrene to mention a few.

D Data from 1 sensor in single frequency mode. 1 data point is collected every 5 seconds. The Sauerbrey relation is assumed to be valid.

E Data from four sensors in multiple frequency mode (3 harmonics) are collected within 1 second. The Sauerbrey relation is assumed to be valid.

F Data from four sensors in multiple frequency mode (3 harmonics) are collected within 1 second. Peak to peak value from one minute data acquisition.

All specifications are subject to change without notice.



## Biolin Scientific

[ Progress Together ]

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### About Us

Biolin Scientific is a leading Nordic instrumentation company with roots in Sweden, Denmark and Finland. Our customers include companies working with pharmaceuticals, energy, chemicals, and advanced materials, as well as academic and governmental research institutes. Our precision instruments help discover better drugs faster, develop better solutions for energy and materials, and perform research at the frontiers of science and technology.