



# Q-Sense Analyzer

rapid characterization of bio-interfaces



Q-Sense Analyzer is the latest generation of instruments from Q-Sense featuring the following:

### Measure the mass

of molecular layers forming on the surface with nanogram sensitivity. For example, 1% or less of a protein mono-layer can be detected.

### Structural changes

to be measured simultaneously so as to distinguish between two similar binding events or observe a phase transition in bound layers.

### Real time analysis

allowing real-time recording and evaluation of kinetics.

### Label free

No need for labelling of molecules, the instrument measures the molecules themselves.

### Flexible choice of surface

including metals, polymers and chemically modified surfaces. Any surface that can be applied as a thin film can be used.

### Flow measurements

Chamber specifically designed for flow measurements in a temperature-controlled environment.

### 4-Sensor chamber

allows higher throughput and makes reproducibility easier.

### Electrochemistry chamber

Study electrochemical reactions simultaneously by using an optional electrochemistry chamber.

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## rapid characterization of bio-interfaces



<p>1. Mount quartz crystal sensors in the temperature controlled chamber. Four sensors are fixed in removable flow modules with inlet and outlet. The quartz crystal sensors may be pre-coated with, for example, metals, polymers or SAMs.</p>	<p>2. Introduce sample and conduct in-situ experiments. The chosen experimental procedure is run; for example, buffer followed by sample A and sample B and back to buffer. The peristaltic pump is included in the system.</p>	<p>3. Follow results in real time on the computer screen. Frequency changes reflect mass changes taking place on the sensor surface, dissipation changes reflect changes in the adlayer's viscoelastic properties.</p>	<p>4. Analyse and present results in the software QTools. Extract mass, thickness, viscoelastic properties, kinetic constants, adsorption phases and so on.</p>

### Specifications Q-Sense Analyzer

Sensors and sample handling system	
Number of sensors	4, also possible to measure using only 1, 2 or 3 sensors
Volume above each sensor	~ 40 µl
Minimum sample volume	~ 300 µl
Working temperature	15 to 65 °C, controlled via the software, stability ± 0.02 K
Flow rates	0-1 ml/min
Cleaning	All parts exposed to liquid can be removed and cleaned in e.g. ultrasound bath
Sensor crystals*	5 MHz, 14 mm diameter, polished, AT-cut, gold electrodes
* Several other sensor materials are available, for example SiO <sub>2</sub> , Titanium, Stainless steel, Polystyrene to mention a few.	

Software	
PC requirements	USB 2.0, Windows 7, Vista, XP
Input data, analysis software	Multiple frequency and dissipation data
Output data, analysis software	Modelled values of viscosity, elasticity, thickness and kinetic constants
Import/Export	Excel, BMP, JPG, WMF etc.

Frequency and dissipation characteristics	
Frequency range	1-70 MHz (up to the 13th overtone, 65 MHz for a 5 MHz crystal)
Maximum time resolution, 1 sensor, 1 frequency	up to 200 data points per second
Maximum mass sensitivity in liquid**	~ 0.5 ng/cm <sup>2</sup> (5 pg/mm <sup>2</sup> )
Normal mass sensitivity in liquid***	~ 1.8 ng/cm <sup>2</sup> (18 pg/mm <sup>2</sup> )
Maximum dissipation sensitivity in liquid**	~ 0.04 x 10 <sup>-6</sup>
Normal dissipation sensitivity in liquid***	~ 0.1 x 10 <sup>-6</sup>
Typical noise peak to peak (RMS) in liquid****	~ 0.16 Hz (0.04 Hz)
** Data from 1 sensor in single frequency mode. 1 data point is collected every 5 seconds. The Sauerbrey relation is assumed to be valid. *** Data from all 4 sensors in multiple frequency mode (3 harmonics) are collected within 1 second. The Sauerbrey relation is assumed to be valid. **** Data from all 4 sensors each running at 3 harmonics are collected in about a second. Peak to peak value from one minute data acquisition.	

Dimensions	Electronics unit	Measurement chamber
Height	18 cm	12 cm
Width	36 cm	23 cm
Depth	21 cm	34 cm
Weight	9 kg	8 kg