

QCM-I mini

Quartz Crystal Microbalance with Impedance Measurement

The **QCM-I mini** measuring unit is a high-sensitivity mass sensor, which measures the change in frequency of a quartz crystal resonator and as a label free biosensor it measures the “wet mass” of the adsorbed layer in processes occurring at or near the sensor surface.

The measuring principle is based on impedance analysis of the quartz crystal. The resonant frequency and the bandwidth of the resonant conductance curve are determined. The bandwidth or full width at half maximum, (FWHM) is direct correlation with the quality factor (Q) which is by definition the inverse of the well known dissipation (D).



Main features:

- Measures frequency and FWHM (or bandwidth or dissipation)
- Measures fundamental frequency and overtones up to 80 MHz
- Temperature control from 20°C to 80°C (± 0,05 °C)
- Optional EC measurement module with ITO-QCM sensors
- Modular sensor holder for different sensor sizes
- Fanless design, silent operation
- External PC with Windows® 7 or 10

QCM sensors

The heart of the Quartz Crystal Microbalance (QCM) instrument is a thin AT-cut quartz crystal with an electrode on each side.

Quartz crystal sensors with Au or with ITO electrodes and a variety of coatings are available.

The modular sensor holder allows using either 14 mm diameter or 1” diameter quartz crystals, but using other sensor sizes is also possible.

Remote immersion style sensor holder with temperature sensor is optionally available.

Diameter 1”



Diameter 14mm



Control & Measurement

The **BioSense** software performs full control of the **QCM-I mini** instrument. Two measurement modes are available:

- Resonance: Measurement of resonance curve and calculation of the resonance frequency & FWHM up to 80 MHz
- QCM-t: Continuous measurement of resonance parameters and the temperature of the flow-cell.

Calculation: various QCM and ad-layer parameters can be calculated using standard or custom made models. All these parameters can be displayed on the screen, printed, saved or can be exported for further evaluation.

Technical Specification of QCM-I mini

Measurement Channels	One (optionally a second external sensor holder)
Frequency Range	1-80 MHz, up to the 13 th overtone for a 5 MHz Crystal
Working Temperature	20 °C to 80 °C, controlled manually or via software, stability ± 0.05 °C
Flow Cell Volume	~ 40 µl (typical with Ø14 mm crystals)
Wetted parts	PTFE, PEEK, SS, VITON or Kalrez
Resonance Frequency sensitivity in Liquid	2 x 10 ⁻¹ Hz
Dissipation Sensitivity in Liquid	~ 1 x 10 ⁻⁷
Mass Sensitivity in Liquid	≤ 1 ng/ cm ⁻¹
BioSense	Universal software platform for OWLS, QCM & EC measurements
Import / Export of the measured data	Export to third party software Excel, JPG, BPM, WMF etc.
PC Requirement	USB 2.0, works with Windows® 7 or 10
Power Supply	12VDC power supply with universal input voltage (100V-240V AC / 50-60 Hz)