

QSense Initiator

Get Started with QCM-D



Join the QSense Community

Investing in a QSense® QCM-D instrument is an excellent choice providing you with a premium system for measurements of surface interactions at the nanoscale. We invite you to discover the many possibilities of the QCM-D technology with QSense Initiator, and join the QSense community.

By Scientists for Scientists

The foundation for the first commercial QCM-D instruments was created by Scientists in a laboratory at Chalmers University of Technology in Sweden in the 90s. A lot has happened since the first prototype, the QSense instrument range has grown wider alongside the interest for the technology from the scientific community. Today, the instruments are used at research facilities worldwide and in a vast variety of applications within areas such as pharmaceuticals, biotechnology, energy, and electronics.

QSense in numbers

- In academic and industrial labs since 1999
- More than 1000 installed instruments in 50+ countries
- Mentioned in 3000+ publications
- Over 200 customized sensor coatings developed for customers



QSense Initiator

Get started with QCM-D technology using QSense Initiator. The instrument features core functions of QCM-D measurements and produces high quality data.



Most suitable when:

You are getting started with QCM-D

A clean design and straightforward software makes QSense Initiator perfect as an introduction with the QCM-D technology.

You are into the basics

QSense Initiator supports all the core functions and basic qualities of QSense instruments.

You need to study interactions qualitatively

But not to quantify your films.

You will experiment within a limited temperature range

You are performing your measurements between 20-45 °C.

3 reasons to invest

Ease of use

QSense Initiator is designed to meet your basic needs in QCM-D technology. The instrument is easy to set up and run.

High quality data

Excellent temperature and measurement stability, in combination with the measurement of two harmonics, ensure accurate and reliable measurements.

One channel, plenty of possibilities

This 1 channel system has high chemical compatibility and works with the entire range of QSense Sensors which gives you a wide variety of experimental possibilities.

What our customers say

"I have found QSense to be one of the best techniques for an undergraduate lab because it's turnkey and it requires very little maintenance."

Malkiat Johal,
Professor of Chemistry,
Pomona College, US

Enjoy World-leading Technology

The first step to trustworthy results is to make sure your data reflects the surface interactions under study, and not uncontrolled interference from external factors. The excellent measurement stability and low drift of QSense Initiator are key to protecting your data from artifacts, whether you perform shorter or longer measurements. Superior temperature stability, and well-designed and robust electronics ensure that the measured QCM-D response reflects actual changes in the system under study rather than uncontrolled interference.

Next, make sure you choose the technology with the best ability to catch the processes you want to study. The unique QSense Decay Technology is the fastest and most accurate way to measure frequency and Dissipation. Continuous optimization of the data acquisition continues to translate theoretical performance parameters into actual data quality in real measurement situations, making it possible to detect even the smallest and fastest changes in mass or viscoelastic properties.

QSense key features

- **Robust design**
Protects the measurements from external shock or vibrations.
- **Superior temperature and measurement stability**
Safeguards against artifacts.
- **Measurement of 7 harmonics**
The second harmonic provides stable data and additional information to simplify subsequent data analysis. The fundamental harmonic also works as a quality indicator for the fluid pathway and sensor set-up.
- **Minimal noise**
Distinguishes small changes in mass and viscoelastic properties from noise.
- **QSense Decay Technology**
Optimized time resolution and data quality to catch the smallest and fastest events and processes, in rigid as well as in soft films.
- **5 Speed-to-Noise Acquisition modes**
Select the acquisition mode suitable for the process you want to measure.
- **QSense Smart Tuning**
Continuously fine-tunes the sampling to optimize the data quality in each measurement situation
- **Flow module with homogenous flow profile**
Ensures even sample exposure, good thermal stability and lowers risk of trapping air bubbles.

QSense Decay Technology

The unique decay-based QCM-D technology offers a fundamentally different way of bringing a quartz sensor into resonance compared to all other QCM set-ups. In brief, the sensor is excited to resonance, and the decay curve is analyzed under non-voltage conditions as the sensor oscillation is damped. Each sensor excitation results in independent and true values of f and D without disturbances from parallel impedances, which leads to excellent measurement accuracy and stability.

In detail

- Excellent measurement accuracy and stability are achieved through non-voltage readout of f and D , free from disturbances from parallel impedances.
- Uninterrupted tracking of not only rapid and slow changes, but also small and large shifts in f and D for all harmonics. The full range of events, from sub-monolayer uptake at the surface to medium exchange from air to liquid, is automatically captured, without compromising the time resolution.
- The second harmonic provides stable data while the fundamental harmonic works as a quality indicator for the fluid pathway and sensor set-up.

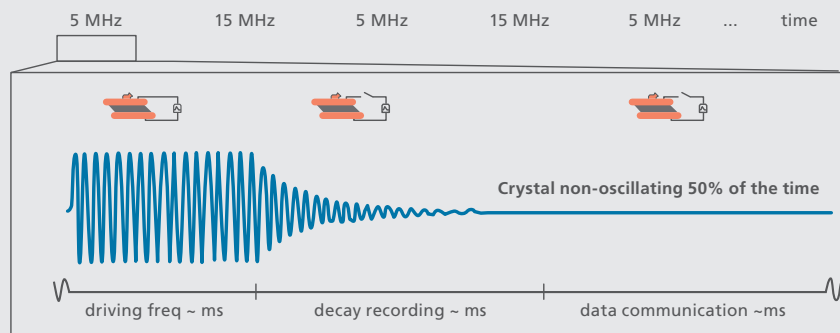


Figure 1 QSense QCM-D sampling

QSense Smart Tuning

QSense Smart Tuning tracks your signal to always give you the best possible noise level and sample rate no matter whether you are building thick and soft layers, or thin and rigid films. The Smart Tuning algorithm analyzes the output quality of each f and D readout and fine-tunes the settings for the next decay-curve acquisition.



Why use 5 MHz Sensors?

Sensitivity, sensing depth, and catching valuable information for the study of soft films, are optimized by using 5 MHz sensors.

- The theoretical mass sensitivity increases with the fundamental frequency, but so does the noise. This means that a high fundamental frequency does not directly correlate with a better mass detection limit, more important are signal-to-noise ratio and long-term stability.
- The sensing depth decreases with the resonance frequency. The lower the resonance frequency, the thicker the layer that can be sensed.
- The fundamental frequency affects how high the frequency of the harmonic will be, and as the impact of noise will be more noticeable as the frequency increases, a low fundamental is desirable.

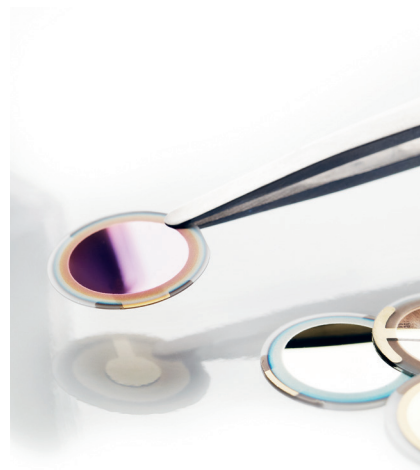
Choose between a variety of sensors

The choice of sensor coating is crucial for your experiment. To match your needs, we offer over 50 standard sensor coatings - from various metals, oxides and carbides to polymers, functionalized coatings and standardized soils. Which sensor material and coating is best suited for your research? Visit biolinscientific.com to see your options.

Our sensors are developed and produced to provide you with stable, reliable and reproducible data. Full performance is ensured through extensive quality controls and guaranteed for one-time use according to the recommendations.

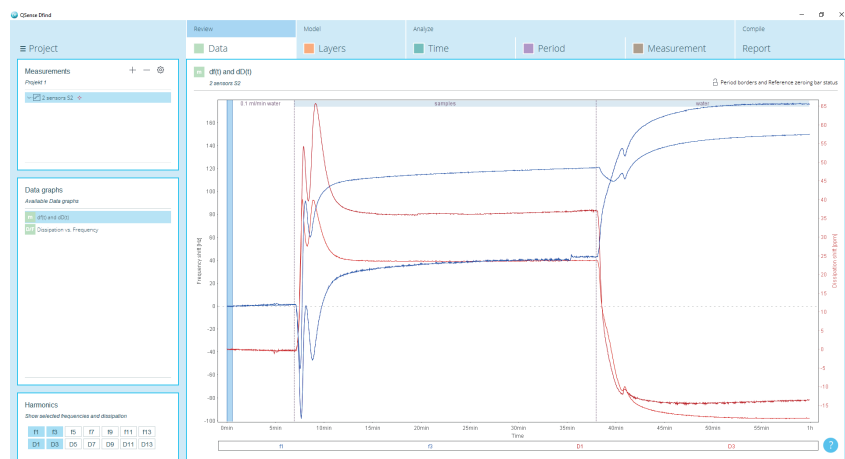
Custom-made for you

We have the widest range of quality sensors on the market, and also the capability to customize both materials and coatings based on your requirements.



Add our intuitive analysis software

To reveal the full potential of your data, you can add Dfind to your package. The reliable and easy-to-use analysis software from QSense helps you to quickly and simply extract the information you are looking for, such as mass, thickness, and adsorption rates.



Analysis software QSense Dfind

Dfind features

- **Dynamic output data**
Including kinetics, slope, rise time and more.
- **Sauerbrey equation**
Gives you information about mass and thickness of your film.
- **Automatic data plotting and reporting tool**
- **More than 10 pre-defined methods for data extraction**
- **Batch mode for simultaneous analysis**
Process more than 100 datafiles at the same time and easily add new data files step-by-step.
- **Template tool**
Supporting reuse and sharing of data analysis templates with other users.

The QSense Range



QSense Omni

- The latest and sharpest QCM-D technology
- The most trustworthy and reproducible data
- Smooth and automated procedures with maintained



QSense Analyzer

- Be both flexible and fast
- Test and compare several samples at the same time
- Run experiments in special conditions

Not sure which instrument to choose?

[Our tool InstruMentor will guide you along the way to your new instrument. Just answer a few questions and the instrument selector will provide you with the top choices based on your specific needs.](#)



QSense Pro

- Be fast and productive without losing quality
- Test and compare several samples at the same time
- Get highly reproducible results



QSense Explorer

- Get the flexibility to change between experimental setups
- Combine QSense with complementary techniques
- Run experiments in special conditions



QSense Initiator

- Get started with QCM-D
- Be confident to get high quality data
- Get qualitative data but not quantify your films

Specifications

Measurement range and capacity				
Measurement channels	1			
Working temperature	20 to 45 °C			
Sensors (frequency range)	5 MHz (1-72)			
Number of measured harmonics	2			
Sample and fluidics				
Minimum sample volume, stagnant mode	~ 40 µl			
Minimum sample volume, flow mode	~ 200 µl			
Flow rates	25-150 µl/min applicable for QSense setup (Peristaltic pump settable to 0-1 ml/min)			
Performance characteristics				
Maximum time resolution	4 datapoints per second (each datapoint represents an <i>f</i> and <i>D</i> value)			
Long-term stability ^a	Frequency: < 1 Hz/h Dissipation: < 0.15·10 ⁻⁶ Temperature: < 0.02 °C/h			
Software	QSoft Acquisition Software		Dfind Analysis Software	
Data output	Time resolved Frequency and Dissipation for 2 harmonics		Thickness (or mass), kinetics, slope, rise time and more	
Computer requirements	USB 2.0		PC with 64-bit > 1366x768 px screen resolution, > 4 GB RAM	
Operating system	Windows 10 or later (earlier Windows versions may not fully work and support cannot be guaranteed)			
Import/export	Excel, BMP, JPG, WMF, GIF, PCX, PNG, TXT		CSV files. Decimal separator, full stop or comma	
Electrical data				
Power supply and frequency	100 / 115-120 / 220 / 230-240 V AC, 50-60 Hz The power supply should be properly grounded			
Dimensions and weight	Height (cm)	Width (cm)	Depth (cm)	Weight (kg)
Electronics unit	18	36	21	9
Measurement chamber	5	10	15	1

^a The temperature stability depends on variations in how the ambient affects the warming or cooling of the chamber. The specified temperature stability may not be reached if the room temperature changes more than $\pm 1^\circ \text{C}$, if there is a draft or a heat source nearby. All specifications are subject to change without notice.

About us

At Biolin Scientific we are committed to empower professionals in Surface and Interface science and engineering to reach outstanding results faster and easier. Our instruments and sensors are tailored for advanced analysis of thin film properties and surface and interface phenomena at the nanoscale. Trusted by top universities and industrial labs worldwide, our premium solutions help solve complex challenges and drive progress in scientific research and product development.

Biolin Scientific AB

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Biolin Scientific
Empowering Innovators