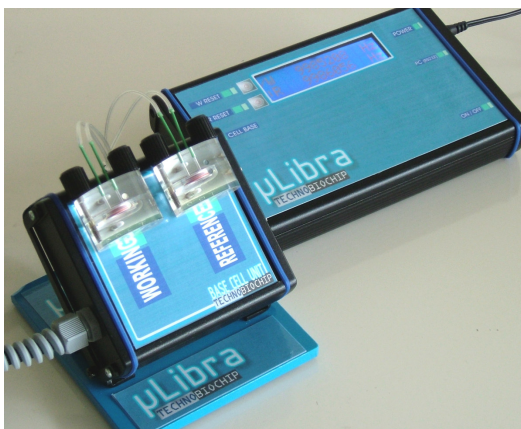
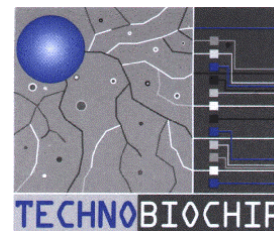


# μLibra



## Introduction

**μLibra** is a Quartz Crystal Microbalance (QCM) system, composed by a Main Unit and a Cell Base Unit which can support two measuring chambers.

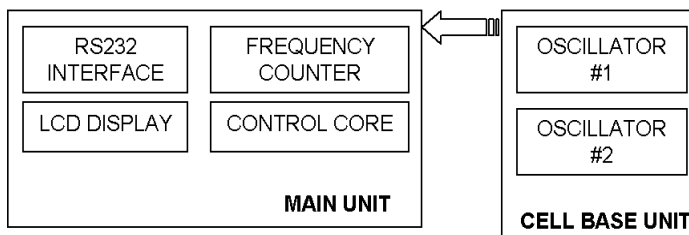
**μLibra** allows experiments from biology to chemistry, to physics. As biosensor, it can monitor ligand-receptor interactions. The instrument offers a rapid and easy way to detect and measure mass deposition or adsorption as well as film thickness. Alternatively, density and viscosity variation of fluids can be measured, if mass deposition/adsorption is known.

## The instrument

**μLibra** is a 2 channel high-resolution and very low noise microbalance system based on quartz crystal resonators. The instrument is compact and easy to use. Two channel acquisition system allows single cell operation as well as working/reference measurements. Oscillators either work in air or in solution.

The Main Unit combines one high stability frequency counter, an LCD display and a RS232 interface. Frequency values are shown on to a LCD Display and sent to the connected PC.

The system is driven by LibraVIEW software, a user-friendly tool running under Windows®.



**μLibra** can be equipped with two low-volume flow-through or static cells. Housing the transducers inside the cells is rapid and secure. The provided cells have been designed for a wide range of static and flow measurement experiments, however, on requests, custom measuring cells can be made on design.

## Main Features

- capability to operate both in air and under flow conditions
- low cost
- practically no maintenance costs (the only interchangeable parts are the crystal resonators)
- high accuracy and reliability
- very simple operation
- user-friendly software package

## Typical applications are:

- real time monitoring of ligand/receptor interactions
- measure of kinetics and affinity constants
- monoclonal antibody characterization
- kinetic studies in DNA hybridisation

Moreover, **μLibra** can assist the research of:

- infectious disease
- protein engineering
- pesticide detection

**Standard equipment:**

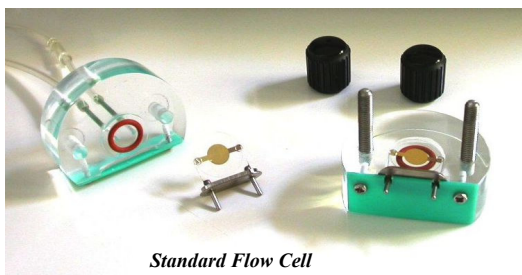
- One Main Unit and one Cell Base Unit with two 10 MHz oscillators
- 110/220Vac – 12Vcc power supply
- RS232 cable
- Two flow cells for measurements in solution
- Two 10-MHz quartz crystals
- 8 silicon o-rings
- Driving software **LibraVIEW**<sup>(1)</sup>

**Optional equipment:**

- Silicone, nitrile and viton o-rings

**µLibra specifications:****Basic measurement:**

Mass sensitivity<sup>(2)</sup>: 4.4 ng/Hz cm<sup>2</sup>  
 Viscosity resolution<sup>(3)</sup>: 2.5 µPa·sec/Hz

**Main Unit**

Frequency counter range: 1÷20 MHz  
 Frequency resolution: 1Hz  
 Acquisition rate: 2 Acq/sec.  
 Data acquisition channels: 2  
 Warm-up time: 20'  
 Weight: 1 Kg  
 Dimensions (mm) : 220 x 140 x 40  
 Interface: Serial cable (RS232)  
 Main supply: 12Vcc 800mA

**Cell Base Unit**

Channels: 2  
 Oscillators nominal frequency: 10 MHz  
 Dimensions (mm): 120 x 130 x 70  
 Weight: 500 g

**Standard Flow Cell**

Flow-cell volume: 25 µl  
 Tubes outer diameter: 2 mm  
 Weight: 50 g

(1) minimum PC Configuration: Proc. Pentium II, 128 Mb, 500MHz, Windows<sup>®</sup> 98 SE/ Windows<sup>®</sup> 2000

(2) for 10Mhz quartzs

(3) measured with Glycerol solutions @25C°

**Publications:**

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- M. Pighini, L. Piras, S. Fenu, L. Longo, G. P. Tonini, M. Cocco, Development of DNA-sensors for the detection of genetic mutations associated with the human cancer presence, *Proceedings of the 6th Italian Conference on Sensors and Microsystems*, Pisa, Italy, February 5-7, 2001. World Scientific, C.Di Natale, A.D'Amico, P.Dario editors. Pag.15-20.
- M.Nocentini, G.Caminati, M.Cocco, C.Focardi, F.Gambinossi, B.Mecheri, L.Piras, M.Puggelli: Development of a sensor for the determination of tetracycline residues in milk using a Quartz Crystal Microbalance and UV-Vis Spectroscopy as detectors, *Congrilait*, Paris, France 24-27 September 2002.

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