

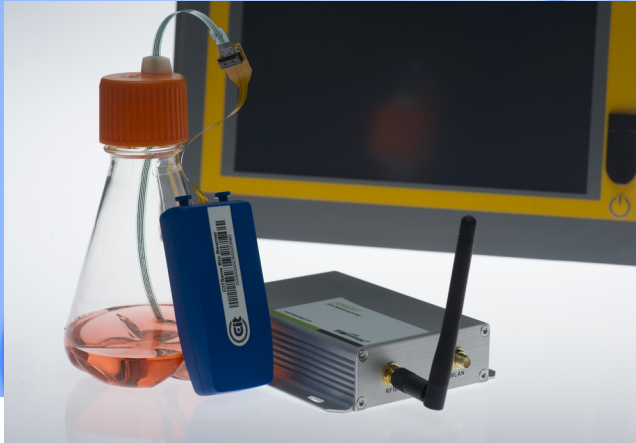


**Our sensors let you  
focus on what really  
matters**



**Process control  
based on  
metabolites**

# Our unique solution for cell culture monitoring...



## CITSens Bio System

- Continuous in-situ measurement of glucose or lactate
- Optimized for single parameter analysis
- RFID communication

CITSens Bio and CITSens MeMo allow continuous in-situ measurement of glucose and/or lactate in defined cell culture media as well as in complex matrices, e.g. blood

Our systems consist of a handheld computer incl. pre-installed CITSens software, receiver, transmitter, and battery charger.

The affordable sensor system is unique and delivers real-time information on a culture's growth behavior and metabolic state at any time of the process

Data is being generated at a 20 second frequency and continuously sent to a database via wireless communication out of a closed incubator.

Process control based on the online measured kinetics of glucose consumption and/or lactate accumulation has become reality.

To be used with our Screen Printed Glucose and/or Lactate Sensor, Smart Disposable Bioreactors, CapSensors, PG 13.5 Process Probe or Flow-Cell.

- Available for low (<3 g/l) and high (<8 g/l) glucose media
- Available without or with feed pump for complete process control (CITSens APC)



## CITSens MeMo System

- Continuous in-situ measurement of glucose and lactate
- One sensor, one electronic, two analytes
- Bluetooth communication





# ..and process control system based on glucose concentration

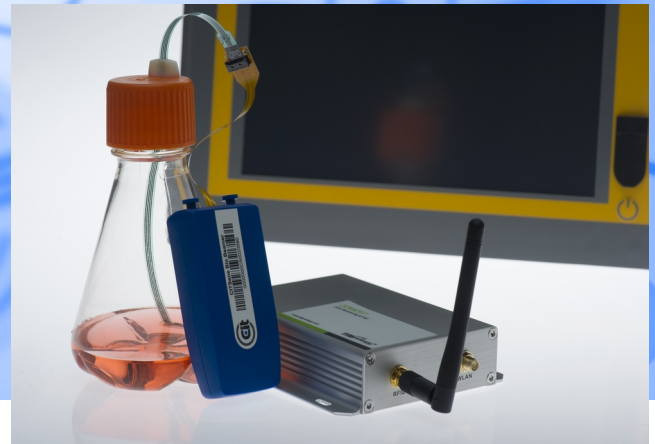
CITSens Bio APC and CITSens MeMo APC are the first process control systems based on continuous in-situ Glucose or Lactate monitoring.

It is made for in-situ monitoring of Glucose or Lactate and can be used to control processes by metabolites. It makes Cell line selection easy and fast, allows optimized media & process development and improves science.

The system increases yield of product and gives you remote control of your cell culture process. The system measures glucose continuously and gives a feedback to a pump connected to the system for automated media feed.

Data can be integrated in all kind of process control systems. The glucose and lactate sensors are suitable for all kind of reactors, shake flasks and other single-use vessels

To be used with the disposable glucose and lactate sensors of C-CIT Sensors AG



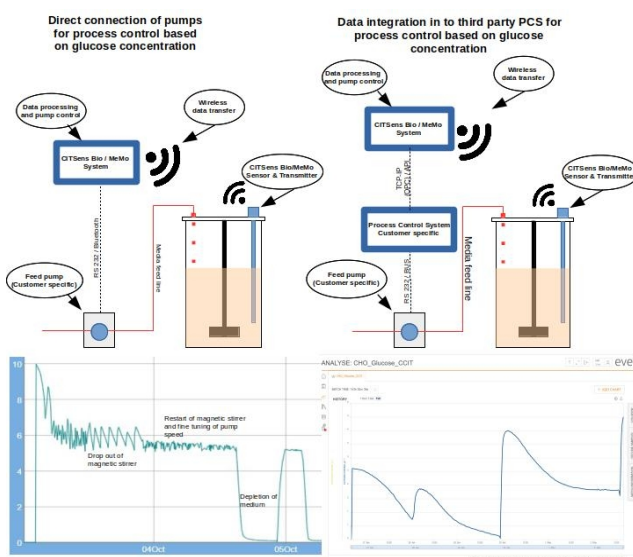
## CITSens Bio APC

- Continuous in-situ measurement of glucose or lactate
- Optimized for single parameter analysis
- RFID communication
- Process control



## CITSens MeMo APC

- Continuous in-situ measurement of glucose and lactate
- One sensor, one electronic, two analytes
- Bluetooth communication
- Process control



# Our consumables from T-Flask to bioreactor scale



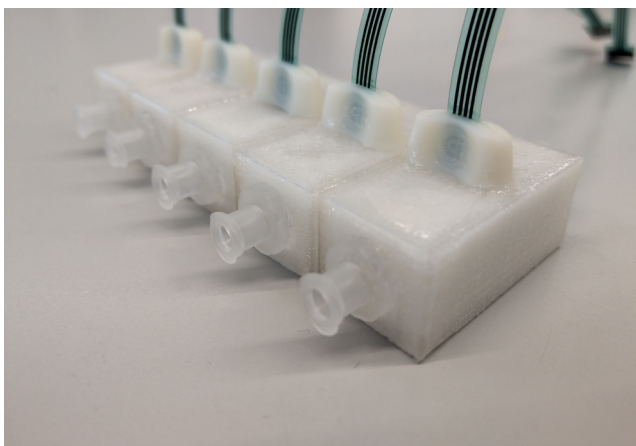
## CapSensor

Upon request, C-CIT Sensors manufactures Cap Sensors for applications where cells are cultivated in T-, Shake, Roller and Spinner-Flasks. All media wetted materials are USP Class VI compliant.



## Process Probe PG I3.5

Through its shape the Process Probe easily fits into any stirred bioreactor via PG13.5 threaded lid or side ports. Using PEEK or POM-C as main in-process material, the Process Probe complies with USP VI.



## Flow Cell Sensor

The Flow-Cell specially designed for tube based reactor systems or any perfusion based bioprocesses allows the culture media to pass through the cell and avoids any cell aggregation in or around the sensor.



## Customized Solutions

All our sensors can be adapted to any customized bioreactor. The measuring electronic as well as the signal transfer can be customized providing full integration capability of the sensor into closed systems or OEM solutions.



# Ion selective electrodes and membranes to sens the chemistry of life



## CITSens Ion Mini-tube Electrodes

- For small sample volumes
- High resolution and good selectivity
- Ideally used with the potentiometer of C-CIT Sensors AG

The „CITSens Ion“ ion selective Mini-Tube electrodes, because of their size, are especially designed to measure in very small sample volumes.

All ion selective Mini-Tube electrodes has a high resolution, a good selectivity against other ions and a long life-time. The Electrodes are for laboratory application or mobile insert and can be gamma-sterilized.

The „CITSens Ion“ Electrodes will be delivered without integrated reference electrodes and are available for different ions.

C-CIT Sensors AG produces on your desire ion selective membranes and cocktails for different ions and applications. On this way, you receive, optimal adapted Membrane compounding for your process from the specialist for ion selective sensors. With this membranes and cocktails are you able to build up your own ion selective sensors.



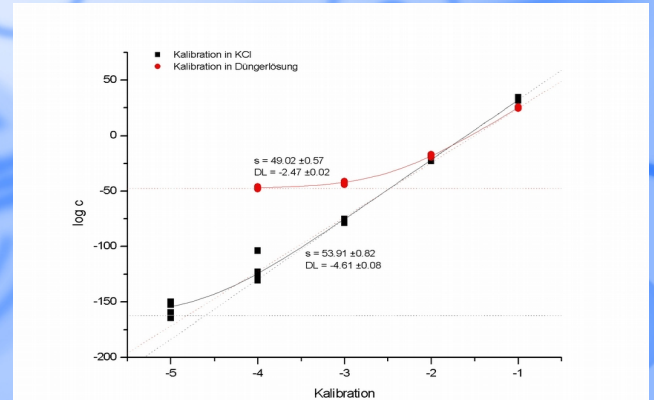
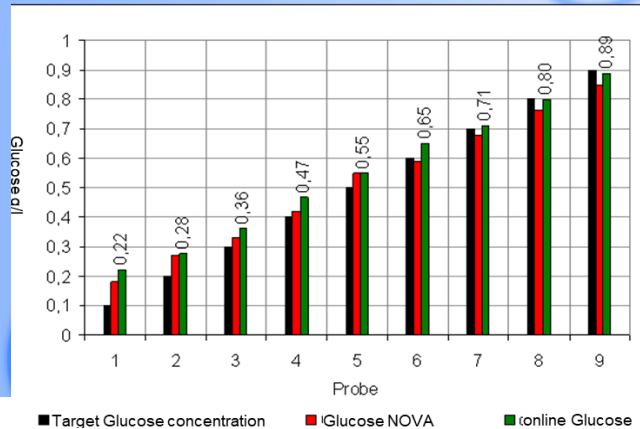
## CITSens Ion Selective Membranes

- Ion selective membranes to design your own ion selective sensors
- Ion selective membranes combined with the MT050 electrode body for testing different membranes with buying total sensor

The components of the membrane can be change on your request. For more information or details, please contact us. The ion selective membranes can be used to build in the electrode body UniISE MT050. The membranes together with the electrode body are ideal tools for the development of own ion selective electrodes.



# C-CIT The Company for Cell Culture Insitu Technologies



## Comparison of off-line and “CITSens Bio” in-situ measurement

A glucose sensor was integrated in a shaker flask and the flask was filled with a cultivation medium without glucose addition. In a next step, 0.1 g/l glucose were added and the sensor was calibrated within this medium. In parallel, an aliquot of the medium was sampled and analysed with the instrument „Bioprofile“. Subsequently, glucose was added in steps of 0.1 g/l glucose. The sensor response was monitored and interpreted relative to the off-line results of „Bioprofile“.

## Comparison of ion selective sensors in pure and mixed solutions

Any analyte molecule interacting with any other compound in the sample will not be detected by the sensors and has no influence whether on-line or off-line sensors are applied. The free fraction depends on the background of the measured solution. An example of a possible difference in the free fraction and the total concentration is given in the picture above. If you dilute MgCl in water you will have different fractions of the analyte. Ion selective sensors do only measure the  $Mg^{2+}$  fraction. If you use now a method to compare with, where sample preparation is needed, you may see different results depending on pH, temperature,  $O_2$ ,  $CO_2$  and other matrix effects than measured with the sensors.

For any question please contact:

**C-CIT Sensors AG**  
 Headquarter Binningen  
 Einsiedlerstrasse 34  
 CH-8820 Waedenswil

Tel. +41 43 477 85 55  
 Email: [sales@c-cit.ch](mailto:sales@c-cit.ch)  
[www.c-cit.ch](http://www.c-cit.ch)

