

FLOW CELLS

Online pH and Dissolved Oxygen Monitoring in Flow Loops



Challenges

Standard Probes are Cumbersome

- Require time and money for repeated calibration and sterilization
- Block bioreactor ports

Custom or Unique Systems

- Vessels with low volumes that make offline sampling difficult
- Systems not compatible with standard probes that require alternative measuring solutions



What Our Customers Say

“Incorporating sbi’s pH and DO flow cells into our system removed the need for manual sampling, saving us time, reducing the risk of contamination, and providing information on how the CAR T-cells are growing even when we are not in the lab. With availability of this more detailed view of our culture, we can make informed improvements to our cell expansion process.”

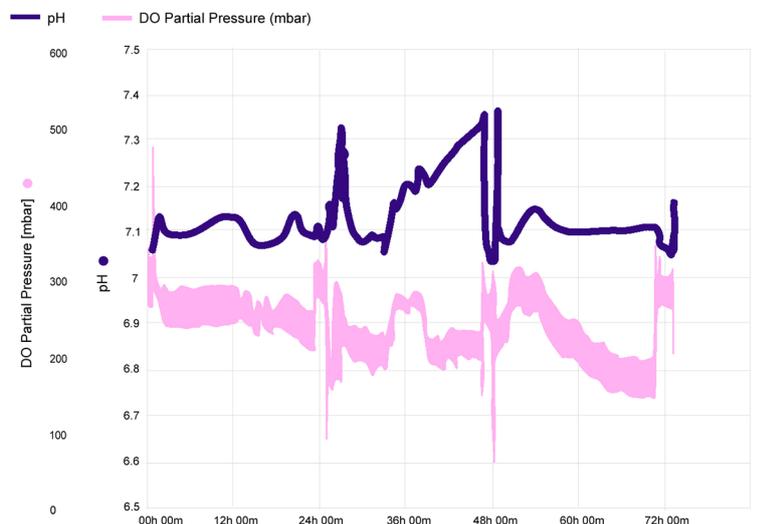
- Kitana Manivone Kaiphanliam (Washington State University)

Key Features

- pH and DO ranges for a variety of applications
 - pH ranges: 5-7, 6-8, 7-9
 - DO range: 0-50% O₂ (gas), 0-100% O₂ (liquid)
- Factory-calibrated and pre-sterilized for immediate use
- Flexible flow rate range: 5-500 mL/min
- Powerful DOTS Software for easy sensor handling and real-time data visualization

Benefits

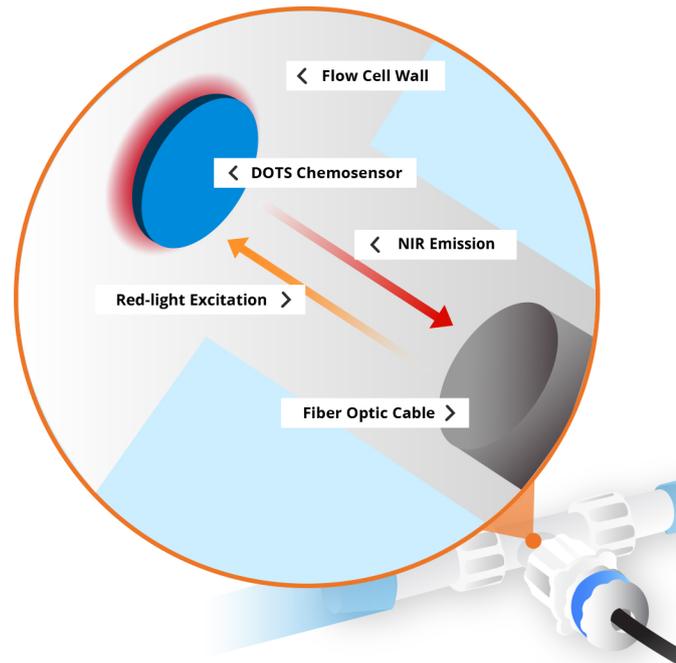
- Save hours of manual hands-on time for probe setup, calibration, and conditioning
- Free up valuable port space for other uses
- Gain actionable insights through continuous, non-invasive monitoring of critical cell culture parameters



How It Works

The flow cell is placed into a flow loop. Each flow cell comes with an integrated chemosensor, containing luminescent dye indicators suitable for either pH or DO sensing. Sitting on an optically transparent portion of the flow loop, the chemosensor is in contact with the liquid inside the flow loop, while being read out contactless with a fiber optic cable.

The indicators are excitable with red light (orange-red at a wavelength of 610-630 nm) and show luminescence in the near infrared region (NIR, 760-790 nm). Depending on the molecules present in the solution, the amount of luminescence changes. The fiber optic sensor measures this phase shift which is then calculated into the relevant parameter.



Compatible With Your...

Bioprocess

- ✓ Suitable for mammalian cell culture and microbial fermentation
- ✓ Environmental temperature and pressure compensation allows for variable culture conditions

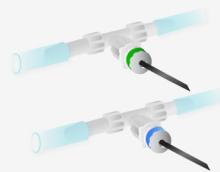
Lab Infrastructure

- ✓ Perfusion bioreactors, custom benchtop bioreactors, small-scale fermenters, and microfluidic chips
- ✓ On-line flow loops
 - Harvest lines, sampling lines, media in/out flow lines, waste removal lines

Applications

- ✓ Cell culture expansion
- ✓ Microfluidic applications
- ✓ Bioprocess quality control
- ✓ Harvest of cellular metabolic products
- ✓ Early contamination detection based on shifts in pH or DO levels

Components



Flow Cell

Single-use flow cells with integrated chemosensors for pH and dissolved oxygen (DO).



Fiber Optic Sensor

Collects data from all connected flow cells via an LED which excites the chemosensor and a photodiode that detects the NIR emission.



DOTS Software

Powerful software for easy sensor handling and real-time data visualization.



Want To Connect The DOTS In Your Bioprocessing?

Contact Us