



# Flow Cells

**Online pH and Dissolved Oxygen Monitoring in Flow Loops**

# Continuously monitor pH and dissolved oxygen (DO) using fiber optic sensors for flow loops.

## Flow Cells

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# A flow cell system consists of three components: The flow cell, the fiber optic sensor and the DOTS Software.

## Hardware & Software Components

### Flow Cells



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

### Fiber Optic Sensor



Contains an LED, which excites the chemosensor, and a photodiode that detects the emitted luminescence. Collects the data from all connected flow cells.

### DOTS Software

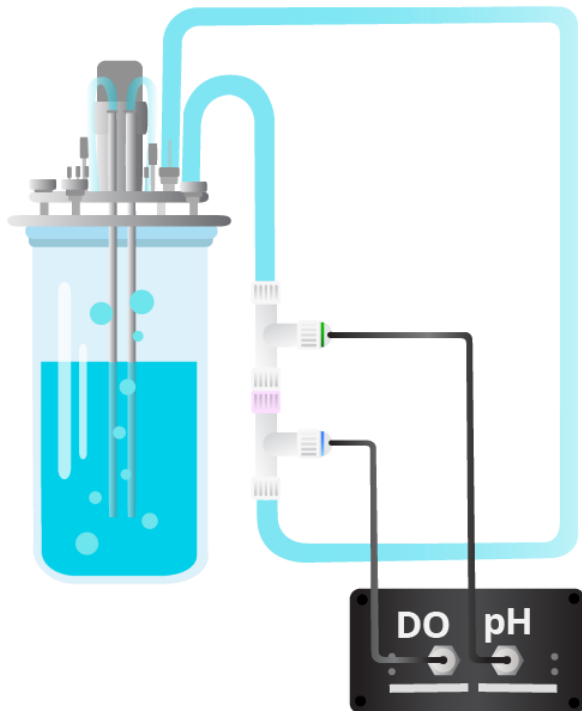


DOTS Software enables a simplified control of sensors and visualizes the received data from all monitored flow loops in real-time.

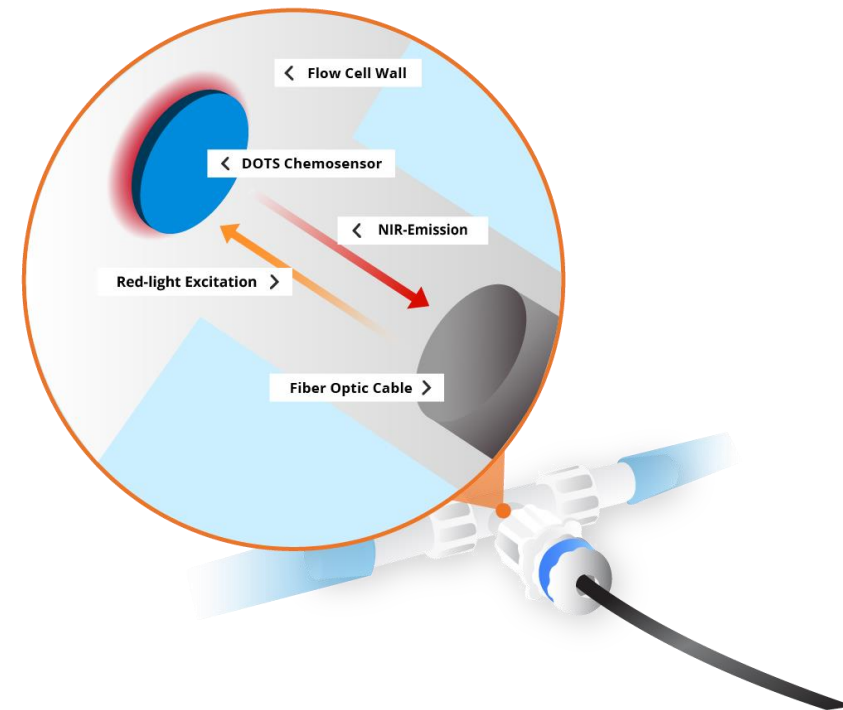
# The Flow Cells use the principle of spectroscopy for optical pH and DO monitoring.

## Principle of Measurement

### Flow Cell Architecture

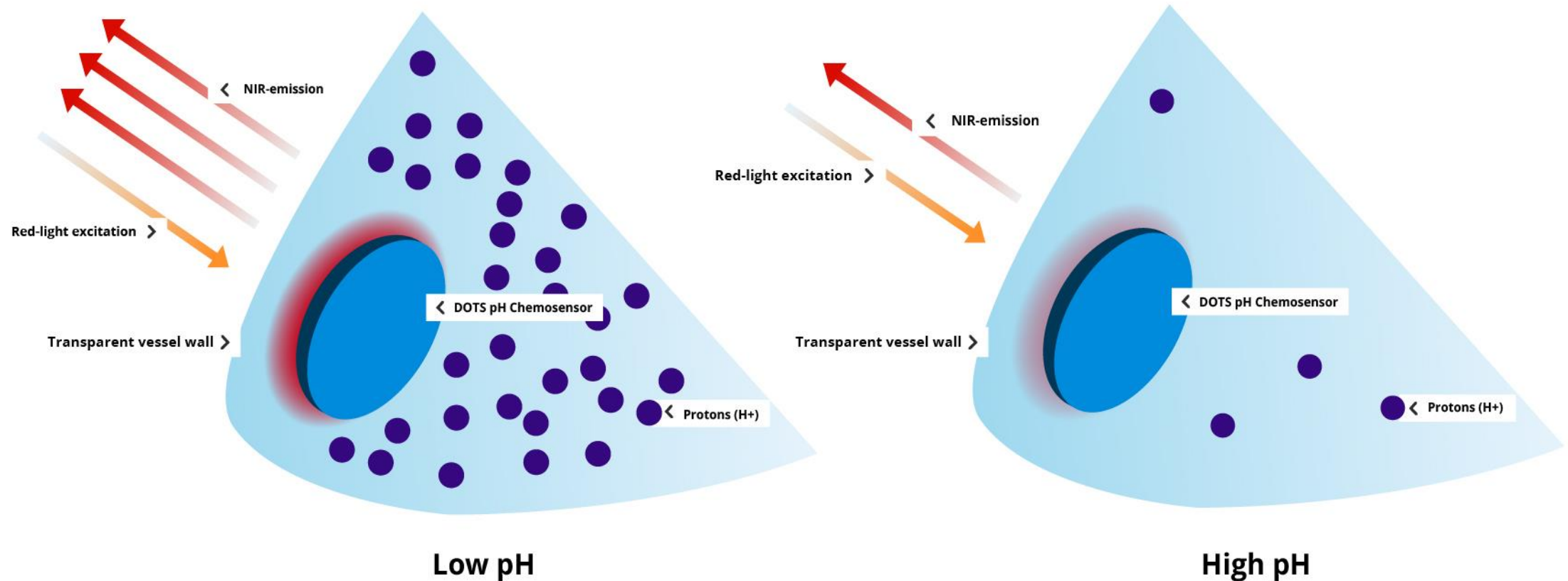


### Sensing Principle



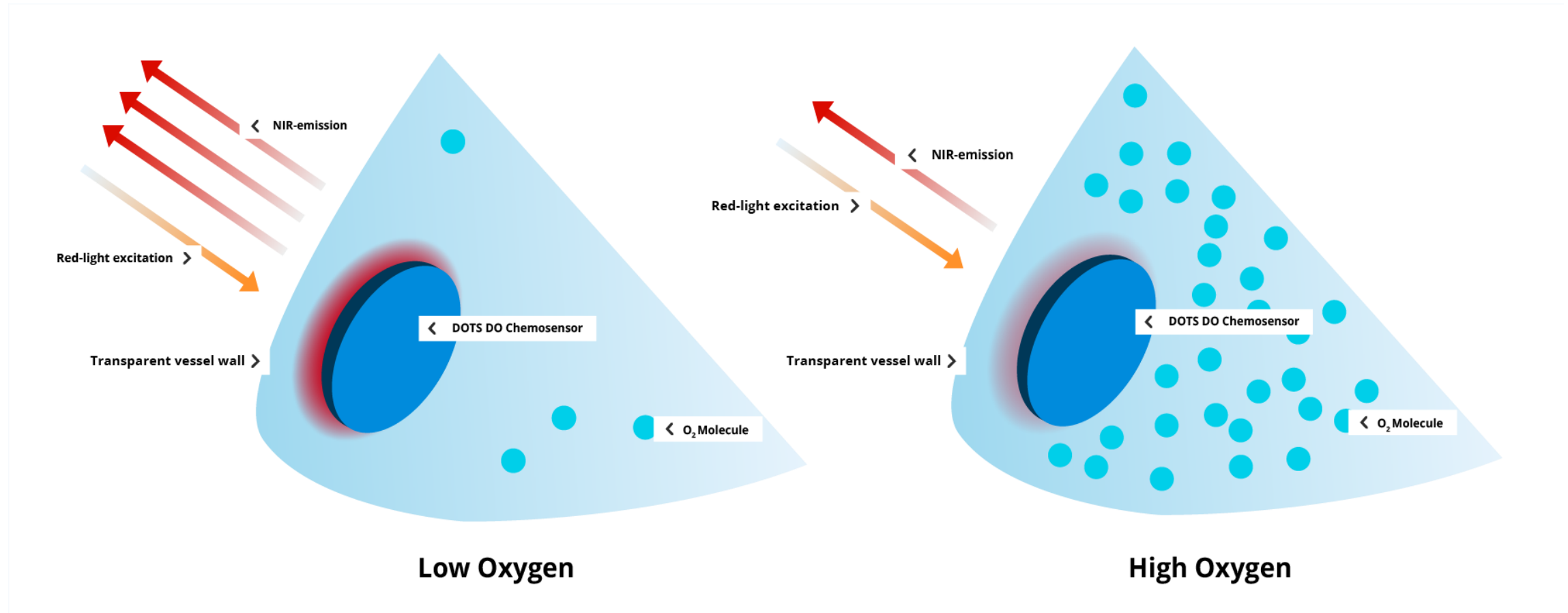
**The chemosensors contain indicator dyes which are excitable with red light (610-630 nm) and show luminescence in the near infrared region (NIR, 760-790 nm).**

### Principle of Measurement - pH



**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.**

### Principle of Measurement – Dissolved Oxygen (DO)



# Flow Cells enable scientists to continuously monitor cell culture conditions, removing the need for manual sampling.

## Flow Cell Key Facts



### Key Facts

#### Ranges for a variety of applications

*pH ranges: 5-7, 6-8, 7-9*

*Dissolved Oxygen (DO) range: 0-50% O<sub>2</sub> (gas) / 0-100% O<sub>2</sub> (liquid) (mbar)*

#### Single or dual Channel

*Combine pH and DO flow cells with a luer-luer adapter and measure both parameters in the same flow loop simultaneously*

#### Easy to install and use

*Standard luer-lock connectors allow for easy installation into flow loops with different tubing sizes*

#### Ready-to-use

*Factory-calibrated and pre-sterilized for immediate use*

#### Flexible flow rates

*From 5 mL/min to 500 mL/min*

#### Powerful DOTS Software

*Simplified sensor control and data visualization for improved comparability*

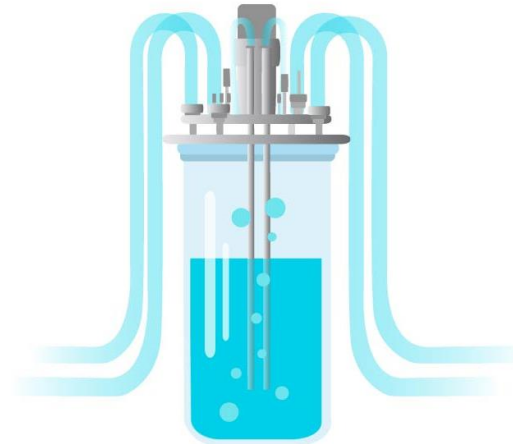
# Flow Cells are compatible with a variety of lab infrastructure.

## Compatible Laboratory Infrastructure

Perfusion bioreactors, custom  
benchtop bioreactors, and  
small-scale fermenters

Flow Cell

Harvest lines, sampling lines,  
media in/out flow lines, waste  
removal lines





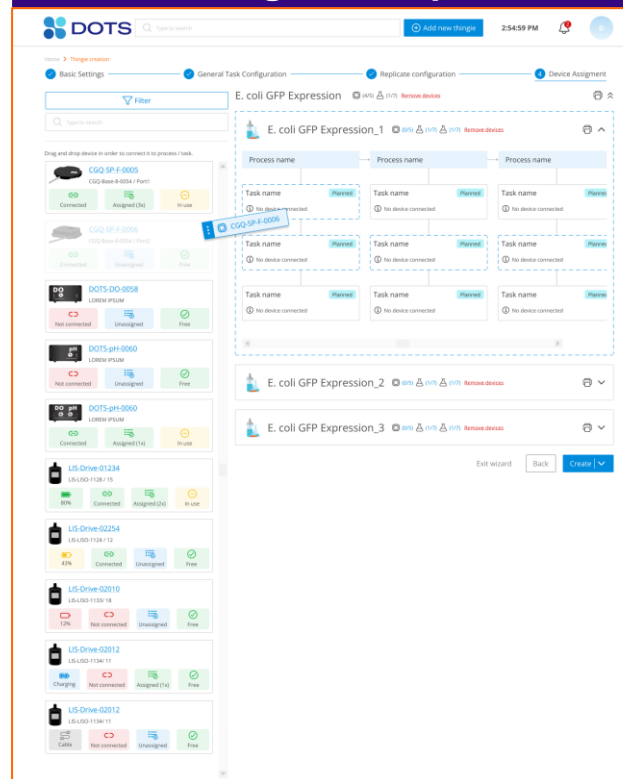
# The DOTS Software enables easy sensor handling and real-time data visualization.

## DOTS Software Modules

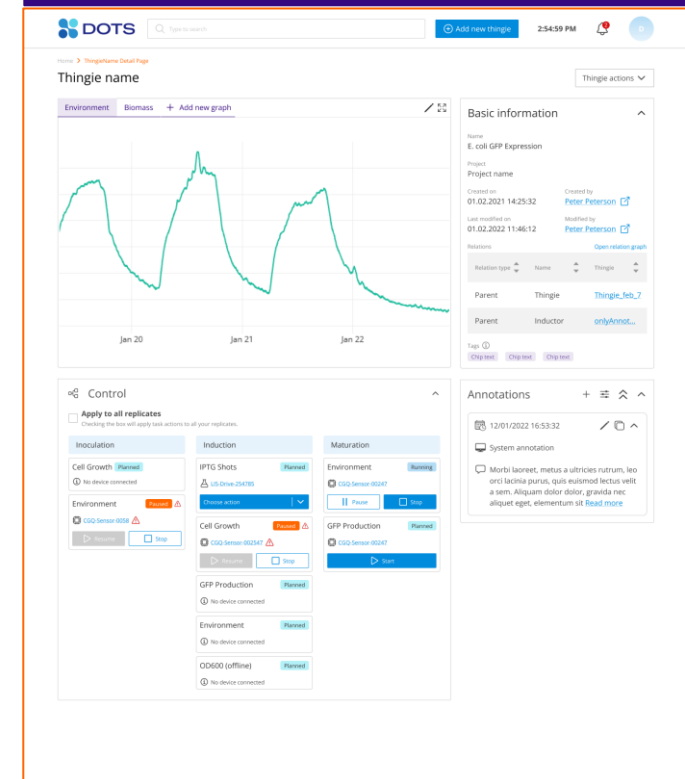
Create an experiment with pre-defined application templates or via the custom template generator

The screenshot shows the 'Create new thingie' wizard in the DOTS software. The 'Basic Settings' tab is active, showing fields for 'Name', 'Number of thingies', and 'Project'. A 'Thingie Structure' section on the right prompts the user to 'Select a template in order to see thingie structure.' Below the main form is a 'Relations' section with an 'Add new relation' button. The interface includes a search bar, a 'Type to search' prompt, and a 'Next' button at the bottom right.

Assign sensors to objects via drag and drop



Start your experiment and visualize your data in real-time

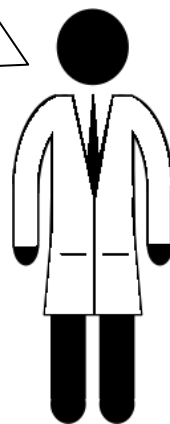


# Our flow cells are built around the sensing needs of our customers.

## Customer Feedback

“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)



“Having an integrated oxygen flow cell made all the difference in getting our cell expansion culture to work. The consistent real-time data showed us we needed to provide a better oxygenation system for successful cellular growth.”

-Dr. Bernard J. Van Wie  
(Washington State University)





# Let's Connect!

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