HUGO SACHS ELEKTRONIK

a division of **Harvard Bioscience, Inc.**

PreSens Flow-Through Sensors with Temperature Compensation

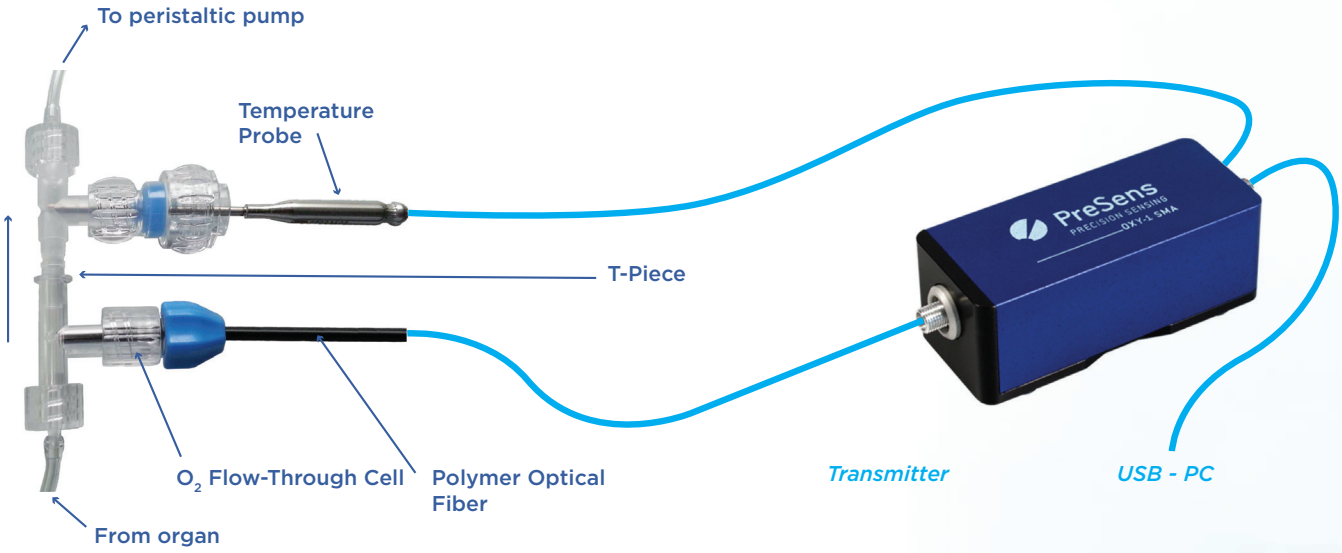
Continuous pO_2, pCO_2 and pH Measurement in Ex Vivo Organ Perfusion Systems

Using PreSens Flow-Through Sensors with Temperature Compensation

Precise and stable temperature-compensated measurement of pO_2, pCO_2 and pH in ex vivo organ perfusion systems is now possible using PreSens fiber optic minisensors and space-saving digital-phase transmitters. These high performance systems can be used for discrete rapid checks or continuous measurements, even in multi-day perfusion studies.

Features

- State-of-the-art system provides unprecedented performance and precision.
- Temperature compensation ensures accurate measurements even in environments or experiments with temperature variations.
- Sterile, beta irradiated flow-through cells.



Example setup for measuring one parameter (pO_2 shown). For continuous measurement in a flow-through cell, a peristaltic pump with eight or more rollers is required (not shown).

Easy to Set Up, Easy to Use

Simply add the flow-through cell for the parameter you wish to measure with a T-piece to your perfusion line and connect to the associated transmitter with a polymer optical fiber. Connect a Pt100 temperature probe for temperature compensation and temperature measurement. Then connect the transmitter to a PC using the included USB cable to record and view data via Measurement Studio 2 Software.

Multiple Measurements

To measure two or three parameters simultaneously, add the flow-through cells in series to the measuring channel in a bypass*, ending the sequence with a Pt100 temperature probe. Connect the appropriate transmitter to the sensor using a polymer optical fiber. The USB port on each transmitter connects to the PC.

For a multi-channel system only one Pt100 temperature probe is required. It is recommended to have the temperature probe at the end of the sequence of flow-through cells (after the sensors) so that no air bubbles are trapped.

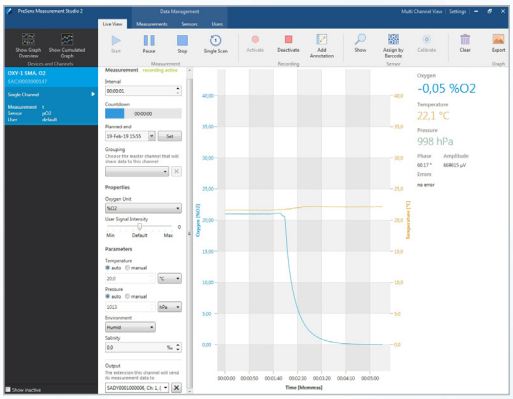
**For perfusion studies with continuous flow rates below 2 ml/min the sensors can be placed directly inline of the afferent or efferent cannulae. For perfusion flow rates above 2 ml/min or for non-continuous flow rates (e.g. constant pressure perfusion) a bypass or side stream flow line must be created with a fluid T connection and a peristaltic pump drawing perfusate through the sensor(s) at a continuous rate ideally between 1 to 2 ml/min.*

System Components

PreSens
PRECISION SENSING

Flow-Through Cells

PreSens flow-through cells are parameter-specific fiber optic sensors (pO_2, pCO_2 and/or pH) that interface between the solution and the polymer optical fiber. They feature a water-tight connection for the optical fiber and Luer lock connectors for easy interconnection to the fluid circuit. The three parameters can be measured continuously in a bypass circuit with the addition of an appropriate peristaltic pump to the setup.



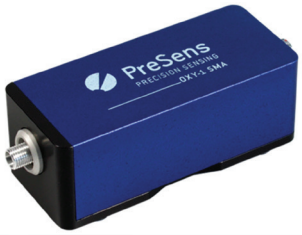
PreSens Measurement Studio 2 Software

The PreSens Measurement Studio 2 Software is included with all transmitters (pO_2, pCO_2 and pH) and records parameter values from one or more PreSens transmitters through a USB connected Windows® 7 or 10 OS-based computer. Data management for sensors, measurement files and users, as well as export of files into .csv format, can be accomplished easily with just a few clicks. The intuitive measurement control facilitates precise measurements with multiple devices simultaneously.

Pt100 Temperature Probe for Temperature Compensation

The Pt100 temperature sensor is integrated into any single- or multi-channel flow-through circuit and connected to any one of the transmitters. Solution temperature affects the measured values of pO_2, pCO_2 and pH. To accurately measure these parameters, especially during chronic perfusion studies, it is important that solution temperature be measured simultaneously. The Studio 2 software records the temperature and calculates the compensated values in real time.

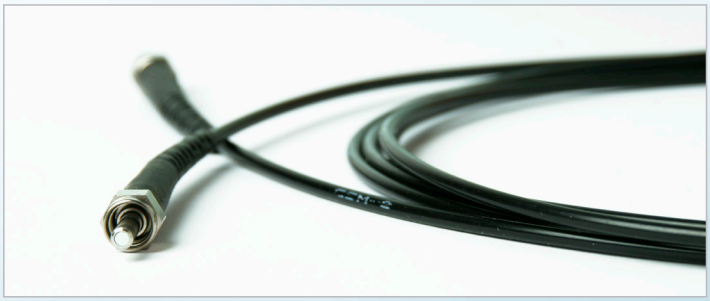
Single-Channel Fiber Optic Transmitters



PreSens transmitters convert an optical signal (light) into a digital value which is recorded using the Measurement Studio 2 Software that is included with all transmitters. These transmitters can be assembled in a few easy steps and are extremely space-saving. Because the devices are powered via USB, no additional power connections, cables or adapters are required.

Polymer Optical Fiber

The polymer optical fiber transfers excitation light to the sensor and the sensor response back to the transmitter.



Analog Output Extension

This extension allows continuous, simultaneous recording of PreSens measured values in addition to other significant values using any Data Acquisition System (DAQ) such as HSE ISOHEART and PULMODYN, ADI PowerLab or DSI PoNeMah.

The analog output extension is connected via USB to the PC. All the digital values (pO_2, pCO_2, pH, temperature) which are taken from the PreSens transmitters and displayed in the Measurement Studio 2 software can be sent to the analog output extension. An external DAQ System synchronizes recording of pO_2, pCO_2 and pH together with all other collected signals such as pressures, flows, ECG, etc. to one time scale, for easier evaluation of experiment results.

Each analog converter outputs two user-selectable signals to an external DAQ or other device. Two analog output extensions can be used simultaneously if you require 3 to 4 analog representations (outputs) of the measured parameters.

Ordering Information

Item #	Description
73-5041	OXY-1 SMA Single-Channel Fiber Optic Oxygen Transmitter, includes USB mini cable and PC recording software for single- and multi-channel devices. Includes all necessary tubing connectors to secure POF into flow-through cell.
73-5044	Flow-Through Cell for Oxygen, oxygen sensitive coating, 0 to 100% O_2 (0 to 760 mmHg), beta irradiated
73-5042	pH-1 SMA Single-Channel Fiber Optic pH Transmitter, includes USB mini cable and PC recording software for single and multi-channel devices. Includes all necessary tubing connectors to secure POF into flow-through cell.
73-5045	Flow-Through Cell for pH, pH sensitive coating, pH 5.5 to 8.5, beta irradiated
73-5043	CO_2-1 SMA Single-Channel Fiber Optic CO_2 Transmitter, includes USB mini cable and PC recording software for single- and multi-channel devices.
73-5046	Flow-Through Cell for pCO_2, 1 to 25% CO_2 (8 to 180 mmHg). beta irradiated
73-4941	Polymer Optical Fiber for use with fiber optic minisensors O_2, pH, CO_2
73-5047	Pt100 Temperature Probe for temperature compensation. Cable length 5 M, Length of temperature probe 40 mm, OD 1.9 mm. Includes connectors and fittings to insert probe into perfusion circuit.
73-5048	2CSB Analog Output Extension with two analog output channels for two software selectable parameters. Includes USB- RS485-RJ 4-4 cable
73-2952	REGLO Analog 2-Channel MS-2/8-160, 115 VAC, 60 Hz
73-2448	REGLO Analog 2-Channel MS-2/8-160, 230 VAC, 50 Hz
73-0126	3-Stop Tygon® E-Lab Tubing, 1.22 mm ID, 12/pack, Red/Grey
73-5083	PreSens Adapter Kit. Replacement fittings package for fiber optic pO_2, pCO_2 or pH measurement. Includes all necessary adapters, Luer connectors, T-pieces and tubing.

Contact Us

Germany

Hugo Sachs Elektronik
Harvard Apparatus, GmbH
Gruenstrasse 1
D-79232 March-Hugstetten, Germany
Tel: +49 0 7665 9200-0
Fax: +49 0 7665 9200-90
Email: sales@hugo-sachs.de
Web: www.hugo-sachs.de

United States

Harvard Apparatus
84 October Hill Road
Holliston, Massachusetts 01746, USA
Tel: 508-893-8999
Toll Free: 800-272-2775 (US Only)
Fax: 508-429-5732
Email: sales@harvardbiosci.com
Web: www.harvardapparatus.com