

METERS

MCR-01P1C1



This compact multi-channel meter has a channel for oxygen (0 – 100 % O₂), pH (5.5 – 8.5 pH) and CO₂ (1 – 25 % CO₂). It is compatible with non-invasive sensors, dipping probes and flow-through cells and can be used in multiple applications, like benchtop bioreactor monitoring, respirometry or microfluidics. Each channel of the MCR-01P1C1 has separate temperature compensation, so most precise measurements in environments with changing temperatures can be taken. The meter is USB-powered and operated with the PreSens Measurement Studio 2 software, which enables simultaneous control of several devices, so measurement networks can be set up. With numerous features and additional pressure and salinity compensation, the software makes the MCR-01P1C1 applicable in almost any application.

- Parallel O₂, pH & CO₂ monitoring with one device
- Individual temperature compensation for each channel
- Pressure & salinity compensation
- For use with non-invasive sensors, dipping probes & flow-through cells

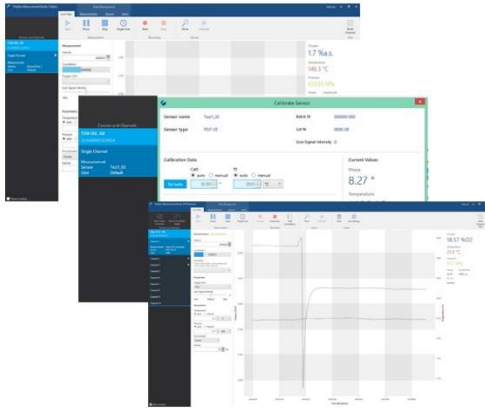
TECHNICAL

Specifications

Sensors	O ₂ : PSt3 pH: HP5 CO ₂ : CD1
Temperature sensor	Pt100 temperature sensor connector (sensor not included)
Temperature performance	From 0 ° to + 50 °C, resolution ± 0.1 °C, accuracy ± 1.0 °C
Power supply	5 VDC (USB-2.0-Mini-B, cable included)
Temperature: operating / storage	From 0 °C to + 50 °C / from - 20 °C to + 70 °C
Relative humidity	0 % to 80 % (non condensing)
Dimensions	164 mm x 80 mm (with SMA connectors) x 50 mm
Weight	430 g
Digital interface	USB interface cable to PC (cable included)

SOFTWARE

PreSens Measurement Studio 2



The PreSens Measurement Studio 2 has been developed and designed to control several PreSens devices connected to a PC / notebook with one software. It enables data transfer between device and PC / notebook. Easy data management for sensors, measurement files, and users as well as export of files into .csv format can be realized with just a few clicks. The intuitive measurement control eases performing precise oxygen measurements with a multitude of devices simultaneously.

- Control multiple devices connected to one PC / notebook
- Easy data management
- Data transfer
- Grouping of measurement channels

TECHNICAL

	Minimum System Requirements	Suggested Configuration
Operating system	Microsoft® Windows® 7 SP1, 8 or 10 (32 or 64 Bit)	Microsoft® Windows® 10 (64 Bit)
Processor	2.4 GHz Single Core (one device) 2.4 GHz Multi Core (up to 10 devices)	3 GHz Multi Core
RAM	2 GB	4 GB or more
Hard disk	10 GB free memory	40 GB or more free memory
USB	USB 2.0	USB 2.0
Screen resolution	1200 x 800	1920 x 1080 (Full HD) or higher

SENSORS

Oxygen Sensor Spot SP-PSt3-NAU



Sensor spots are the most versatile version of non-invasive optical oxygen sensors. The red side of the spot can be attached to the inner surface of any transparent glass or plastic vessel like e. g. shake and spinner flasks, tubes, Petri dishes or cultivation bags. Oxygen is measured contactless and non-destructively through the transparent vessel wall. The SP-PSt3-NAU has a measurement range of 0 – 100 % oxygen in dissolved or gaseous phase. The oxygen sensitive coating is immobilized on 125 µm flexible transparent polyester foil, which does not stand autoclaving.

- Non-invasive measurements through the vessel wall
- No consumption of oxygen
- Signal independent of flow velocity
- Measure oxygen in liquids as well as in gas phase

TECHNICAL

Specifications	Gaseous & Dissolved O ₂	Dissolved O ₂
Measurement range	0 – 100 % O ₂ 0 – 1000 hPa	0 – 45 mg/L 0 – 1400 µmol/L
Limit of detection	0.03 % oxygen	15 ppb
Resolution	± 0.01 % O ₂ at 0.21 % O ₂ ± 0.1 % O ₂ at 20.9 % O ₂ ± 0.1 hPa at 2 hPa ± 1 hPa at 207 hPa	± 0.004 mg/L at 0.091 mg/L ± 0.04 mg/L at 9.1 mg/L ± 0.14 µmol/L at 2.83 µmol/L ± 1.4 µmol/L at 283.1 µmol/L
Accuracy*	± 0.4 % O ₂ at 20.9 % O ₂ ± 0.05 % O ₂ at 0.2 % O ₂	
Drift	< 0.03 % O ₂ within 30 days (sampling interval of 1 min. / at 0% oxygen)	
Measurement temperature range	from 0 to + 50 °C	
Response time (τ ₉₀)	< 6 sec.	< 40 sec.
Properties		
Compatibility	Aqueous solutions, ethanol, methanol	
No cross-sensitivity	pH 1 – 14 CO ₂ , H ₂ S, SO ₂ Ionic species	
Cross-sensitivity	Organic solvents, such as acetone, toluene, chloroform or methylene chloride Chlorine gas	
Sterilization procedure	Ethylene oxide (EtO) Gamma irradiation	
Cleaning procedure	Cleaning in place (CIP, 2 % NaOH, + 80 °C, + 176 °F) 3 % H ₂ O ₂ Acidic agents (HCl, H ₂ SO ₄), max. 4 – 5 %	
Calibration	Two-point calibration with oxygen-free environment (nitrogen, sodium sulfite) and air-saturated environment	
Storage stability	60 months provided the sensor material is stored in the dark	

*after two-point calibration as described in the manual

SENSORS

Self-adhesive pH Sensor Spot SP-HP5-SA



The new self-adhesive technology simplifies the integration of these sensor spots. They can be mounted in transparent glass or plastic vessels. The pH is measured non-invasively and non-destructively from the outside – through the vessel wall. Optimized for physiological solutions and culture media these sensors are especially suited for bioprocess development or pharmaceutical applications. They are available irradiated or untreated. These sensor spots come pre-calibrated and ready-to-use. One-time autoclaving is possible.

- Simplified integration with new self-adhesive technology
- Compatible with glass & nearly all plastic vessels
- Pre-calibrated & ready-to-use
- Online monitoring without sampling
- Contactless measurements through the vessel wall

TECHNICAL

Specifications*

Measurement range	5.5 - 8.5 pH
Resolution	at pH = 7: ± 0.01 pH
Accuracy	at pH = 7: ± 0.05 sensor spot calibration
Drift	at pH = 7: < 0.005 pH per day (sampling interval of 1 min.)
Measurement temperature range	from + 5 to + 50 °C
Response time (t_{90})**	< 120 sec.

Properties*

Compatibility	Aqueous solutions, methanol (max. 10 % v/v), pH 2 - 10
Cross-sensitivity	Reduced to ionic strength (salinity); a high concentration of small fluorescent molecules in the visible range can interfere
Cleaning procedure	pH spots are delivered either beta-irradiated or untreated; one-time autoclaving or EtO treatment is possible***, a second irradiation or ethylene oxide treatment is not recommended
Calibration	pH spots are pre-calibrated
Storage stability	18 months provided the sensor is stored in the dark
Carrier materials	Adheres to nearly all surfaces like glass, polystyrene, polyethylene, polymethacrylate (acrylic glass), polycarbonate. The sensor does NOT adhere to silicone surfaces!

* provided pH sensors are used without further handling in physiological solutions

** equilibrated sensor kept in well stirred solution at 37 °C

*** recalibration is recommended

SENSORS

CO₂ Sensor Spot SP-CD1



The CO₂ sensor spots measure the partial pressure of dissolved carbon dioxide. The spots are fixed on the inner surface of glass or transparent plastic vessels. Measurements are then taken contactless from the outside through the transparent container material.

- Re-usable & disposable sensors
- Online monitoring
- Non-invasive & non-destructive measurement
- Measurement range from 10 – 250 hPa CO₂ (8 ... 180 mmHg)
- No consumption of carbon dioxide
- Measures carbon dioxide in liquids
- Beta-irradiated and autoclavable sensors available

TECHNICAL

Specifications*

Measurement range	1 - 25 % CO ₂ at atmospheric pressure (1013.15 hPa) 10 - 250 hPa pCO ₂ 8 - 180 mmHg pCO ₂
Resolution at + 20 °C	± 0.06 % at 2 % CO ₂ ± 0.15 % at 6 % CO ₂ ± 0.5 mmHg at 15 mmHg pCO ₂ ± 1.2 mmHg at 45 mmHg pCO ₂
Accuracy**	± 5 % of reading or 0.2 % (1.5 mmHg); whichever is higher
Drift at + 37 °C***	typically < 5 % of reading per week
Measurement temperature range	from + 15 to + 45 °C
Response time (t ₉₀) at + 20 °C	< 3 min. for change from 2 % to 5 % (15 mmHg - 38 mmHg) pCO ₂

Properties

Compatibility	Aqueous solutions, pH 4 - 9
Cross-sensitivity	Optical pCO ₂ sensors display reduced cross-sensitivity to ionic strength (salinity); acetic acid, SO ₂ , HCl vapours
Stability	pCO ₂ sensors do not stand: organic solvents, pH above 10 or below 4
Cleaning procedure	Depends on the sensor type used - please ask our experts
Calibration	pCO ₂ spots are pre-calibrated , re-calibration is possible Beta-irradiated or autoclavable pCO ₂ sensors available
Storage stability	12 months provided the pCO ₂ sensor is stored in its original package

* provided pCO₂ spots are used without further handling in physiological solutions

**after multipoint calibration

*** in a carbon dioxide incubator with 100 % rel. hum. at 5 % CO₂; measurement interval of 1 min.

ACCESSORIES

Polymer Optical Fiber POF



A polymer optical fiber (POF) is needed to transfer excitation light to the sensor and the sensor response back to the meter. We offer different versions for different meters depending on their optical connector type. A POF enables non-invasive and non-destructive measurements to be made from the outside through the wall of a transparent or slightly colored container. The POF with SMA connector is compatible with meters of the Fibox, OXY-1 SMA, OXY-1 WM, OXY mini and pH mini series, as well as the pCO₂ mini. The POF with ST connector is compatible with meters of the Microx 4 and OXY-1 ST series. Different standard lengths are offered, e. g. 2.5 m, and fibers with connectors on one or both ends are available, depending on your adapter or sensor application.

- Enables contactless measurement
- Versatile light guide
- Different lengths available

TECHNICAL

Specifications	SMA	ST
Dimensions	Optical diameter: 2 mm Outer diameter (incl. black cladding): approx. 2.8 mm Min. bending radius: 40 mm	Optical diameter: 1 mm Outer diameter (incl. black cladding): 2.2 mm Min. bending radius: 17 mm
Connector type	SMA connectors on one or both ends available for use with SOA or ARC	ST connectors on one or both ends available for use with SOA or ARC-1 ST
Length of fiber	Available standard lengths 1.0, 2.5 and 5.0 m; for lengths of more than 5 m, please contact our service team	
Compatibility	All devices with SMA connector, e.g. Fibox, OXY-1 SMA, pH mini series, pCO ₂ mini	All devices with ST connector, e.g. Microx 4 or OXY-1 ST series

GET IN CONTACT

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PreSens Precision Sensing GmbH
Am Biopark 11, D-93053
Regensburg
Phone +49 941 942 72 100
Fax +49 941 942 72 111
info@PreSens.de