CO2-1 SMA

TRANSMITTERS

Instruction Manual

PreSens
PRECISION SENSING

CO_2-1 SMA

Specification:

Fiber optic CO_2 meter for use with CO_2 sensor spots, flow-through cells & dipping probes

Software:

PreSens Measurement Studio (PMS2)

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Specifications may change without prior notice.

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1 Preface

You have chosen a new, innovative technology for measuring carbon dioxide.

The CO_2-1 SMA is a compact fiber optic CO_2 meter. It is based on a novel technology, which creates very stable, internally referenced measured values. This allows a more flexible use of CO_2 sensors in various fields of interest.

Optical CO_2 sensors (also called optrodes) have several important features:

- They are small.
- Their signal does not depend on the flow rate of the sample.
- They can be physically divided from the measuring system which allows a non-invasive measurement.
- They can be used in disposables.

Therefore, they are ideally suited for the examination of small sample volumes, for highly parallelized measurements in disposables, and for biotechnological applications. A set of different CO_2 minisensors, flow-through cells and non-invasive sensors is available to make sure you have the sensor which matches your application.
Please feel free to contact our service team to find the best solution for your application.

Your PreSens Team

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE WORKING WITH THIS DEVICE. WHEN DISREGARDING THESE INSTRUCTIONS THE SAFETY OF THE DEVICE CAN BE IMPAIRED.

2 Intended Use

The CO_2-1 SMA is a USB powered 1-channel desktop device for pCO_2 and temperature measurement. The device is designed for end users in the academic field, as well as for use in research and development. The measurement medium is exclusively aqueous solutions with sufficient buffer capacity (> 2mM). Gas measurements are not possible with the device. The meter is operated via a commercially available laptop or PC with Windows and the PreSens Measurement Studio software. The instrument is only to be operated with PreSens sensors type CD1 and CD2 (prototype) for measurement of dissolved pCO_2. The use of other sensors is explicitly excluded.

For best accuracy and resolution, calibration of the sensors by the customer is recommended. A minimum 5-point calibration should be performed with a gas mixing unit which includes the CO_2 range to be measured (see sensor instruction manual chapter ‘Calibration’). If a calibration with min. 5 calibration points is not possible, a one-point adjustment of the supplied factory data (see FIP) is recommended (according to sensor and software instruction manual chapter ‘One-Point Adjustment’).

Intended application fields for this device are biology, medical science & pharma (basic research only!), and food technology, more specifically in the following areas:

- Measurement in culture media
- Basic research (cell culture, microfluidics, etc.)
- Liquid analysis (physiology, sea water, wastewater, beverages, etc.)
- Environmental sciences (sediments, soils, etc.)

3 Safety Notes

! It is the customer's responsibility to validate the sensor and transmitter under end-user conditions according to safety precautions of the application to ensure that the use of the sensor is safe and suitable for the intended purpose.

! Any medical use on humans is categorically excluded! The device and its sensors must not be used for diagnostic or therapeutic purposes on humans or for clinical decision making. This also prohibits the use of the device on non-human samples or experiments which would have direct diagnostic or therapeutic consequences on humans or for clinical studies.

Basic research on non-human samples is not affected.

! Control of the device is only permitted via the PreSens Measurement Studio software. The manufacturer accepts no liability for control via other means.

! Process monitoring in industrial plants is explicitly excluded. This also includes the control and monitoring of food and its manufacturing processes. OEM / EOM use as well as use of the CO_2-1 SMA outside of the housing is not permitted.

! Monitoring of critical safety processes, such as monitoring of room or breathing air, is prohibited with the device.

! The device is not suitable for temperature regulation or temperature control.

! Use of the device and its sensors in connection with medium and high voltage (> 1000 volts), high pressure (> 100 bar) as well as use in potentially explosive atmospheres (e.g. ATEX 2014/34/EU as well as 1999/92/EC) are excluded.

! The manufacturer accepts no liability for the operation of the device with strong ionizing radiation (see radiation protection ordinance) as well as radioactive radiation (X-ray ordinance and similar).

! Use in biological safety laboratories of level 3 & 4 (S3, S4 as well as BSL-3, BSL-4), with assured exposure to toxic substances, as well as strong ionizing radiation (radiation protection ordinance and X-ray ordinance) is categorically excluded for **devices RENTED from PreSens Precision Sensing GmbH**.

PreSens is explicitly not liable for direct or indirect losses caused by the application of these measurement systems. In particular it has to be considered that malfunctions can occur due to the naturally limited lifetime of the sensor depending on the respective application. The set-up of backup measurement stations is recommended when using the sensors in critical applications to avoid consequential losses. It is the customer’s responsibility to install a suitable safety system in the event of sensor failure.

4 Description of the CO_2-1SMA

Fig. 1 CO_2-1 SMA optical carbon dioxide meter

The single channel CO_2-1 SMA device is compatible with non-invasive sensors, dipping probes and flow-through cells of type CD1 (1 - 25 % CO_2). The device is USB powered and does not need an extra power adapter. CO_2-1 SMA has temperature compensation, so even in environments with changing temperatures precise CO_2 measurements can be performed. The CO_2 meter is operated with the PreSens Measurement Studio 2 software, which enables simultaneous control of several devices. With numerous features and additional pressure compensation, the software makes the CO_2-1 SMA suitable for numerous applications.

! Several single- and multichannel devices can be connected to the PreSens Measurement Studio 2 software, so you can measure with as many sensors simultaneously as required.

5 Set-Up

4.1 Connecting the Devices

1. Remove the protective cap from the male plug on the polymer optical fiber (or the probe) and insert it in the SMA connector of the CO_2-1 SMA. The safety nut must be screwed on.

Fig. 1 Connecting the SMA plug to the CO_2-1 SMA

For further information on sensor handling and calibration please refer to the respective sensor instruction manual.

2. Connect the USB cable to the connector on the CO_2-1 SMA and to a USB port of your PC / notebook.

Fig. 2 Connecting the USB cable

3. If required, you can now connect a Pt100 temperature sensor to the device.

Fig. 3 Connecting the temperature sensor to CO_2-1 SMA

There is a red mark on the temperature sensor connector of the CO_2-1 SMA as well as on the temperature sensor plug. Match those two marks before inserting the temperature sensor plug into the connector on the CO_2-1 SMA; else, the plug might be damaged.

4. Now start the PreSens Measurement Studio (PMS2) software on your PC / notebook. (The CO_2-1 SMA always has to be connected via USB before the software is started.) After successful initialization, the software main screen is displayed and the CO_2-1 SMA will show in the **Device** section.

   For further details on how to use the PreSens Measurement Studio please refer to the software instruction manual.

4.2 Important Considerations for USB Handling

! PreSens recommends the use of a dedicated USB 2.0 PCI Card to connect and handle USB PreSens Devices with a Desktop PC.

! In order to enhance the system stability avoid the use of USB hubs and connect PreSens Devices directly to your PC / notebook USB Ports.

! If possible, disconnect all other USB devices that are not in use, as they may reduce or disturb the USB resources of your PC / notebook.

! Docking stations may also reduce or disturb the USB resources of your PC / notebook and therefore affect the correct function of the software.

! It is also recommended to disable the Power Saving Settings of your USB Root controller.

6 Technical Data

Tab. 1 Sensor specifications

OPTICAL SENSOR		
CO_2 sensor	CD1	
Optical connector	SMA	
Channels	1; up to 10 CO_2-1 SMA can be controlled simultaneously via PMS2 software	
LED peak wavelength	470 nm	

Tab. 2 Temperature sensor specifications

TEMPERATURE SENSOR		
Potentiometric temperature sensor (Pt100)	Range	0 – 50 °C
	Resolution	± 0.1 °C

Tab. 3 Power supply specifications

POWER SUPPLY	
Supply voltage	5 VDC (USB-2.0-Mini-B)
Current / Power	400 mA

Tab. 4 Digital interface specifications

DIGITAL INTERFACE	
USB interface cable to PC	Cable included

Tab. 5 Environmental specifications

ENVIRONMENTAL CONDITIONS	
Operating temperature	0 °C to 50 °C
Storage temperature	- 10 °C to + 70 °C
Relative humidity	0 % to 80 % (non-condensing)

Tab. 6 Device dimensions & weight

DIMENSIONS / WEIGHT	
W x L x H	ca. 35 mm x 101 mm (with connectors) x 30 mm
Weight	128 g

7 Operational Notes

6.1 Optical Output

The SMA connector is a high precision optical component. Please keep it clean and dry. Always use the rubber cap to close the output when not in use.

6.2 Maintenance

The transmitter is maintenance-free.
The housing should be cleaned with a cloth only. Avoid any moisture entering the housing. Never use benzine, acetone, alcohol or any other organic solvents.
The SMA fiber connector of the sensor can be cleaned with lint-free cloth or a cleaning implement for SMA connectors only.

6.3 Service

Alignment, rework or repair work may only be carried out by the manufacturer:

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Please contact our service team in case of any question. We look forward to helping you and are open for any proposition or criticism.

8 Concluding Remarks

Dear Customer,

With this manual, we hope to provide you with an introduction to work with the CO_2-1 SMA fiber optic CO_2 meter.

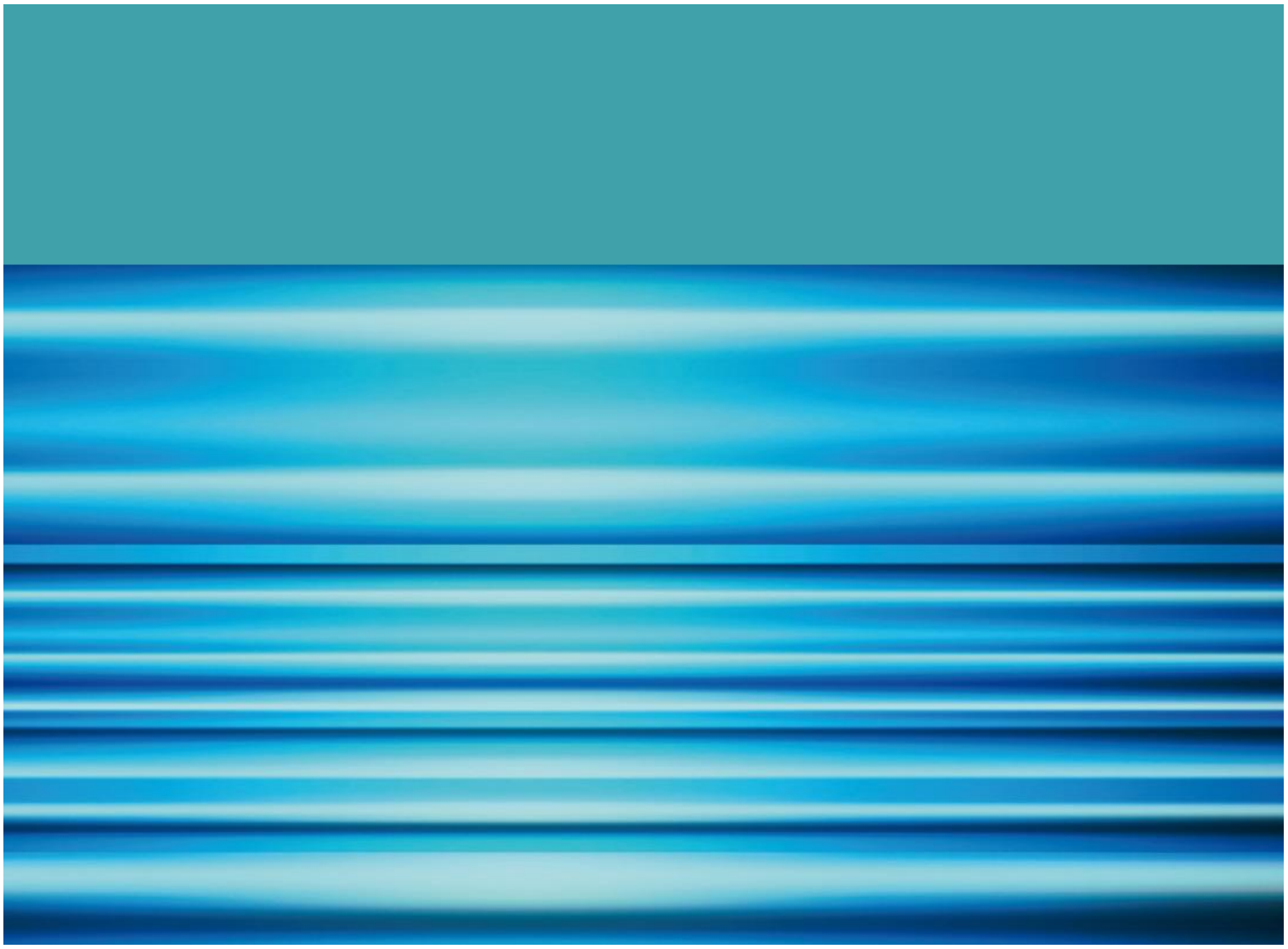
This manual does not claim to be complete. We are endeavored to improve and supplement this version.

We are looking forward to your critical review and to any suggestions you may have.

You can find the latest version at www.PreSens.de.

With best regards,

Your PreSens Team



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