

pH-1 SMA HP5 / LG1

TRANSMITTERS

 [Instruction Manual](#)



pH-1 SMA HP5 / LG1

Specification:

Fiber optic pH meters for use
with pH sensor spots, flow-through cells & dipping
probes

Software:

PreSens Measurement Studio (PMS2)

Document filename: IM_pH-1 SMA_dv3

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1 Preface

You have chosen a new, innovative technology for measuring pH.

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

Optical pH 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 pH 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 pH-1 SMA HP5 / LG1 is a USB powered 1-channel desktop device for pH and temperature measurement. The device is designed for end users in the academic field, as well as for use in research and development. 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 HP5 or LG1 (depending on device type) for measurement of pH. 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 buffers which includes the pH 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 pH-1 SMA outside of the housing is not permitted.
- ! Monitoring of critical safety processes, 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 pH-1 SMA HP5 and pH-1 SMA LG1



Fig. 1 pH-1 SMA HP5 and pH-1 SMA LG1

Due to their small size these fiber optic pH meters can be set up almost anywhere. As their names already indicate pH-1 SMA HP5 is compatible with all sensors type HP5 / HP8 (measurement range pH 5.5 – 8.5) and pH-1 SMA LG1 is compatible with LG1 sensors (measurement range pH 4.0 – 7.5). Both pH meters have temperature compensation, so even in environments with changing temperature precise pH measurements can be performed. They are USB-powered so there is no need for extra power connection, cables and adapters. The pH-1 SMA devices are controlled with the PreSens Measurement Studio 2 software (free download on <https://www.presens.de/support-services/download-center/software.html>), which enables simultaneous control of several PreSens pH, O₂ and CO₂ devices. With numerous features, the software makes pH-1 SMA HP5 / LG1 the ideal pH measurement tool for almost any application.

5 Set-Up

5.1 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 pH-1 SMA. The safety nut has to be screwed on.



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

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

- !** Do not look directly into the optical connector (without the fiber connected) while the device is measuring and emitting light pulses.
2. Connect the USB cable to the connector on the pH-1 SMA and to an 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 (not supplied, must be ordered separately). There is a red mark on the temperature sensor connector of the pH-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 device, else the plug might get damaged.



Fig. 3 Connecting the temperature sensor

4. Now start the PreSens Measurement Studio (PMS2) software on your PC / notebook. (The pH-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 pH-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 (<https://www.presens.de/support-services/download-center/manuals-getting-started.html>).

5.2 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	
pH sensor	pH-1 SMA HP5: HP5 / HP8 pH-1 SMA LG1: LG1
Optical connector	SMA compatible, 2 mm PMMA fiber
Channels	1; up to 10 pH-1 SMA can be controlled simultaneously via PMS2 software
LED peak wavelength	pH-1 SMA HP5: 470 nm pH-1 SMA LG1: 505 nm

Tab. 2 Temperature sensor specification

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

Tab. 3 Power supply specifications

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

Tab. 7 Device labelling

Device Label



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Type: pH-1 SMA HP5
S/N: SAE000100001
Rating 5V  / 500mA



PreSens
Precision Sensing GmbH
Germany, Regensburg
www.presens.de

Type: pH-1 SMA LG1
S/N: SAE000100001
Rating 5V  / 500mA



7 Operational Notes

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.

7.2 Maintenance

The transmitter is maintenance-free.

The housing should be cleaned with a cloth only. Avoid any moisture entering the housing. Never use benzene, 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.

7.3 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 pH-1 SMA HP5 / LG1 fiber optic pH meters.

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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