

SLS-1500 Liquid Flow Meter

Compact Flow Meter for Industrial Applications

- Liquid flow rates up to 40 ml/min
- 20 ms response time
- High chemical compatibility
- Modular electrical interface



Product Summary

The SLS-1500 liquid flow meter enables precise, non-invasive measurements of dynamic liquid flow rates up to 40 ml/min bi-directionally. Excellent biocompatibility is ensured by the exclusive use of high-performance stainless steel, PTFE and PEEK for the wetted parts. The flow path of the SLS-1500 liquid flow sensor is formed by an especially thin-walled, straight tube which assures excellent sensitivity.

Interface Options

- | | |
|----------------|------------------------------|
| Digital | Analog |
| - I2C-Bus | - Voltage output (0-10 V) |
| - RS485-Bus | - Additional operation modes |
| - USB Cable | |

For more information on communication, please refer to page 2 of this document.

1 Sensing Performance

Table 1: Performance of SLS-1500 (all data for medium H₂O, 23°C, 1 bar_{abs} unless otherwise noted)

Parameter	SLS-1500	Unit
Full scale flow rate	40	ml/min
Sensor output limit ^a	65	ml/min
Accuracy ^b (whichever error is larger)	5 0.25	% of measured value % of full scale
Repeatability ^b (whichever error is larger)	0.5 0.025	% of measured value % of full scale
Temperature coefficient (additional error per °C; whichever is larger)	0.25 0.00625	% measured value / °C % full scale / °C
Mounting orientation sensitivity ^c	<0.1	% of full scale
Flow detection response time τ_{63}	20	ms
Response time on power-up	25	ms
Operating temperature	+5...+50 (+41...+122)	°C (°F)
Ambient storage temperature ^d	-10...+60 (+14...+140)	°C (°F)
Recommended maximum operating pressure	12 (175)	bar (psi)
Burst pressure	25 (360)	bar (psi)

^aFlow rate at which the sensor output saturates, see section 2 for performance specification between full scale and saturation point.

^bAccuracy respectively repeatability below ± 20 ml/min. See the charts in section 2 for the accuracy respectively repeatability specifications between ± 20 ml/min and full scale.

^cMaximum additional offset when flow channel is vertical.

^dNon-condensing, flow path empty.

2 Specifications Charts

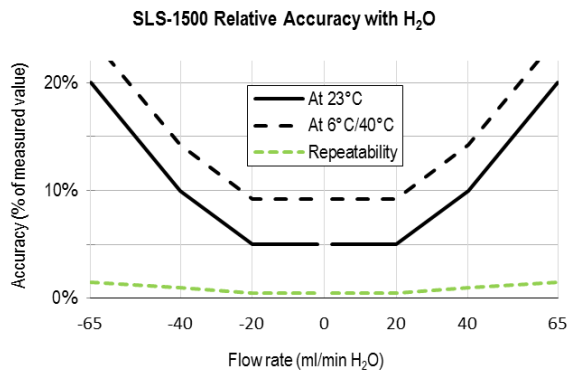


Figure 1: Sensor accuracy and repeatability (% of measured value) across the sensor's flow range

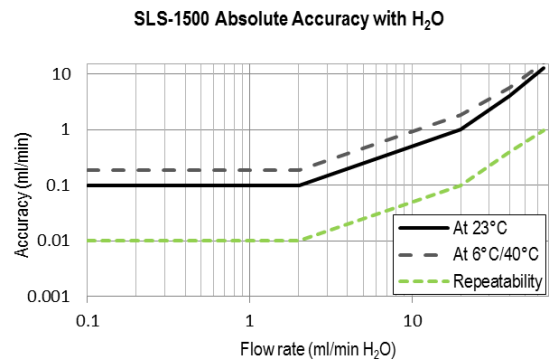


Figure 2: Sensor accuracy and repeatability (ml/min) across the sensor's flow range

3 Communication with the Liquid Flow Meter

The SLS-1500 flow meter shows bidirectional, linear transfer characteristics. The product comes fully calibrated for water.

Digital sampling time at 16 bit resolution: 74 ms
Digital sampling time at 9 bit resolution: 1 ms

3.1 Electrical Specifications

This section describes electrical specifications when connecting directly to the sensor's M8 connector for I²C communication. The preferred mode of communication is via the SCC1 interface cables. See the respective SCC1 datasheets for further details.

Table 2: DC characteristics

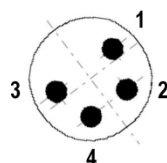
Parameter	Conditions	Min.	Typ.	Max.	Unit
Power supply DC, VDD		4.0	5.0	6.0	V
Operating current	VDD = 4.0 - 5.5 V		5.1		mA

3.2 Electrical Connector and Sensor Pinout

The flow meter is equipped with a male connector type M8, 4-pin, threaded lock according to IEC 61076-2-101 (Ed. 1)/ IEC 60947-5-2, and is compatible with Sensirion's SCC1 interface cables.

Table 3: Electrical pinout

Pin	
1	SDA (data)
2	GND
3	VDD
4	SCL (clock)



3.3 Digital Communication via RS485-Bus

The SCC1-RS485 Sensor Cable for liquid flow meters provides communication via RS485 interface for use in a demanding industrial automation environment. In addition to the standard commands available in the I²C interface of the flow meter, the incorporated microcontroller of the cable provides more complex logic such as a dispense volume totalizer, automatic dispense detection, automatic heater control and data buffer for asynchronous readout.

For further information please see the SCC1-RS485 Sensor Cable datasheet, available on www.sensirion.com/liquidflow-download.

3.4 Analog Communication

The SCC1-ANALOG Sensor Cable allows simple and quick readout of Sensirion's liquid flow meters by converting the digital flow meter reading to a 0...10 V analog voltage output. Additionally, a digital (high/low) output with two different modes of operation is available (Flow Switch / Volume Counter).

For further information please see the SCC1-ANALOG Sensor Cable datasheet, available on www.sensirion.com/liquidflow-download.

3.5 Communication via USB cable

The Sensirion SCC1-USB Sensor Cable provides an easy-to-use USB interface for laboratory and desktop use.

For further information please see the SCC1-USB Sensor Cable datasheet, available on www.sensirion.com/liquidflow-download.