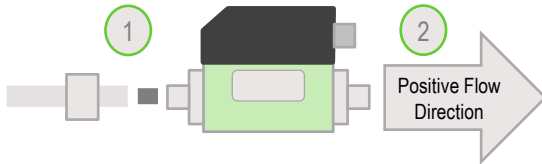


SLQ-QT105 Installation Guide

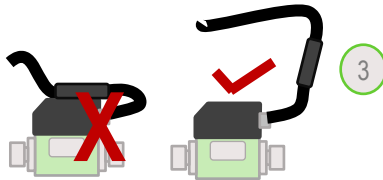
General Installation

1 Connect 4x3 mm PFA tubing using the sensor's Super 300 Type Pillar Fitting

2 The electrical connector points in the direction of positive flow

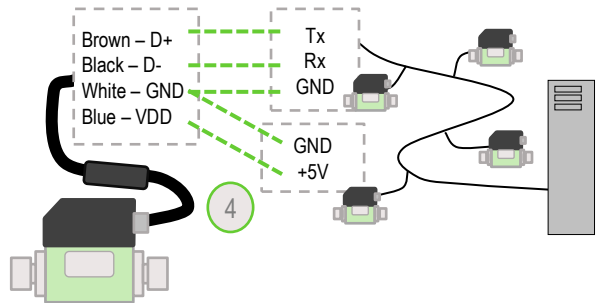


3 The cable's molded electronics should not touch the sensor's housing to avoid heat dissipation onto the sensor



4 Make the power and RS485 connection via the RS485 adapter cable

- Supply the adapter cable with 5V
- Connect the RS485 Tx/Rx lines to the RS485 network/backbone
- **Make sure GND of the RS485 and 5V supply are connected together**
- Use either software or hardware termination



RS485 Installation / Hardware

1 RS485 allows connecting up to 127 sensors in a RS485 network

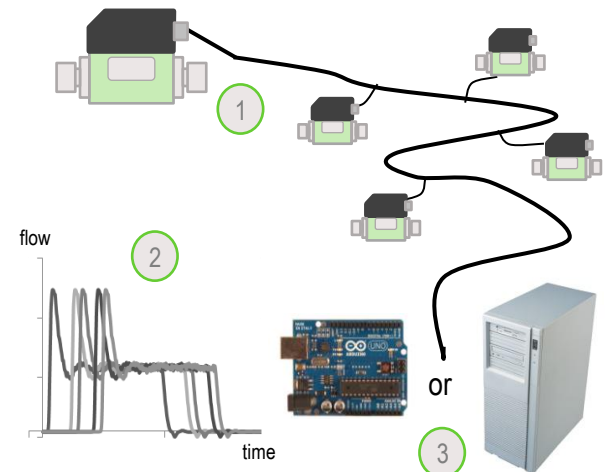
2 Simultaneous measurements are possible with 20-50 sensors (depending on hardware, type of measurement and settings)

3 The controller device of the sensors can be a PC, microcontroller board or other programmable control unit that offers RS485 capability

4 The controller must be programmable and the sensor's HDLC protocol must be implemented (see documents: DLL Documentation and HDLC Documentation. Sensirion offers sample programs for the driver DLL written in C++)

5 The controller must implement the aspects of the flow measurement with multiple sensors over the network

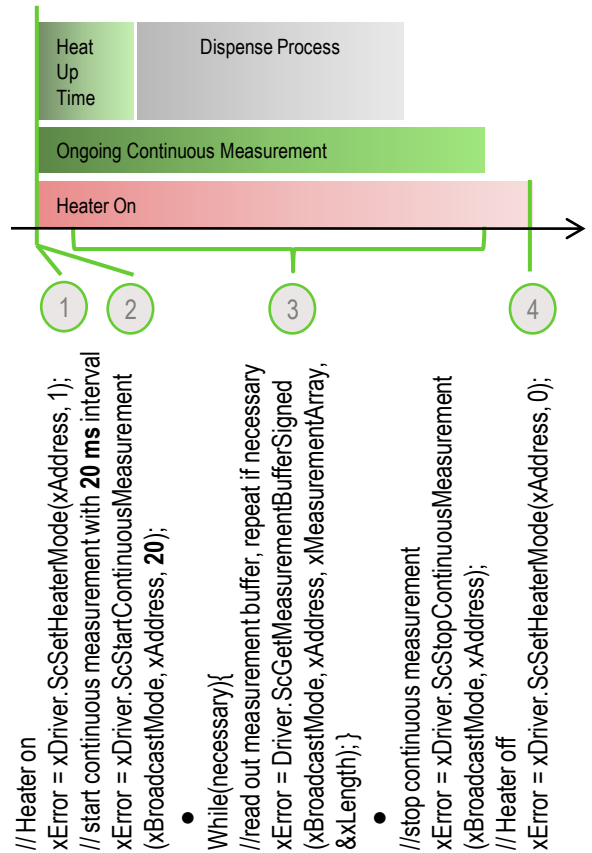
- Addressing of a specific sensor for a measurement
- Heater management (see next section)
- Simultaneous measurement with many sensors at the same time



```
// Heater on
xError = xDriver.ScSetHeaterMode(xAddress, 1);
// start continuous measurement with 20 ms interval
xError = xDriver.ScStartContinuousMeasurement
(xBroadcastMode, xAddress, 20);
•
While(necessary){
//read out measurement buffer, repeat if necessary
xError = Driver.ScGetMeasurementBufferSigned (xBroadcastMode,
xAddress, xMeasurementArray, &xLength); }
•
//stop continuous measurement
xError = xDriver.ScStopContinuousMeasurement (xBroadcastMode,
xAddress);
// Heater off
xError = xDriver.ScSetHeaterMode(xAddress, 0);
```

Measurement

- 1 The sensor must be initialized (= heater on) by sending the heater on command, either directly when the flow starts or shortly before (up to 1 sec before)
(It is very important that the time between sending the heater on command and start of the flow is always the same)
 - 2 Start the continuous measurement after heater on.
*(Choose **20 ms** measurement intervals when calling the continuous measurement function for even spacing of the measurements)*
 - 3 The measurements are stored in the internal ring buffer. It has space for 2.54 seconds. Call the get function to retrieve all measurement values.
(a continuous measurement stream is possible by calling the get function repeatedly)
 - 4 When the flow stops (i.e. valve closes or pump stops) the heater must be turned off quickly.
- !** Not managing the heater will lead to bad measurement performance and cause unnecessary heat up of the liquid
(Heater management is not complicated to implement and we strongly encourage it for dosing measurement)

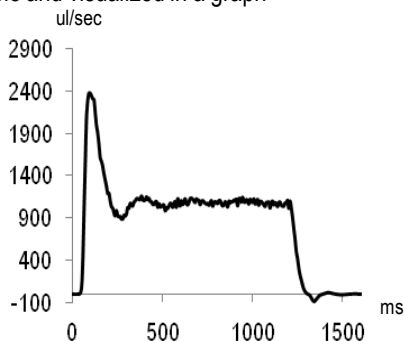


Measurement Analysis

- 1 The result of one dosing measurement is a list of measurement values

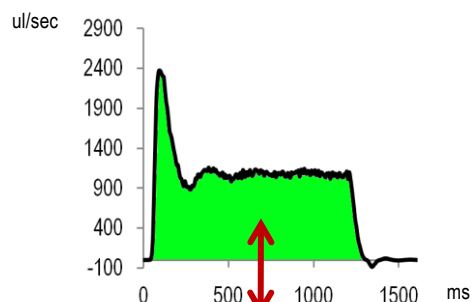
Time [ms]	Flow Rate [ul/sec]
0	0.23
20	20.03
40	1051.05
...	...

- 2 The list can be thought of as flow rates at moments in time and visualized in a graph



- 3 The dosed volume (of IPA – the calibration liquid) is the area under the curve and can be determined by integration (add all the measurement values and

multiply with the time difference between two measurements)



$$\text{Total Volume} = (\text{Meas. value 1} + \text{Meas. value 2} + \dots) * \text{time difference between two measurements}$$

- 4 The dosing profile can also be analyzed for irregularities, for example, to detect bubbles

