

EN - English



Installation and operating Instructions

CS Instruments GmbH

**Service Software Flow
Sensors**

Table of contents

1 First steps	3
1.1 Installation of the CS Service Software	3
1.2 Connecting the device to the "CS Service Software Adapter"	3
1.3 Connecting the flow meter to the computer	3
1.4 Connecting with Modbus RTU.....	4
2 Description of the software.....	5
2.1 Device Info.....	6
2.1.1 VA5xx.....	6
2.1.2 Actual Values	7
2.1.3 Firmware Update.....	8
2.1.4 Update Language.....	8
2.1.5 XML - Settings.....	8
2.2 Sensor Settings	9
2.2.1 General	9
2.2.2 Gas.....	9
2.2.3 Units	10
2.2.4 Parameter	10
2.2.5 Zero Point Adjustment	10
2.3 Average Values	11
2.3.1 Average Time Span / Clear Min, Max	11
2.4 4 - 20 mA	12
2.4.1 4 - 20 mA analog outputs settings.....	12
2.5 Relais	13
2.5.1 Pulse settings.....	13
2.5.2 Alarm settings.....	13
2.6 Interface Settings	14
2.6.1 Modbus Settings.....	14
2.6.2 Display Settings	14
2.7 Expert Settings.....	15
2.7.1 Calibration settings / Factory settings.....	15

1 First steps

1.1 Installation of the CS Service Software

Please install now the "CS Instruments GmbH - Service Software Flow Sensors".

You can find the latest version on the following link:

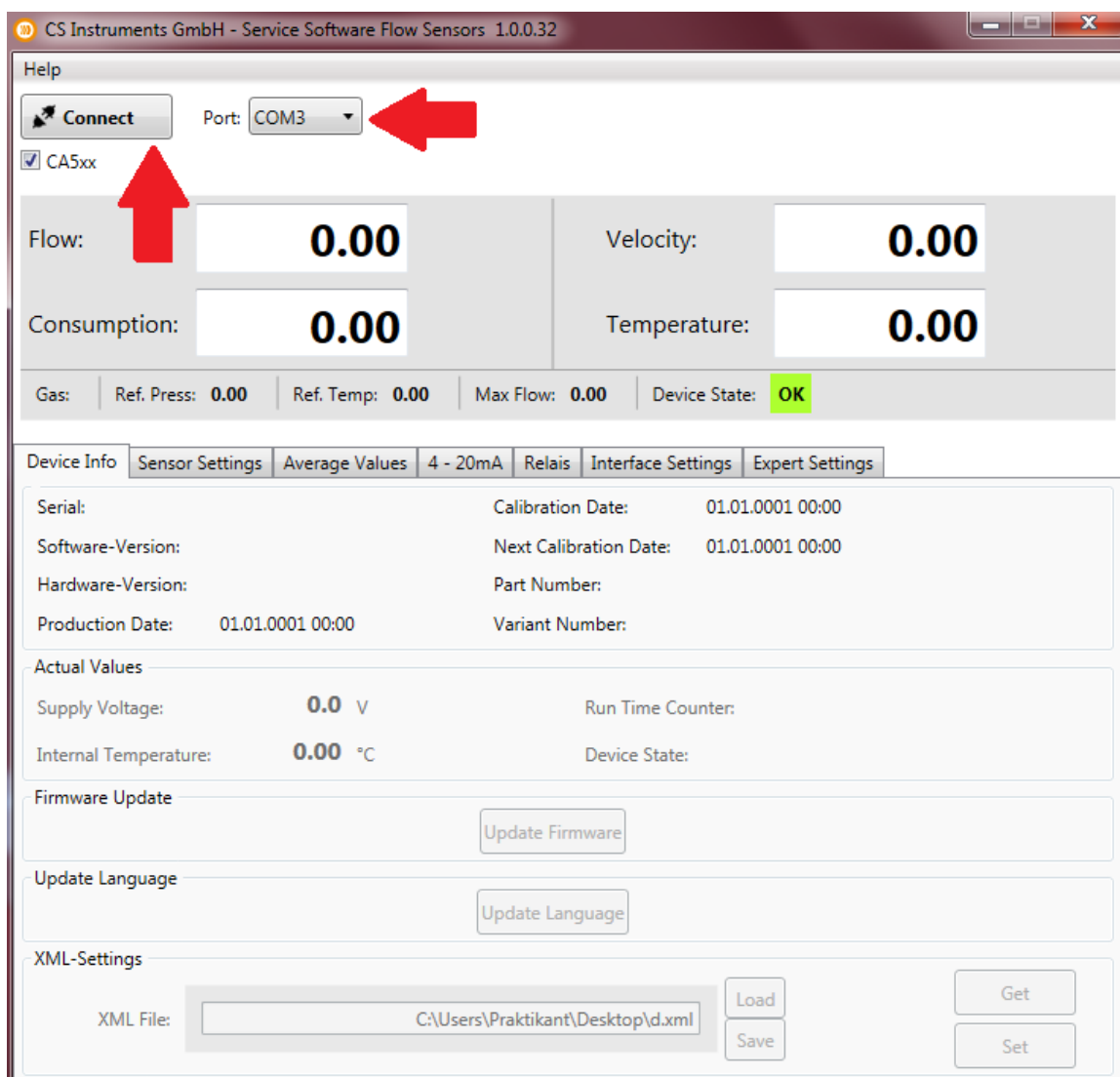
www.cs-instruments.com --> Downloads --> Software --> Firmware Sensoren & Service Software

1.2 Connecting the device to the "CS Service Software Adapter"

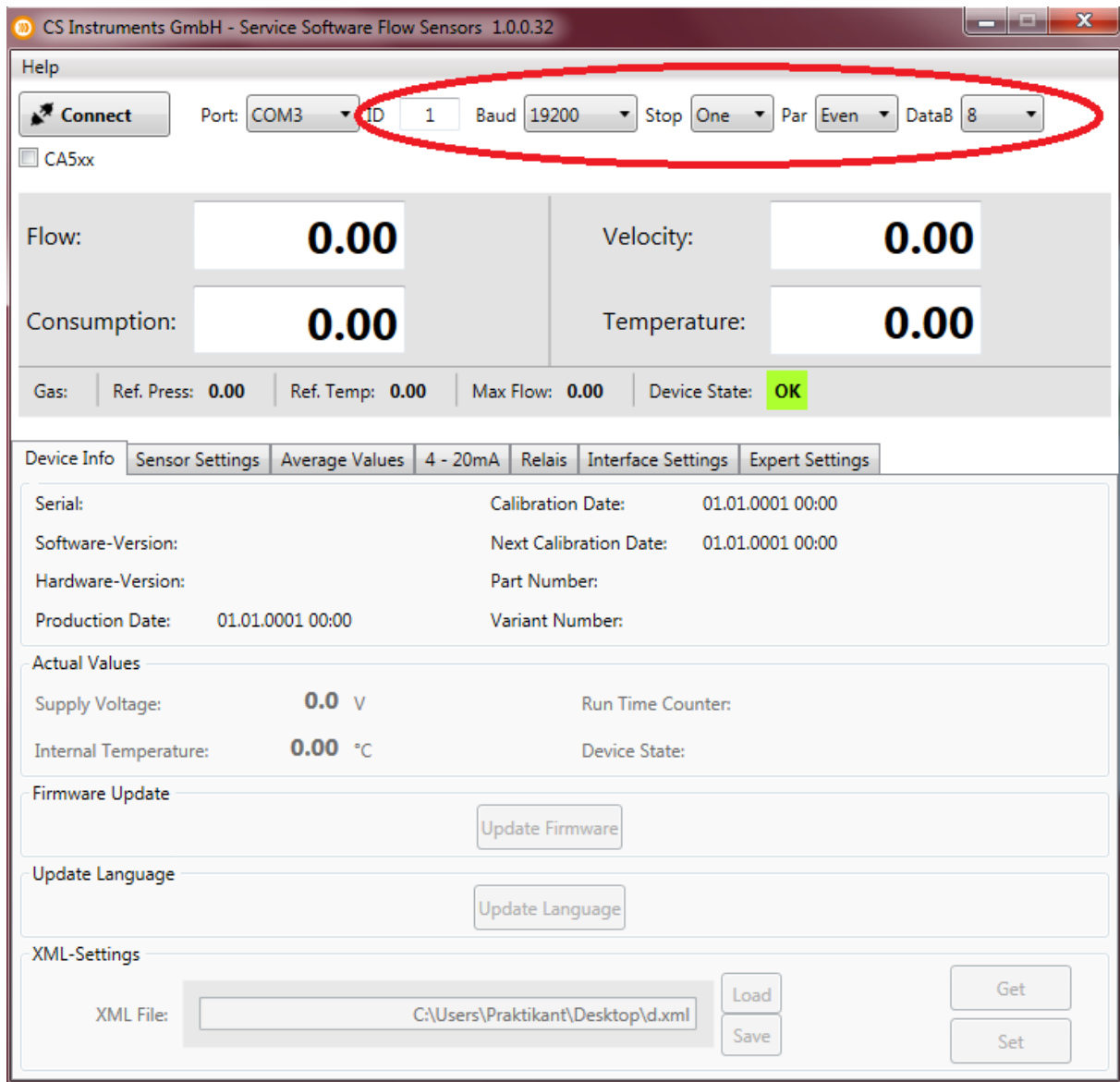
- Please connect the "CS Service Software Adapter" with the power grid.
- Now connect the "CS Service Software Adapter" with plug **A** of the flow meter.
- Connect the "CS Service Software Adapter" with the USB port of your computer.

1.3 Connecting the flow meter to the computer

Please open the latest version of the "CS Instruments GmbH - Service Software Flow Sensors". Be sure, that the control window "CA5xx" is activated. Now choose the "COM-Port" and click "Connect".



1.4 Connecting with Modbus RTU



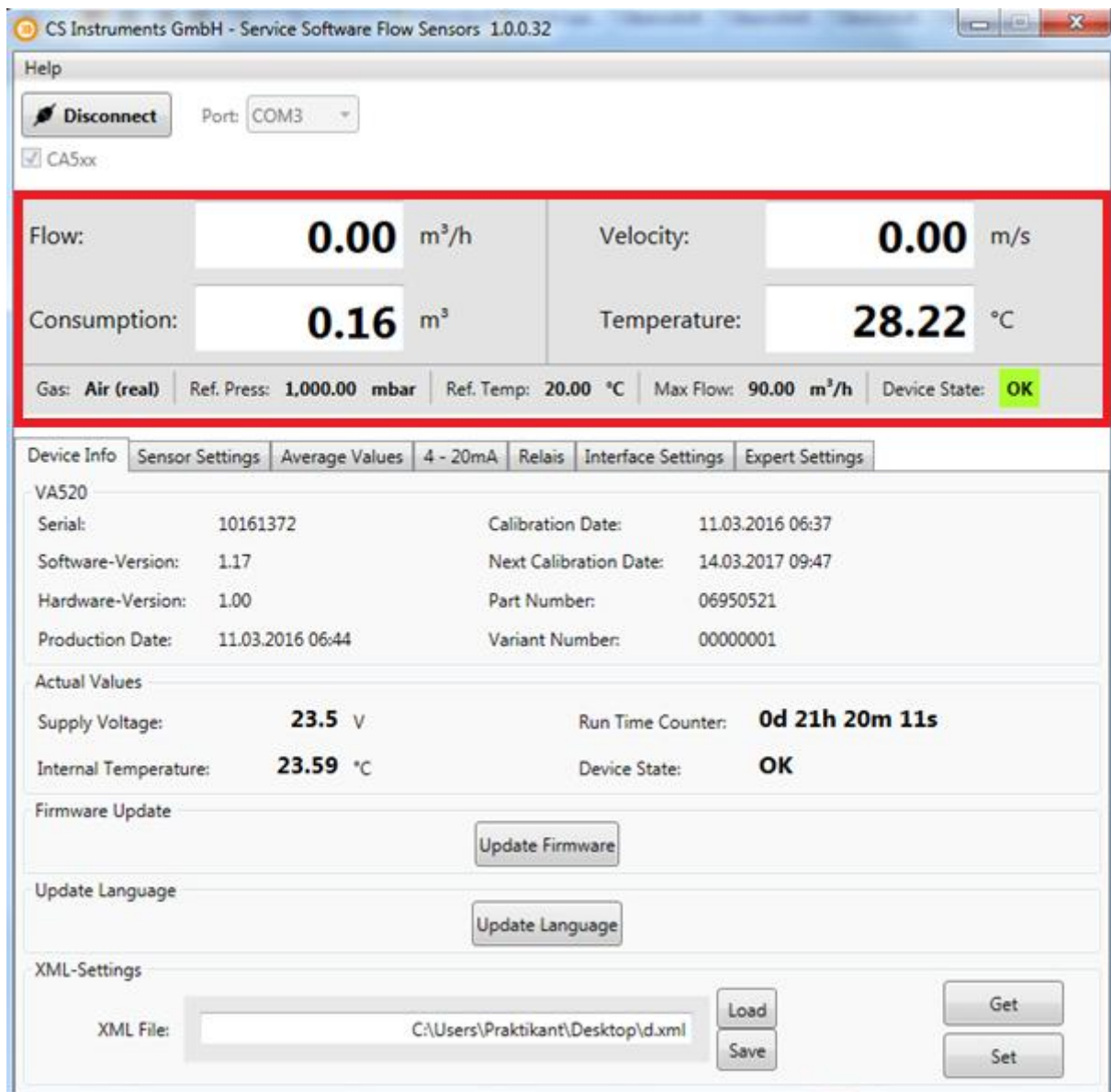
If you don't have the "CS Service Software Adapter", but your own Modbus converter, please deactivate the control window "CA5xx".

Enter the specific values of the flow meter in the red marked area above.

- ID: 1
- Baud: 19200
- Stop: 1
- Parity: even
- Databits: 8

Please have also a look at - 2.6 Interface Settings

2 Description of the software



The upper part of the window shows the current measurements. In this case the calculation of "Flow" and "Velocity" are based on the values "Reference pressure" and "Reference temperature".

- Flow: Current rate of flow volume
- Consumption: The consumption meter adds the whole flow volume since the beginning of the measurement (**Please have also a look at 2.2 Sensor Settings - General - Consumption**)
- Velocity: Current flow velocity
- Temperature: Current gas temperature
- Gas: Current kind of gas (Sensor Settings --> Gas)
- Ref. Press.: Current set reference pressure (Sensor Settings --> Parameter)
- Ref. Temp.: Current set reference temperature (Sensor Settings --> Parameter)

- Max. Flow: The maximum flow rate which is possible with the actual settings of reference pressure, reference temperature and kind of gas.
- Device State: The "Device State" will glow green, if the device is operable. The state will switch from green (OK) to red (ERROR), if the device is not proper connected.



2.1 Device Info

The tab "Device Info" shows different information's about the flow meter.

2.1.1 VA5xx

The menu item VA5xx shows an overview about different specific information's. For example the serial number of the connected flow meter etc.

The screenshot shows the 'Device Info' tab of the service software. The main display area shows the following data:

Flow:	0.00 m ³ /h	Velocity:	0.00 m/s
Consumption:	0.16 m ³	Temperature:	25.91 °C

Below this, a status bar displays: Gas: **Air (real)** | Ref. Press: **1,000.00 mbar** | Ref. Temp: **20.00 °C** | Max Flow: **90.00 m³/h** | Device State: **OK**

The 'Device Info' tab is selected, showing the following details for a VA520 device:

Serial:	10161372	Calibration Date:	11.03.2016 06:37
Software-Version:	1.17	Next Calibration Date:	14.03.2017 09:47
Hardware-Version:	1.00	Part Number:	06950521
Production Date:	11.03.2016 06:44	Variant Number:	00000001

Other sections visible in the interface include:

- Actual Values:** Supply Voltage: **23.5 V**, Run Time Counter: **1d 1h 2m 28s**, Internal Temperature: **32.28 °C**, Device State: **OK**
- Firmware Update:** Update Firmware button
- Update Language:** Update Language button
- XML-Settings:** XML File: C:\Users\Praktikant\Desktop\d.xml, with Load, Save, Get, and Set buttons.

2.1.2 Actual Values

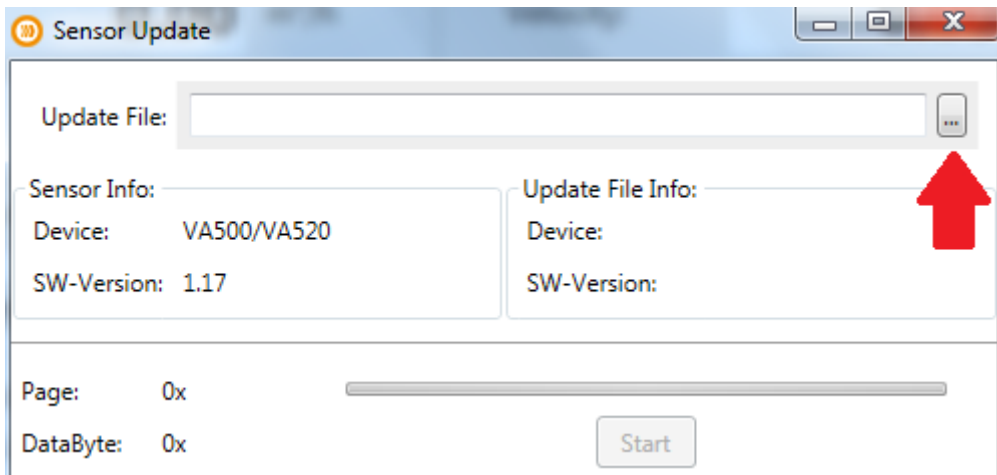
The screenshot shows the 'Service Software Flow Sensors' interface. At the top, there's a 'Help' section with a 'Disconnect' button and a 'Port' dropdown set to 'COM3'. Below that is a 'CA5xx' checkbox. The main display area shows four large numerical values: Flow (0.00 m³/h), Velocity (0.00 m/s), Consumption (0.16 m³), and Temperature (25.91 °C). A status bar at the bottom of this section shows 'Gas: Air (real)', 'Ref. Press: 1,000.00 mbar', 'Ref. Temp: 20.00 °C', 'Max Flow: 90.00 m³/h', and 'Device State: OK'. Below this is a 'Device Info' section with tabs for 'Sensor Settings', 'Average Values', '4 - 20mA', 'Relais', 'Interface Settings', and 'Expert Settings'. The 'Actual Values' section is highlighted with a red border and contains: 'Supply Voltage: 23.5 V', 'Internal Temperature: 32.28 °C', 'Run Time Counter: 1d 1h 2m 28s', and 'Device State: OK'. Below this are sections for 'Firmware Update' (with an 'Update Firmware' button), 'Update Language' (with an 'Update Language' button), and 'XML-Settings' (with an 'XML File' input field containing 'C:\Users\Praktikant\Desktop\d.xml' and buttons for 'Load', 'Save', 'Get', and 'Set').

The section "Actual Values" shows:

- Supply Voltage: The current supply voltage of the connected flow meter
- Internal Temperature: The current internal temperature of the connected flow meter
- Run Time Counter: Shows the total time of operation (Day:Hour:Minute:Second)
- Device State: please have a look at section **2 Description of the Software**

2.1.3 Firmware Update

At this point you can update your device with the latest software version



Please click the red marked button above and choose the right link to the latest software version.

The latest software version is available at our CS-Instruments homepage.

www.cs-instruments.de --> Downloads --> Software --> Firmware sensors & service software

2.1.4 Update Language

You can update your sensor with different language files at "Update Language".

For more information please ask our CS-Service personal.

2.1.5 XML - Settings

With a XML file you can save or restore sensor settings. You can also transfer sensor settings to different sensors.

2.2 Sensor Settings

CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Disconnect Port: COM3

CA5xx

Flow: **0.00** m³/h Velocity: **0.00** m/s

Consumption: **0.16** m³ Temperature: **28.22** °C

Gas: **Air (real)** Ref. Press: **1,000.00** mbar Ref. Temp: **20.00** °C Max Flow: **90.00** m³/h Device State: **OK**

Device Info Sensor Settings Average Values 4 - 20mA Relais Interface Settings Expert Settings

General

Consumption: m³ Set

Sensor Location: Set

Gas

Selected Gas: Set

Units

Flow: Consumption: Temperature: Set

Velocity: Diameter: Pressure: Set

Parameter

Diameter: mm Set RefPressure: mbar Set

RefTemp: °C Set SysPressure: mbar Set

Zero-Point Adjustment

Zero Point: m³/h Set

Low Flow Cut Off: Set

2.2.1 General

- Consumption: At this point you can set your consumption meter on any value you want. The consumption meter can also be reset.
- Sensor Location: Enter up to 15 symbols.
For Example: Location of the sensor, Name of the Sensor.

2.2.2 Gas

At "Selected Gas" you can choose between different preprogrammed gas types.

It is a **real gas calibration**, if there is the addition "(Real)" behind the name of the gas.

The measuring values will be calculated based on the values of air, if there is no addition.

2.2.3 Units

For different measuring values you can choose different units (temperature, flow,...)

The units kW and kWh are only adjustable for the measuring values "Flow" and "Consumption", and only for flammable gases.

2.2.4 Parameter

At the point "Parameter" you can change reference temperature and reference pressure. It is also possible to enter your system pressure.

In case you have an immersion sensor it is possible to enter your pipe diameter at "Diameter".

The diameter don't have to be entered if you have a sensor with integrated measuring section.

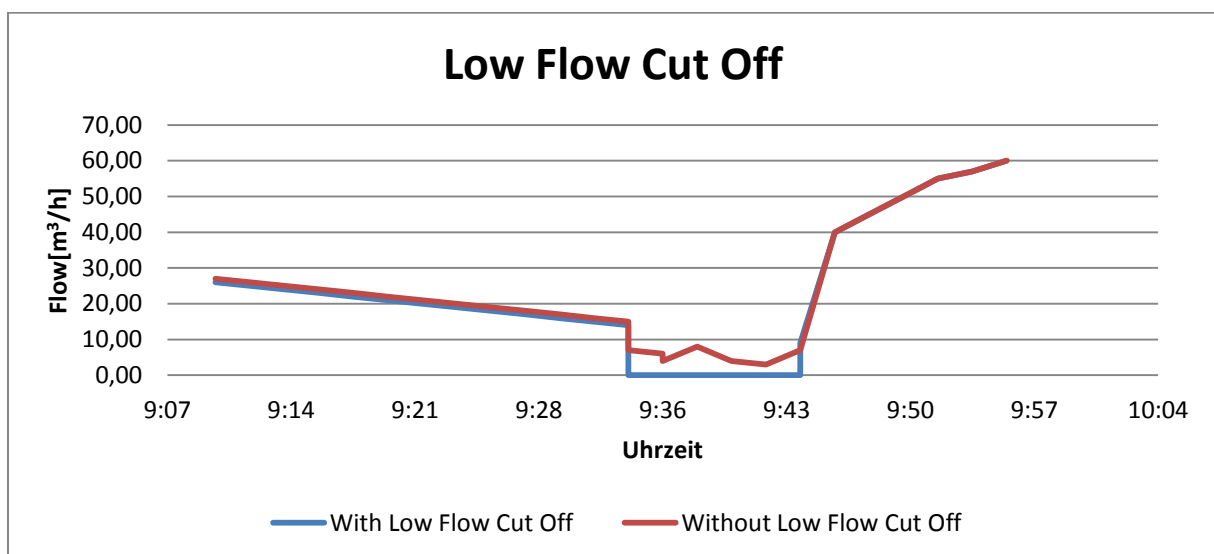
2.2.5 Zero Point Adjustment

It is possible to enter a value that will be used either for **zero point calibration** or **low flow cut off**.

- Your entered value will be used as zero point, if you choose "Zero Point". The sensor will start counting at this point. This adjustment is helpful if there is no flow in the pipe, but the sensor shows some.

For example: Although there is 0,00 m³/h flow in the pipe the flow meter shows 0,08 m³/h. Now you can raise up your zero point to 0,08 m³/h, the flow meter will show now 0,00 m³/h.

- Your entered value will be used as cut off value, if you choose "Low Flow Cut Off". All measuring values below this value won't be shown at the display of the VA5xx. The values below your entered value also won't be calculated to the consumption meter. Even the 4 - 20 mA output will be set to zero (4 mA) and there won't be impulses.



For Example: The flow meter shows about 8 m³/h. The customer set the low flow cut off at 10 m³/h. The display and the impulse outlet now shows zero also the 4-20 mA outlet shows zero (4 mA).

2.3 Average Values

The screenshot displays the 'Average Values' tab of the CS Instruments GmbH Service Software Flow Sensors 1.0.0.32. The interface includes a 'Disconnect' button, a 'Port' dropdown set to 'COM3', and a checked 'CA5xx' checkbox. The main display area shows real-time values: Flow (0.00 m³/h), Velocity (0.00 m/s), Consumption (0.16 m³), and Temperature (24.82 °C). A status bar at the bottom indicates Gas: Air (real), Ref. Press: 1,000.00 mbar, Ref. Temp: 20.00 °C, Max Flow: 90.00 m³/h, and Device State: OK. The 'Average Values' tab is selected, showing an 'Average Time Span' of 60 min. Below this, a table displays 'Min', 'Max', and 'Average' values for Flow, Velocity, Consumption, and Temperature. 'Clear Min/Max' and 'Clear AV' buttons are also present.

	Min	Max	Average	Unit
Flow	0.00	0.00	0.00	m³/h
Velocity	0.00	0.00	0.00	m/s
Consumption			0	m³
Temperature	24.33	28.21	25.41	°C

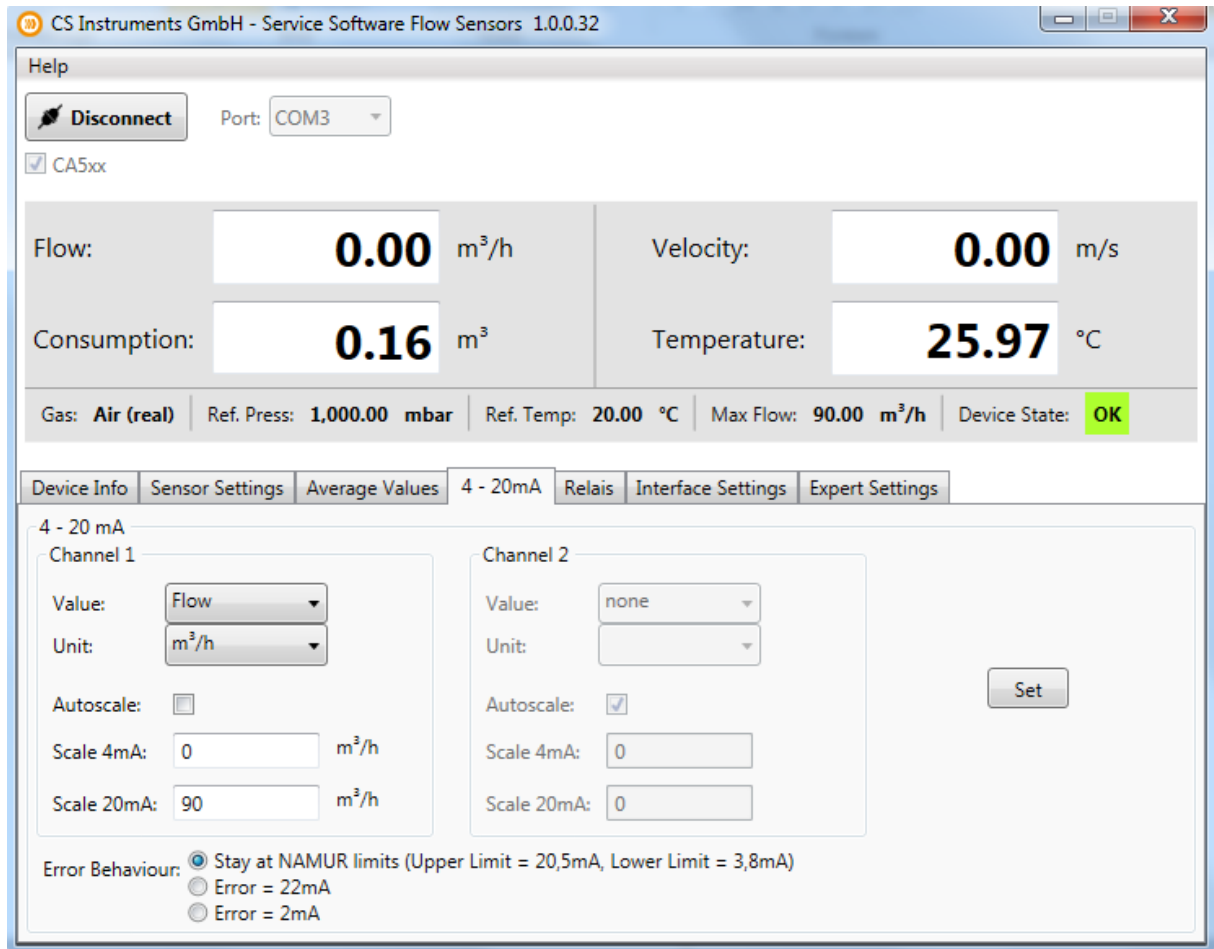
2.3.1 Average Time Span / Clear Min, Max

The average time span can be entered at this tab. (Minimal: 1 minute; Maximum: 1440 minutes)

With the buttons "Clear Min/Max" and "Clear AV" it is possible to reset the minimal/maximal values and the average values (Flow, Velocity, Consumption, Temperature).

2.4 4 - 20 mA

The VA5xx sensor has one (optional 2) 4 - 20 mA analog output(s). The outputs are individual adjustable.



2.4.1 4 - 20 mA analog outputs settings

You can enter your desired measuring outputs at "Value". Please enter also the correct units for your needs at "Unit".

Your upper limit value will be the measuring limit of the value that was set at "Value", if you choose "Autoscale".

Please insert your specific limits at "Scale 4mA/Scale 20mA" if you want to scale manually.

You can also enter adjustments for "Channel 2", if the sensor is equipped with 2 channels.

It is possible to set different scenarios in case of an error at "Error Behaviour".

- Stay at NAMUR limits: Depending on the the measuring value the output will be set 3,8 mA or 20,5 mA.
- Error = 22 mA: The output current will be set to 22 mA.
- Error = 2 mA: The output current will be set to 2 mA.

2.5 Relais

The galvanic isolated output can set as puls- or alarm output.

CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Port: COM3

CA5xx

Flow: **0.00** m³/h Velocity: **0.00** m/s

Consumption: **0.16** m³ Temperature: **25.80** °C

Gas: **Air (real)** Ref. Press: **1,000.00** mbar Ref. Temp: **20.00** °C Max Flow: **90.00** m³/h Device State: **OK**

Device Info Sensor Settings Average Values 4 - 20mA **Relais** Interface Settings Expert Settings

Pulse / Alarm Settings

Mode: none

Pulse

Unit: m³

Value: 1.00 m³

Polarity: pos.

Alarm

Unit: °C

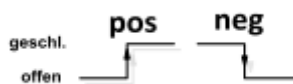
Value: 25.00 °C

Direction: under

Hyst.: 1.00 °C

2.5.1 Pulse settings

Please select "Pulse" with the button "Mode". You can now specify the desired settings for the pulse output. Choose a unit for your pulse output at "Unit". You can change the pulse-value at "Value" and the polarity at "Polarity" (pos. 0-->1; neg. 1-->0)

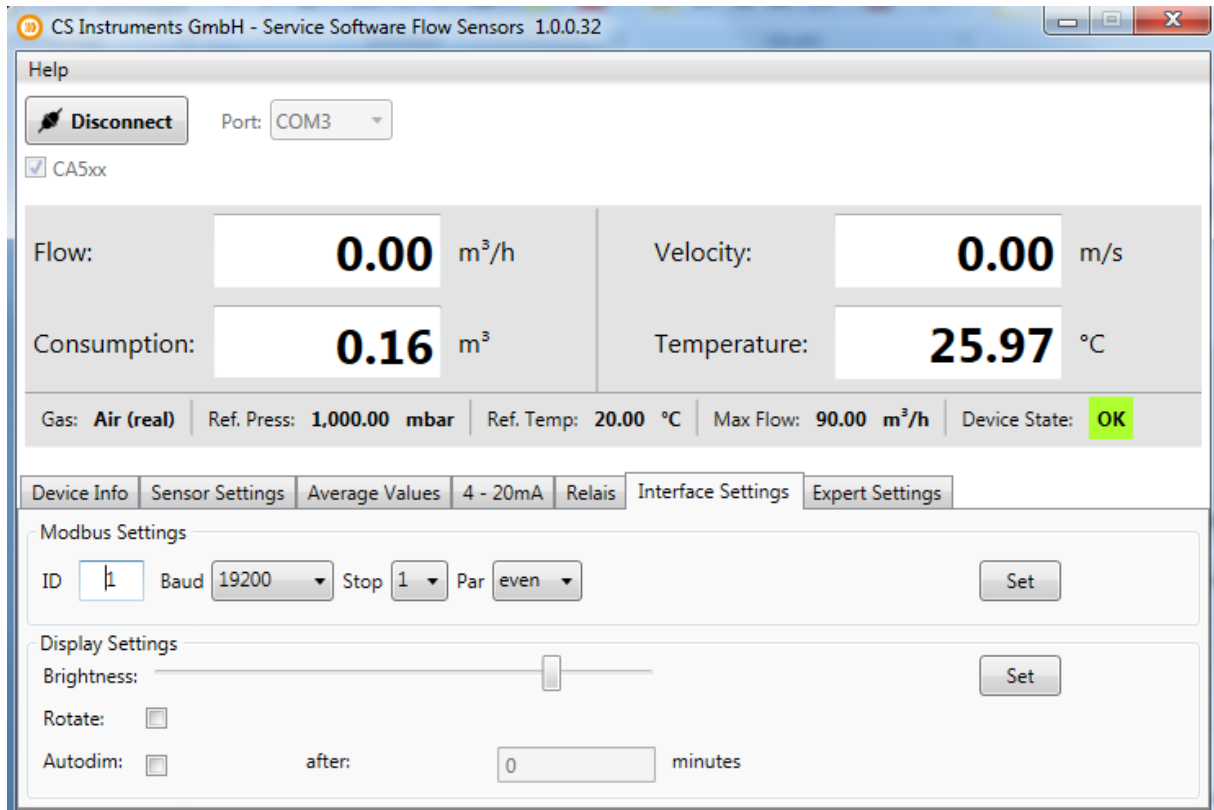


2.5.2 Alarm settings

Please select "Alarm" with the button "Mode". Select now your desired unit for the alarm. Specify the alarm value. With "Direction" you can choose if you want to trigger the alarm whether by passing the entered value or by falling below this value. You can also enter a value for the hysteresis at "Hyst.".

2.6 Interface Settings

The flow meter VA5xx owns a RS485 (Modbus RTU) interface. You have to specify the different interface settings before a communication with your modbus master device and the flow meter is possible.



2.6.1 Modbus Settings

Factory Settings:

- Modbus ID: 1
- Baud: 19200
- Stop: 1
- Par: even
- Data: 8

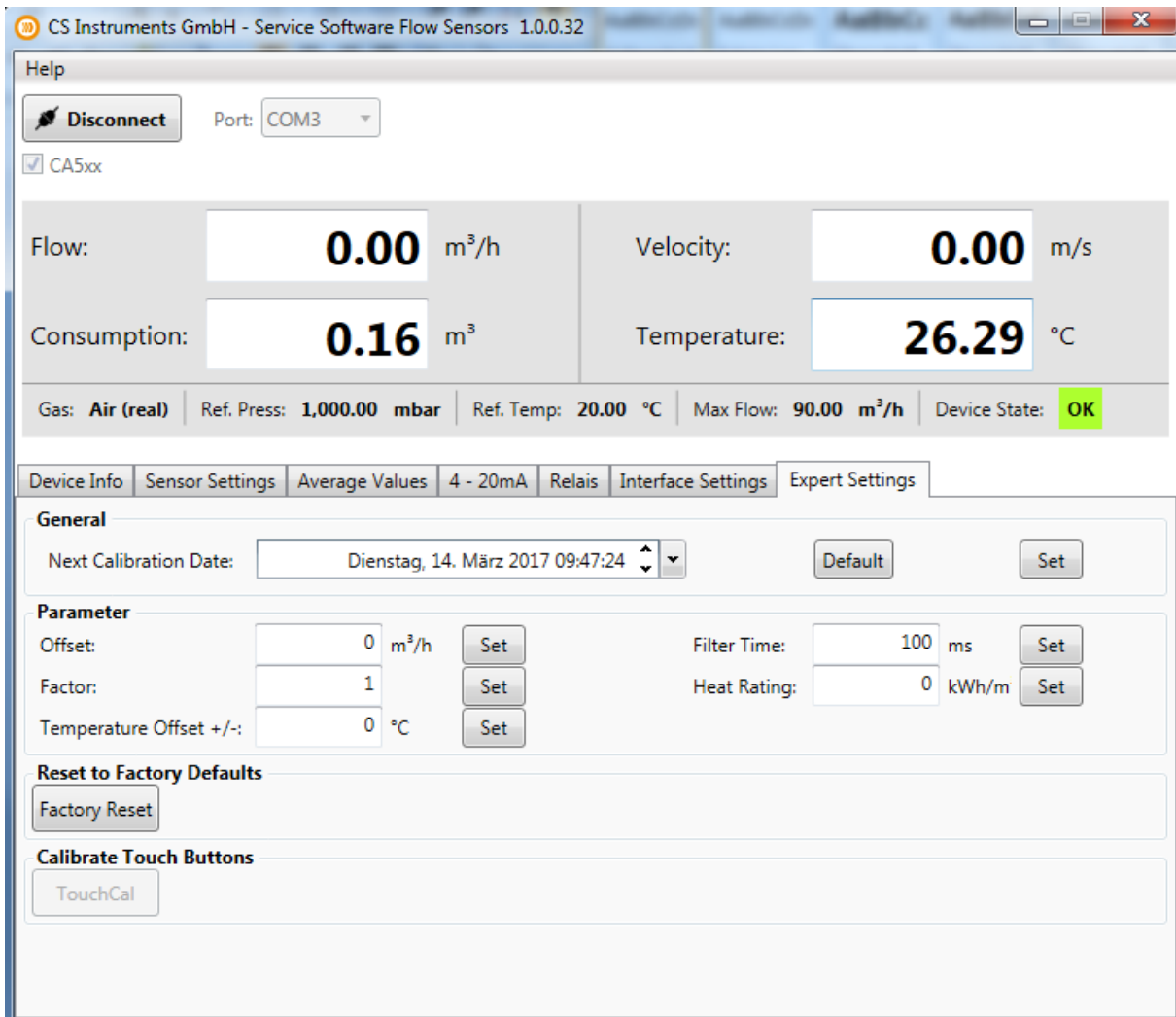
It is necessary to set the correct interface settings for your modbus master device. Sensor and master device settings have to be identically. You can find the interface settings in our **CS Instruments Modbus RTU installation guide "VA5xx_Modbus_RTU_Slave_Installation"**

2.6.2 Display Settings

You can change the display brightness with moving the regulator. Confirm your adjustment with pressing the "Set"-button.

You can also rotate the display by 180 degrees, if you activate the control window "Rotate"

2.7 Expert Settings



CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Port: COM3

CA5xx

Flow: **0.00** m³/h Velocity: **0.00** m/s

Consumption: **0.16** m³ Temperature: **26.29** °C

Gas: Air (real) | Ref. Press: 1,000.00 mbar | Ref. Temp: 20.00 °C | Max Flow: 90.00 m³/h | Device State: **OK**

Device Info | Sensor Settings | Average Values | 4 - 20mA | Relais | Interface Settings | **Expert Settings**

General

Next Calibration Date: Dienstag, 14. März 2017 09:47:24

Parameter

Offset: 0 m³/h Filter Time: 100 ms

Factor: 1 Heat Rating: 0 kWh/m

Temperature Offset +/-: 0 °C

Reset to Factory Defaults

Calibrate Touch Buttons

2.7.1 Calibration settings / Factory settings

You can change the next calibration date at "General"

The different parameters for calibration can be changed at "Parameter"

- Offset: The measuring value will be changed by the entered value
- Factor: The measuring value will be multiplied by the entered value
- Temp. Offset: Correction of temperature
- Filter Time: It is possible to enter a filter time to change the attenuation (0-10000 [ms])
- Heat Rating: Enter a calorific value for flammable gases (0°C; 1013,25 mbar)

To reset the sensor to factory settings please press "Factory Reset".