

Instruțiuni de instalare și utilizare

Soft Service pentru senzori masurare debit

CS Instruments GmbH

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1 Primii pasi

1.1 Instalare CS Service Software

Instalati acum "CS Instruments GmbH - Service Software Flow Sensors".

Descarcati ultima versiune a softului accesand link-ul urmator::

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

1.2 Conectare senzor la "Adaptor CS Service"

- Conectati "Adaptorul CS Service Software" la tensiunea de alimentare.
- Conectati acum "Adaptorul CS Service Software Adapter" la **mufa A** a senzorului pentru debit.
- Conectati "Adaptorul CS Service Software" la portul USB al calculatorului.

1.3 Conectare senzor debit la calculator

Deschideti ultima versiune a "CS Instruments GmbH - Service Software Flow Sensors". Bifati optiunea "CA5xx". Alegeti portul corespunzator "COM-Port" si dati click pe butonul "Connect".

CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Port: COM3

CA5xx

Flow:	0.00	Velocity:	0.00
Consumption:	0.00	Temperature:	0.00

Gas: | Ref. Press: **0.00** | Ref. Temp: **0.00** | Max Flow: **0.00** | Device State: **OK**

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

Serial: | Calibration Date: 01.01.0001 00:00
Software-Version: | Next Calibration Date: 01.01.0001 00:00
Hardware-Version: | Part Number:
Production Date: 01.01.0001 00:00 | Variant Number:

Actual Values

Supply Voltage:	0.0 V	Run Time Counter:
Internal Temperature:	0.00 °C	Device State:

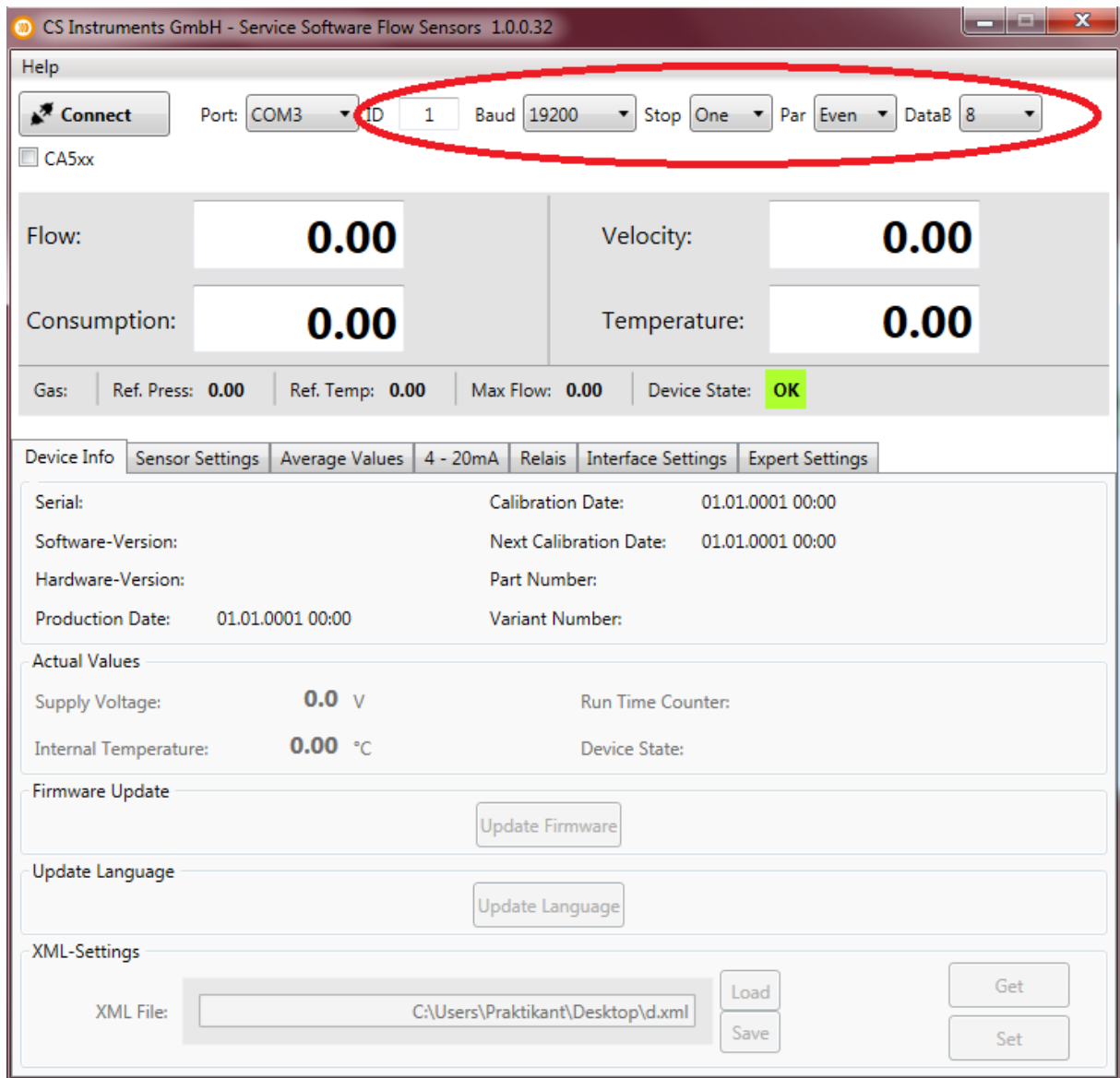
Firmware Update

Update Language

XML-Settings

XML File:

1.4 Conectare senzor cu Modbus RTU



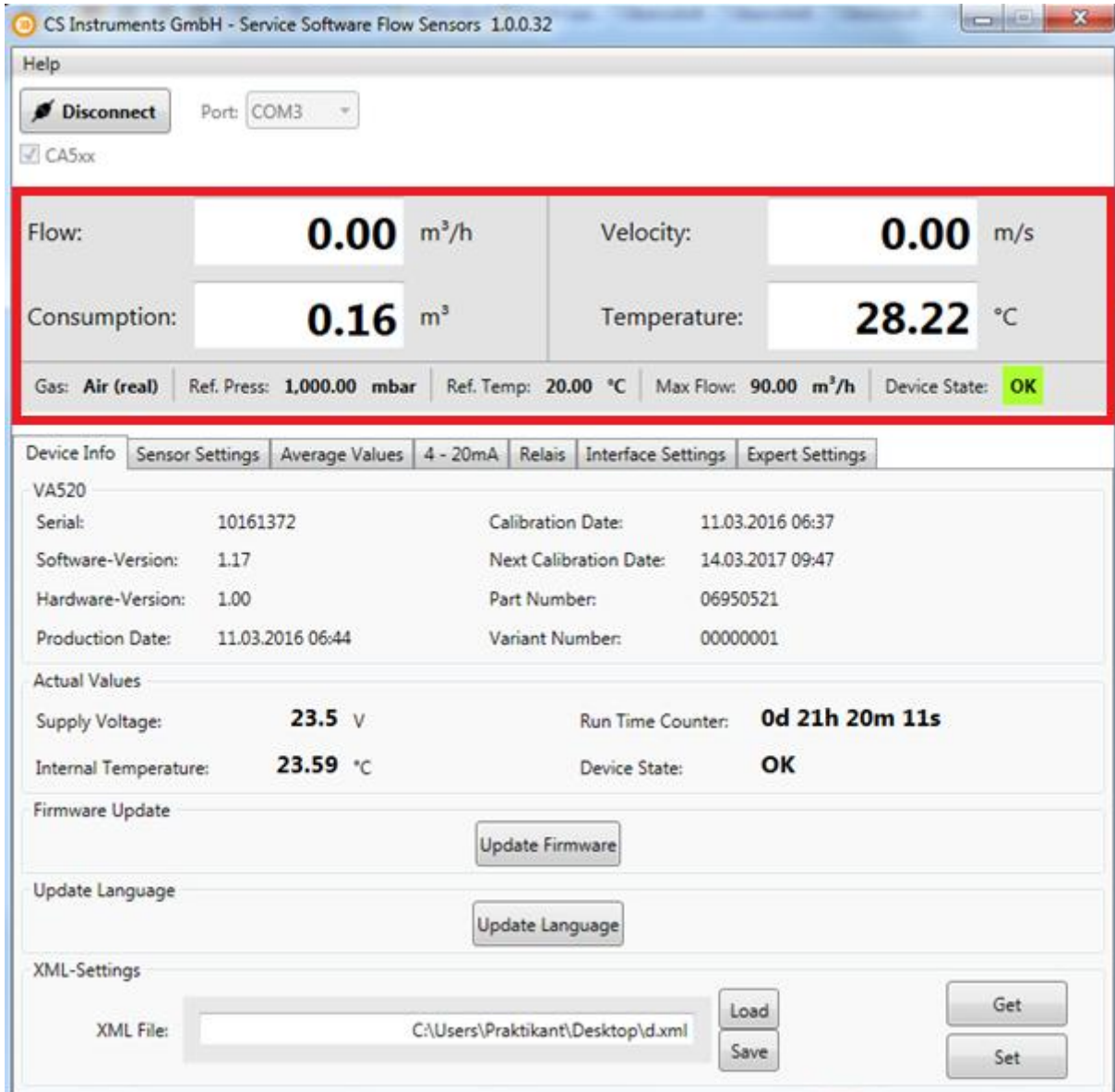
Dezactivati optiunea "CA5xx", daca nu aveti "Adaptorul CS Service Software" si folositi un dispozitiv Modbus propriu.

Introduceti parametrii specifici ai dispozitivului in campurile de mai sus (cele marcate cu rosu).

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

Vedeti si capitolul: 2.6 Setari interfata.

2 Descriere soft



CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Port: COM3

CA5xx

Flow:	0.00 m ³ /h	Velocity:	0.00 m/s
Consumption:	0.16 m ³	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

VA520

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

Actual Values

Supply Voltage:	23.5 V	Run Time Counter:	0d 21h 20m 11s
Internal Temperature:	23.59 °C	Device State:	OK

Firmware Update

Update Language

XML-Settings

XML File:

Partea de sus a ferestrei arata valorile masurate actuale. In acest caz, calcularea valorilor "Debit" si "Viteza" ("Flow" and "Velocity") se face pe baza valorilor introduse in campurile "Reference pressure" si "Reference temperature".

- Flow: Valoarea curenta a debitului.
- Consumption: Contorul de debit adauga tot volumul masurat de la inceputul procedurii de masurare (**Vedeti si capitolul: 2.2 Sensor Settings - General - Consumption**).
- Velocity: Valoarea curenta a vitezei.
- Temperature: Valoarea curenta a temperaturii gazului.

- Gas: Tipul de gaz (Sensor Settings --> Gas).
- Ref. Press.: Valoarea de referinta a presiunii (Sensor Settings --> Parameter).
- Ref. Temp.: Valoarea de referinta a temperaturii (Sensor Settings --> Parameter).
- Max. Flow: Debitul maxim care este posibil de masurat cu setarile actuale ale presiunii de referinta, temperaturii de referinta si ale tipului de gaz.
- Device State: Campul "Device State" va deveni verde (OK), daca dispozitivul este functionabil. Starea va trece din verde (OK) in rosu (EROARE), daca dispozitivul nu este conectat corect.

Device State: **Error** Device State: **OK**

2.1 Informatii senzor (Device Info)

Meniul "**Device Info**" arata toate informatiile disponibile despre senzorul conectat.

2.1.1 VA5xx

Meniul "**VA5xx**" arata toate informatiile disponibile despre senzorul de debit conectat. De exemplu: seria senzorului pentru debit conectat, data fabricatiei, etc.

CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32

Help

Disconnect Port: COM3

CA5xx

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

VA520

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

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

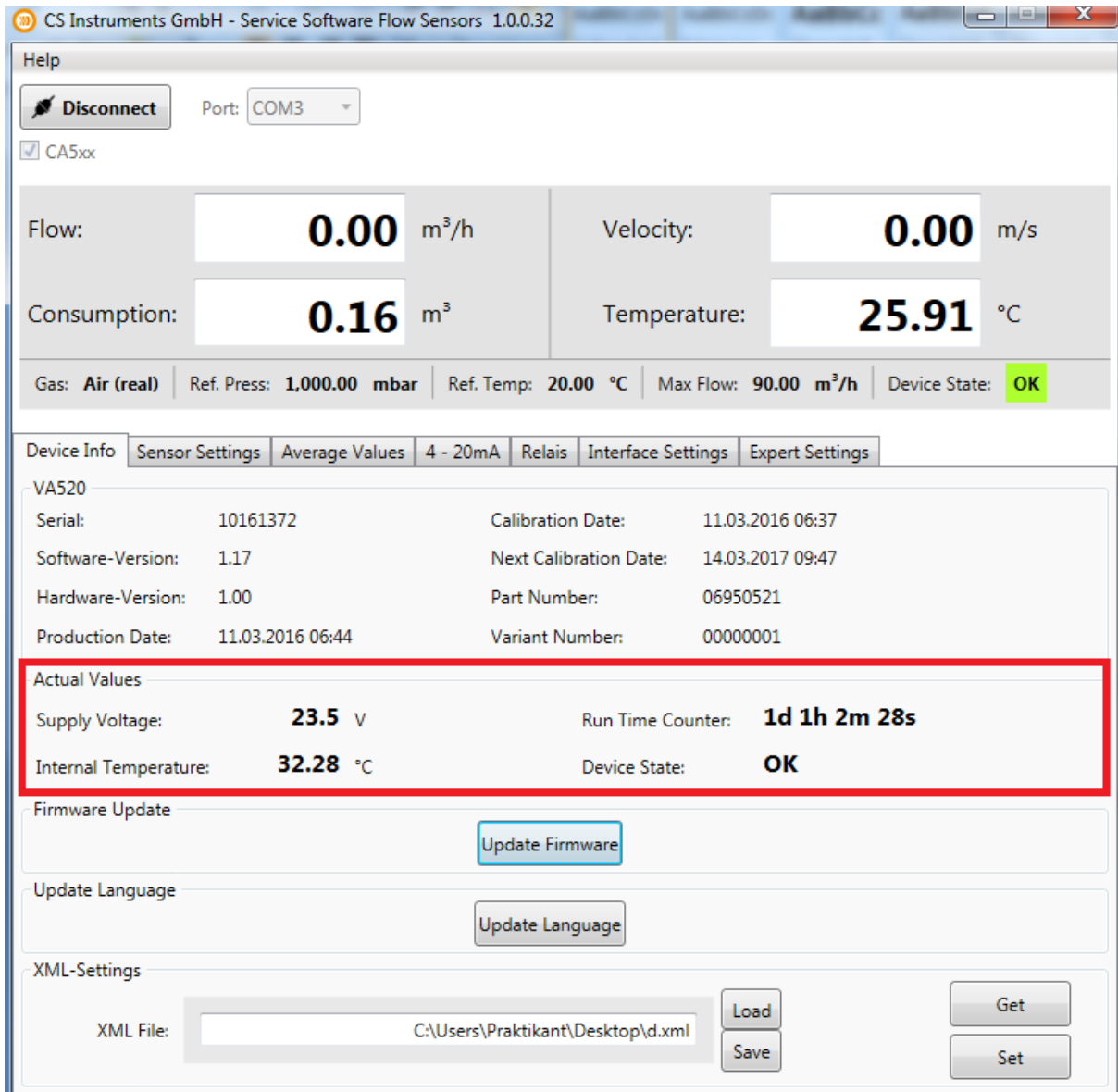
Update Language

Update Language

XML-Settings

XML File: **Load** **Save** **Get** **Set**

2.1.2 Valori actuale (Actual Values)



The screenshot displays the 'Actual Values' section of the CS Instruments Service Software Flow Sensors 1.0.0.32 interface. The 'Actual Values' section is highlighted with a red border and contains the following data:

Actual Values	
Supply Voltage:	23.5 V
Run Time Counter:	1d 1h 2m 28s
Internal Temperature:	32.28 °C
Device State:	OK

Other visible data in the interface includes:

- Flow: **0.00** m³/h
- Velocity: **0.00** m/s
- Consumption: **0.16** m³
- Temperature: **25.91** °C
- 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' section shows details for the VA520 sensor, including 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), and Variant Number (00000001).

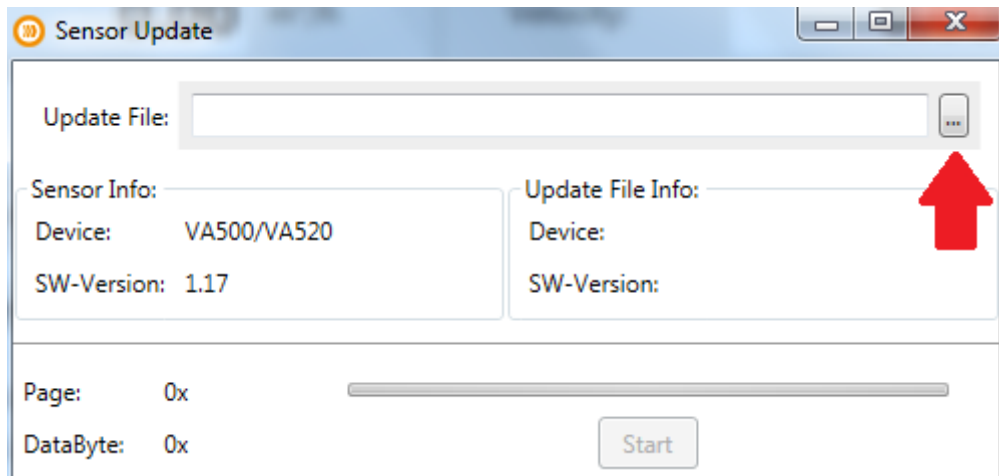
Additional options include Firmware Update (Update Firmware), Update Language (Update Language), and XML-Settings (XML File: C:\Users\Praktikant\Desktop\d.xml, Load, Save, Get, Set).

In meniul "Actual Values" sunt afisate urmatoarele valori:

- Supply Voltage: Valoarea curenta a tensiunii de alimentare a senzorului conectat.
- Internal Temperature: Valoarea curenta a temperaturii interne a senzorului conectat.
- Run Time Counter: Afiseaza timpul total de functionare Zi:Ora:Minut:Secunda (Day:Hour:Minute:Second)
- Device State: Vedeti capitolul: **2 Descriere soft.**

2.1.3 Actualizare firmware (Firmware Update)

In acest meniu puteti actualiza softul senzorului (firmware) cu ultima versiune disponibila.



Dati click pe butonul marcat cu rosu si alegeti link-ul corespunzator ultimei versiuni de soft.

Ultima versiune de soft este disponibila pe pagina de internet a firmei CS Instruments.

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

2.1.4 Actualizare limba (Update Language)

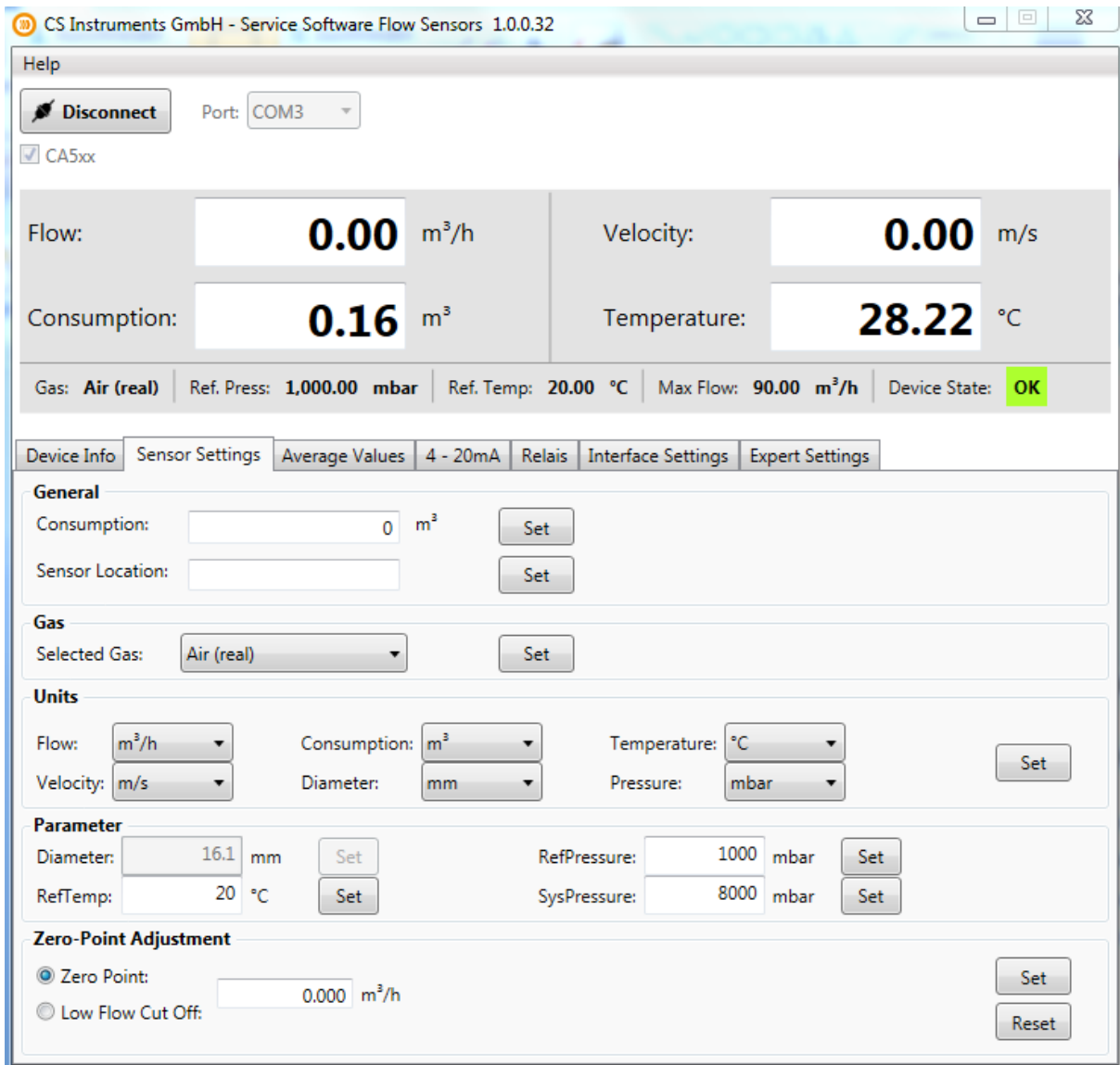
In meniul "Update Language" puteti actualiza diferite limbi utilizate de senzorul conectat.

Pentru mai multe informatii contactati distribuitorul local al firmei CS Instruments GmbH.

2.1.5 Setari XML (XML - Settings)

Fisierul XML va permite sa salvati sau sa restaurati setarile senzorului. Puteti transfera setarile efectuate pentru un senzor, la alti senzori diferiti.

2.2 Setari senzori (Sensor Settings)



The screenshot shows the 'Sensor Settings' tab in the CS Instruments Service Software. The interface displays real-time sensor data and configuration options.

Real-time Data:

- Flow: 0.00 m³/h
- Velocity: 0.00 m/s
- Consumption: 0.16 m³
- Temperature: 28.22 °C

Status Bar:

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

Configuration Sections:

- General:** Consumption (0 m³), Sensor Location (empty).
- Gas:** Selected Gas: Air (real).
- Units:** Flow (m³/h), Consumption (m³), Temperature (°C), Velocity (m/s), Diameter (mm), Pressure (mbar).
- Parameter:** Diameter (16.1 mm), RefTemp (20 °C), RefPressure (1000 mbar), SysPressure (8000 mbar).
- Zero-Point Adjustment:** Zero Point (0.000 m³/h), Low Flow Cut Off (empty).

2.2.1 Parametri generali (General)

- Consumption: Puteti alege unitatea de masura pentru consum si puteti reseta contorul.
- Sensor Location: Introduceti un nume format din maxim 15 simboluri.
De exemplu: Locatia senzorului sau numele senzorului.

2.2.2 Gaz (Gas)

In meniul "Selected Gas" puteti alege intre diferitele tipuri de gaz pre-programate.

Daca in dreptul numelui de gaz apare textul "(Real)", se poate efectua **calibrare cu gaz real**.

Valorile masurate vor fi calculate pe baza parametrilor aerului, daca nu se specifica altceva.

2.2.3 Unitati de masura (Units)

Puteti alege unitatea de masura pentru diferiti parametri masurati (temperatura, debit, etc.).

Unitatile de masura kW si kWh sunt disponibile numai pentru parametrii "Flow" si "Consumption" si numai pentru gaze combustibile.

2.2.4 Parametri de referinta (Parameter)

In zona "Parameter" puteti modifica presiunea si temperatura de referinta. Puteti introduce si valoarea presiunii sistemului.

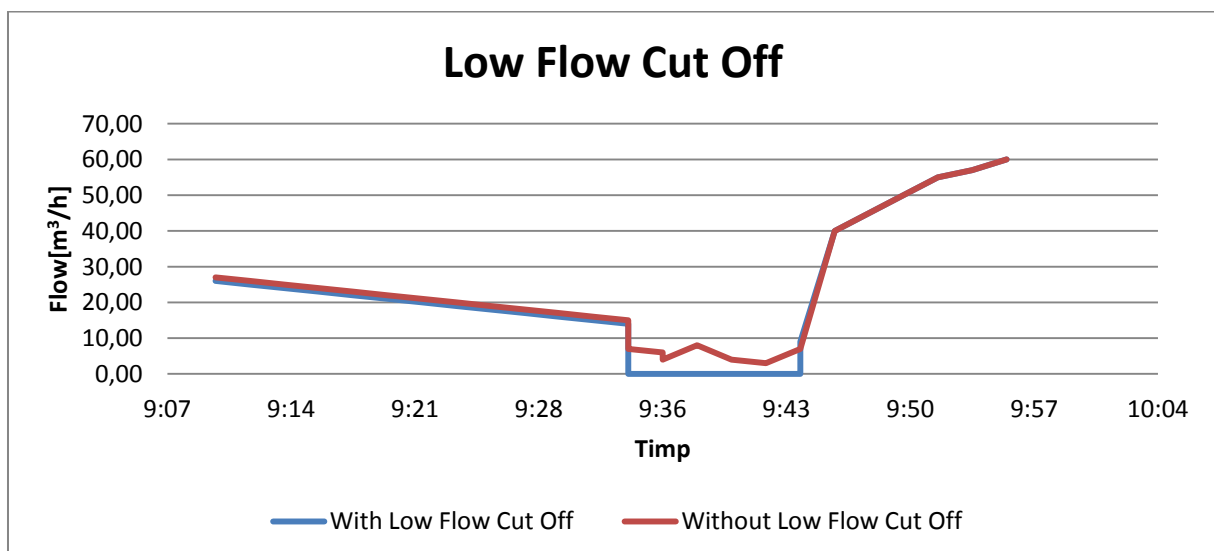
In cazul in care aveti un senzor cu imersie puteti introduce diametrul sectiunii in campul "Diameter".

Nu introduceti diametrul daca aveti un senzor cu sectiune de masurare integrata.

2.2.5 Setare punct de zero (Zero Point Adjustment)

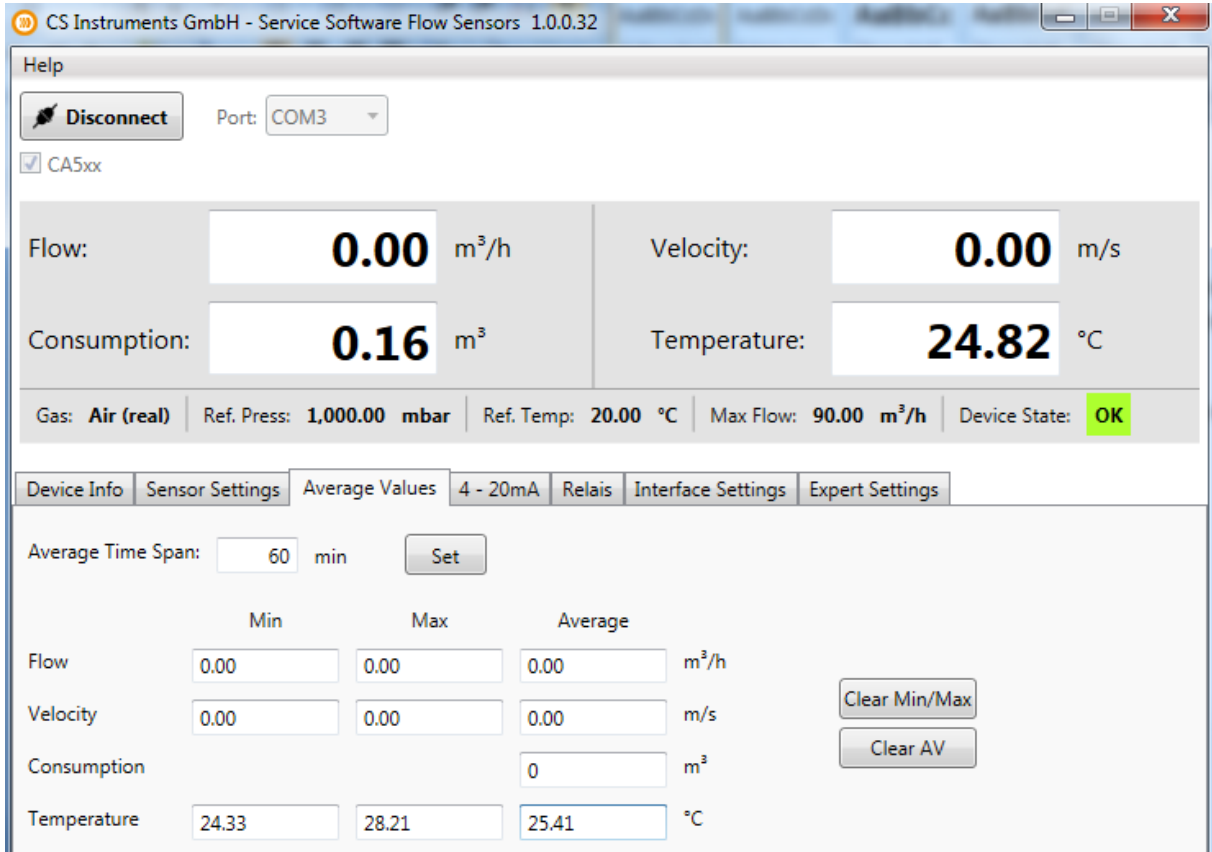
Puteti introduce o valoare care va fi utilizata pentru **calibrare punct de zero** sau **valoare cut off**.

- Daca bifati optiunea "Zero Point", valoarea introdusa va fi utilizata pentru setarea punctului de zero. Senzorul va porni contorizarea de la aceasta valoare. Aceasta setare este utila in cazul in care nu exista flux prin conducta dar senzorul arata o anumita valoare.
De exemplu: Desi nu exista flux prin conducta ($0,00 \text{ m}^3/\text{h}$) senzorul pentru debit arata valoarea $0,08 \text{ m}^3/\text{h}$, diferita de zero. Puteti modifica valoarea punctului de zero la $0,08 \text{ m}^3/\text{h}$, astfel incat contorul sa arate valoarea $0,00 \text{ m}^3/\text{h}$.
- Daca bifati optiunea "Low Flow Cut Off", valoarea introdusa va fi utilizata ca valoare cut off. Toate valorile masurate care sunt sub aceasta valoare nu vor fi afisate pe ecranul senzorului VA5xx. Toate valorile care se afla sub pragul introdus nu vor fi luate in calcul la consumul total. In acest caz, iesirea semnalului analogic 4 - 20 mA va reprezenta valoarea zero (4 mA) si nu vor fi generate impulsuri.



De exemplu: Senzorul arata un debit de cca. 8 m³/h. Daca setati valoarea de cut off la 10 m³/h, pe ecran se va afisa valoarea zero, iar iesirea analogica 4-20 mA va arata valoarea zero (4 mA).

2.3 Valori medii (Average Values)



The screenshot shows the 'Average Values' tab in the software. At the top, there is a 'Disconnect' button and a 'Port' dropdown set to 'COM3'. Below that is a checked checkbox for 'CA5xx'. 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' section includes an 'Average Time Span' set to 60 min with a 'Set' button. Below this is a table for setting minimum, maximum, and average values for various parameters:

	Min	Max	Average	Unit
Flow	0.00	0.00	0.00	m ³ /h
Velocity	0.00	0.00	0.00	m/s
Consumption			0	m ³
Temperature	24.33	28.21	25.41	°C

Buttons for 'Clear Min/Max' and 'Clear AV' are located to the right of the table.

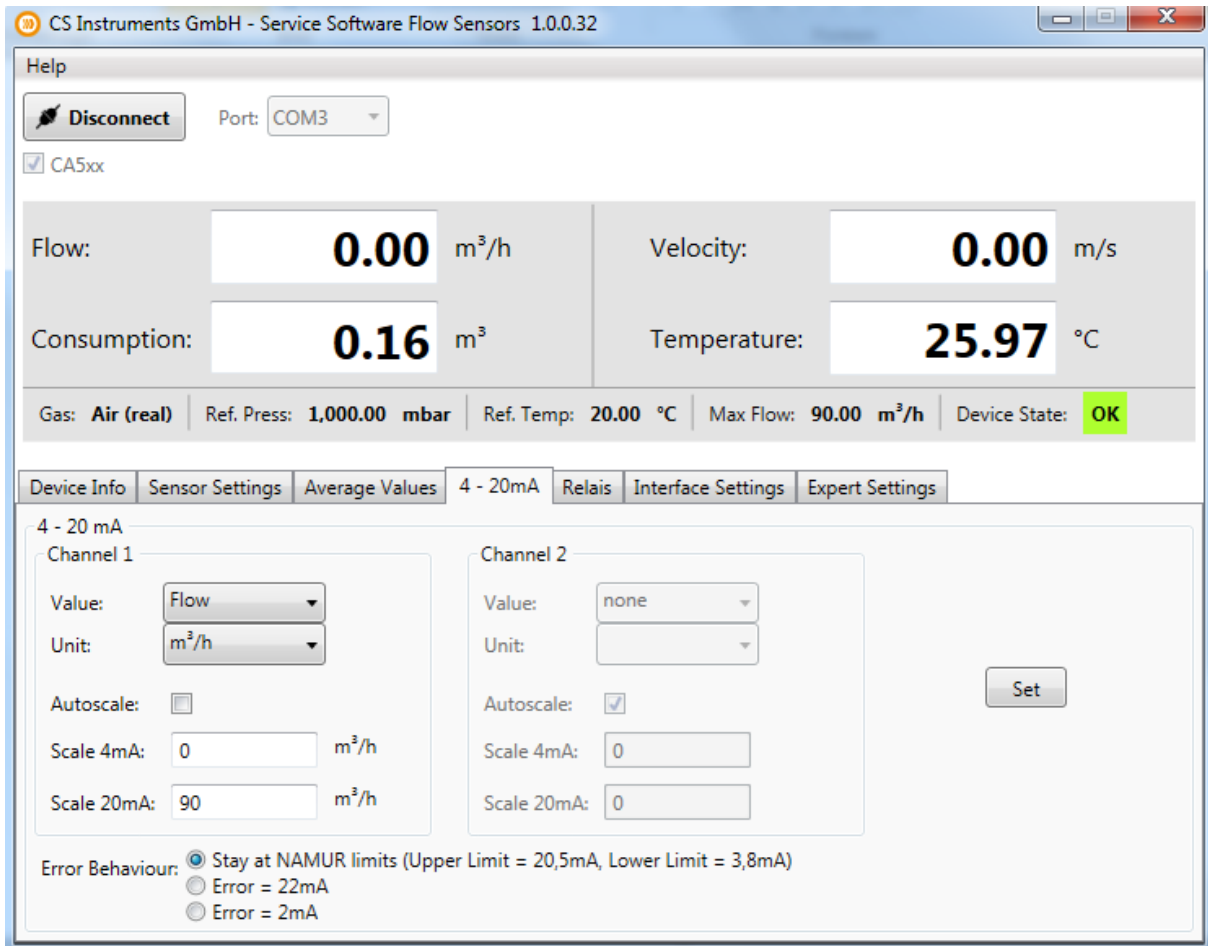
2.3.1 Timp mediere / Stergere Min, Max (Average Time Span / Clear Min, Max)

Introduceti in campul "Average Time Span" timpul in care se va face medierea (Min: 1 minut; Max: 1440 minute).

Utilizati butoanele "Clear Min/Max" si "Clear AV" pentru resetarea valorilor minime/maxime si ale valorilor medii pentru debit, viteza, consum si temperatura (Flow, Velocity, Consumption, Temperature).

2.4 Iesire analogica 4 - 20 mA (4 - 20 mA)

In configuratie standard, senzorul VA5xx are o iesire analogica 4 - 20 mA (optional poate avea 2 iesiri analogice). Iesirile sunt reglabile individual.



The screenshot displays the 'Service Software Flow Sensors 1.0.0.32' interface. At the top, there is a 'Help' section with a 'Disconnect' button and a 'Port' dropdown set to 'COM3'. Below this, a checkbox for 'CA5xx' is checked. The main display area shows real-time data: Flow (0.00 m³/h), Velocity (0.00 m/s), Consumption (0.16 m³), and Temperature (25.97 °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 '4 - 20mA' tab is selected, showing settings for Channel 1 and Channel 2. Channel 1 is configured for 'Flow' with a unit of 'm³/h', and its 'Autoscale' checkbox is unchecked. Channel 2 is currently set to 'none'. Both channels have 'Scale 4mA' and 'Scale 20mA' fields set to 0. The 'Error Behaviour' section has three radio button options: 'Stay at NAMUR limits (Upper Limit = 20,5mA, Lower Limit = 3,8mA)' (selected), 'Error = 22mA', and 'Error = 2mA'. A 'Set' button is located to the right of the channel settings.

2.4.1 Setari iesire analogica 4 - 20 mA (4 - 20 mA analog outputs settings)

In campul "Value" puteti introduce valorile dorite pentru iesirea analogica. In campul "Unit", introduceti unitatile de masura corespunzatoare.

Daca ati bifat optiunea "Autoscale", limita superioara reprezinta valoarea care a fost setata in campul "Value".

In meniul "4 - 20mA Value", puteti introduce domeniul dorit pentru iesirea analogica.

Introduceti manual valorile limita ale scalei in campurile "Scale 4mA/Scale 20mA".

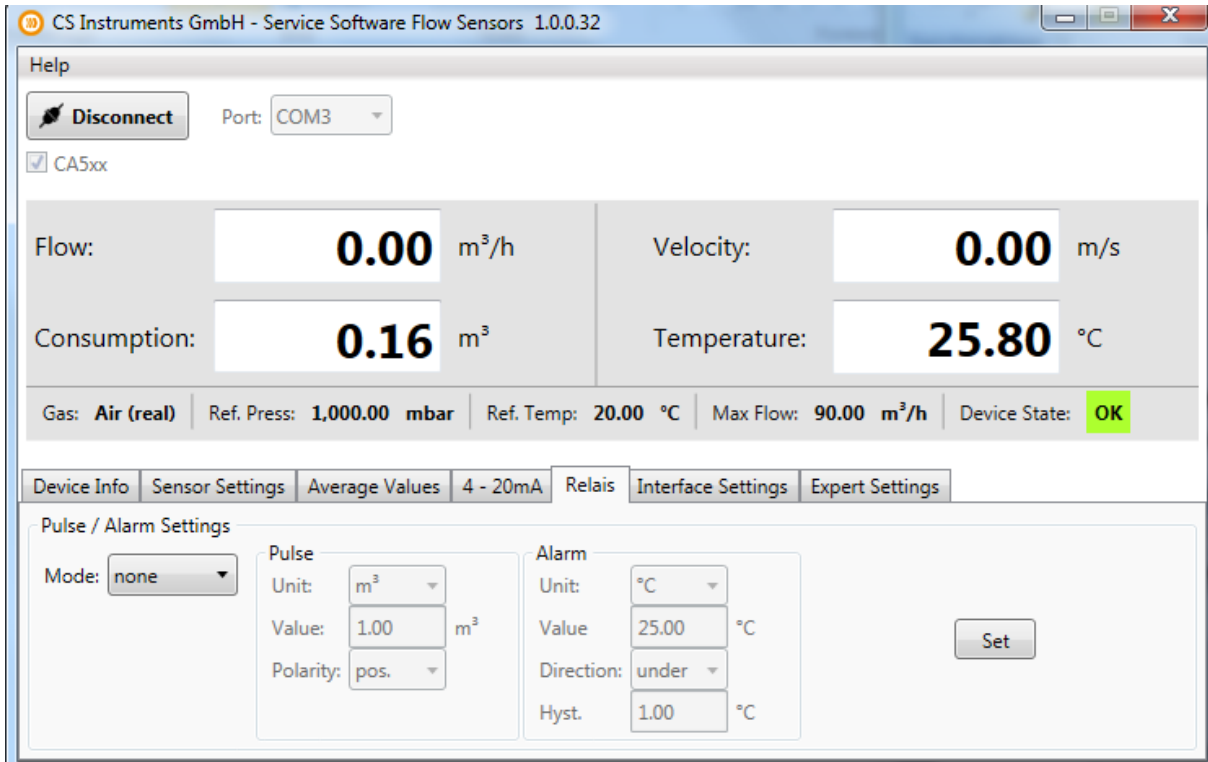
In campul "Channel 2", introduceti setarile pentru canalul suplimentar daca senzorul este echipat cu 2 canale.

In campul "Error Behaviour" puteti bifa una din urmatoarele variante:

- Limite NAMUR: In functie de valoarea masurata, curentul de iesire va fi setat la 3,8 mA sau 20,5 mA.
- Error = 22 mA: Curentul de iesire va fi setat la 22 mA.
- Error = 3,6 mA: Curentul de iesire va fi setat la 3,6 mA.

2.5 Relee (Relais)

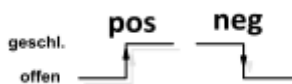
Iesirea izolata galvanic poate fi setata ca iesire in impuls sau iesire de alarma.



The screenshot shows the 'Pulse / Alarm Settings' tab in the software. The 'Mode' is set to 'none'. The 'Pulse' section has 'Unit' set to m³, 'Value' set to 1.00 m³, and 'Polarity' set to 'pos.'. The 'Alarm' section has 'Unit' set to °C, 'Value' set to 25.00 °C, 'Direction' set to 'under', and 'Hyst.' set to 1.00 °C. A 'Set' button is visible to the right of the alarm settings.

2.5.1 Setari impuls (Pulse settings)

Alegeti optiunea "Pulse" in campul "Mode". Setati parametrii doriti pentru iesirea in impuls. Alegeti o unitate de masura in campul "Unit". In campul "Value" puteti modifica valoarea unui impuls, iar in campul "Polarity" puteti alege frontul activ al impulsului (pos. 0-->1; neg. 1-->0).

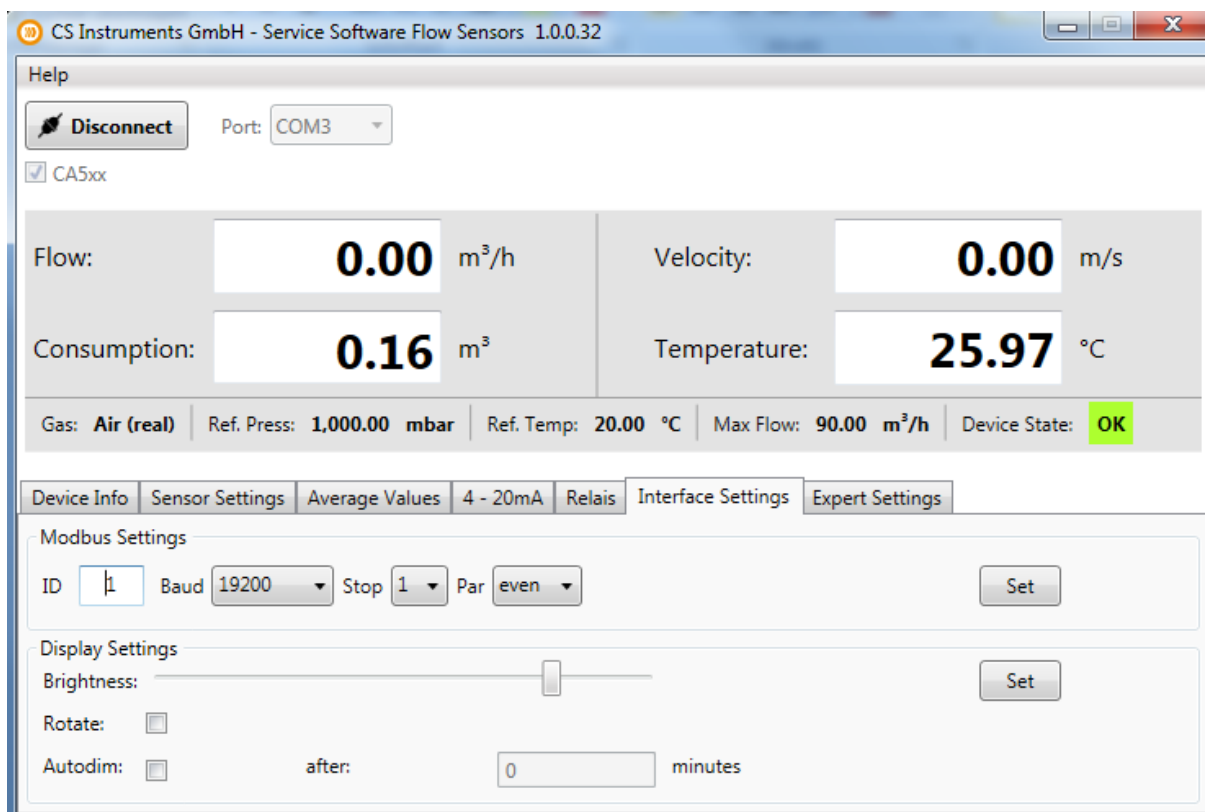


2.5.2 Setari alarma (Alarm settings)

Alegeti optiunea "Alarm" in campul "Mode". Setati parametrii doriti pentru iesirea de alarma. Alegeti parametrul vizat pentru alarmare. Specificati valoarea pragului de alarmare. In campul "Direction" puteti alege modul de declansare a alarmei, specificand frontul crescator sau frontul descrescator. In campul "Hyst." puteti introduce valoarea histerezisului.

2.6 Setari interfata (Interface Settings)

Senzorii VA5xx au o interfata RS485 (Modbus RTU). Inainte de a comunica cu dispozitivul master, trebuie sa setati parametrii interfetei.



2.6.1 Setari Modbus (Modbus Settings)

Setari implicite (din fabrica):

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

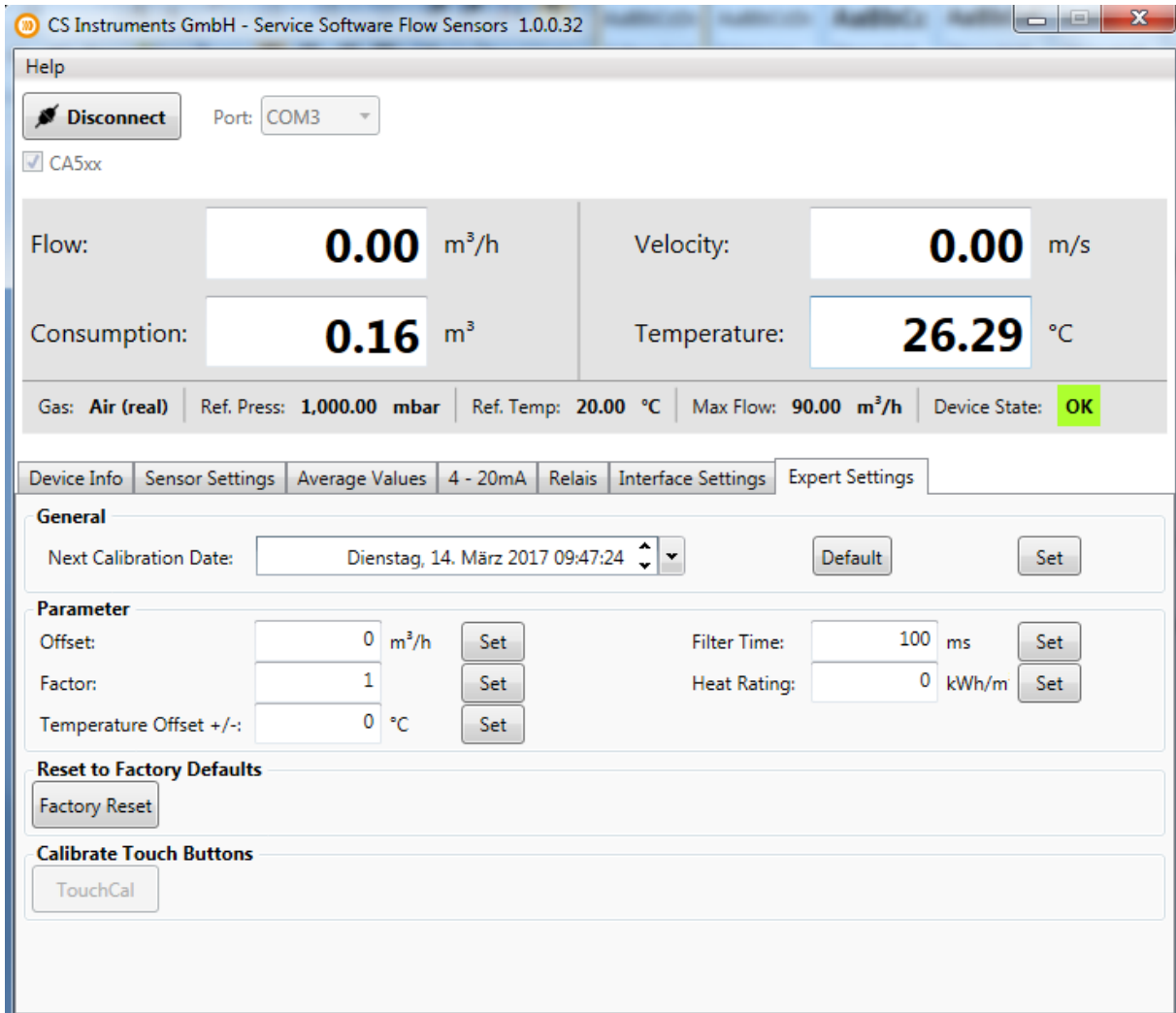
Este obligatorie setarea corecta a parametrilor interfetei dispozitivului Modbus master. Setarile senzorului si ale dispozitivului mater trebuie sa fie identice. Gasiti setarile interfetei in **Ghidul pentru instalarea interfetei Modbus RTU de la CS instruments "VA5xx_Modbus_RTU_Slave_Installation"**.

2.6.2 Setari afisaj (Display Settings)

Puteti modifica stralucirea ecranului mutand cursorul din dreptul campului "Brightness". Confirmati setarea facuta dand click pe butonul "Set".

Puteti roti ecranul cu 180° daca bifati optiunea "Rotate" .

2.7 Setari avansate (Expert Settings)



The screenshot shows the 'Expert Settings' tab of the 'CS Instruments GmbH - Service Software Flow Sensors 1.0.0.32' application. The interface includes a 'Help' section with a 'Disconnect' button and a 'Port' dropdown set to 'COM3'. A 'CA5xx' checkbox is checked. The main display area shows real-time sensor data: Flow (0.00 m³/h), Velocity (0.00 m/s), Consumption (0.16 m³), and Temperature (26.29 °C). Below this, status information includes 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 'Expert Settings' tab is active, showing sections for 'General' (Next Calibration Date: Dienstag, 14. März 2017 09:47:24), 'Parameter' (Offset: 0 m³/h, Factor: 1, Temperature Offset +/-: 0 °C, Filter Time: 100 ms, Heat Rating: 0 kWh/m), 'Reset to Factory Defaults' (Factory Reset), and 'Calibrate Touch Buttons' (TouchCal).

2.7.1 Setari calibrare / Setari implicite (Calibration settings / Factory settings)

In campul "General" puteti modifica data urmatoarei calibrari.

In campul "Parameter" puteti modifica parametrii calibrarii, dupa cum urmeaza:

- Offset: Valoarea masurata va fi deplasata cu valoarea introdusa
- Factor: Valoarea masurata va fi multiplicata cu valoarea introdusa
- Temp. Offset: Corectia cu temperatura
- Filter Time: Introduce un filtru de timp pentru modificarea atenuarii (0-10000 [ms])

- Heat Rating: Introduce un coeficient caloric pentru gazele combustibile (valabil in conditiile de referinta 0°C si 1013,25 mbar)

Pentru revenirea senzorului la setarile din fabrica, apasati butonul "Factory Reset".