VPStudio User Manual

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www.vpinstruments.com

VP INSTRUMENTS

VPStudio User Manual

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1 Introduction

Congratulations! We thank you for choosing our products. Designed with professional compressed air auditors in mind, *VPStudio* offers you an all-in one software solution for configuration, readout and data processing . For more information on our products you can visit our website www.vpinstruments.com. Instruction videos can be found on Youtube.

VPStudio is designed for the *VPFlowMate*, *VPFlowScope*, *VPFlowScope DP, VPFlowScope in-line* and *VPFlowTerminal* product line. Depending on your license, you can use the various functions of *VPStudio*.

This manual is dedicated to:

VPS.R150.PXXX,	where P indicates the probe length.
VPS.R200.P4DP,	where P4DP stands for differential pressure version.
VPS.RXXX.MXXX,	where R stands for flow range and M stands for diameter
VPF.RXXX.MXXX,	where R stands for flow range and M stands for diameter
VPFlowTerminal,	2012 version with USB and Analog Inputs

Software version: 1.0.22

Older software features may not be covered by the contents of this user manual. Please contact us for a service subscription program, which includes software and firmware updates!

Do you like our products and this user manual? Tell others! Do you miss something? Let us know via sales@vpinstruments.com!

2 Getting Started

2.1 Software installation

In this chapter, we will guide you through the software installation process. *VPStudio* software tested for the following Windows versions:

- Windows XP
- Windows VISTA
- Windows 7
- Windows 8

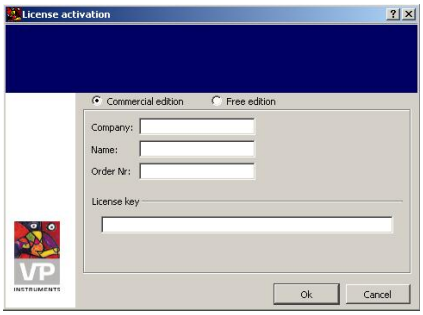
Other versions are not supported, and use is at own risk. Screen shots in this manual may appear differently depending on your settings.

Without License Key the functionality of *VPStudio* is limited. You can obtain a valid license key from your local dealer or distributor.

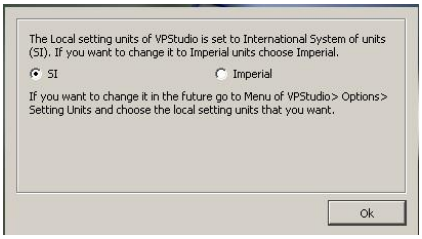
Install *VPStudio* software
VPStudio can be found on the CD ROM or on our website www.vpinstruments.com/downloads. Click vpstudio.msi and follow installation steps.

Open *VPStudio*, enter your license key
The first time you open it: the license activation screen will appear. Find the license key with your order. It is capital sensitive. Enter your license key and press ok.

No license? Select Free edition for basic configuration functions.



Select preferred units
VPStudio has two modes, SI mode and Imperial mode. Data will be displayed in either SI or Imperial units, during real time measurements, diameter configuration and so on. In both modes, you can export all measurement data in both SI and imperial units.



Connect the cables
Now it is time to connect your product. Connect your device to the PC, then proceed.

Refer to the product user manual (*VPFlowScope*, *VPFlowMate*, *VPFlowTerminal*) for instructions on the electric connections.

Product	Cables and accessories
VPFlowScope	JB5 + USB-RS485 converter + Power supply
VPFlowScope in-line	JB5 + USB-RS485 converter + Power supply
	Direct USB cable, can be powered via USB (for programming)
	Direct USB cable + M12 power supply (full operation)
VPFlowMate	JB1 + RS232 cable / RS232-USB converter + Power supply
VPFlowTerminal	Direct USB cable, can be powered via USB (for programming) or fully powered by mains (full operation).

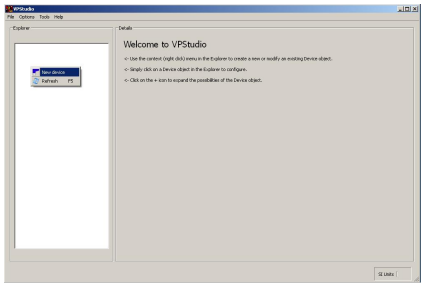
After installation, you will see an empty explorer screen. By clicking right mouse while hovering over the explorer field, you will get the "New Device" dialog.

Install the USB drivers
Some of our products make use of an internal USB interface or an external USB converter. You need a software driver to activate the USB connection on your computer.

Product	Interface	USB converter
VPFlowMate	RS232 (TX, RX, Ground)	Optional (Prefer FTDI Chipset)
VPFlowScope	RS485 (A, B, Ground)	USB-RS485 (ATC 820)
VPFlowScope inline	RS485 (A, B, Ground)	USB-RS485 (ATC 820)
	USB	CP210x
VPFlowTerminal, old style	RS232	Optional (Prefer FTDI Chipset)
VPFlowTerminal 5000, graphic display	USB	CP210x

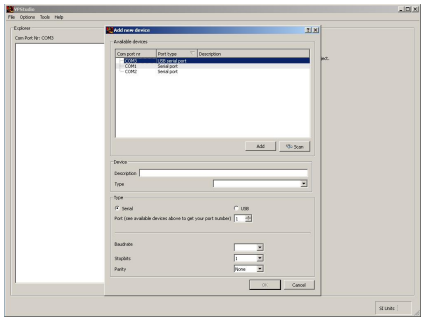
For most USB converters and USB drivers, the installation is as follows: Insert the USB connector in your PC, the computer will recognize it and will install the driver. You can download the newest drivers from the respective manufacturer website. If not automatically installed, open Windows device manager, click update driver and browse the drivers location.

Configure your connection - all devices
Right mouse click on the white explorer on the left site of your window. A popup will show. Clicking add device will open a new window. You will see a list of known devices with it's COM port number and type. Your device will be listed if the driver is properly installed. Choose the device (for example, a *VPFlowScope*). Press the Add button. The default settings will be automatically filled in.



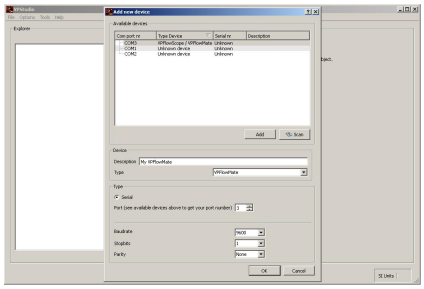
Port type	Description
Serial port	Physical COM port on the computer
USB serial port	A USB to serial converter
USB	A direct usb cable

Configure your connection - *VPFlowScope*
Select the desired COM port from the available device list. If not listed, check the USB drivers. Once selected, click add. All known settings will be filled in below. Check for missing input fields, enter a name and change communication parameters if needed.



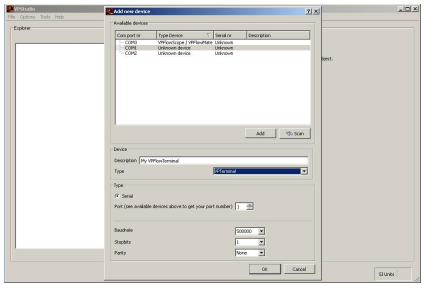
VPFlowScope sensors which have been used by others or which have been returned from an audit may have different baud rate, stop bits and parity settings. Please ALWAYS create a tag label with the settings when you decide to change these, for your own convenience!

Configure your connection - *VPFlowMate*
VPFlowMate sensors are connected to either a serial port (old hardware) or a USB-RS232 converter. This may cause detection issues. You can find the right COM port via My Computer --> properties --> Device Manager (refer to MS Windows Help).
Another trick is to unplug the USB converter, press the SCAN button. Plug in the USB converter. press SCAN again and you will see the com port appearing in the list of available devices.



If not detected automatically, choose type = *VPFlowMate* in the pull down menu. Press ADD to add the device. All parameters will be pre-set correctly. Assign the device name, for example "My *VPFlowMate*", and press OK.

Configure your connection - *VPFlowTerminal*
The *VPFlowTerminal* has a built-in USB port. The port may be detected as a generic COM port, so you have to select the *VPFlowTerminal* manually in the pull down menu "Type". Once chosen, the parameters are filled in automatically. Assign a device name, for exampe "My *VPFlowTerminal*", and press OK.



2.2 Basic controls

VPStudio can handle more than one device, as long as it has a unique COM port. Each device has to be connected with an individual RS485-USB converter or individual COM port to your computer. You can read out only one device at a time, but you can switch in between devices in the explorer.

***VPFlowScope* - Internal clock synchronization**
When you 'Store' settings via *VPStudio*, the internal clock of the *VPFlowScope* synchronizes with the clock of the computer.

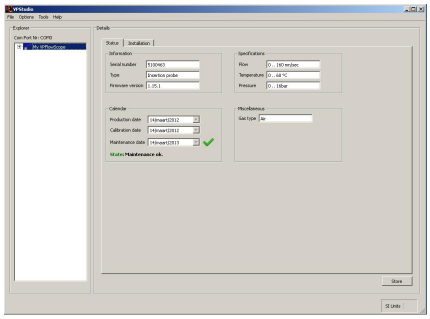
Menu structure of *VPStudio*
- Units: Go to Options > Setting Units to change the units between SI and Imperial.
- License Manager: Go to Help > License manager. To adapt or change the license key.
- Help --> Index: Access to the interactive help file.

Refresh the connection or the configuration data by hitting F5, or by the right mouse button: Click in the explorer field and click "Refresh". VPStudio actively seeks connection with the device. It will give feedback when there is a communication issue.

3 Product Configuration

3.1 VPFlowScope

Basic configuration
Click on your *VPFlowScope* in the explorer



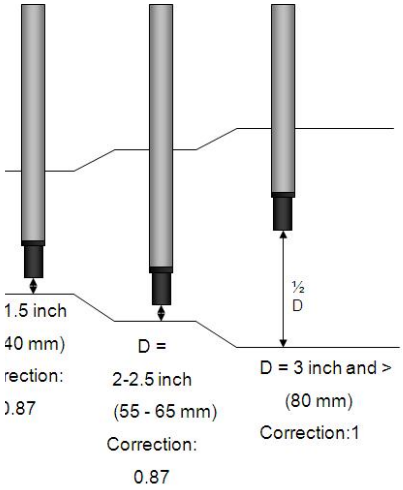
The status tab shows specifications of your *VPFlowScope*:
- Serial number
- Firmware version
- Gas type

Important: you can see when your *VPFlowScope* was produced, last calibrated and when it needs maintenance.

In the installation tab you can configure your *VPFlowScope*.

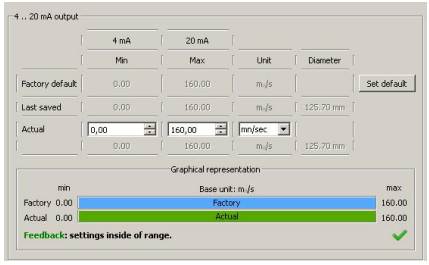
Environment
Probably the most important setting, because here, you configure the inner pipe diameter! Press 'Store' once you are done.

! The diameter and insertion depth combined are key to accurate measurements, as the *VPFlowScope* has an internal correction table for blockage and flow profile effects. Wrong diameter entry and/ or wrong insertion depth will result in over reading or under reading. Check the *VPFlowScope* user manual for details.



Miscellaneous
Reset the totalizer counter, by selecting the box and press 'Store'.
Select the current output mode. Only one can be selected. This select box will enable or disable 4..20mA or pulse.

4..20mA output
The *VPFlowScope* features a single 4..20 mA output for monitoring one of the three sensor signals.



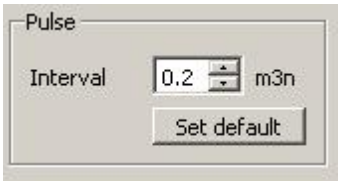
The 4..20 mA output can be used to read out the *VPFlowScope* remotely, for example by a DCS control or central supervision system.

Default setting: mn/sec: 0..100% of flow range. You can change the range and type of output (pressure, temperature). In the pull down menu, you can choose flow, pressure, temperature related units.

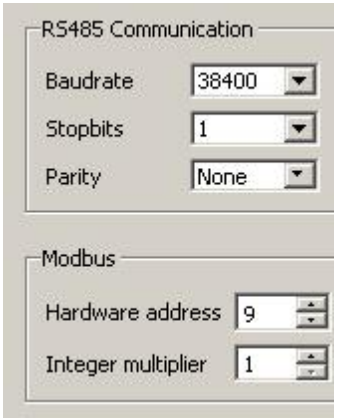
When the diameter is known, the programmed diameter is calculated in the settings. So change the diameter first, then the analogue settings. *VPStudio* provides feedback while you are changing the settings. Use "set default" to go back to the factory default.

Flow direction option in 4..20mA
Default setting: -100% to +100% of flow range. You can change this to your liking. See also the *VPFlowScope* user manual for examples.

Pulse output
The *VPFlowScope* series have a software selectable pulse output (firmware 1.0.19 and higher). The pulse size can be changed according to the expected usage.



RS485 communication
The *VPFlowScope* supports Modbus RTU. Isolate the *VPFlowScope* from the Modbus network when you need to configure it, as other devices will interfere with *VPStudio* commands.



Only change the RS485 settings in *VPStudio* when the *VPFlowScope* is mounted in a slower network.

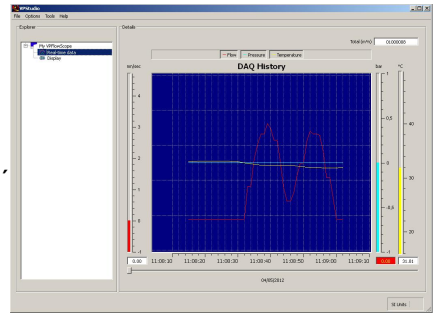
- Hardware address: Modbus address, between 1 and 247. Each *VPFlowScope* in the same network needs to have a different address
- Integer multiplier: This multiplier is used for the integer registers only (see Modbus table). Divide the output by this number to get the real, floating point value. Adapt the value when the actual reading is a very small number, or when an extra digit resolution is needed.

Example:
flow = 32.3 m/sec
multiplier = 10
Modbus output on register 16: 323. Divide by ten to get 32.3
multiplier =1
flow =32.3
Modbus output on register 16: 32

Store button
Click 'Store' to save the new settings. During the write process, the store button is grayed out. When a writing problem occurs, *VPStudio* will provide you with feedback via a pop-up window.

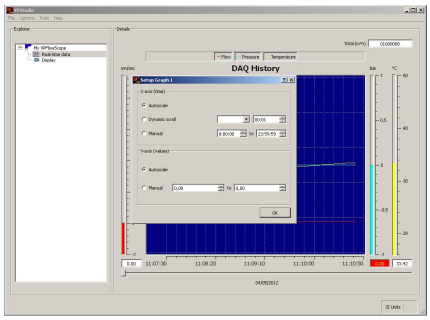
Store = Sync. When you press the store button, the internal clock of the *VPFlowScope* is synced with the PC clock. This is very convenient when using more than one *VPFlowScope* in your audit.

Graph settings - real time measurement
All three parameters combined in one graph. You can enable/ disable parameters by pushing one or more buttons at the top legend of the graph (Flow, Pressure, Temperature)



The settings of the graphs in both ´Real time data´ and ´Display´ > 'DAQ sessions' are preset and prescaled automatically: the graphs will auto scale according to the data.

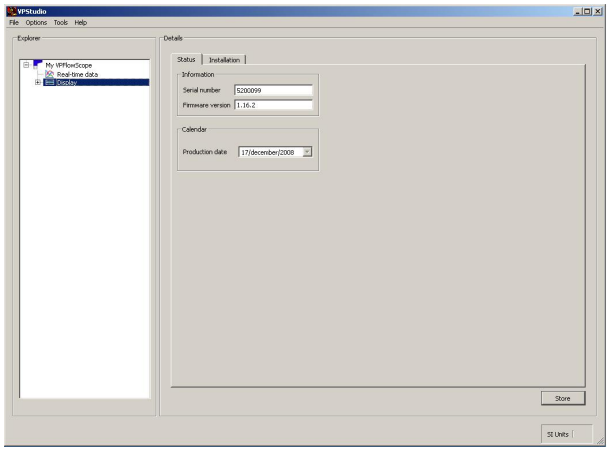
Change the layout to a more suitable manner when desired. During data acquisition, press right mouse button to find the menu for graph settings and the export function.



You can fix the axis manually.

3.2 VPFlowScope Display

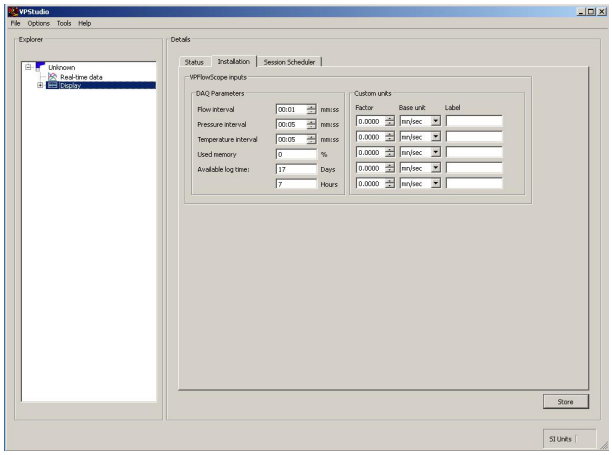
Read out the basic information
Select 'Display' to see and configure the display and data logger.



Status tab: see firmware version and production date.

Installation tab:
- Set interval of the three parameters for the DAQ log session; for flow, pressure and temperature. The numbers correspond with "minutes : seconds".

Data logging
The *VPFlowScope* display takes snapshots, like a digital camera. The time interval between snapshots can be changed for each of the three channels. The more frequent you take snapshots, the more memory your data log session will take. Feedback on the current memory status and remaining logging time is display below.



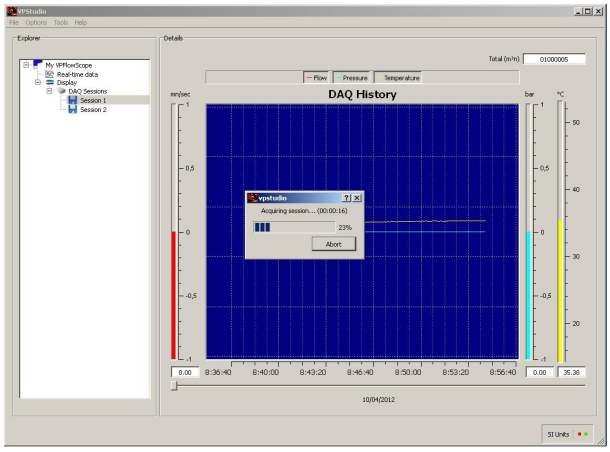
On the display, press the escape/enter button to start a data log session.

Scheduler
The *VPFlowScope* display has a built-in scheduler. This is a timer, which you can pre-set to start a data log session on a certain date and time. It's a great feature for audits with more than one *VPFlowScope*. All data will be synced down to less than a second.

Custom units
In the 'Custom units' you can create your own customized unit. For example, you can convert from m3n to Euro or USD. Custom units are only visible real time in the display itself.

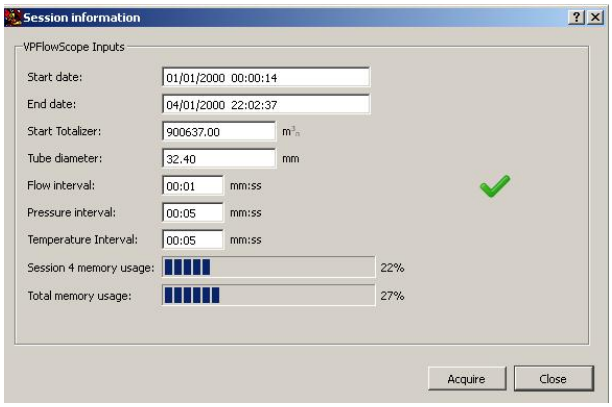
Reading out the data logger
Select your session and acquire the retrieved data by clicking right-mouse-button when you hover the mouse over the graph. A Pop up with the word "Acquire" will appear.

During the download process, the progress bar provides feedback on how long it takes to read in the data. You can change the graph settings and export the data while downloading. The controls are identical to Real-time data acquisition.



DAQ sessions - Detailed information
In the explorer field, select a session, and click right mouse button on the session to view DAQ session information. A pop up window will display relevant information about the session, like start date, tube diameter and the intervals. The memory usage of the session and the total memory usage can also be found here.

Press the Acquire button to download the session to your PC. A progress bar will popup to show how long it takes to finish the download.

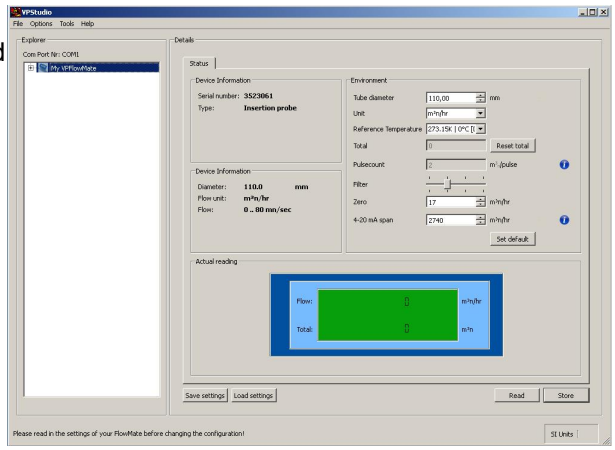


Deleting DAQ sessions --> All at once!
You can only delete your DAQ session in the display itself, by using the keypad. Go to menu -> DAQ sessions -> Delete all. Press Enter and delete all DAQ sessions. You can not delete just one session.

3.3 VPFlowMate

The *VPFlowMate* features a RS232 output. This output is common on older PC's and professional laptops. Modern PC's and consumer-style laptops do not provide a RS232 port anymore. In those cases, you need a RS232-USB converter. We strongly recommend to use FTDI chip- based converters.

Configuration
We offer the *VPFlowMate* as insertion probe and in-line meter. Based on the type, some features are enabled for configuration.
Probes: The diameter and unit can be changed and enabled in the configuration.
In Lines: The diameter and unit is fixed, and disabled in the configuration.
On the right, you see the overview screen.



Device Information
Serial number and type, current settings which are stored in the *VPFlowMate* memory.

Environment
Parameters you can change: Tube diameter, unit.

Reference temperature
You can program the *VPFlowMate* with a different reference temperature. BE CAREFUL. This temperature is used in all measurement calculations. Make sure to re-label the product when you do this.

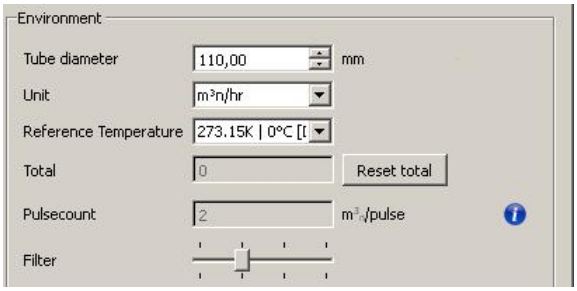
Reset Total
Use this button to reset the totalizer.

Set default
To restore factory default settings, you can push this button.

Actual reading
Shows measurement values, identical to the built-on display.

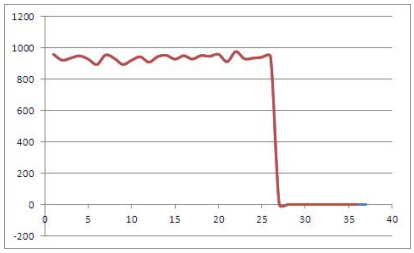
Pulse count
In the pulsecount display you can see the actual value of each pulse. This value depends on the model and the programmed diameter. Below the "i" button you can find an overview table.

Filter setting
The *VPFlowMate* has a built-in moving average filter. This filter can be used to smoothen the display readings. This filter does NOT influence the 4..20 mA output, as you can filter this yourself externally, for example in the PLC.

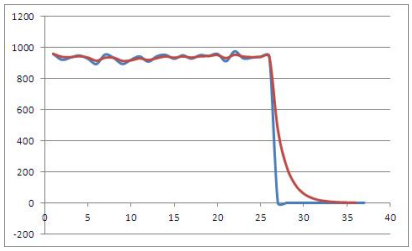


The moving average filter can be adjusted between 0 and 3, The internal filter algorithm: Flow (filtered) = (Original flow + Average * Filter Value)/ (1 + Filter Value)

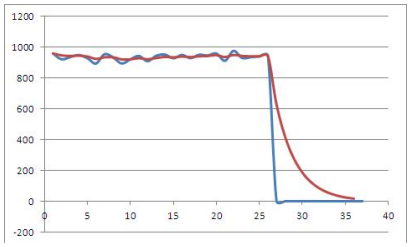
Example: Filter = 0
When the filter is set to zero, the *VPFlowMate* display is as fast as the sample time, which is 1 x per second for the probe, and 2 x per second for the in-line.



Example: Filter = 1
When the filter is set to 1, the *VPFlowMate* display shows filtered data. This equals a response time which is about 5 times slower than the sample time.

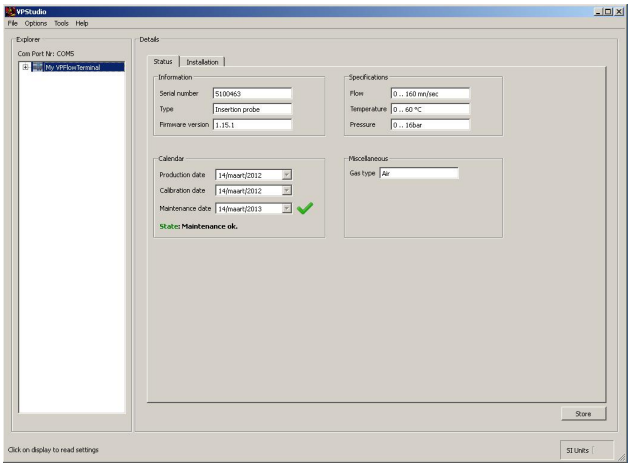


Example: Filter = 2
When the filter is set to 2, the *VPFlowMate* display shows filtered data. This equals a response time which is about 10 times slower than the sample time.

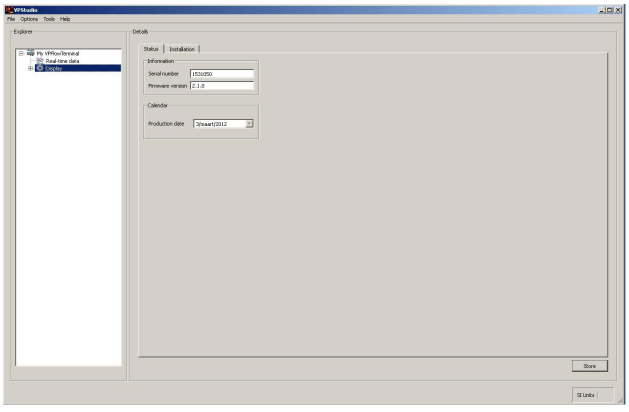


3.4 VPFlowTerminal

Configuration - *VPFlowScope*
The connected *VPFlowScope* can be configured through the *VPFlowTerminal*. The *VPFlowTerminal* forms a link to the *VPFlowScope* and provides all configuration possibilities. See the *VPFlowScope* topics for further details.

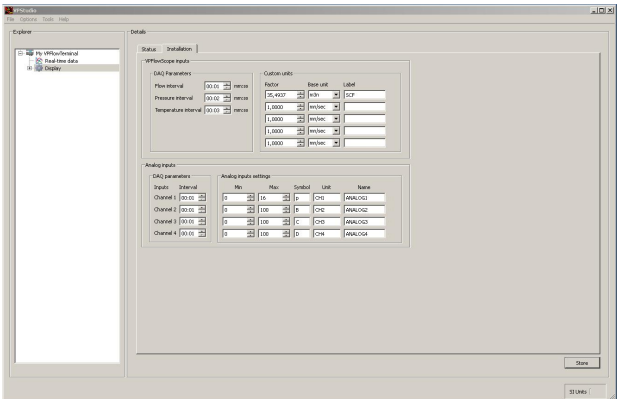


***VPFlowTerminal* device properties**
The *VPFlowTerminal* behaves similar to the *VPFlowScope* display module. It is shown in the explorer tree below the *VPFlowScope* sensor. Click on the display icon to show the basic information. Click on the installation tab to change the data logger parameters.



DAQ Parameters and Analog Input DAQ parameters

The DAQ parameters and Analog Input DAQ parameters show the measurement interval for each channel. For models with analog inputs, the analog channels can be configured as well.
Default settings are 5 seconds for each channel. The data logger offers 2 Million points capacity.



Analog channels configuration

The analog inputs can be defined in *VPStudio*. To get there, in the Explorer tab click ‘display’ at the drop down menu of the *VPFlowTerminal* and then click on ‘Installation’ at the Detail tab.

Enable/disable analog inputs

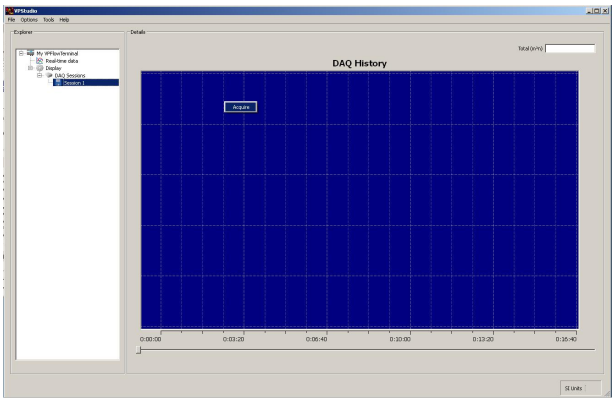
At the DAQ parameters screen, under Interval, set the time for the preferred sensor. When the time at the interval is 00:00 the channel is disabled and will not be read out or logged.

Configure settings

At the analog input settings screen several parameters can be adjusted:
- Interval; set your measurement interval: mm:ss (minutes and seconds).
- Min/max; the range which corresponds with the 4..20 mA entrance.
- Symbol; the symbol to be seen in the display.
- Unit; measuring unit.
- Name; insert the name of the sensor here.

DAQ Sessions readout

To read out data log sessions, unfold the tree in the explorer completely. The log sessions appear under Display --> DAQ Sessions. Select one session, hover your mouse over the graph, or you can use the DAQ session information function, to preview the recorded session information.

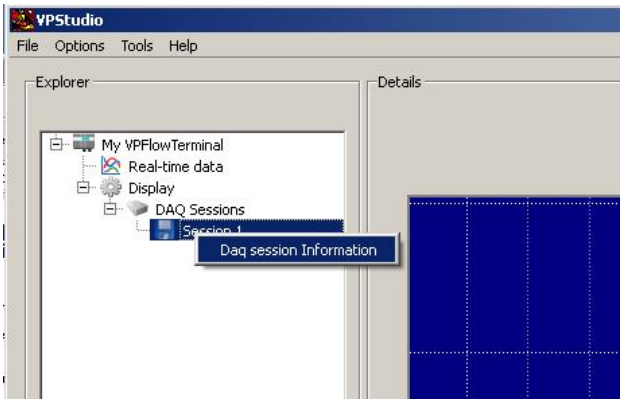


Now press right mouse button and click 'Acquire' to start downloading your data log session from the memory to the PC.

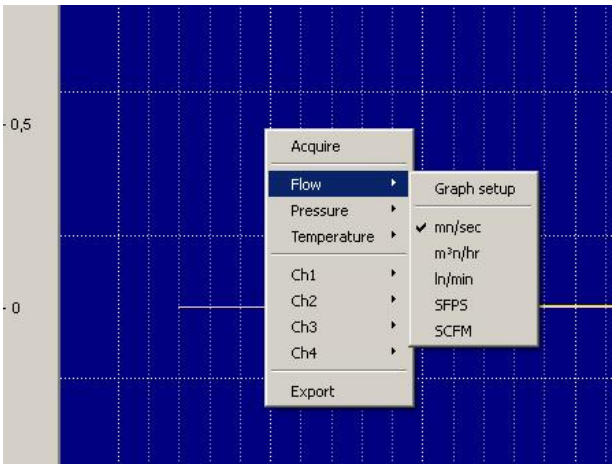
The enabled channels appear on the right next to the DAQ History graph.

For recording: See the *VPFlowTerminal* user manual.

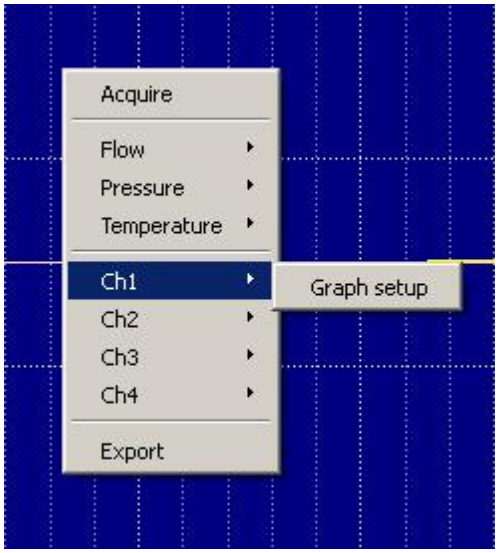
DAQ Session information
You can use the DAQ session information function, to preview the recorded session information.



DAQ Session Graph setup (*VPFlowScope* channels)
During the download process, and after downloading your data, you can change the units of your graphs. Hoover over the graph, press right mouse and change the unit per graph. Choose Graph Setup for advanced scaling options.



DAQ Session Graph setup (analog channels)
During the download process, and after downloading your data, you can also change the analog input channels bar graph and plot scales. Choose for example Channel 1, then Graph setup to change the scale manually.

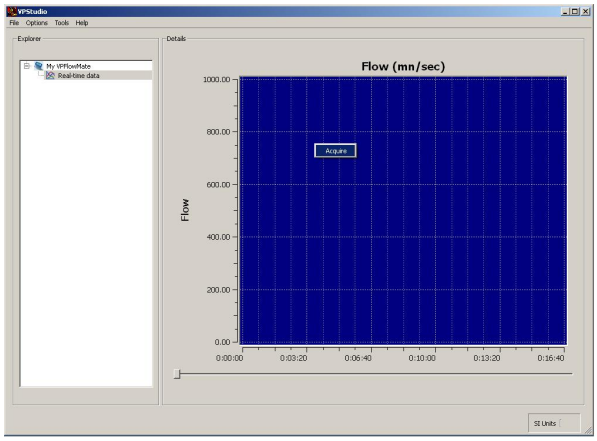


4 Real time Data

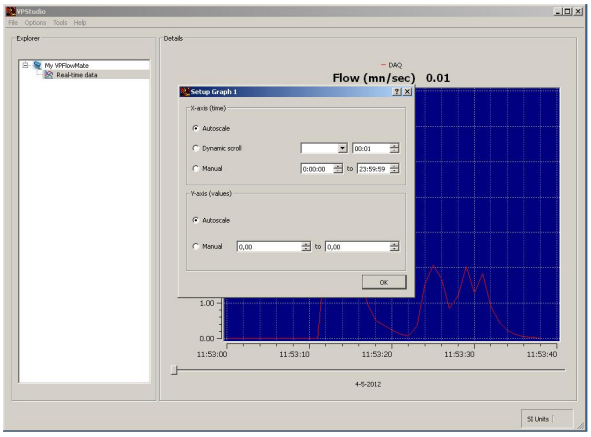
4.1 Real Time measurements

Starting the real time data acquisition
Depending on your license, you can use *VPStudio* to log data real time to your PC or Laptop. For all three products, the real time data acquisition can be started by unfolding the folder underneath the product icon.

Hover over the graph, press right mouse to reveal the acquire button. Then push the button to start.



Graph control
The graphs in both ´Real time data´ and ´Display ´ > ‘DAQ sessions’ are preset and pre-scaled automatically: The graphs will auto scale according to the data.

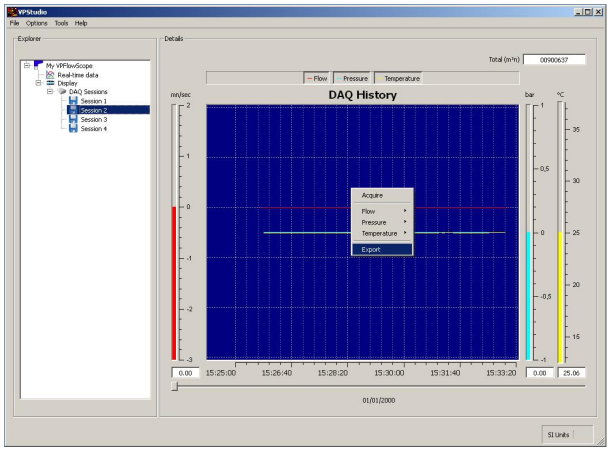


Stopping the real time data acquisition
You can stop data acquisition at any time by hovering your mouse over the graph, press the right mouse button and select stop.

5 Data Processing

5.1 Export CSV

Exporting- General instructions
For all three products, *VPFlowScope*, *VPFlowMate* and *VPFlowTerminal*, the basic export functions are the same. The only difference is the number of units you can export.

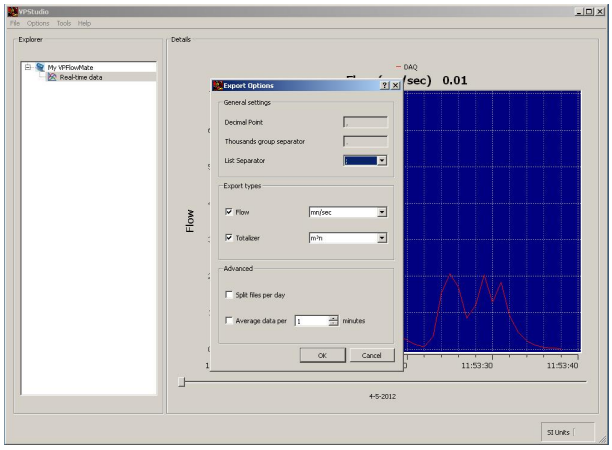


The real time data can be exported to a csv.file at any moment for further data processing.

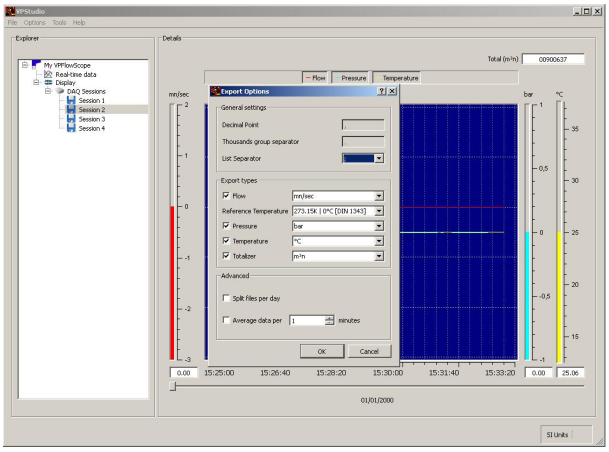
- Click right mouse button in the details field, click 'Export'.
- Choose a name and a place for your export file, click OK.
- The 'Export Options' dialog appears. Choose which data to export and how:

- General settings: You can change the delimiter for the CSV file here to match you country residual settings.
- Export: Select which parameters with which units you want to export.
- Advanced: When you have a lot of measurement data; split files per day and/or average the data to make it manageable.

***VPFlowMate* export dialog**
After clicking your right mouse --> Export, you will get a dialog window. In this dialog, you can choose:
List Separator:
Choose ";" or another separator for your CSV filt.
Export types:
Choose the channels you want to export and the units.



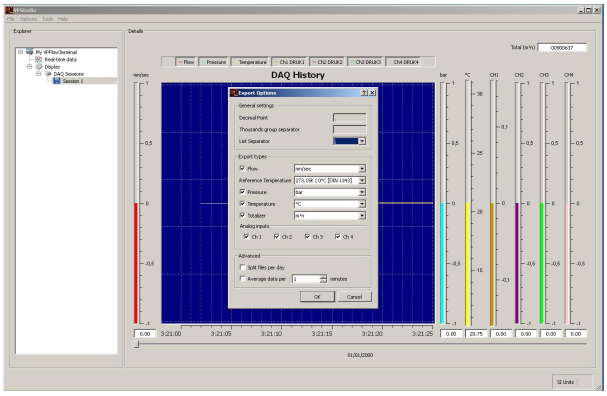
***VPFlowScope* export dialog**
The *VPFlowScope* has some more options. You see the local settings for Decimal Point. You can adapt the List Separator to match your local settings.



Export types:
Choose the channels you want to export and the units.
For flow, you can also choose the reference conditions.

Press OK to export the file, now you can open it in a spread sheet program (Excel, Open Office Calc)

***VPFlowTerminal* export dialog**
The *VPFlowTerminal* is similar to the *VPFlowScope*. With the Analog Inputs option, you can also select the analog signals you want to export. The channel settings cannot be changed here, they should have been pre-configured BEFORE you make the measurements.



Finish, and save the file
Advanced:
Split files per day option, to create separate CSV files for each day. Average function to create smooth averages of your data and to limit the amount of data points.

Press OK to export the file, now you can open it in a spread sheet program (Excel, Open Office Calc).

5.2 Excel import

(See also the office.microsoft.com website)
You can open a text file that you created in another program as an Excel workbook by using the Open command. Opening a text file in Excel does not change the format of the file — you can see this in the Excel title bar, where the name of the file retains the text file name extension (for example, .txt or .csv).
Click the Microsoft Office Button , and then click Open.

The Open dialog box appears.
On a computer that is running Windows Vista
- In the list, select Text Files.

On a computer that is running Microsoft Windows XP
- In the Files of type list, select Text Files.

On a computer that is running Windows Vista
- In the Address bar, locate and double-click the text file that you want to open.

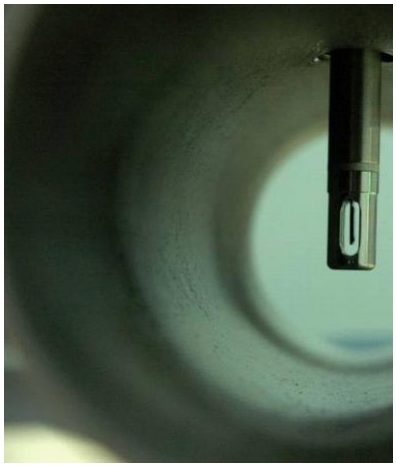
On a computer that is running Microsoft Windows XP
- In the Look in list, locate and double-click the text file that you want to open.

If the file is a text file (.txt), Excel starts the Import Text Wizard. If the file is (.CSV) Excel will try to interpret the data automatically. Here you can run into problems when your country settings do not match the .CSV!

Note from Microsoft: When Excel opens a .csv file, it uses the current default data format settings to interpret how to import each column of data. If you want more flexibility in converting columns to different data formats, you can use the Import Text Wizard. For example, the format of a data column in the .csv file may be MDY, but Excel's default data format is YMD, or you want to convert a column of numbers that contains leading zeros to text so you can preserve the leading zeros. To run the Import Text Wizard, you can change the file name extension from .csv to .txt before you open it, or you can Import a text file by connecting to it.

6 Service

6.1 Service Programs



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Professional auditors choose our well known full Service Subscription; annual exchange of your flow meter, without any down time and life time warranty. Have a fully calibrated flow meter 24/7, 365 days a week!

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- Warranty extension
- Software- and firmware updates
- Live support and e-mail support by our skilled technicians

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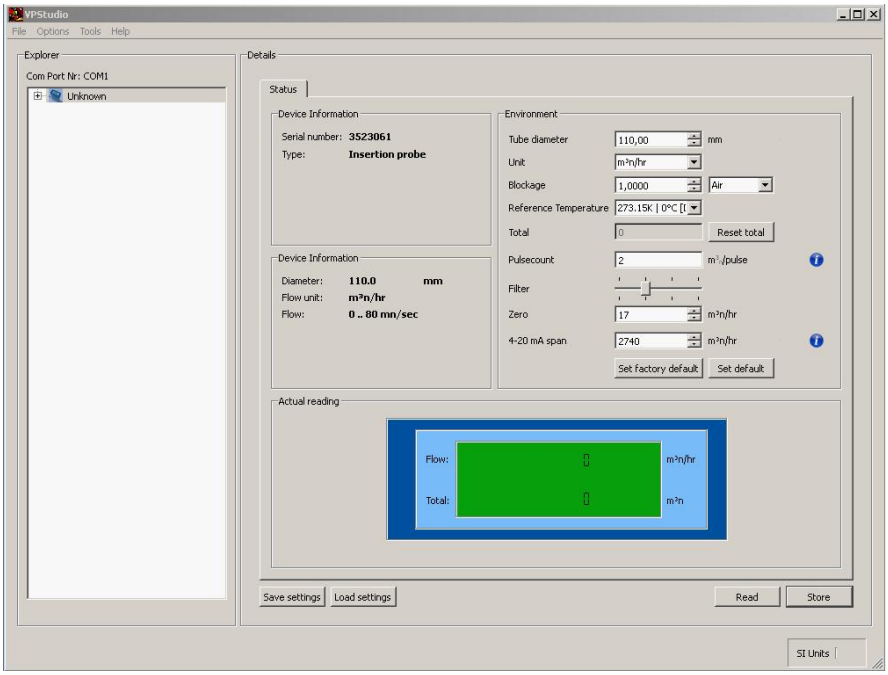
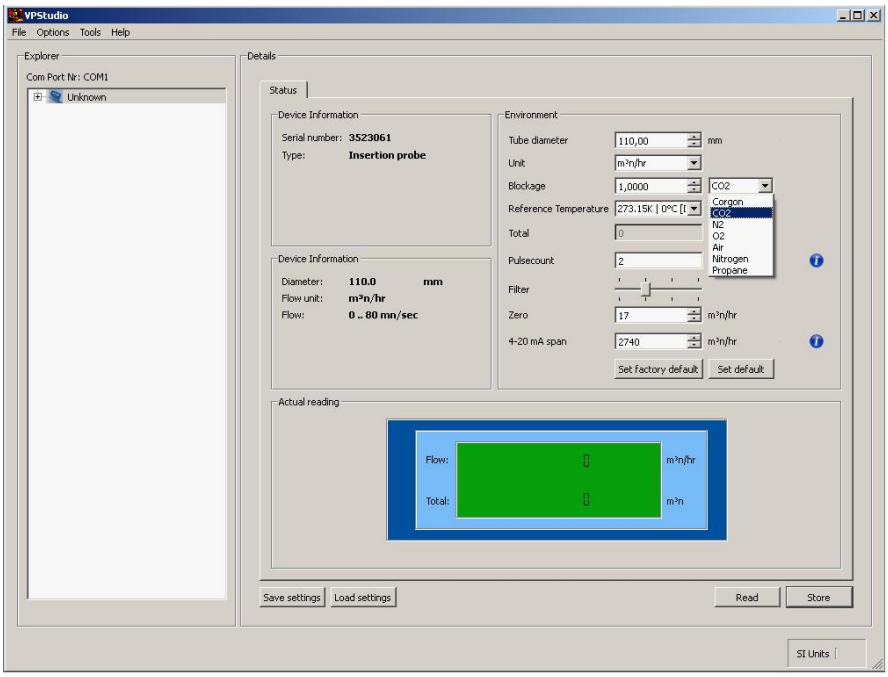
7 Expert mode

Using the blockage factor

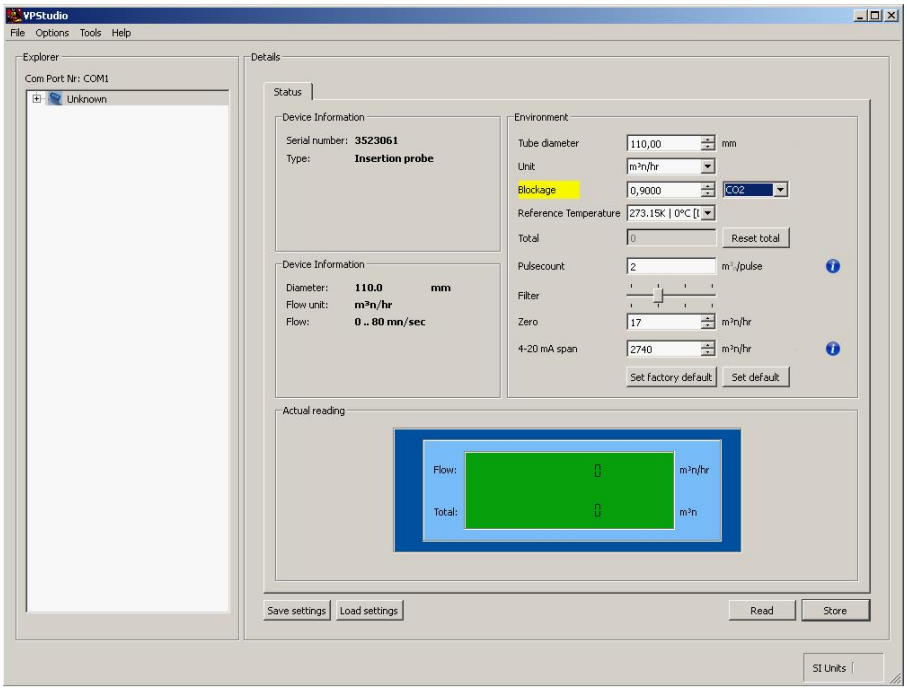
By factory default, the blockage factor is set to 1.0000. The flow will be multiplied by this factor. This value can be changed in *VPStudio*'s expert mode.



The blockage factor can be changed manually or according gas types. A list of gasses is added near the blockage factor.



The selected gas type will change the blockage factor to the gas' value



After storing the values, the blockage factor will be used in post processing.

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MAN-VPStudio-UK
Revision:2
Date:25-09-2013