

## **Digital Measuring Amplifier CA-USB**

### **Installation Instructions for USB Drivers**

This guide describes an installation on Windows 7.

The installation under older Windows versions starting from 2000, as well as under newer Windows versions takes place accordingly.

#### **Before Installation**

**Be sure to pay attention!**



**Please note that Windows requires administrator rights to install drivers!**

**Please check with your administrator if you do not have it!**

**Log on to the PC as an administrator.**

**Before installation please close all programs and save all your data.**

**In addition, all other applications should be closed, especially virus scanners.**

**Disconnect all HAEHNE devices from your PC.**

**Remove any existing HAEHNE USB Sensor Drivers.**

**Control Panel> Programs / Software> Uninstall Programs**

**Manual uninstall: Run> cmd.exe (as administrator)> pnputil.exe (driver management)**

#### **Driver Installation**

The necessary **CA-USB device drivers** are available as downloads on the *HAEHNE* homepage in the form of a ZIP file: <https://haehne.de/en/service/download-device-software/>

The necessary CA-USB device drivers are available as downloads on the *HAEHNE* homepage in the form of a ZIP file: <https://haehne.de/service/download-geraete-software/>

During the installation, please select the folder that matches your Windows version and run the "HaehneVCPInstaller.exe" required for your operating system.

It is advisable to tick the box "Always trust software from *HAEHNE* GmbH".

The driver installation will now be completed in the background. Occasionally it may happen that you are asked to restart the computer. The *HAEHNE* GmbH driver package was derived from a driver package signed by Microsoft, whereby only a few character strings and the identification features of the CA-USB Sensor Interface..

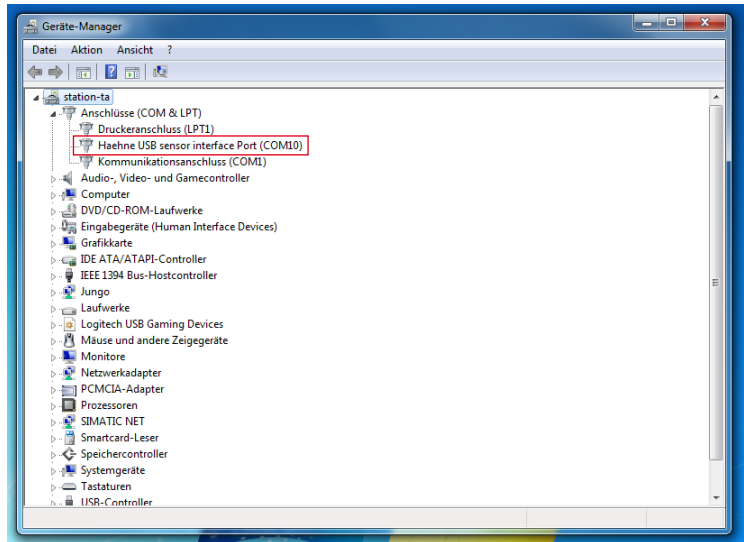
## Check Installation

The driver installation is completed in the background. There is no notification of success. Connect the USB device to the PC (you may have to confirm messages, depending on the operating system).

The correct installation will be checked in Device Manager:

Open the Device Manager:

- Start via Control Panel:  
System> Device Manager
- Start with key combination:  
Windows key + pause> Device Manager
- Manual start:  
Run> devmgmt.msc



If the entry "Haehne USB sensor interface Port (COM #)" appears, the driver package is installed correctly (see picture).

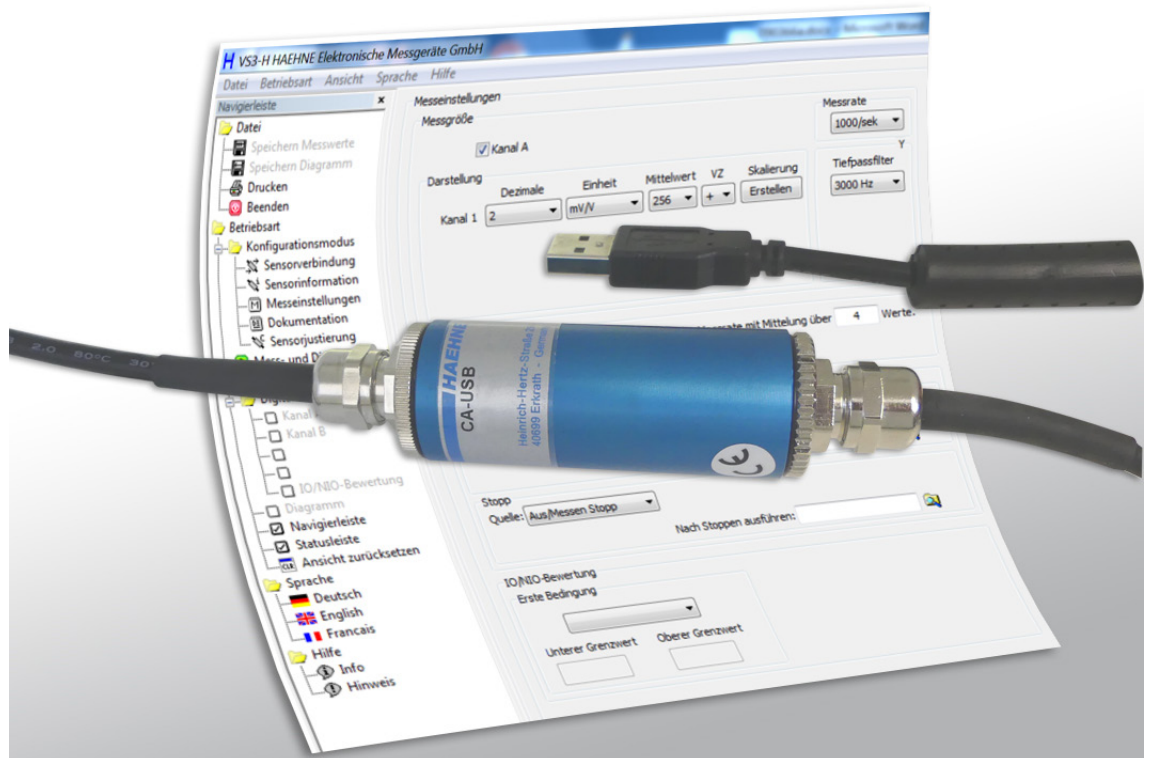
Under this COM port, the device can be addressed by your software. If you connect several HAEHNE USB devices, a separate line appears in the Device Manager for each device.

## Debugging

Error	Possible Cause	Correction
Amplifier listed under "?" or "Other devices> Unknown device / USB device".	Driver not installed.	Remove the amplifier from the PC. Install driver package. The first installation must be done with administrator rights. Connect the device to the PC. Uninstall existing old drivers.
Driver installation aborts with errors.	Administrator rights are missing.	Repeat the process with administrator rights.
Driver installation on connection fails.	Administrator rights are missing.	Repeat the process with administrator rights.

## Cable Amplifier CA-USB

### Configuration and Calculation Software VS3-H Operation Manual



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## Symbols of this operating manual

### Notice



In front of passages with additional informations

### Attention!



Sections of this notice contain important points to note

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## 1 Remarks

This manual describes the installation under Windows 7. The installation under Windows 8 - 10 occurs accordingly.

Please note that Windows imperatively requires administrator rights for the installation of drivers.

Please speak to your administrator if you do not have those rights and be shure to pay attention to "CA-USB Installation Instruction".

### License Terms for HAEHNE Software

The copyrights for this software remain at:

HAEHNE Elektronische Messgeräte GmbH  
Heinrich-Hertz-Str. 29  
40699 Erkrath  
<https://haehne.com/>

During the software installation, the license conditions will be displayed and must be accepted, otherwise the installation will be aborted. After the installation, the license conditions can be viewed in menu 'Help > Advice'

### Intended Use

The VS3-H software was designed for the adjustment, control and read-out of the CA-USB. Further functions of the VS3-H are reception, display and storing of measured values. Any use beyond this is considered as not intended.

### System Requiirements

The operation of VS3-H requires a PC with following system conditions:

- Windows 7 - 10
- USB interface
- Maximal two monitors will be supported

### Recommended Hardware Requirements:

- Application process without diagram: Single-Core from 2,0 GHz
- Application process with diagram: Dual-Core from 1,8 GHz
- The higher the sampling rate and the longer a measurement lasts, the higher the required main storage should be. The measurement ends as soon as the system does not provide anymore free main storage space. The absolute size of the main storage is depending on the operation system and the components installed in addition.

## 2 Preamble

### Product Description

This operation manual describes characteristics and operation courses of VS3-H.

### Setup of the Software

The VS3-H consists of following components:

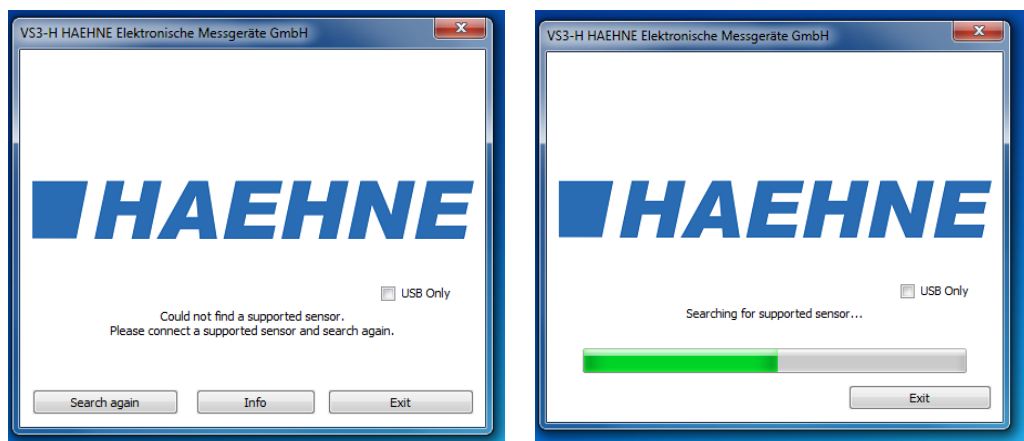
- Configuration possibilities for the VS3-H
- Storage of sensor-related scaling and adjustment data
- For the presentation of measured data (actual value, tare value, minimal and maximal value)
- Display and storage of measured data evaluations
- Presentation of the measured data in a diagram
- Storage of measured data in CSV-format (output configurable)
- Storage of the diagram in BMP-format (output size configurable )
- Print-out of the diagram (output size defined)
- Presentation of the sensor information

**Note** 

- Observe the correct sensor adjustment.
- Consider the correct VS3-H configuration.
- Choose a significant file identification/prefix when storing measured data..

## 3 Starting the Software

The software only starts if it can find at least one compatible sensor. After starting the executable, the search for a compatible sensor appears. If the search is unsuccessful, please check whether the cables from the sensor to the PC are undamaged and that the corresponding drivers have been installed correctly. Please also check if another software is connected to the sensor and disconnect this connection if necessary. Please check also whether the USB plug has been inserted correctly. Then click on 'Search again' to search again for a compatible sensor. If a compatible sensor is found, the sensor-related data is automatically read out. If you only want to work with sensors that are equipped with a USB interface, the search can be accelerated. To do this, click on the box "USB only". This setting can be changed at any time (here and in the dialog "Sensor connection").



## 4 Description of the Operating Mode

The software consists of a menu bar, navigation bar, status bar and a workspace. The functions of the menu bar comply with the navigation bar. The digital measured values of the physical values, the valuation display and the diagram can be seen in 'Operating Mode > Meas./Diagram Mode'. In the workspace the consolidated dialogs are displayed in 'Operating Mode'.

- Adjust. Mode (.2)
- Meas./Diagram Mode (4.3)

Switching between the dialog boxes can be done through the navigation bar as well as via the equivalent menu bar. Adjustment changes in the dialog box will be accepted without confirmation. All settings will be saved when the application is closed and reloaded when the application is restarted. The status bar displays current status information of the application

- 'Ready for use. Sensor connected'
- 'Sensor disconnected'
- 'Measure...'
- 'wait for trigger start event'
- 'Measure! Wait for trigger stop event'

Furthermore, information from the menu bar and navigation bar through the control elements as well as the storage progress in a CSV-file are indicated in the status bar.

### 4.1. The Menu Bar/Navigation Bar of the Program

#### 4.1.1 File > Save Measured Value (Shortcut ,Ctrl+M')

From here, the measured data of the last measurement are stored in a CSV-file. The output format of the file is adjustable in dialog box 'Operating Mode > Adjust. Mode > Documentation' under the headline 'Output measured values' (4.2.4. Documentation > Output Measured Values)

In the first column of the CSV-file, the measured values are numbered ascending. The output of columns two to maximal three will be taken over by adjustment 'Operating Mode > Adjust. Mode > Measure Adjust.' under the 'Diagram' headline. Here, each adjusted physical value will be written into the file.

The sequence: [X-Axis], [Y1- Axis], [Y2- Axis].

	A	B	C	D
1	-----			
2	Headline:			
3	Measurement 1.3			
4				
5	Address:			
6	HAEHNE Elektronische Messgeräte GmbH			
7	Heinrich-Hertz-Str. 29			
8	40699 Erkrath			
9				
10	Comment:			
11	Max Mustermann			
12				
13	Measurement informations:			
14				
15	Sensor:CA-USB	SG		
16	Sensortype:	0		
17	Serial number (Chan	22456		
18	Upper range value:	SG		
19	Accuracy class:	0,10%		
20	Uncertainty of measurement:			
21	Sampling rate:	20/sec		
22	moving average:	4		
23	Reducing the sampling rate by averaging via 1 value(Diagra			
24				
25	Factory adjustment:	11/09/2018	active	
26	User adjustment:	06/28/2019	inactive	
27	Start (Date Time):	11.08.2019	2:21:01 PM	
28				
29				
30	Date	Time	Test 1	
31	(Stop - Event)		Maximum V; Unit	
32				
33		104	-265,53 kN	
34		105	-265,53 kN	
35		106	-265,53 kN	
36		107	-265,53 kN	
37		108	-265,53 kN	
38		109	-265,53 kN	
39		110	-265,53 kN	
40		111	-265,53 kN	

### Attention!



All output adjustments must be carried out before the measurement.

\* Measurement: recording of a measured value series in the configured measuring rate of Start [...] to Stop [...].



## Note

A CSV-file is a text file for the storage of simply structured data. The abbreviation CSV stands for 'Character Separated Values' or 'Comma Separated Values'. These values are separated from each other by special delimiters, e.g. by a comma or a semicolon. A CSV-file can be started by Excel® through double-click (Windows Excel® 2007 - import via data > "from text").

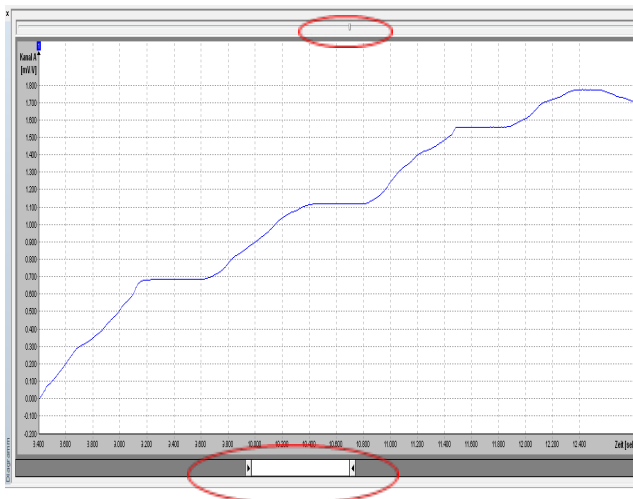
The denotation of list/field/line-ending marks is not explicitly determined. The definitions under 4.2.4. Documentation > Output Measured Values > '**End of line character**' / '**Column separator**' / '**Decimal separator**' must possibly be adjusted in VS3-H or in your spreadsheet.

### 4.1.2 File > Save Diagram (Shortcut 'Ctrl+D')

From here, measured data of the previous measurement can be stored in a BMP-file.

Predefined output variables can be adjusted in '**Operating Mode > Adjust. Mode > Documentation**' under the 'Output diagram' heading in box 'Memory size'. There are following possibilities:

- max: Adjustment is only available, if the running system recognizes two monitors. On these two monitors, the diagram is maximum size stretched and stored.
- normal: The diagram is stretched to approx. screen size and stored.
- min: The diagram is stretched to approx. 800x600 pixel of the monitor and stored.
- Window: The diagram gets stored the way it was adjusted by the user. Any measurement range can be selected by the range slider and the interval slider.



< Range slider

< Interval slider

The diagram has a context menu. By right-click on the mouse key, following functions are available:

- Zoom in: The mouse pointer becomes cross-shaped. By pressing the left mouse key and moving the mouse in the diagram, a rectangle appears which can be zoomed by releasing the mouse key.
- Zoom out: The diagram indicates the complete range of the previous measurement.

- Scrolling: The mouse pointer becomes cross-shaped with arrows. By holding the left mouse key in the diagram, the curve can be shifted.
- Grid on/off: The dashed lines in the diagram form the grid. By this function, the dashed lines can be faded in/out.
- Show legend: The legend indicates the physical variables and their units. By this function, it can be faded in/out.

## Attention!



When storing the diagram, only the currently presented part of the measurement will be stored.

### 4.1.3 File > Print (Shortcut 'Ctrl+P')

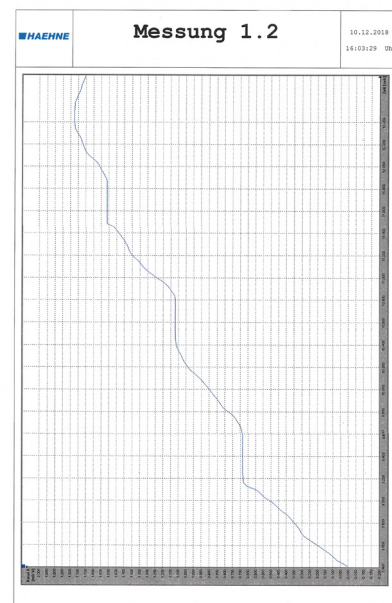
This function enables the print-out of the diagram with print time, configurable heading, configurable remark, configurable address as well as a customized Logo (picture to the right).

The user can carry out the configuration by the navigation bar "documentation".

Line breaks in remark and address are converted into blanks.

Following restrictions are valid

- The heading is restricted to 20 characters
- The remark is restricted to 57 characters
- The address is restricted to 82 characters



### 4.1.4 File > Exit (Shortcut 'Ctrl+E')

Closes the program. If the program is still in the measuring mode while closing, the measurement will be ended. If automatic storage is adjusted it will be executed before the program is closed.

(4.2.4. Documentation > Output Measured Values and > Output Diagram)

### 4.1.5 Operating Mode

This umbrella term contains all sensor-specific adjustments 'Adjust. Mode' as well as the 'Meas./Diagram Mode'. By selecting a mode it will be displayed in the workspace. Following dialog boxes can be displayed:

- Adjust. Mode > Sensor Connection (4.2.1)
- Adjust. Mode > Sensor Information (4.2.2)
- Adjust. Mode > Measure Adjust. (4.2.3)
- Adjust. Mode > Documentation (4.2.4)
- Adjust. Mode > Sensor Adjustment (4.2.5)
- Meas./Diagram Mode (4.3)

When restarting the software it will start with the previous active dialog box. The next menu can be entered via the shortcut 'Ctrl+TAB'; the previous menu can be entered by 'Ctrl+Shift+TAB'

## 4.1.6 View

The control elements under 'View' are responsible for fade in/out of bars and displays as well as setting back the windows view. In the menu/navigation bar a checkmark indicates faded in/out bars and displays. The digital displays and the diagram can only be switched in the measuring and diagram mode, otherwise they are grey (disabled). While executing 'View > Reset Views' (e. g. via the shortcut 'Ctrl+R') the digital displays, the diagram and the main window are set back to original condition.

## 4.1.7 Language

Here, the language of the VS3-H can be adjusted.

All indications of the application are changed in accordance with the selected language.

Following languages are supported:

- German
- English
- French

At restart of the software, the previously adjusted language will show.

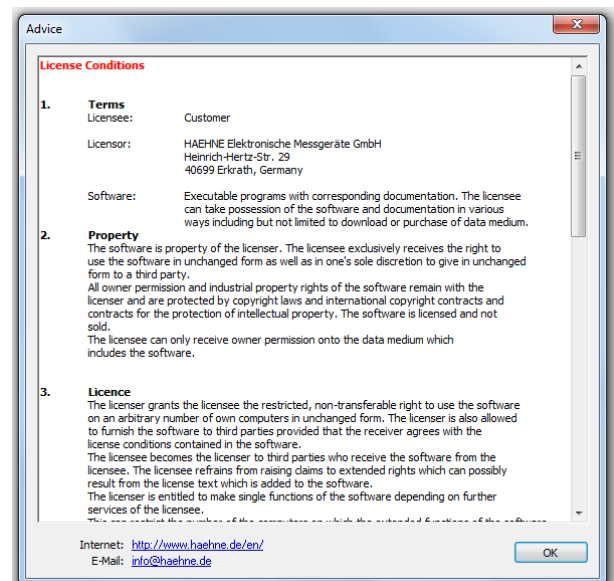
## 4.1.8 Help > Info



Here, the version number of the software is indicated.

## 4.1.9 Help > Advice

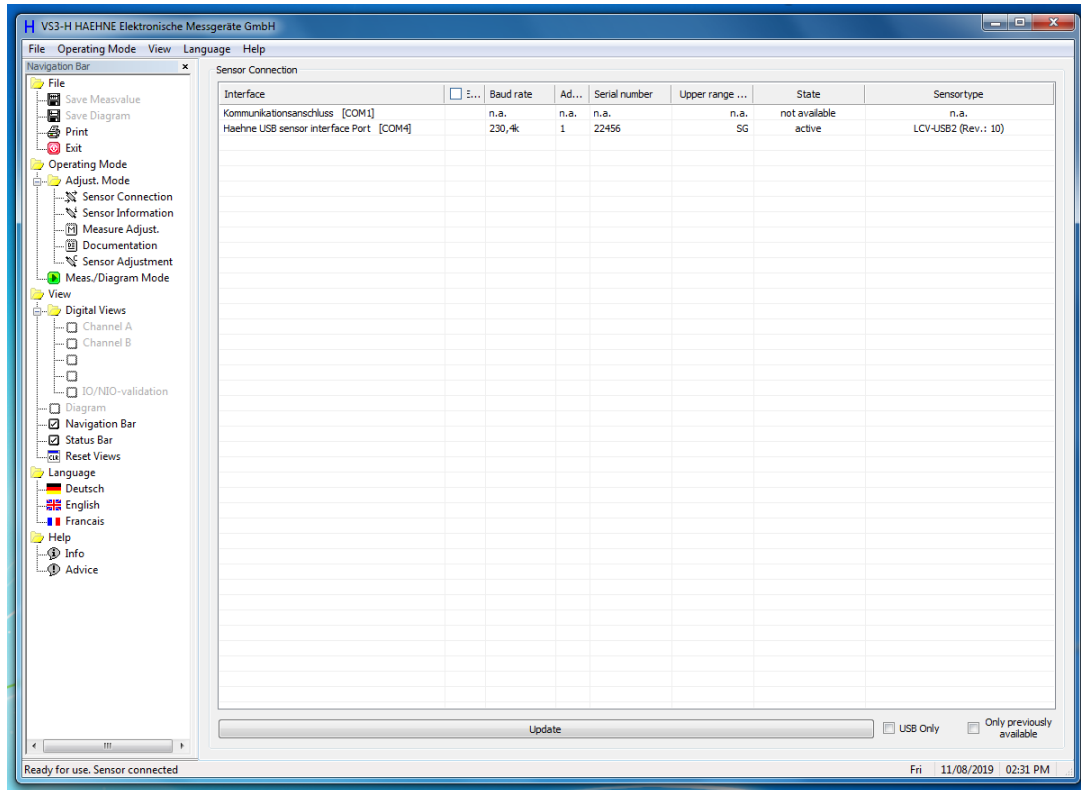
Contains the license conditions for this software, the address as well as the website and e-mail links.



## 4.2 Configuration Mode

The configuration mode contains all of the sensor-, measurement- and documentation adjustments as well as the output of sensor information. The adjustment dialog boxes are presented in the work space through the menu/ navigation bar. In the following chapters, the adjustments are introduced and the functions are explained.

### 4.2.1 Sensor Connection



This software only supports *HAEHNE* devices of the type CA-USB. If only one *HAEHNE* device is directly or indirectly connected to the PC, this is automatically activated by the VS3-H. The VS3-H can only activate one device at a time. In the case of several devices, the one that was active in the previous application session is activated. With a simple double-click on one of the displayed lines, with the status 'available', the desired device is activated. Devices and sensors marked 'not available' in the 'Status' column can not be activated.

'Not available' means that the VS3-H can not open or activate the interface, or that the device has not responded. If another process or another application accesses the desired interface, this access must be terminated and the "Refresh" button must be searched for free interfaces again.

The status 'not supported' indicates devices not supported by the VS3-H software with *HAEHNE* protocol-enabled sensors.

The list provides further information about the device, such as baud rate (115.2 or 230.4 kBaud), address, serial number, full scale value and sensor type and the actual nominal value of the channel at or the interface type DMS.

Disabling a device is done either by activating another device or by double-clicking on the active device. Disabling releases the COM interface and can be used by other applications.

## Device Connection - Baud Rate

Sensor Connection				
Interface	<input type="checkbox"/> Enabling	Baud rate	Address	Serial number
Kommunikationsanschluss [COM1]		n.a.	n.a.	n.a.
HaeHne USB sensor interface Port [COM4]		115,2k	1	22456
		115,2k		
		230,4k		

The baud rate can be switched to the corresponding interface between 115.2 kBaud and 230.4 kBaud with the click of a button in the baud rate column (see example, Interface "HAEHNE USB [COM 8]")

Baud Rate	Maximal adjustable measure rate
115200 Baud	2500 Meas./s
230400 Baud	5000 Meas./s

### Note

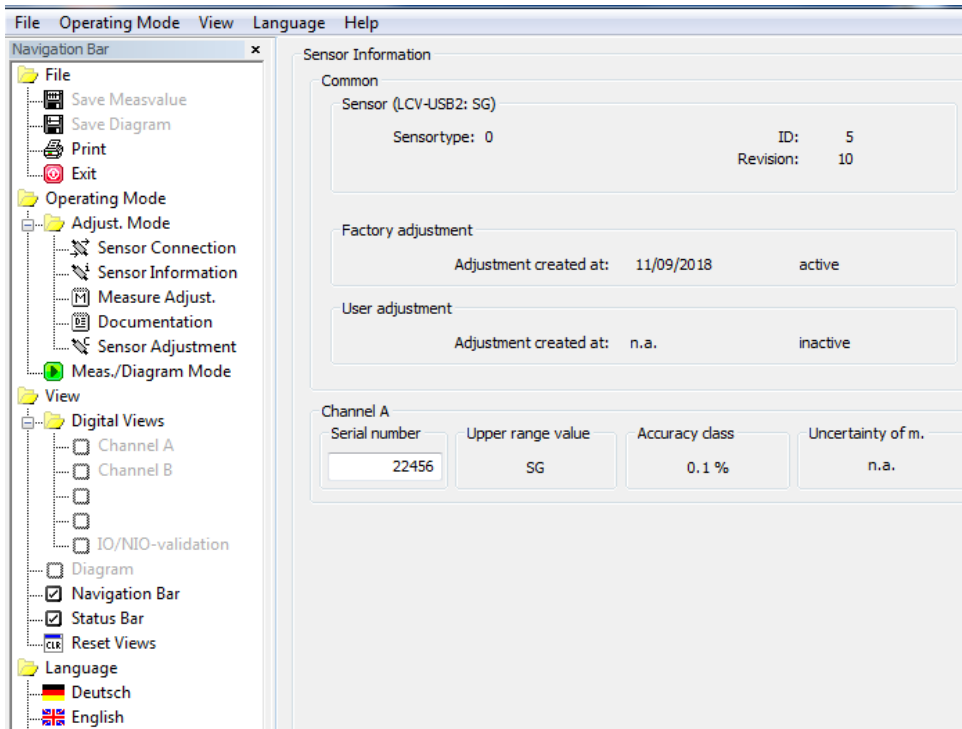
- The changed baud rate is constantly stored in the sensor. This adjustment is also valid for the interplay with other applications.
- The maximal adjustable sampling rate is depending on the adjusted baud rate and the used processor of the PC.

## Device Connection > Update

During this update all HAEHNE interfaces which are integrated in the PC will be checked and read-out. The baud rate and the device address are determined and set automatically. Furthermore the complete sensor data and sensor information will be read-out. The progress of the update will be visually presented (see following image). The update is also started every time a device is disconnected or connected via a USB port.

Sensor Connection						
Interface	<input type="checkbox"/> Enabling	Baud rate	Address	Serial number	Upper range value	State
Kommunikationsanschluss [COM1]		n.a.	n.a.	n.a.	n.a.	check interface
HaeHne USB sensor interface Port [COM4]		n.a.	n.a.	n.a.	n.a.	83%

## 4.2.2 Sensor Information



The dialogs shown above display information and properties about the activated sensor. The data is read by the VS3-H when the sensor is activated. If no sensor is activated, all information is displayed 'n. a.'. If the measurement uncertainty is equal to 'n. a.', this means that there is no measurement uncertainty for the activated sensor. This value in% can be determined with a factory calibration or with a DKD calibration. The determined value can be stored in the 'Sensor adjustment' menu under 'Store measurement uncertainty in sensor' in the activated sensor.

The VS3-H compatible Amplifiers each have two memory locations for adjustment values, a fixed factory adjustment block, and a variable user adjustment block. The status 'active' during the user adjustment is additionally marked with a '\*' if this adjustment uses the same factors as the factory adjustment. This is the case after the subsequent storage of a measurement uncertainty during active factory adjustment.

### Sensor Information > Common

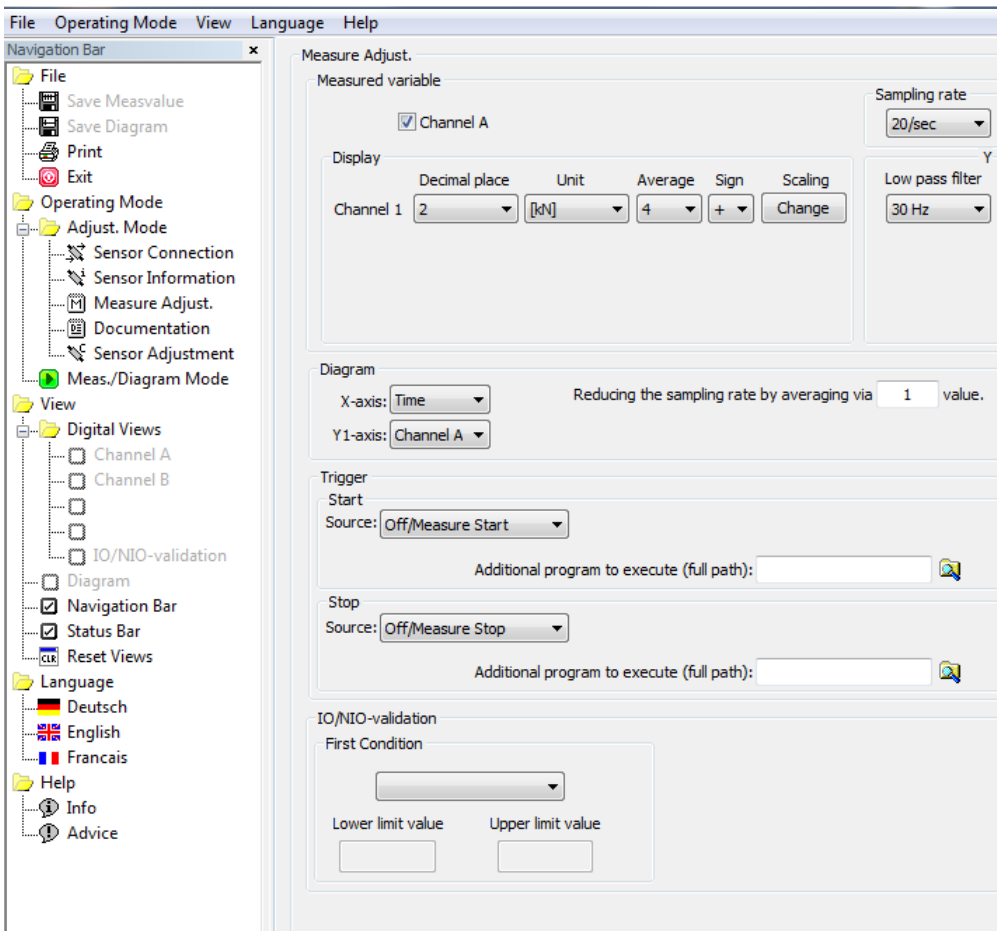
In addition to the invariable factory parameters such as sensor type, ID, revision and factory calibration, information about the activated device is also stored here.

Under the heading "Sensor" you will find in brackets the name of the device with the sensor type.

### Sensor Information > Channel

These fields contain information about the measuring channel. The serial number of the CA-USB is preset. The serial number of the channel can be changed by the user, if eg. B. the serial number of the connected sensor should be stored. Possible characters are uppercase and lowercase letters from A to Z and numbers from 0 to 9.

## 4.2.3 Measurement Adjustment



In this dialog box all measuring adjustments can be viewed and changed. The measurement adjustments are subdivided into measured variable, diagram, trigger and OK/NOK - evaluation. Except for the serial number, these adjustments will be accepted without confirmation.

The adjustments in

**Measured variable > Type, Measured variable > Sampling rate, Measured variable > Display and Measured variable > Diagram > Reducing the sampling rate by averaging via X values**

are sensor related data and are saved in the sensor. Herewith an automatic configuration of the software to the connected sensor is warranted.

When the application is finished, the previously not mentioned values are stored in the Windows registry under the logged in user and restored after a restart of the software.

## Measure Adjust. > Measured Variable > Low Pass Filter

The integrated analog input filter is configured with this setting.

The following 3 dBc frequencies are adjustable: 30 Hz, 300 Hz, 1000 Hz, 3000 Hz.

## Measure Adjust. > Measured Value > Sampling Rate

Following measuring/sampling rates are adjustable: 5000/sec, 2500/sec, 1250/sec, 1000/sec, 500/sec, 250/sec, 200/sec, 185/sec, 100/sec, 50/sec, 33/sec, 25/sec, 20/sec, 10/sec, 1/sec, 50/min, 20/min, 10/min, 1/min.

The maximal adjustable sampling rate is depending on the adjusted baud rate and the PC system (4.2.1. Sensor Connection-Baud Rate).

## Measured Adjust. > Measured Variable > Display

The connected CA-USB will be displayed as channel 1.

Display	Decimal place	Unit	Average	Sign	Scaling
Channel 1	2	[kN]	4	+	Change

The adjustments under 'Measured variable > Display' determine the output and display of the respective channel. Hereby, the number of decimal places, the unit, gliding averaging and the leading sign can be selected and configured.

Up to four decimal places can be indicated for every physical size. This adjustment is considered in the digital displays, in the diagram and in the readout of the CSV-file. For the adjustment of the unit of a physical size, German, English and American units can be selected.

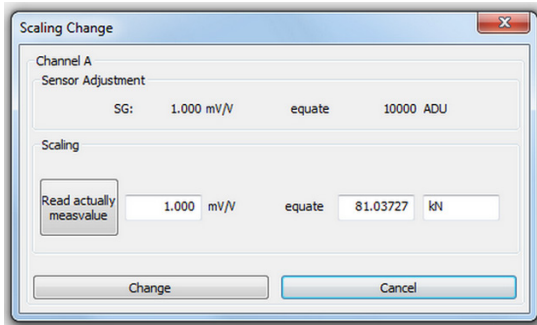
The conversion onto the adjusted unit is automatically carried out by the software. The under "Scaling" additionally defined unit is shown in square brackets. A gliding average can be formed for each physical size of 1 to 512 values, with a grading in raster  $2^n$  of the adjusted sampling rate. The leading sign of the channel is predefined in the sensor and can be changed through the adjustment 'Measured variable > Display > Sign'\*.

Key 'Change' under Scaling opens a dialog which allows scaling as well as the definition of an additional unit. In the choice box 'Measured variable > Display > Unit', the additional unit is marked with square brackets.

## Note

\* If no scaling was stored, 'Create' will appear instead of 'Change' and the selection in the unit box is limited to the device type without an additional unit.





In dialog 'Scaling Change' the input variable (see image 'Scaling Change') can be scaled with an arbitrary unit. The 'Sensor adjustment' displays the defined proprietary calibration and/or the user adjustment of the channel. In the figure, channel A is selected with the input quantity DMS which outputs the nominal value 10000 ADU at 1000 mV / V.

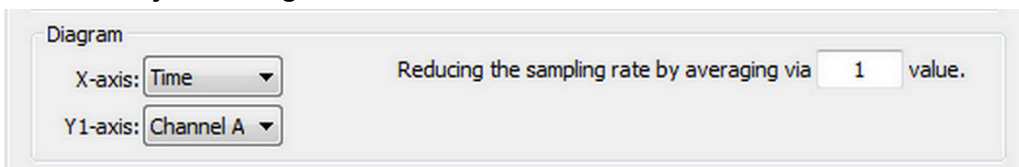
With the help of the input fields in the box Scaling a rescaling of these values can be performed.

In the left input box either a certain force value can be entered or the actual measured value of the sensor can be read. In the middle input field, enter the new output value that corresponds to the input value from the left field. In the right input box a unit with a maximum length of 5 digits can be entered. By pressing key **Change**, these inputs will be saved in the sensor. The application sets the newly defined under, **Measure > Representation > Unit** .

## Note

The closer the scaling value to the final value of the sensor, the more precisely is the display of the measured value during the measurement.

## Measure Adjust. > Diagram



In input box 'Reducing the sampling rate by averaging via X values' it is possible to decrease the measuring points which should be saved by entering a value for X. Hence, the adjusted sampling rate e.g. 200/sec at X=10 will be reduced to 20 displayed values in the diagram. This is also valid for storing the measured values in a file. When reducing the sampling rate, an averaging over the last X values is carried out.

## Note

- The adjustment 'Reducing the sampling rate by averaging via X values.' has no effect on the represented values in the digital displays.
- The adjustments under 4.2.3 Measure Adjust. > Measured variable > Display > Average of the individual physical sizes and the adjustment 'Reducing the sampling rate by averaging via X values.' act cumulatively.
- When the diagram is updated during a running measurement, the complete measurement is displayed at a resulting measurement rate less than or equal to 20 measurements per second. At measurement rates above 20 measurements per second, only the last minute of the measurement is displayed. After completing a measurement, the complete measurement is always displayed in the diagram.

When setting this configuration, the X axis should be started. As a result of setting the X-axis, the application updates the number of Y-axes and their selectable content.

All combinations of the measured quantities can be shown in the diagram.

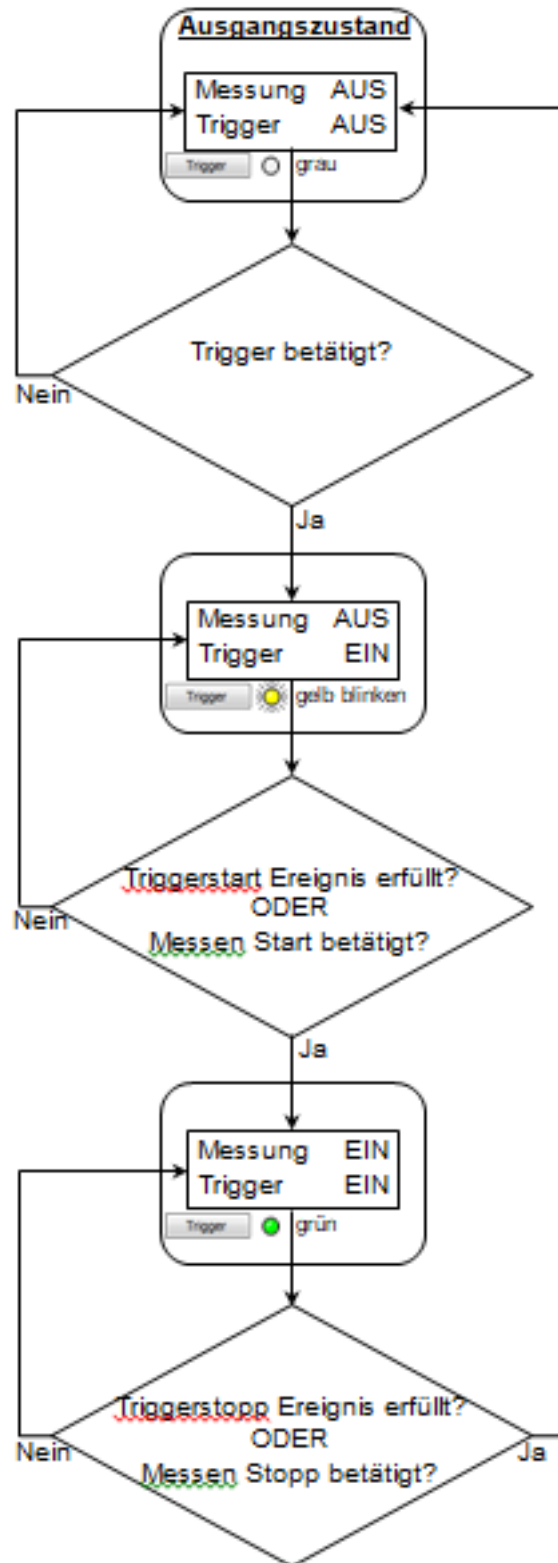
## Attention!

The measured values are written to the CSV file. The order of writing is: [X-axis], [Y1-axis], [Y2-axis]. It is also possible to set Y-axis to 'Off' if it is not needed. However, the application takes care that at least one size on the Y-axis is not off.

## Measure Adjust. > Trigger

Course:

1. Select a start event.
2. Select a stop event.
3. Enter Trigger key.
4. Actuate a trigger start event.
5. Actuate a trigger stop event.
6. Measurement recorded.



In the previous signal flowchart, the general course of measurement by means of a triggering is described. The activation button **'Trigger'** can be found in the **'Meas./Diagram Mode'** under **'Measure Stop'**. The software triggering consists of two events which are adjustable according to the requirements as follows:

- **Trigger Start > Source:**

- **Off/Measure Start:**

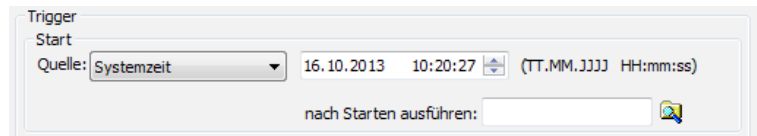
Entering 'Measure Start' releases the Trigger start event. (The function to start an event can also be entered in the following sources).

- **Channel A:**

4.2.3. Trigger

- **System time:**

The application shows an input box where the date and the time of the measurement start can be adjusted. The adjustment is limited to the current time plus 15 seconds. These values must be re-adjusted after each measurement; otherwise the following measurement will start immediately by pressing the trigger, because the previously adjusted time lies in the past



- **Trigger Stop > Source:**

- **Off/Measure Stop:**

Entering 'Measure Stop' releases the Trigger stop event. (The function to stop an event can also be entered in the following sources)

- **Channel A:**

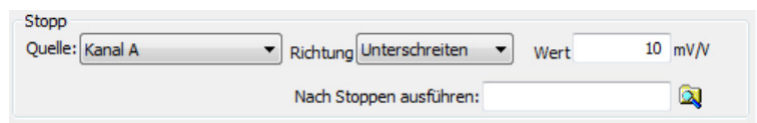
4.2.3. Trigger

- **Measurement Duration:**

For this selection an input box is available. The time unit (seconds, minutes) is taken from the sampling rate. The number of measurements is calculated and displayed by the application next to the input box.

- **Number of Measurements:**

For this selection, an input box is available to indicate the number of measuring points. The measurement duration is displayed and calculated next to the input box. The time unit (seconds, minutes) is taken from the sampling rate.



## Note

The source adjustments of trigger start and trigger stop can be optionally combined with each other. The adjustments "Measurement duration" and "Number of measurements" refer to the adjusted sampling rate and not to the reduction of the sampling rate.

### After Executing Start/Stop:

Two trigger events can be assigned actions through these fields. After the event occurrence and/or evaluation and storage actions, the program specified in this field will be executed.

Any executable files and batch files are admissible. These files can be manually specified with full path or selected via requester through the folder icon.

## Trigger

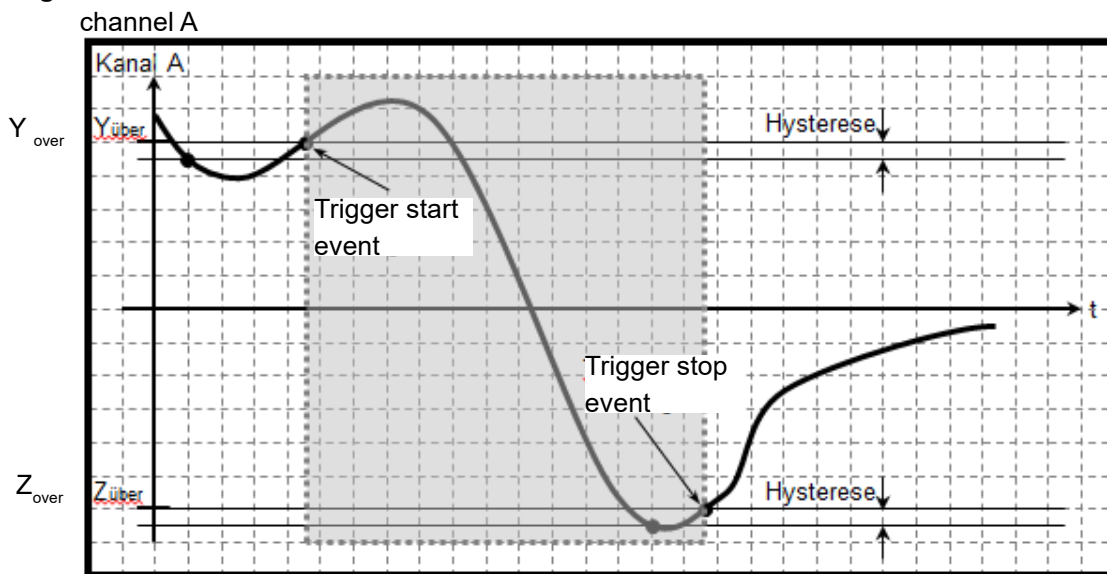
The picture on the following page shows an example of how a measurement by means of triggering can be recorded to a physical variable. At excess, the hysteresis value will be deducted from the threshold and at under-run it will be added.

At this triggering not only the value of threshold ( $Y_{\text{over}}$ ;  $Z_{\text{over}}$ ) of a physical variable, but also a direction must be indicated. In the example diagram, the direction 'over run' is triggered. This means that the measured value must drop below the hysteresis value first, before the trigger is responsive to the exceeding of the threshold. In contrast, the setting "drop below" means that the measured value must rise over the hysteresis value before the trigger is responsive to dropping below the threshold value.

The grey boxed area of the example diagram corresponds to the display in the diagram of the VS3 after the measurement. This area can be saved in a CSV-file.

- $Y_{\text{over}}$  = Trigger start value of a physical variable with directional adjustment 'over run'
- $Z_{\text{over}}$  = Trigger stop value of a physical variable with directional adjustment 'under run'

## Example Diagram



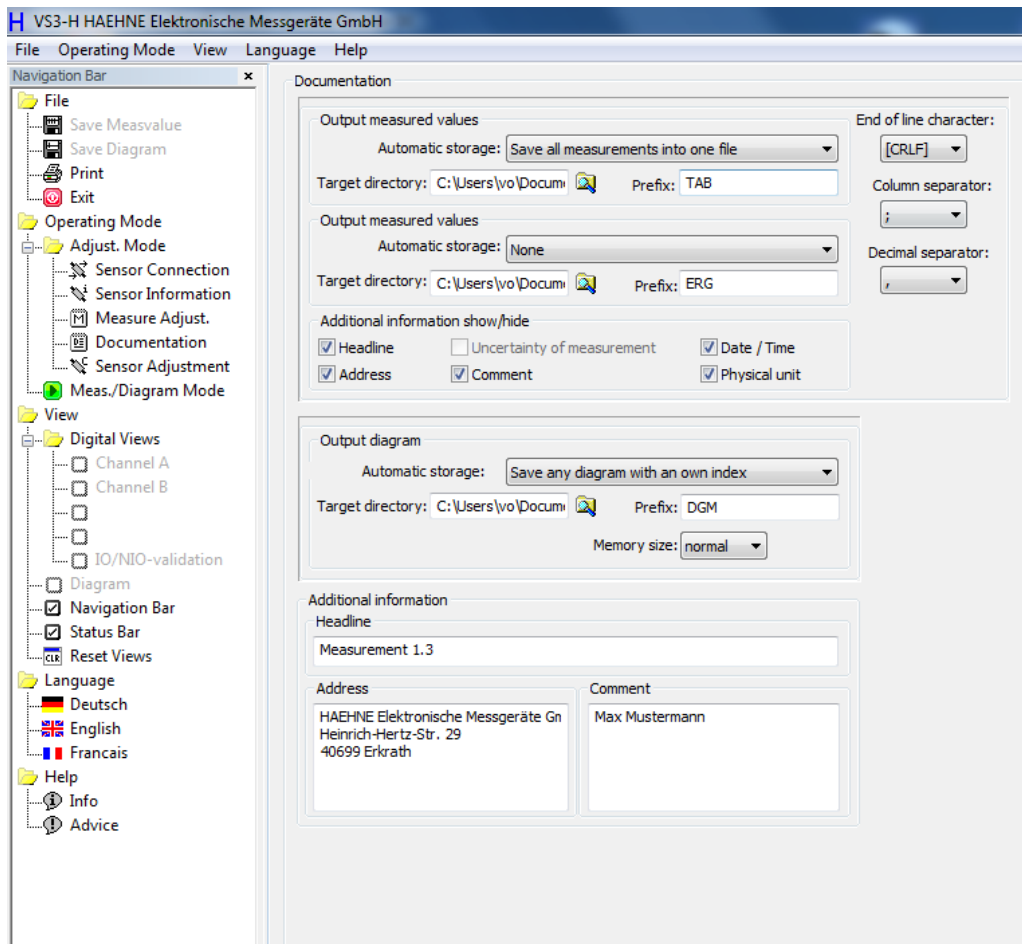
## Hysteresis

The size of the hysteresis is 1% of the specified maximum input value.

## Measurement Adjustments > OK/NOK Evaluation

These settings affect the evaluation of a measurement series. After a trigger stop event occurs, the max. values of these measurement series are determined and compared with the stored limits. In order to obtain an OK-display, the max. value of a measurement series must be above the lower and below the upper limit. If two conditions are defined, both conditions must meet the OK criteria for a total OK-display.

## 4.2.4 Documentation



Here, the user can carry out documentation configuration. The adjustments refer to the storage of measurements as BMP and/or CSV-file.

### Documentation > Output Measured Values

- **Automatic Storage:**

The storage of the measured value into an output file can occur automatically by the software.

Three adjustment possibilities can be selected:

- **None:** The automatic storage is disabled.
- **Save all measurements into one file:** This option files each measurement in the same CSV-file at the end. The name from the prefix field is used as the file name. The file is saved in the registered target directory.
- **Save each measurement with its own index:** This option creates a separate CSV-file at the end of each measurement. The file name consists of the prefix and the index `YYYYMMDDHHmmss####` ('####' number beginning with leading zeros 0000; 0001; ...)
- The **path length** is limited by the operating system.



Definition „Measurement“ (4.1.1)  
File > Save Measured Value (Shortcut ,Strg+M')

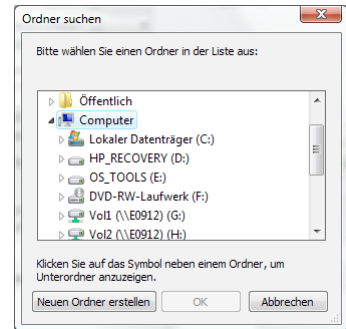
- **Target Directory:**

The target path is entered in 'Target directory' (Standard adjustment ...\ <user name>\My documents\VS3-H).

Likewise you can click on the folder and select a directory.

- **Prefix:**

Please enter the file name which is used for the automatic storage in this input box. (Further details about file name/prefix can be found under headline "Automatic Storage").



## Documentation > Output Diagram

- **Automatic Storage:**

The software can automatically save the diagram in an output file. For this, three adjustment possibilities are available:

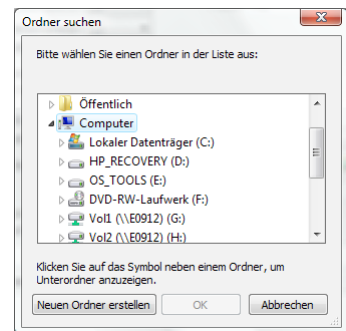
- **None:** the automatic storage is disabled.
- **Write all measurements to a file:** This option attaches every further measurement to the same CSV file at the end. The name from the Prefix field is used as the file name. The file is saved in the entered destination directory.
- **Save any diagram with an own index:** this option creates a separate BMP-file at the end of each measurement. The file name is a combination of the prefix and the index YYYYMMTTHHmms##### ('#####' number beginning with leading zeros 0000; 0001; ...).  
The **path length** is limited by the running system.

- **Target Directory:**

The target path is registered in 'Target directory' (standard adjustment ...\ <user name>\my documents\VS3-H). Instead of this, you can click on the folder and select a directory.

- **Prefix:**

Enter the file name which shall be used for the automatic storage in this input box (further details regarding file name/prefix can be found under the headline 'Automatic Storage').



## Common Settings Output Values and Output OK/NOK-Evaluation

- **End of line character:**

The desired line ending mark for the output in a file gets adjusted in this box.

Following possibilities can be selected:

**CRLF:** Carriage Return / Line Feed Carriage return line feed (MS-DOS, Windows)

**LFCR:** Line Feed / Carriage Return Line feed carriage return (Linux Konsole)

**CR:** Carriage Return Carriage return (Apple II, Apple Mac OS up to Version 9)

**LF:** Line Feed Line feed (Unix-Derivate, Mac OS X)

- **Column separator:**

The column delimiter will be read out at the first execution of the application from Windows system control (country selection) and will be set accordingly.

At each further restart of the application, the previously adjusted delimiter will be used.

Following selection is possible in this box:

**TAB :** Tabulator

**;** : Semicolon

**,** : Comma

**.** : Point

**Space :** Space character

- **Decimal Separator:**

The decimal delimiter is carried out the same way as described for the column separator. Following selection is possible in this box:

- , : Comma
- . : Point



Supplementary changes of the country adjustments in the operating system have no influence on the once adjusted values of this software.

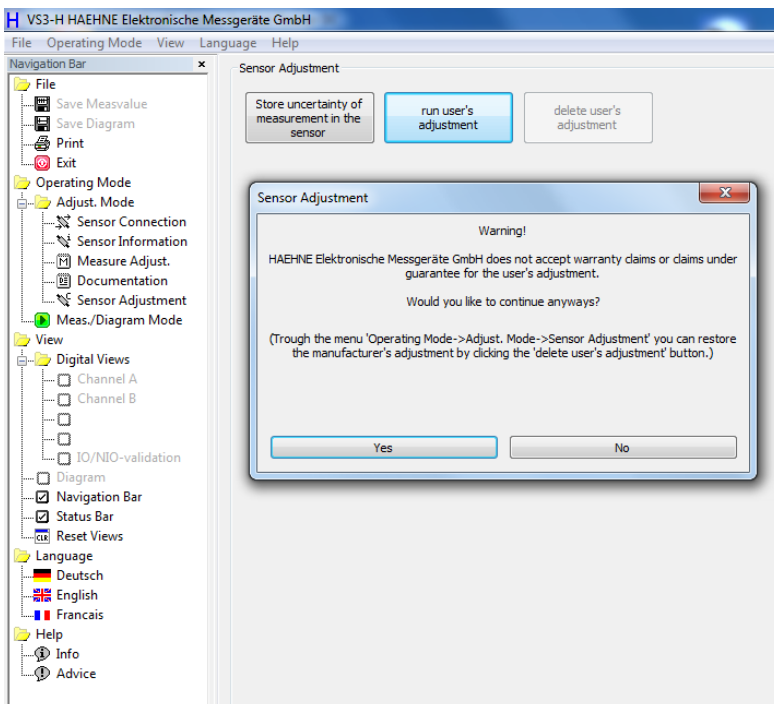
- **Additional Information Show / Hide:**

In this group, checkmarks can be placed to add further information to the output of measured values. The entries in the three entry boxes 'Headline', 'Address' and 'Comment' can be specified arbitrarily. With the checkmark, these entries will be recorded in the output file. The 'Uncertainty of measurement' - if the connected sensor has one - can also be displayed in the output file. By a checkmark in 'Date / Time' the measurement period can also be recorded in the output file. By a checkmark in 'Physical unit' it is also possible to systematically fade in/out the physical units in the output file.

### Documentation > Additional Information

This is free text which can be activated in 'Documentation > Output Measured Values > Additional Information show / hide'.

## 4.2.5 Sensor Adjustment



Here you can do three actions with the sensors:

Storage of the measurement uncertainty, adjustment and deletion of the user adjustment.

After deleting, the factory adjustment becomes current.

## Store Uncertainty of Measurement in the Sensor

In this dialog, a measurement uncertainty in % (for example with regard to nominal value or adjustment value) can be stored in the connected sensor. This size, if present, will be displayed in the Sensor Information dialog. Furthermore, the measurement uncertainty can be output in the CSV output file

(4.2.4. Documentation> Output Measured Values).

The value of the measurement uncertainty is usually determined during a factory or DKD calibration. If the factory calibration of the connected sensor is active and a value for the measurement uncertainty is given, then the sensor was subjected to factory or DKD calibration by HAEHNE GmbH. Permissible values of this size are [5%> Uncertainty> 0%]. The value of the measurement uncertainty is only for documentation. This value has no influence on the measured values.

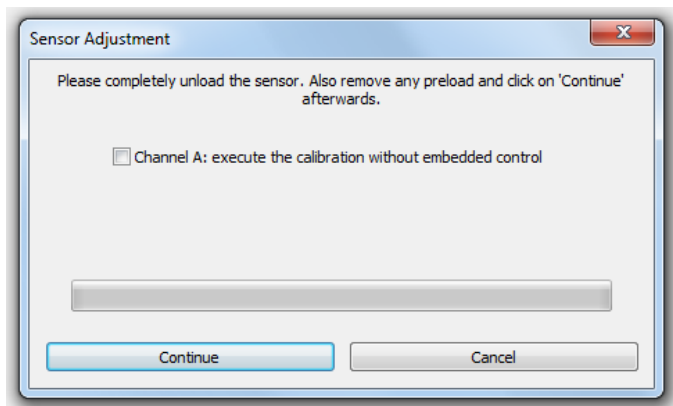
## Adjustment

In the factory setting, the following assignment is preset:  $\pm 3,000 \text{ mV / V}$  corresponds to  $\pm 30,000$  digits, or  $\pm 1,000 \text{ mV / V}$  correspond to  $\pm 10,000$  digits, etc.

In the "Adjustment" dialog, the CA-USB can be readjusted to the characteristic values according to the sensor assigned to it. The results are then stored in the device.

### Attention!

HAEHNE does not warrant or guarantee the user adjustment.  
A corresponding warning is issued!

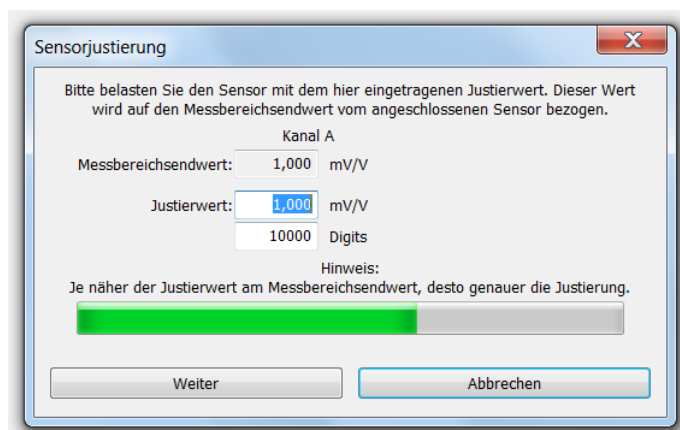


In this dialog box "Channel A: Perform the adjustment without built-in control".

In the next step, the sensor is loaded or unloaded.

Pressing the 'NEXT' button triggers the adjustment for the determination of the zero point.

At the end of this process, the next dialogue of the sensor adjustment will appear.



In this window the new adjustment values for the rated load (s) and ADU value (in the range between 5000 and 30000) are entered.

Pressing the button triggers the adjustment.

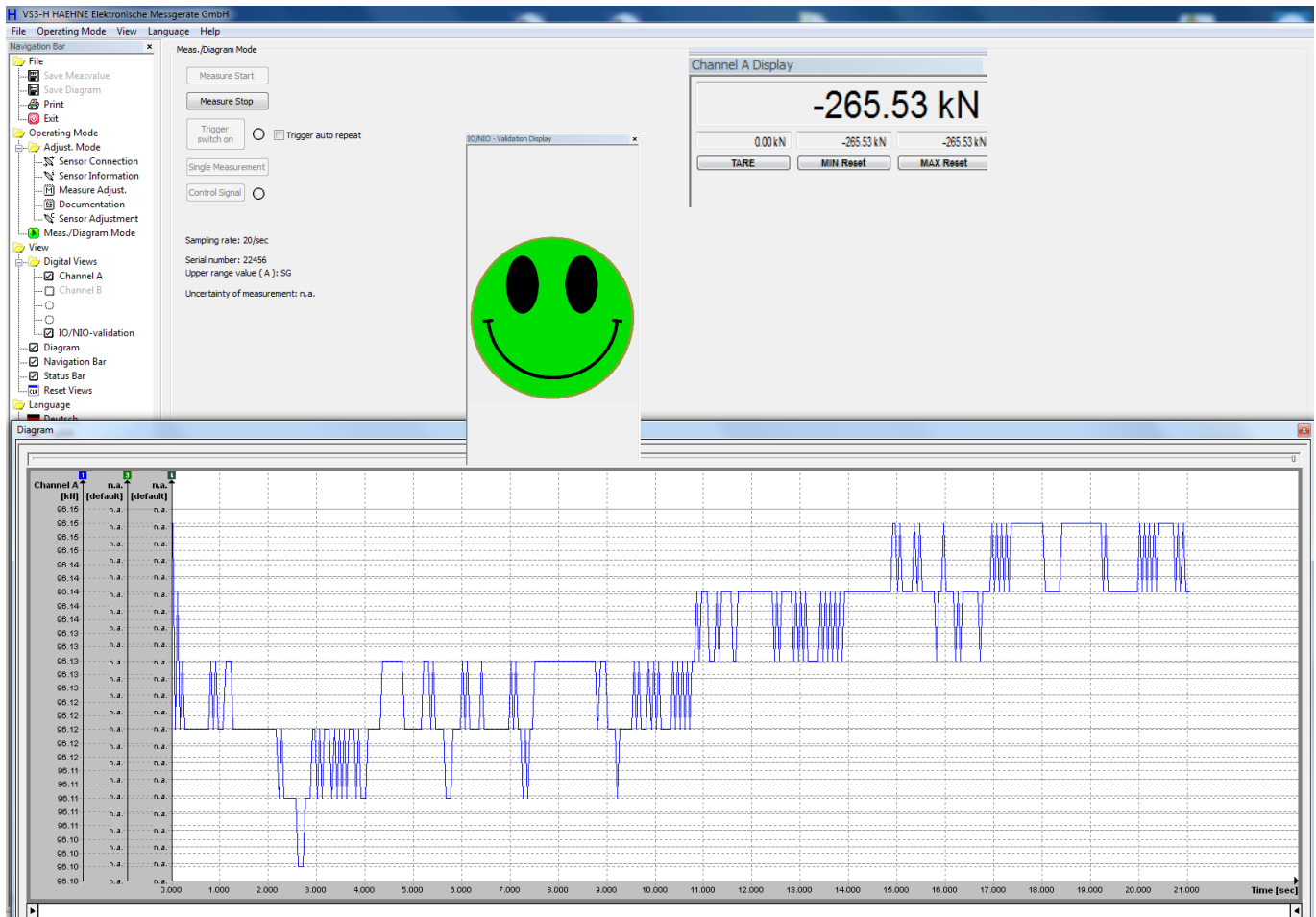
After the completion of this process, the adjustment is completed.



## 4.3 Meas./ Diagram Mode

**Attention!** 

During a measurement the data connection to the PC is allowed not be interrupted!



In 'Meas./Diagram mode' the digital displays of the physical variables and the diagram can be activated. Only the indicators that are ticked under 'Measurement Adjust.> Measured variable> Type' are activated.

Each, the digital displays and the diagram are in a separate window. These windows can be docked on the main window or they can freely be placed on the monitor. In order to scroll the windows, the mouse pointer must be placed on the title bar of the respective window. By keeping the left mouse key pressed, the window can be moved or docked. The contents of the window automatically adjusts to the size of the window. Pressing the 'Ctrl' key prevents docking with the main window.

Due to system-relevant restrictions under operating systems Windows 2000 and Windows XP it is not possible to draw the diagram out of the main window of the application. Also, with these operating systems, the application cannot be placed outside of the monitor. When trying, it will always go back to the visible workspace.

Each digital display has four output fields, one for the current measured value, the tare value, the minimum value and the maximum value. The minimum and maximum value can be reset by the buttons '**MIN Reset**' and '**MAX Reset**'. If the tare-button shows '**TARE**' and is kept pressed, this will set the current measured value to zero and the tare difference will be displayed above in the output field. Afterwards this button shows '**TARA=0**', the taring can be canceled again.

The OK/NOK display always shows the total of all defined criteria. If the criteria is met, a green indicator appears. If at least one criterion is not met, the indicator turns red. A grey indicator means that there is currently no evaluation, e.g. after start-up or after a new series of measurements was started.

## Measure Start:

With this button, a measurement gets started.

The digital displays and the diagram will be fed with measured values after pressing this button. Unnecessary keys are deactivated during the measurement. Also, the status of the application “Measuring...” is indicated in the status bar.

- > Software Trigger start event

## Measure Stop:

Can only be used during active measurement. As soon as the key was pressed, the measurement will be stopped and will initiate possible automatic storage (4.2.4 Documentation). At active automatic storage into a file, the progress is shown on the status bar as well as the idle state ‘Ready for use. Sensor connected’.

- > Software Trigger stop event

## Trigger:

This key activates a software triggering (4.2.3. Trigger). The status lamp on the side of the key blinks yellow at active triggering. By pressing again, the triggering will be deactivated.

Trigger LED	Condition
Grey	Trigger OFF
Yellow flashing	Trigger waits for a trigger start event. Only the digital displays are updated
Green	Trigger Measurement ON. Digital displays and diagram are updated with values.

## Trigger Auto Repeat:

If a tick is set, the trigger is reactivated as soon as all actions of the trigger stop event occur are processed for example: Write file.



**Note**

Activate only, if Auto Storage is active (4.2.4.) .

## Single Measurement:

With this key, a single current measured value gets requested from the active sensor. This function can only be carried out in the idle mode/measuring stop of the application.

## Control:

The button ‘Control’ is only activated during the measurement at low sampling rates (<20/sec) and in idle mode. With the help of Control, the measuring bridge in the sensor gets detuned and issues the nominal range. A red lamp next to the button indicates active control. By clicking on ‘Control’ again, it will be deactivated.

This function is no longer supported by *HAEHNE* sensors.

## Measuring Time / Sampling Rate:

The maximum measuring time depends on the sampling rate set in the menu Measurement Adjust  
Measurement Adjust. > Measured variable > Sampling rate (4.2.3)

After selecting a measurement duration, the measurement will be executed until the set time value has been reached after pressing "Measure Start". Once the measurement has been completed, a new measurement must be confirmed again with "Measure Start".

A measurement can be prematurely ended at any time with "Measure Stop".

Adjusted Sampling Rate	Maximal Meas. time	Alternatively selectable measuring times
5000 Meas./s	4 min	1min / 2 min
2500 Meas./s	8 min	1min / 2 min / 4 min
1250 Meas./s	16 min	1min / 2 min / 4 min / 8 min
1000 Meas./s	32 min	2 min / 4 min / 8 min / 16 min
500 Meas./s	1 h	4 min / 8 min / 16 min / 32 min
250 Meas./s	2 h	8 min / 16 min / 32 min / 1 h
200 Meas./s	2 h	10 min / 20 min / 40 min / 1 h
185 Meas./s	2 h	
100 Meas./s	5 h	20 min / 40 min / 1 h / 2 h
50 Meas./s	10 h	40 min / 1 h / 2 h / 5 h
33 Meas./s	16 h	1 h / 2 h / 4 h / 8 h
25 Meas./s	16 h	
20 Meas./s	16 h	
10 Meas./s	2 d	3 h / 6 h / 12 h / 1 d
1 Meas./s	16 d	1 d / 2 d / 4 d / 8 d
50 Meas./min	16 d	
20 Meas./min	64 d	4 d / 8 d / 16 d / 32 d
10 Meas./min	128 d	8 d / 16 d / 32 d / 64 d
1 Meas./min	480 d	30 d / 60 d / 120 d / 240 d

## 5 Debugging

This chart helps to find frequent errors and the measures for debugging.

<b>Error</b>	<b>Possible Cause</b>	<b>Debugging</b>
Application does not start	The operating system is WIN98 or older	Required operating system WIN XP / Vista / 7 - 10
	No driver for USB sensors	Follow the instructions for installing drivers for USB devices.
	Sensor is not connected to the PC	Connect the CA-USB to the PC
Sensor is connected to the PC but the application won't start or communication not available.	Driver problems or errors in the connection line	Close the application and unplug the connection cable between the sensor and the PC