Multi Analyzer & Research Software

User Manual

For Software Versions newer V0.0.127.27230

Edition May 2021

The MARS-Tool

Multi Analyser & Research Software Tool



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1 General

The MARS-Tool enables data logging of all relevant parameters from the sensor (chart and data).

The main user level of this software can read all parameters and set Zero- and Endpoint of the Gas Channels. It is also possible to turn on or off the radiation sources of the sensor.

Note:

To change the calibration coefficients and some other sensible parameters the user can type a password to entry into an advanced user mode. The password is given after request and only in special cases.

1.1 Surface Description Data Logging



Figure 1: Surface Description Data Logging Tab

1. Selects the serial COM port
2. Scans available sensor(s) and port(s)
3. Opens / closes selected COM port; reads configuration of sensor
4. Display of connected serial number
5. Display of sensor configuration
6. Selects / de-selects channel for logging and chart view
7. Channel and function designators, free editable (stored in configuration)
8. Measurement values
9. Colour for the plotted line (chart view)
10. Thickness of the plotted line (chart view)
11. Selects primary or secondary axis (chart view)
12. Storage path and file name for data logging file
13. Storage path for copy of data logging file to network (optional)
14. Time interval for logging the data in milli-seconds, minimum 100 msec
15. Starts / stops data logging into *.csv file
16. Interval for copy of data logging file to network (optional)
17. Starts copy of data logging file to network (optional)
18. Selects / de-selects all channels for logging and chart view
19. Sets all designators to default
20. Sets all channels to zero (with inert gas N_2, H_2)
21. Opens chart view in separate window
22. Reads all measurement values
23. Enables advanced user mode
24. Starts measurement cycle independently from data logging. Useful for chart view and direct feedback values
25. Received data frames
26. Restarts the complete sensor
27. Shows the measurement values in combination with a chart
28. Exits the software

1.2 Surface Description Basic Configuration

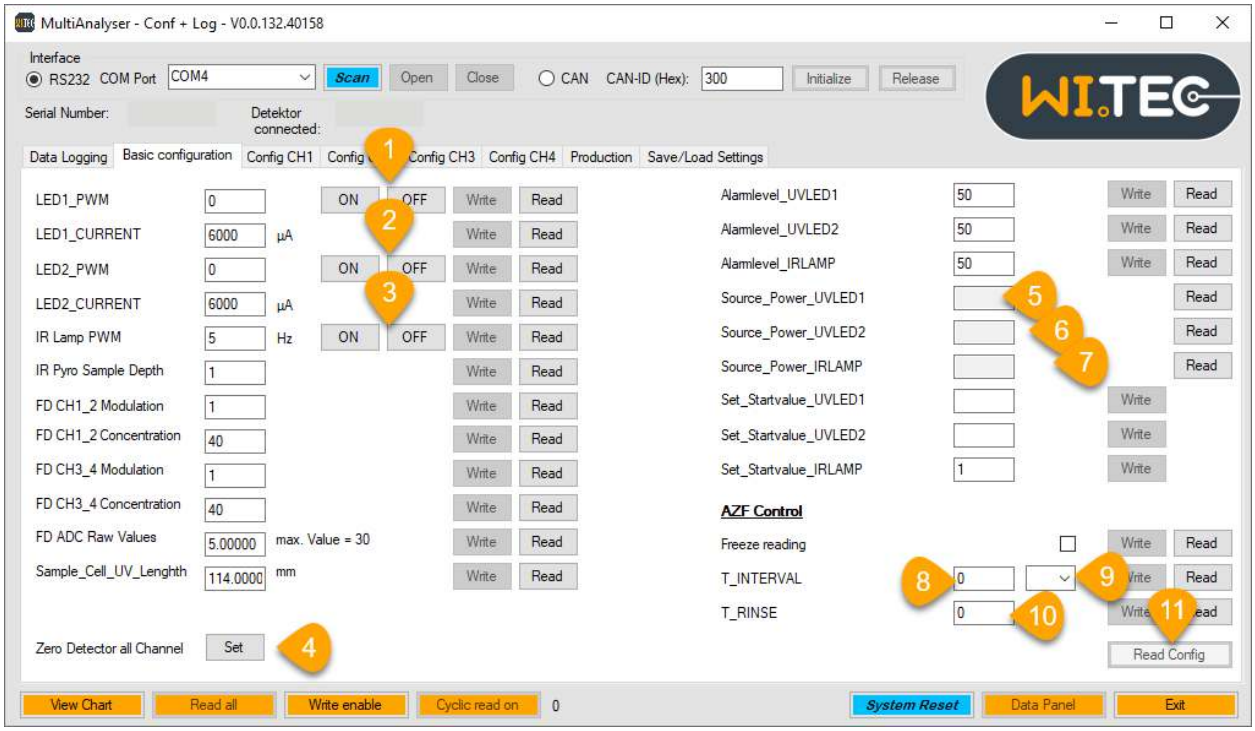


Figure 2: Surface Description of Basic configuration Tab

1. Turn on/off radiation source UV LED 1
2. Turn on/off radiation source UV LED 2
3. Turn on/off radiation source IR Source
4. Sets all channels to zero (with N_2, H_2)
5. Percentage of radiation power UV LED 1
6. Percentage of radiation power UV LED 2
7. Percentage of radiation power IR Source & EDL
   →indicators for aging

   Auto Zero Function (option):

8. Time interval in which the zero point is to be set
9. Selection of minutes(min) hours (hr) or days (d) for the time interval
10. Time in sec for how long the sensor should be rinsed at each interval
11. Reads all basic configuration settings

1.3 Surface Description Configuration

The Configuration tabs for the different gases are very similar to each other, but the marked fields are in the same place in each tab.

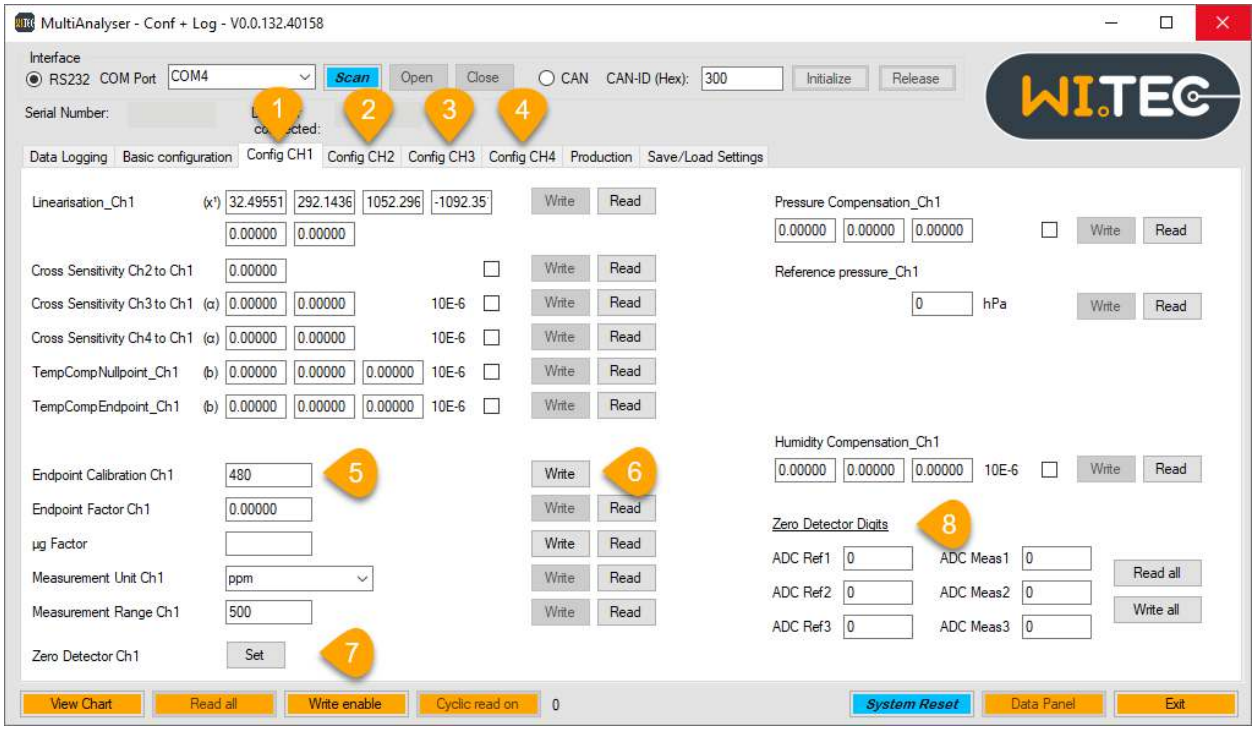


Figure 3: Surface Description of Config CH1 Tab

1. - 4. Config CH1 – CH4 Tab
5. Concentration of the test gas at the end point setting (may deviate max. ±10% F:S.)
6. Sets the endpoint
7. Sets the zero point only of the gas in which tab you are
   → important for carrier gas dependencies
8. Raw values after the last zero point setting

1.4 Surface Description Production

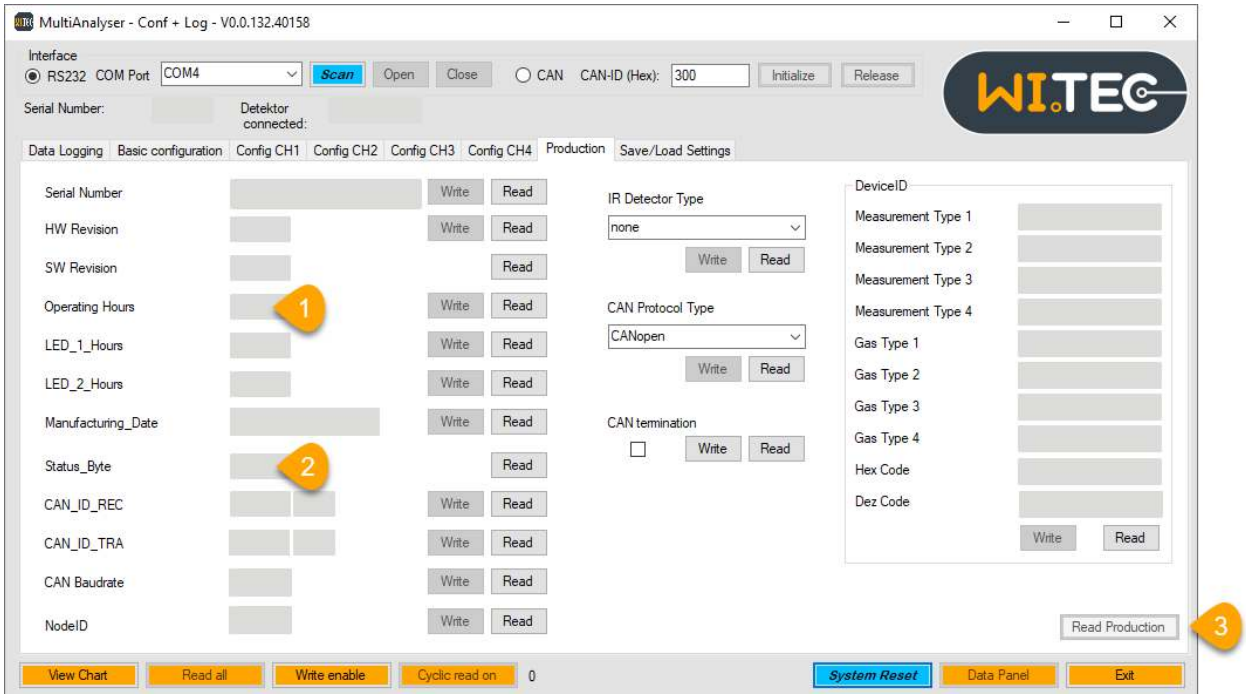


Figure 4:Surface Description of Production Tab

1. The counter for the operating hours of the sensor
2. The Status Byte of the sensor
3. Reads all production settings /information

1.4.1 Status Byte

IR /EDL detected	NA	UV LED1 detected	UV LED2 detected	IR /EDL Level error	NA	UV LED1 Level error	UV LED2 Level error			
Bit0	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Status code bin	Status code hex	Status code dez
0	1	0	0	1	1	1	1	11110010	4F	79
1	1	0	0	1	1	1	1	11110011	CF	207
1	1	0	0	0	1	1	1	11100011	C7	199
0	1	1	0	1	1	1	1	11110110	6F	111
0	1	1	0	1	1	0	1	10110110	6D	109
0	1	1	1	1	1	1	1	11111110	7F	127
0	1	1	1	1	1	0	0	00111110	7C	124
0	1	1	1	1	1	0	1	10111110	7D	125
0	1	1	1	1	1	1	0	01111110	7E	126
1	1	1	0	1	1	1	1	11110111	EF	239
1	1	1	0	0	1	0	1	10100111	E5	229
1	1	1	0	0	1	1	1	11100111	E7	231
1	1	1	0	1	1	0	1	10110111	ED	237
1	1	1	1	1	1	1	1	11111111	FF	255
1	1	1	1	0	1	0	0	00101111	F4	244
1	1	1	1	0	1	0	1	10101111	F5	245
1	1	1	1	0	1	1	1	11101111	F7	247
1	1	1	1	0	1	1	0	01101111	F6	246
1	1	1	1	1	1	0	0	00111111	FC	252

1.5 Surface Description Save/Load Settings

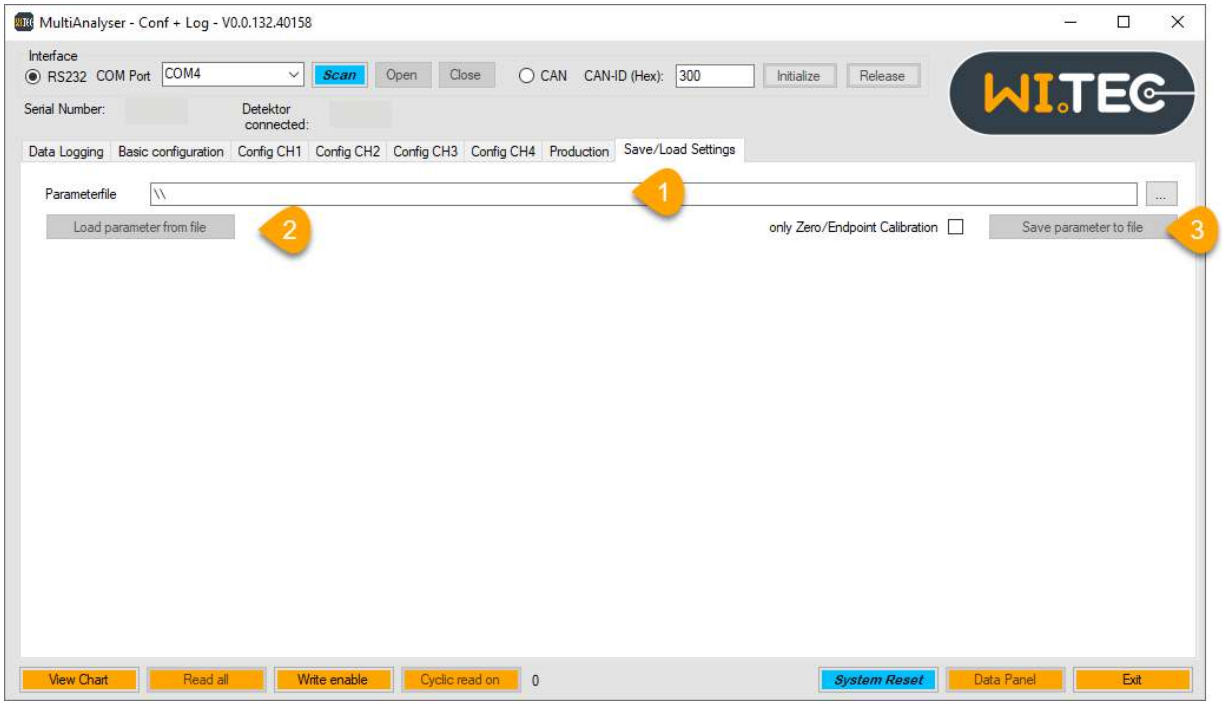


Figure 5: Surface Description of Save/Load Settings Tab

1. Storage path and file name for settings
2. Loads parameter from file
3. Saves parameter to file

2 Instructions

In every first delivery you will find in addition to your ordered sensor a data cable that goes from the sensor (Female IDC Connector 10pol/Female D-sub) to D-sub-Female, as well as a USB stick (host software, documentation, ...).

You need additionally to connect your sensor

- a power supply 24VDC (300mA, 2A for our thermobox module with heater)
- PC with Windows7 or newer
- USB to RS232 serial adapter (e.g. FTDI CHIPI-X10)

In Figure 6: Connection between the module and the PC/LaptopFigure 6 the connection between the module and the PC/Laptop is shown.



Figure 6: Connection between the module and the PC/Laptop

To know which gas is measured on which channel, each sensor gets a label on which this information and some more can be found.

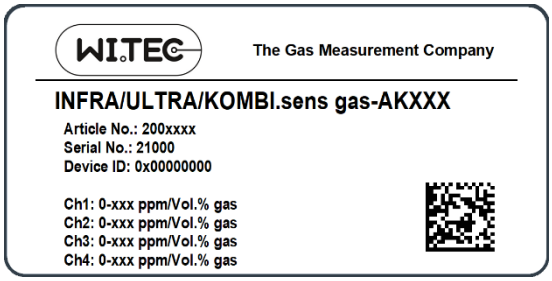


Figure 7: Label of Wi.Tec sensors

2.1 Starting the program

The program can be directly started from the directory it is not necessary to install anything.

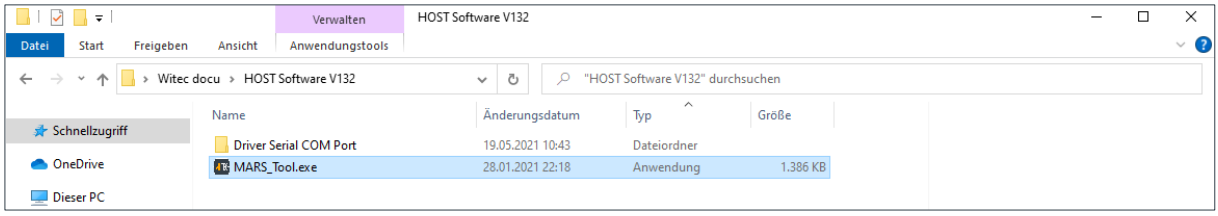


Figure 8: USB stick Witec docu → HOST Software V132 → MARS_Tool.exe

Right klick on MARS_Tool.exe and open with administration rights!

2.2 Connecting the Sensor

Connect the sensor with a serial data cable on the COM port and power the sensor

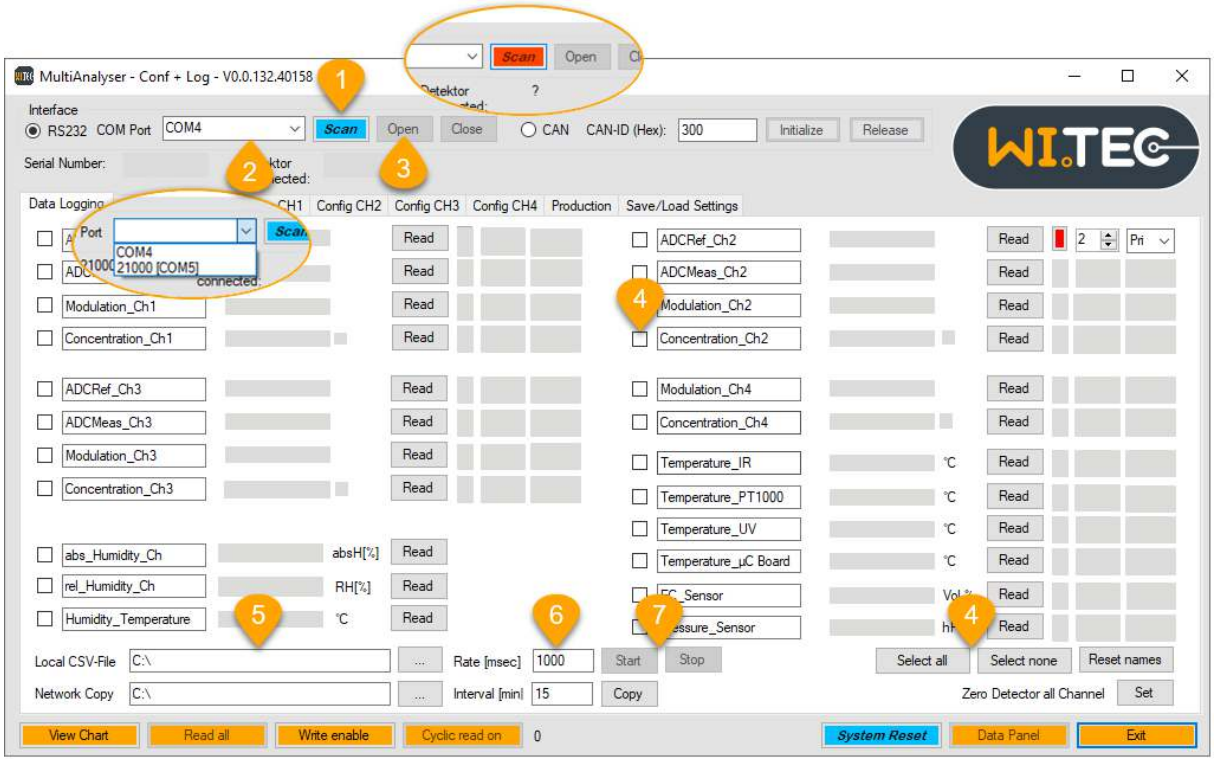


Figure 9: Starting a measurement

1. Click the button [scan] it will change from blue to red in the time when it scans the COM ports from your PC, when it is ready the button change to blue again
2. click on the dropdown menu and choose the serialnumber from your sensor you will find it on the label (see Figure 7) or on the sample cell
3. click the button [open] → serialnumber and sensor configuration are displayed
4. click on the button [Select all/ Select none] or the boxes from the gas channels (see Figure 7)
5. choose a storage path and file name for data logging file
6. choose a measurement interval (min. 100ms)

7. click the button [start], if the file already exists you can choose if the file will be overwritten or the new data will be attached to the old data
   click the button [stop] to stop the recording in the data file

2.3 Zero- and End-point calibration

For a high accurate gas measurement, it is necessary to check the zero point and span point on a regular basis.

- Zero Check every 24h
- Span Check every week

In case of a deviation (e.g. > 2% of span) the MARS Tool has a function to set the zero and span point easily.

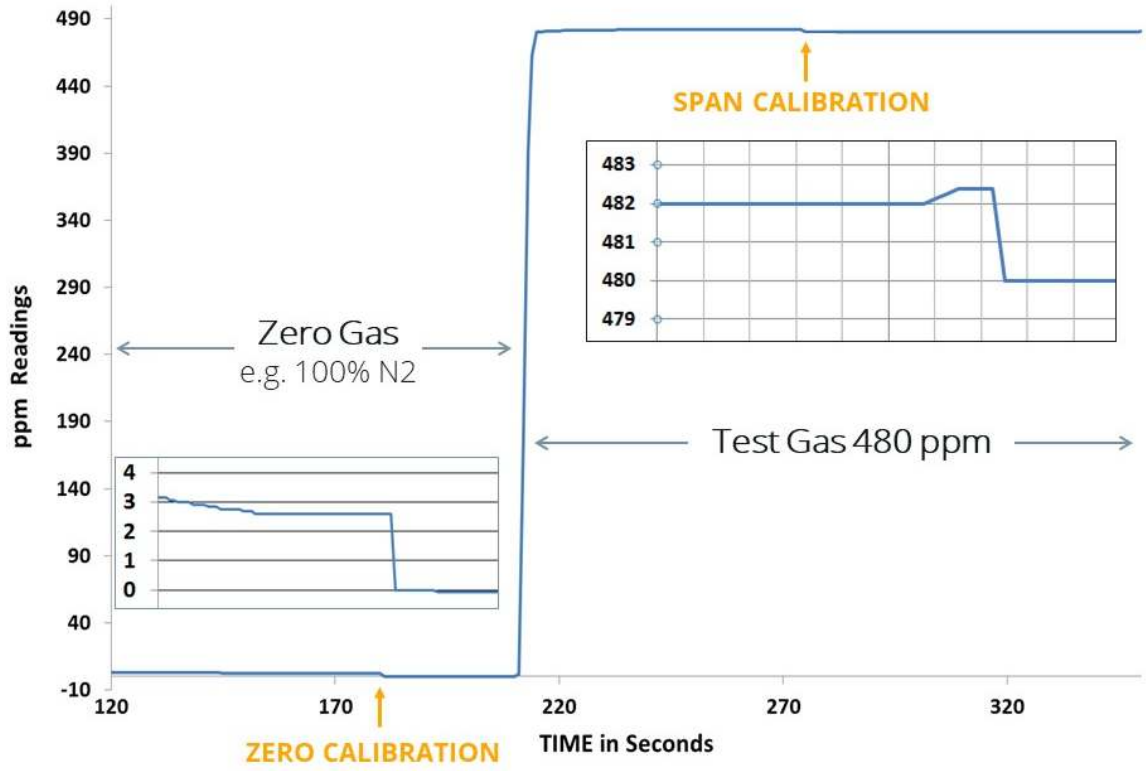


Figure 10: The behaviour of the concentration readings during zero and span point calibration

2.3.1 Zero-point calibration

Purge the entire gas measurement system with a sufficient volume (1l/min) of zero gas (e.g. N_2, Ar, H_2 or cleaned Air) and wait until the gas concentration reading is stable (<1% F.S.).

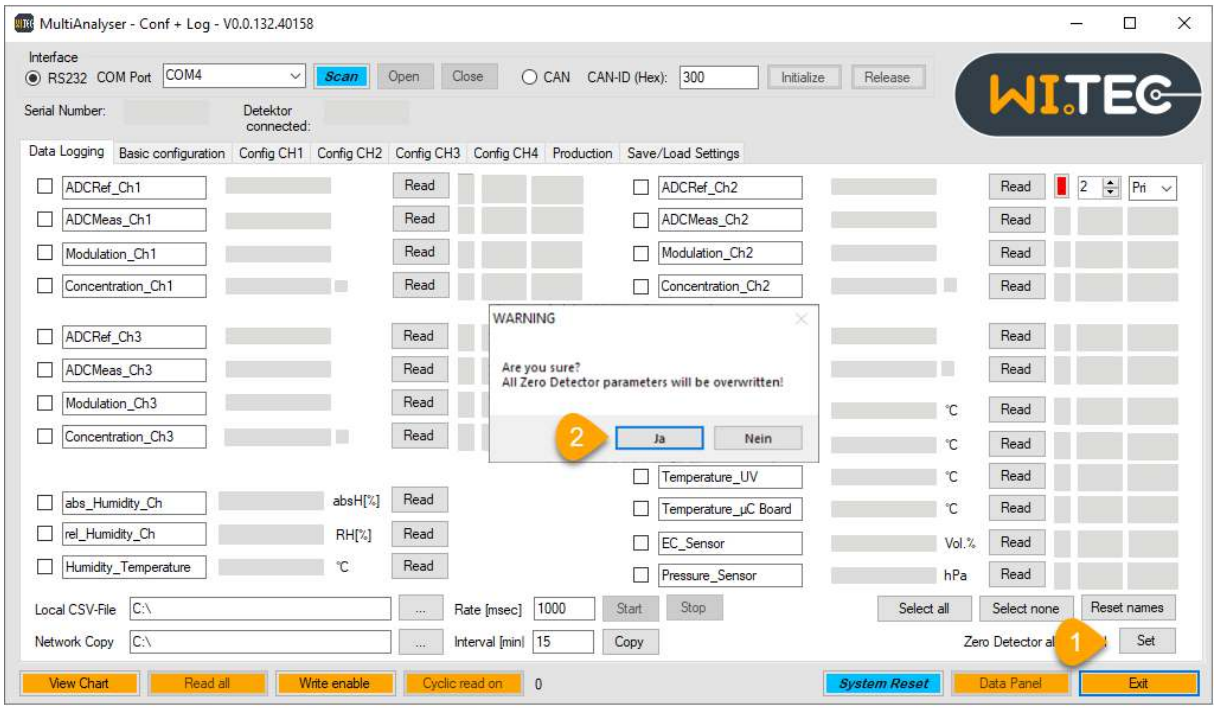


Figure 11: Zero-point calibration

1. click the button [Set] behind Zero Detector all Channel
2. click the button [ja] to do a zero-point calibration
   → the concentration reading is now 0.0000ppm

2.3.2 End-point calibration

For setting the endpoint it is necessary to use a well-known concentration of test gas. If you use a certified test gas bottle (cylinder) you will find the gas concentration value on the label or in the provided certificate (e.g. 480,00 ppm CO2)

- Before applying the end-point calibration, it is important to do a zero-point calibration with N_2 (inert gas) to set the offset to zero
- Make sure that the test gas concentration does not deviate more than 10% from F.S.
- Purge the entire gas measurement system with sufficient volume (1l/min) of test gas and wait until the gas concentration reading is stable (<1% of Span).

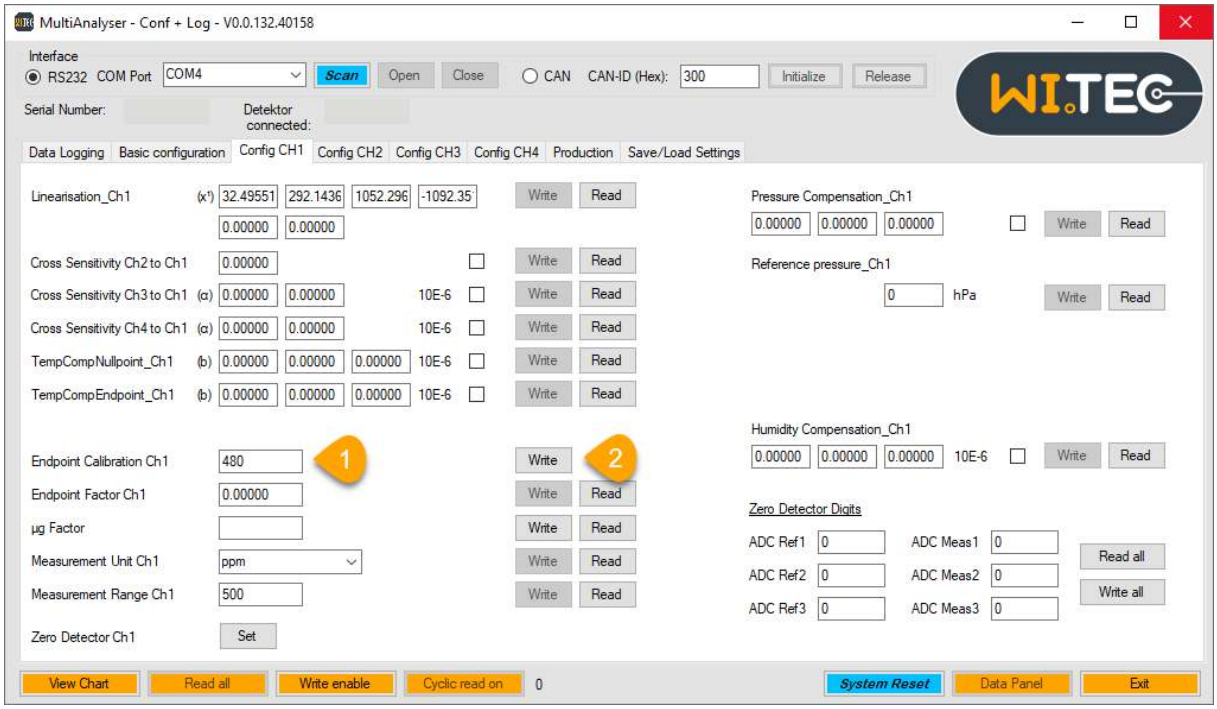


Figure 12: End-point calibration

1. type the flowing test gas concentration in the textbox
2. click the button [write] to do the endpoint calibration

2.4 Advanced User Mode

When you go into the advanced user mode you can change some additional parameters.

Basic configuration
- LED current
- Filter depth
- Alarm Level Sources
- AZF Settings

Config CHs
- Linearization Coefficients
- Temperature Compensation Coefficients
- Measurement Unit
- Measurement Range
- Cross Sensitivity
- µg Factor
- Pressure Compensation Fields

Save/Load Settings
- Save settings
- Reload zero/endpoint calibration
- Overwrite the complete settings with a new settings file (maintenance)

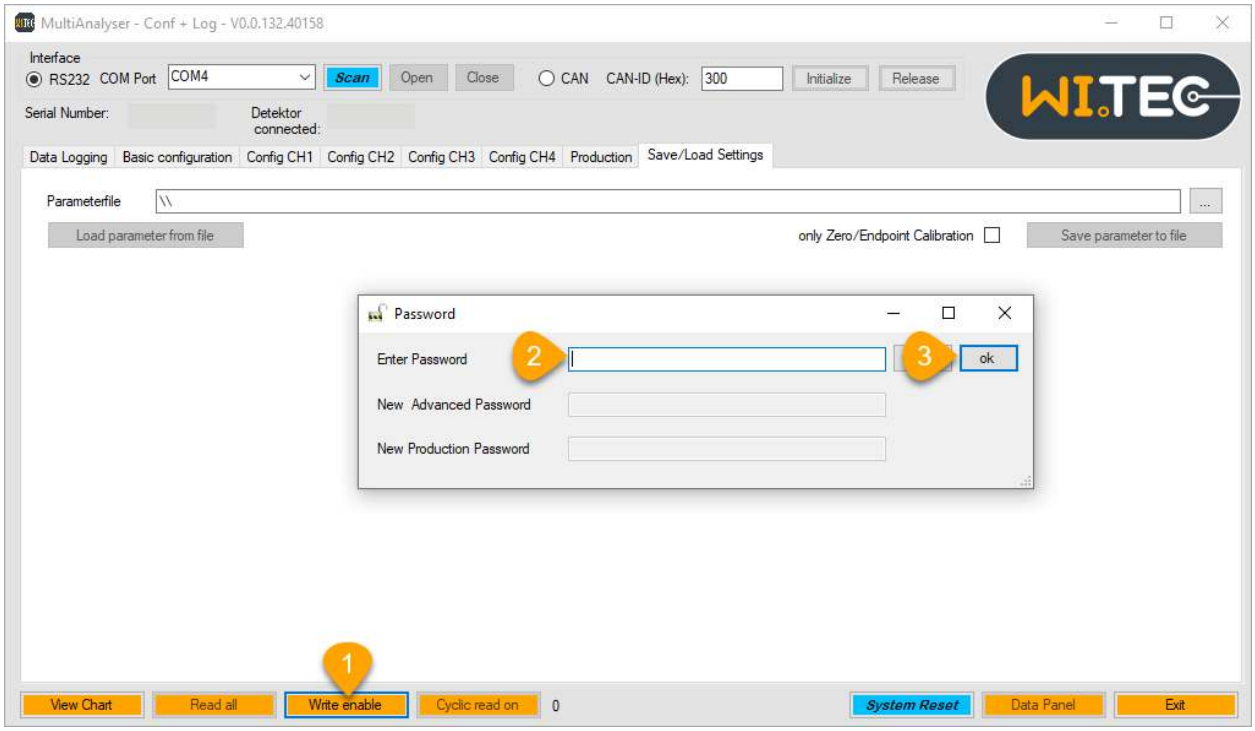


Figure 13: Change into advanced user mode

It does not matter in which tab you are.

1. Click the button [Write enable]
2. type the password in the line
3. click the button ok]

IMPORTANT:

Please save the sensor settings before changing the parameters (see sec. 2.5).

2.5 Save/Load the Sensor Settings

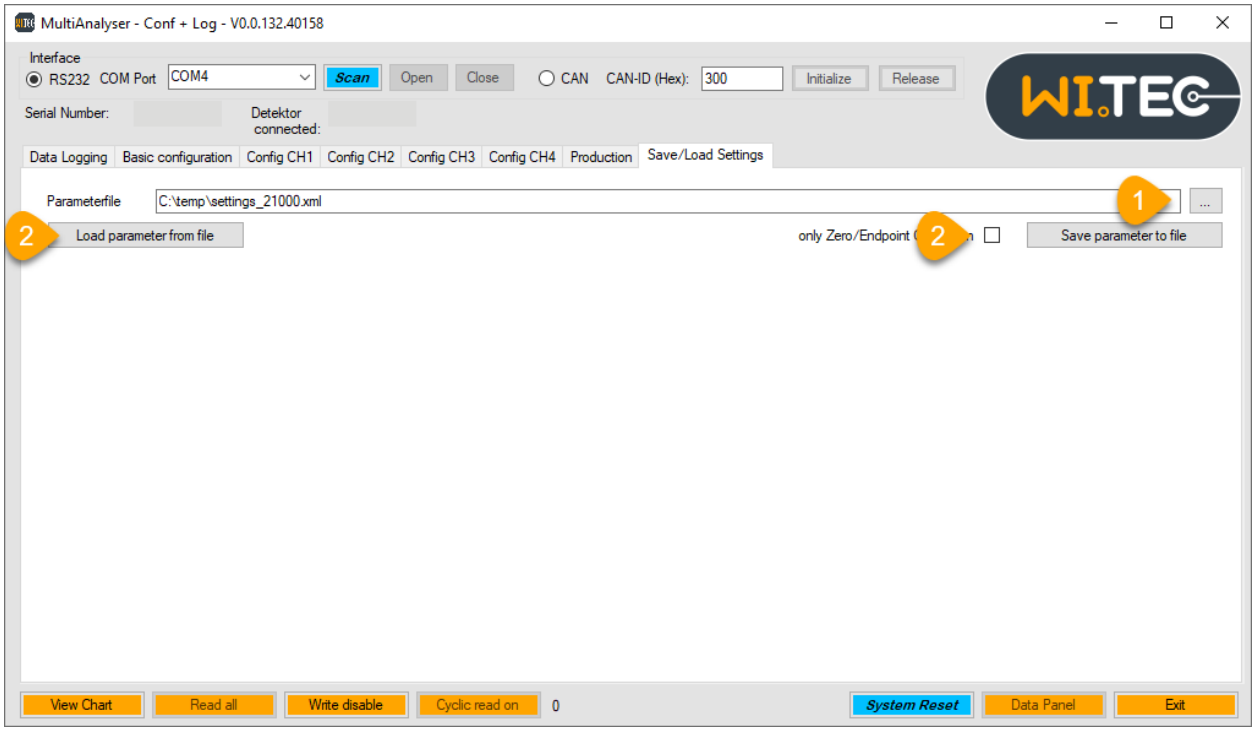


Figure 14: Save/Load settings

Save settings

1. Select a storage path and *.xml file name for the settings that you want to save
2. Click the button [save parameter to file]

Load settings

1. Select the storage path and the *.xml settings file that you want to load
   (optional) set the checkbox when just want to reset the Zero/endpoints
2. Click the button [Load parameter from file]

Note: The *.xml file can be edit with a standard XML viewer

2.6 Panel View with Data Panel

In this mode you are capable to show the relevant measurement signal in front panel design mode. This can be useful thing to demonstrate the measurement or make some diagnostics with the sensor.

To open the Data Panel click the button [Data Panel] (see Figure 1 button no. 27).

Note: before you can use the panel view you must have established a connection with the sensor (see sec. 2.2)

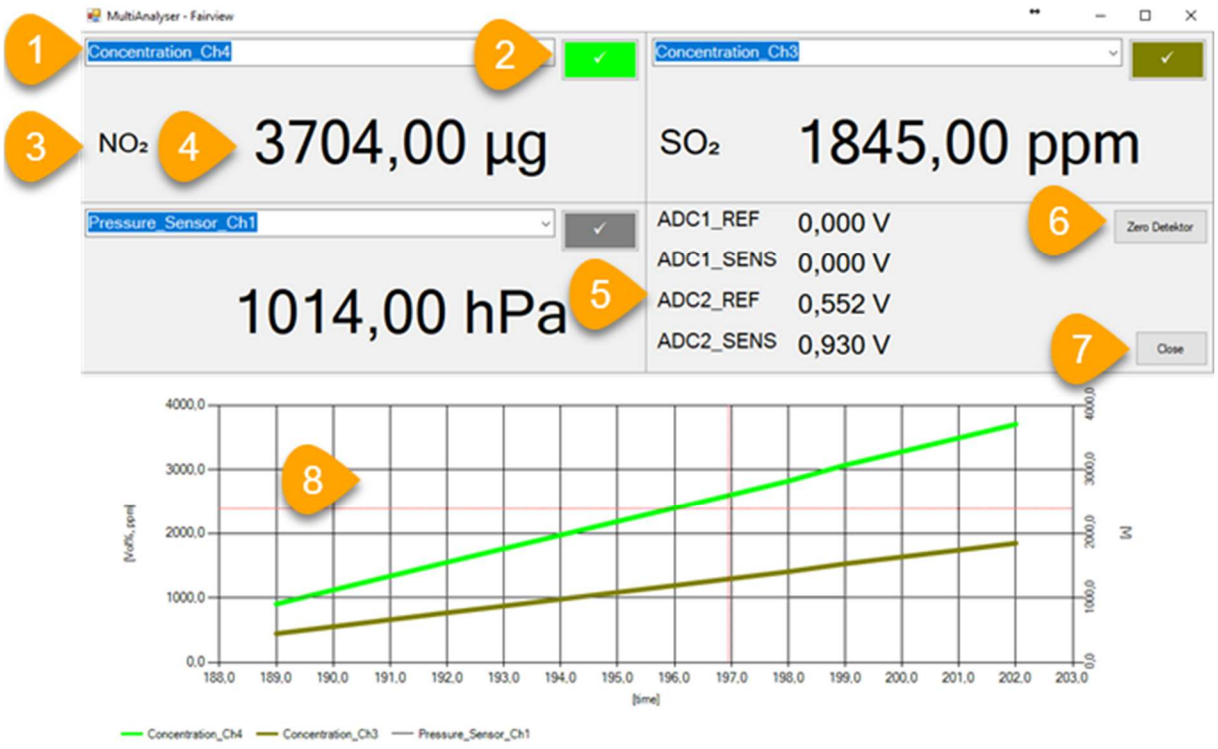


Figure 15: Data Panel View

1. Data Channel Selection
2. Activate/ deactivate data logging
3. Gas component of the selected channel
4. Actual gas concentration readings
5. Raw data values (preamp signals)
6. Sets all channels to zero (with inert gas N_2,H_2)
7. Closes panel view, the settings will be saved
8. Signal plot

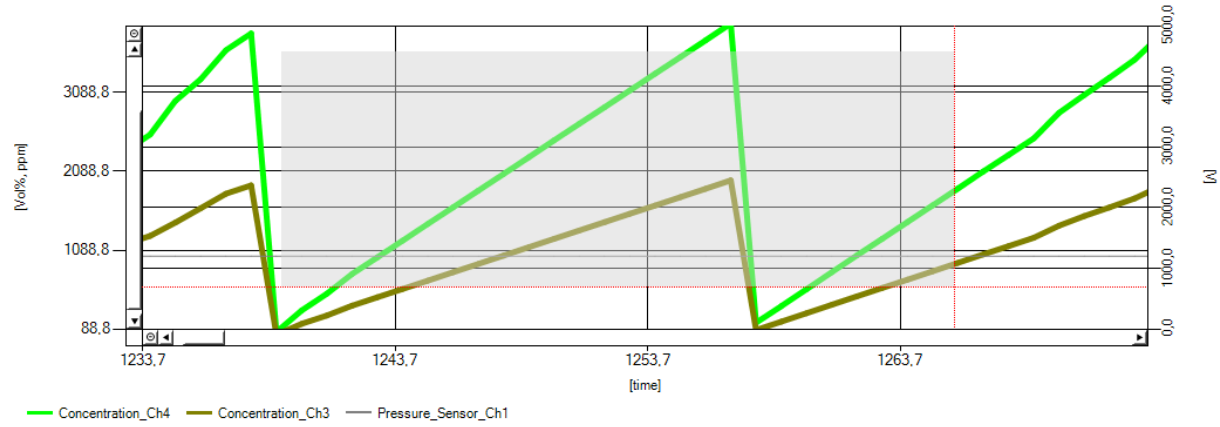


Figure 16: Data panel with zooming function

If you keep the left mouse button pressed you can select an area you want to zoom in.

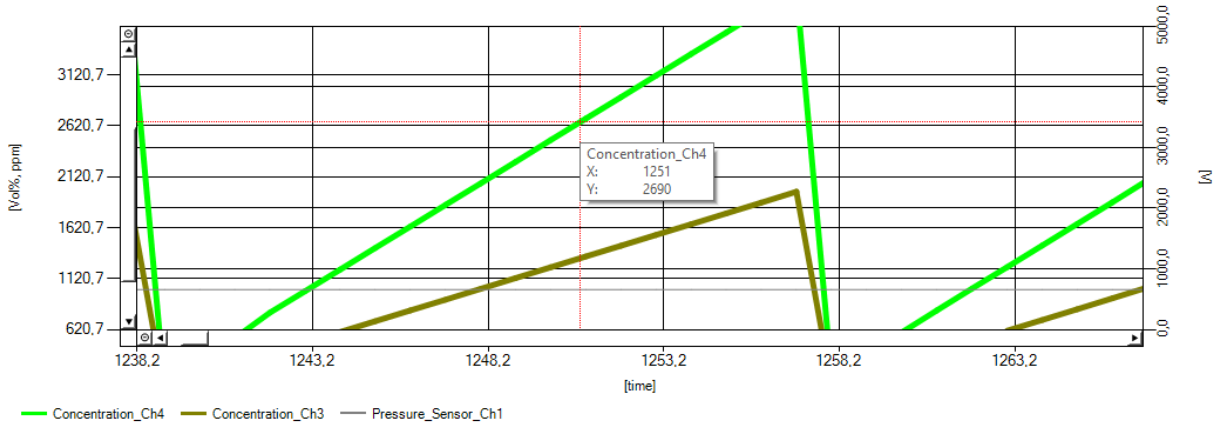


Figure 17: Data panel with label

If you move the mouse over the area, a label with the exact measurement values will be displayed.

NOTES:

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