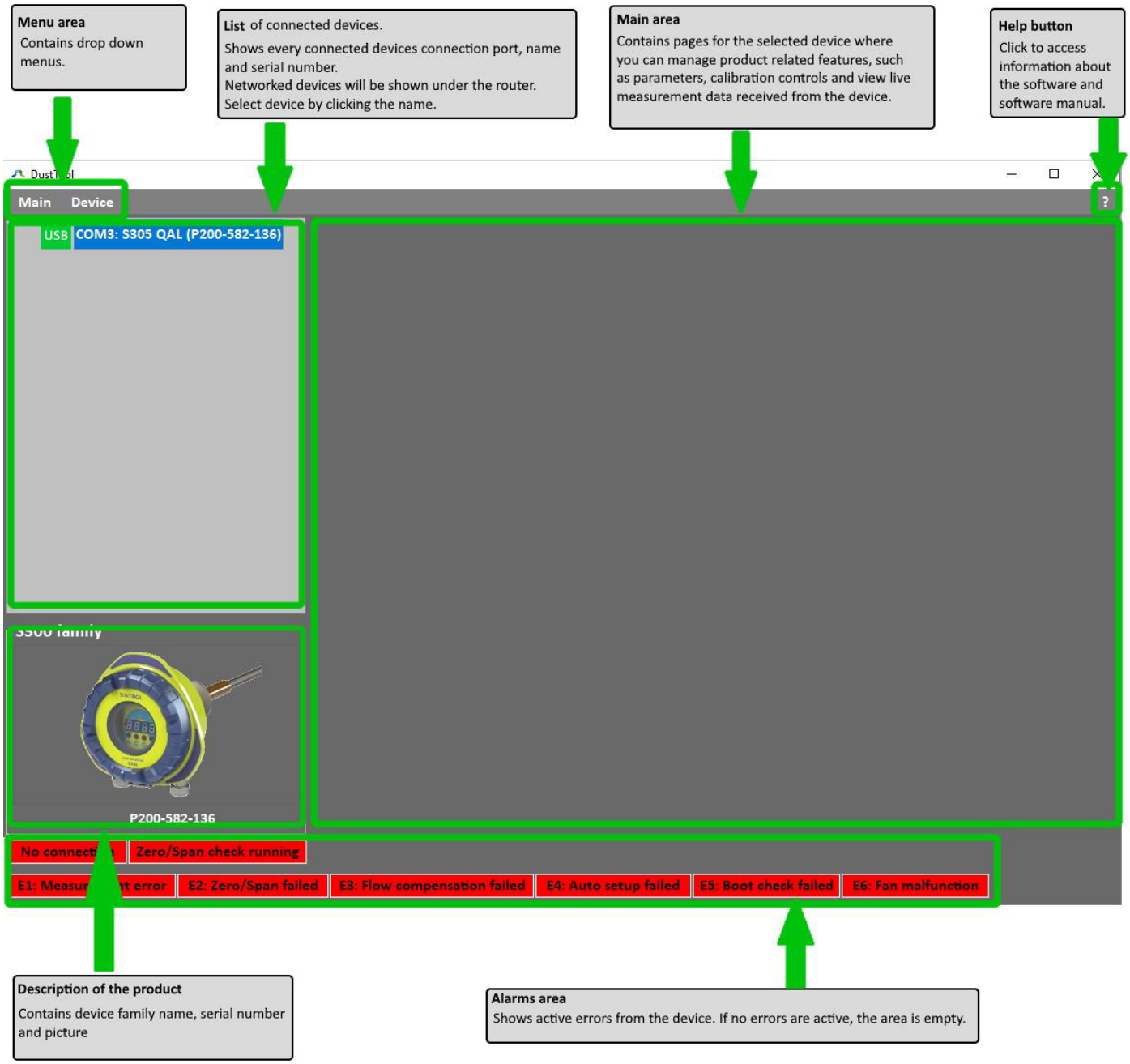
Basic Usage



"Main" menu

Currently contains only Close button to shut down the DustTool software.

"Device" menu

You can save the measurement parameters of the selected device by clicking the Save device parameters to file button and load measurement parameters from a file by clicking the Import device parameters from file button.

"?" menu

Info: Opens a popup showing software version information.
Manual: Opens this document as a pdf.

List of connected devices

Shows every connected device on a list. Select a device by clicking on the list.

Single devices are shown as a line showing the Com port they are connected to, the name of the device and the serial number of the device in brackets.

A device network will show the Router at the top and the connected devices listed under the Router. All the devices will show the name and serial number, and the router will also have the Com port the network is connected to.

Description of the product

The device info box shows the device family name, generic image of the device family of the device and the serial number of the device. Clicking the Serial number text will open a browser windows showing Sintrol webpage displaying the information of the selected device.

Alarms area

Alarms area will show different errors received from the device. Only active alarms/errors are shown. If no alarms is active, the area is empty. The E#-errors are device specific and you can find information about them from the device manual.

- **No connection:** No measurement from the device in 15 seconds.
- **Zero/Span check running:** Zero and Span check is running.
- **E1: Measurement error**
- **E2: Zero/Span failed**
- **E3: Flow compensation failed**
- **E4: Auto setup failed**
- **E5: Boot check failed**
- **E6: Fan malfunction**

Main area

When you have selected a device from the device list, the main area will show information related to the device. The top part contains buttons to select different views for the device. The buttons shown will depend on the type of the connected device. For example, Monitor and Calibration buttons are not shown for Router devices.

Selected view button will be shown with Blue background.

Note: Most variables or variable groups have Save and/or Read buttons next to them. Every value change needs to be saved to the device by clicking on the Save button. Fields with changed/different values are highlighted with a yellow colour.

Read button reads the current value from the device and updates it on the view.

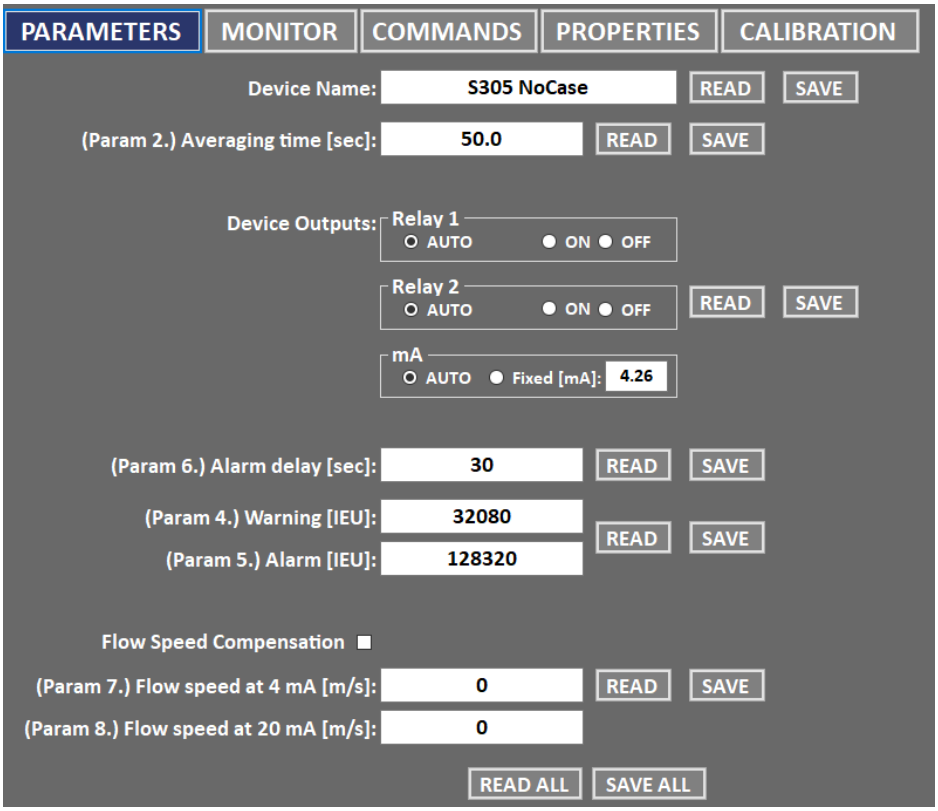
Parameters

Parameters view contains variables that are related to the operation and measurement of the selected device.

Some variables can be hidden, depending on the type of the selected device.

There is a Read and a Save button next to each variable/variable combinations so you can save/read specific variables.

The Read All and Save All buttons at the bottom of the page will save/read all variables.



Device Name [text, 30 characters]

The name of the device. The name is shown also on the device list.

(Param 2.) Averaging time [sec, 0-300]

Signal averaging time refers to the period from which the device calculates the average signal level. For example, with the default value of 50, the displayed measurement result is the moving average of the past 50 seconds.

Outputs

Settings for the outputs of the selected device. Relay 1 and Relay 2 can be set to On or Off for configuration purposes. On the Auto setting, the relays operate as specified on the manual of the specific device.

mA output can be set to a fixed mA value for testing. On Auto setting, the mA output is set according to the measurement.

(Param 6.) Alarm Delay [s]

Alarm delay time determines how long the average dust level must be above the configured ALERT or ALARM threshold before an alarm is triggered. This is to avoid false alarms caused by naturally occurring peaks in dust levels in certain processes.

(Param 4.) Alert [IEU / mg/m³]

The value of the Alert threshold. If the device is calibrated, this value is in mg/m³, otherwise in IEU.

(Param 5.) Alarm [IEU / mg/m³]

The value of the Alarm threshold. If the device is calibrated, this value is in mg/m³, otherwise in IEU.

Flow compensation [on / off]

Flow velocity can have an impact on the measurement results. You can compensate the influence that changes in flow velocity have on the signal level by connecting the mA output of an external flowmeter to the mA input of the device.

For information on how to connect an external flowmeter to the device, please refer to the manual of the specific device.

(Param 7.) Flow velocity at 4 mA [m/s, 0-99.9]

Use parameter 7 to set the flow velocity value that corresponds to the 4 mA output signal level from the external flowmeter. Parameter value corresponds to the flow velocity in m/s.

(Param 8.) Flow velocity at 20 mA [m/s, 0-99.9]

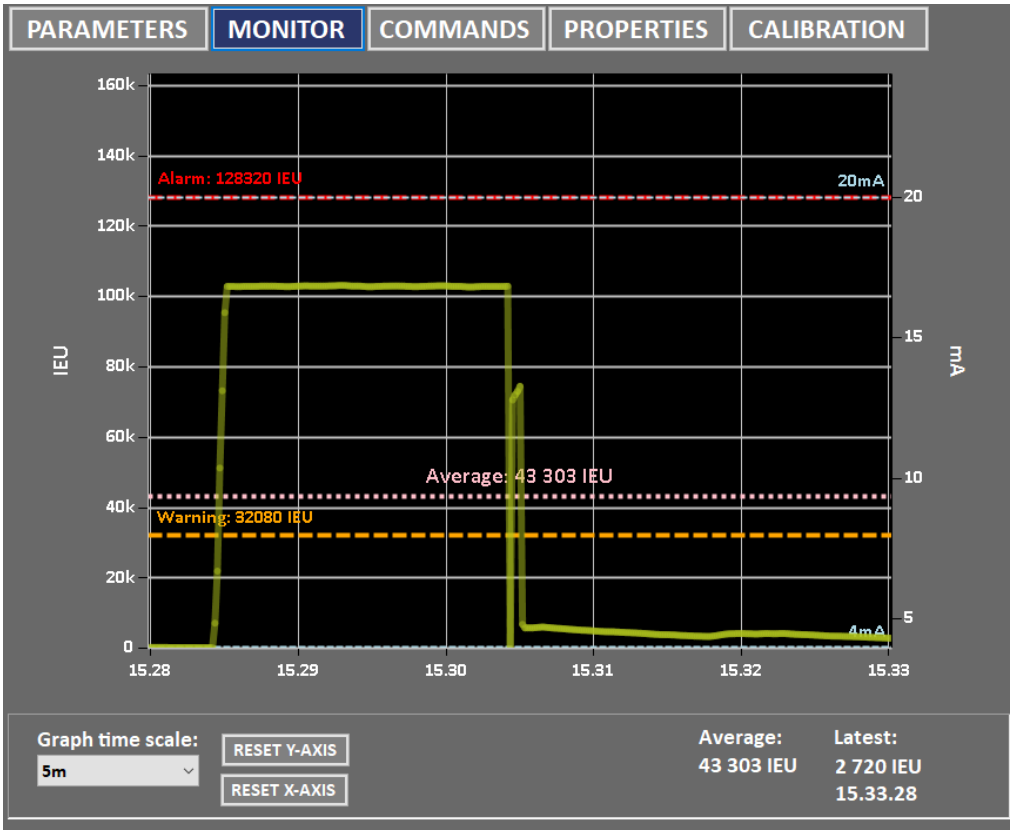
Use parameter 8 to set the flow velocity value that corresponds to the 20 mA output signal level from the external flowmeter. Parameter value corresponds to the flow velocity in m/s.

Monitor

Monitor view contains the graph showing the measurement values collected from the selected device.

DustTool collects measurement from each connected device as long as the software is running, and the device is connected. If you disconnect the device or shut down the DustTool software, the measurement data is lost.

Note, this is not a data logging software. If the software is shut for any reason, the measurement data is lost. Recommended maximum continuous usage time is about 12 hours.



Graph

The left y axis shows the measurement value. The left y axis is in mg if the device is calibrated, and in IEU if the device is not calibrated.

The right y axis shows the mA value corresponding to the measurement value.

The graph automatically adjusts the x-axis by moving constantly forward and y-axis depending on the maximum value shown.

The latest measurement value is shown in the Latest field below the graph.

Graph scale

The time scale of the graph can be adjusted by dragging the trackbar at the bottom of the view. The scale can be adjusted from 5 minutes to 1 hour in 5-minute increments and from 1 hour to 12 hours in 1-hour increments.

In higher time scale values, the amount of visible measurement points is reduced. So the graph might draw points every 2 or every 10 seconds, depending the value of the time scale.

Average

The graph updates a line showing the average value of the measurement values in the current time period. The average value is also shown below the graph in the Average field.

This value is calculated from all the measurement values from the time period even if the graph is scaled to longer time period and the amount of visible measurement points is reduced.

Cursor

You can move the mouse on the graph and a red Cursor line will be shown. The time and measurement values of the cursor are shown below the graph.

Mouse controls

You can control the graph with the mouse.

- **Right click:** Select a point in the x-axis. A line is added on the graph showing the specified time value. When 2 points are selected, a popup screen will show the amount of time between the selected points and minimum, average and maximum values calculated from the values between the two selected time values.
- **Left click:** You can move on the x-axis of the graph by clicking and holding down the left mouse button and dragging the graph right or left. This way you can check measurement values from history. When you move the graph away from the current time, the graph will stay at that point and will not move forward automatically.
- **Mouse wheel:** You can adjust the y-axis of the graph with mouse wheel. Scrolling up raises the maximum of the y-axis and scrolling down reduces the maximum. If you use the mouse wheel, the graph will no longer automatically adjust the y-axis depending on the measurement values.

Reset Y-axis

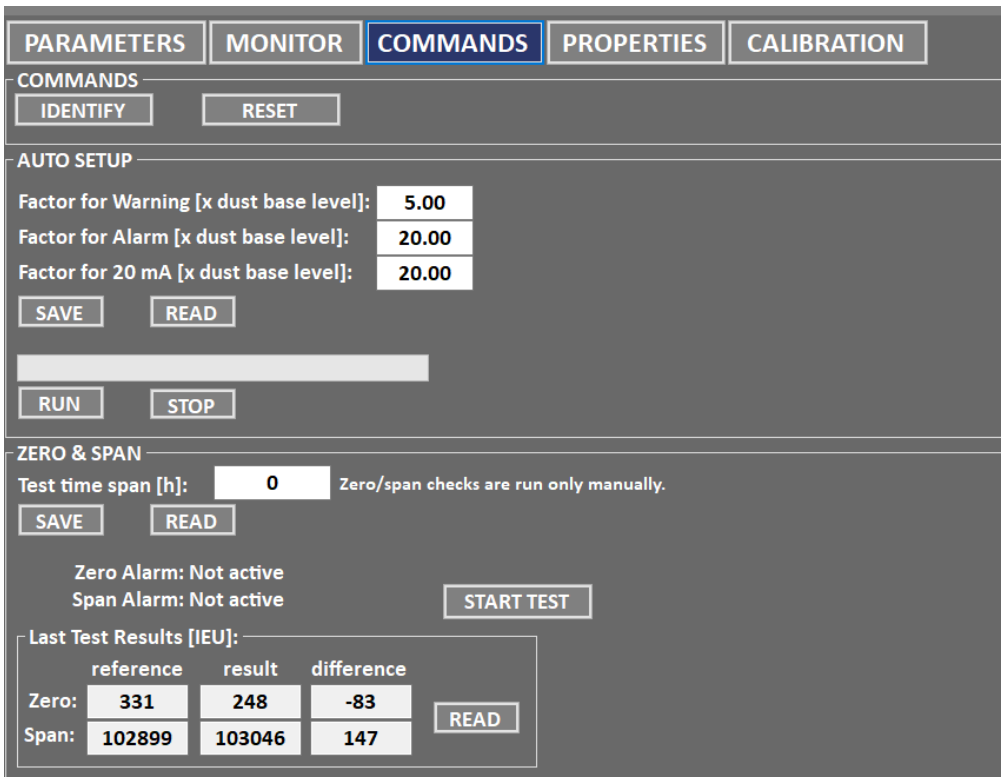
The button will only show if the y-axis has been modified by the user. Clicking the button will return the y-axis to be automatically updated.

Reset X-axis

The button will only show if the x-axis has been modified by the user. Clicking the button will return the graph to real time and the graph will continue to update automatically.

Commands

Command view contains device specific commands that can be used to identify, test, or adjust the device.



CommandsIdentify: Clicking the Identify button will set the LEDs blinking on the device for a short time period so you can identify the device.

- **Reset:** Clicking the Reset button will reset the device to factory default settings.

Auto Setup

In normal operation, the device continuously measures the dust concentration in the airflow. During Auto Setup, the device analyzes the present measurement signal, determines an average signal level and establishes normal process conditions that are used as a baseline for future measurements.

Auto Setup also sets up two alarm thresholds (ALERT and ALARM) that are proportional to the normal dust level. An alarm is triggered when the dust concentration exceeds the configured dust level threshold.

Auto Setup is performed during normal operating conditions after the device is installed and the process that the device monitors is running.

Note: Make sure that Auto Setup is performed during normal operating conditions and usual dust levels. Performing Auto Setup during irregular conditions can result in false measurement results.

During Auto Setup, the device always uses the parameter default values specific to the device for signal averaging time and alarm delay time. Signal averaging time determines the period from which the device calculates the average signal level, and alarm delay time determines how long the dust level must be above the configured ALERT or ALARM threshold before the relays switch position and trigger the alarms.

Auto Setup takes 500 or 1000 seconds (depending on the device) to complete. After Auto Setup is completed or cancelled, signal averaging time and alarm delay time automatically revert to their user-set values.

Zero & Span

The device runs automatic self-diagnostics functions during normal operation to ensure that the measurement zero and span points and the linearity of the measurement response remain correct over time. For this, the device has an internal reference signal generator.

When automatic zero/span check starts, the internal signal generator disconnects the sensor probe from the measurement chain and induces a computer-generated signal to the processing electronics. The device uses this reference signal to test and compensate for possible drift and non-linearity in zero, span and linearity points.

For more information about the zero/span check, refer to the device manual.

(Param 9.) Zero/span check interval

To enable automatic zero/span check, set the desired zero/span check interval in the Test time span text box. The interval can be set between 1 to 999 hours.

To disable automatic zero/span check, set the value to 0. This way the test is run only manually when the user clicks on the Start test button.

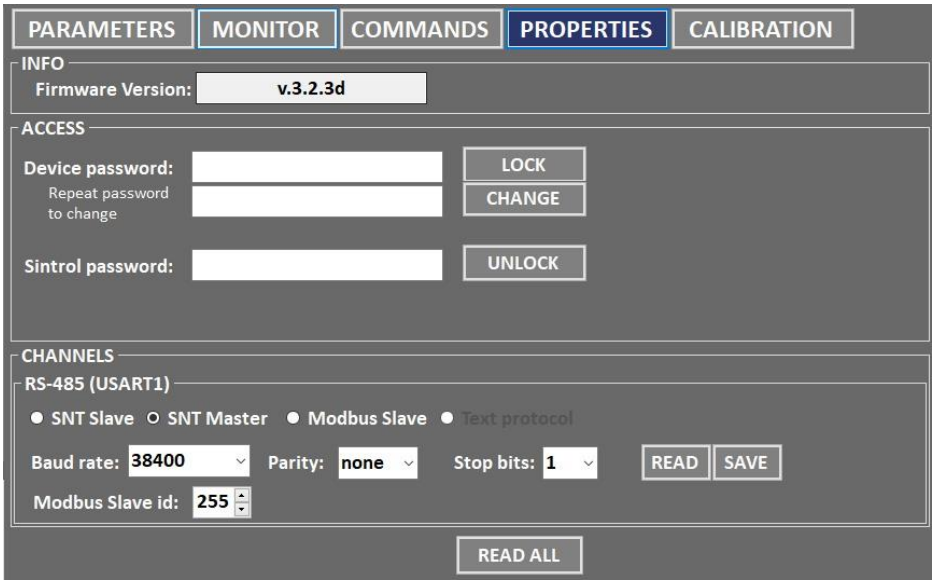
Running zero/span check manually

You can start the zero/span check by clicking on the Start test button. When the test is done, the latest results will be updated.

The results show IEU values of the Zero and Span reference values, the measured Zero and Span values, and the difference in these Zero and Span values.

The texts will also display, if either Zero or Span alarm was triggered.

Properties



Properties view contains variables related to the connection of the device and other non-measurement related parameters. Most of the parameters are locked behind a password which is only available to Sintrol personnel.

Info

Contains firmware version of the device.

Access

There are 2 different passwords for the device.

- **Device password** locks all the parameters so that they can not be changed unless the password is used to unlock the device. If the device password is set, but the device is unlocked, the device will be in maintenance mode. Please check the device manual for more information.

  For devices with 4 seven segment displays and push buttons: Keep in mind that the device password is the same password that is used to open the device with the buttons. If you change the password to include other characters than numbers and/or set the password to different length than 4 characters, you will not be able to unlock the device with the push buttons.

- **Sintrol password** is a unique password generated during the manufacturing of the device and it locks most of the variables in the properties view. This password is not available to customers.

Both passwords work the same way. You can lock and unlock the device by writing the password on the text box and clicking the appropriate button. If you insert a wrong password, there will be a popup message informing you.

To change the password, you will first have to have the specific password unlocked. Then you can write the password in the two textboxes and click on the Change button. The password can also be completely removed this way by leaving the boxes empty and clicking on the Change button.

Channels

Here the communication channels of the device are configured. The device can have different number of channels depending on the device type, and some of the channels and their settings might be hidden behind the Sintrol password. If an option is greyed out, it is either not supported or it is locked by the password.

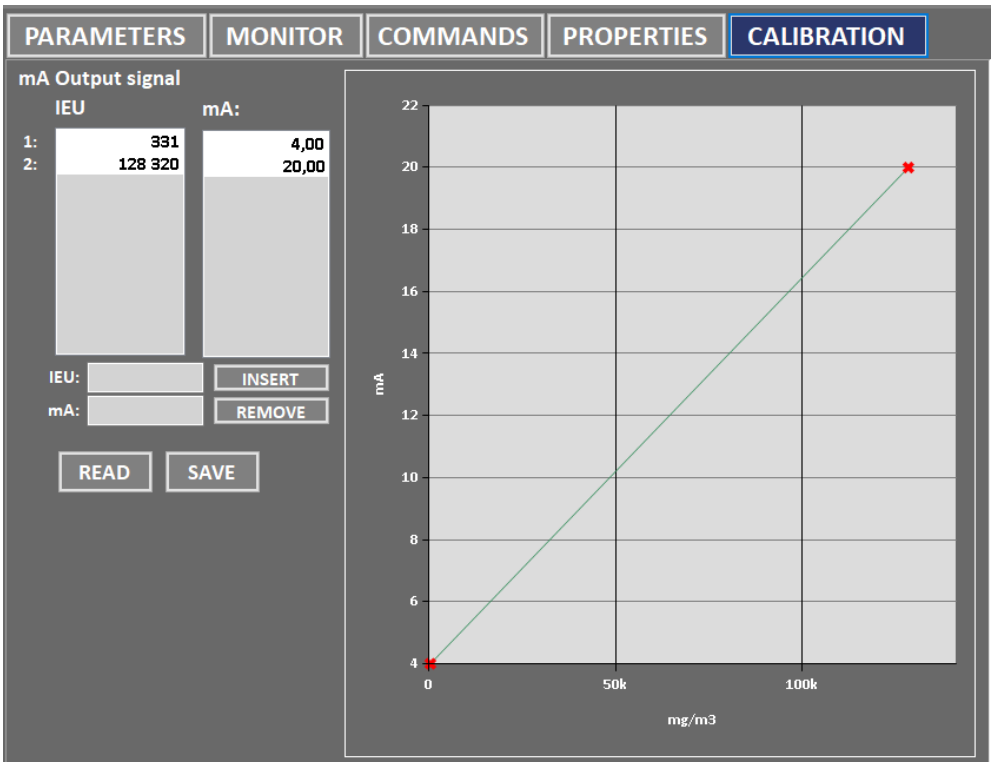
RS-485 (USART 0, 1 or 2)

You can select the communication protocol of the RS-485 channel by clicking on the different options.

- SNT Slave: used in devices connected to a network which uses Sintrol protocol and a Router.
- SNT Master: used in direct communication with the pc. Requires an RS-485 to USB adapter.
- Modbus Slave: used in Modbus network.
- Text protocol: used in direct communication with the pc with a terminal software. Requires an RS-485 to USB adapter.

For the Modbus connection, you can select the baud rate, parity, stop bits and Modbus slave id for the device. For text protocol, you can select the baud rate, parity and stop bits. For the Sintrol protocol default values are used.

Calibration



Calibration view contains tools to set the mg-calibration and mA-calibration parameters of the device.

mA-calibration is enabled always, but the mg-calibration needs to be enabled for it to work.

mA Output signal

The mA Output signal calibration consists of 2 value lists which are used to calculate the mA output value depending on the measurement.

The first list of values is mg/m3 if the device is calibrated, and IEU if the device is not calibrated. If you change the calibration on/off, the values are calculated automatically to the correct type.

You can add points to the list by entering the desired measurement and mA values and clicking the Add point button. The values are ordered in rising order by the measurement values. You can add a maximum of 10 value pairs.

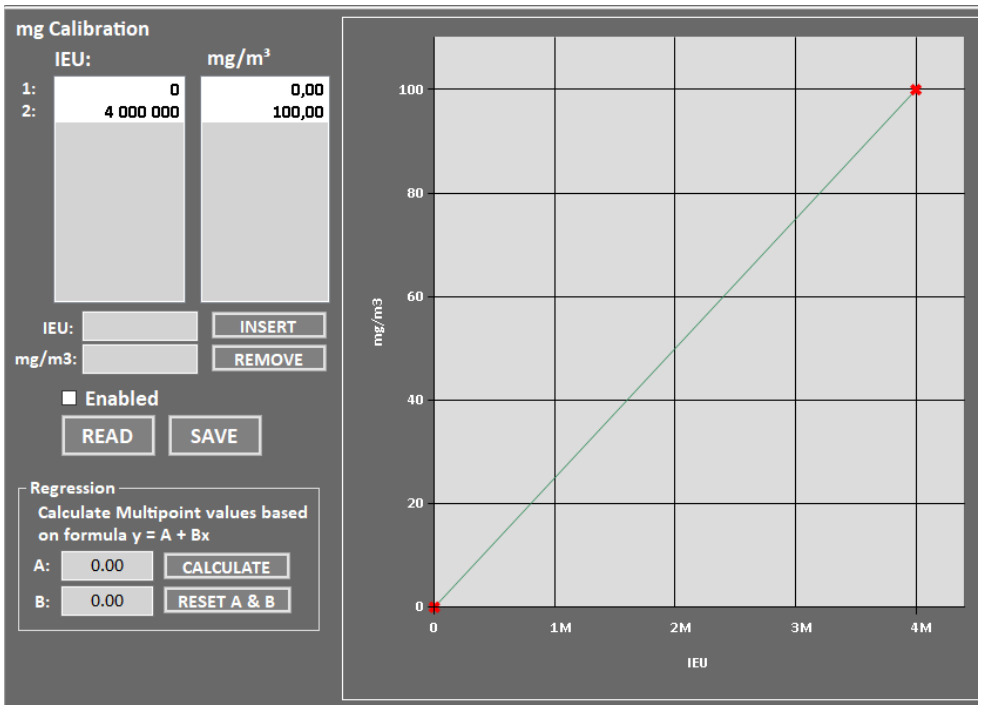
You can remove a point from the list by selecting the value pair and clicking on the Remove point button.

You can change a points mA value. Click on the value pair in the list, change the mg/m³ value and click Add point button. DustTool will confirm that you want to change the value.

After any changes to the value lists, you need to save the values to the device by clicking on the Save button.

The graph shows the values in a line graph to help visualize the settings.

Note: The device can not output values below 4mA and above 20mA.



mg / m³ calibration

The mg/m³ calibration consists of 2 value lists which are used to calculate the mg values from the IEU measurement.

The calibration check box shows if the mg calibration is enabled. You can enable/disable the calibration by toggling the checkbox and saving the change to the device by clicking Save button.

You can add points to the list by entering the desired IEU and mg/m³

values and clicking the Add point button. The values are ordered in rising order by the IEU values. You can add a maximum of 10 value pairs.

You can remove a point from the list by selecting the value pair and clicking on the Remove point button.

You can change a points mg/m³ value. Click on the value pair in the list, change the mg/m³ value and click Add point button. DustTool will confirm that you want to change the value.

After any changes to the value lists, you need to save the values to the device by clicking on the Save button.

The graph shows the values in a line graph to help visualize the settings.

Regression

Some devices have an option to calculate the mg-calibration using regression. The points are calculated by using the formula y = A + Bx. You can insert the values for A and B and then click Calculate button. This will calculate 2 points to the calibration list and enable the calibration.

Reset A & B button sets the A and B values on the device to 0 but does not disable the calibration or change the points in the calibration list.

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