

User Manual

Fidas[®] Firmware

Fidas[®] mobile

Fidas[®] 100

Fidas[®] 200/200 S/200 E

Valid from Firmware-Version 100417

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1 Important information on switching-on and switching-off Fidas®

Since the firmware of Fidas® runs on a dynamic operating system which is based on Windows XPembedded for industrial applications, **Fidas® should never been switched off at the power switch.**

For the switching off of Fidas® the button "shut down" should be used. Only after the operating system has automatically shut down, the power switch should be operated!

Attention:

If you do not use the firmware shutdown button and just turn off the main power of the instrument you can lose data!

Fidas® is a high-capacity optical aerosol spectrometer and dust monitor with a 1.7 GHz Intel® Atom™ processor. Thus it is able to evaluate measured particle size information in real time. The dust monitor starts automatically after switching it on at the power button.

After turning on the Fidas® the Windows operating system is booted first. Then, the Fidas® startup-manager is starting up automatically. The latest revision (highest number) of the firmware is selected and started unless the user selects an older version.

Note: Selecting "Ver.exe" will bring the user straight to the Windows operating system.

This screen also displays the Palas® contact details.



Figure 1: Screen of the startup-manager

During the startup process, the aerosol pump is turned on (maximum throughput) and then regulated to a volume flow of 4.8 l/min. Then the Fidas® starts measuring and saving the data to the internal memory automatically.

After completing the startup process the main menu of the user interface is displayed (figure 2).

2 Fidas® user interface

2.1 Main menu

The main menu is displayed automatically after startup or by pressing “menu” in the status bar from any screen.

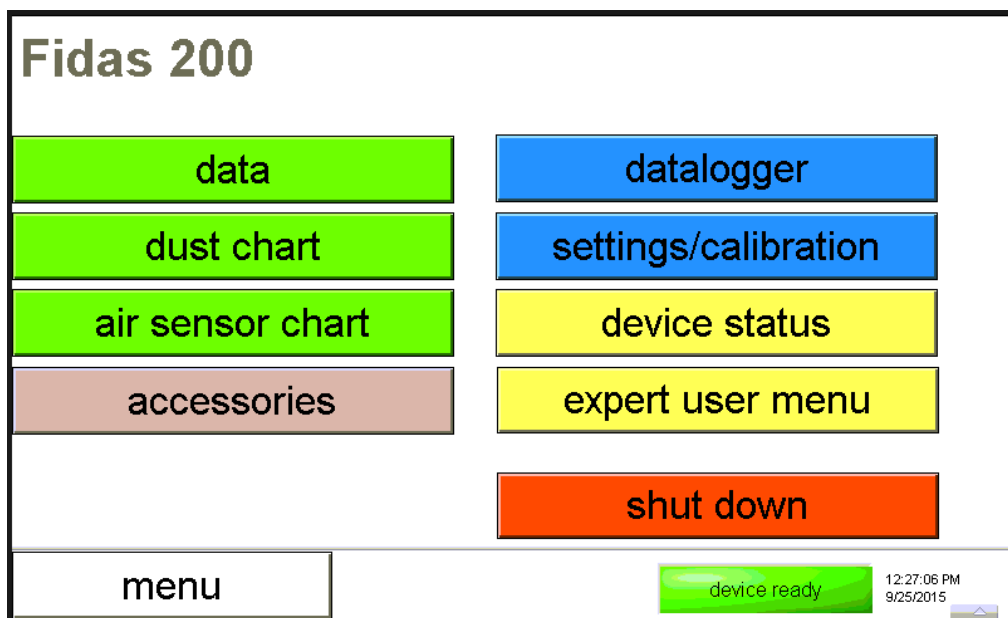


Figure 2: Main menu of the Fidas® user interface

The main menu is structured as follows:

The green buttons deal with the measured data:

| | |
|------------------|---|
| data | shows the data overview with the currently measured values for PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ , PM _{tot} (TSP) and particle number concentration Cn. Additionally, the measured values from the weather station for relative humidity, ambient temperature and ambient pressure are displayed. |
| dust chart | graph that displays the measured values of PM-fractions and number concentration over time |
| air sensor chart | graph that displays the measured values from the weather station over time |

The grey button contains additional information and capabilities:

| | |
|-------------|--|
| accessories | contains further screens, i.e. IADS, weather station, nano sizer/counter, filter system, particle size distributions, alarms |
|-------------|--|

The blue buttons relate to data logging and data quality

| | |
|------------|--|
| datalogger | allows entering a comment to the data that are saved internally or transmitted through a communication protocol. Additionally, the internally saved data can be exported to an USB-stick. It also enables text file data logging and entering a comment to this text file |
|------------|--|

settings/calibration allows the validation of the calibration of the Fidas® with MonoDust 1500. Additionally, displays an online-calibration feedback and whether the calibration is within an allowed range

The yellow buttons deal with the hardware of the Fidas®:

device status overview of important system parameters, i.e. sensor flow, coincidence, suction pumps, weather station, IADS, calibration, LED temperature and operating mode

expert user menu access to the expert user interface.
Note: This is password protected to ensure only trained personnel have access to the advanced functions of this system.

The red button ends the measurement:

shut down shuts down the Fidas® and Windows® user interface.
This is the recommended way to turn-off the system
Note: For access to the Windows user interface go to “expert user menu”
->”system”->”exit to OS”

Attention:

If you do not use the shutdown button and just turn off the main power of the instrument you can lose data!

In the upper left the product name and model is displayed. In the upper right is the Palas® logo.

At the bottom is the status bar:

On the left is the “menu” button that can be activated from any screen and will bring you to the main menu. On the right is the device status (green: „device ready“ or red: „check device status“), and the system time and date. Time and date can be changed under Windows.

2.2 „data“ overview

Here one can see all measured PM-values and the particle number concentration.

Additionally, the measured values for relative humidity, ambient temperature and pressure of the air sensor are shown.

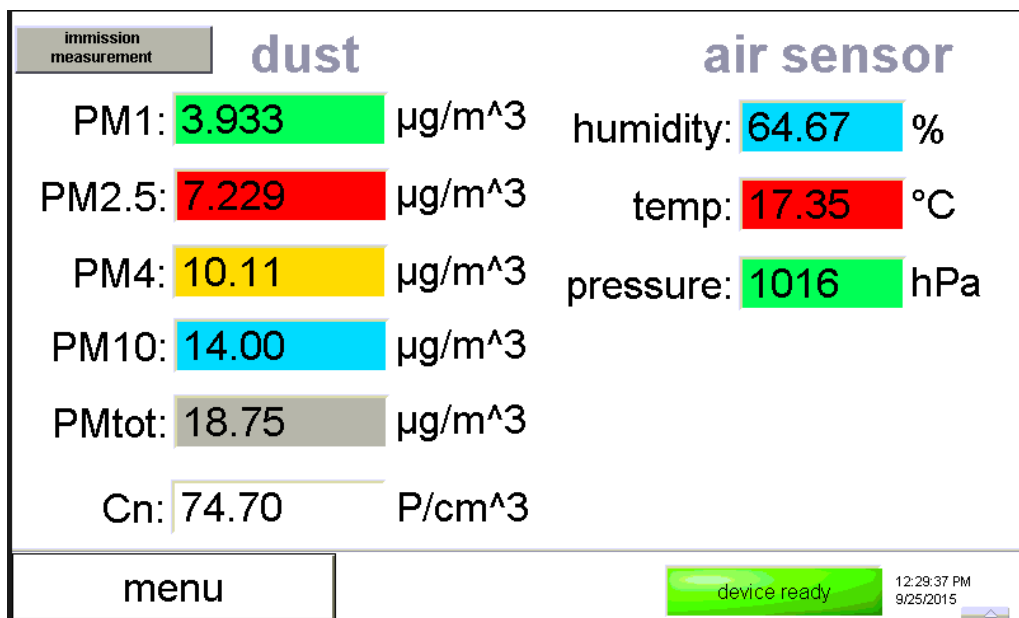


Figure 3: “data” overview

The particle number concentration is displayed in real time. The measurement value of the PM-fractions is based on a sliding average with a time constant of 900 seconds (entry in the promo.ini file), updated every 30 seconds. The data from the weather station are displayed with a time resolution of 1 minute.

All data are saved with a time resolution of typically 1 minute (or as set in the data logger in the expert user menu).

The grey field in the upper left corner shows “immission measurement”. In this case the size dependent and TÜV verified (TÜV report 936/21218896/A respectively 936/21227195/A) conversion algorithm is used to transform the measured particle size and number concentration to PM-fractions.

Further information to the measurement technology can be found in the Fidas® manual.

2.3 „dust chart“ – measured values over time

This chart shows all measured PM-values (coloured, right axis) and the particle number concentration (white line, left axis) over time.

“clear charts” will restart the chart.

Note: This has no effect on the saved data, so no data are lost by restarting this display.

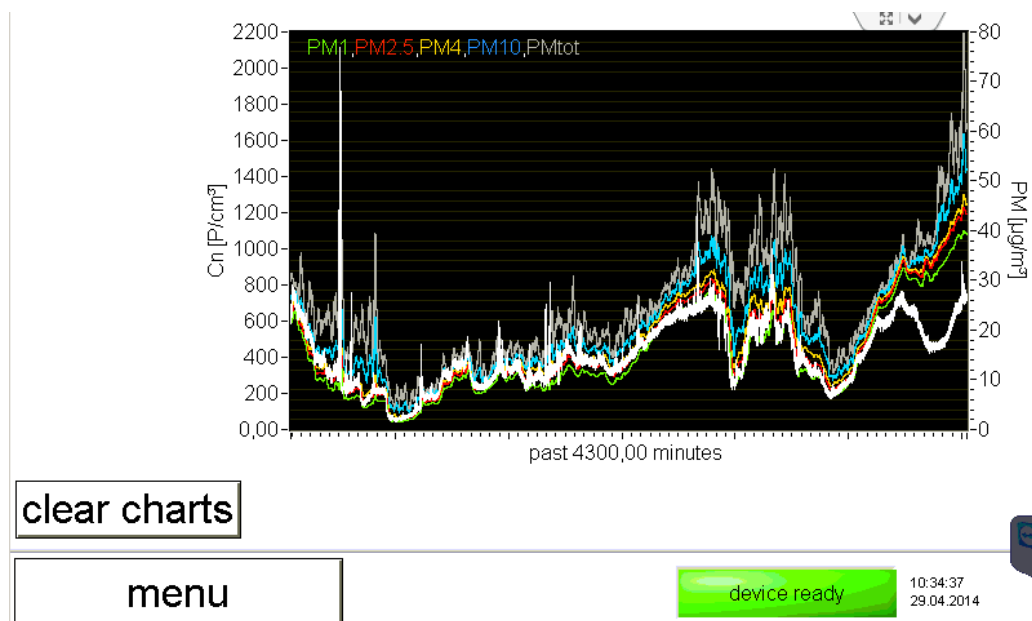


Figure 4: “dust chart” – measured values over time

2.4 „Air sensor chart“ – data from the weather station over time

This chart displays the measured relative humidity h [%], ambient temperature T [°C] and ambient pressure p [hPa]. The chart is updated every minute and shows a time-period of approximately one week.

| | | |
|-------|---------------------|------------|
| Blue | relative humidity | left axis |
| Red | ambient temperature | right axis |
| Green | ambient pressure | right axis |

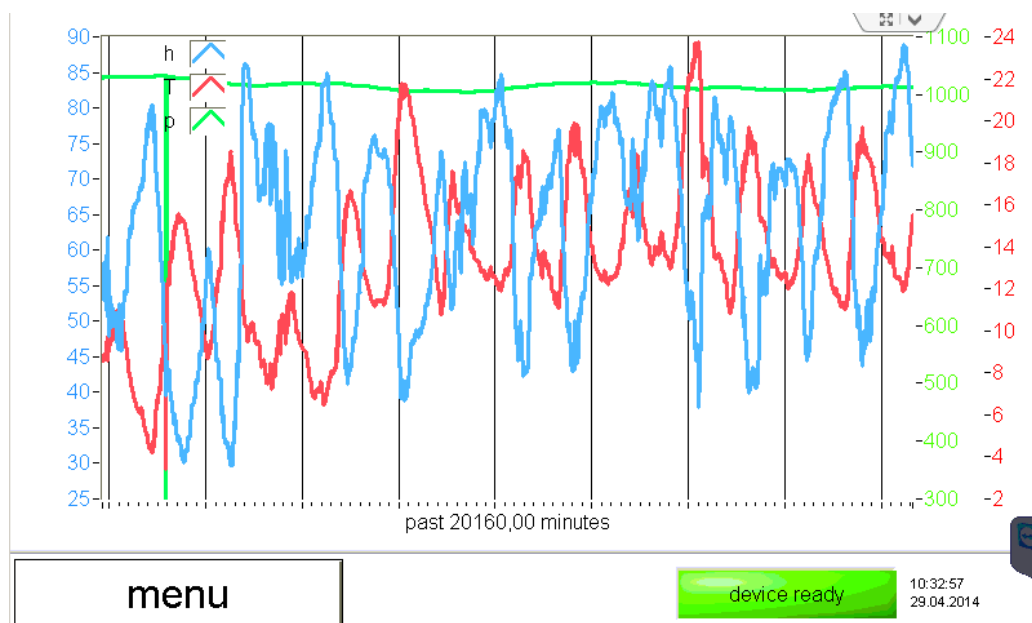


Figure 5: „air sensor chart“ – data from the weather station over time

Note: If the weather station (e.g. Lufft WS 600-UMB) reports additional values, for example amount of precipitation, wind direction and wind speed, then these values are also saved. They can be viewed under “accessories”->“weather station”.

2.5 „Accessories“

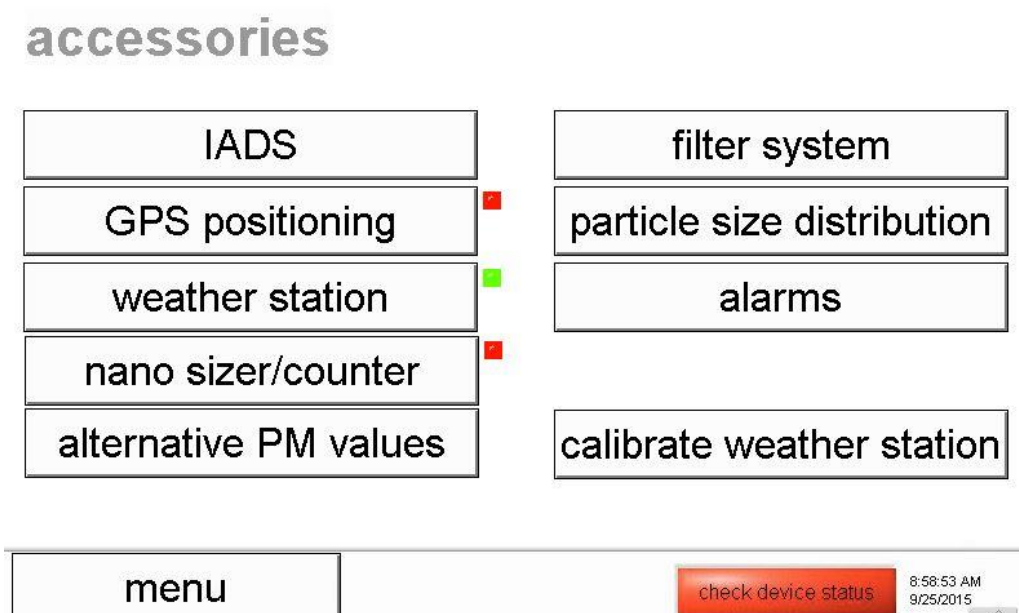


Figure 6: accessories

This menu contains the following sub menus that offer additional information and capabilities:

| | |
|-----------------------|--|
| IADS | abbreviation for “intelligent aerosol drying system” and stands for the regulated heating in the sampling probe. Here, the basic setting of the IADS can be changed. |
| GPS positioning | if a GPS mouse is connected through the backside USB port, its coordinates are displayed here <u>Note:</u> this is no longer actively supported by Palas! |
| Weather station | displays all values from the weather station. The graph displays wind speed, wind direction and precipitation amount over time if these values are reported by the weather station (e.g. Lufft weather station WS 600-UMB). |
| Nano sizer/counter | if a DiSCmini from Matter/Testo is connected through the USB port, its data are displayed here and automatically attached to the saved data. |
| Alternative PM values | lists PM-values and algorithm (e.g. PM2.5_ambient #11) that was used to obtain these (same PM-values as shown under “data”), followed by PM-values (e.g. PM2.5_classic) as obtained if using the density that is entered under “expert user menu”->“???”, followed by PM-values (e.g. PMthoracic) based on EN 481 that are more relevant for indoor measurements |
| Filter system | assists the user for a filter exchange. The time and date when the filter is inserted and removed as well as the weight of the filter before and after the measurement can be entered and logged. |

| | |
|----------------------------|--|
| Particle size distribution | this shows two graphs. The upper graph shows the particle size distribution by number concentration, the bottom graph shows the particle size distribution by mass concentration. Red is the discrete, blue is the cumulative distribution. |
| Alarms | if activated an e-mail is sent to the entered e-mail address whenever one of the status parameters (see "device status") is out of range. In the bottom section a limit value for a PM-fraction can be defined (the value is defined in the promo.ini file). When this value is surpassed a digital alarm (at the digital out connector) is triggered. |
| Calibrate weather station | Since firmware version 100389, the sensors of the weather station for temperature, ambient pressure and rel. humidity can be adjusted. |

2.5.1 “IADS” – settings of the intelligent aerosol drying system

The intelligent aerosol drying system is used to remove moisture from the aerosol, so particles are measured and sized at their original size. Further, fog droplets should not be interpreted as particles and are therefore removed. The IADS needs a weather station for operation as it uses the measured ambient temperature and humidity to dynamically adjust the heating that is integrated in the sampling tube. The IADS has three different settings:

“off”: The IADS is switched off, however the internal tube of the IADS is heated to +1 K related to the ambient temperature to avoid condensation within the IADS and the optical sensor.

“remove volatile / moisture compensation”: The IADS removes volatile particles (water droplets) and compensates the condensation of water and the related particle growth if the relative humidity is larger than 60 %. The setpoint temperature is dynamically adjusted in dependence of the ambient temperature and humidity.

“remove volatile and semi-volatile”: The IADS removes volatile and semi-volatile particles (water droplets, hydro-carbon droplets) and compensates the influence of moisture on the particle size. The internal heating of the IADS is set to a constant temperature of 75°C.

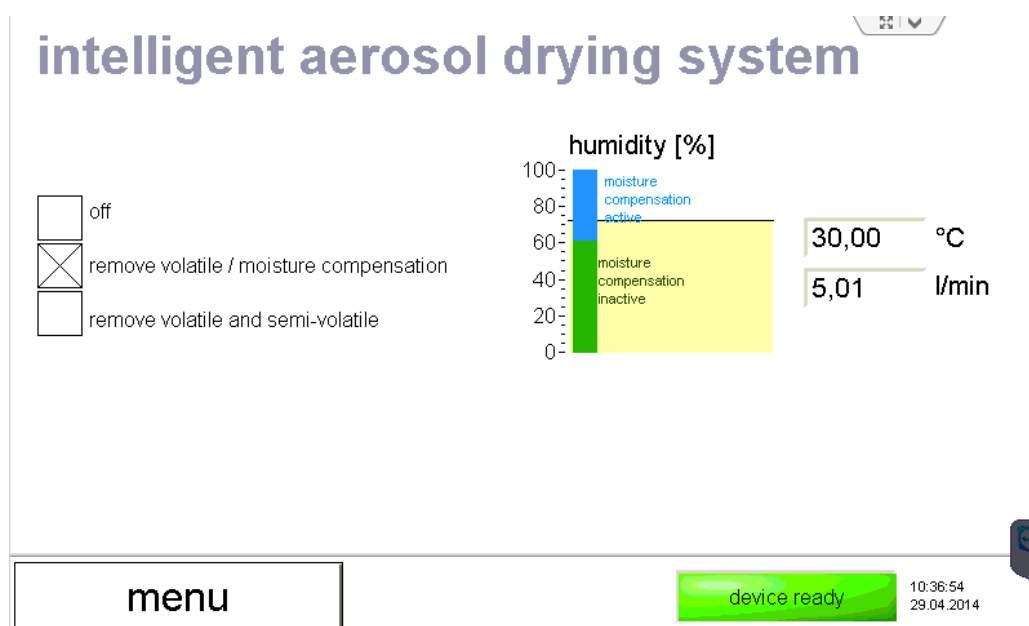


Figure 7: “IADS” – settings of the intelligent aerosol drying system

2.5.2 “GPS positioning” – coordinates of the GPS mouse

If a GPS mouse is connected to the USB slot in the back of the instrument, its data are displayed automatically.

Note: this is no longer actively supported by Palas!

GPS positioning

| | | | |
|---------------------|------------------------|-------------|--------|
| timestamp: | 00:00:00 DD.MM.YYYY | UTC via GPS | status |
| timestamp: | 00:00:00 DD.MM.YYYY | local clock | |
| latitude: | 0 | ddmm.mmmm | |
| longitude: | 0 | ddmm.mmmm | |
| course over ground: | 0 | ° | |
| speed over ground: | 0 | knots | |

menu

device ready

13:47:36
27.02.2013

Figure 8: “GPS positioning”

Note:

If desired, this menu item can be completely blanked. For this the following entry has to be carried out in the promo.ini: „GPS_connected=no“

2.5.3 “weather station”

If a weather station is connected to the Fidas® the measured values are displayed here. The graph displays wind speed, wind direction and precipitation amount over time if these values are reported by the weather station (e.g. Lufft weather station WS 600-UMB).

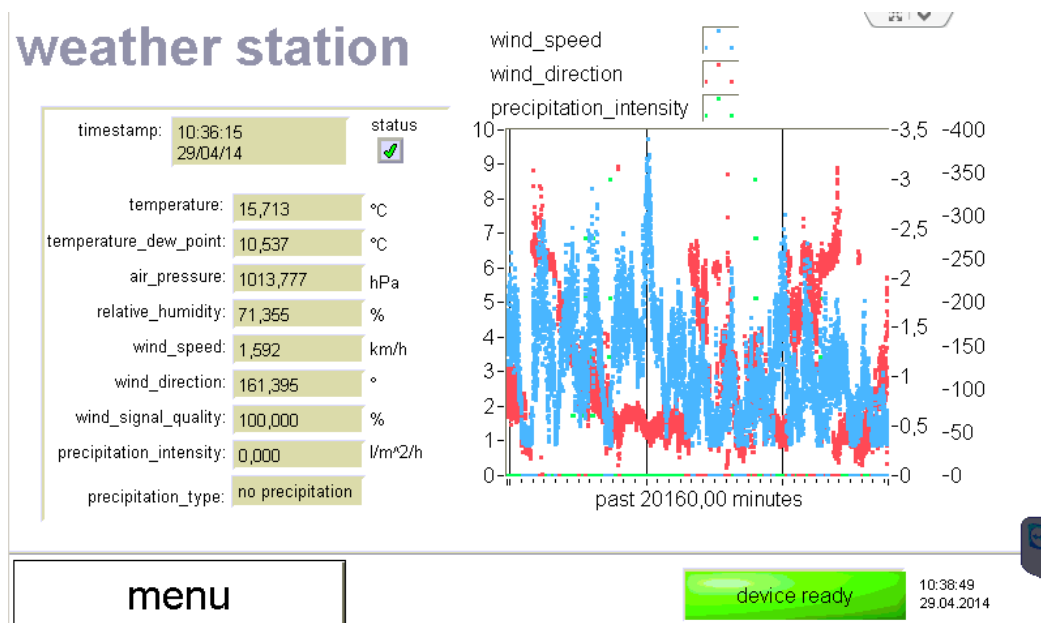


Figure 9: “weather station” – all data of the connected weather station

2.5.4 „nano sizer/counter“ – additional information on nanoparticles

If a DiSCmini from Matter/Testo is connected through the USB port, its data are displayed here. The data are also automatically saved (attached to the other saved data).

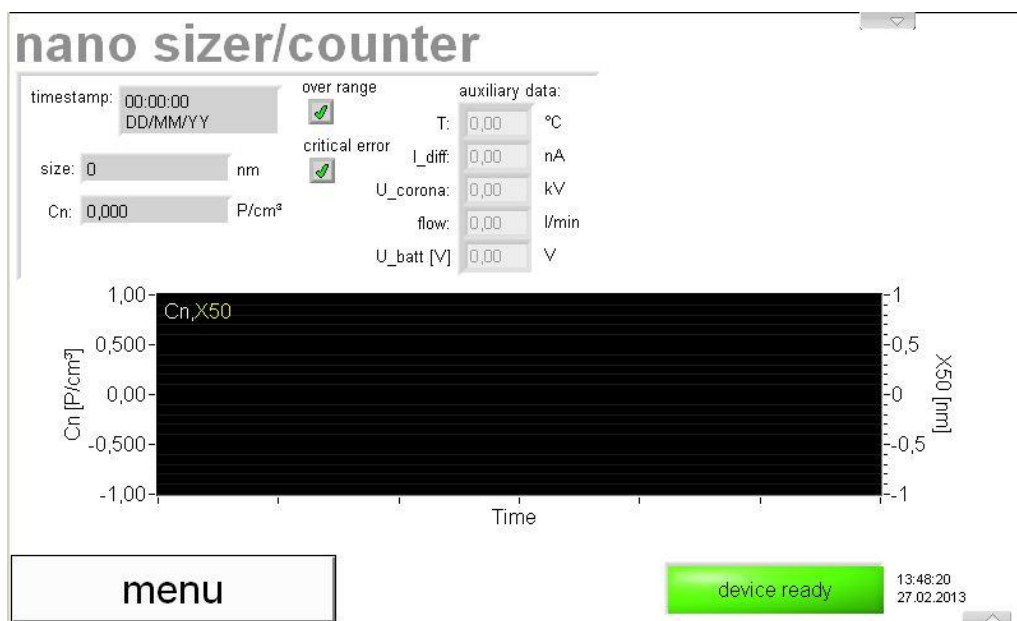


Figure 10: “nano sizer/counter” – additional information on nanoparticles

Note: It can be necessary to manually change the Com-port under Windows, if the USB-converter selected an improper com-port.

Note:

If desired, this menu item can be completely blanked. For this the following entry has to be carried out in the promo.ini: „discmini_connected=no“

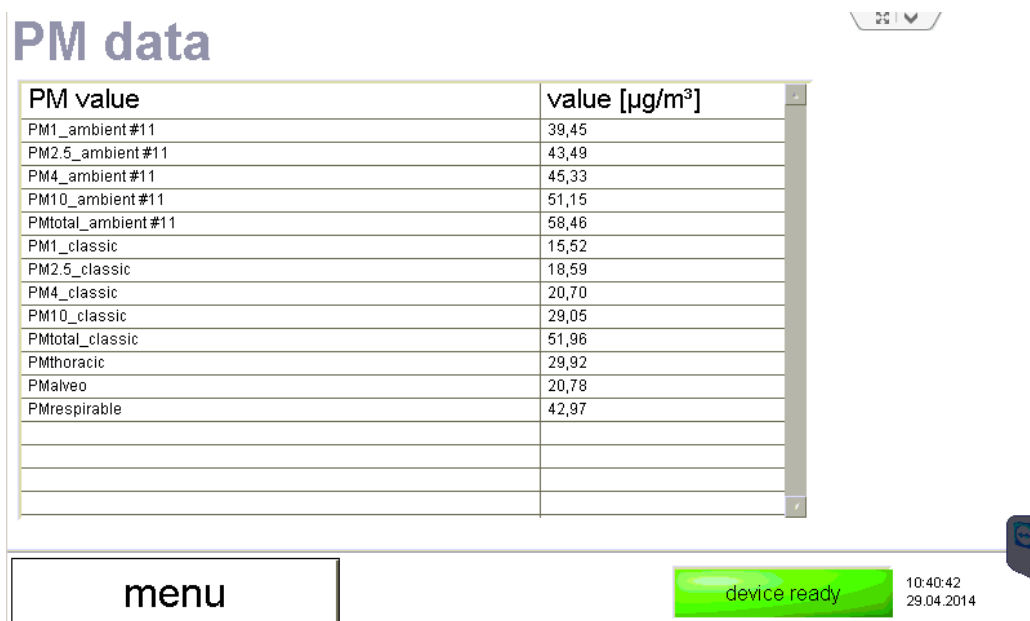
2.5.5 “alternative PM values”

Lists PM-values and the algorithm (e.g. PM2.5_ambient #11) that was used to obtain these. In this case algorithm 11 is used, this is the same algorithm that is TÜV certified.

The PM-values are the same that are shown under “data”.

Next are PM-values (e.g. PM2.5_classic) that are based on the constant density / form factor, which are entered under “expert user menu”->“sensor/calibration”.

Last are PM-values (e.g. PMthoracic) that are based on the definitions in EN 481 that are typically more relevant for indoor measurements.



PM data

| PM value | value [µg/m³] |
|---------------------|---------------|
| PM1_ambient #11 | 39,45 |
| PM2.5_ambient #11 | 43,49 |
| PM4_ambient #11 | 45,33 |
| PM10_ambient #11 | 51,15 |
| PMtotal_ambient #11 | 58,46 |
| PM1_classic | 15,52 |
| PM2.5_classic | 18,59 |
| PM4_classic | 20,70 |
| PM10_classic | 29,05 |
| PMtotal_classic | 51,96 |
| PMthoracic | 29,92 |
| PMalveo | 20,78 |
| PMrespirable | 42,97 |
| | |
| | |
| | |
| | |

menu device ready 10:40:42
29.04.2014

Figure 11: “alternative PM values”

2.5.6 “filter system”

Provides assistance in case of a manual filter exchange, specifically when a filter is inserted for a gravimetric measurement. The user can switch on/off the pump, set the time when a filter is inserted and can enter its weight (“weight in”). Upon removal of the filter the user can set the time when the filter is removed and enter the weight of the filter after the measurement (“weight out”). When all entries are completed a new button “save to datalogger” appears and the data can be saved to file.

The screenshot displays the 'filter system' interface. At the top left, the title 'filter system' is shown. Below it are four input fields: 'filter in', 'weight in...', 'filter out', and 'weight out...'. To the right of these fields are two buttons: 'switch pump on' and 'switch pump off'. Below the input fields is a 'save to datalogger' button. At the bottom left is a 'menu' button. On the right side, a data log is displayed with two entries. Each entry shows a filter identification number (FID), a timestamp, a date, and a weight in micrograms (µg). The status bar at the bottom indicates 'device ready' and shows the current time and date.

| filter in | weight in... | filter out | weight out... |
|-----------|--------------|------------|---------------|
| | | | |

switch pump on switch pump off

FID20160407_124415

12:44:15 PM
07/04/16

1000.000 µg

12:44:38 PM
07/04/16

1000.500 µg

save to datalogger

menu

device ready 12:44:59 PM
4/7/2016

Figure 12: “filter system”

The entries are:

| | |
|-----------------------------------|---|
| switch pump on switch pump off | Switch on / off sampling pump |
| filter in | The current time is taken as the time the filter is inserted. Additionally, a filter-identification-number (FID) is created and displayed. |
| weight in... | A popup window appears in which the weight of the empty filter can be entered. It is implied that the entered weight correlates to the „filter in“ time and date. |
| filter out | The current time is taken as the time the filter is removed. |
| weight out... | A popup window appears in which the weight of the full filter can be entered. It is implied that the entered weight correlates to the „filter out“ time and date. |
| save to datalogger | The entered data are saved to file and are available when the data are analyzed using PDAnalyze. |

2.5.7 “particle size distribution”

Displayed here are two graphs. The upper graph shows the particle size distribution by number concentration, the bottom graph shows the particle size distribution by mass concentration. Red is the discrete, blue is the cumulative distribution.

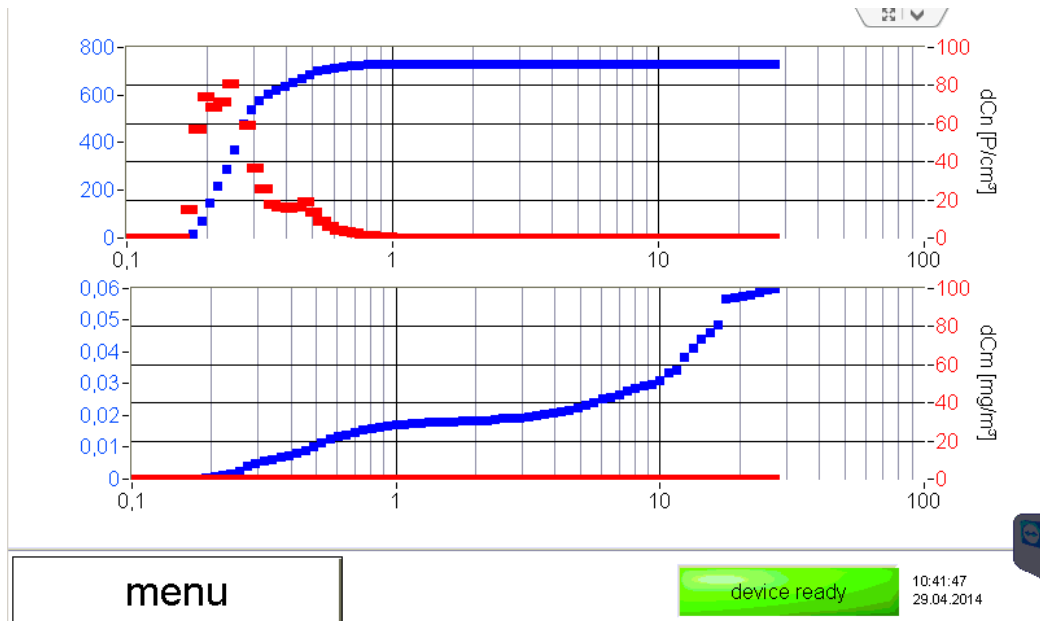


Figure 13: “particle size distribution”

2.5.8 „alarms“ – e-mail notification in case of warnings/errors

If activated an e-mail is sent to the entered e-mail address whenever one of the status parameters (see “device status”) is out of range.

In the bottom section a limit value for a PM-fraction can be defined (the value is defined in the promo.ini file). When this value is surpassed a digital alarm (at the digital out connector) is triggered and can be used to control a warning light or other warning signal.

alarms

☐ E-mail alarm by status error

E-mail address:

☐ digital out alarm by PM threshold

PM threshold: $\mu\text{g}/\text{m}^3$

PM 10 0,000 $\mu\text{g}/\text{m}^3$

menu

device ready

13:04:24
09.04.2014

Figure 14: “alarms” – e-mail notification in case of warnings/errors

The following entry needs to be in the promo.ini file:

In the [Fidas] section:

alarm_threshold=50 (or any other value)

alarm_value=PM10 (or e.g. PM2.5)

2.5.9 „calibrate weather station“ – Adjustment of weather station

Since firmware version 100389, the sensors for temperature, ambient pressure and rel. humidity of the connected weather station (WS300-UMB or WS600-UMB) can be adjusted by comparing the measured values with the measured values of a transfer standard.

Single-point calibration (usually under field conditions):

→ Determination of slope factor (scale), offset remains 0

Multi-point calibration (e.g. in a calibration lab):

→ Determination of slope factor (scale) and offset by regression analysis

weatherstation calibration

| | scale | offset |
|--------------------|-------|--------|
| temperature: | 1.00 | 0.00 |
| pressure: | 1.00 | 0.00 |
| relative humidity: | 1.00 | 0.00 |

value = scale x measured_value + offset

Changes take effect after restart only!



Figure 15: „calibrate weather station“ – Adjustment of the weather station

Note: Changes take effect after system restart only.

2.6 „datalogger“ – saving data to internal memory or text file

Fidas® continuously saves the measured data to a file. Fidas® generates a new file each day. The files can be transferred to a USB stick (copy datafiles to D:\).

If a USB-stick is connected to the Fidas®, it automatically copies the data files to the USB-stick at midnight.

| | |
|-----------------------|--|
| copy datafiles to D:\ | Copies the datafiles from internal memory to an USB-stick (drive D:\ is the front USB port). |
|-----------------------|--|

At any time a comment can be entered that is saved along with every saved measurement data. The same comment is saved until the comment is deleted or changed.

datalogger - data files

enter comment

copy datafiles to D:\

DUSTMONITOR_5728_YYYY_mm.txt

☐
data saved to textfile

☒
diskspace sufficient
diskspace must be > 1GB

copy textfiles to D:\

delete all textfiles

comment

menu

device ready

12:46:10 PM
4/7/2016

Figure 16: “datalogger” – saving data to internal memory or text file

Additionally, text file datalogging can be activated so that data are continuously saved to a text file in text format with a time resolution of typically 1 minute (can be modified in the promo.ini file).

The name of this text file is „dustmonitor_serial number_year_month.txt (Example: dustmonitor_0117_2014_04.txt).

If measuring continuously a new text file is created every month and is stored on the hard disk of the panel PC in the folder “Fidas\textfiles” (Requirement: at least 1GB empty disk space).

The textfiles can also be transferred to a USB-Stick (copy textfiles to D:\).

The columns of this text file are:

Columns A-L

| | | | | | | | | | | | |
|------|------|---------|-----|-------|-----|------|---------|-------------------------|----------|-------------|----------|
| | | | | | | | | | | | |
| Date | Time | Comment | PM1 | PM2.5 | PM4 | PM10 | PMtotal | Number Concentration | Humidity | Temperature | Pressure |

Columns M-U

| Flag for status parameters | | | | | | | | |
|----------------------------|-------------|-------|--------------------|------|-------------|-----|-------------------|------------------|
| Flow | Coincidence | Pumps | Weather station | IADS | Calibration | LED | Operating mode | Device status |

Columns V-AE

| | | | | | | | | | |
|-----|-------|-----|------|---------|-------------|---------------|-------------|--------------|-----------------|
| | | | | | | | | | |
| PM1 | PM2.5 | PM4 | PM10 | PMtotal | PM1_classic | PM2.5_classic | PM4_classic | PM10_classic | PMtotal_classic |

Columns AF-AH

| | | |
|------------|---------|--------------|
| | | |
| PMthoracic | PMalveo | PMrespirable |

Columns AI-AO

| Numerical values for status parameters | | | | | | |
|--|----------|-------------|-------------|------------------|--------------------------|-----------------|
| Flowrate | Velocity | Coincidence | Pump_output | IADS_temperature | Raw channel deviation | LED temperature |

Columns AP-AR

| | | |
|--------------|-----------|-----------|
| | | |
| Temperature* | Humidity* | Pressure* |

* only relevant, if optional sensor for temperature, rel. humidity and pressure is connected.

The device status is a numeric and coded as follows:

| | |
|--------------------|----------|
| Mode: Scope | 0 |
| Auto | 1 |
| Manual | 2 |
| Idle | 3 |
| Calib | 4 |
| Offset | 5 |
| PDControl | 6 |

Note: only the bold ones are likely to be seen with the Fidas® system. Note: if the text file is moved or deleted, the Fidas® will automatically create a new text file for the current month. If a text file for the current month exists, Fidas® will append the data.

2.7 „settings/calibration“

The calibration of the Fidas® is monitored online through a patented analysis of the measured signal in the graph “immission estimated channel deviation – trend 40h”.

If the calibration starts to drift it can be seen by a downward progression of dots between two red horizontal lines. The dots are based on a ½ hour measurement. If the average deviation over a period of 40 hours is more than 3.5 raw data channels an error flag is set and the Fidas® should be checked with MonoDust 1500.

Note: Individual dots might be outside the limit values, this happens occasionally and is no reason for concern, the calibration is also valid for these occurrences.

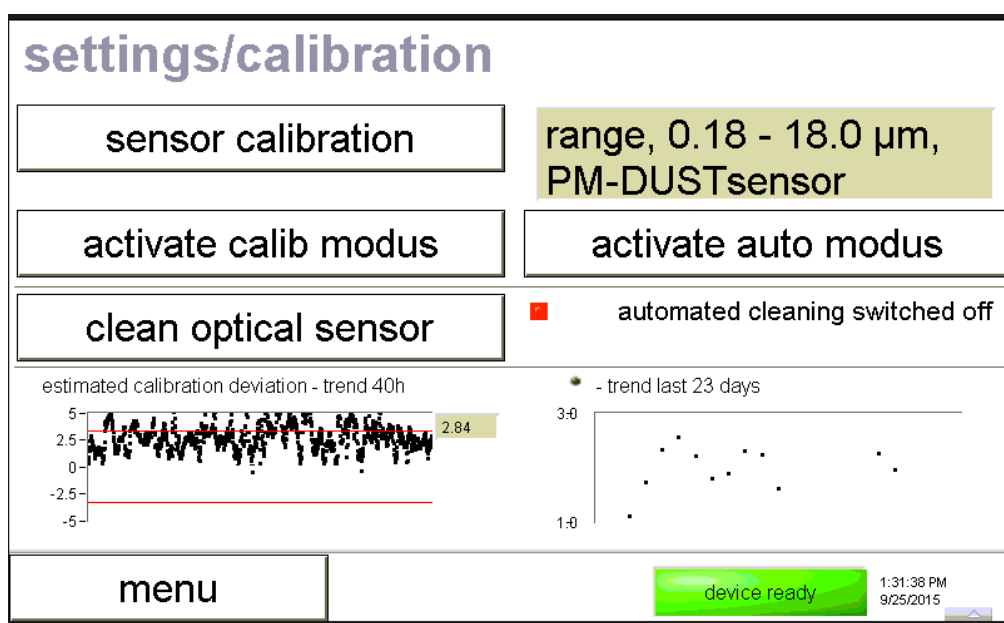


Figure 17: “settings/calibration”

In order to calibrate the Fidas® activate “sensor calibration”.

Further information on how to proceed with the calibration can be found in the Fidas® manual.

“activate calib modus” flags all data as obtained during calibration and they will not be used for evaluation unless specifically chosen in PDAnalyze. This button can also be used during maintenance of the Fidas® to ensure data are omitted for evaluation during these activities.

Note: if activated manually, auto mode needs to be turned on (“activate auto modus”) manually after work is finished, otherwise the unit will show “device not ready” as in device status, “auto mode” would then not be shown.

“clean optical sensor” starts an automatic cleaning procedure in which the IADS is heated up to 75 °C and the pumps alternate between 0 l/min and maximum flow. The intention is to loosen and remove possible material in the flow path.

If desired, an automated schedule can be activated in the promo.ini file.

Note: Unless there is a real problem at a specific site with material or insects entering the sampling system frequently it is not advised to turn on an automated schedule for the cleaning procedure as it puts extra strain on the pumps.

2.8 “device status”

The “device status” status overview shows the different sensor information, which is necessary for a correct operation of the Fidas®. This information is saved in form of an error byte with every data record.

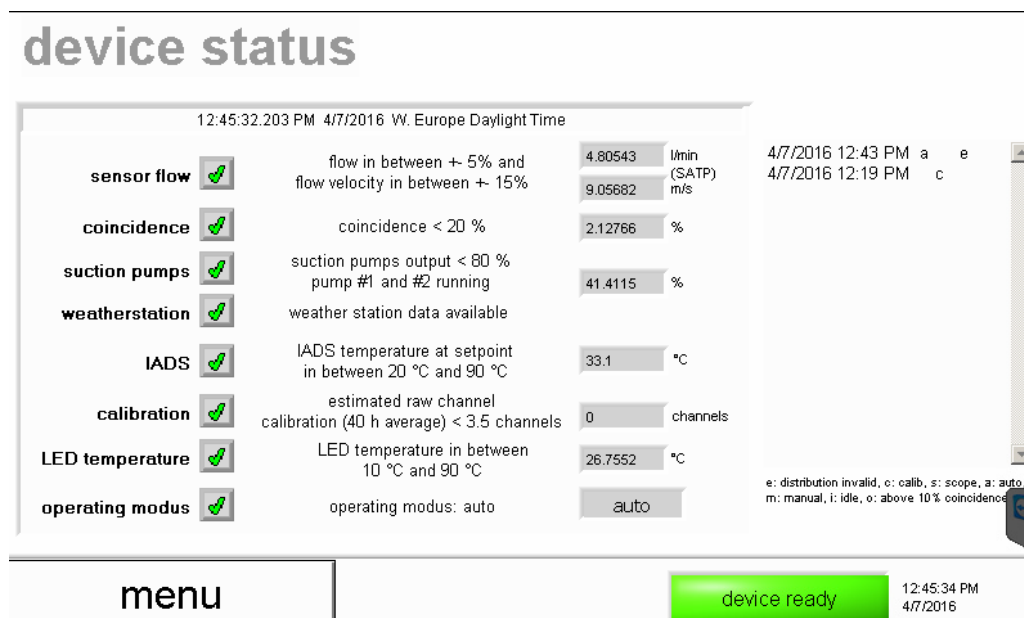


Figure 18: “device status”

In detail:

Sensor flow a feedback circuit with a mass flow meter and with respect to the measured values for temperature and ambient pressure is used to regulate the volume flow through the Fidas® 100 or 200. The flow is regulated to 4.8 l/min. The volume flow is standardized to „standard atmospheric temperature and pressure (SATP)“, i.e. with regard to 25°C & 1013 hPa. An error is set, if the flow deviates more than 5 % from the set value.

Note: In some older models the flow was regulated to 5.0 l/min.

The second value shows the particle velocity through the optical detection volume.

An error is set, if the particle velocity differs more than 15 % from the nominal value. This nominal value corresponds to the velocity determined during the factory calibration taking into account the current IADS temperature and the ambient pressure.

| | |
|--|--|
| Coincidence | Detection of more than one particle in the optical detection volume. Error output if it occurs with a frequency of more than 20 %. |
| Suction pumps | In Fidas® 100 und 200 two pumps (connected in parallel) provide the volume flow. If one pump fails, the other one can take over, but then the input is higher which leads to an error. If both pumps consistently age, an error occurs if they exceed 80 %. It is important to know that the device continues to measure correctly, but the user has to change the pumps soon. |
| Weatherstation | Shows that the weather station is connected correctly and provides values |
| IADS | Shows that the IADS is connected correctly and the temperature corresponds to the given set point |
| Calibration | monitors the calibration online, if it differs for more than 3.5 raw data channels (as an 40h average), an error occurs. |
| <u>Note:</u> In some cases this value can be outside the measurement, however the device will function properly. Need for action (i.e. a field calibration with calibration dust) is only necessary, if a long-term trend (>40 hours) can be seen. | |
| LED temperature | The LED light source is temperature controlled. If there is a problem in this control loop an error bit is set. |
| Operating modus | The operation mode should be set to „auto“, otherwise the data are not saved correctly or the device does not start independently after a blackout. |

The status log keeps track of activities performed with the Fidas®. The abbreviations are:

| | | |
|---|-----------------------|---|
| a | auto mode | Standard operating mode of the Fidas® |
| c | calibration mode | during calibration all data are marked with „c“ and are not included in the evaluation |
| i | idle | the Fidas® is running idle, i.e. no measurements are performed |
| m | manual mode | the Fidas® was switched to manual mode |
| s | scope mode | the Fidas® was switched to scope mode. This is an electronic oscilloscope where the individual signals can be analyzed |
| e | distribution invalid | the measured distribution is invalid |
| o | above 10% coincidence | concentration was so high that more than 10% of the measured data were in coincidence, i.e. during measurement more than one particle was in the detection volume more than 10% of the time |

2.8.1 Differences for the Fidas® mobile

The “device status” screen of the Fidas® mobile is simplified (e.g. no IADS or weather station) and the error checkboxes are removed as shown in figure 18a.

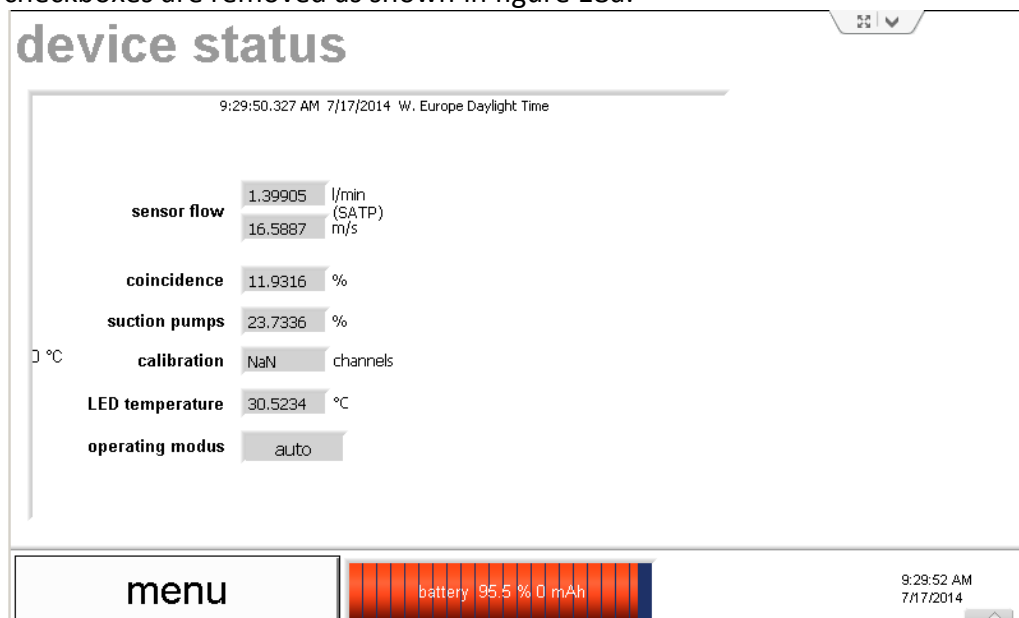


Figure 18a: Simplified “device status” screen for the Fidas® mobile

2.9 “expert user menu”

Advanced functions and information can be accessed through the expert user menu. In order to access this menu a code needs to be entered to ensure that only trained personnel can access this. The code is “1” followed by “-” followed by “accept” (figure 18).

Note: It is possible to set the password differently. In order to do that the following needs to be entered in section [Fidas] in the promo.ini file:

password_service=-1 (-1 is the default password, if desired change this to a different password)

Further information to the expert user mode can be found in the manual to the expert user mode.

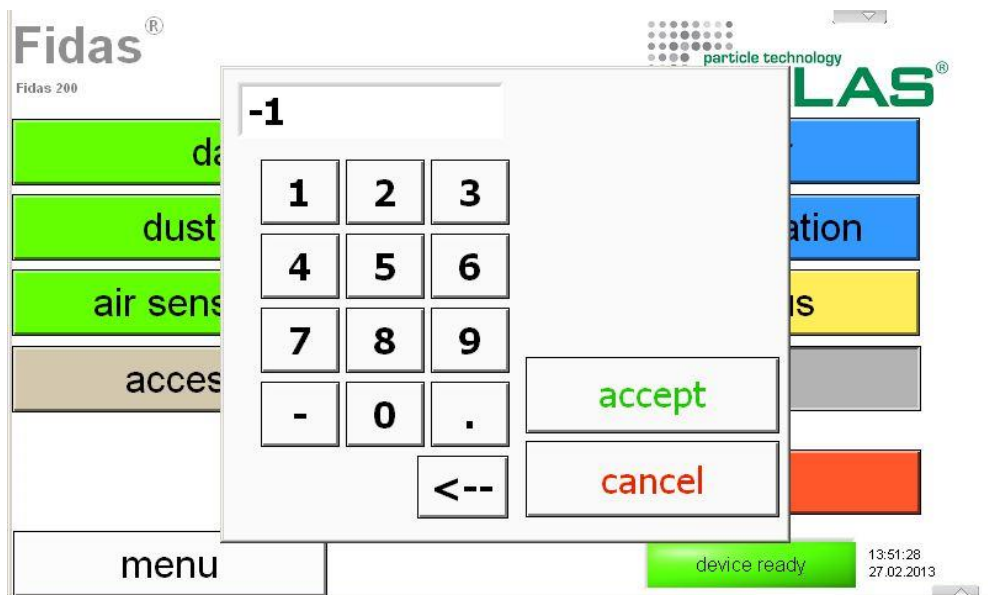


Figure 18: „expert user menu“ – changing into the expert user mode



Figure 19: „expert user menu“ – main menu

Note: The firmware version string is composed as follows:

| | | |
|-------------|--------|--|
| Position 1: | 100396 | Firmware version of the panel PC (Touchscreen) |
| Position 2: | 0014 | Firmware version of the SCA board |
| Position 3: | 0001 | Firmware version of the MIO board |
| Position 4: | 0001 | Firmware version of the Pt100 board |
| Position 5: | 0011 | Method |

2.10 “shut down” - shutting down the Fidas® Firmware

We recommend using “shut down” to turn off the Fidas®.

Since the Fidas® firmware is running on a dynamic operating system that is based on Windows XPembedded for industrial applications, the Fidas® should not be turned off by just flipping the power switch. This could result in a corruption of the file system.

If the “shut down” is initiated, the following popup will appear on the screen:



The Fidas® Firmware is now shut down properly. After this procedure is finished and the touch screen monitor is off (green indicator light is off), the Fidas® can be turned off by pressing the on/off button on the backside of the instrument. It's recommended to do so, else the internal fan will keep running.