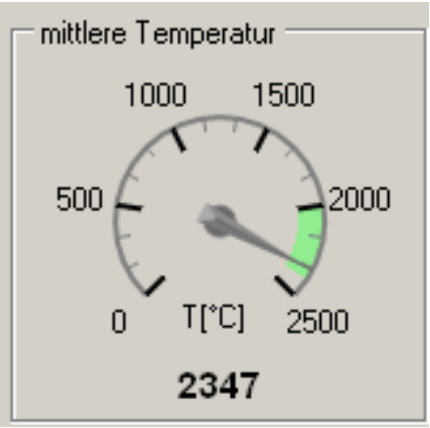
SOFTWARE DOCUMENTATION

PACT V2.04



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1 SYSTEM REQUIREMENTS

PC: 1 GHz

RAM: 512 MB

needed disk space: 2MB

operating system: MICROSOFT WINDOWS XP - Service Pack 3

COM – interface 1: USB 2.0

COM – interface 2: Ethernet

2 SOFTWARE INSTALLATION

After the delivered CD-ROM is inserted, the file “setup.exe” has to be run. The installation is guided by the WINDOWS-Installer. Please follow the instructions.

The installation routine does not produce a program icon on the Desktop of your computer. To do this, click the right mouse button and open a *“New short cut”* in the menu *“New”*. Connect this short cut with the file *“PaCT_App.exe”* in the program directory.

3 HARDWARE INSTALLATION

To install the sensor device on the computer connect the NIR-sensor with the computer using a USB wire. After a few seconds WINDOWS XP automatically tells the user, that a new hardware is found. Now start the driver installation and follow the instructions. The needed driver files could be found in the subdirectory “Treiber” in the directory of the software.

The hardware installation needs two steps. After the first driver installation the second installation is started automatically after few seconds.

If Software and Hardware are installed, the PaCT-Software can be started.

4 START

The Software is started with a double click on the program icon. Alternatively the software can be started in the program directory. After a correct start of the software the user interface is opened (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

The area *"Measurement template"* including the *"Details"* – button is used to set up the limit of the temperature measurement and the allowed (green) arrays of the particle measurements (chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).

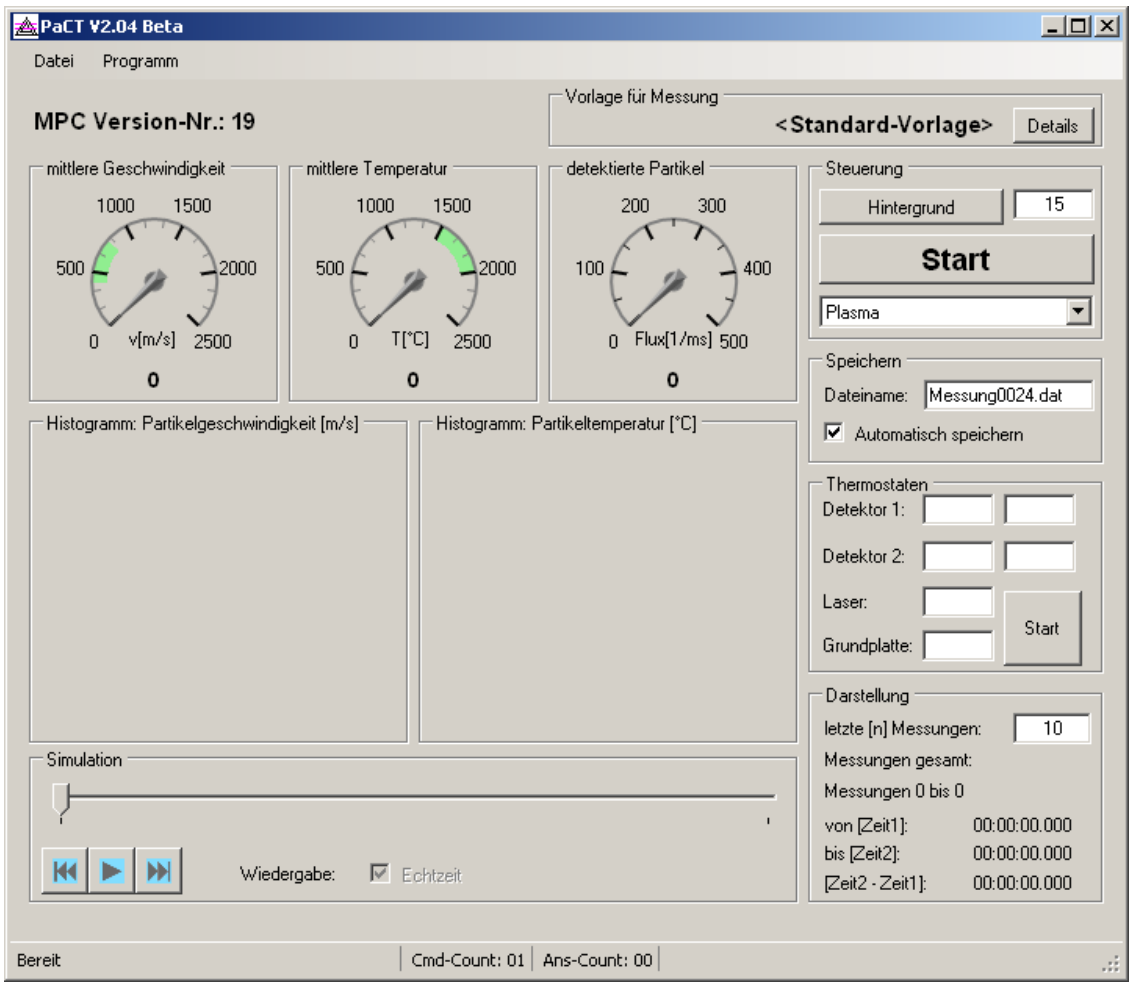

Figure 1: user interface of the software PaCT V2.04

Based from this user interface all necessary parameters could be monitored and adjusted.

In the centre of the graphical interface are three instruments which display the average velocity and temperature of the measured particles and the measured number of particles. Below these displays are two histograms – one for the particle velocity and one for the particle temperature.

On the right side there are the control elements of the software. The general parameters of the measurement and of the display of measured data can be set up there. The functions of these elements are explained in the following.

Control: In this area there are two buttons, one input box and one drop down menu including three options (see Figure 2). The user can chose between three kinds of particle flows - particles with high velocity, particle with low velocity and particles in a plasma – for the measurement.

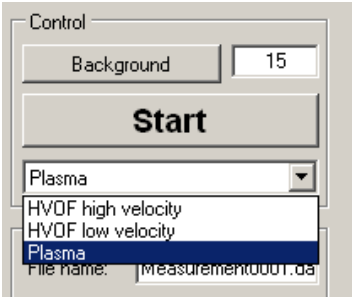

Figure 2: Drop down menu in the control area

Background – Button: This button starts the background measurement. In the input box the number of desired measurements is defined.

Start – Button: Using this button starts or stops the current measurement.

Save: In the input box the filename of the measured data is defined. If the checkbox *"Auto save"* is activated, all measurements will be saved automatically by the software. In this case the filename has a continuously number.

Thermostats: In this area all the temperatures, measured on different places in the sensor device, are displayed. If one of the temperatures is higher than the set limit, the display of this temperature is colored red.
Clicking the *"Start"* button starts an independent temperature measurement.

Display: With the input box the number of the displayed measurements is defined. Also the number of all done measurements and their time of measurement are shown.

Simulation: In this area saved measurements can be displayed.

5 Drop Down Menus

In the button bar of the user interface there are two drop down menus – File and Program, as shown in **Fehler! Verweisquelle konnte nicht gefunden werden.**. Using these menus different function can be called, which are explained in the following.

Menu – File – Measurement: In this menu the functions to load and export measurement data can be called. If one of these functions is called a dialog to define filename and –extension is opened.

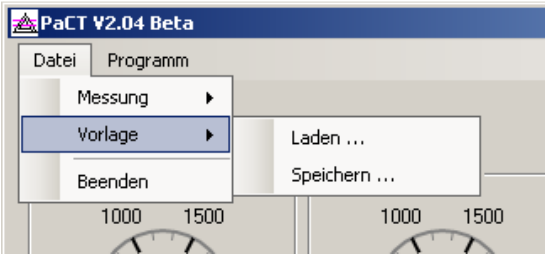

Figure 3: Menu File Measurement

Menu – File – Template: Using this menu templates can be load and saved. Filename and –extension are defined in a separate dialog.

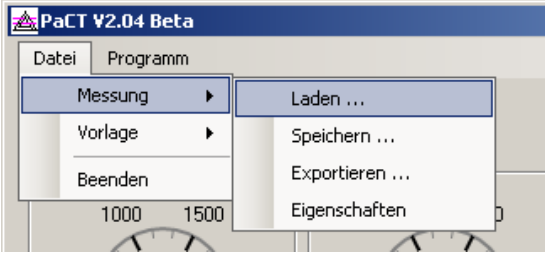

Figure 4: Menu File Template

Menu – Program – Settings: With this function a new user interface is opened, where parameters of the measurement can be adjusted. See also chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Figure 5: Menu Program

Menu – File – Exit: Calling this function shut down the software PaCT 2.04. If not all parameters and data were saved, a warning will be displayed to avoid data loss.

6 SETTINGS

If the dialog “Settings” in the drop down menu “Program” is opened as described in chapter 5, the window displayed in Figure 6 is opened. The user can adjust different parameters of the functionality of the software in this window.

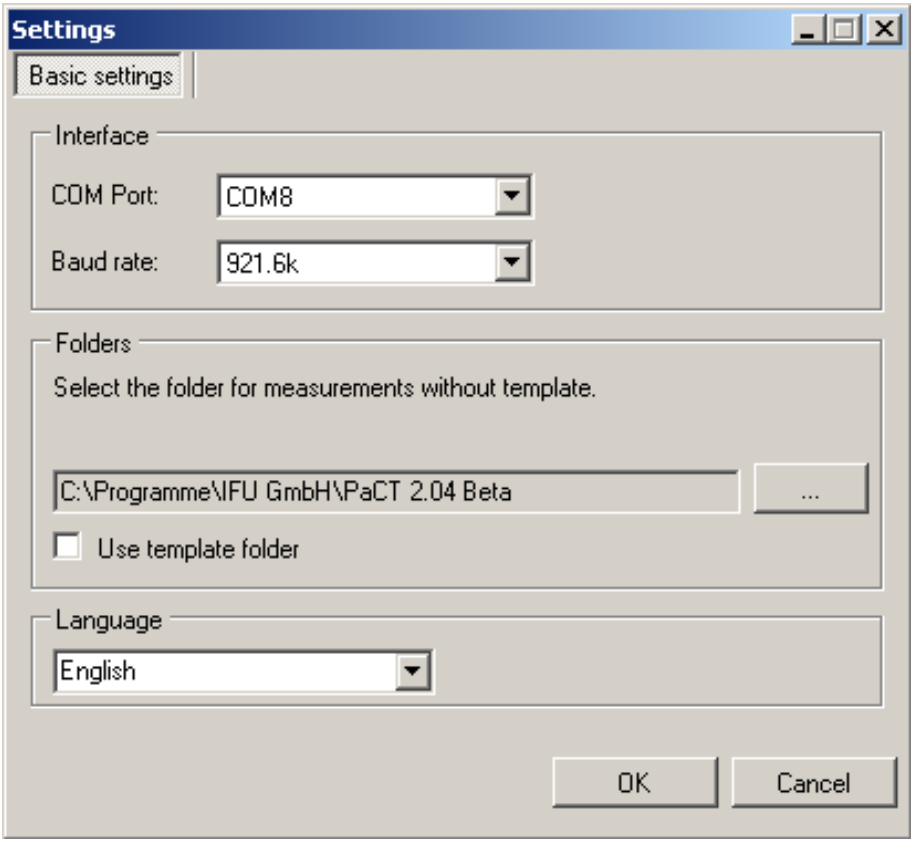

Figure 6: settings of the software

Interface: In this area the port number and baud rate of the COM-port used by the NIR-sensor is set up.

Folders: This parameter is used to define the directory where the measurement data shall be saved. For this also the directory defined in the template can be used. In this case the checkbox *“Use template folder”* has to be used.

Language: In this menu the language used by the software is defined. The user can choose between German and English. If the language settings are changed, the software has to be restarted.

7 Measurement Details

As described in chapter 4, by clicking the button “Details” in the area “measurement template” a new window is opened, in which some parameters of the particle measurement can be predefined.

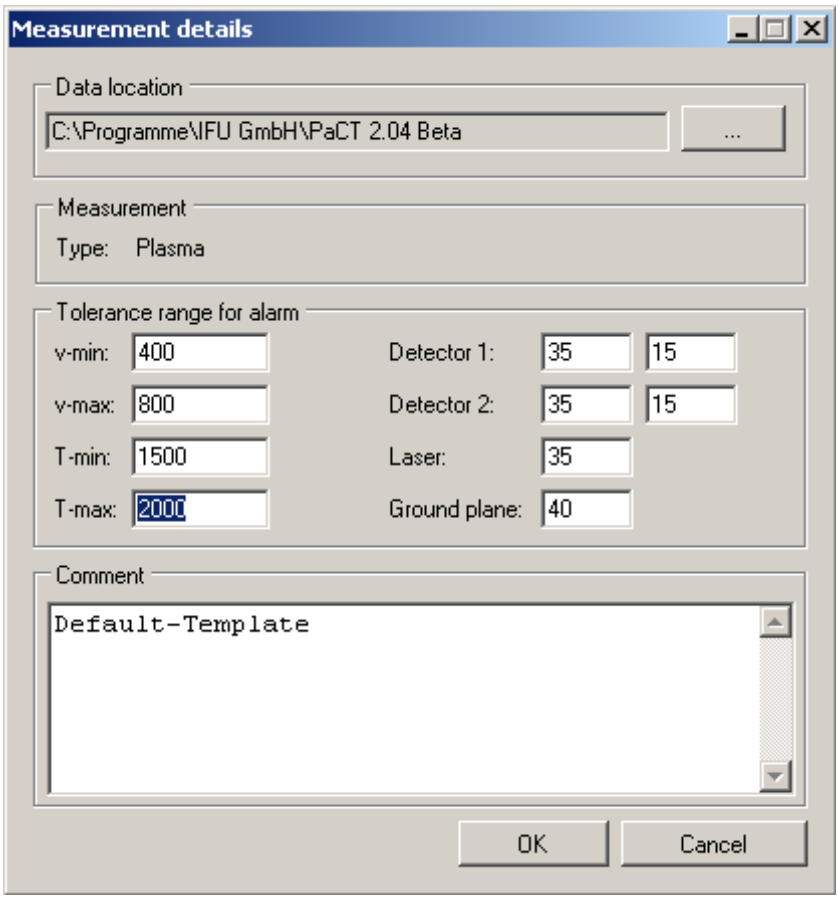

Figure 7: window measurement details

Data location: In this area the directory where the measure data will be saved is defined. Default is the program directory.

Measurement: Here the type of measurement adjusted by the user is shown. Changes can be done with the in subitem *“Control”* in chapter 4 described drop down menu.

Tolerance range for alarm: In the input boxes the minimum and maximum values of the velocity and temperature of the particles are set up. These ranges are displayed green in the instruments of the start window.
The inputs for the detectors 1 and 2, the laser and the base plate define the upper limit of the working temperatures of the different parts of the sensor.

Comment: The user has the possibility to write some notes about the measurement here.

8 EXAMPLE MEASUREMENT

In the following the single steps of a measurement are described. First the software has to be started correct and the NIR-sensor has to be connected to the computer.

1. Set up the needed parameters for the measurement in a template (Button Details). See also chapter 4.
2. Set up the correct Type of measurement (see chapter 4).
3. Define the place to save the measured data (see chapter 4).
4. Accomplish the background measurements (see chapter 4).
5. Start of the measurement with the *"Start"* Button. The label "*Start"* will be replaced by *„Stop"*.
6. Stop the measurement with the *"Stop"* Button. The label *"Stop"* will be replaced by "*Start"*.

A correct measurement is shown in Figure 8.

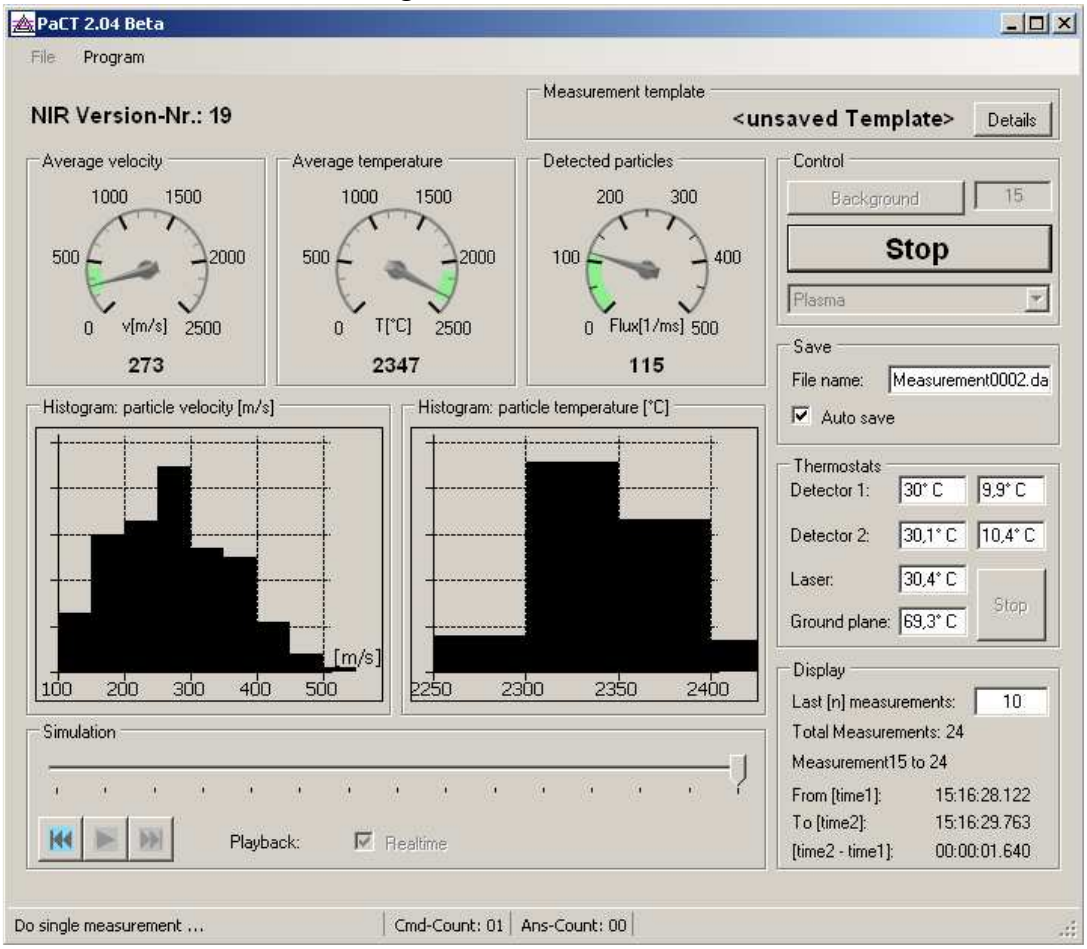

Figure 8: successful measurement

If the values of average velocity, average temperature and number of particles are out of range, which are defined in window *"Settings"* (chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**), the software PaCT 2.04 automatically warns the user by frame the according instrument red as shown in **Fehler! Verweisquelle konnte nicht gefunden werden.**.

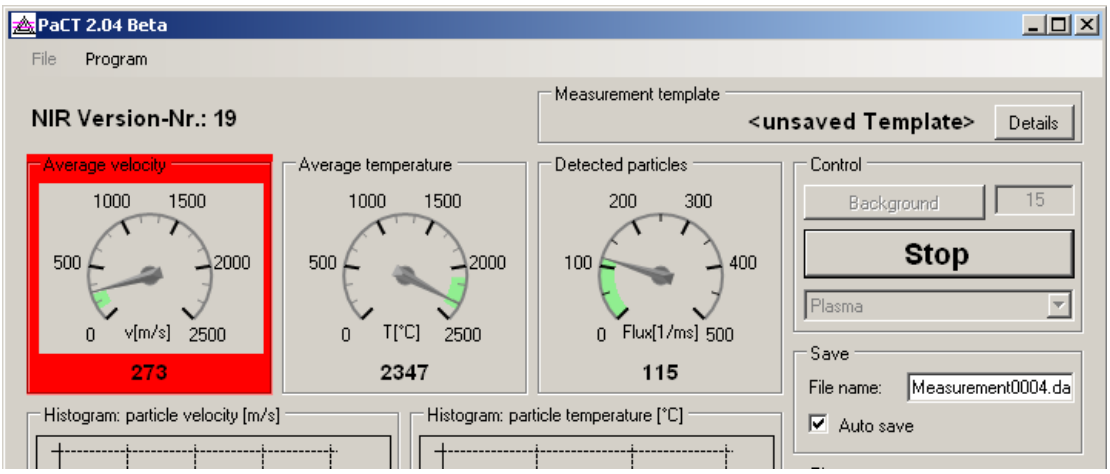

Figure 9: average velocity out of range

Also the connection between NIR-sensor and computer is monitored by the software. If the connection is interrupted, the software writes a warning on the monitor as shown in **Fehler! Verweisquelle konnte nicht gefunden werden.**. When the sensor and the computer are connected again, the software automatically detects the working connection after a few seconds.

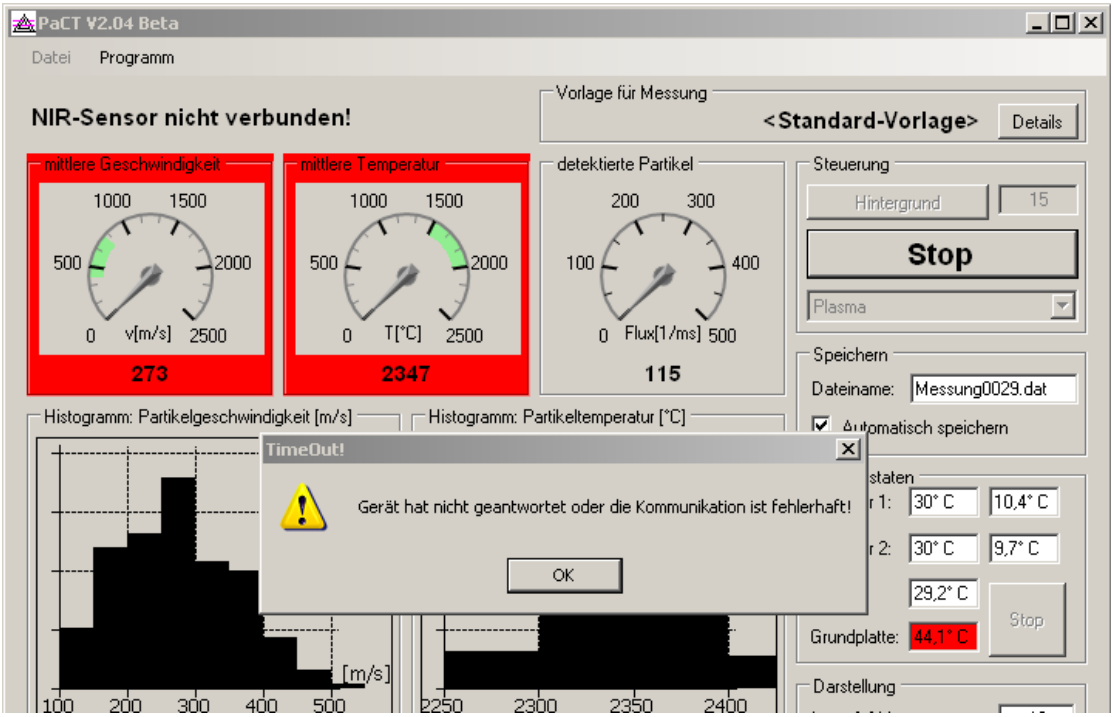

Figure 10: error message when the connection between sensor and computer is interrupted