Operating Manual

# *Measurement and simulation server (MSS) version 2.7*

Version 09/2016

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**EN**

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## System requirements:

Client's browser:
Internet Explorer 9 or higher, Firefox 15 or higher, a Google Chrome browser must support HTML5 Canvas.
**Pop-up blockers must be disabled.**
Caching mechanism must be deactivated (see web browser settings)

Miscellaneous:
Microsoft Silverlight must be installed at the client end.

## Connection with the server:

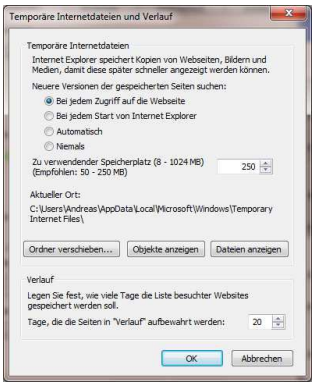
The measurement and simulation server is available at www.renner-verbrauchsmessung.de or via www.renner-datalogging.com .
Use one of the browsers specified in the system requirements and enter the web address listed above to connect to the server. The PC must naturally have internet access activated.

## Registration:

You will receive free access as a RENNER dealer. Access data can be requested from the internal sales department or via your local Renner GmbH field service employees.

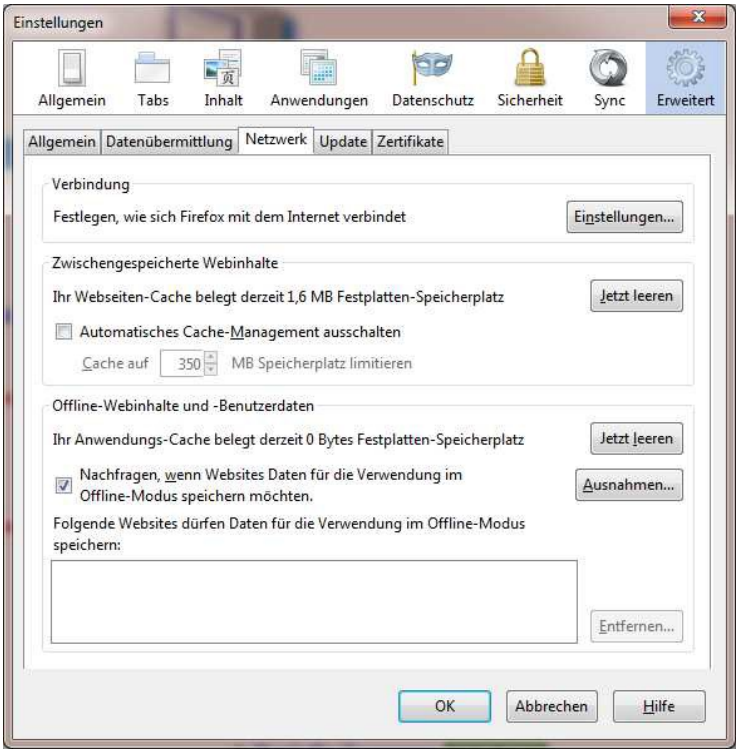
## Web browser settings:

The software requires web browser caching to be disabled. You can achieve this by setting the option in Internet Explorer:
"Temporary internet files: Every time I visit the webpage." See diagram:



This dialogue box can be found in Internet options -> Browser settings.

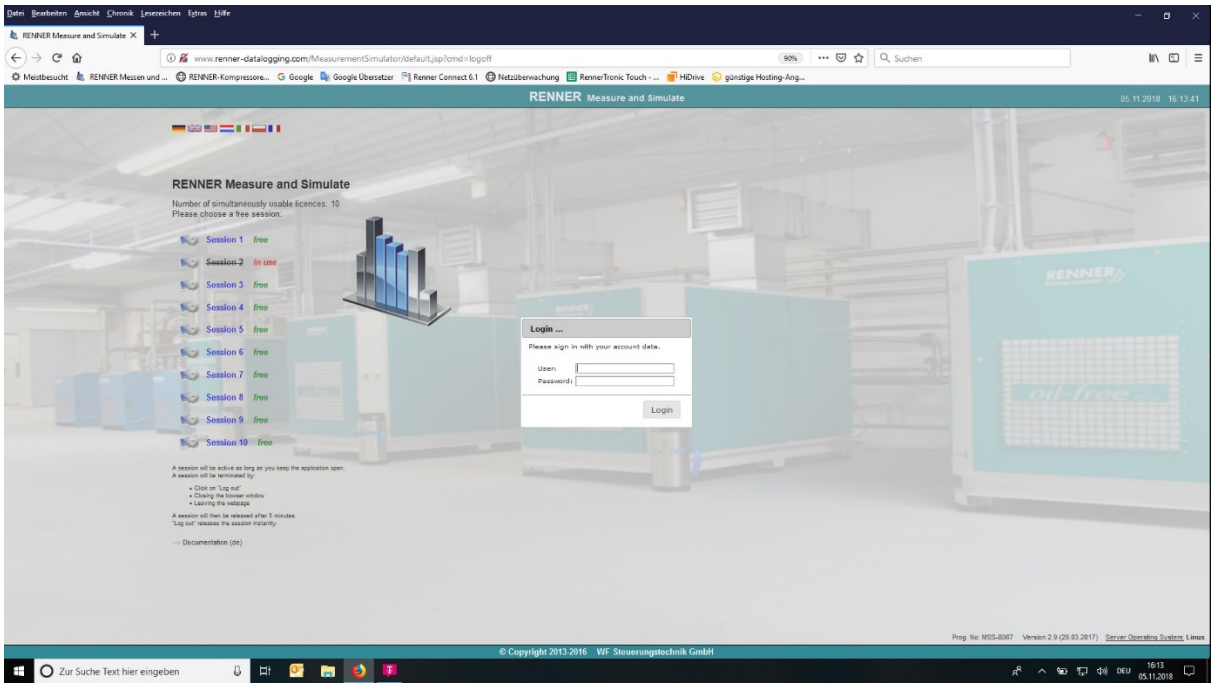
In Firefox, this option can be found under "Settings->Advanced->Network"
Select the option "Ask me If website data is to be used in offline mode".



## The Home screen:

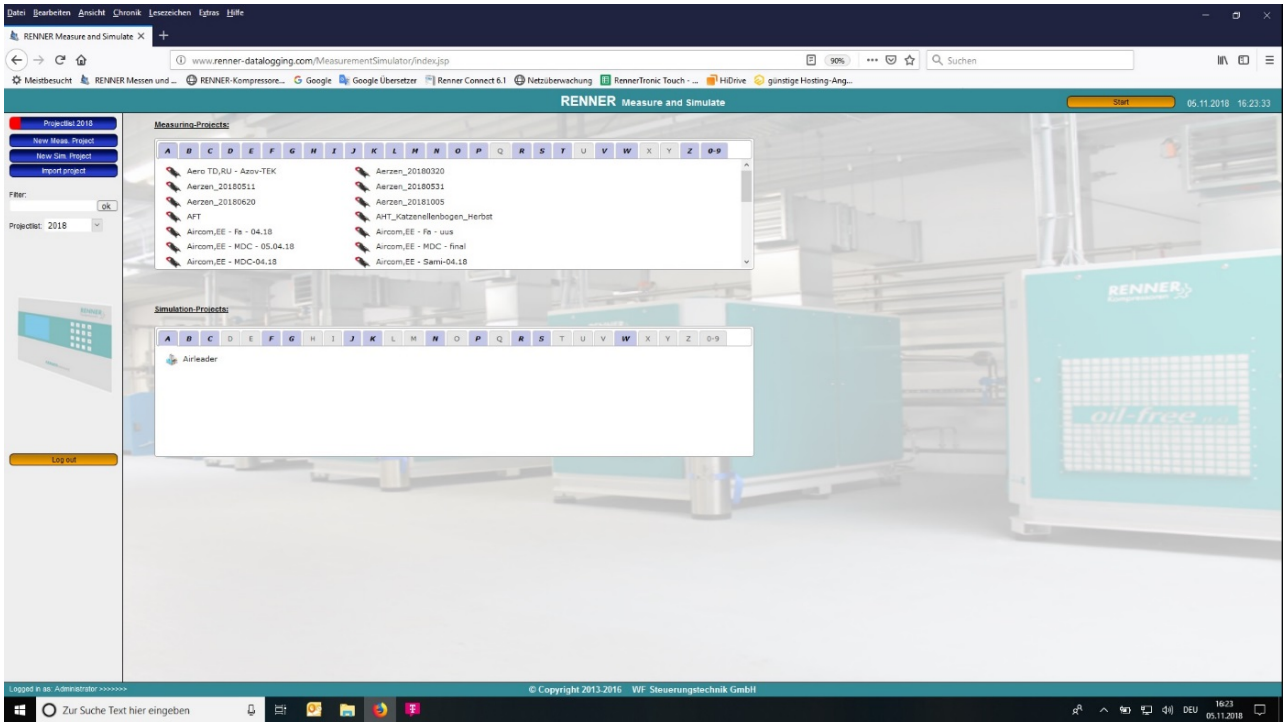
Open your browser.
Accessing http://www.renner-verbrauchsmessung.de takes you to the home page.

Here you can select a free session. (See license).




Clicking on a free session will take you to the project overview.

# Project overview:




The project overview is divided into:

- Measurement projects
- Simulation projects

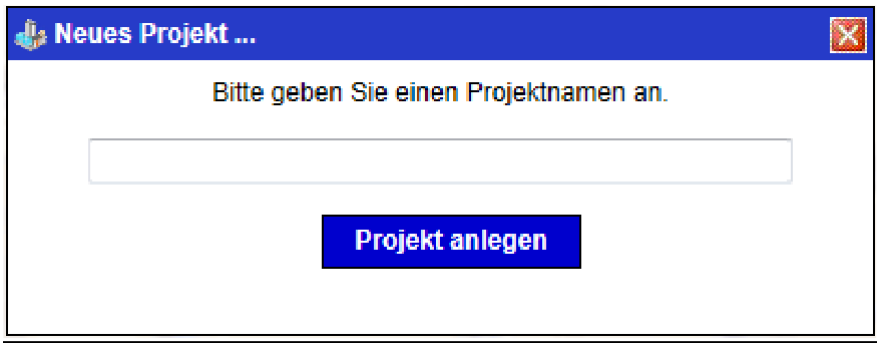
The project overview provides you with the following options:

- Selection of a measurement or simulation project
  Clicking on the project name takes you to the relevant project.
- Creating a new measurement or simulation project:
  - Enter a name for your new project

All projects are managed in an alphabetically arranged tab system.

Please therefore name your measurement by the following scheme:
Your company name YYMMDD project name (or other identifier for the measurement)
This naming helps you and us to quickly identify the measurement when you call.

Creating a new project:




## Measurement project:

A measurement project represents the evaluation of a measurement made using the RENNER analogue measuring case.
The MSS enables evaluations of simultaneous measurements made with up to 4 analogue measuring cases. The following options are available to you in an evaluation:

- Uploading the measurement data (separately by measuring case) or directly from the measuring case via a network
- Programming and organising the channels
- Evaluating the data
- Stipulating the load, idling and standstill limits for compressors
- Printing the evaluation
- Creating a simulation

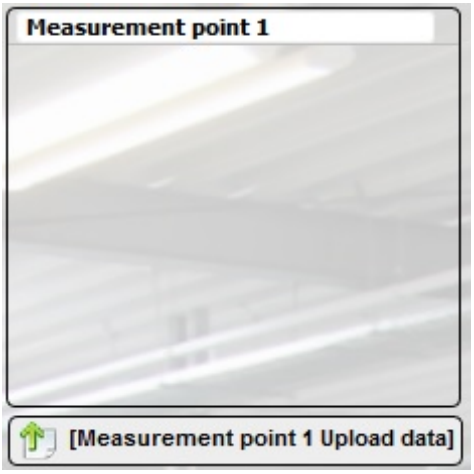
Advantages compared to the previous PC evaluation programme:

- Greater accuracy
- Direct impact of the total consumption curve
- Common data retention

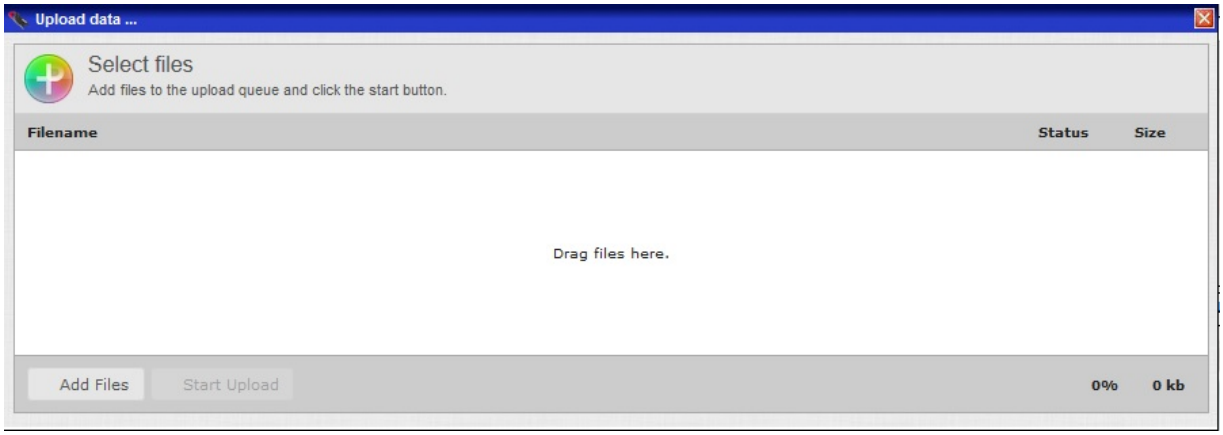
Generation of simulations without any further configuration work

Uploading the measurement data:

Click the "Upload" link below the desired measurement point. (From a USB stick, for example)
The data can also be downloaded directly from the measuring case if it is connected via a network cable.




Here you can select the measuring data on your hard drive or USB stick and confirm this with the "Upload" button.
The uploaded data will be listed in the measuring point after a successful upload.

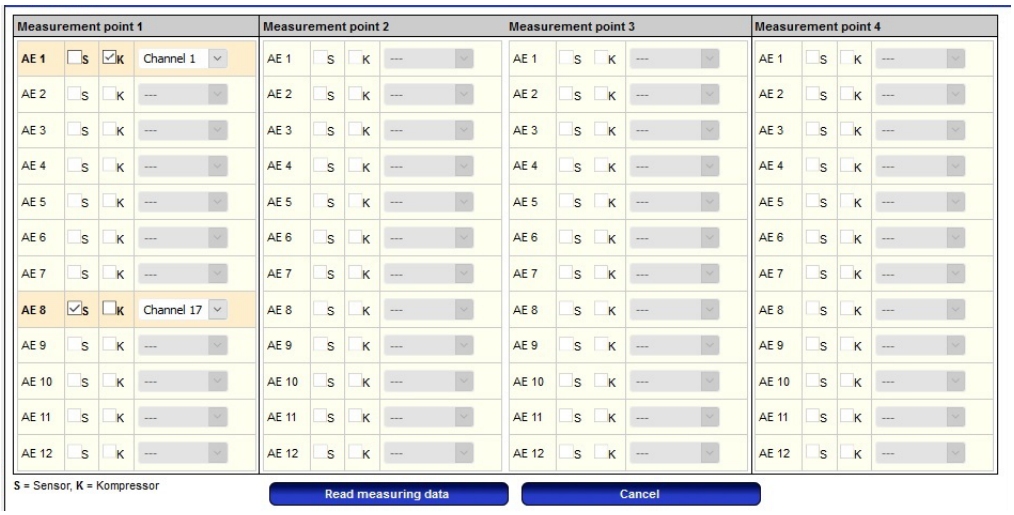



Repeat this process for each measuring point if you have used multiple analogue measuring cases for your measurement.

## Programming:

Programming is used to organise the connected sensors:
The channels on the current clamps (compressors) should be logically assigned to the customer's compressor numbering.

These have to be programmed after uploading the data.
This involves assigning fixed channels 1–8 on the measuring case to the virtual channels, where compressors are allocated to channel 1–16 and sensors to channel 17–32. A channel can only be assigned once within a measurement.



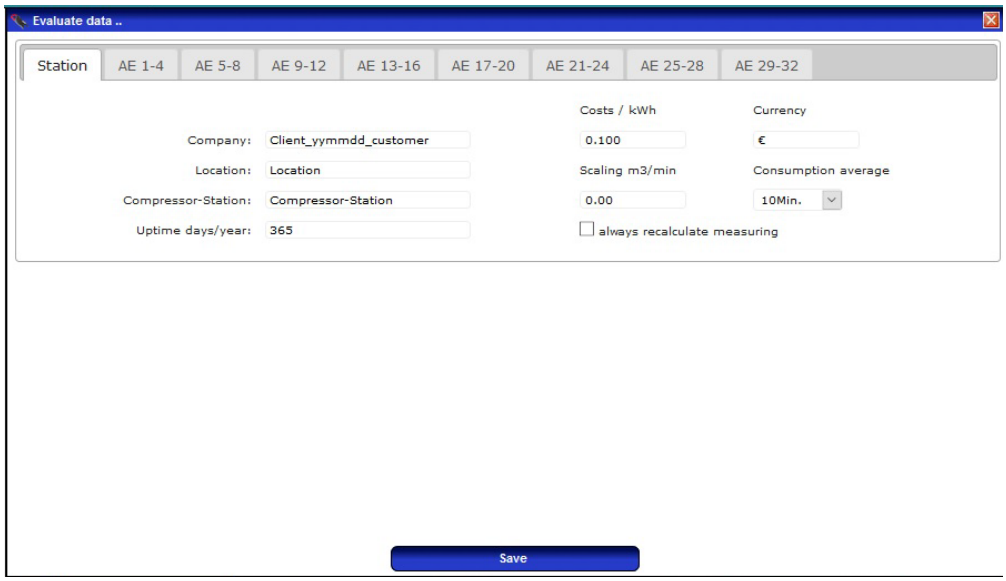

The programming process can take several minutes depending on the amount of data and the number of measuring points.

## Evaluating:

The technical data for the measured components is specified during evaluation. Basic parameters such as electricity price, measuring cycle and scaling are also specified here.

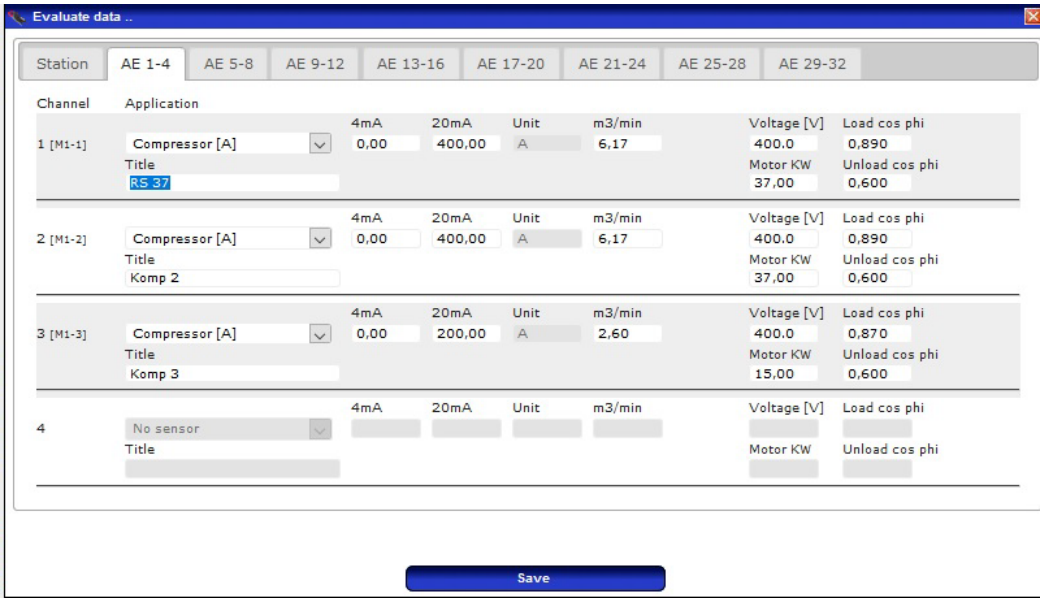
*Basic parameters:*

Input all project data, such as cost, location, total amount (default = the sum of all connected compressors + 10%), etc.



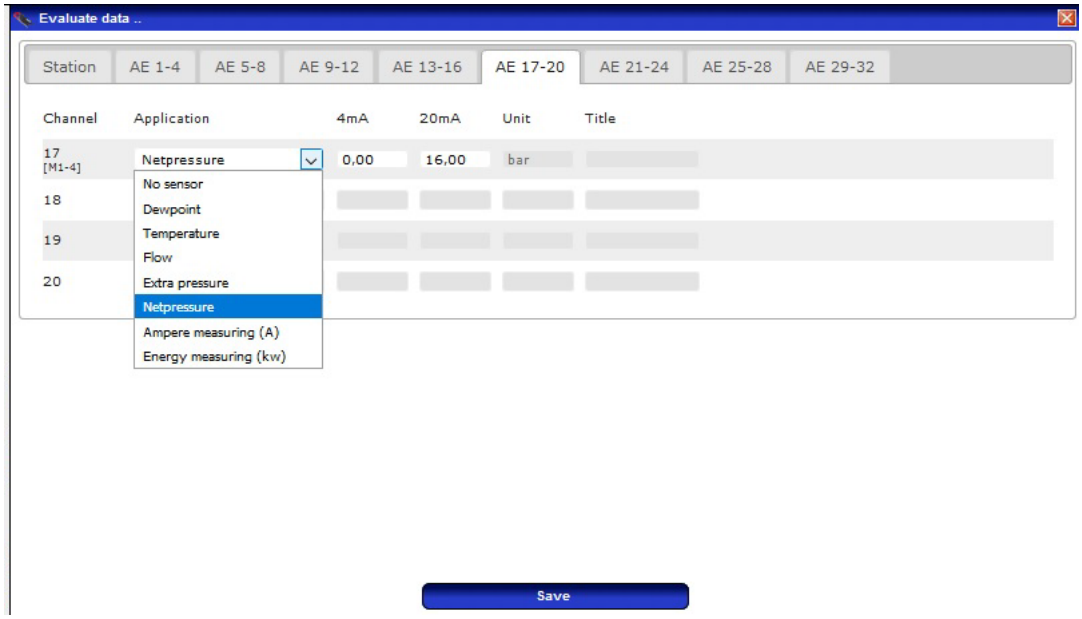
*Compressor data:*

Input the compressor configuration data and measuring ranges. Ideally during measurement you should have measured the voltage and determined the cos phi value from the motor type plate.




*Sensor data:*

Input the type and measurement ranges of additional sensors, such as pressure, dew point, flow, etc.

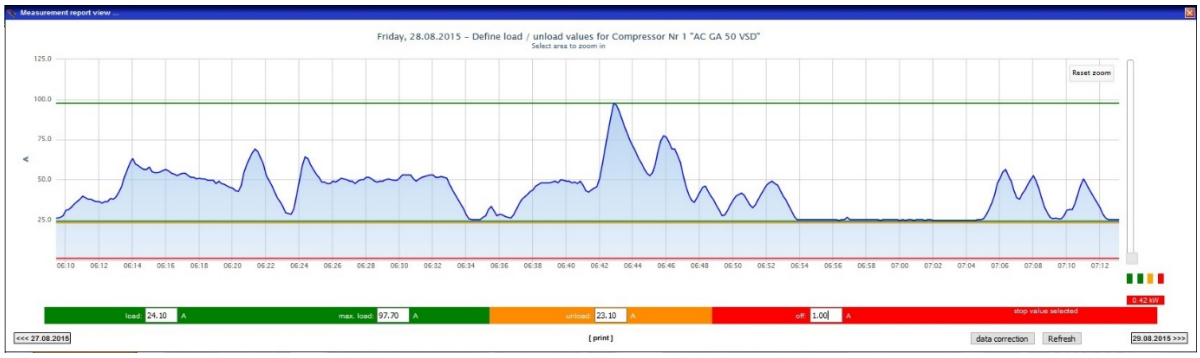



Please first programme the parameters for all sensors in all relevant tabs, only then click "Save".
Saving immediately starts generating a raw evaluation and can take some time depending on the amount of data.

After successful evaluation, the data will be available for viewing and continued processing in the "Evaluated files" field, since:
the limit values for the ampere or kW measurements **must** subsequently be stipulated, whereby at least one load/idle cycle is required for each compressor.
Click on an appropriate day in the evaluated files to do this.
The generated raw evaluation chart will be displayed. On the left-hand side there are additional navigation points for all sensors and current clamps involved in the measurement.

Selecting an ampere measurement on the compressor provides the following chart in which the limit values for load/idle running and standstill still need to be stipulated.
There are **two** green limit lines for minimum load and maximum load when measuring a compressor.
Please set the limit values accordingly. (*Please manually introduce the minimum/maximum load during installation to enable appropriate settings*)

*Stipulating load/idle running and stop limit values (for compressors with frequency converters):*



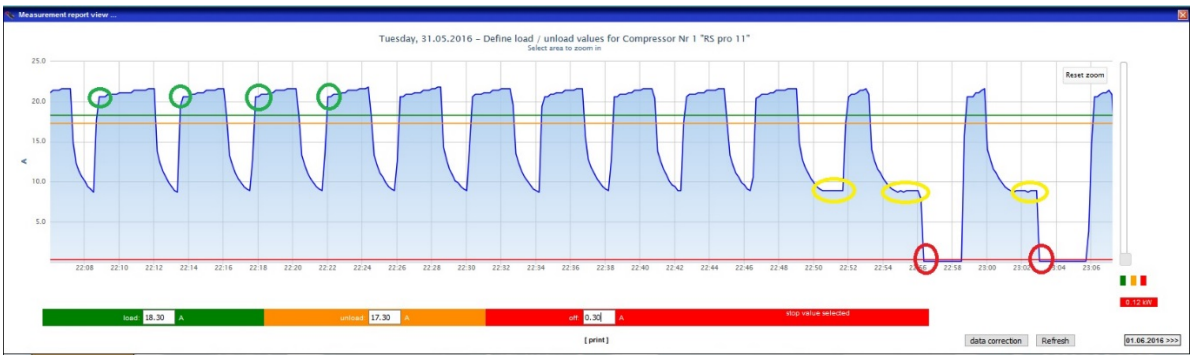

Use your mouse to set the lines by selecting the corresponding input field. Now you can either enter a value via the keyboard or use the slider on the right to move the lines using the mouse.

Set the "Maximum load run" line by searching out days within the entire measurement period on which power consumption was at its highest. The programme computes using the full delivery quantity if this current value is reached.

Then search out days on which the power consumption was constantly at its lowest, but there was obviously still a load condition because power consumption is lower still in idle running. This is the power consumption below which the load run line should be placed. It is the point for minimum delivery quantity. Everything below this line is evaluated as idle running, everything above it proportionally as a load run. You can search the load run line by +/- one third of the maximum load run line as a reference point. The amber idle run line is coupled to the load run line.

The red line signifies that everything below it is evaluated as standstill. This line should be placed just above the lowest power consumption line.

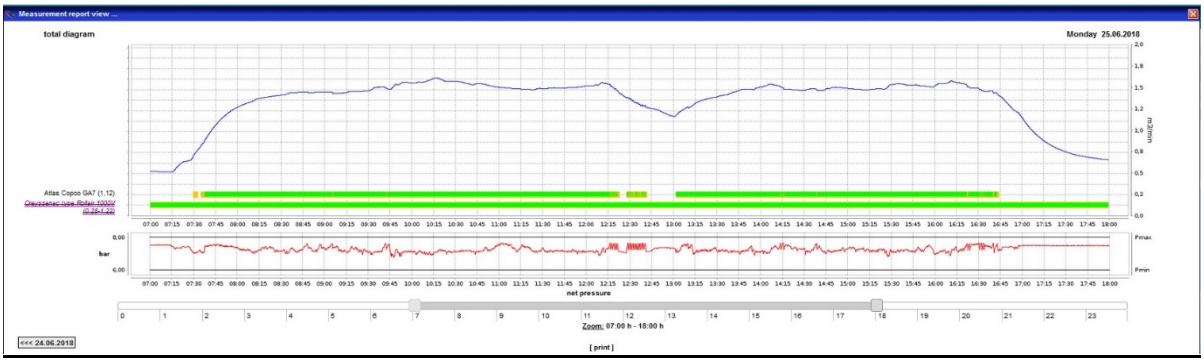
*Stipulating load/idle running and stop limit values (for compressors without frequency converters):*




There is no maximum load line for fixed speed compressors. In this case the load/idle run line should be set between the current value at the start of the load run (here circled in green) and the fully discharged state (circled in yellow) – and certainly at a level where both the rising and the declining current curves are at their steepest.

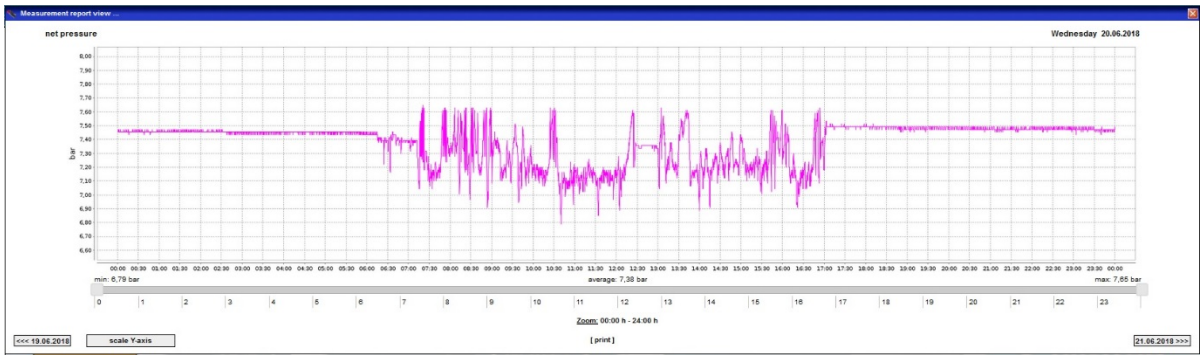
Here too it is applicable that the standstill threshold should be set above the lowest value (red marking).

*Evaluation chart:*



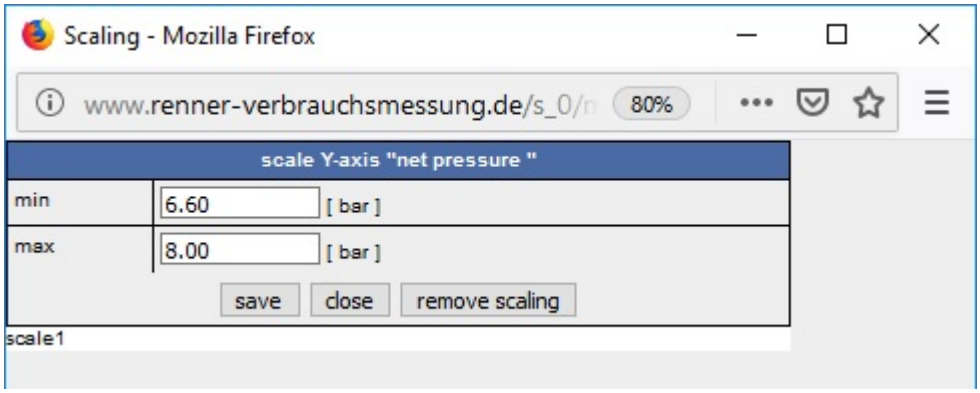

Click "Data correction" if the settings for a day have been fully completed. This will apply all settings for all other measurement days.
Then please check other days at random and check the limit values set there as well. Correct the settings as necessary. (Don't forget to click "Data correction").

*Network pressure chart:*




Should a pressure transducer have been defined as network pressure, the "Network pressure" navigation point can be used to view the pressure gradient chart and this in turn can be used to scale to a format appropriate for the measurement.

*Network pressure scaling:*




A RENNERconnect controller can be used to immediately generate a simulation of the measured station from the measurement via the "Generate simulation" menu item.
The complete measurement can be printed separated by charts, computation value tables or in full.

Version 1.2 and above:

If no compressors were measured during a measurement and only a flow measurement was conducted, then this measurement can be applied as consumption for the simulation. The data will be averaged to 5 minutes.

## Simulation:

There are two options available for creating a new simulation:

1. Via "New simulation project" in the overview's navigation
2. From a measurement via "Generate simulation"

In the latter case, the consumption data calculated in the measurement evaluation has already been copied as a basis for the consumption data.
All data already generated in the measurement evaluation are also applied (pressure band, electricity price, compressor data, etc.).

Master data:

All master data can be specified on the main Simulation screen.

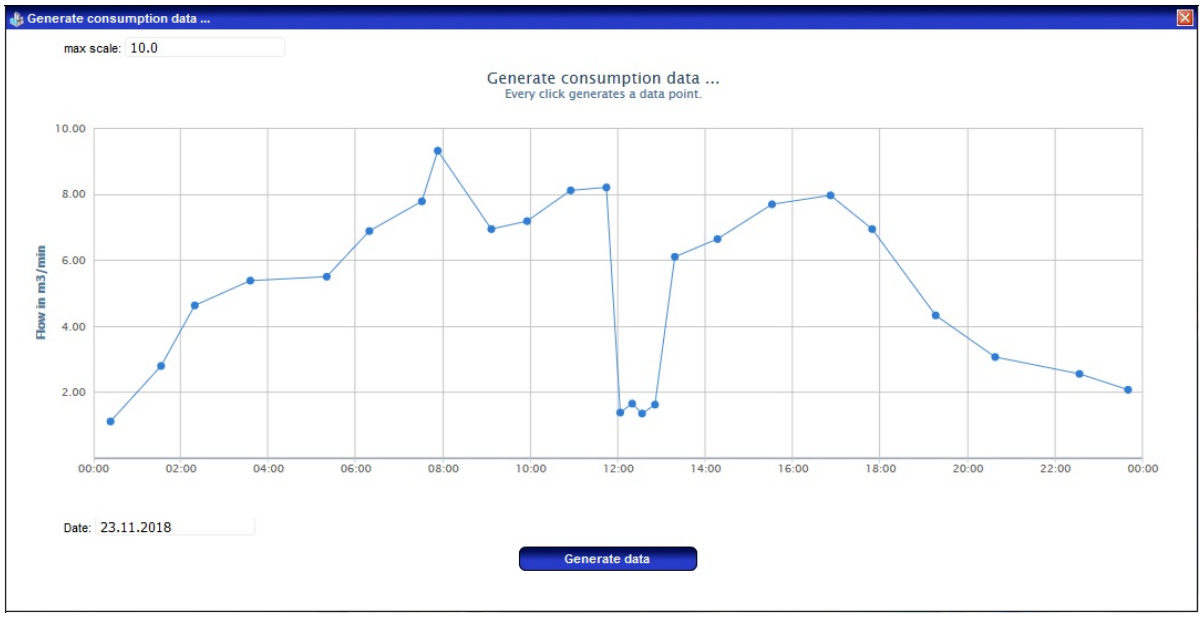
- Vessel volume
  Here you can input the existing network volume
- pMin and pMax
  Minimum and maximum value of the pressure band
- Start pressure
  Pressure value at which the simulation begins
- Electricity price per kWh
- Scaling
  Maximum scaling of the consumption chart
- Operating time per year
  The basis for the overall report when extrapolating to the year


Consumption data:

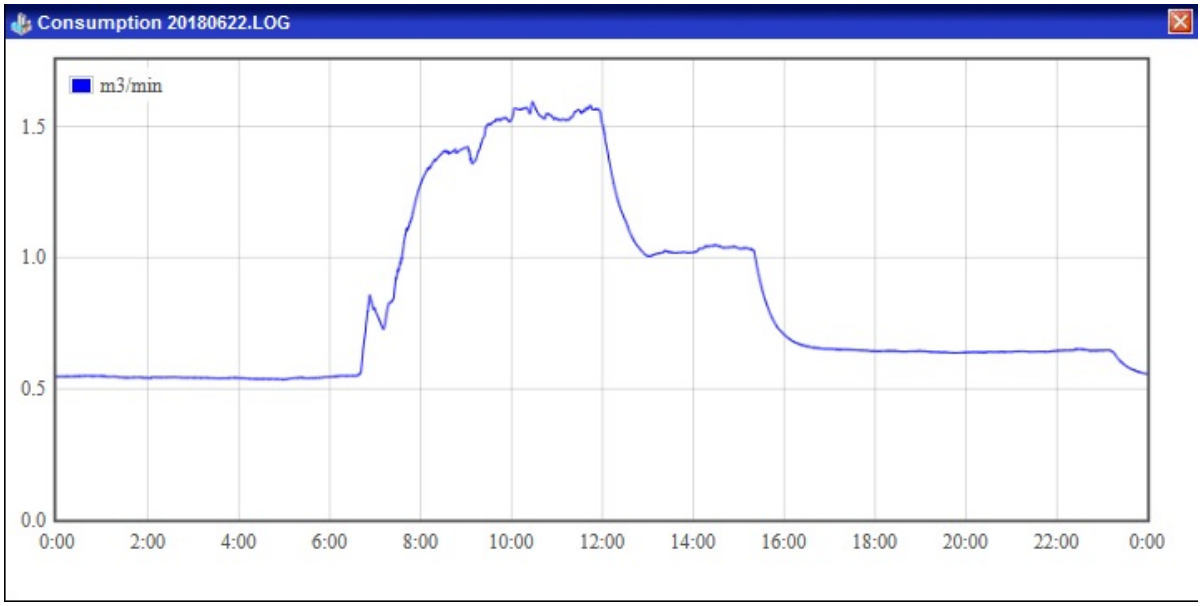
Consumption data will be required for a simulation. This can be evaluated from the previous measuring case programmes, their CSV exports, data from the RENNERconnect online visualisation or directly generated consumption curves. This can be done via the "Generate consumption data" button.

Consumption data averaging:
Consumption data can also be averaged to 5, 10 or 15 minutes.


Altering consumption data:
Consumption data can subsequently be increased or decreased by a fixed amount or percentage.




Insofar as it is available, consumption data can be uploaded into the project via "Upload consumption data" on the MSS. A click on a file displays the corresponding consumption curve.




Compressors:

The next step is to define the compressors. The MSS enables a simulation with up to 4 compressors with frequency converters.

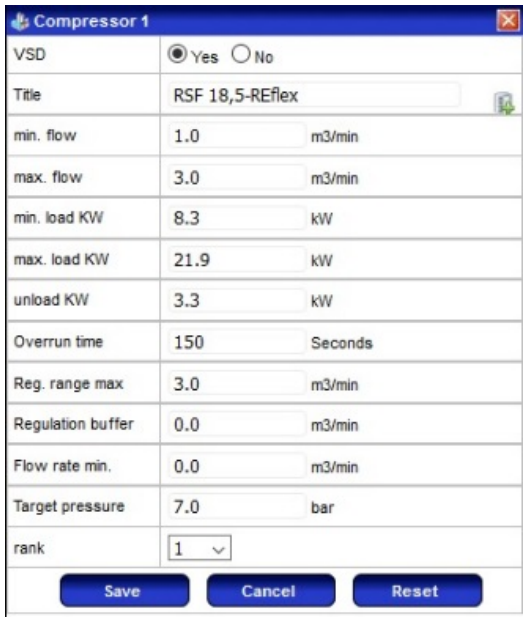
This is where you input all the data for the compressors.

You can reach this screen by clicking on one of the 16 compressors in the project's main view.

Some points are invalid for fixed compressors and are then greyed out.

Please also note that for compressors with frequency converters the target pressure has to be defined and should ideally be in the middle of the pressure band.

Determine how the precedence of the compressors is to be stipulated. For quick adjustments, these can also be made directly in the compressor overview.




**Compressor database** Compressor configurations can be stored with a name in an integrated database and can be retrieved at any time.

<u>PID settings:</u>

The "PID settings" button takes you to the PID controller screen.


Here you can input different PID controller settings for each FC compressor. A most meaningful value configuration should in principle already have been calculated based on the control range and network volume. Fine tuning can however be performed here at any time.

Using an existing configuration:

An already existing configuration from an old measuring case programme (WF.DAT) or a RENNERconnect webserver configuration (CONFIG.CFG) can also be used for a simulation. These can be uploaded into the project via "Upload Configuration" on the MSS. All settings will be then be applied.

Creating a simulation:

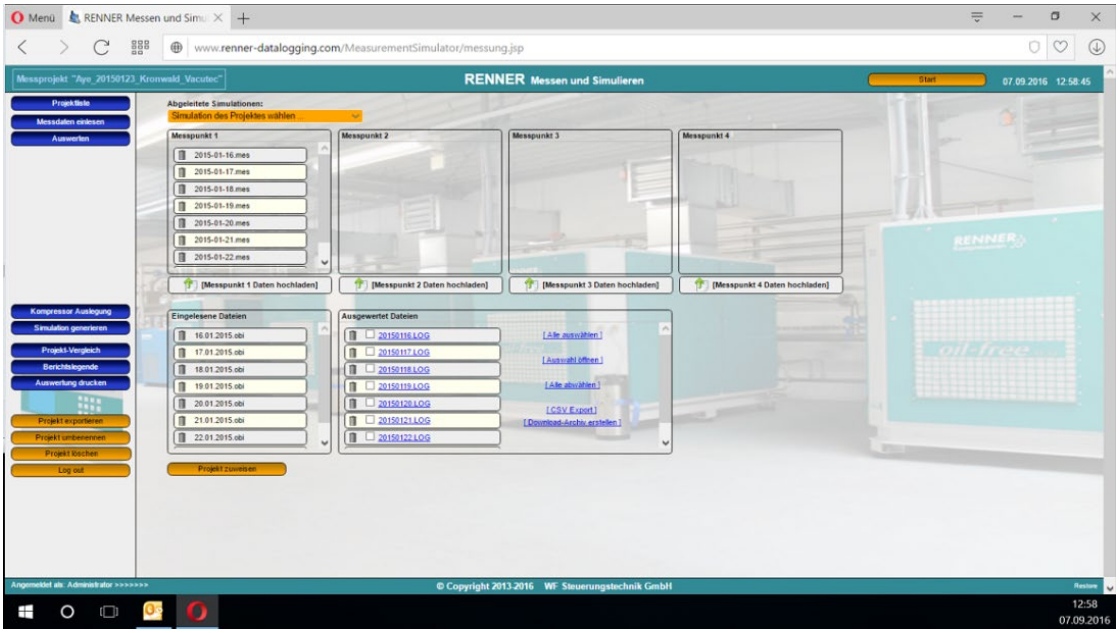
"Create simulation" can be used to generate the simulation once all configuration work has been completed. This process can take several minutes depending on the amount of data.
The simulation must be regenerated after each alteration in the settings for the alterations to take effect.
The generated data can be viewed and printed in the "Simulation data" tab. A complete report for the entire simulation can also be printed here.

Copying a simulation:

Should you want to try out a simulation with different configurations, for example, you can copy the simulation using "Copy project".
Any desired adjustments can then be made in the copy and this simulation regenerated.
A project can also be renamed at any time.

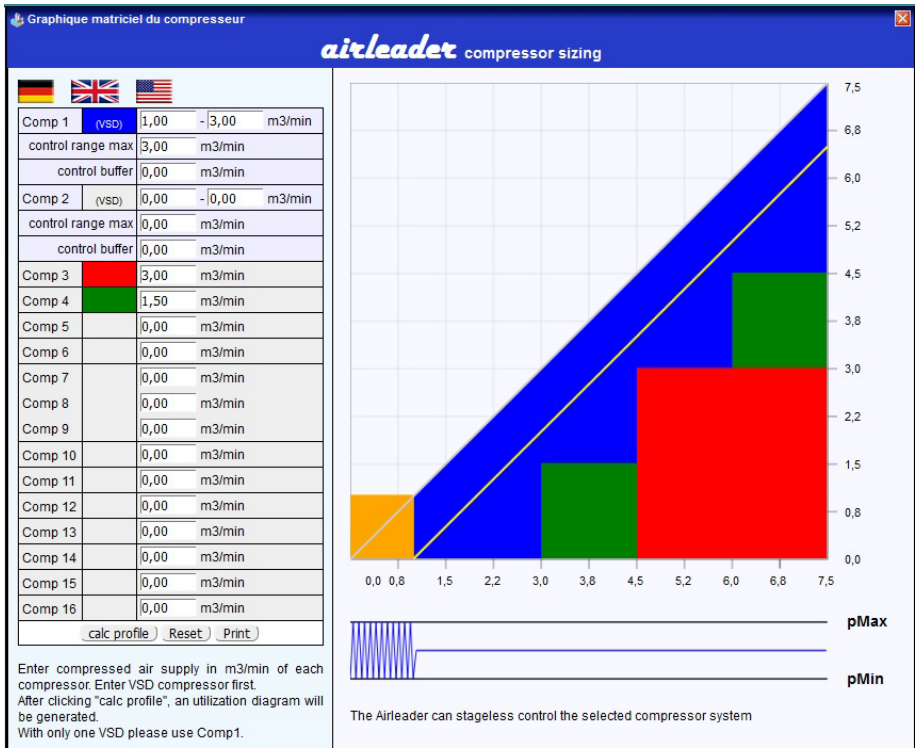
Simulation projects generated from measurements are always assigned to the measurement and do not appear as a project entry in the list of simulation projects.
These must be accessed via the measurement project.

Copies of a simulation also do not appear as a separate project in the project overview. These should always be accessed from the original project.



Compressor layout:

"Compressor layout" can be used to display consumption coverage of the compressor configuration after at least one compressor has been defined in the simulation.
Any control gaps will also be displayed here.




Exporting / importing a project:

The opportunity exists within a measurement project or an independent simulation project to export the entire project, including all simulations.
Clicking the "Export project" button produces an archive with the extension "wfpro".

This file is normally saved to your Internet Explorer download directory. This export file can be reimported to another location.
That only requires the "Import project" button in the project list to be clicked.

Just assign a project name in the dialogue that appears and select the wfpro file to be imported.

The project will then be imported.