
QUICKSTART FOR LOADPROFILE-ANALYSIS-TOOL V1.6

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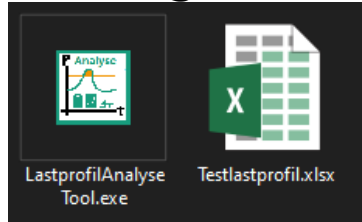
QUICKSTART FOR LOADPROFILE-ANALYSIS-TOOL V1.6

■ Contents

- [Installation](#)
- [Starting the application](#)
- [The graphical user-interface](#)
 - [Box-Plot](#)
 - [Peak analysis](#)
 - [Energy bar graph](#)
- [Structure of menus](#)
- [Additional features](#)
- [Appendix: Description of the plot types](#)

Before first use: The installation

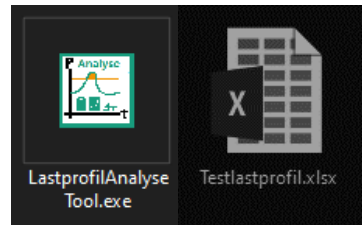
- Unzip the file **LoadProfilAnalysis_GUI.zip** to any folder (for example, with the application 7-Zip).
- The target folder now contains two files:



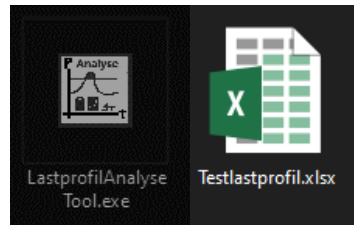
Files that are available
after unzipping

Before starting: Executing the application

- The load profile analysis tool is started with the executable file **LastprofilAnalyseTool_GUI.exe** (or **LoadprofilAnalyseTool.exe**) contained in the destination folder. Thereby no installation is necessary. Besides the tool, an exemplary load profile history is also available.



Start of loadprofile-analysis-tool



Exemplary data set for testing the tool

- A console is opened:
 - After some waiting time, the graphical user interface is displayed.
 - This is now available for use.

The graphical user interface

■ Areas and functions

- ① Menu bar (see next page)
- ② Read data → a window opens to select the file, for text-based files like csv the format ③ (time stamp, separator) must be defined in advance
- ④ Create graphics → the plots are displayed in the lower area ⑤
- ⑥ Adjustment of the parameters of the evaluation functions → If the automatic plot update ⑦ is activated, the graphics are updated automatically, a click with the right mouse button opens a dialog window for numerical input



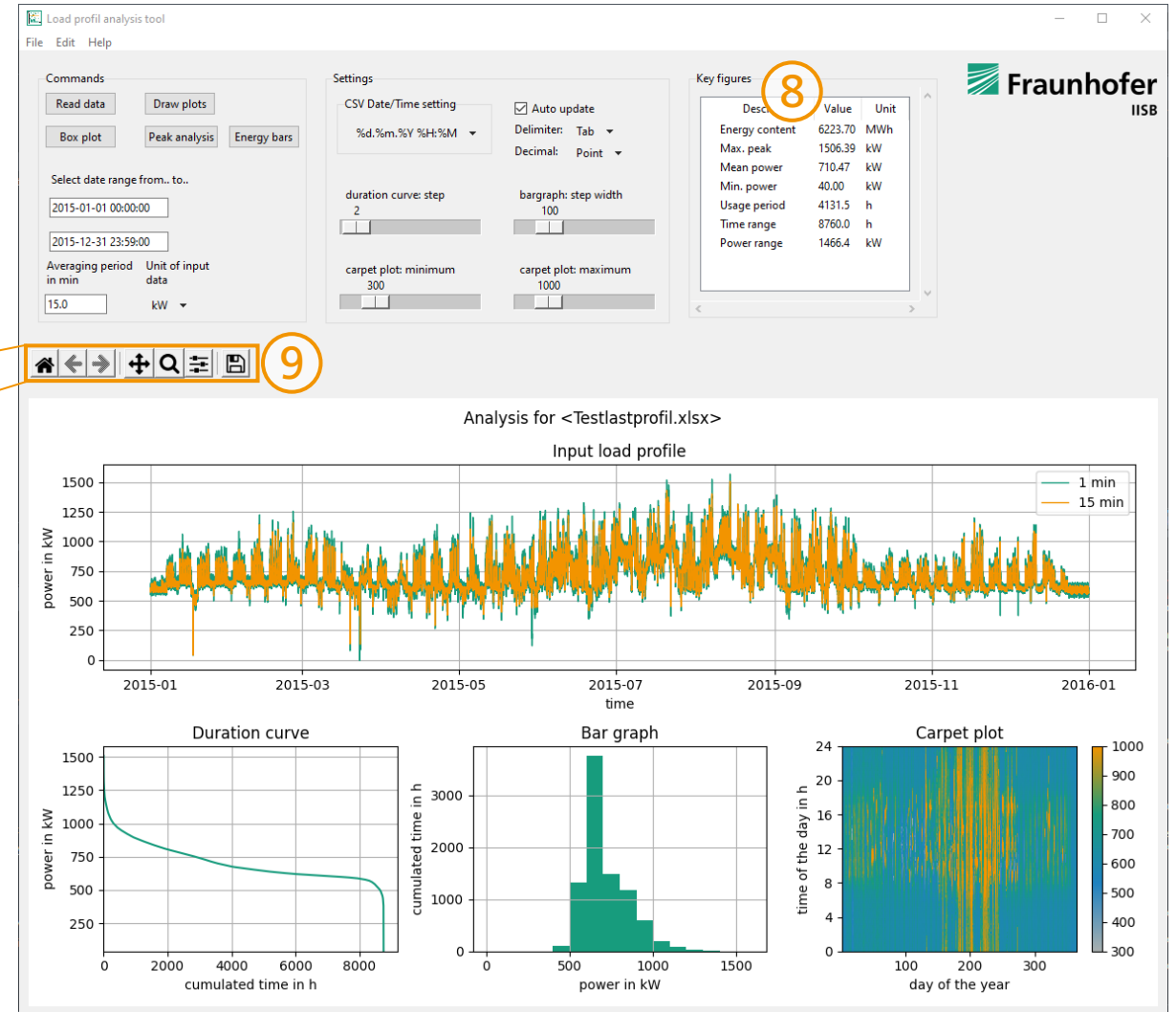
The graphical user interface

■ Areas and functions

- ⑧ Characteristics of the input data set
- ⑨ Tools for moving and zooming the plots



- ① Restore view
- ② Undo or ③ redo action
- ④ Move or ⑤ zoom in the plot
- ⑥ Settings for spacing etc.
- ⑦ Save plots



The graphical user interface

Box-Plot

■ Areas and functions

⑩ Open an additional window to display a box plot

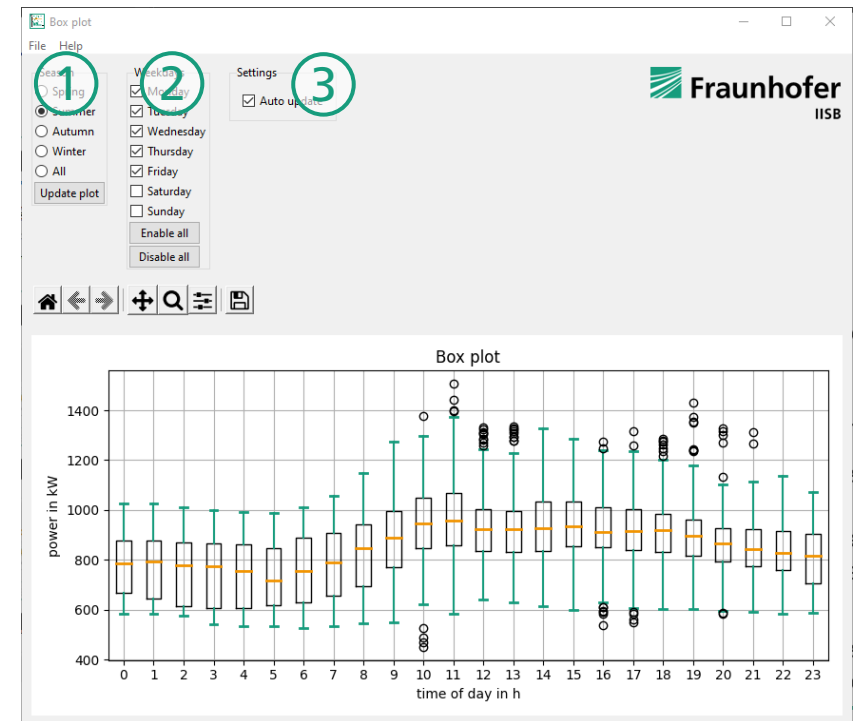
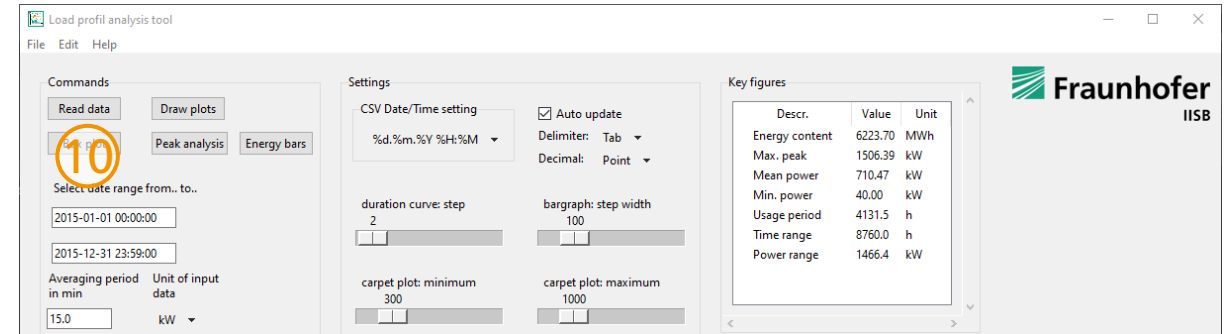
① Select the season(s) of the year, which will be considered in the evaluation.
In addition to spring, summer, autumn and winter, it is also possible to select all seasons.

② Set the day(s) of the week to be considered in the evaluation.

Enable all: select all weekdays

Disable all: deselect all weekdays

③ If automatic plot update is activated, a change of the season or the weekdays leads to an update of the plots



The graphical user interface

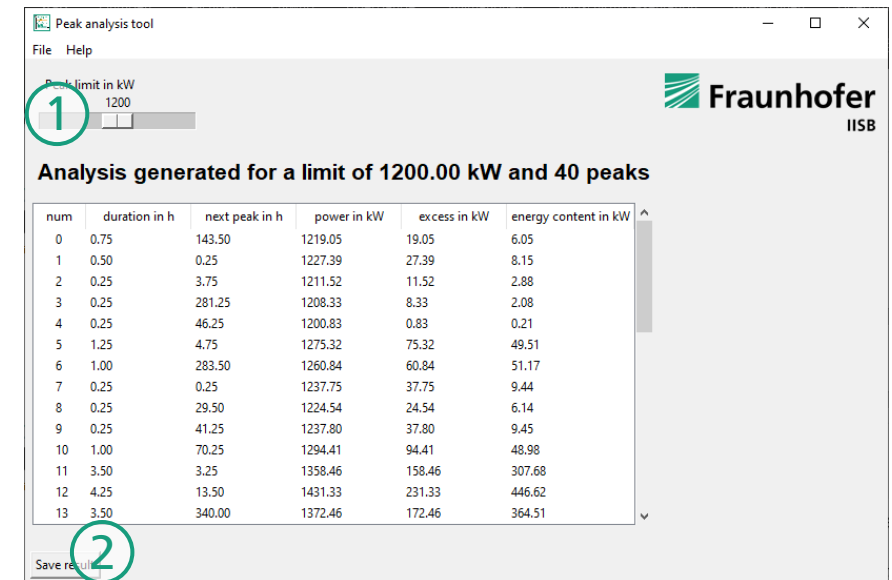
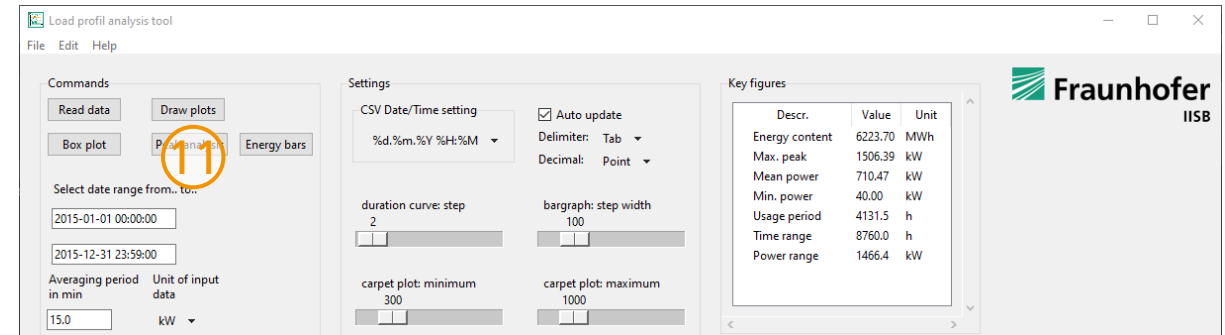
Peak analysis

■ Areas and functions

①① Open an additional window for analysis of load peaks

① Set limit, a click with the right mouse button opens a dialog window for numerical input

② Save result as Excel



The graphical user interface

Energy bar graph

■ Areas and functions

⑫ Open an additional window for analysis of energy balances

① Set display type of x-axis (sum of energy or load peaks by day, week, month or year)

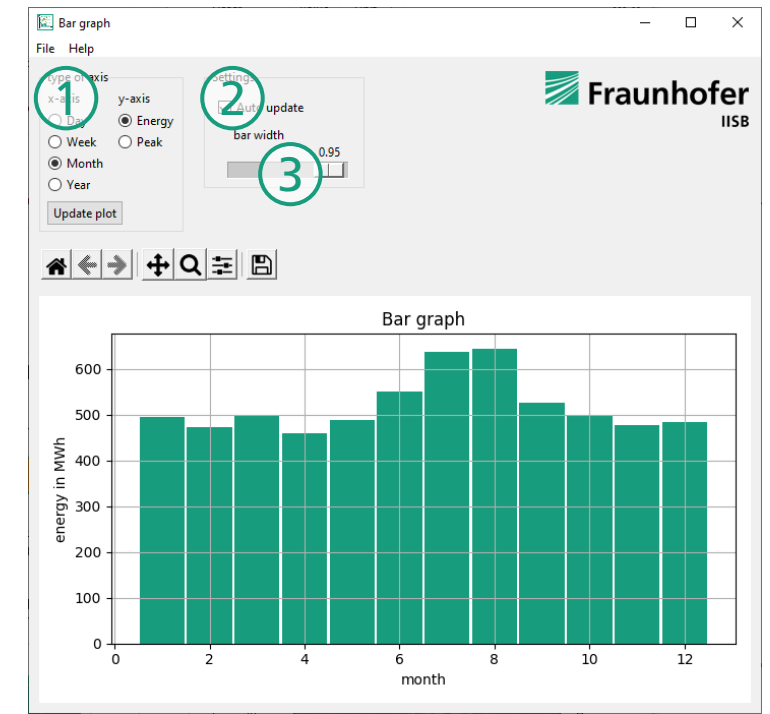
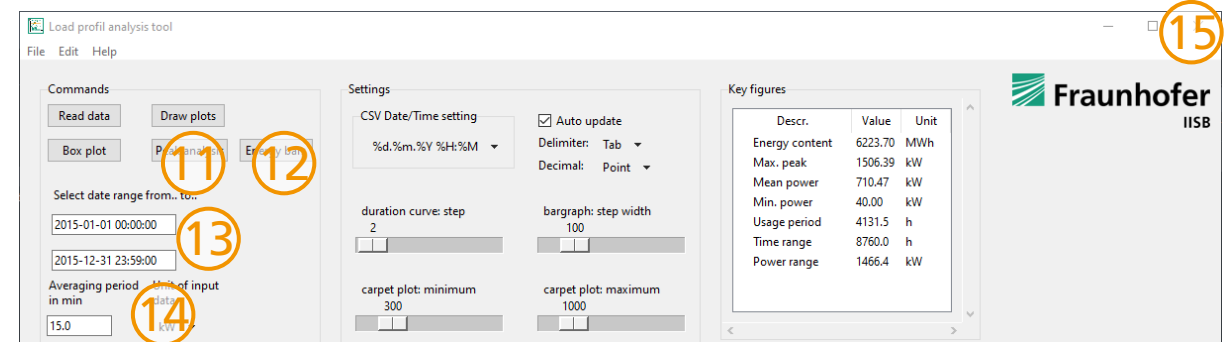
② Enable automatic plot update

③ Set width of bars

⑬ Limitation of the considered time range, all diagrams and evaluations are affected by this setting!

⑭ Specification of the mean period and the unit

⑮ Closing the application
→ closes console as well

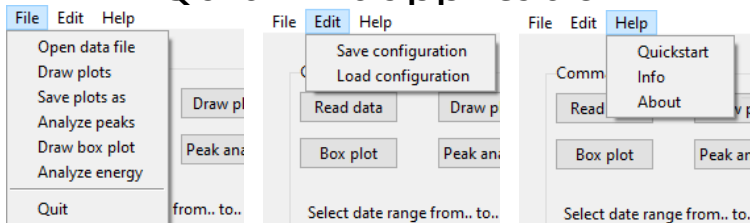


The graphical user interface

Structure of menus

■ File

- Open data: Read load profile file
- Draw plots: Generate plots
- Save plots as: Save plots as picture or as PDF file
- Analyze peaks: Open peak analysis
- Draw box plot: Open box plot
- Analyze energy: Open energy bar graph
- Quit: Exit application



■ Edit

- Save Configuration: all settings are saved
 - Load Configuration: all settings are loaded
- **Note:** after loading a valid configuration file, the data is automatically imported (if possible) and the graphics are generated.

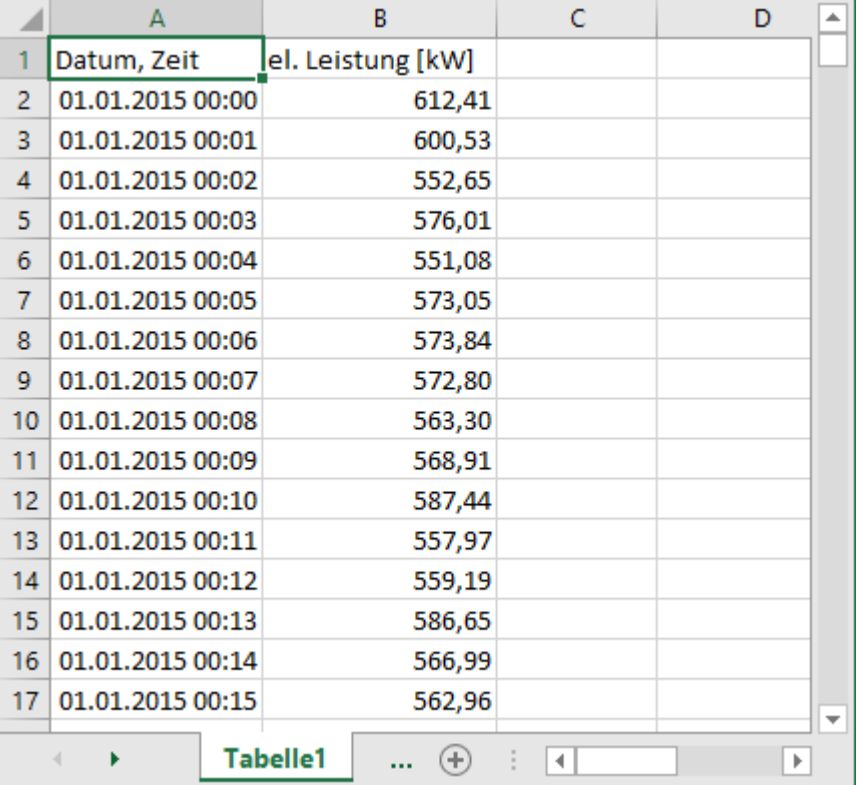
■ Help

- Quickstart: show quickstart
- Info: information about used licenses
- About: show version number

The graphical user interface

Additional features

- User interface resizing
 - Best performance if window size is adjusted before plots are created
 - Changes made afterwards are optimized by redrawing the plots with ④ (suitable window size)
- Structure of the input data file (load profile)
 - Excel / text / CSV
 1. column: time stamp
 2. column: demand (power) in kW
 - For Excel files, the first available spreadsheet will be imported!



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D
1	Datum, Zeit	el. Leistung [kW]		
2	01.01.2015 00:00	612,41		
3	01.01.2015 00:01	600,53		
4	01.01.2015 00:02	552,65		
5	01.01.2015 00:03	576,01		
6	01.01.2015 00:04	551,08		
7	01.01.2015 00:05	573,05		
8	01.01.2015 00:06	573,84		
9	01.01.2015 00:07	572,80		
10	01.01.2015 00:08	563,30		
11	01.01.2015 00:09	568,91		
12	01.01.2015 00:10	587,44		
13	01.01.2015 00:11	557,97		
14	01.01.2015 00:12	559,19		
15	01.01.2015 00:13	586,65		
16	01.01.2015 00:14	566,99		
17	01.01.2015 00:15	562,96		

Appendix

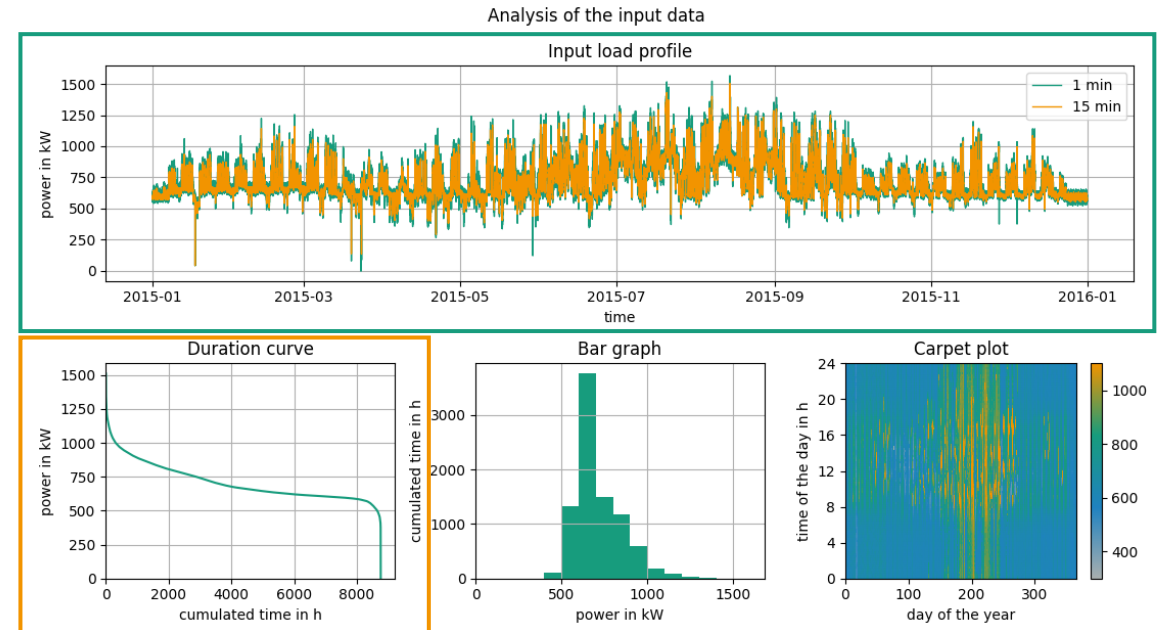
Description of the plot types

■ Time series (top)

- Shows the temporal course of the imported load profile
- Features are difficult to recognize, which is why the following diagrams are used

■ Duration curve (bottom left)

- Indicates how long (x-axis) a given power value (y-axis) is exceeded.
- Example (see figure): There is a power greater than or equal to 750 kW for 3000 h
- Temporal dependence is lost → with this representation it is not clear how strongly the occurrence duration is "related"



Appendix

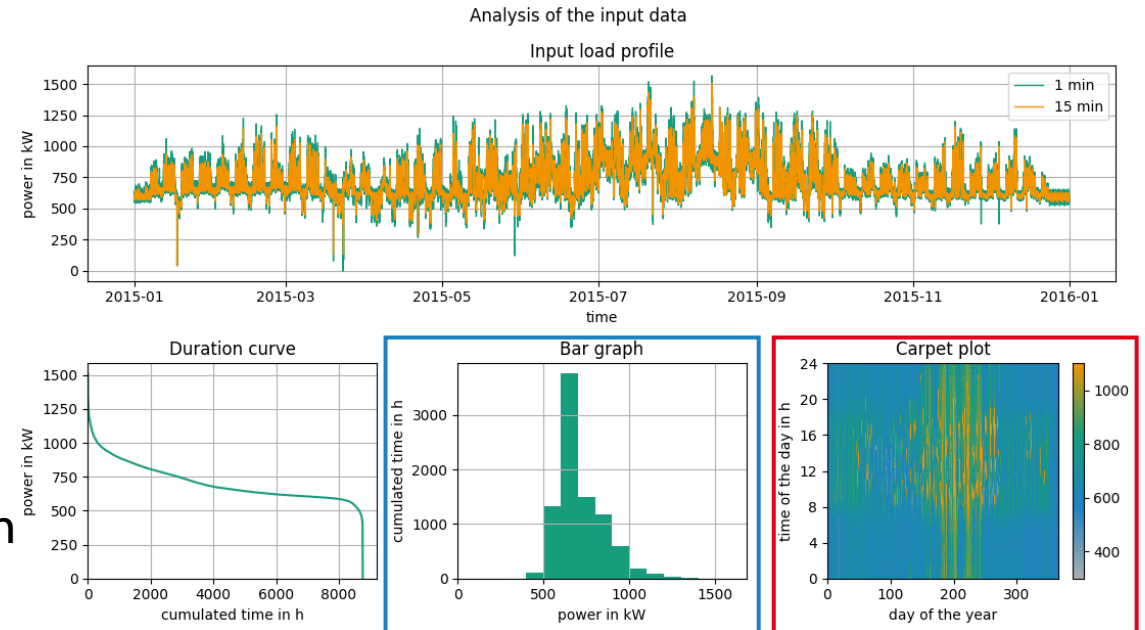
Description of the plot types

■ Bar graph (bottom center)

- Indicates how long (y-axis) a given power range (x-axis) occurs
- Example (see figure): The power between 600 and 700 kW occurs for 3756 h

■ Carpet plot (bottom right)

- Indicates the power (color scale) depending on the day in the year (x-axis) as well as the time on the respective day (y-axis)
- This is mainly used to make qualitative statements about the data set, e.g., in which time periods very high power occurred (in the figure: late summer and fall)

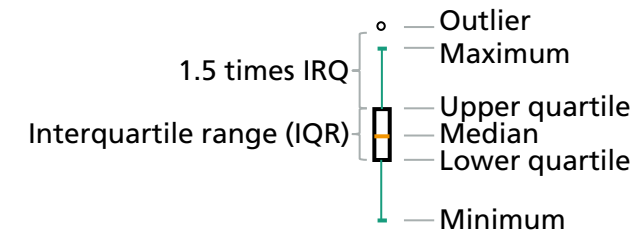
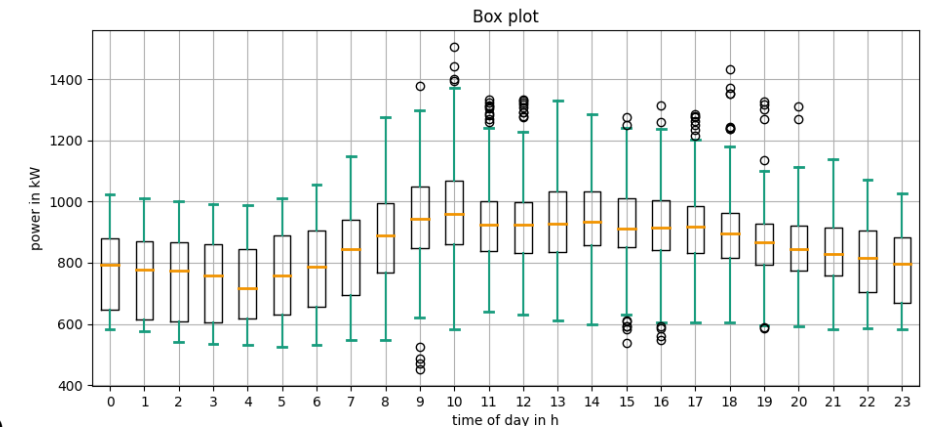


Appendix

Description of the plot types

■ Box-Plot

- Displays different statistical evaluations for the power (y-axis) depending on the time (x-axis) as well as on the season and the day of the week (selection boxes)
- Components
 - **Median** (orange line)
 - **Upper (25 %) and lower (75 %) quartile** (rectangles)
 - **Minimum and Maximum** (green line) → these must be within 1.5 times the interquartile range
 - **Outliers** (black circles) → values outside of 1.5 times the interquartile range



Appendix

Description of the plot types

- Analysis of the load peaks based on a given limit
 - **num**: number sorted by time of appearance
 - **duration**: duration of the peak
 - **next peak**: time interval to next load peak → restricts the possibility to charge an energy storage between two consecutive load peaks
 - **power**: amplitude of the peak
 - **excess**: difference between the peak and the limit → defines the needed power for reduction of the considered peak
 - **energy content**: energy content of the peak → defines the needed capacity for reduction of the considered peak

num	duration in h	next peak in h	power in kW	excess in kW	energy content in kW
0	0.75	143.50	1219.05	19.05	6.05
1	0.50	0.25	1227.39	27.39	8.15
2	0.25	3.75	1211.52	11.52	2.88
3	0.25	281.25	1208.33	8.33	2.08
4	0.25	46.25	1200.83	0.83	0.21
5	1.25	4.75	1275.32	75.32	49.51
6	1.00	283.50	1260.84	60.84	51.17
7	0.25	0.25	1237.75	37.75	9.44
8	0.25	29.50	1224.54	24.54	6.14
9	0.25	41.25	1237.80	37.80	9.45
10	1.00	70.25	1294.41	94.41	48.98
11	3.50	3.25	1358.46	158.46	307.68
12	4.25	13.50	1431.33	231.33	446.62
13	3.50	340.00	1372.46	172.46	364.51

Note: Dimensioning of battery energy storage based on the analysis of the load peaks alone is not possible, because also the charging of the battery as well as the battery and algorithm parameters must be considered in detail for this !

Contact

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