



<https://sl-rack.solarprotool.com>



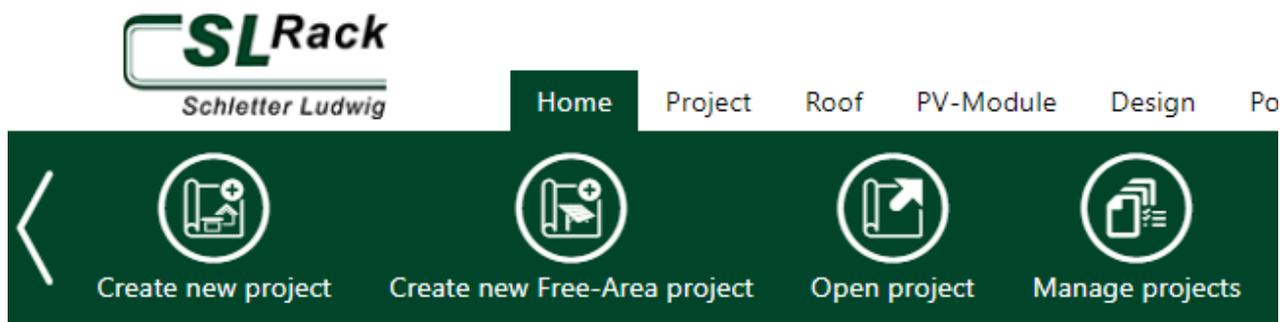
CONTENT

HOME / NAVIGATION	3
PROJECT	4
MASTER DATA	4
PROJEKT ADRESSE / DELIVERY ADDRESS.....	4
ROOF.....	6
PV MODULES.....	10
CONSTRUCTION	10
LAYOUT.....	11
MENU BAR / TOOL BAR	11
NAVIGATION	12
CAD-PLAN	12
STATIC.....	13
E-DESIGNER.....	14
PV PLANNING	14
DESIGN OPTIONS.....	15
ELECTRICAL.....	16
OUTPUT	17
PROFITABILITY.....	19

HOME / NAVIGATION

Below you will find a quick guide to the most important functions of the Solar.Pro.Tool. On YouTube there are also practical tips in a video, including a step-by-step explanation. On the start page you can create new projects or search, copy and delete existing projects by choosing the tab "Project Management". By choosing the tab "New E-Designer Project" you can skip the steps of roof design and substructure, and proceed directly to the inverter design.

Above the green navigation bar you will find the main navigation bar. You are guided through the design step by step, by unlocking the individual main tabs one after another. This ensures all project relevant data has been entered. The blue menu bar contains the most important functions of the respective main tab.



In the gray area in the upper right corner you will always find the information about the current roof project, the name of the person working on the project as well as the size of the system. With a click in the gray area you can copy the link of the report and quickly send it to somebody else. The icon next to "Current roof" opens a roof overview where you can create, copy, edit or delete roofs. If you click on the small gray box with the folder icon below (top right), an overview with the project performance opens up.



Form of roof



Ridge roof



Hip roof



Half-Hipped Roof



Pavilion roof



Shed roof



Flat roof (Elevation)



Custom



Custom (Elev.)

Building height h [mm]* !

Slope of roof [°]:

Title

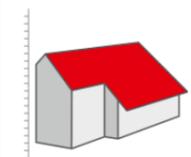
Roofparallel Elevated

Roofing: Tiled Roof

System alignment [°]* !

Snow load [kN/m²]* ! derated

Wind load [kN/m²]* ! derated



Custom

PROJECT MASTER DATA

All important information about the project is entered here. All mandatory fields are shown in red below. If you don't know the delivery date yet, enter "-" to proceed.

Master data

Project Name*	<input type="text"/>
Project Number	<input type="text" value="SL_DE_2p2kUm9p"/>
Comment	<input type="text"/>
Planning Responsible	<input type="text"/>
Client (Manufacturer)	<input type="text" value="SL Rack"/>

PROJEKT ADRESSE / DELIVERY ADDRESS

As you can see below, there are 2 ways to enter the address. Either you enter the information manually or you press the Google Maps icon. With both options you can transfer the project address to the delivery address with the arrow button.

Project Address

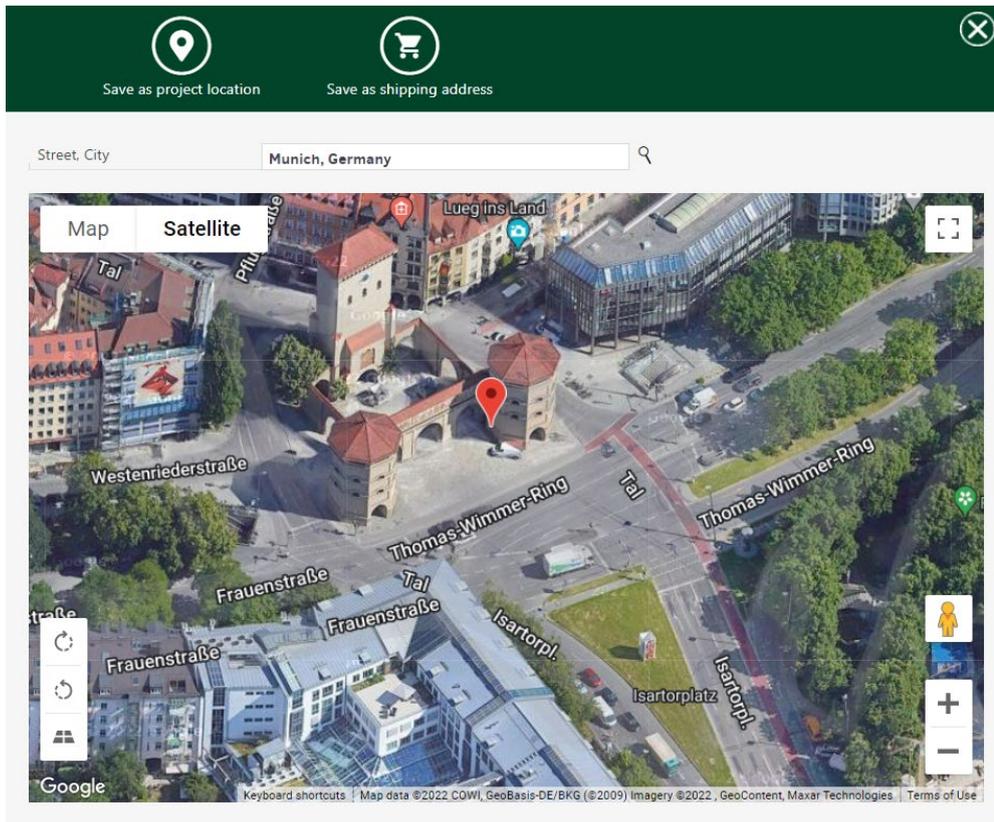
Company	<input type="text"/>	
Name	<input type="text"/>	
Street Address*	<input type="text"/>	
Postal code*	<input type="text"/>	
City*	<input type="text"/>	
Phone	<input type="text"/>	
Email	<input type="text"/>	
Notes	<input type="text"/>	
Country	<input type="text" value="Germany"/>	

Shipping address

Company	<input type="text"/>	
Name	<input type="text"/>	
Street Address	<input type="text"/>	
Postal code	<input type="text"/>	
City	<input type="text"/>	
Phone	<input type="text"/>	
Email	<input type="text"/>	
Notes	<input type="text"/>	
Country	<input type="text" value="Germany"/>	

After clicking the "Google Maps icon", an input window pops up. You can now enter the address, and the satellite image of the address will be displayed. Then click "Save".

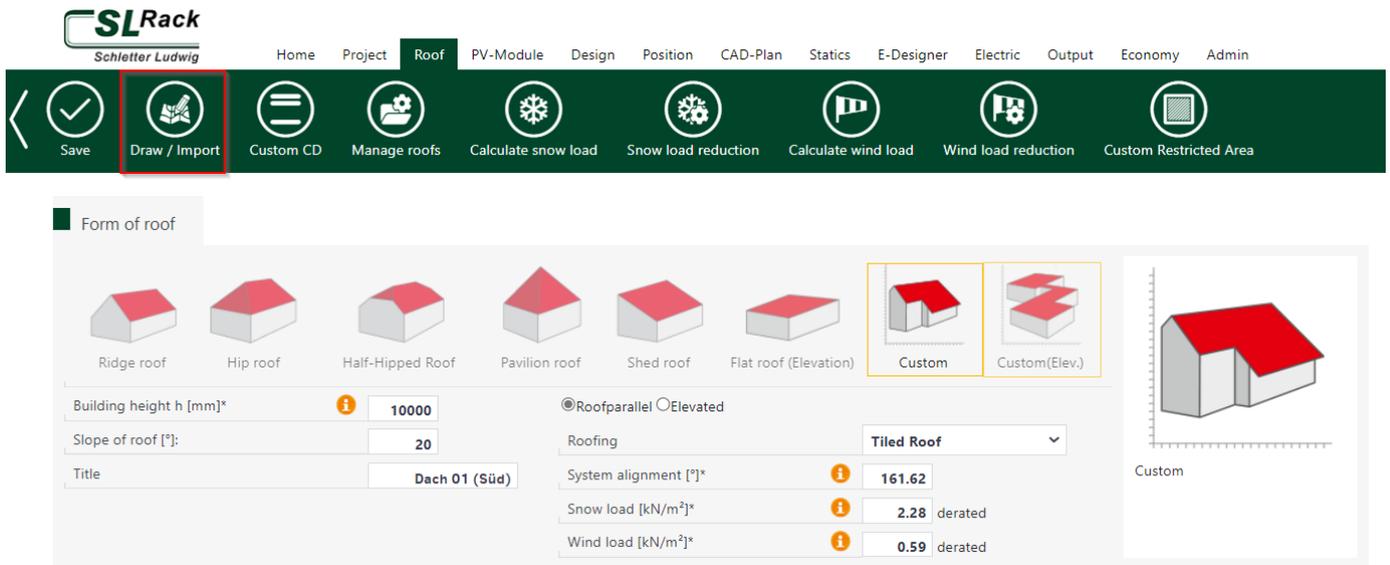
Once the master data and addresses have been entered, press the "Save" button again and proceed to the next item, "Roof".



ROOF

Here the existing roof construction is selected and all important data and dimensions are entered. There are 2 options for selecting the roof shape. Either you select a fixed roof shape and enter all dimensions of the roof manually or you select the free roof shape and then press the button

"Draw / Import" in the blue menu bar.



The satellite section of the project address then opens up. Now you can draw the roof including all obstructions. Once the roof area, obstructions and the alignment have been drawn, press "Save", then the pop-up window will close.

As an alternative to drawing on the satellite image, you can also import technical drawings in JPEG or PNG

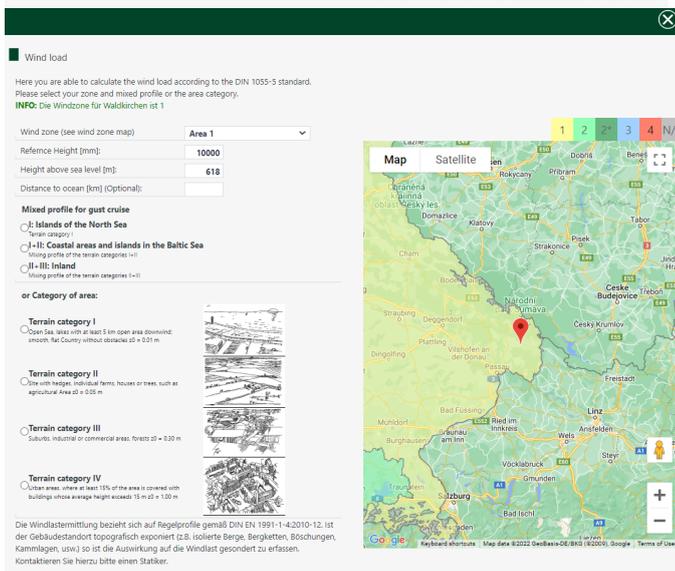
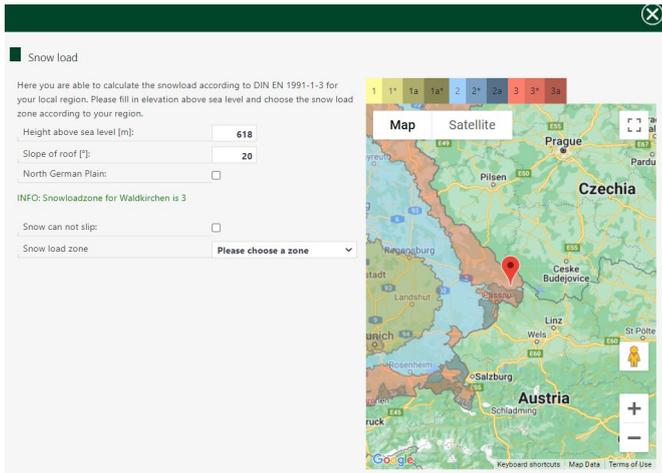


format. Please make sure that a reference dimension is included in the drawing.

Once you have entered the roof area, you need to input the remaining roof parameters. To add the snow load, just click in the input field and a pop-up window will open. Here you can select the snow load zone. The appropriate factor, which is stored in the program, is automatically applied.

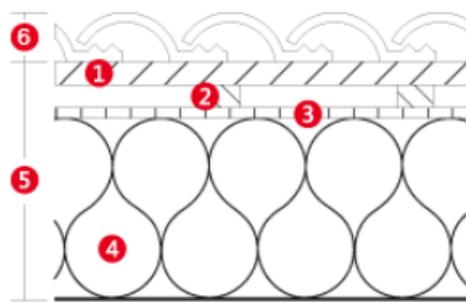
The wind load can be added in the same way. However, the terrain category must be selected. Mixed and individual categories are available for selection.

The roof data can be further customized in the substructure and roof structure area. If you do not enter any project-specific values, the default parameters are used for the calculation.



Roof Structure

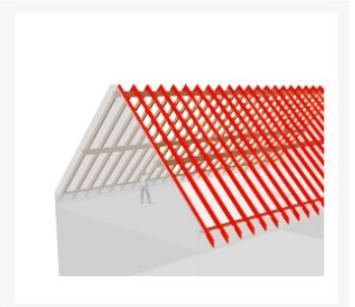
1 Batten [mm]	<input type="text" value="30"/>
2 Counter Batten [mm]	<input type="text" value="24"/>
3 Sheathing [mm]	<input type="text" value="0"/>
4 Insulation [mm]	<input type="text" value="0"/>
5 Roof construction total [mm]:	<input type="text" value="54"/>
6 Roofing Thickness [mm]:	<input type="text" value="45"/>



Construction Design (CD)



Distance [mm]*	<input type="text" value="700"/>	First rafter offset from verge left [mm]	<input type="text" value="276"/>
Rafter Height o [mm]	<input type="text" value="160"/>	Rafter Width p [mm]	<input type="text" value="100"/>
Material Batten/Rafter	Wood	Batten Distance d [mm]*	<input type="text" value="350"/>
Distance to first Batten [mm]	<input type="text" value="100"/>		



As soon as all values have been entered and "Save" has been pressed in the menu bar, the next section appears in the main navigation panel.

PV MODULES

In this section, the modules for the project are selected. The tab "PV module selection" displays all compatible modules. Select a module from the list and click "Save".

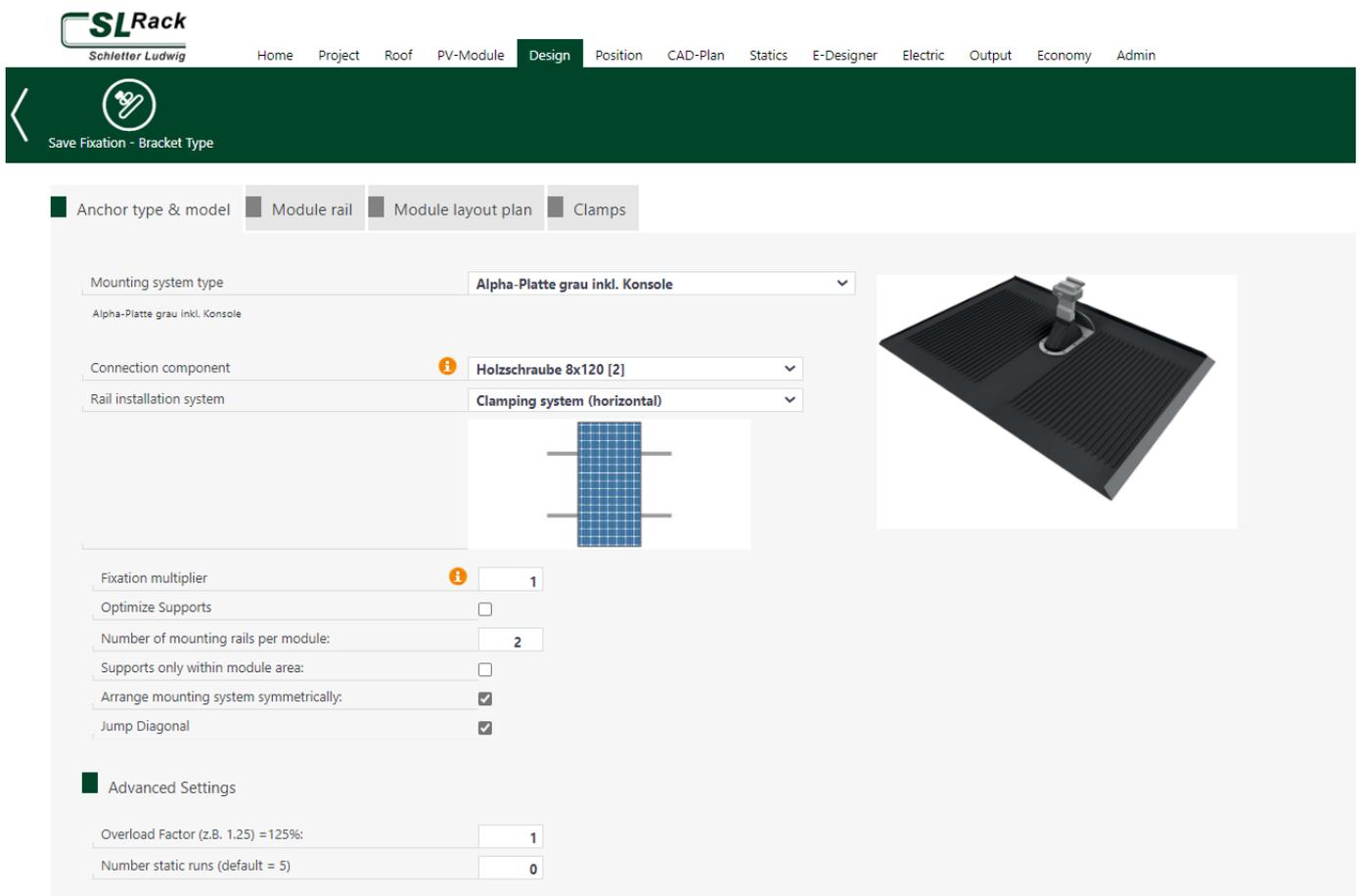
CONSTRUCTION

On this tab you need to enter the parameters of the substructure for the respective roofing material, attachment and roof shape. Save the entries for each menu item with the "Save" button in the menu bar.

For flat roofs, the distance between the module eaves is adjusted by entering the "System variant" and thus define a maintenance aisle between the module pairs.

The optional parameters help you create the most efficient design for your project.

For pitched roofs, the type of attachment for the various roofing materials is particularly relevant. The choice of attachment has a major impact on the structural design. Horizontal rails (thickness & length), module orientation as well as module clamps can be adjusted here.



The screenshot shows the software interface for configuring PV module fixation. The top navigation bar includes the SL Rack logo and menu items: Home, Project, Roof, PV-Module, Design (active), Position, CAD-Plan, Statics, E-Designer, Electric, Output, Economy, Admin. Below the navigation bar, the current task is identified as 'Save Fixation - Bracket Type'. The main configuration area is divided into several sections:

- Anchor type & model:** Includes tabs for 'Module rail', 'Module layout plan', and 'Clamps'. The 'Module rail' tab is active.
- Mounting system type:** A dropdown menu set to 'Alpha-Platte grau inkl. Konsole'.
- Connection component:** A dropdown menu set to 'Holzschraube 8x120 [2]'.
- Rail installation system:** A dropdown menu set to 'Clamping system (horizontal)'. Below this is a small diagram showing a solar panel mounted on a horizontal rail.
- Fixation multiplier:** A numeric input field set to '1'.
- Optimize Supports:** An unchecked checkbox.
- Number of mounting rails per module:** A numeric input field set to '2'.
- Supports only within module area:** An unchecked checkbox.
- Arrange mounting system symmetrically:** A checked checkbox.
- Jump Diagonal:** A checked checkbox.
- Advanced Settings:**
 - Overload Factor (z.B. 1.25) =125%:** A numeric input field set to '1'.
 - Number static runs (default = 5):** A numeric input field set to '0'.

On the right side of the configuration area, there is a 3D rendering of the selected 'Alpha-Platte' mounting system, showing a solar panel held by a clamp on a metal rail.

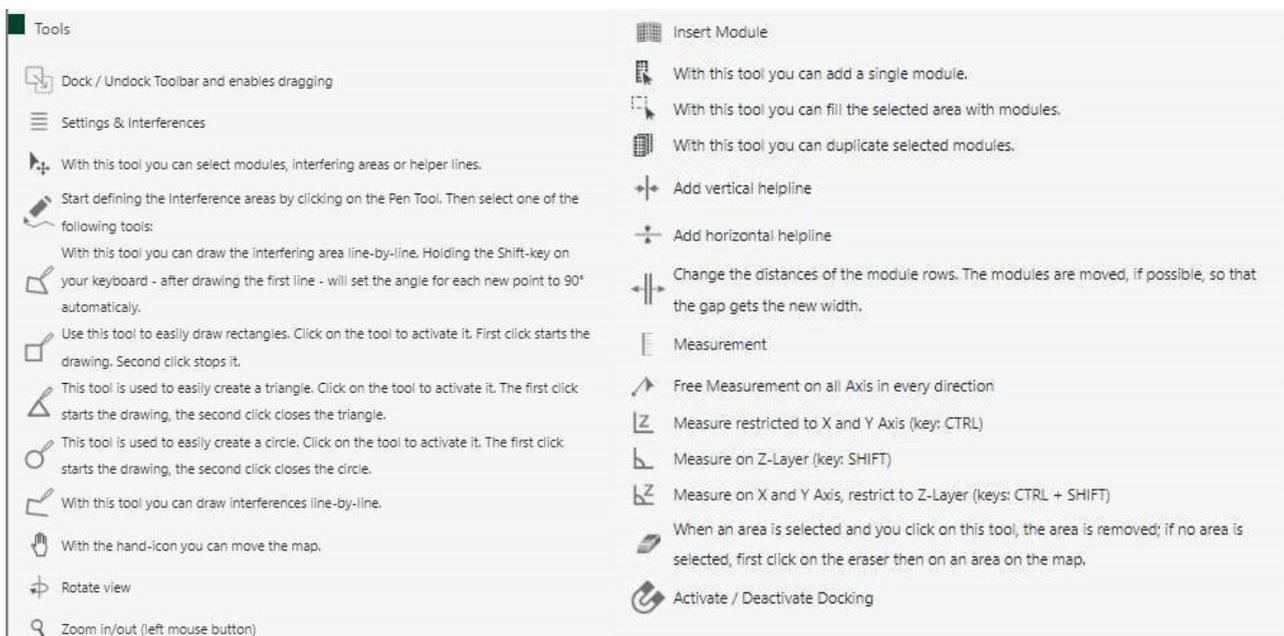
LAYOUT

The layout on the roof is automatic, however, it can be adjusted manually.

MENU BAR / TOOL BAR

Once the layout is loaded, the design proposal of the program, which was created based on your specifications, is displayed. You can adjust edge distances, spaces and the view in the blue menu bar. The menu bar also gives the option to display shading of obstacles and the background. For example, the section of the satellite image is displayed, if you used the free roof shape when you defined the roof in an earlier step.

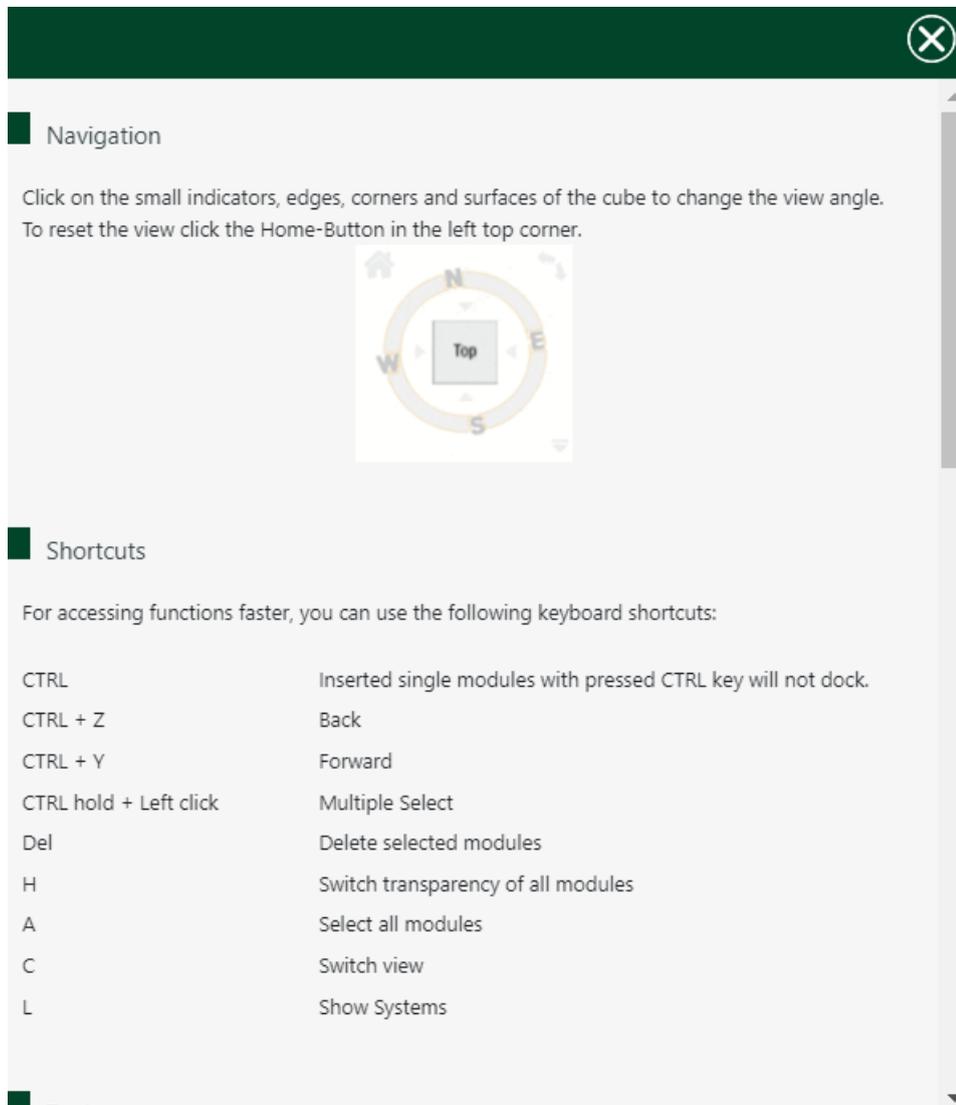
The toolbar on the left offers the following functions:



To avoid unintentional entries, always use the selection tool.

NAVIGATION

You can change the view via the navigation cube or by pressing down the right mouse button. You can zoom in or out by using the wheel of the mouse.

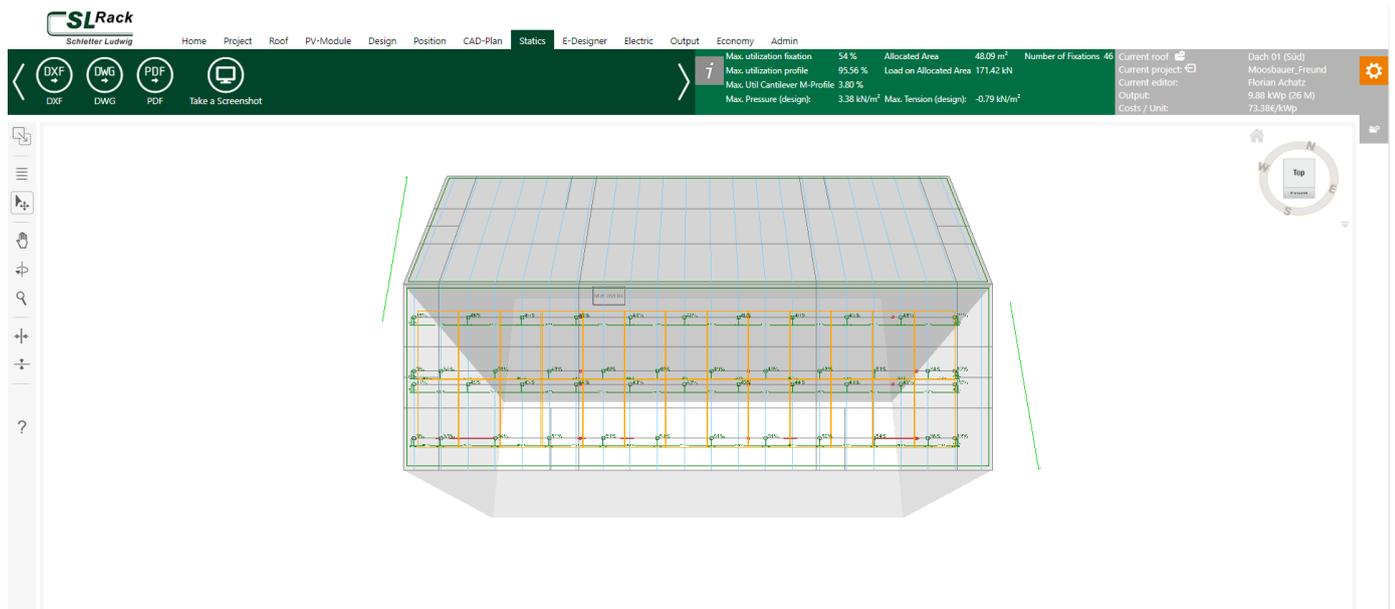


CAD-PLAN

The CAD plan is used to inspect the racking system and to create assembly plans. In the green menu bar you will find the buttons for exporting to native CAD formats or exporting as PDF. You can draw your own dimension lines with the "Measure tool".

STATIC

The Structural Analysis section calculates the static loading of the system. For flat roofs, it shows the ballast plan. It allows the review of the ballast and helps to create the ballast plans required for the installation. In the blue menu bar you will find the buttons to export to native CAD formats or to export as PDF. On the right side of the blue menu bar you will find an explanation as well as the average load per m² for elevated flat roof systems. For pitched roofs, the maximum utilization of the attachments and profiles is displayed. If the statics are not sufficient, it will be indicated by a large blue banner. In this case, you need to go back and adjust the design and / or the layout until the statics work. The utilization of each attachment and profile is displayed in % and highlighted in color.

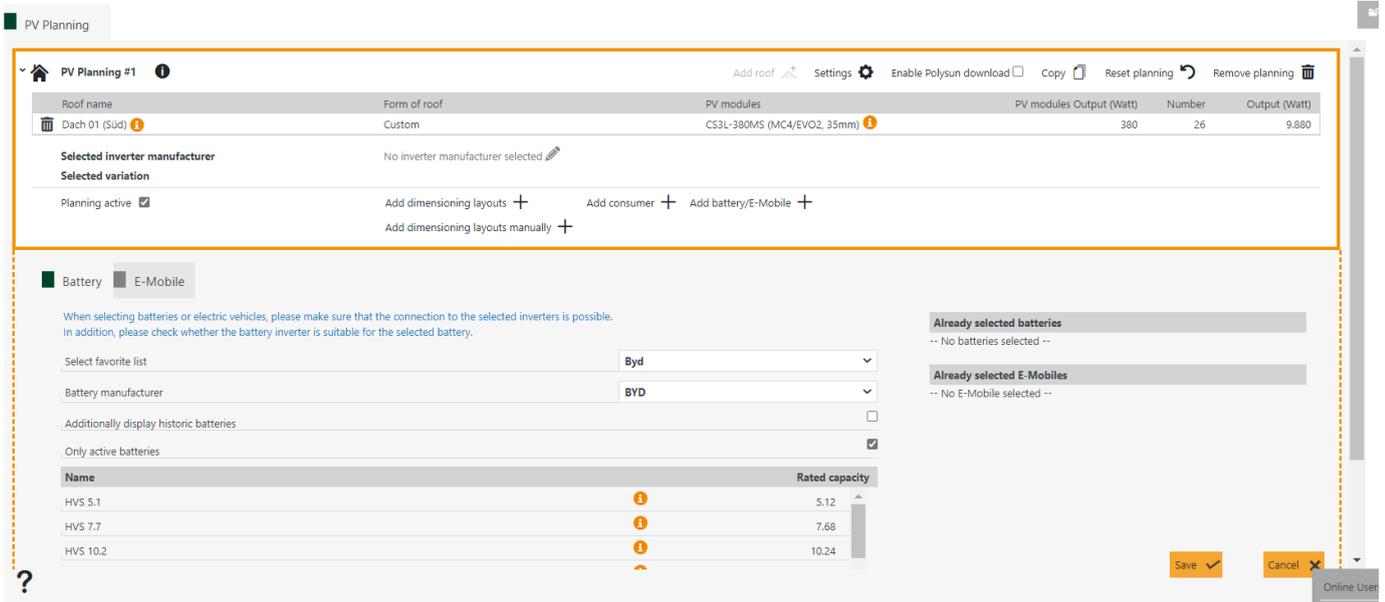


E-DESIGNER

» Click here for a detailed Youtube-tutorial about the Solar.Pro.Tool:
[SL Rack Configurator: Solar.Pro.Tool. - YouTube](#)

PV PLANNING

In the menu bar, click the "Add planning" button. A new planning will be created. In the settings you can adjust the parameters. Then press "Add roof" and select all the desired roofs that you have already planned. If you would like to add a battery, you must first select a consumption profile via the button "Add consumer". You can choose between predefined standard load profiles and creating your own load profiles. Select a profile and then press the blue "Save" button below. Next, the button "Add battery / E-mobile" appears. Click on it and a selection area opens up. Select the desired battery as shown in the following illustration, click on "Add battery" and then on "Save".



The screenshot shows the 'PV Planning' interface. At the top, there's a navigation bar with 'PV Planning #1' and various action buttons like 'Add roof', 'Settings', 'Enable Polysun download', 'Copy', 'Reset planning', and 'Remove planning'. Below this is a table with columns: 'Roof name', 'Form of roof', 'PV modules', 'PV modules Output (Watt)', 'Number', and 'Output (Watt)'. The table contains one entry: 'Dach 01 (Süd)' with 'Custom' roof form and 'CS3L-380MS (MC4/EVO2, 35mm)' PV modules.

Below the table, there are sections for 'Selected inverter manufacturer' (No inverter manufacturer selected), 'Selected variation', and 'Planning active' (checked). There are also buttons for 'Add dimensioning layouts', 'Add consumer', and 'Add battery/E-Mobile'.

The 'Add battery/E-Mobile' section is active, showing a warning: 'When selecting batteries or electric vehicles, please make sure that the connection to the selected inverters is possible. In addition, please check whether the battery inverter is suitable for the selected battery.' There are dropdowns for 'Select favorite list' (Byd) and 'Battery manufacturer' (BYD). There are also checkboxes for 'Additionally display historic batteries' (unchecked) and 'Only active batteries' (checked).

A table of available batteries is shown with columns 'Name' and 'Rated capacity':

Name	Rated capacity
HVS 5.1	5.12
HVS 7.7	7.68
HVS 10.2	10.24

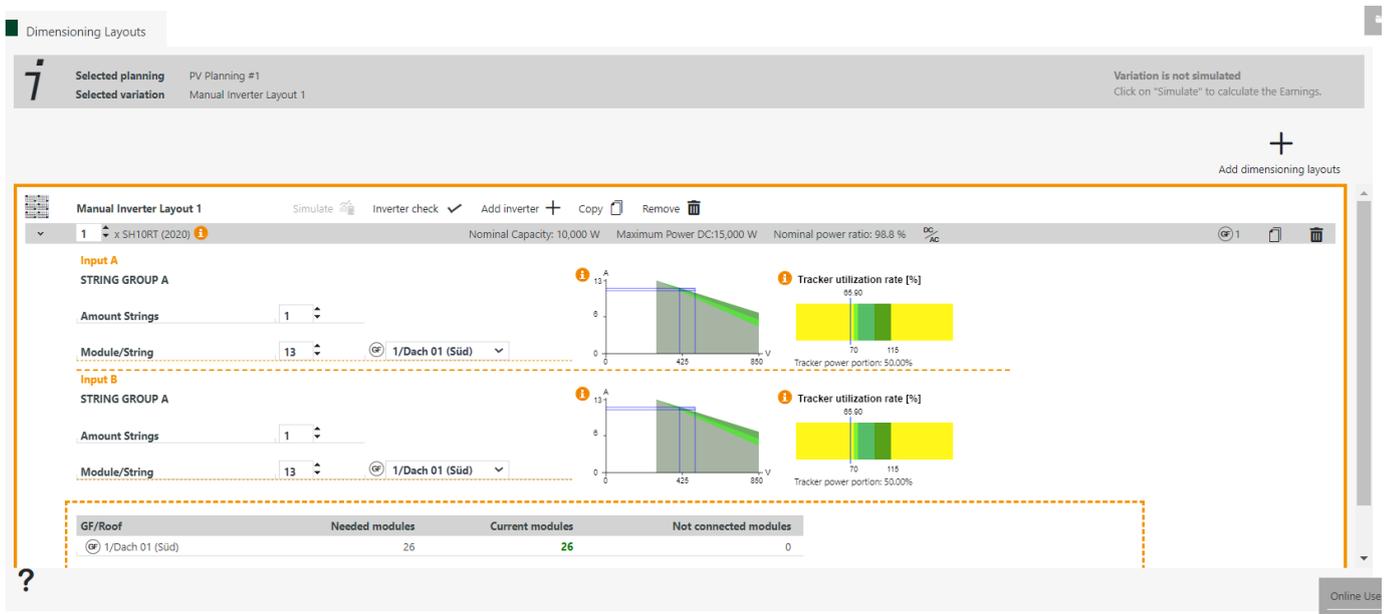
On the right side, there are sections for 'Already selected batteries' (No batteries selected) and 'Already selected E-Mobiles' (No E-Mobile selected). At the bottom right, there are 'Save' and 'Cancel' buttons.

DESIGN OPTIONS

To add the appropriate inverter combination, a design option can be added either manually or automatically. For automatic design, press "Add design option" and select the inverter manufacturer. Again, you have the choice to adjust the selection of inverters that will be considered for the calculation of the design. Press the blue button "Calculate design option". The program will propose at least one design. Choose a design and press the blue button "Accept design option". For manual design press "Add design option manually". Next, press "Add inverter" and select a suitable inverter.

Now you can distribute the modules to the existing inputs. When designing, also pay attention to the nominal power ratio that is displayed above. When you have divided all modules, you can click on "Check inverter". A table with all the limits of the inverter will be displayed under the string division. If a limit is exceeded or not reached, a red X appears. In this case adjust the splitting and/or the inverter again.

Then press the blue "Save" button. After you have defined the design option, you need to press "Simulate".



Dimensioning Layouts

Selected planning: PV Planning #1
Selected variation: Manual Inverter Layout 1

Variation is not simulated. Click on "Simulate" to calculate the Earnings.

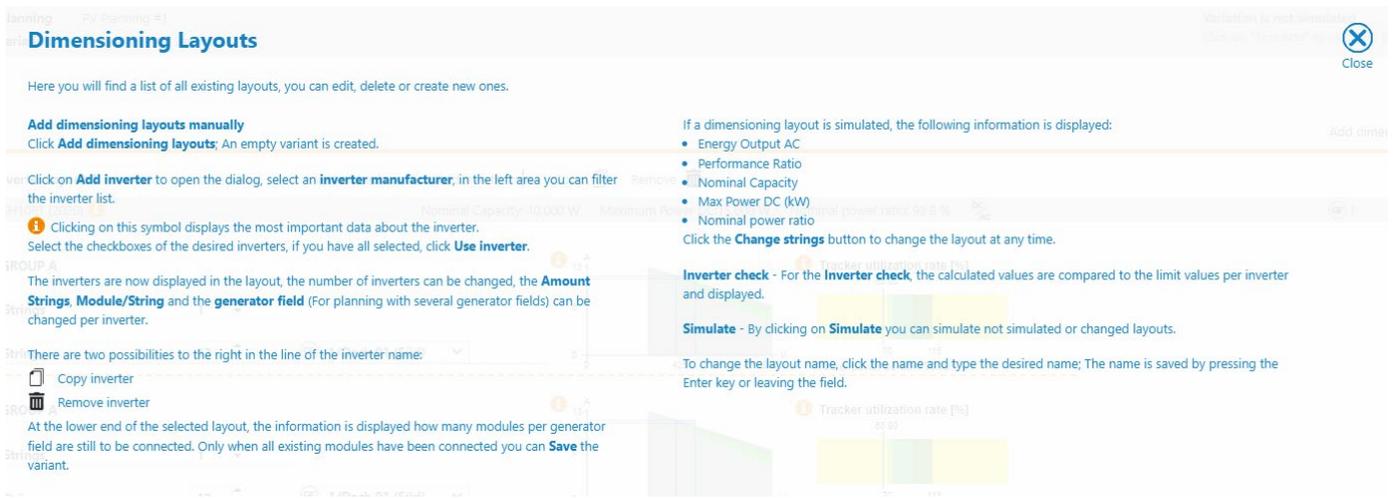
Manual Inverter Layout 1 | Simulate | Inverter check ✓ | Add inverter + | Copy | Remove

Nominal Capacity: 10,000 W | Maximum Power DC: 15,000 W | Nominal power ratio: 98.8 %

Input A
STRING GROUP A
Amount Strings: 1
Module/String: 13 | 1/Dach 01 (Süd)

Input B
STRING GROUP A
Amount Strings: 1
Module/String: 13 | 1/Dach 01 (Süd)

GF/Roof	Needed modules	Current modules	Not connected modules
1/Dach 01 (Süd)	26	26	0



Dimensioning Layouts

Here you will find a list of all existing layouts, you can edit, delete or create new ones.

Add dimensioning layouts manually
Click **Add dimensioning layouts**; An empty variant is created.

Click on **Add inverter** to open the dialog, select an **inverter manufacturer**, in the left area you can filter the inverter list.

Clicking on this symbol displays the most important data about the inverter.
Select the checkboxes of the desired inverters, if you have all selected, click **Use inverter**.

The inverters are now displayed in the layout, the number of inverters can be changed, the **Amount Strings**, **Module/String** and the **generator field** (For planning with several generator fields) can be changed per inverter.

There are two possibilities to the right in the line of the inverter name:
Copy inverter
Remove inverter

At the lower end of the selected layout, the information is displayed how many modules per generator field are still to be connected. Only when all existing modules have been connected you can **Save** the variant.

If a dimensioning layout is simulated, the following information is displayed:

- Energy Output AC
- Performance Ratio
- Nominal Capacity
- Max Power DC (kW)
- Nominal power ratio

Click the **Change strings** button to change the layout at any time.

Inverter check - For the **Inverter check** the calculated values are compared to the limit values per inverter and displayed.

Simulate - By clicking on **Simulate** you can simulate not simulated or changed layouts.

To change the layout name, click the name and type the desired name; The name is saved by pressing the Enter key or leaving the field.

The following areas can be used:

ELECTRICAL

In the menu bar you will find the item "Settings circuit diagram". Here you can adjust the default settings such as self-consumption, active power limitation or remote control. Based on the inverter design, the strings for the modules are planned. Either automatically with the button "Horizontal" or "Vertical" in the menu bar or manually. There you will also find the buttons for exporting to native CAD formats or exporting as PDF. The following tools are added in the left toolbar:

Electric

You can use the buttons on the top menu to perform the following actions:

- **Reset** - Already existing module connections will be reset.
- **Horizontal & Vertical** - All modules are automatically connected horizontally or vertically.
- **Dxf & Dwg** - Download the roof with the connected modules as a dxf or dwg document.
- **Take a screenshot** - A screenshot is taken and saved.
- **Scale** - Download a pdf document, paper size and scale can be selected.

Click on the small indicators, corners, edges and surfaces of the cube to change the view. To reset the view, click on the Home button in the upper left corner.

Use the icons in the lower left to change the display:

- Show the roof with the connected modules

The following menu items are available in the left area:

- With this icon, the toolbar can be undocked and moved on the screen, by clicking on the icon again, the toolbar is docked again on the left edge.
- This fly-out-menu shows the keyboard jump. The X-position and the Y-position of the selected object can be changed.
- The menu displays the inverters used with the modules per input.
 At the far right of the input line, the color is displayed that identifies the modules of this input on the roof. If an input has not been connected, this icon will be displayed. An already connected input indicated by this symbol.
- With the selection tool you can select one module or several modules. To select several modules, hold down the Ctrl key and left-click on the desired modules. You can also drag a rectangle over several modules to mark them.
- Allows you to move the building on the screen.
- With this tool you can rotate and tilt the building.
- With the magnifying glass symbol you can enlarge parts of the roof.
- Click on the symbol and drag a roof penetration point onto the roof surface and click where it should be placed.

The inverter menu shows the list of required strings in the respective color. By clicking on a string, it will be highlighted both in the menu and in the plan.

SLRack Schletter Ludwig

Home Project Roof PV-Module Design Position CAD-Plan Statics E-Designer **Electric** Output Economy Admin

Save Reset Horizontal Vertical DXF DWG Electric circuit plan PDF Take a Screenshot

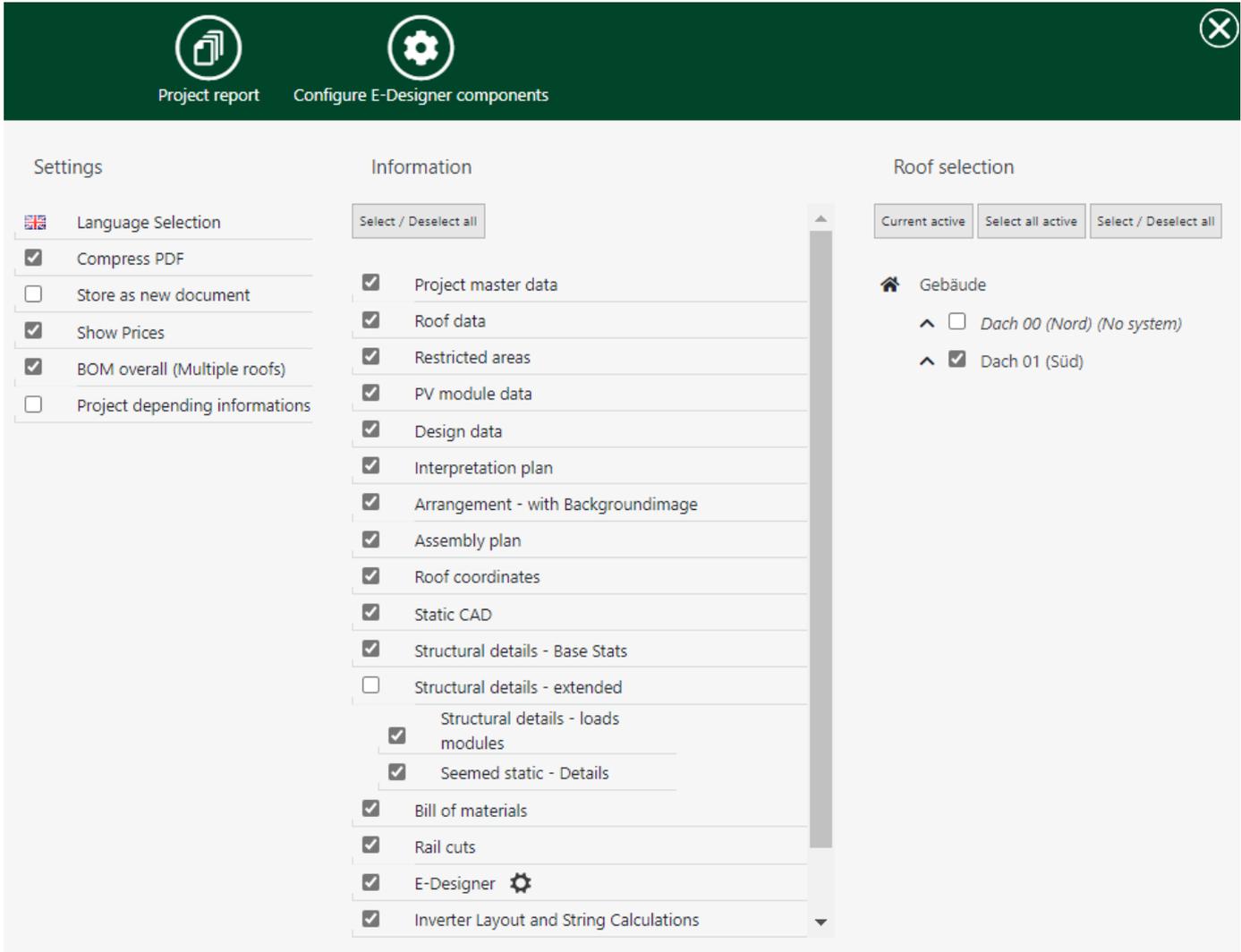
Current roof: Dach 01 (Süd)
 Current project: Moodsbauer_Freund
 Current editor: Florian Achatz
 Output: 9.88 kWp (26 M)
 Costs / Unit: 73.38€/kWp

Cursor X: 10240 Cursor Y: 3706 Selection X: 0 Selection Y: 0 Selection L: 0 Selection W: 0 Selected elements: 0 Amount Selected Modules: 0

Online Users

OUTPUT

The output of the project report can be either for the currently active roof or for all planned roofs. In the output you can see the material list, which contains all items in the required quantity. In the blue menu bar you can create a quote, adjust pricing, reset the list of material and create a project report. You can check/uncheck all the information you want to display. We recommend checking the "Compress PDF" box. To export the report you just need to click on the "Project Report" button at the top left of the window.



The screenshot shows the configuration menu of the Solar.Pro.Tool software. The interface is divided into three main sections: Settings, Information, and Roof selection.

- Settings:**
 - Language Selection (with a flag icon)
 - Compress PDF
 - Store as new document
 - Show Prices
 - BOM overall (Multiple roofs)
 - Project depending informations
- Information:**
 - Select / Deselect all
 - Project master data
 - Roof data
 - Restricted areas
 - PV module data
 - Design data
 - Interpretation plan
 - Arrangement - with Backgroundimage
 - Assembly plan
 - Roof coordinates
 - Static CAD
 - Structural details - Base Stats
 - Structural details - extended
 - Structural details - loads modules
 - Seemed static - Details
 - Bill of materials
 - Rail cuts
 - E-Designer 
 - Inverter Layout and String Calculations
- Roof selection:**
 - Current active | Select all active | Select / Deselect all
 - Gebäude
 - Dach 00 (Nord) (No system)
 - Dach 01 (Süd)

The material list as well as the chart displaying the various rail length can also be exported individually as PDF or Excel file.

Generate offer
Pricing
Reset quotation
Report
Finalize project
Would you like to close this Project?

Material list | Rail Cuts | Project documentation | Material list total

Reset quotation
PDF
Total PDF
EXCEL
Total EXCEL
XML
XML Total
Manage Articles

Position	Image	Modified	Part number	Description	Matchcode	Packaging	VPE Anzahl	AnzahlExact	Price (€)	Total price (€)	Weight (kg)	Total weight (kg)	Length (mm)
1		No	11500-00	Alpha-Plate, colour: brick red RAL 8004		5	10	46	38.55	385.50	1.400	14	0
2		Yes	81140-02	Internal Connector RAIL 2.0 for RAIL 40		50	1	12	4.67	4.67	0.267	0.3	0
3		No	81160-01	Innenverbinder RAIL 60		1	24	24	2.49	59.76	0.145	3.5	0
4		No	81160-4350	RAIL 60 - 4350 mm		98	1	14	49.01	49.01	19.375	19.4	4350
5		Yes	91112-00	Endklemme Vario 30-50 / 70 blank		1	1	33	1.50	1.50	0.065	0.1	0
6		Yes	91121-01	Mittelklemme Vario mit Erdung		1	1	47	1.50	1.50	0.064	0.1	0
7		Yes	91520-00	Lightning Protection Clamp bottom		100	1	2	2.43	2.43	0.076	0.1	0
8		No	92108-12	Wood screw, flange head 8 x 120 mm TX 40		50	2	92	0.63	1.26	0.029	0.1	0
9		No	94660-06	Kunststoff-Endkappe RAIL 60 nrail		250	1	8	0.72	0.72	0.014	0	0

PROFITABILITY

In this section, you can perform the profitability calculation of the system.

Home
Project
Roof
PV-Module
Design
Position
CAD-Plan
Statics
E-Designer
Electric
Output
Economy
Admin

Calculate
Reset fields
Load E-Designer Data
Save as Template
Load/Organize as Templates

Input
Result
Amortization schedule
Charts

Plant data

Plant size [kWp]	9.88
specific yield/year [kWh/kWp]	1,097.00
annual degradation [% p.a.]	0.10
operating costs of investment in percentage [% p.a.]	1.50
Increase in operating costs per year [% p.a.]	1.50
Useful life [Years]	20.00

Market data

Annual electricity consumption [kWh]	3,500.00
Self-sufficiency [%]	100.00
Power consumption [%]	32.29
Feed-in tariffs [EUR/kWh]	0.0010
Electricity price (net) [€/kWh]	0.25
Monthly fee (net) [EUR]	5.00
current electricity price (net) [€/kWh]	0.27
current electricity price (gross incl. VAT) [€/kWh]	0.33
Electricity price increase [%/Year]	3.50
EEG apportionment [€/kWh]	0.0617
Country	DE

Funding

Total investment (gross incl. VAT) [EUR]	0.00
Sales tax on the investment [EUR]	0.00
Small business regulation	<input type="checkbox"/>
Loan Amount [EUR]	15,000.00
Interest rate of loan [%]	2.00
Time of loan [Years]	10.00
Interest rate for determining the present value [%]	1.00
personal income tax rate [%]	43.00
Date of commissioning	01.06.2022

Click on "Load data" in the green menu bar to automatically transfer the values of the system. Now you can individually adjust project values, market data and financing. Then click "Calculate" in the blue menu bar. You can output the profitability by pressing "Output" in the main navigation bar.

Further information about the Solar.Pro.Tool. is available online at www.sl-rack.com
or at our [YouTube-Channel!](#)

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Subject to errors in the description,
changes in the software Solar.Pro.Tool,
as well as design and software errors.

Version 04/2022 V1