

"RENEWABLE ENERGY and ENERGY EFFICIENCY of the XXI CENTURY"

SOFTWARE FOR DESIGN OF PHOTOVOLTAIC SYSTEMS



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Victron MPPT Calculator Fronius Solar Configurator

Polní test: PV moduly

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victron energy BLUE POWER

Produkty Trhy Stahování

Home : MPPT Calculator

MPPT sizing calculator

Reset 2 Results [Share your config](#)


String 1 +

Victron module Custom module


Victron solar modules: 20W-12V Mono Series: 1 Parallel: 1

Cable length (m): 10 Cross-section (mm²): 6

PV Module temperature (°C): Min: -10 Max: 70
14 °F 158 °F




SmartSolar MPPT 75/10
Article number: SCC075010060R
Connector: Terminals
✓ Bluetooth Smart
[Calculations](#) [Graphs](#)
[Where to buy](#)



BlueSolar MPPT 75/10
Article number: SCC010010050R
Connector: Terminals
✗ Bluetooth Smart
[Calculations](#) [Graphs](#)

Fronius SOLAR.CONFIGURATOR 4.0

LOG IN EN HELP



**PLANNING OF PHOTOVOLTAIC SYSTEMS
DIMENSIONING MADE EASY**

PV MODULE

PV module manufacturer: 1Soltech Inc.

Model: 1 STH-210 Tile Red_(1)

Number of PV Modules (1/2/3): 0 0 0

Module temperature (min. - max. / °C): -10 70

INVERTER

Country: Germany

Series: All inverters

Type: Primo GEN24 4.6 Plus

Inverter ratio (min. - max. / %): 80 120

GENERAL

Project name: 2022-05-15_1257

Storage: Without

Annual power consumption (kWh): 4000

Load profile: Employed

PV GIS online tool

European Commission
 European Commission > EU Science Hub > PVGIS > Interactive tools

Home Tools Downloads Documentation Contact us

Welcome to PVGIS 5.2 Beta version with solar data to 2020! Check the release notes

Cursor: 49.429, 14.752
 Selected: 49.669, 13.596
 Elevation (m): 482
 PVGIS ver: 5.1

Use terrain shadows:
 Calculated horizon
 Upload horizon file

Download: [csv](#) [json](#)
[Procházet...](#) [Soubor nevybrán.](#)

[Switch to version 5.2](#)

PERFORMANCE OF GRID-CONNECTED PV

GRID CONNECTED TRACKING PV OFF-GRID MONTHLY DATA DAILY DATA HOURLY DATA TIME

Solar radiation database* PVGIS-SARAH

PV technology* Crystalline silicon

Installed peak PV power [kWp]* 1

System loss [%]* 14

Fixed mounting options

Mounting position* Free-standing

Slope [°] 35 Optimize slope

Azimuth [°] 0 Optimize slope and azimuth

PV electricity price

PV system cost (your currency)

Interest [%/year]

Lifetime [years]

PERFORMANCE OF GRID-CONNECTED PV: RESULTS

[PV output](#) [Radiation](#) [Info](#) [PDF](#)

Summary

Provided inputs:

Location [Lat/Lon]: 49.669,13.596
 Horizon: Calculated
 Database used: PVGIS-SARAH
 PV technology: Crystalline silicon
 PV installed [kWp]: 1
 System loss [%]: 14

Simulation outputs:

Slope angle [°]: 35
 Azimuth angle [°]: 0
 Yearly PV energy production [kWh]: 1022.41
 Yearly in-plane irradiation [kWh/m²]: 1273.2
 Year-to-year variability [kWh]: 52.62

Changes in output due to:

Angle of incidence [%]: -3.08
 Spectral effects [%]: 1.75
 Temperature and low irradiance [%]: -5.32
 Total loss [%]: -19.7

Monthly energy output from fix-angle PV system

Month	Energy output [kWh]
Jan	30
Feb	50
Mar	85
Apr	115
May	120
Jun	122
Jul	125
Aug	118
Sep	100
Oct	75
Nov	40
Dec	30

Outline of horizon

Legend:
 ■ Horizon height
 - - Sun height, June
 Sun height, December

PV Syst designer



Grid system definition, Variant VC1: "With horizon and linear shadings"

Sub-array

Sub-array name and orientation
Name: PV Array
Orient: Fixed Tilted Plane
Tilt: 25°
Azimuth: 20°
Presizing Help: Enter planned power: 19.3 kWp
or available area(modules): 125 m²

Select the PV module

Available Now: Filter: All PV modules
Generic: 250 Wp 26V Si-mono Mono 250 Wp 60 cells Bifacial Since 2015
 Use optimizer
Bifacial module: Bifacial system

Maxim	VT8020	280 W	Since 2015
Maxim	MAX20800	320 W	Since 2017
Maxim	VT8024	330 W	Since 2015
Maxim	MAX20801A	335 W	Since 2018
Maxim	MAX20801B	355 W	Since 2018
Maxim	MAX20800A	384 W	Since 2017
Maxim	MAX20801C	395 W	Since 2018

Select the inverter

Available Now: Generic: 3.0 kW 125 ~ 440 V TL 50/60 Hz 3 kWac inverter Since 2012
Nb. of inverters: 5
Operating voltage: 125-440 V Global Inverter's power: 15.0 kWac
Input maximum voltage: 550 V "String" inverter with 2 inputs

Design the array

Number of modules and strings
Mod. in series: 13 (between 5 and 13)
Nb. strings: 5 (only possibility 5)
Overload loss: 0.0 %
Prom ratio: 1.08
nb. modules: 65 Area: 106 m²

Operating conditions
Vmp (60°C): 334 V
Vmp (20°C): 408 V
Voc (-10°C): 548 V

Plane irradiance: 1000 W/m²
Impo (STC): 40.9 A
Isc (STC): 43.2 A
Isc (at STC): 43.2 A

You should define at least one string per inverter or MPPT input.
Max. in data: 14.4 kW (at 1000 W/m² and 50°C)
STC: 16.3 kWp (Array nom. Power (STC))

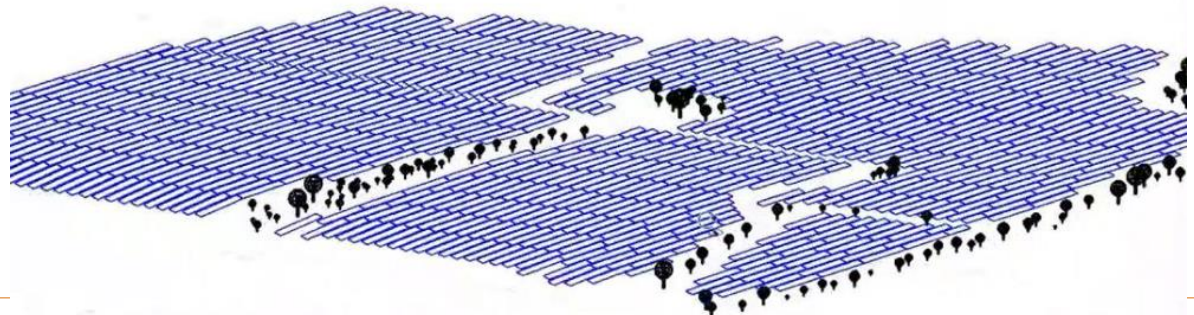
List of subarrays

Name	#Mod	#Inv.	#String	#MPPT
PV Array				
Generic - Mono 250 Wp 60 cells Bi	13		5	
Generic - 3 kWac inverter		5		1

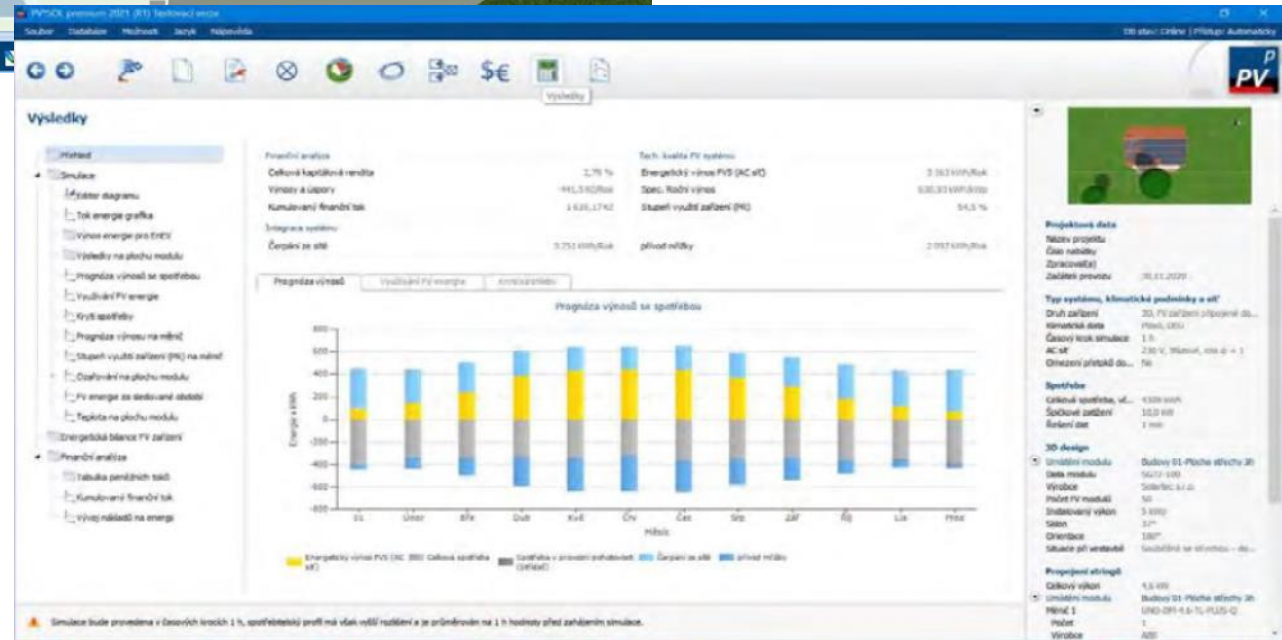
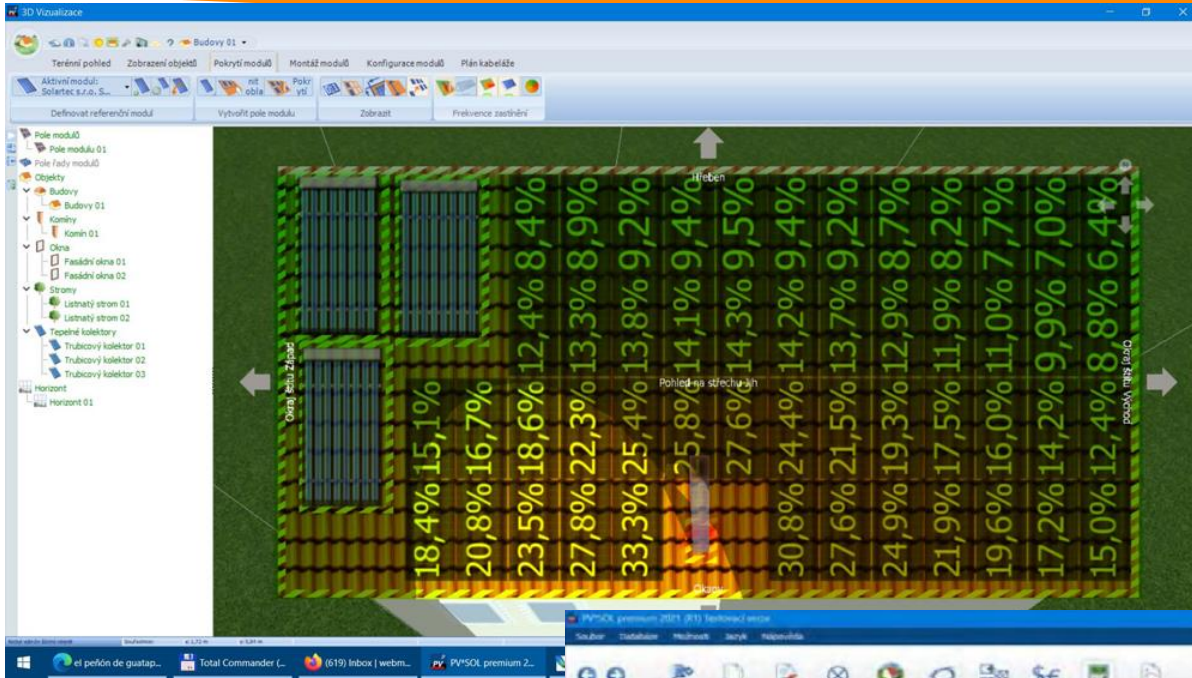
Global system summary

Nb. of modules	65
Module area	106 m²
Nb. of inverters	5
Nominal PV Power	16.3 kWp
Maximum PV Power	15.1 kWDC
Nominal AC Power	15.0 kWAC

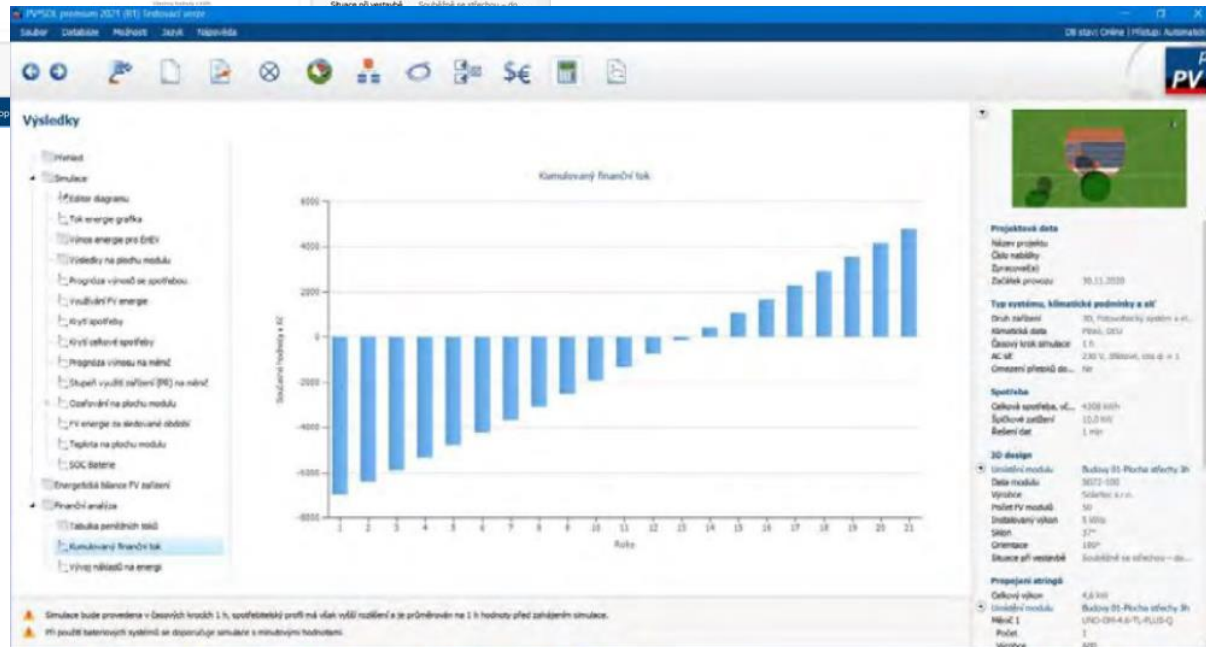
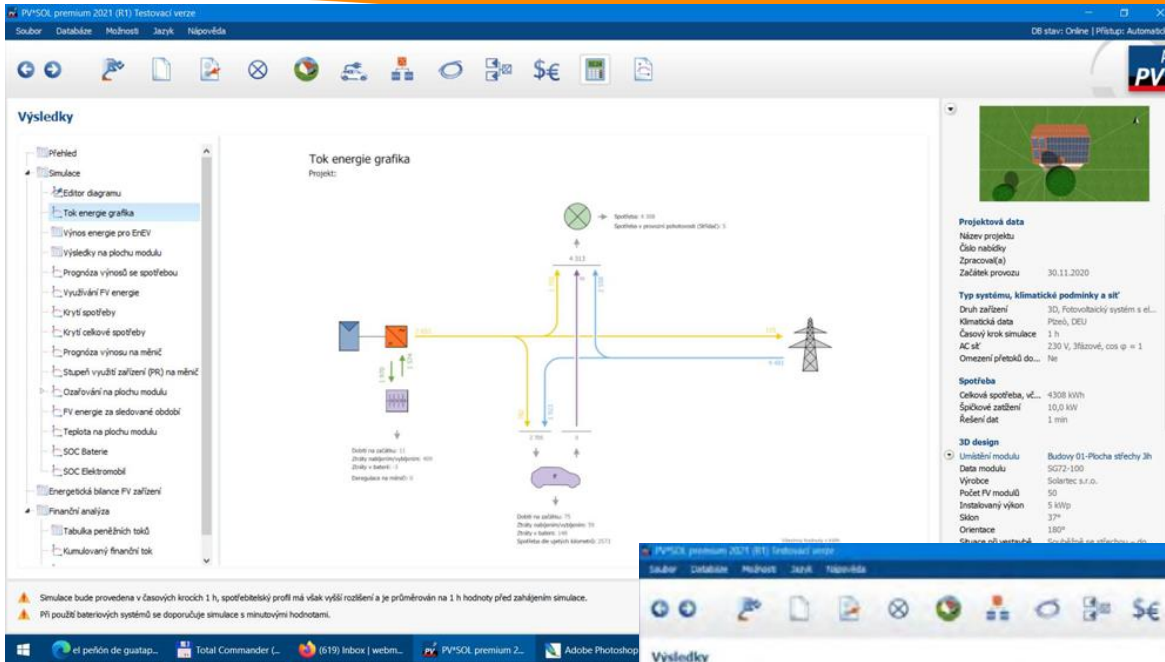
System overview | Simplified sketch | Cancel | OK



Shading, energy balance, ...



Energy chart, cash flow, ...



Conclusions



- Presented software for PV systems design give the accuracy around 6% if compared to real measured values in long term period as verified on measurements on experimental 20 kWp PV system installed on the UWB building in Pilsen.
- These results are for 2-3% better than results of similar simulations performed with software around 2010.

Energy [kWh/m ² /y]			<u>Measured</u>	PV Designer	PV GIS	<u>PV Syst</u>	PV Sol
2010	<u>California</u> 78,4 kW	I[kWh/m ² /y]	2178,6	1984,6	1981,2	1977,3	1911,8
		dI[%]	-	-8,91	-8,92	-9,22	-12,2
		E[kWh/y]	123,1	118,5	119,9	119,8	114,7
		dE[%]	-	-3,7	-2,5	-2,6	-3,7
	<u>California</u> 481,5 kW	E[kWh/m ² /y]	2037,6	1918,3	1956,4	1944,1	1855,7
		dI[%]	-	-5,9	-4,0	-4,6	-8,9
		E[kWh/y]	849,2	719,6	777,3	779,1	759,3
		dE[%]	-	-15,2	-8,5	-8,2	-10,8
2022	<u>Czechia</u> 20 kW	E[kWh/m ² /y]	1356,1		1299,2	1311,7	1317,4
		dI[%]	-	-	-4,2	-3,1	-3,2
		E[kWh/y]	681,3	-	631,2	644,5	649,2
		dE[%]	-	-	-7,3	-5,3	-5,1



Thank you for your attention!

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