

SMA Tripower Inverters in PV*SOL: A step-by-step guide

1. Background

Due to the characteristics of SMA's Tripower inverter series, PV*SOL users should treat each of this inverter's two inputs (Input A & Input B) as separate inverters when designing such a system. These inverters are saved for each project in the PV*SOL inverter database.

2. Plan your system arrangement

We recommend using SMA's free 'Sunny Design' software to plan the system arrangement (stringing and inverter selection). To download the SMA software please see their website: <http://www.sma.de/en.html>

Worked example:

Using SMA's Sunny Design software, a 60 panel x 240W (14.40kW) system selects a 'Tripower 15000TL' inverter and the following arrangement:

Input A: 2 strings of 24 modules in series (total PV Power for Input A: 11.52kW)
Input B: 1 string of 12 modules in series (total PV Power for Input B: 2.88kW)

Note: The sum of the modules = 24 + 24 + 12 = 60; the sum of the power = 11.52 + 2.88 = 14.4kW

3. Create a new inverter for Input B

To create the inverter, stay in the main part of the PV*SOL program (not in the 3D mode) and go to Main Menu > Databases > Inverter > Grid Connected Operation > Load. Then select the SMA 'Sunny Tripower Extraeingang'.

Modify the model name to anything memorable, or ideally something that refers to the project you are working on so you can find this again later.

You will need to overwrite three variables:

- DC Power Rating (kW)
- AC Power Rating (kW)
- Max. AC Power (kW)

They all must now equal the PV rated power that you intend for input B. Then click 'Save As' to save the new inverter.

Worked example:

The three variables will now all read 2.88kW as per the following diagram:

4. Create a new inverter for Input A

In the main part of the program (not in the 3D mode) go to Main Menu > Databases > Inverter > Grid Connected Operation > Load. Then select the SMA Tripower inverter model that you chose in Step 1. *Example = 'Tripower 15000TL' inverter.*

Modify the model name to anything memorable, or ideally something that refers to the project you are working on so you can find this again later.

You need to overwrite three variables:

- DC Power Rating (kW)
- AC Power Rating (kW)
- Max. AC Power (kW)

You must overwrite each of the values of the three variables above by reducing them individually by the rated PV Power for Input B that you designed in Step 1 with the SMA software.

Click 'Save As' to save the new inverter.

Worked example

The three variables will now be reduced by 2.88kW:

- DC Power Rating (kW) = 15.34 - 2.88 = 12.46
- AC Power Rating (kW) = 15.00 - 2.88 = 12.12
- Max. AC Power (kW) = 15.00 - 2.88 = 12.12

Note: Unlike Step 2, the values are not necessarily all the same.

5. Set up your system with these inverters

You now have a choice of designing in 2D mode or 3D mode.

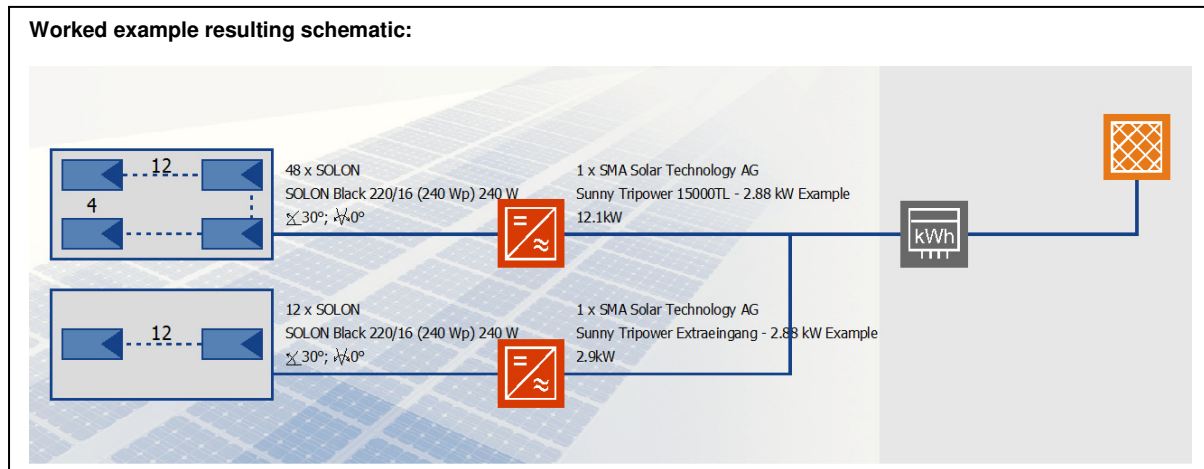
If you are working in PV*SOL Pro or PV*SOL Expert 2D:

Go to Main Menu > System > Technical Data > System > Inverter Concept, then select 'Multiple Inverters'.

Go to Main Menu > System > Technical Data > System > Number of Arrays, then select '2'
Note that two Array tabs will appear at the bottom of the dialogue.

Select Array 1 and select only the PV modules you intend for Input A. Select the Tripower inverter model that you have already adjusted in step 3.

Select Array 2 and select only the PV modules you intend for Input B. Select the new inverter model that you already created in step 2.



If you are working in PV*SOL Expert's 3D module:

You can place modules on the roof in the usual way in 3D.

When you are selecting the inverter as normal in the module configuration tab, use the 'limit inverter selection' option. Now limit the inverter selection to the two inverters you have created for this project in steps 2 & 3.

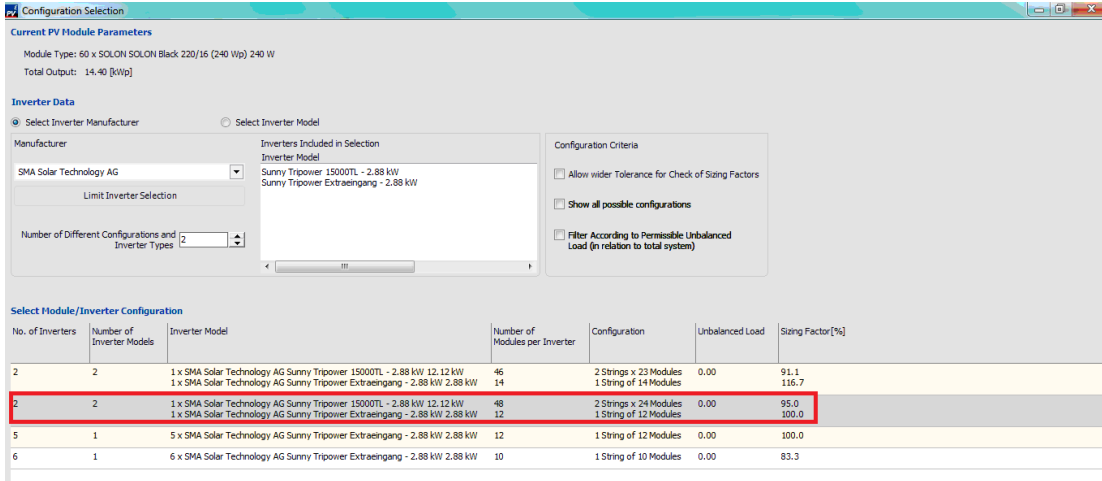
Select the option with one of each inverter and select 'OK'. Your system is now complete.

What if one of each inverter is not an option? Please check that you have:

- The correct number of panels/panel types.
- Not made a mistake when creating the new inverters in the inverter database.
- Your settings set to 'Calculate from Climate Data' & 'Calculate Permissible Sizing Factors from Location and Installation'. You will need to check this in the main part of the program at Options > Settings > System Check.

Worked Example

We now limit selection to the configured 'Sunny Tripower 15000TL 2.88 kW Example' and 'Sunny Tripower Extraeingang 2.88 kW Example' inverter models. We can then select the option of the inverters we have created and the stringing we have designed (see below).



Configuration Selection

Current PV Module Parameters
 Module Type: 60 x SOLOIN SOLOIN Black 220/16 (240 Wp) 240 W
 Total Output: 14.40 [kWp]

Inverter Data

Select Inverter Manufacturer Select Inverter Model

Manufacturer: SMA Solar Technology AG
 Inverters Included in Selection:
 Sunny Tripower 15000TL - 2.88 kW
 Sunny Tripower Extraeingang - 2.88 kW

Configuration Criteria:
 Allow wider Tolerance for Check of Sizing Factors
 Show all possible configurations
 Filter According to Permissible Unbalanced Load (in relation to total system)

Select Module/Inverter Configuration

No. of Inverters	Number of Inverter Models	Inverter Model	Number of Modules per Inverter	Configuration	Unbalanced Load	Sizing Factor[%]
2	2	1 x SMA Solar Technology AG Sunny Tripower 15000TL - 2.88 kW 12, 12 kW 1 x SMA Solar Technology AG Sunny Tripower Extraeingang - 2.88 kW 2.88 kW	46	2 Strings x 23 Modules 1 String of 14 Modules	0.00	91.1 116.7
2	2	1 x SMA Solar Technology AG Sunny Tripower 15000TL - 2.88 kW 12, 12 kW 1 x SMA Solar Technology AG Sunny Tripower Extraeingang - 2.88 kW 2.88 kW	48	2 Strings x 24 Modules 1 String of 12 Modules	0.00	95.0 100.0
5	1	5 x SMA Solar Technology AG Sunny Tripower Extraeingang - 2.88 kW 2.88 kW	12	1 String of 12 Modules	0.00	100.0
6	1	6 x SMA Solar Technology AG Sunny Tripower Extraeingang - 2.88 kW 2.88 kW	10	1 String of 10 Modules	0.00	83.3