

WORKING WITH THE FRONIUS SYMO AND PVSYST

This document is a guide to working with Fronius Symo .OND files, unbalanced MPPTs, and the unique requirements of PVSyst when dealing with such files.

Balanced Strings

When using a configuration with all strings having the same number of modules, the easiest way to set the system up is with one MPPT per inverter. This is done by clicking on the 'Adjust' button next to the inverter. This feature is available on version 6.35 and later.

Select the inverte	er							EZ 50 k	4.2
Available Now	 Sort inve 	rters by: 🔿 Power	O Vo	oltage (max)				₩ 60 F	lz lz
Fronius USA	▼ 20 kW	200-800 V TL 9	50/60 Hz	Symo 20.0-3 / 48	0	Since 2014	-	🐴 Op	ben
Nb of MPPT inputs	8 📩 🔽	Operating Voltage:	:	200-800 V	Global Inverter's	power 160	kWac	🔪 Ad	ijust
• Main input	Secondary un	usedput maximum volt	tage:	1000 V	Inverter with	2 Unbalanced	IMPPT		

The 'Nb of MPPT inputs' is equal to the number of inverters in the sub-array.

🕤 MPPT inputs Power sharing definitions 🦳 🗖 🗙							
Specify the nominal power sharing between MPPT inputs of a same inverter							
Be careful: the PVsyst dadabase doesn't hold all kinds of limitations set by the manufacturers When specifying derates from the normal case, you should check the compatibility with the datasheets specifications !							
UnbalMPPTTab							
Special inverters with unbalanced MPPT inputs have a "Main" and a "Secondary" input. Please check with the manufacturer that not using the secondary input is authorized for this inverter. Unbalanced MPPT inverter							
Inverter 5ymo 20.0-3 / 480							
in the sub-array Sub-array #1							
The secondary input is not used for this inverter							
X Cancel							

Unbalanced Strings

When using a different string length on each of the Fronius Symo's two MPPTs, separate sub-arrays must be created. There will be two sub-arrays for each set of inverters, and 'Nb of MPPT inputs' should be the same for both sub-arrays. PVsyst treats these as separate inverters, but will check to make sure there is the same number of main and secondary inputs. Care should be taken to put less DC power on the secondary input as it has a lower input current rating, as noted by the 'Global Inverter's power.'

Sub-array #1



-Select the invert	er				
Available Now	Sort inverte	ers by: C Power	🔿 Voltage (max)		▼ 50 Hz ▼ 60 Hz
Fronius USA	▼ 20 kW	200 - 800 V TL 50/60	0 Hz Svmo20.0-3 / 4	480 Since 2014 👤	搔 Open
Nb of MPPT inputs	8 : V C Secondary	Operating Voltage: Input maximum voltage:	200-800 ∨ 1000 ∨	Global Inverter's power 80 kWac Inverter with 2 Unbalanced MPP	Adjust

Sub-array #2

Select the inverte	Sort inverte	ers by: C Power C	Voltage (max)		▼ 50 Hz ▼ 60 Hz
Fronius USA	▼ 20 kW	200 · 800 V TL 50/60 I	Hz: Svmo 20.0-3 / 4	480 Since 2014 💌	🐴 Open
Nb of MPPT inputs	8 ÷ ▼ ⊙ Secondary	Operating Voltage: Input maximum voltage:	200-800 ∀ 1000 ∀	Global Inverter's power 60 kWac Inverter with 2 Unbalanced MPP	T

Undersized Inverter Power

PVsyst assigns a maximum AC power to each MPPT and treats is as a separate inverter for sizing and



simulation. This is a consequence of the program's design history and cannot, at the moment, be changed. With DC-AC ratios much greater than 100%, it is possible to get an "Inverter is undersized" error, and the program will not allow the simulation to be run. To overcome this, it's possible to adjust the 'limit overload loss' in the 'Albedo –settings' parameters for the project.

Site-dependent Design Reference temperatures for array design by respect to the inverter input voltages	parameters ?	Lower temperature for Absolute Voltage limit -2 Winter operating temperature for VmppMax design 0	Default °C
		Summer operating temperature for VmppMin design 60	v ⊽ ⊃
Other design Parameter Array Max. voltage © IEC (usually 1000 V) © UL (usually 600 V) muVoc value © From one-diode model © From specification	?	Limit overload loss for design 5.0	x V

The default setting of 5.0% can be increased to allow the configuration and allow the simulation to be run. However, the simulation will assume the AC power limit on a per-MPPT basis. Caution is needed as this unrealistic view of the inverter operation can cause simulation losses that would not occur in actuality. The input current is limited on a per-MPPT basis, but AC power is only limited on the whole inverter.

It is also possible to not exceed the overload loss limitation and still get an error based on inverter power.

The Array maximum power is greater than the specified Inverter maximum power. (contractual condition) 'Global Inverter's power' is determined based on the ratio of DC current between the main MPPT and secondary MPPT. The physical limitation on total DC power for the Fronius Symo is 150% and PVsyst applies this limit to each individual MPPT AC power allocation. The designer should ensure that 150% of the inverter power is not exceeded with all input power amongst the two MPPTs.

If this error occurs, the only way to allow the simulation to run is to modify the OND file by clicking 'Open' next to the inverter name.



Select the invert	er				50 Hz
Available Now	 Sort inverte 	ers by: C Power C	Voltage (max)		C 60 H₂
Fronius USA	▼ 20 kW	200 · 800 V TL 50/60 H	lz Svmo 20.0-3 / 4	180 Since 2014 💌	👸 Open
Nb of MPPT inputs	8 - 🔽	Operating Voltage:	200-800 ∨	Global Inverter's power 60 kWad	\smile
C Main input	Secondary	Input maximum voltage:	1000 V	Inverter with 2 Unbalanced MPP	т

The 'Required' box for Maximum PV Power should be unchecked. Then click OK and save the OND file.

🥝 Grid inverter definition 🦳 🗖 💌					
Main parameter Efficiency curv	ve Additional parameter 0	utput parameters Sizes Comm	ercial		
Model Symo 20.0-3 / 4	Symo 20.0-3 / 480 Manufacturer Fronius USA				
File name FroniusUSA_Sy	FroniusUSA_Symo_20_0_3_480.ONC Data source Manufacturer 2014				
2 Original PVsyst d	atabase	Prod. from 2014			
Input side (DC PV field) Minimum MPP Voltage Min. Voltage for PNom Nominal MPP Voltage Maximum MPP Voltage Absolute max. PV Voltage Power Threshold	200 V 450 V 710 V 800 V 1000 V 100.0 W	Output side (AC grid) Type C Monophased G Triphased Grid Voltage Nominal AC Power Maximum AC Power	Frequency ✓ 50 Hz ✓ 60 Hz 277 V 20.0 kVA		
Contractual specifications, v real physical meaning Nominal PV Power Maximum PV Power Maximum PV Current	ithout ? Required 20.4 W/ W/ 30.0 KW F 70.5 A V	Nominal AC current Maximum AC current Efficiency Maximum efficiency CEC efficiency Efficiency defined for 3	24.0 A 27.4 A 98.0 % 97.0 % ? voltages		
🕒 Copy to table 🖉 Print 🗶 Cancel 🗸 OK					

The file can be saved with a different name to alert you to this change, or you must remember to ensure you check the overall DC-AC ratio, as PVsyst will no longer alert you.