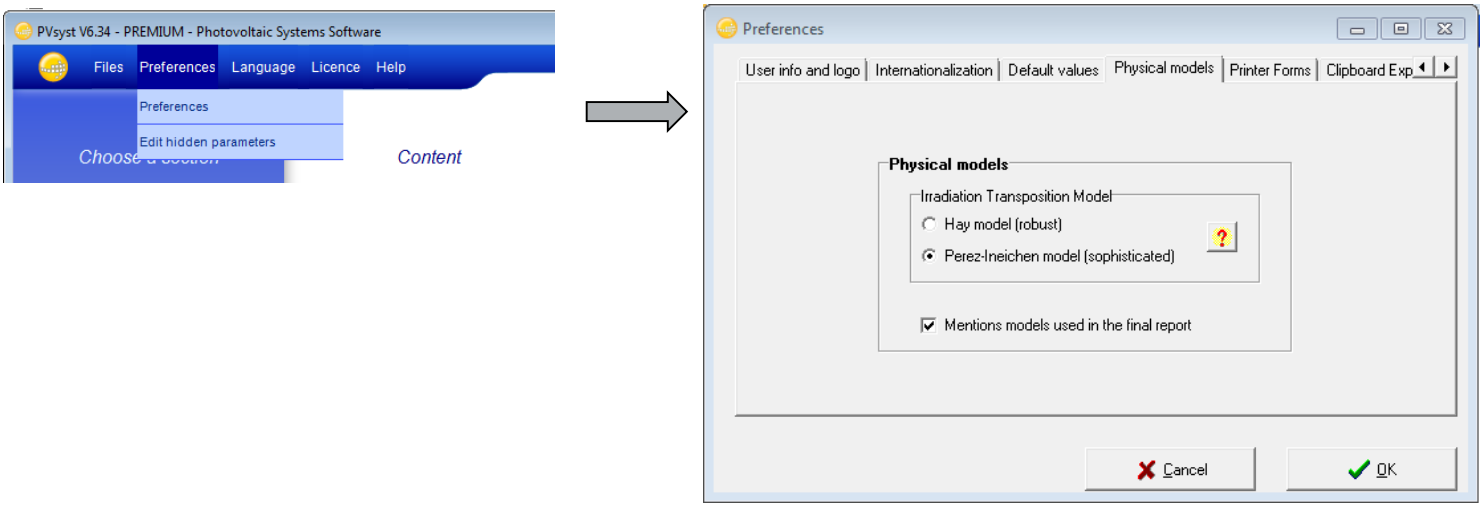
SunPower® PV-Syst Modeling Guide: Modules

Transposition Model Selection

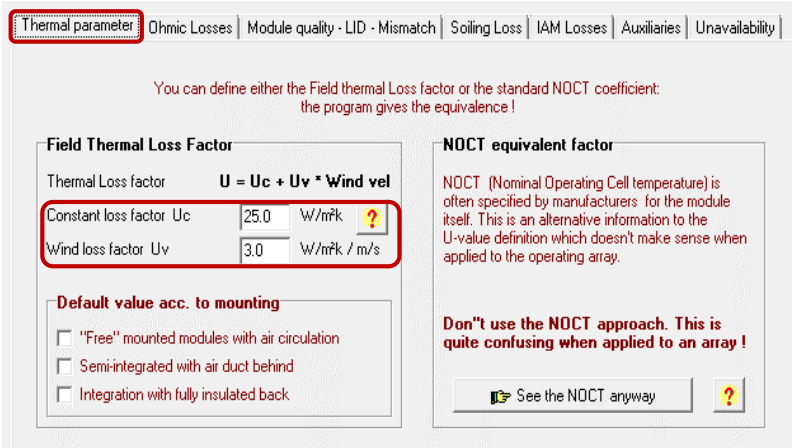
SunPower has worked directly with Richard Perez to understand the most current representation of the Perez tilted-plane (transposition) model and has done an extensive validation to demonstrate that the plane-of-array irradiance calculations are accurate [Perez Diffuse Irradiance on Tilted Plane and PVSim white paper]. Therefore, select the Perez-Ineichen physical model under *Preferences*.



Thermal Parameter Selection

Free-standing systems (ground mount fixed tilt or trackers)

- Uc = 25.0 W/m^{2}K
- Uv = 3.0 W/m^{2}K / m/s



On roof or BIPV

Use default PV-Syst settings.

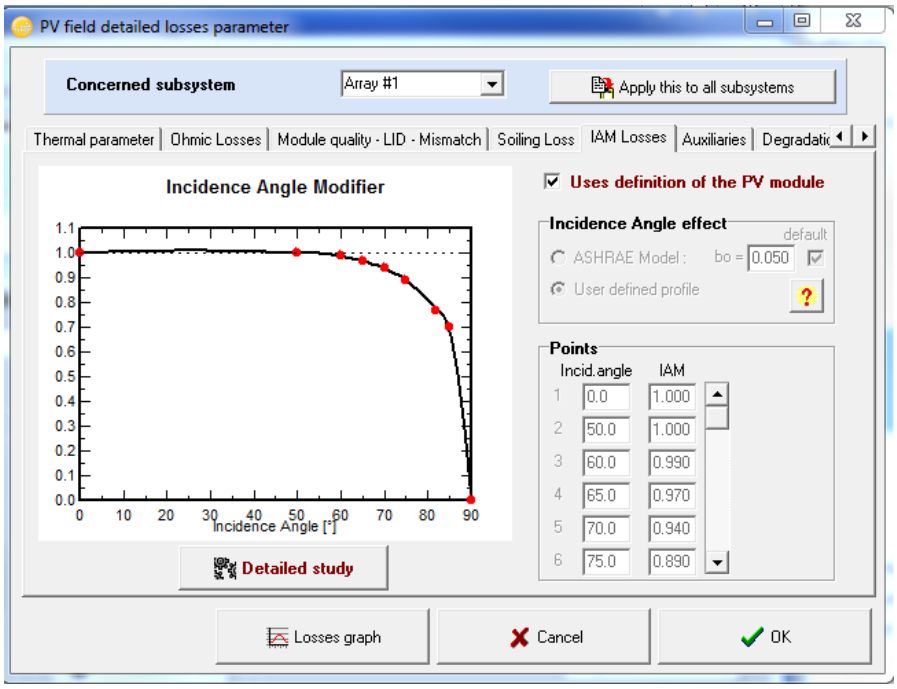
IAM Losses

Make sure to use the PV module definition for IAM Losses.

You can also set those values manually:

E- and X-Series

Point #	Incid. angle	IAM
1	0.0	1.00
2	50.0	1.00
3	60.0	0.99
4	65.0	0.97
5	70.0	0.94
6	75.0	0.89
7	80.0	0.81
8	85.0	0.70
9	90.0	0.00

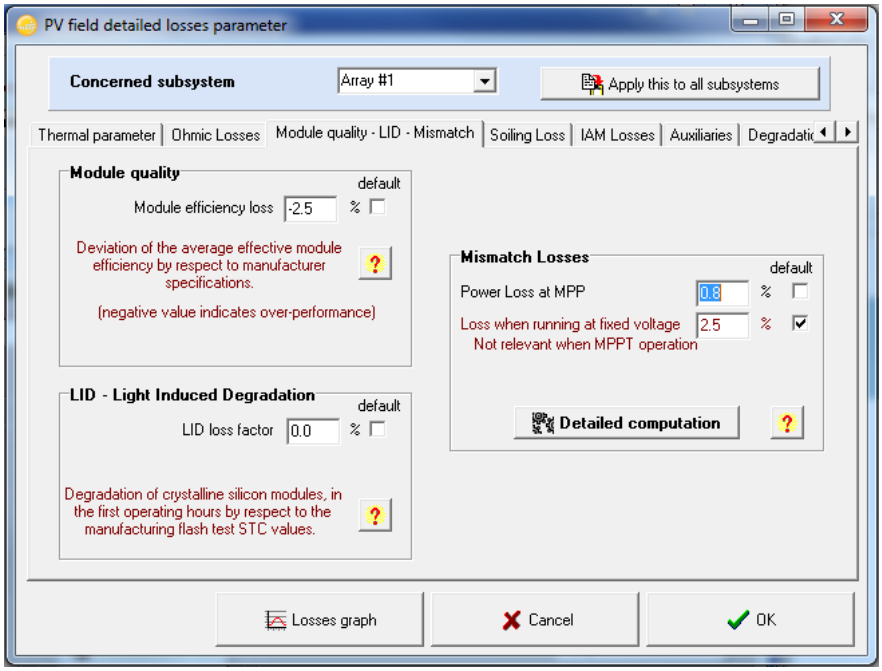


P-Series

Point #	Incid. angle	IAM
1	0.0	1.00
2	20.0	1.00
3	30.0	1.00
4	40.0	1.00
5	50.0	1.00
6	60.0	0.99
7	70.0	0.92
8	80.0	0.73
9	90.0	0.00

Module Quality – LID – Mismatch

Mismatch Losses



0.8% for E and X Series.
0.5% for P Series

LID – Light Induced Degradation

0% for E- and X-Series
1.2% for P17
2.0% for P18
1.4% for P19

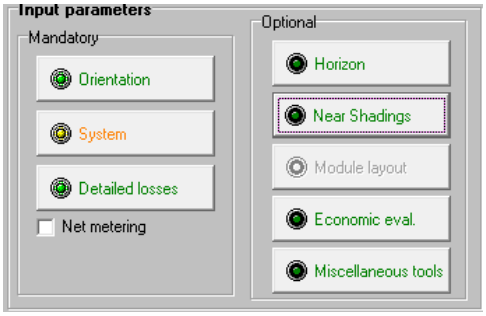
Module quality

E20-327: -2.5%
E20-327-COM: -1.0%
E20-435-COM(-1500V): 0.0%

P-Series: -0.6%

X-Series: -1.0% for COM modules; -2.5% for all other X-Series modules

E.g.: X22-360: -2.5%; X22-360-COM: -1%



Near Shadings

E- and X-Series

Use *According to module strings* or *Detailed, according to Module Layout* options to simulate the shading scene of your project.

P-Series

The P-Series module has a much better response to shade than conventional c-Si modules when installed in landscape orientation.

To reflect this better response in PV-Syst, create a shading scene in the *Near Shadings* section and select the *Linear shadings* option.

Note: advanced PV-Syst users know that for conventional PV systems, the *Detailed, according to Module Layout* option yields more accurate results. However, this is not true for SunPower's P-Series modules.