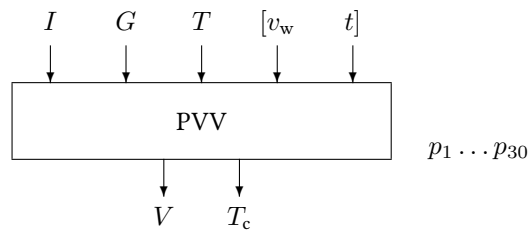


Block PVV

The PVV block calculates the output voltage and the temperature of a crystalline photovoltaic generator, depending on PV generator current, global radiation on the generator plane, ambient temperature, and wind speed.



Name	PVV
Function	se0001
Inputs	3 ... [5]
Outputs	2
Parameters	30
Strings	0 ... [1]
Group	S

Inputs

- 1 Current I / A
- 2 Global radiation on the generator plane G / W m^{-2}
- 3 Temperature T / $^{\circ}\text{C}$
- 4 Wind speed close to the generator v_w / m s^{-1}
- 5 Time t / s

Outputs

- 1 Voltage V / V
- 2 Cell temperature T_c / $^{\circ}\text{C}$

Parameters

- 1 Mode
 - 0 The cell temperature is given by input 3.
 - 1 The cell temperature depends on the thermal parameters of the PV modules and the inputs of the block; initial value of the cell temperature is given by parameter number 28.
 - 2 The difference between cell temperature and ambient temperature is a linear function of the global radiation (input 2) on the basis of NOCT.

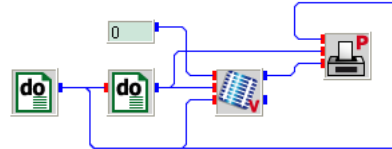
2	Number of cells in series per module N_s
3	Number of cells in parallel N_p
4	Number of modules in series M_s
5	Number of modules in parallel M_p
6	Area of a single cell A_c / m^2
7	Area of a single module A_m / m^2
8	Band gap E_g / eV (c-Si $\approx 1.12 \text{ eV}$, a-Si $\approx 1.75 \text{ eV}$)
9	Coefficient of short-circuit current density c_{ph} / V^{-1}
10	Temperature coefficient of short-circuit current $c_t / \text{V}^{-1} \text{K}^{-1}$
11	Coefficient of saturation current density (Shockley diode) $c_s / \text{A m}^{-2} \text{K}^{-3}$
12	Coefficient of saturation current density (Recombination diode) $c_r / \text{A m}^{-2} \text{K}^{-5/2}$
13	Series resistance parameter $r_s / \Omega \text{m}^2$
14	Parallel resistance parameter $r_p / \Omega \text{m}^2$
15	Diode ideality factor α
16	Diode ideality factor β
17	Bishop parameter a
18	Bishop parameter m
19	Bishop parameter V_{br} / V
20	Module tolerance plus / %
21	Module tolerance minus / % (< 0)
22	Characteristic module length ℓ_m / m
23	Module mass m_m / kg
24	Absorption coefficient a
25	Emission factor ϵ
26	Specific heat of a module $c_m / \text{J kg}^{-1} \text{K}^{-1}$
27	Nominal operating cell temperature NOCT / $^{\circ}\text{C}$
28	Initial value of cell temperature / $^{\circ}\text{C}$
29	Error tolerance of voltage (or current) of a single cell in the numerical iteration to solve the two-diode-model equation
30	Maximum number of iterations to solve the two-diode-model equation

Strings

1	Product ID
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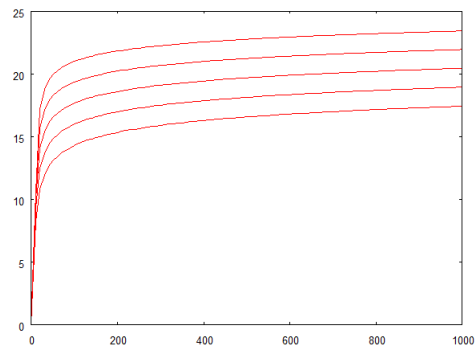
Description For a detailed description of the models used in the [PVV](#) block please refer to the description of block [PVI](#).

pvv.vseit



Two nested **DO** blocks are used to vary temperature (outer block) and radiation (inner block) from 0 to 80 °C in steps of 20 °C and 0 to 1000 W/m² in steps of 10 W/m², respectively. The current input of the **PVV** block is set to zero by a **CONST** block in order to simulate open-circuit voltage.

The **PLOT** block displays radiation dependence of the module's open-circuit voltage with the module temperature as curve parameter.



See also Blocks **PVI**, **PVDET1**, **PVDET2**, **PVFIT1**, **PVFIT2**.