

Solar String Calculator

Compares PV string module counts against cold-weather Voc and inverter MPPT voltage limits using module data, temperature assumptions, and equipment voltage ratings.

Generated October 10, 2026

<https://www.elecatrix.com/solar-backup-power/solar-string-calculator/>

Inputs

Input	Value	Unit
Module Voc	49.5	V
Module Vmp	41.2	V
Voc temperature coefficient	-0.28	%/C
Minimum temperature	-10	C
STC temperature	25	C
Inverter max voltage	600	V
MPPT minimum voltage	150	V
MPPT maximum voltage	480	V

Results

Result	Value	Unit
Cold module Voc	54.351	V
Temperature delta	-35	C
Max modules by voltage	11	modules
Min modules by MPPT	4	modules
Max modules by MPPT	11	modules
Recommended max modules	11	modules

Status

Status	Value	Unit
String window comparison	String window available	

Calculation details

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Detail	Value	Unit
Calculation basis	Cold Voc applies the entered temperature coefficient to the difference between minimum temperature and STC temperature. Module-count limits compare cold Voc and Vmp against entered inverter windows.	
Selection boundary	Solar string estimate only; no code correction table, equipment listing, rapid shutdown, conductor, protection, inverter approval, utility, or code-compliance result is made.	

Formulas

$$\Delta T = T_{min} - T_{STC}$$

$$V_{oc,cold} = V_{oc,STC}(1 + \alpha_{Voc} \Delta T)$$

$$N_{max,voltage} = \lfloor \frac{V_{inverter,max}}{V_{oc,cold}} \rfloor$$

$$N_{min,MPPT} = \lceil \frac{V_{MPPT,min}}{V_{mp}} \rceil$$

$$N_{max,MPPT} = \lfloor \frac{V_{MPPT,max}}{V_{mp}} \rfloor$$

$$Recommended\ max\ modules = \min(N_{max,voltage}, N_{max,MPPT})$$

Warnings and limitations

This solar string estimate is a voltage-window comparison. It does not replace PV code correction methods, inverter listing instructions, rapid shutdown, conductors, protection, utility interconnection, or code compliance.