

/ Perfect Welding / Solar Energy / Perfect Charging



**THE SIMPLE ANSWER
TO SHADING -**

DYNAMIC PEAK MANAGER.

PARTIAL SHADE

IN PV SYSTEMS

Shading can affect the yield of a photovoltaic system. Depending on the intensity and the area that is in shadow, it can be highly detrimental to the total yield of a PV system. An intelligent system design and efficient shade management are therefore essential for the best-possible operation of a shaded PV system.

With Fronius Dynamic Peak Manager, you can always bring out the best for your customers – even when there is partial shading. This highly efficient MPP tracking algorithm detects any shade and optimises the yield at the string level. No additional, sensitive components are needed at the module level, as it is already integrated into the inverter. Not only does this cost less because there are fewer system components, it also keeps installation and service costs to a minimum.

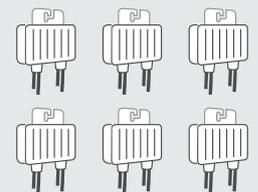
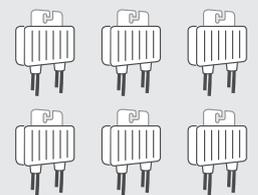
THE ADVANTAGES OF THE FRONIUS DYNAMIC PEAK MANAGER:

- / Maximum yields, even in the case of partial shading
- / Optimisation at string level
- / No additional components needed
- / Greater system reliability
- / No installation work

*shading management also integrated into the SnapINverter series.



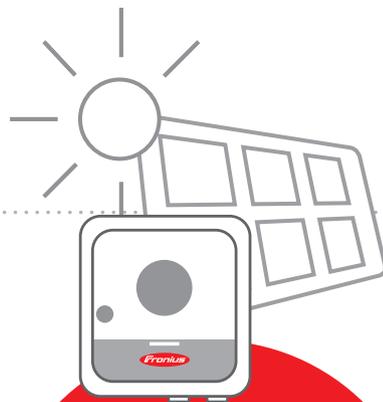
DC-OPTIMISED SYSTEMS



HIGHER YIELD DESPITE PARTIAL SHADE:

PV system size: 3.3 kWp
Region: Central Europe
Orientation: South-west
Tilt angle: 19.5°
Shadow: Partially shaded

*Yield can vary, depending on the system.

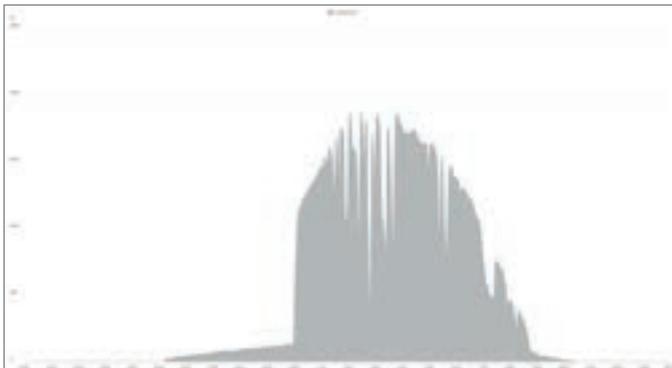


**7%
HIGHER
YIELD***

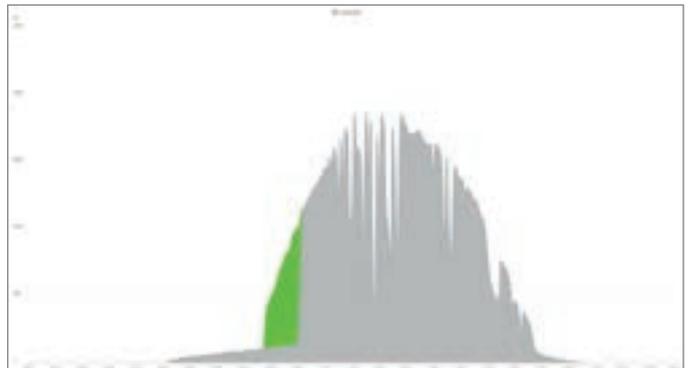
12 solar modules were installed in this three-phase system. This exactly matches the minimum string length of a well-known manufacturer for DC-optimised systems. However, if the majority of the module array is in shadow, for example, in partial shade from 8:45 to 10:00 in the morning, the string voltage decreases. Power optimisers can no longer work properly.

→ Therefore in this system, the yield with power optimisers is the same as with a string inverter without shade management!

WITHOUT DYNAMIC PEAK MANAGER:



WITH DYNAMIC PEAK MANAGER:

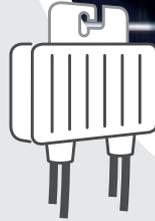


Put your system online. For a clear presentation of your energy flows.

The effect of Dynamic Peak Manager is particularly noticeable in the Fronius Solar.web visualisations. The yield is 7% higher overall on this day.

POWER OPTIMISERS –

ARE DC POWER OPTIMISERS REALLY THE SOLUTION TO SHADE?



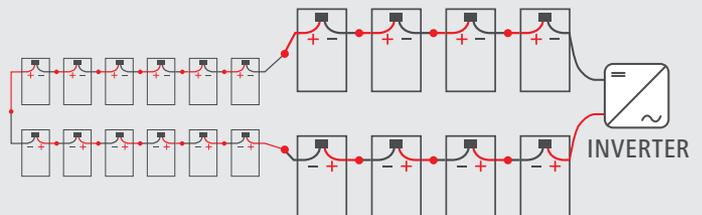
NO, power optimisers can adjust the voltage of the individual solar modules – they can either boost it, or decrease it. This adapts the voltage of the shaded modules to that of the unshaded modules.

Power optimisers need energy to boost or decrease. The more shade there is, the higher the consumption of the optimiser, and the lower the efficiency. This means, especially in partial shading, that power optimisers often cannot compensate for the shade, so they do not generate a higher yield.

Another disadvantage of DC-optimised systems is the large number of components on the roof. Each power optimiser sits directly behind the solar module and is therefore exposed to heat, cold, rain and snow all year round. This is bad for the sensitive power electronics and can have repercussions for servicing and fire risk. DC plug connections are a major source of PV system problems. There are about three times as many of them in a system with power optimisers.

SYSTEM WITH STRING INVERTER:

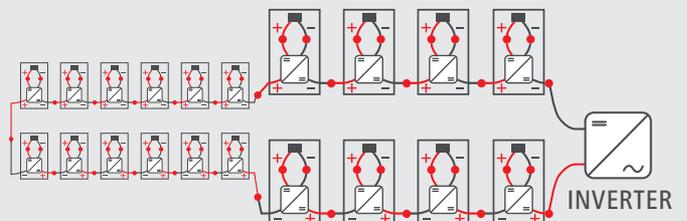
21 PLUG CONNECTIONS



● DC plug connection

SYSTEM WITH DC POWER OPTIMISER:

61 PLUG CONNECTIONS



● DC plug connection

More on the topic of safety and PV systems can be found here:



MYTHS

ABOUT DC-OPTIMISED SYSTEMS

FACT:

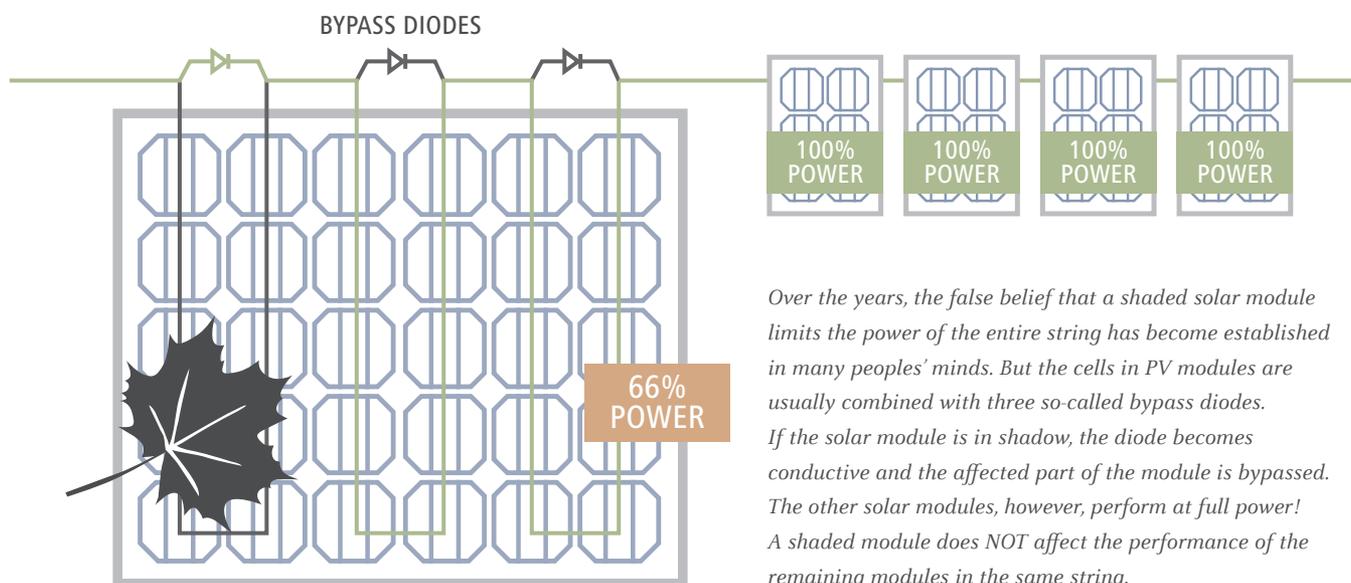
Power optimisers have a reputation for high flexibility in system design, but as proprietary DC-optimised systems work on the fixed voltage principle, the string must consist of a great many solar modules to achieve this fixed voltage.

MYTH:

“Flexibility in system design”

MYTH:

“The entire string loses power”



Over the years, the false belief that a shaded solar module limits the power of the entire string has become established in many peoples' minds. But the cells in PV modules are usually combined with three so-called bypass diodes. If the solar module is in shadow, the diode becomes conductive and the affected part of the module is bypassed. The other solar modules, however, perform at full power! A shaded module does NOT affect the performance of the remaining modules in the same string.

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,440 employees worldwide and 1,264 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

PERFECT WELDING

Our mission is Perfect Welding; a task we have approached with passion and skill for decades in order that our customers can join materials with the perfect weld seam. With our outstanding technologies and services and together with our customer's applications, not only do we solve their specific welding technology problems, but we also make a substantial contribution to increasing their productivity.

SOLAR ENERGY

Our mission is to achieve 24 hours of sun. Day after day we are hard at work turning this vision of a future in which 100% of the world's energy needs are covered by renewable sources into a reality. We are therefore concentrating on solutions to intelligently, efficiently and economically generate, store, distribute and consume solar energy.

PERFECT CHARGING

As know-how leaders in the world of battery charging, we deliver exceptional solutions to create the maximum benefit for our customers. For the intralogistics sector, we are committed to energy flow optimisation for electric forklift trucks and are constantly striving for the next innovation. Our powerful charging systems for vehicle workshops guarantee safe and reliable processes.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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