



HUAWEI

Huawei Technologies Co is a Chinese multinational networking and telecommunications equipment and services company with annual revenue of over \$90 billion, making them the world's largest telecoms company.

The Huawei FusionSolar Smart PV division specializes in production of their SUN2000 commercial PV string inverter range, and shot to the World's number 1 commercial inverter manufacturer by shipment deployment in 2015, and firmly held the number 1 position in 2016 & 2017.

SEGENSOLAR

Formed in October 2015, SegenSolar (Pty) Ltd operates from offices in Johannesburg and Cape Town, South Africa, distributing and supporting high quality solar PV equipment across Southern Africa.

SegenSolar (Pty) Ltd is part of the Segen group, the UK's largest solar PV distributor. Founded in 2005, the company holds a very strong position in the UK, accounting for 35% of the UK rooftop solar market. The Segen group currently employs over 75 members of staff and active in the UK and much of Europe which is serviced by SegenSolar GmbH.

Segen has been successfully selling the Huawei range in Europe since 2015.

THE HUAWEI RANGE

Full range of commercial 3-phase grid-tied inverters, from 8kW to 50kW (low voltage), and 65kW to 100kW (for connection to a medium voltage grid) with full compliance to South Africa's grid standards.



The HUAWEI SmartLogger allows cloudbased monitoring for the solar plant from any location in the world, and supports full export limitation capabilities to meet the stringent requirements of Africa's electricity utilities. SegenSolar is able to provide customers with pre-commissioned packages using high quality compatible energy meters.

SegenSolar offers a range of IP65 DC protection boxes including Type I/II surge protection and individual string DC isolation for rapid installation to an assured quality standard.

THE ADVANTAGES OF CHOOSING A MULTIPLE MPPT INVERTER

Knowing and tracking energy yield of any PV system is critical to the party that will be benefitting from the production. It might be the home owner or the PPA owner that will be concerned about the Operations and Maintenance cost as well as the yield of the system. It might be the bank that is financing the system. Achieving the best possible return on investment is what will matter. Understanding what the possible issues are and how to overcome it will make a difference when designing a system and choosing a solution.

An optimizer tracks each individual module in the string's performance and an MPPT track each string's performance in an array. There are dual optimizers that track the performance of 2 modules and is usually used in larger installations. In commercial plant design, tracking each module is not always necessary and often tracking string performance is sufficient. Choosing a multiple MPPT Inverter will not only make string level monitoring possible, but will allow design flexibility and overall efficiency without having to increase the cost of the project with module level optimisation.

USEFUL INFORMATION

The number of modules that can be connected to 1 string is dependent in the string voltage of the inverter. For example, when using JA Solar 320W Poly 5BB with a 1000V string inverter, 18 – 23 modules can be used on 1 string, depending on the cell temperature.

All modules in an array will perform as per the poorest performing module and without multiple MPPT's this will have a major impact on the performance of the system. With a Multiple MPPT Inverter, each string will perform independently and therefore poor performing strings or modules will not affect the yield of the total system, delivering the highest yield possible.

STRING LEVEL CAPABILITIES

- Detects the fault in the string.
- Panel miss match: PV modules with same ratings coming out of one production line in a factory do not possess identical current-voltage characteristics for many reasons. This inequality causes PV modules to compromise on common voltage and current when they are connected in series or parallel in an array.
- Most module manufacturers guarantee a mine output and often a 320W module for instance will actually be a 325W module. With a multiple MPPT inverter, one can take advantage of the extra free power.
- A multiple MPPT inverter allows for strings to be connected that might have 320W modules in the one string and 330W modules in the other string without having to compromise on the performance.
- Allowing for different string lengths depending on the roof requirements.
- Making installations possible on multi-faceted roofs with different pitch angles. Even a few degrees can make a big difference on larger commercial roof tops that are not perfectly even.
- Shading on parts of the array will only affect the one string and not the entire array.
- Panels degrade at different rates over time and the output will always be as per the poorest performing module.
- Soiling can drastically affect the performance of individual modules and more so in low rain fall areas. On average there is a daily efficiency reduction of 0.2% in days without rainfall in dry weather. Annual losses caused by this trend due to larger ground mounted systems, the bottom row of the modules can be separated from the rest of the sub-array when using an inverter with multiple MPPT's to ensure the overall performance is not effect.

MULTIPLE MPPT VS SINGLE MPPT INVERTERS

The purpose of an MPPT is first and foremost to measure and monitor the performance of the sting. There are many inverters that only has 1 MPPT input and for those inverters the aim of the MPPT is to see what is going on in that string and not necessarily to look for the best performing string as there is only 1 string. For smaller installations this might be sufficient if all panels are facing the same direction and the same tilt and orientation and assuming all modules will soil and degrade at the same rate. This is more often than not, not the case.

For larger installations a combiner box can be connected externally to the inverter to connect multiple strings to a single MPPT inverter. This will depend on the max MPPT current identified by the inverter. This is identified as IPPM on the data sheet of the inverter and refers to the max operating current. This will however add significantly to the overall cost of the project.

The 2 biggest advantage of multiple MPPT inverters are design flexibility and overall efficiency.

All panels in an array will perform as per the poorest performing module and without multiple MPPT's this will have a major impact on the performance of the system.

	1 MPPT	4/6 MPPT	YIELD GAIN
String Length Flexibility	No	Yes	
Module Type Flexibility	No	Yes	
Selective Optimisation	No	Yes	
Different Orientations	Very Poor	Good	0.0% - 2%
Mismatch Losses	Poor	Good	0.5% - 1%
Shading Losses	Very Poor	Good	0.0% - 2%
Degradation Losses	Poor	Good	0.5% - 1%
Temperature Losses	Poor	Good	0.5% - 1%
Soiling Losses	Poor	Good	0.5% - 1%
Low Voltage Start-up	Poor	Good	0.5% - 1%
TOTAL			2.5% - 9%

APPLICATIONS FOR INSTALL

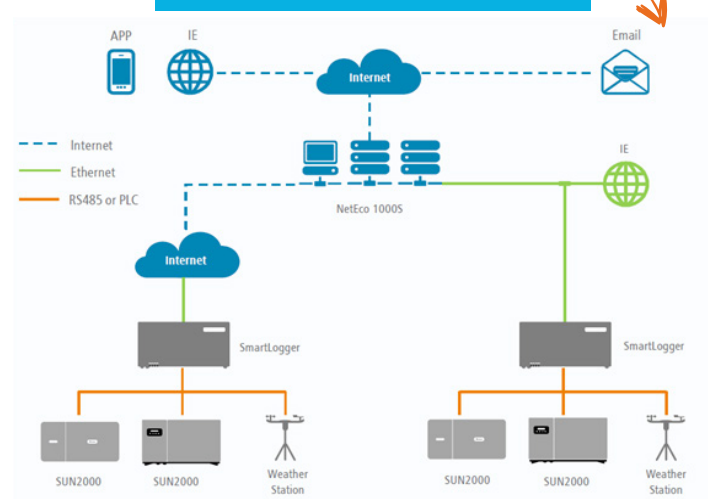
Commercial 3-phase grid-tied rooftop and ground-mount applications from 8kW upwards.

REMOTE MONITORING

The HUAWEI NetEco cloud platform allows monitoring of connected solar PV plants from anywhere in the world, supporting remote monitoring, plant performance, and automatic alerts. NetEco is a free monitoring service that Huawei offers to its users.

Huawei Fusion Cloud service, available in South Africa, is a solution tailored for utility/large scale plants, with pricing determined on a project-by-project basis.

HUAWEI FUSION CLOUD SERVICE



LOCAL AFRICAN SUPPORT

Dedicated pre and post sales technical support provided by SegenSolar and HUAWEI staff based in South Africa and Dubai, with replacement inverter stock available for immediate dispatch. SegenSolar can offer design support to meet the demanding requirements of installations on the African continent including DC and AC side electrical protection, power conversion and monitoring.

WORLD-WIDE INSTALLATIONS

HUAWEI has shipped over 60GW globally between 2015 and 2017.

SEGENSOLAR CUSTOMER INSTALLATIONS



EPC: SWITCH TO GREEN

Project Size: 36 kWp
Product: Huawei SUN2000 36KTL
End User: Farming Cold Rooms
Location: Hartebeesfontein, Britz - North West Province



EPC: SOVENTIX

Project Size: 60kWp
Product: Huawei SUN2000 33KTL
End User: KNYSNA Elephant Park
Location: Western Cape



EPC: SUNRANCH SOLAR

Project Size: 250kWp
Product: Huawei SUN2000 36KTL
End User: Chalmar Beef
Location: Kempton Park - Gauteng



EPC: CLACKSON POWER

Project Size: 1.2MWp
Product: Huawei SUN2000 36KTL
End User: ClanWilliam
Location: Western Cape

FusionSolar Smart PV Solution Always Available For Highest Yields

INSTALLATION MAP IN AFRICA



KEY USP'S

- **Bankable:** World's largest telecoms company with revenue over \$90bn
- **No.1 Global Inverter manufacturer by shipments:** Announced by GTM
- **Flexible Design:** 2 MPPT on 8KTL, 3 MPPT on 20KTL, 4 MPPT on 36KTL, 6 MPPT on 50KTL
- **Wide MPPT voltage range:** Giving increased yield across all light conditions
- **Reliable:** Fan-less/no fuses/no LCD screen, low failure rate of 0.5%
- **100% Factory Tested:** Every inverter made is fully heat cycled post manufacturing
- **Highest Efficiency:** Highest commercial inverter Euro efficiency of 98.5%
- **Integrated Surge Protection:** AC and DC Type II surge protection
- **Rated:** For use in hot African climates at high altitude
- **String level monitoring:** Providing rapid fault diagnosis, alerts and reporting to improve yield

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