

DAANAA

Revolutionizing Power Electronics

Increase Performance, Simplify Designs, Consolidate Supply Chains

Energy Untethered™



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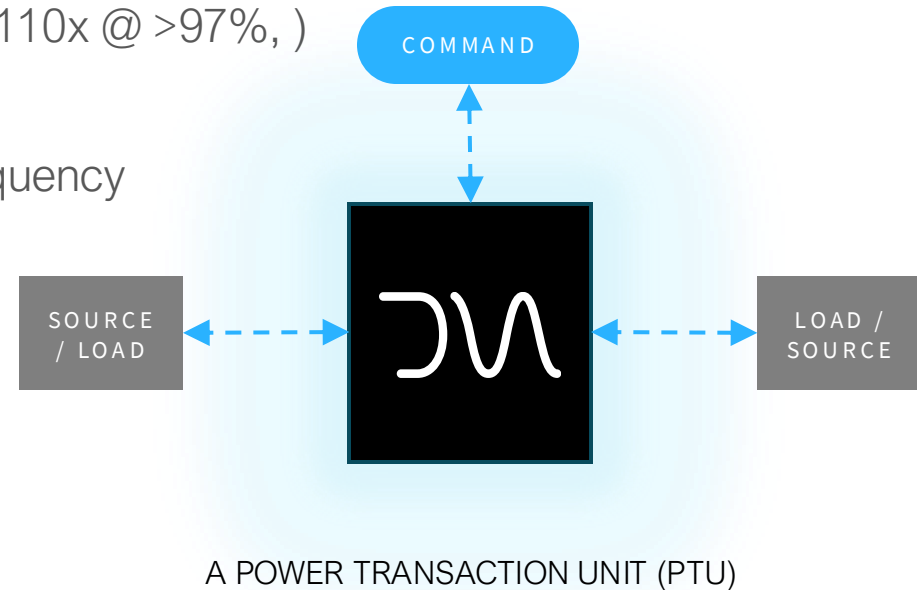
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Existing Power conversion systems require a combination of serial connections, multi-stage conversions and multi component designs. This leads to 20-50% power losses, excess heat, wasted funds and resources, additional mitigation components and supply chains dependencies

By Integrating the **POWER TRANSACTION UNIT (PTU)**
Daanaa Eliminates Multi-Stage Conversion, Serial Connections and Multi-Component Design to Improve Customers' Product performance, generate new revenue and simplify supply chains

Daanaa's Power Transaction (PTU) Capabilities

- High-efficiency, single-step high voltage conversion ratio ($>110\times$ @ $>97\%$,)
- Modal-free conversion (AC or DC)
- Real-time programmable power, voltage, amplitude and frequency
- Bidirectional conversion and power flow
- Scalable power summation – array of independent PTU's
- Fast maximum power point tracking ("MPPT")
- Galvanic isolation and rapid shut down
- Highest power density SoM
- Real-time configuration, monitoring, and diagnostics



*Power transactions include
generation, storage, distribution*

Underlying Technology Innovation:

Real time control, augmentation and manipulation of the entire *Near-Field Reactive Electro-magnetic Spectrum*

Boost Performance Reduce Costs

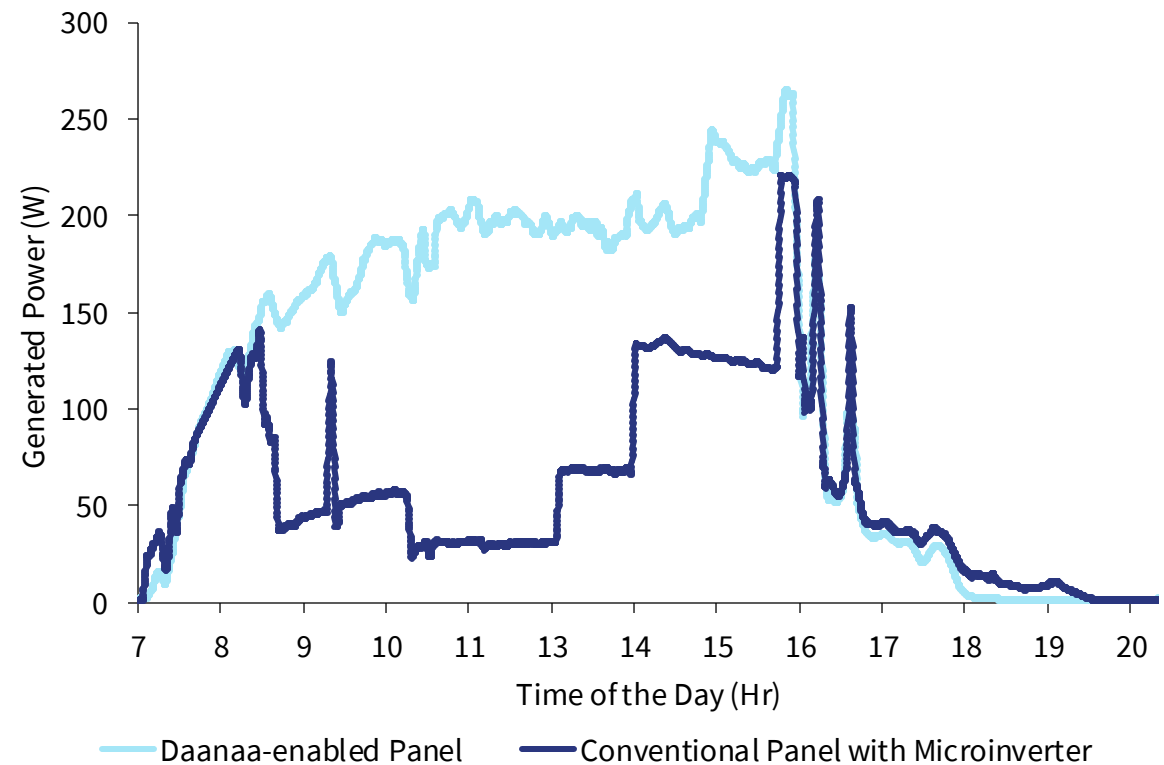
Daanaa's Solar Integration

- **Boost Module Performance:** by 15% on average and up to 47% in light obstruction situations
- **Eliminate All Power Electronics** between the cells string and the destination
- **Lightweight, Real Time Programmable** with a Single interface services all segments
- **Scale Without Redesign** Size and output agnostic shorten validation cycles, and lower integration risk.
- **Advanced Functionally:** integrated Diagnostics and monitoring, protection features reduce failure, eliminate hotspots and increase life of the asset
- **BESS** Integration out of the box



CFV Labs Results

Alpha version of Zodiac-enabled PV modules performs 100% better in a single shady day.



Outdoor Testing- Sample of Result

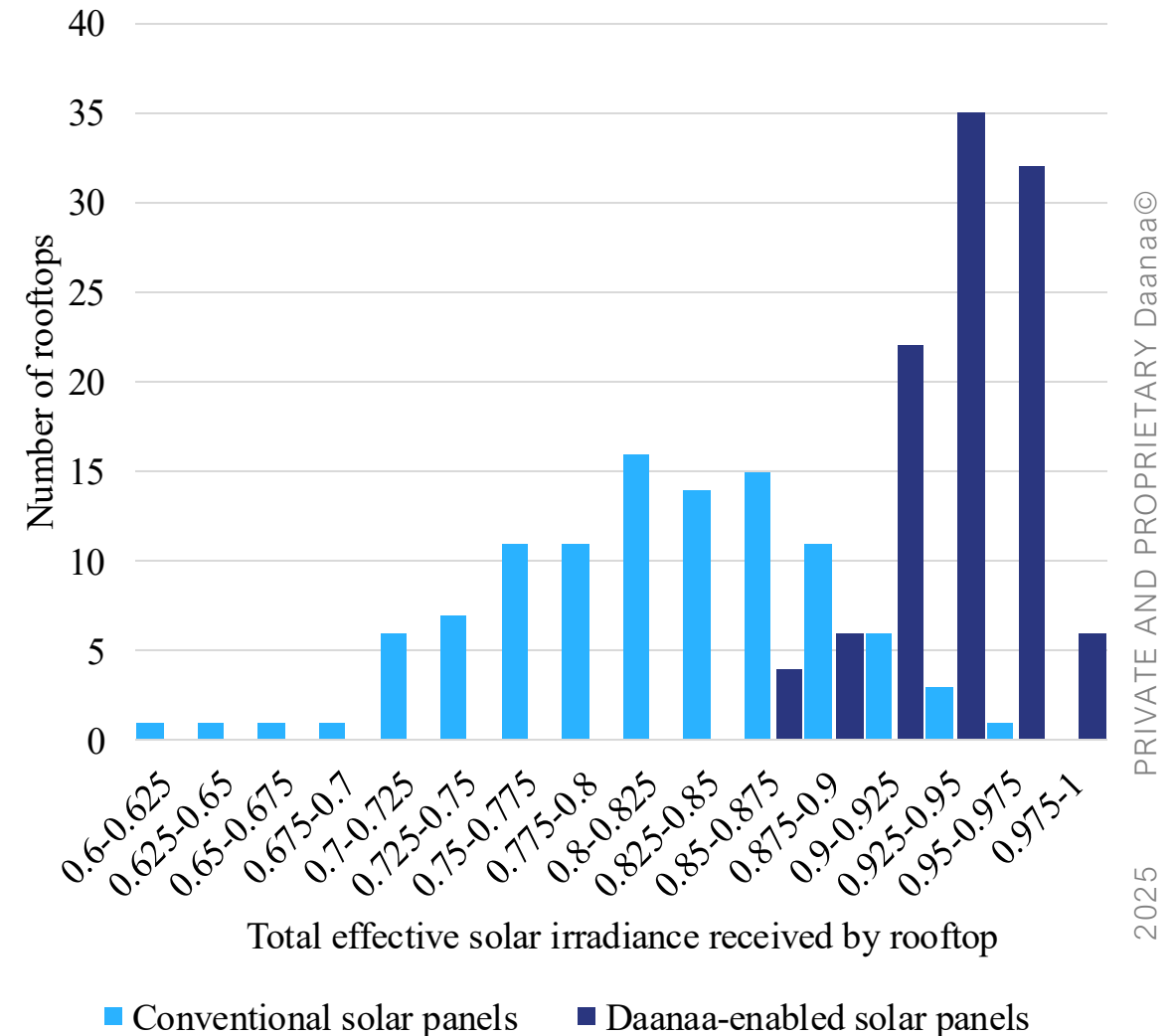
Conditions	Zodiac Rev A-enabled module output power (W)	PV module with DC optimizer output power (W)*	Expected output power using microinverter** (W)	Zodiac Rev A-enabled module performance improvement
No shade	340	330	320	6%
One substring shade	270	200	180	47%
Four substring shade	220	175	160	36%
Six substring shade	160	165	150	7%
Pole shade	275	255	240	14%

*The peak efficiency of microinverter is corrected based on the panel's output power and voltage.

** PV modules have nominal DC output power of 420W and installed with non-optimized tilt angle.

Projected Energy Gains

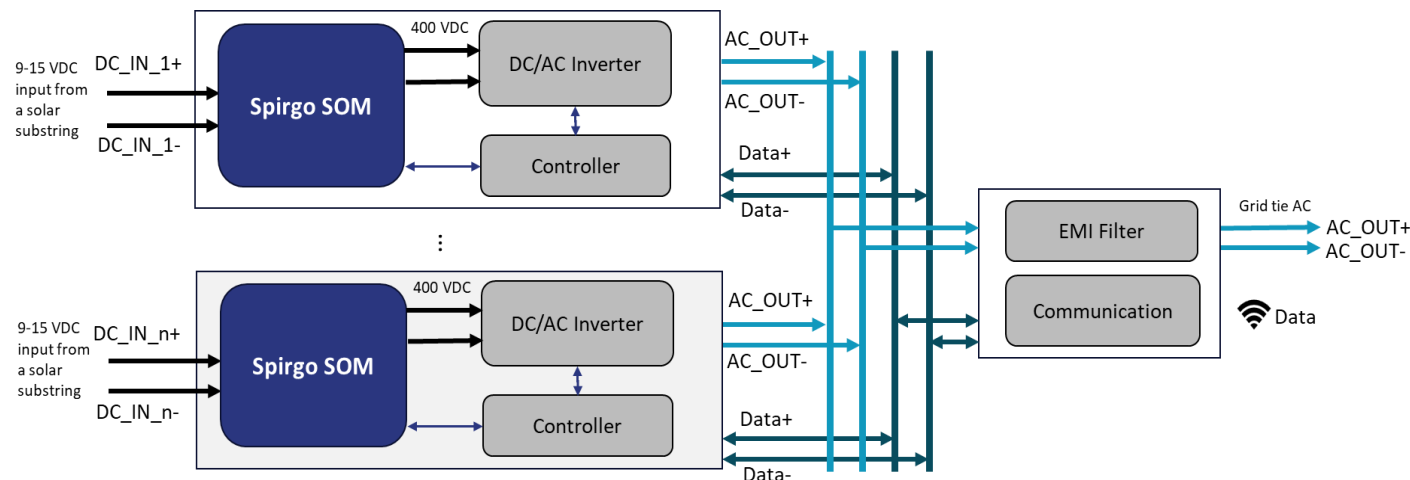
- Results of analyzing 108 residential rooftop data across US shows that Daanaa can increase the energy harvest potential of a rooftop by $15 \pm 4\%$.
- Most rooftops gain an additional 7-17% energy yield when equipped with Daanaa systems. The potential advantages of implementing Daanaa systems are notably higher, ranging from 20% to 27% in shaded areas. While rooftops with extreme shading can gain up to 42% additional energy harvest with Daanaa systems.



Integration Paths

- **Integration Ready Spec Form Factor:** Useful for testing the integration of Daanaa systems into PV modules and testing full scale PV modules in lab or outdoor conditions.
- **Auriga Development System:** Useful for evaluation of Daanaa's electronics with customer's own choice of PV substring or cell technology.

Parameter	Min	Typical	Max	Unit
DC Input per PV channel				
Single Input MPPT Voltage Range	9	10.5	15	V
Single Input Voltage Before Damage			16	V
Single Input Continuous DC Current			10.0	A
Single Input DC Power		90	125	W
Output				
Output DC Voltage	140		430	V
Operational				
Operating Temperature Range	-40		85	C





THANK YOU

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Elevator Pitch

Spirgo is a DC-DC converter System-on-Module (SOM) that converts 9–15 volts from solar substrings or batteries directly to up to 430 volts in a single stage. That means inverter makers can eliminate multiple conversion stages, cut system complexity, and boost efficiency to 97% peak. At 10 kW per liter and only 30 grams per module, Spirgo delivers unmatched power density. And because modules can be paralleled, you can scale power easily without redesigning your inverter architecture. In addition to increasing inverter efficiency, Spirgo offers PV substring optimization that increase the performance of PV modules on average 15% and up to 40% heavily shaded and non-uniform irradiance scenarios.

In short, Spirgo helps you build smaller, lighter, scalable, and more efficient inverters for high performance solar and energy storage systems.



Spirigo SOM

Spirigo System-on-Module (SOM) is a high-efficiency, configurable DC-DC converter purpose-built for solar applications.

It converts a low-voltage DC input (9–15 V) from a short solar substring into a high-voltage DC output (up to 430 V) with a peak conversion efficiency of 97%. Spirigo integrates maximum power point tracking (MPPT) and can lock onto the optimal operating point of the substring in less than one second, ensuring maximum energy extraction under varying conditions.

By combining single-stage conversion, ultra-fast MPPT and a scalable form factor, Spirigo enables inverter manufacturers to deliver smaller, lighter and more efficient products to market faster.



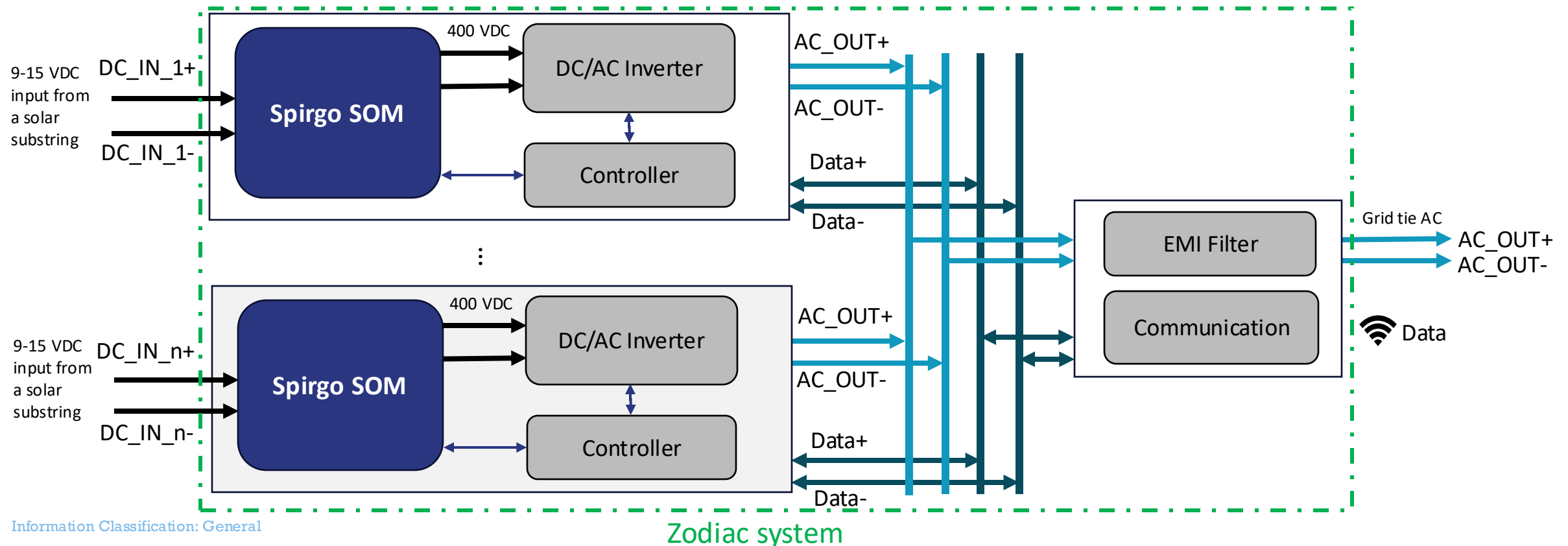
Parameter	Min	Typical	Max	Unit
DC Input per PV channel				
Single Input MPPT Voltage Range	9	10.5	15	V
Single Input Voltage Before Damage			16	V
Single Input Continuous DC Current			10.0	A
Single Input DC Power		90	125	W
Output				
Output DC Voltage	140		430	V
Operational				
Operating Temperature Range	-40		85	C

Spirgo Key Benefits

- **Eliminates multi-stage conversion:** Spirgo converts 9–15 V inputs to up to 430 V in a single stage, removing intermediate boost/isolator stages. Fewer components mean lower system losses, fewer potential failure points, and simpler thermal design.
- **Shrinks size and weight:** At 10 kW/L power density and ~30 g module weight, Spirgo lets OEMs dramatically reduce inverter enclosure volume and thermal burden.
- **Scales without redesign:** Modules can be paralleled to reach higher power levels, enabling flexible system sizing and simplified production variants.
- **Accelerates development:** SOM form factor, integrated monitoring, and protection features reduce NRE, shorten validation cycles, and lower integration risk.
- **Improves energy yield:** Up to 97% peak conversion efficiency increases delivered power and improves system ROI.

Spirgo-enabled Power Electronics Reference Design

Spirgo SOM is a core component in PV modules with integrated electronics. Daanaa supplies Spirgo modules to customers for integration into their finished products and provides reference designs for using the Spirgo SOM in a typical solar application such as the Zodiac system.



Auriga Development System

The Auriga Development Kit is intended for validation in a lab environment. It allows evaluation of Daanaa electronics with customer's PV substring without module integration.

Features

- High ratio voltage conversion ($>110\times$) from low voltage DC to high voltage AC or high voltage DC signal.
- Ultra-fast maximum power point tracking (MPPT) convergence.
- Real-time data communication and programmability through CAN bus.

Use Case:

- Evaluate core functionality without any module integration



Parameter	Min	Typical	Max	Unit
DC Input				
Input DC Voltage Range	3.1	4	5	V
Input Continuous DC Current	1		6	A
AC Output				
Output AC Voltage	100		240	V
Peak Output Power			25	W
Output Frequency		60		Hz
DC Output				
Output DC Voltage	170		430	V
Peak output power			25	W
Mechanical Data				
Dimensions	175 mm x 280 mm x 72 mm			
Enclosure Material	ABS Plastic			

Evaluation Options

To support flexible validation of Spirgo module performance and integration, Daanaa offers three options tailored to different stages of evaluation. These methods allow customers to observe the technology's functionality, performance benefits, and integration potential.

- **Auriga Development System:** Useful for evaluation of Daanaa's electronics with customer's own choice of PV substring.
- **Zodiac Rev A System:** Useful for testing the integration of Daanaa systems into PV modules and testing full scale PV modules in lab or outdoor conditions.

Each option enables hands-on validation depending on customer preferences and capabilities.

Zodiac Rev A Configurations

Zodiac Rev A consists of Virgo and Pandora modules. Virgo is a DC optimizer and solar inverter purpose-built for integration with PV modules. Each Virgo module receives DC inputs from one solar substring and delivers a grid-tie AC output. Pandora is a module that aggregates the AC power from all the Virgo modules and provides a single AC output to the grid.

FEATURES

- Designed for grid-tied systems and compliant to UL 1741-SA
- Integrated DC optimization, inversion, and monitoring functions
- Fully compliant with rapid shutdown certification requirements

Use Case:

- Integrate into PV modules for installation in real-world conditions.

Parameter	Min	Typical	Max	Unit
DC Input				
Single Input MPPT Voltage	9.0	10.0	15.0	V
Single Input DC Operating Voltage	3.0			V
AC Output				
Output AC Voltage	211	240	264	V
Output Power		100	140	W
Output Frequency	57	60	64	Hz
Mechanical Data				
Dimensions	367 mm x 81 mm x 18 mm			
Enclosure Material	Polycarbonates (PC)			
Operating Temperature	-40		85	C