



Sunny Central FLEX

The innovative large-scale
power conversion solution
from SMA

SUNNY CENTRAL
FLEX



This is NEXT LEVEL ENERGY

Sunny Central FLEX¹ is a modular large-scale power conversion solution that makes it possible to design, build and adapt for new and existing power plant use cases.

This flexible, single-supplier solution – enhanced with SMA's leading-edge Grid Forming technology and project-specific support seamlessly integrates into both current and future power grids. Sunny Central FLEX easily meets the demands of your most challenging energy projects.

From PV based power generation, energy storage and grid stabilization to hydrogen production, the possibilities are endless with these significant features:

- ✓ Fully integrated AC/DC and DC/DC converter, and energy storage retrofit options
- ✓ Medium-voltage transformer and medium-voltage switchgear
- ✓ Comprehensive plant and data management system
- ✓ Grid Forming capabilities
- ✓ Full life cycle project assistance



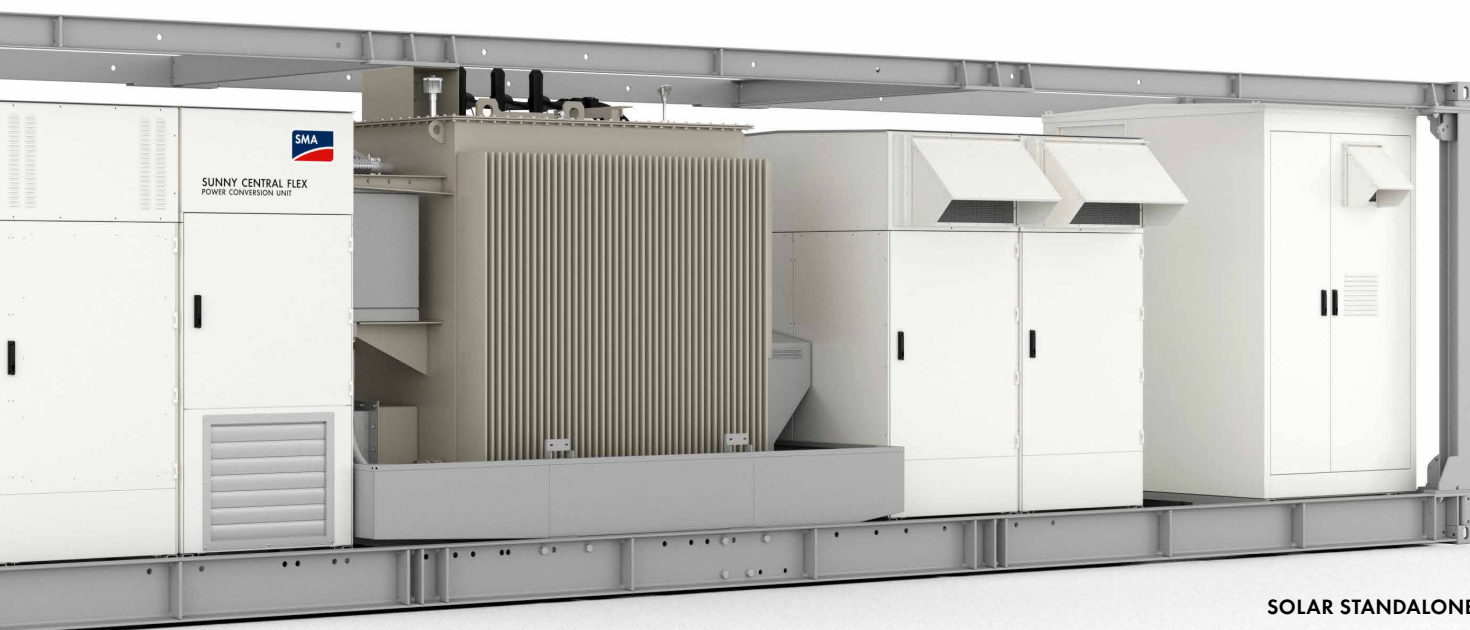
Easily meeting the demands of your most challenging energy projects

With its industry-standard 40-foot-high cube platform, including CSC certified transportation frame, Sunny Central FLEX is easy to transport and quick to commission. In addition, its decentralized cooling as well as rigorous quality control testing, including accelerated lifetime tests, enable it to withstand the harshest of environments.

For the Solar Standalone use case, Sunny Central FLEX allows flexible system design with its output of 6400 kVA, an MPPT voltage range from 880 V DC to 1325 V DC, and up to 48 inputs. The highest available power class of this solution for the Solar Standalone use case is 7040 kVA, making it perfectly suited for the increasing sizes of power plants.



Winner of the 2024 smarter E Award – Photovoltaics category, recognized for its visionary and groundbreaking features that are shaping the future of renewable energy.



SOLAR STANDALONE

DC-COUPLED STORAGE



Superior performance and reliability

Backed by rigorous testing and equipped with IEC 62443 compatible system components, Sunny Central FLEX complies with the leading industrial cybersecurity standards for protected and stable power plant operations.

The user-friendly Sunny Central FLEX System Manager provides easy integration into your communications infrastructure. The whole system can be adapted to new requirements at any time through optional functional upgrades. In addition, the Sunny Central FLEX System Manager provides inherent and optional networking protection measures, including encrypted communication between system components, comprehensive user management, and access control as well as optional network health monitoring.

Additionally, the Power Plant Manager enhances functionality at the power plant level. Its optional, proven plant controller ensures grid-compliant energy generation and efficient energy management, enabling seamless grid connection and reliable operation even under challenging grid conditions. Real-time plant monitoring provides clear performance insights and proactive notifications, enabling faster response times and higher system availability.

A reliable solution that seamlessly bridges the gap between operations and information technology, providing long-term stability for power plant operations.



High profitability and quality

The quality of our equipment enhances the sustainability and longevity of Sunny Central FLEX.

Best of all, its modular and flexible design for new and existing use cases provides you with a secure investment for long and stable power plant operations.

Everything is designed and produced in our purpose-built 'Gigawatt' factory in Germany, a leading-edge, sustainable factory solely dedicated to manufacturing all components, providing you with swift serviceability and fast spare-part replacements.

Benefit from superior performance, with up to 99% CEC efficiency (including auxiliary loads), and with the utilization of SMA's next-generation stack technology. Enjoy peace of mind with robust availability and high uptimes. This single-source solution evolves with your energy needs, promising a safer and faster return for your clean energy investment.



Faster time to market

Getting you to the market easier and faster,
without compromising on quality.

Sunny Central FLEX is more than just the next evolution of SMA's proven success story of central inverters and power conversion systems. It's a holistic SMA Large Scale Energy Solution, with engineering services guiding you along the entire project journey. From planning, commissioning and certification to operation.

Our expertise covers the most complex setups and demanding grid requirements including:

- ✓ Plant-level grid code compliance
- ✓ Source code-based simulation models for all system components
- ✓ Grid study simulations
- ✓ Conceptual plant design support
- ✓ Sophisticated system commissioning and site acceptance tests – enabling smooth grid integration of your plant



Use case applications

Solar Standalone

Performance

- Achieves up to 99.2% maximum efficiency, converting more solar energy into usable electricity.
- Enhanced performance during partial loads due to silicon carbide (SiC) MOSFETs, maximizing energy production in all conditions.
- Reduced system costs and boosted optimal power input thanks to a high DC/AC ratio (over 200%).

Flexibility

- Adapt to future technological advancements cost-effectively with DC coupling options available through a DC/DC converter retrofit.
- Seamless future upgrades with no additional foundation or external cabling for battery connection.

System Intelligence

- Experience faster system response times and better monitoring and diagnostics with more sensors and an integrated design.
- Benefit from predictive analytics using sensor data and advanced algorithms to enhance operational reliability, reducing downtime and maintenance costs.

DC-Coupled Storage

Performance

- Maximize output from solar panels and storage with 99.5% efficiency from high performance DC/DC converter.
- Enhance system robustness and flexibility with high short-circuit current capabilities, supporting larger battery capacities and new battery types.
- Increase resilience and create new business opportunities with SMA Grid Forming technology and Frequency Containment Reserve (FCR) capabilities, including blackstart after blackout, inertia, and grid frequency stabilization.

Flexibility

- Easily integrate storage systems with a unique DC/DC converter retrofit option.
- Streamline operation and simplify design with fully integrated DC/DC converter modules in the power conversion system.
- Improve calibration and battery fault handling with independently controllable power stacks in each DC/DC module.

System Intelligence

- Experience faster system response times and better monitoring and diagnostics.
- Access high-resolution live data, for comprehensive system oversight and management.
- Utilize predictive analytics to enhance reliability, reducing downtime and maintenance costs.



Sunny Central FLEX – a simple, FLEXible solution for all your power needs.

AC-Coupled and Standalone Storage

Grid Reliability and Stability

- Increase resilience and enable new business opportunities with SMA Grid Forming technology and Frequency Containment Reserve (FCR) capabilities, including blackstart after a blackout, inertia, and grid frequency stabilization
- Ensure stable grid frequency and rapid voltage restoration with the Sunny Central FLEX Power Plant Manager, enhancing overall system reliability.

Performance

Benefit from cutting-edge Silicon Carbide (SiC) semiconductor technology:

- Improve temperature performance, with derating occurring at a higher temperature threshold.
- Enable high power and short-circuit current capabilities (> 200 kA per galvanic isolated system) that support the connection of new battery types and ensures robust system operation.

System Intelligence

- Enhance AC storage capabilities with predictive analytics for a future-proof and intelligent system operation.
- Access high-resolution live data, allowing for comprehensive and improved system oversight and management.

Power2Gas

Performance

- Convert more hydrogen into usable electricity with up to 99.2% efficiency.
- Boost hydrogen production capacity with robust support for electrolyzers through increased power from the medium voltage supply.

Flexibility

- Accommodate multiple types of electrolyzers with the DC/DC converter's flexible voltage range.

System Intelligence

- Experience user-friendly operation and monitoring with the improved electrolyzer interface.



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