



# Sunny Central FLEX

SMA's new and innovative large-scale power conversion solution. Built today to meet the clean energy needs of the future.





# This is NEXT LEVEL ENERGY

Sunny Central FLEX is a modular large-scale power conversion solution that makes it possible to design, build and adapt all 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.

Built today to meet the clean energy needs of tomorrow.

From PV-based power generation, energy storage and grid stabilization to hydrogen production, the possibilities are endless and include 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

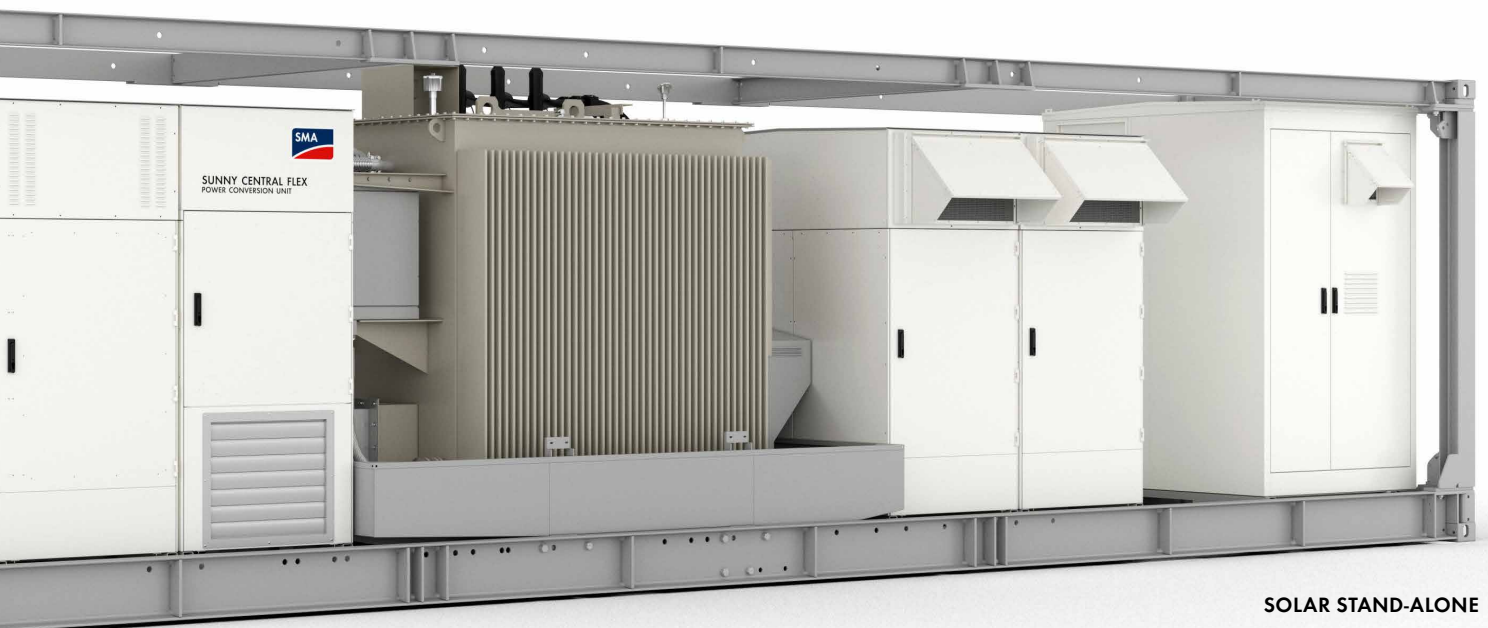


PV stand-alone available now, other applications will follow the release schedule. All values are of a preliminary nature and require verification.

# 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 Sunny Central FLEX quality control testing, including accelerated lifetime tests, enable it to withstand the harshest of environments.

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



SOLAR STAND-ALONE



# High 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 system manager provides easy integration into your communications and control infrastructure. The whole system can be adapted to new requirements at any time through optional functional upgrades. In addition, the Sunny Central FLEX system 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.

Real-time plant monitoring ensures transparent performance insights and proactive notifications, facilitating quicker response times and resulting in higher system availability. This will improve availability and Internet speed.

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





# Maximum profitability and quality

The quality of our equipment ensures 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

## PV Stand-Alone

### Higher yield with secure, future-proof investment

- 99.2% maximum efficiency.
- Superior efficiency, which enables more yield in partial load operation due to silicon carbide (SiC) MOSFETs.
- Higher DC/AC ratio (over 200%), reducing overall system costs and enabling optimal power output of installed PV infrastructure.
- Predictive analytics for more reliable operation.

### Optimal Performance Features

- DC coupling-ready with simple and fast retrofitting of integrated DC/DC converter for battery connection at later stage with no additional foundation or external cabling needed.
- Improved personal safety, including IEC 62271-202 &-212 MVSG arc flash testing of upwards arc flash venting.

## AC-Coupled and Stand-Alone Storage

### The most flexible solution available

- Modular design for long-duration battery use.
- Holistic monitoring system and access to all battery data using hybrid monitoring.
- High round-trip efficiency, leading to better utilization of battery capacity.
- Cutting-edge silicon carbide (SiC) semiconductor technology for:
  - Improved temperature performance, derating 10°C later.
  - High power capability in charging direction.
  - High short-circuit current capabilities (> 200 kA per galvanic isolated system), enabling high battery capacities and connection of new battery types.

### Optimal Performance Features

- Advanced SMA Grid Forming technology and Frequency Containment Reserve (FCR) capabilities.
- New grid services, including black start after blackout and inertia grid frequency stabilization.
- Predictive analytics capabilities based on more sensors and algorithms.



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

## DC-Coupled

**With more flexibility, operational transparency and optimized battery usage**

- 99.5% maximum efficiency.
- High short-circuit current capabilities, enabling higher battery capacities and connection of new battery types.
- Storage retrofitting option.
- More sensors and integrated design enable faster system reaction time and better monitoring and system diagnostics.
- Holistic monitoring system and access to all battery data using hybrid monitoring.
- Independently controllable power stacks within each DC/DC module enable independent management of batteries (calibration, battery faults).
- DC/DC converter modules fully integrated within the power conversion system.

### Optimal Performance Features

- Advanced SMA Grid Forming technology and Frequency Containment Reserve (FCR) capabilities.
- New grid services, including black start after blackout and inertia grid frequency stabilization, open up new business opportunities.
- Predictive analytics capabilities based on more sensors and algorithms.

## Power2Gas

- 99.2% maximum efficiency.
- More power (from MV) to serve electrolyzer.
- The DC/DC converter makes the voltage range extremely flexible, which enables operation of almost any type of electrolyzer.
- Easier grid integration and grid connection.
- Significant noise reduction.
- Improved electrolyzer interface enables better operation and monitoring.



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