



Robust and Reliable

- Top-quality, robust industrial components ensure the highest reliability
- Complete system is comprehensively tested in the unique SMA hybrid test center

- Second generation of the globally successful SMA Fuel Save Controller
- High degree of protection with IP 65

Scalable

- Modular system design for customized configuration and system expansion
- Up to 75% PV penetration (based on diesel generator nominal power)

Flexible

- The right product version and system configuration for every system size
- Energy storage systems can be integrated at any time

SMA FUEL SAVE CONTROLLER

Use photovoltaics and save fuel

The SMA Fuel Save Controller (FSC) is a key component of the SMA solution for photovoltaic/diesel hybrid systems. It allows the use of cost-efficient solar energy to generate power in order to lower fuel consumption from diesel generators.

As the interface connecting the diesel generator, the PV system and the load, it manages need-based PV feed-in according to load and generation profiles of the system as a whole. The FSC performs comprehensive grid management functions, ensures maximum operational safety, and minimizes operating expenditure and CO₂ emissions.

The second generation of the FSC is available for system sizes of 100 kW to 50 MW. Hybrid systems with SMA technologies offer modular expansion at any time and optimum system control through remote monitoring.

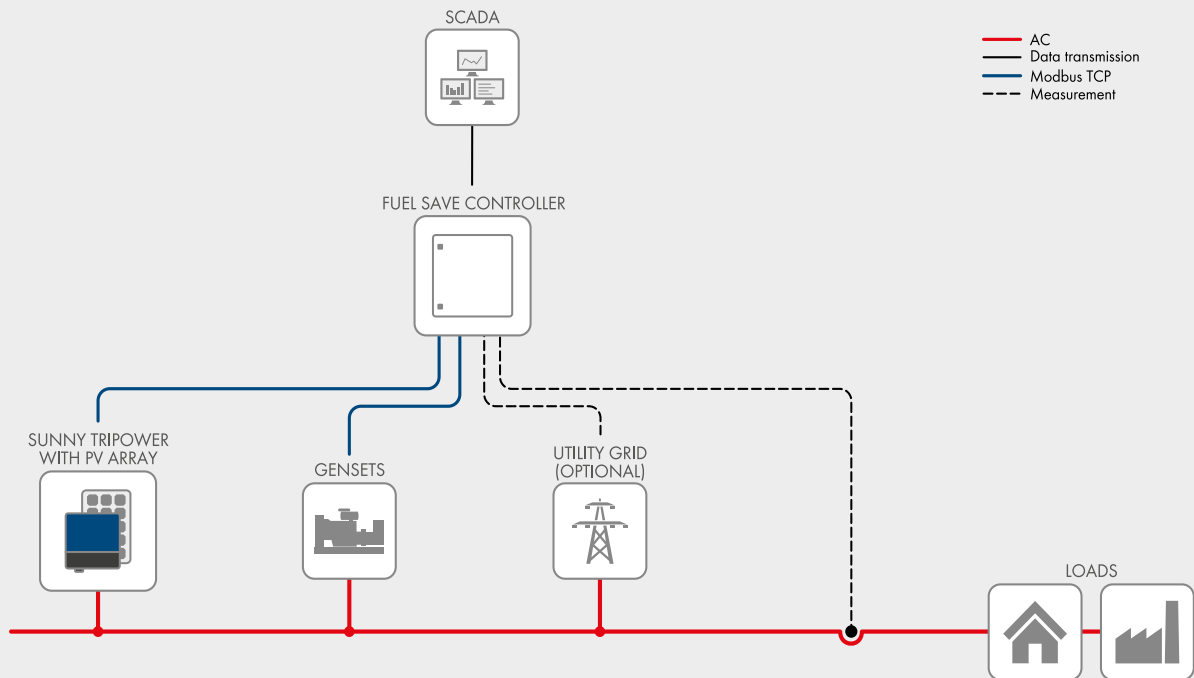
SMA FUEL SAVE CONTROLLER M / L / CUSTOMIZED

Technical Data	Fuel Save Controller M	Fuel Save Controller L and Customized		
	One Box Solution	Fuel Save Controller L	Fuel Save Controller Customized	Fuel Save Controller Data Acquisition Module
General System Design Characteristics				
System size (PV system size)	100 kW to 1000 kW	up to 5000 kW	up to 50 MW	
Maximum PV power ratio	60%	75% of the maximum generator capacity (parallel operation)		
Maximum number of generators	6 / 8	8 / 16	upon request	
Via measurement / via communication				
General Data				
Dimensions (W x H x D) in mm (approx.)	760 x 760 x 210	760 x 760 x 210	upon request	760 x 760 x 210
Weight (approx.)	48 kg	48 kg	upon request	48 kg
Degree of protection in accordance with DIN EN 60529	IP 65	IP 65	IP 65	IP 65
Ambient Conditions				
Operating temperature range	-10 °C to +50 °C			
Maximum operating altitude	2,000 m above mean sea level ¹			
Humidity	5% to 95% (non-condensing)			
Power Supply				
Voltage Supply (nominal value)	110 to 240 VAC (50 to 60 Hz)			
Power consumption (max. / average)	200 W / 120 W			
Communication				
System communication for system monitoring, SCADA and remote monitoring	Modbus / TCP, http, FTP over Ethernet 10 BASE-T and 100 BASE-T(X)			
Communication between modules / maximum cable length		Ethernet 100BASE-FX and TX 2,000 m ¹		
Communication to inverters / maximum cable length	Sunny Central: Ethernet 100 BASE-FX und 100 BASE-TX (optional) / Sunny Tripower: 100 m, Sunny Central: 2,000 m			
Communication protocol to genset controllers	Modbus / TCP Master via Ethernet 100BASE-FX and TX or CAN / CANOpen ²			
Other Interfaces				
Multi-functional digital inputs (for potential-free contacts, maximum voltage drop at 10 mA: 5 V)	10	10	upon request	8
Multi-functional digital outputs (potential-free contacts)	2	2	upon request	2
Power measurement	2 to 6	On-board measurements or remotely via DAQ2.0		2 to 8
Current measurement	2 to 6 1A sensor input	On-board measurements or remotely via DAQ2.0		2 to 8 1A ³ sensor input
Voltage measurement	1 to 3 480V sensor input	On-board measurements or remotely via DAQ2.0		1 to 4 480V sensor input
Visualization & Data Logging				
Visualization and configuration interface	Web interface for local and remote monitoring			
Data & event logging	5 second values for 2 days, 5 minute average values for 30 days			
Compatible Inverters				
Inverters	Sunny Tripower STP TL-30 Family STP US-10 Family STP 60 ⁴	Sunny Central CP-XT SC 500-1000CPXT, SCS 500-900 Sunny Tripower STP TL-30 Family, STP US-10 Family, STP 60		
¹ Individual altitude, cable length upon request				
² Protocol implementation upon request				
³ 5A sensor available upon request				
⁴ Upon request				
Type designation	FSC-20-M	FSC-20-L		FSC-DAQ-20

FUNCTIONS

- Management of reserve capacity
- Reactive power control via PV inverter
- Backfeed protection for diesel generators
- Fully automated system operation
- Remote monitoring and control via SCADA
- Compatible interfaces to all relevant diesel controls
- Intelligent grid feed-in management

FSC M CIRCUITRY PRINCIPLE



Easy Usability and Compact Design

- Faster planning process due to predesigned standard system setups
- Quick wall installation thanks to compact one box design and simple configuration
- Suitable for nearly all system configurations

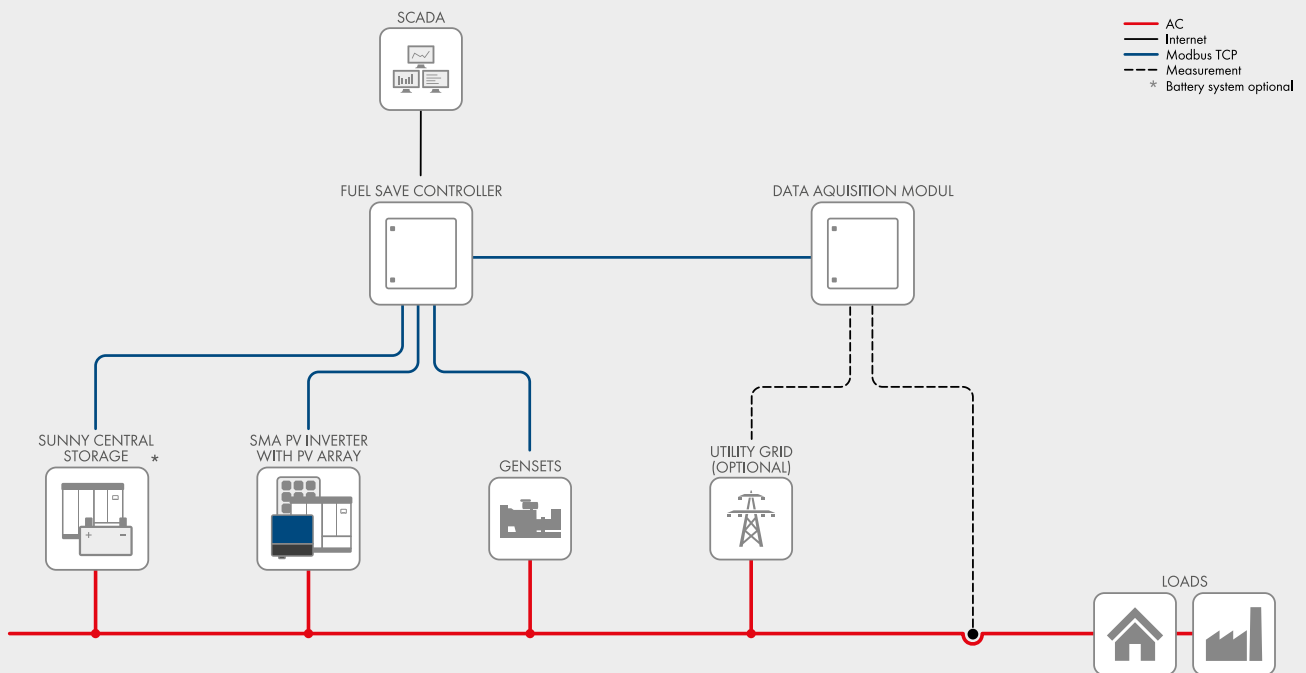
Cost Effective

- Simple and fast installation due to clear layout
- Easy commissioning with standard PC
- Remote monitoring and adjustment of settings possible via SCADA

FUNCTIONS

- Management of reserve capacity
- Reactive power control via PV inverter
- Backfeed protection for diesel generators
- Fully automated system operation
- Compatible interfaces to all relevant diesel controls
- Installation of large distributed systems possible
- Provision of peak load via battery
- Diesel reserve capacity reduced due to battery storage systems
- Integration of larger solar generator possible due to battery storage systems
- Remote monitoring and control via SCADA
- Intelligent grid feed-in management

FSC L CIRCUITRY PRINCIPLE



Tailor-Made

- The modular concept allows system setups where long distances between the PV system and the gensets must be covered.
- The PV system can be expanded at any time.
- An optional battery-storage system including the Sunny Central Storage battery inverter can be integrated as well.
- Both central and string inverters can be used.

High Yields

- High PV penetration of up to 75% lowers total energy costs.
- An optional storage integration with the Sunny Central Storage battery inverter increases the PV penetration level and reduces the number of must run gensets.
- SMA's Technical Consultants support the customer by designing the system for maximum fuel savings.

Customer-Specific

- The modular design of the FSC allows for individual adjustments according to project requirements. Please contact your SMA contact person for more information.