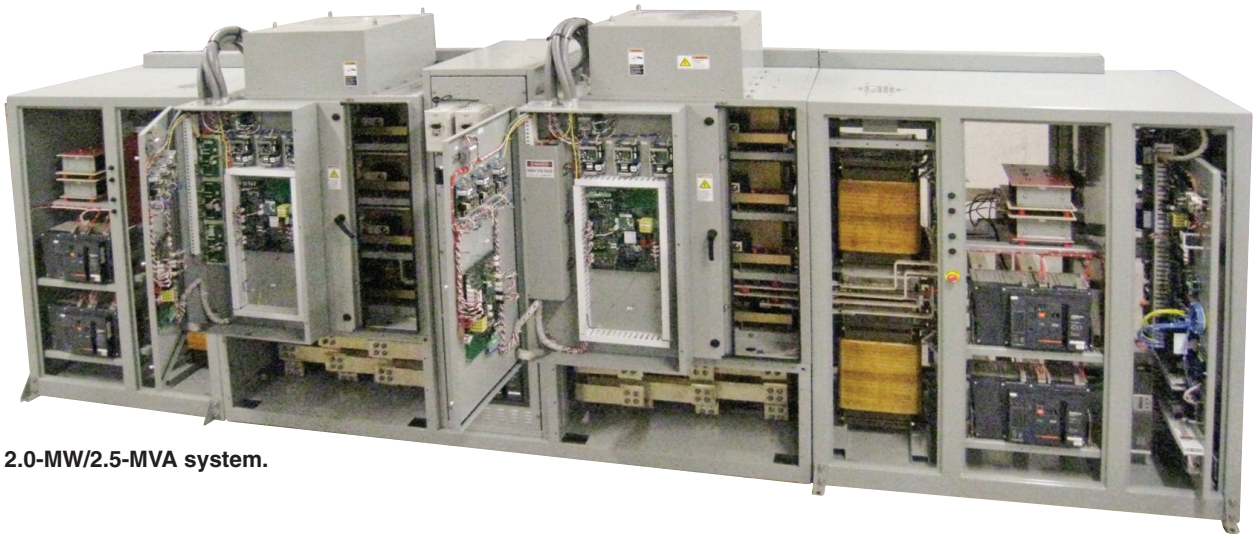
S&C Smart Grid SMS™ Storage Management System



2.0-MW/2.5-MVA system.

Product Features

- Megawatt-hours of energy storage for Smart Grid applications.
- Very high efficiency.
- Fully digital control system.
- Better utilization of renewable energy.
- With S&C's IntelliTEAM SG™ Automatic Restoration System, provides dynamic islanding capability.
- Automatic or remote SCADA control.
- Turnkey installation and project management for smooth integration into utility system.

The Smart Grid SMS™ Storage Management System provides an interface between a stored power source and the utility grid. It consists of a master control system and a 2-MW/2.5-MVA power conversion system (PCS). The PCS is comprised of two inverters, each rated 1 MW/1.25 MVA.

When coupled with stored energy, the SMS can charge the storage device from a utility source, or discharge the storage device to the utility source. When connected to a feeder, the SMS can supply VARs in response to an external command, or hold feeder voltage at a preset level. The SMS can also operate independently, supplying power to a load that is not connected to the utility.

Individual SMS units can be operated in parallel up to 10.0 MW/12.5 MVA, with the outputs of the units connected to a common bus at medium voltage.

Two or four SMSs are housed in a single ISO container for outdoor installation. Each 2-MW block contains two dc circuit breakers, two ac circuit breakers, two PCSs and controls. The output of the PCS is a 480-V delta connection that can be connected to a delta or wye transformer. If it is necessary to supply single-phase loads when the utility source is not present, a delta connection must be used.

Applications

UPS for Data Centers. The SMS is the largest-capacity static inverter pack available in the UPS industry. Its high capacity, coupled with its ability to function at medium voltage, gives data center designers greater flexibility than ever before possible. The SMS's robust design is capable of powering complete data center loads, including air-conditioning chiller systems. Single bus systems up to 24,000 kW are possible with the SMS.

SMS for Renewable Energy. Solar and wind energy are intermittent power sources that the grid must accept whenever available. During absences of sun or wind—when these sources are not generating—replacement power must be provided. The SMS can store the power when it's produced, and then use that energy for generation ramp-rate control, output-smoothing, or time-shifting.

Grid-Scale Energy Storage. The SMS can deliver up to 2 MW of stored energy to the grid from any type of battery storage system.

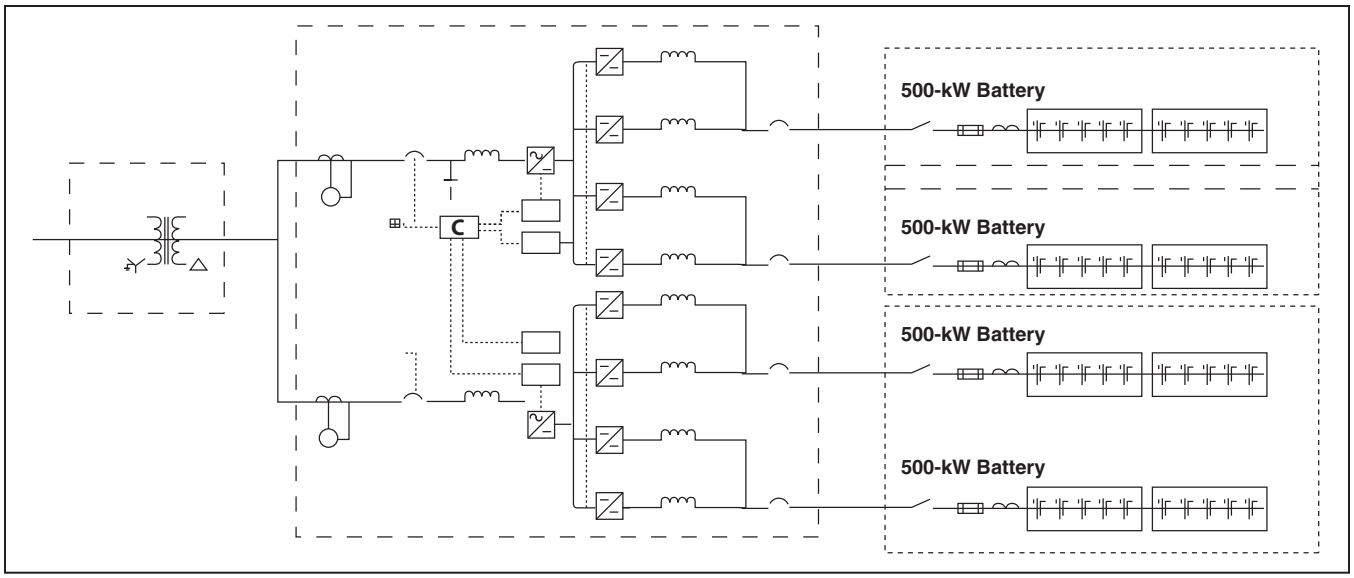
Islanding. When applied with S&C's IntelliTeam SG™ Automatic Restoration System, the SMS can be used in remote areas, as an energy source during power outages. Upon loss of utility power, IntelliTEAM SG re-configures the distribution system and uses the stored energy to serve local customers—now isolated from the utility—for as long as 7 hours.

Peak Shaving. During high demand periods, the SMS can provide full output for up to 7 hours. This reduces the system peak, deferring the need for capacity additions on the distribution or transmission system.

SYSTEM SPECIFICATIONS

Current Source AC Ratings	
Power Nominal, Per Inverter	−1 MW (charge) to +1 MW (discharge)
VA Nominal, Per Inverter	1.25 MVA
Voltage	480 Vac ± 10%
Current Nominal	1504 A
Frequency Range	58.5 to 61 Hz or 48.5 to 51 Hz
Current Harmonics	Less than 5% of nominal current if voltage distortion is less than 5%
Voltage Source AC Ratings	
Power Maximum	2.0 MW
VA Maximum	2.5 MVA
Voltage	480 Vac ± 3%
Current Maximum	3008 A
Frequency	60 Hz ± 0.1 Hz
Voltage Harmonics	Less than 3% if load current harmonic distortion is below 5%
DC Input Ratings (each of the two inputs)	
Voltage	460 Vdc to 800 Vdc
Current in Current Source Mode	−1145 A dc (charge) to 1150 A dc (discharge)
Current in Voltage Source Mode	0 to 1374 A dc (discharge—up to 100 seconds above 1 MW)
Ripple Current	Typical
Ripple Voltage	Less than 4 volts RMS
Environmental Ratings	
Temperature	−40°C to +40°C without derating
Humidity	0 to 100% condensing, including rain
Maximum Altitude	1000 Meters without derating
Seismic Rating	Zone 4
Control Power Backup	UPS, minimum 5-minute backup of all controls needed for data and control of PCS
Time	
Time Source	Integrated GPS. An offset from UTC can be applied to move to local time

2.0-MW/2.5-MVA system.

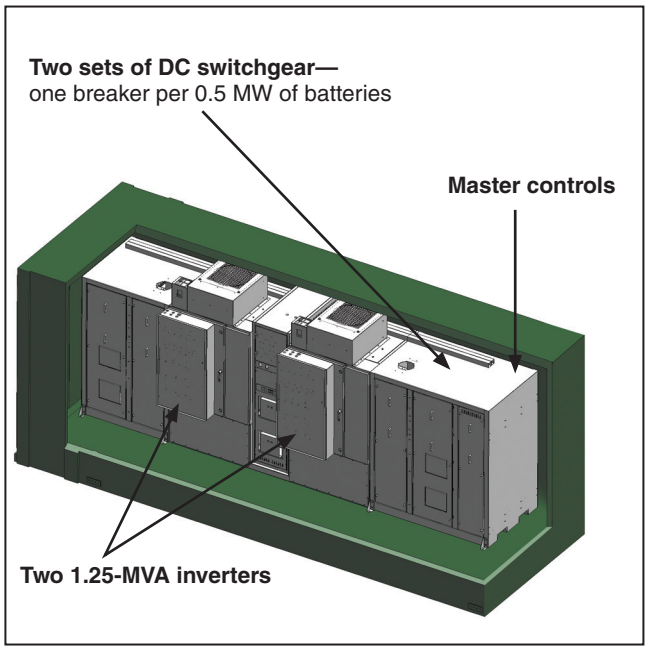


Single-Line diagram of 2.0-MW/2.5-MVA system with step-up transformer for medium-voltage applications.

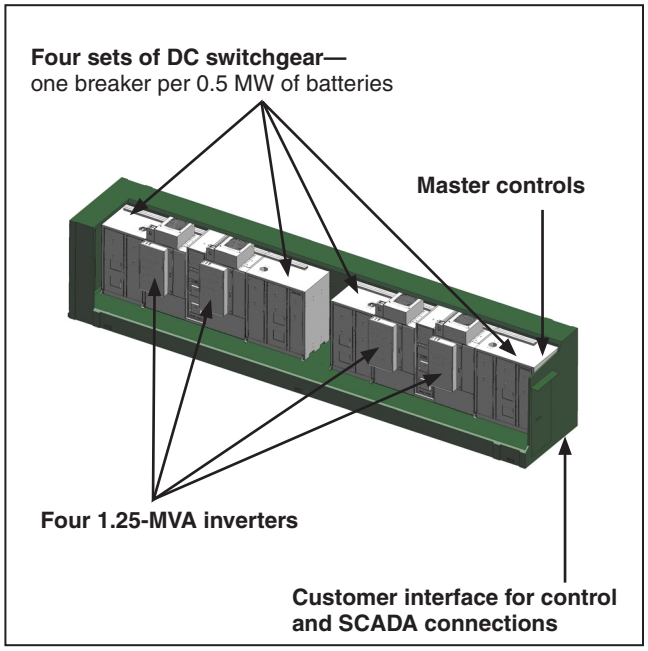
Dimensions of 2.0-MW/2.5-MVA system.

Outdoor Applications

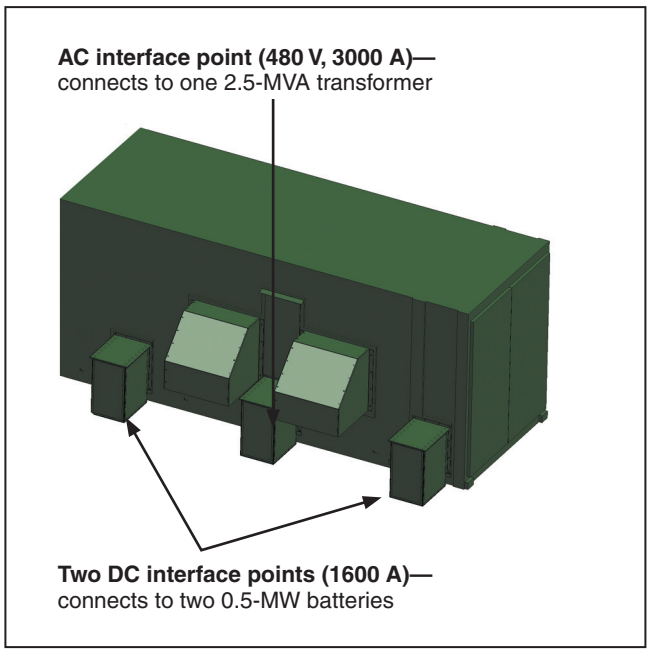
The unique design of the SMS allows outdoor applications in system configurations of 2.0 MW/2.5 MVA per ISO container or 4.0 MW/5.0 MVA, as shown below.



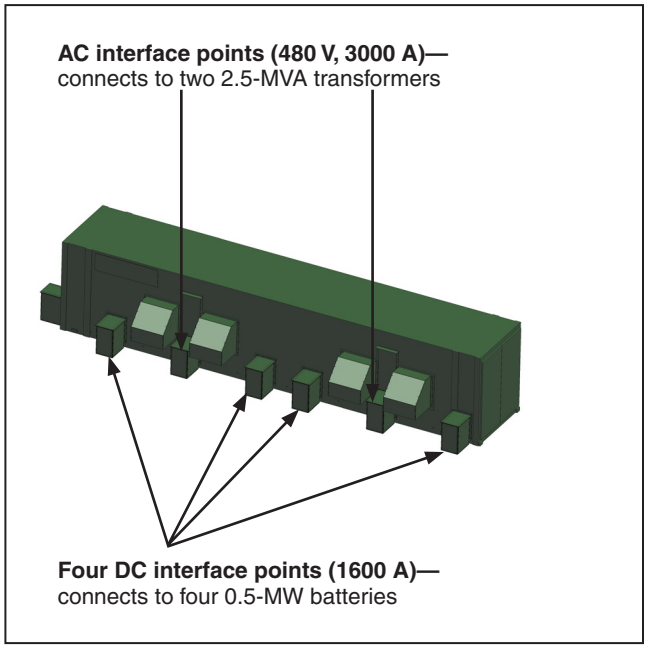
Front cutaway of SMS 27-foot enclosure with two inverters and two dc bays.



Front cutaway of PCS enclosure with four inverters and dc bays.



Rear view of SMS 27-foot enclosure with two inverters and two dc bays.



Rear view of PCS enclosure with four inverters and dc bays.

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