

Micro-SA

Compact, easy-to-install smart power solution for hybrid telecom sites

The Micro-Stand Alone (SA) edition is a compact Hybrid Smart Power solution for telecom. The SA is an outdoor-rated solution which can be easily installed at new or existing sites to ensure reliable power delivery. The stand-alone unit provides all of the benefits of the Micro solution in a more compact system. Micro-SA is a great fit for existing telecom sites which need greater reliability and the ability to dynamically manage power sources and loads.



Easy Installation & Maintenance

The Micro SA is delivered in compact, pre-wired enclosures. The SA can be easily installed at existing sites, and its converter units are extremely easy to maintain. With installations remotely supported by Clear Blue's expert service team, get it right the first time, every time.

Robust Rectification

Micro SA's robust rectification allows sites to combine both AC and DC power inputs. These inputs are automatically managed to prioritize providing solar power when irradiation conditions permit.

IP65 Rated

The SA's compartments are enclosed in outdoor protective units. The converter unit has undergone rigorous environmental testing to become IP65 rated. All electronics are protected from the elements, ensuring reliability and long life.



Micro-SA

Looking Inside The System

Micro-SA can combine AC power supply from genset and grid with DC power supply from solar arrays. The AC power supply is converted into -48 V DC through rectifiers in the modular unit (top). The DC power supply is also converted into -48 V DC through solar converters in the converter unit.

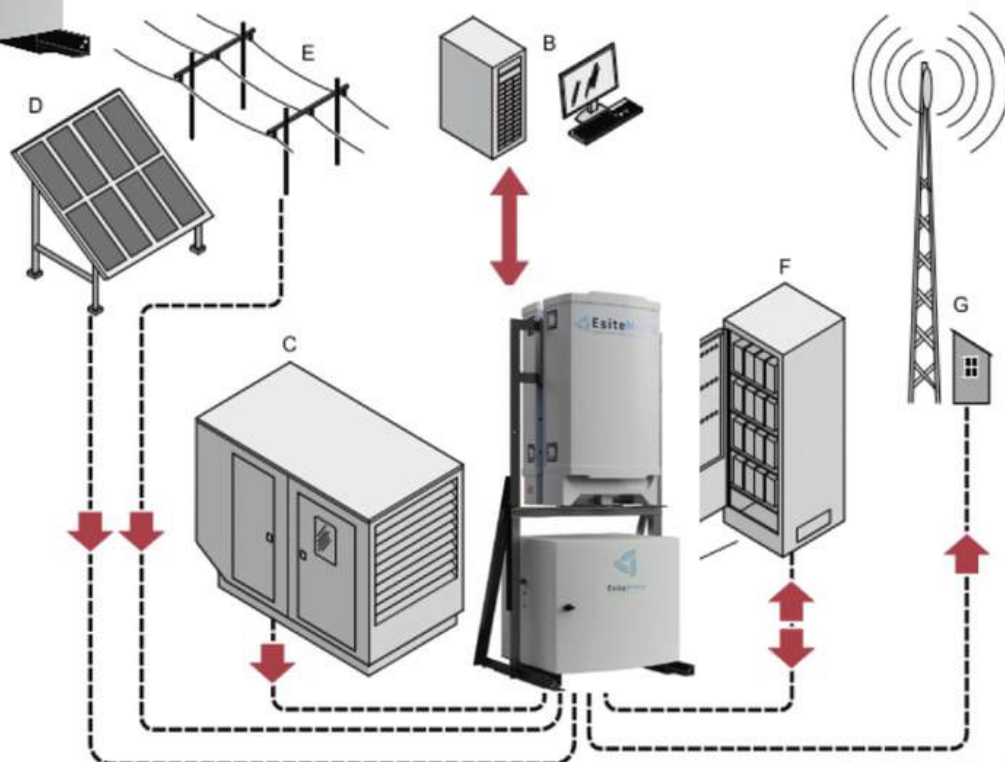


Converter Unit

- The converter unit combines solar charge controllers and rectifiers to maximize the efficiency of multiple power sources
- Designed based on specific site needs
- Pre-wired

Lower Cabinet

- Houses the PCU and RMC which deliver power reliability, intelligent switching, and management and control capability
- The lower cabinet is a compact storage solution, great for existing sites with ample storage
- Pre-wired



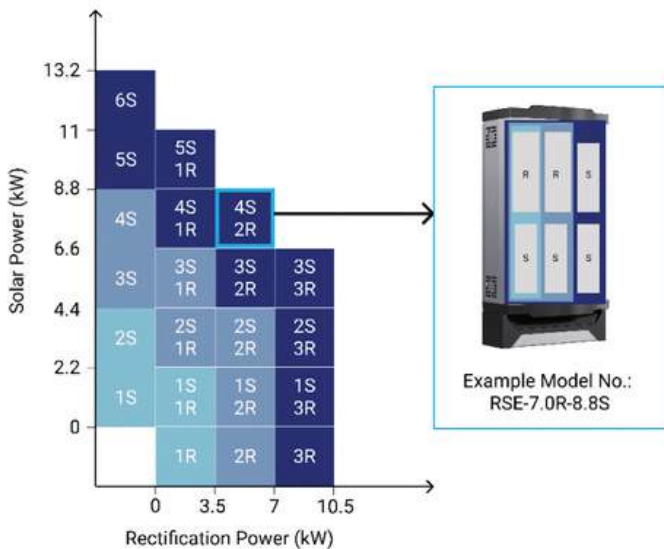
Micro Power Solution

System Sizing and Modularity

Micro's modularity makes it simple to build multi-tenant power solutions for large telecom sites. With Esite-Micro, depending on your power requirements and sources, combine rectifiers and solar controllers to manage multiple power inputs with maximum efficiency. Micro makes it easy to install a modular system designed specifically to support the site's power needs. Rectifier-only systems deliver up to **31.5 kW** of rectification power. Solar-only systems deliver up to **39.2 kW** of solar power, and hybrid systems deliver a combination of rectification and solar.

Step 1:
Determine how much solar and rectification power is needed.
Example, you need 8.8kW of solar and 7kW of rectification.

Step 2:
Find the combination of solar and rectification you need on the table.



A) Each solar charger can have 6-8 solar panels per charger, depending on the solar panel size.

B) Each converter has three channels. Each channel can either fit two rectifiers, one solar and one rectifier or one SE or one RE.



C) Not enough power in one converter? No problem, you can have up to three converters per system



Micro Power Solution

Components



Converter Unit

Available in multiple configurations, the converter unit converts grid, generator, and/or solar power into -48 VDC. Each converter unit has 6 slots which can hold up to 6 power units:

- Quantity 0-3 rectifier units which support grid and generator and include a built in automatic transfer switch.
- Quantity 0-6 solar charges with input of 165V and 22A, able to support x6 580W solar panels each, as an example.

The majority of all possible site configurations can be supported by combining the units and a complete system can be formed by up to three units of any type. The converter units are easily installed on the sides of the cabinet with the pre-installed frames and cable ducts.



Power Combiner Unit (PCU)

The Power Combiner Unit hosts all DC distribution, load disconnect contactors and MCB's. The main function is to act as an electrical connection interface for the batteries, the site load, and the Converter units. The standard version of the PCU supports up to 8 strings of Li-Ion batteries and has optional high and low priority load disconnect contactors.



Remote Monitoring Control (RMC)

The Remote Monitoring and Control unit (RMC) controls up to three converter units and operates all site-related power functions. It acts as a gateway for storage and configuration of all site data and makes sure that this data is available to the integrated Illumience remote management platform, either via local site connection or server-to-server connection.



Solar Panels

Clear Blue's Micro Power Solution can support solar, grid, and generator power sources for large telecom sites. As the system is highly modular, the type, size, and number of panels required for each system may vary. The Clear Blue team will ensure the systems' solar panel configuration is built to fit the needs of the system with future upgrade capabilities possible as power requirements grow.



Batteries

Micro is capable of supporting multiple battery types including Lead Acid and Lithium-Ion. The standard Esite-Micro system includes Clear Blue's 200 Ah x 48VDC batteries, sized for the amount of energy that can be generated in that geographic location, & the percentage of uptime required for the load.

Micro-SA

Illumience Intelligent Power Management

Remote Monitoring & Reporting

The Illumience platform has a variety of reporting options to ensure you have the information you need when you need it.



Monthly, daily and hourly real-time monitoring and reports



Global performance data analytics



Easy to use dashboard map with location tracking for all systems

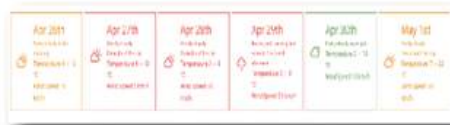


Advanced forward-looking system performance with weather & energy forecasting

Energy Forecasting

Advanced analysis of energy capabilities for better energy management and reduction of downtime.

- Historical and site system data (including aging, degradation, dust).
- Multi-day weather forecast.
- Yields energy forecast for uptime management with customized scheduled service windows.



Battery Life Cycle Management

Variety of battery management features to maximize battery life and performance.

- Patented dynamic charging algorithms.
- Scalable battery pack.
- Support of multiple battery types.
- Lifecycle forecaster.
- Remote battery maintenance & revitalizer.

Potential Energy Analysis

Greater uptime through advanced analysis of current and future energy requirements forward planning and growth.

- Measurements of the potential energy against the actual energy generated/consumed.
- System degradation analysis (dust, shading).



Smart Management & Control

More advanced power management and uptime.

- Fully integrated power distribution unit (PDU) for power and control restarts of individual loads remotely.
- Array of remote troubleshooting tools (solar panel test, cabling and connectivity integrity, remote short circuit reset, and user-defined and configured alarms) for maintenance cost reductions.
- Industry leading platform security and encryption to ensure your power is secure.