ampt®

Optimize PV Systems

Repower PV Systems

DC-Coupled Storage

Monitoring and O&M

DC-Coupled Storage

with Ampt String Optimizers

Ampt String Optimizers are DC/DC converters that lower the cost and improve the performance of PV+storage systems. Some of the largest PV plus DC-coupled storage systems in the world are using Ampt optimizers to save on electrical BOS components, battery converters, and inverters while generating and capturing more energy to increase project ROI.

- Lower total system capex
- More energy increases project ROI
- Increase flexibility for future upgrades

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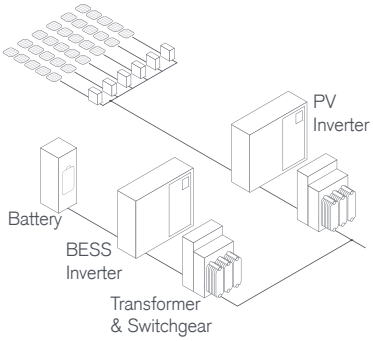
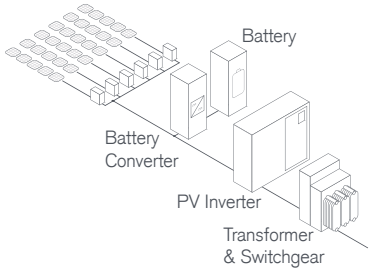
Cost Savings with Ampt

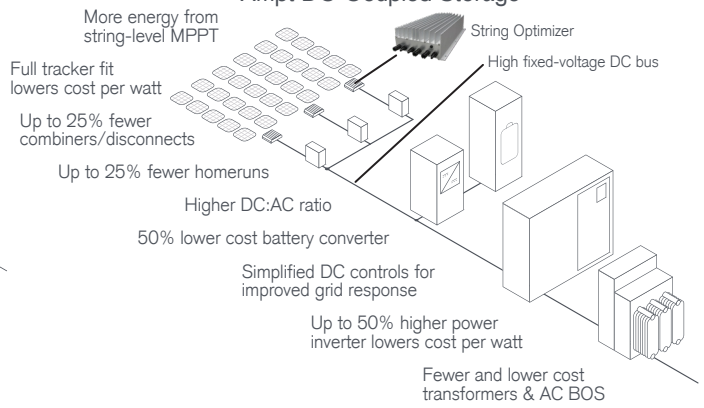
AC-Coupled Storage



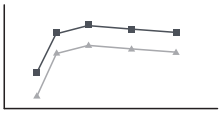
DC-Coupled Storage



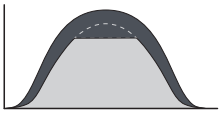
Ampt DC-Coupled Storage



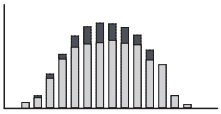
Performance Improvement with Ampt



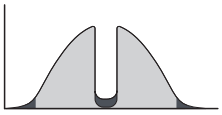
Storage Roundtrip Efficiency
Achieve higher roundtrip storage efficiency while increasing the operating efficiency of the inverter and battery converter.



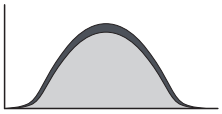
Clipped Energy Harvest
Charge the battery when the PV inverter is clipping output power. Ampt enhances this benefit with higher DC:AC ratios.



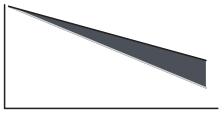
Curtailment Harvest
Capture array power that would normally be lost by charging the battery during periods of AC power curtailment.



Low Voltage Harvest
Charge the battery storage system even when the array voltage is below the inverter turn on voltage to maximize energy production.



Mismatch Recovery
Deliver more energy by recovering mismatch losses from various sources with string-level maximum power point tracking (MPPT).



Mitigate Degradation
Recover energy losses caused by variable degradation of PV cell and modules within a system to improve lifetime system performance.

Ampt's Patented Features Increase System ROI

Dual MPPT per optimizer - Ampt String Optimizers put maximum power point tracking on each of its two input strings of PV modules. This mitigates or eliminates mismatch losses to deliver more energy under changing environmental and system conditions over the lifetime of the power plant.

V-match® – Ampt String Optimizers include V-match technology to automatically match the DC bus voltage while delivering full available power from the PV array. This increases system design flexibility, simplifies controls, and unlocks value across diverse applications.

High Fixed-Voltage Bus (HFVB) – Ampt's HFVB technology enables the DC bus to operate at a constant voltage that is higher than variable voltage systems. The fixed voltage simplifies the connection and control of system components tied to the DC bus. The higher voltage delivers power at a lower current to reduce component and system costs.

Ampt Mode® – Inverters in Ampt Mode operate in a fixed or narrow input voltage range that is closer to the maximum system voltage. This allows the inverter to deliver a higher AC output voltage at the same current which raises the inverter's rated output power up to 50% to lower the inverter's cost per watt.

String Stretch® – Ampt's patented String Stretch technology puts voltage and current limits on the output of each optimizer which doubles the number of modules per string and allows for smaller conductor sizing per kilowatt delivered to save up to 25% on electrical BOS costs.

Direct-to-Converter – For DC-coupled energy storage systems with battery converters, Ampt String Optimizers include Direct-to-Converter technology to operate the DC bus at a fixed voltage that is always higher than the battery voltage. This eliminates 50% of the battery converter's power circuitry while increasing its power density to lower the converter's cost per watt.

Direct-to-Battery® – Ampt String Optimizers include Direct-to-Battery technology which allows them to connect directly to the battery and follow its state-of-charge voltage while delivering full power from the PV array. The optimizer, battery, and battery inverter share the same DC bus without using battery converters.

High DC/AC – This Ampt feature allows PV system designers to achieve optimal DC:AC ratios; expand the DC power on existing systems without replacing inverters, combiners, or cables; optimize inverter utilization; and increase storage durations – all at a lower capex.

Full Tracker Fit – Ampt optimizers overcome string-voltage sizing constraints to fit more modules on a tracker than systems without Ampt. Increasing the number of modules per tracker allows system designers to fully use the tracker's mechanical capacity and lower tracker cost per watt.

Wireless Communication – Ampt String Optimizers incorporate wireless communication to provide optional string-level data that is highly accurate, synchronous, and scalable to improve O&M, as well as enhanced controls for storage applications.

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