

SolarMagic™ Active Power Management Maximizes Energy Generation.



Only the sun should determine the performance of your system

Profitability of a photovoltaic (PV) system is defined not by its capacity in Watts peak (Wp), but by the amount of energy it generates over its lifetime, and the cost to build, operate and maintain it.

PV system design is well understood—site surveys and due diligence ensure optimal system performance. The best components and materials are used by the professional integrators who build and commission the systems. Operations and maintenance (O&M) experts ensure ongoing optimal performance of the system. For system owners, PV acts as an investment by either providing a multi-year revenue stream or a way to lock in the cost of energy as the cost of non-renewable energy increases.

About the System... National Semiconductor utilizes several third party and self-owned arrays to test the performance of its SolarMagic solutions. This site, atop one of the buildings at its Santa Clara headquarters, has been thoroughly characterized and maintained beyond normal standards to ensure the validity of test results.

Despite these best practices, PV systems continue to perform well below expectations costing investors money and decreasing system return on investment (ROI). By combining power optimization and system monitoring and management, SolarMagic™ active power management provides a solution to recapture lost energy, optimize O&M costs, and deliver the lowest system cost per kWh.

Active Power Management Maximizes System Performance

Active power management helps PV systems perform to full potential. Power optimization—a recent advancement in PV led by SolarMagic—automatically corrects mismatch-induced system imbalance. By making this correction, power optimization improves the array's ability to generate and harvest energy.

While array-level monitoring has been available for some time, string-level monitoring and effective performance diagnostics enable timely and effective

operations and maintenance. Identifying and correcting performance issues in a PV system are the key deliverables in system operation and management.

By combining power optimization and string-level monitoring and diagnostics, SolarMagic active power management provides system owners the ability to maximize energy harvest and minimize O&M costs.

SolarMagic powerstring delivers active power management when used in a system. Equipped with highly accurate sensing equipment, SolarMagic powerstring collects current and voltage data and wirelessly transmits it to the system manager (or Internet gateway). This data is accessible through MYPVDATA® portal enabling the system owner/administrator to actively monitor and manage system status and performance levels providing the information needed to take timely action under urgent conditions.

When installed in a string, SolarMagic powerstring optimizers inject missing power into a string with its patent-pending injection boost technology. Injection boost technology senses the value of power needed to bring the string back to its maximum power point (MPP) and injects that precise amount of power into the string. This allows the string to adjust its position on the voltage-current curve and maximize the amount of harvestable power.

Figure 1 was generated with a continuous data stream and demonstrates SolarMagic powerstring injecting power into an underperforming string. The green line represents the level of system operation and difference between the green and blue lines represents the amount of injection boost provided by powerstring. Injection boost injects power between points A and B, allowing the system to operate more efficiently and more energy to be harvested. When injection boost is deactivated at point B, a large drop in the system's operation point occurs. When normalized for irradiance under these conditions, injection boost provides 18% additional energy.

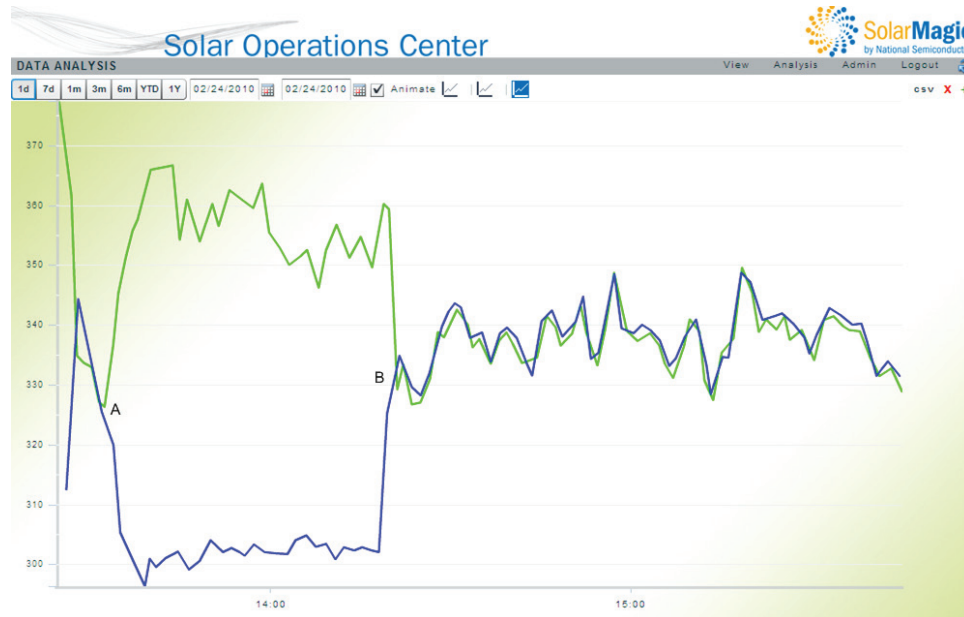


Figure 1 - Powerstring's injection boost technology provides boost to impaired system

Several active power management field trials with SolarMagic powerstring are underway. Results will be published at www.solarmagic.com as they become available.

