

pacific
energy

PCM/DR2
GridOptimizer™

Renewables are known to potentially cause power quality and power system stability problems when integrated into grid or even a microgrid. For PV plants, these issues are mainly linked to the intermittent nature of sun availability. For example, a cloudy sky can change the production of a 100 kW string to less than 50 kW in less than 30 seconds. In addition, energy price and demand also vary over time during the day.

PCM/DR2 100 unit enables lithium battery energy storage systems to control these negative effects by controlling the PV plant power output. It also allows the size of the inverters to be optimized based upon the predictable power output, it provides more flexibility regarding connection location and decreases the cost of the interconnection, and it increases the value proposition by matching load and power injection into the grid.

The PCM/DR2 is a bidirectional buck/boost DC power electronic converter capable of precisely controlling energy storage units, PV arrays, or any other DC source/load robustly, safely, and efficiently. The controller can manage multiple energy storage units, allowing for scalable energy storage and optimized power production

Energy Storage Pack Specifications

	Min	Max	Units
Rated Power Output	60	200	kWh
Rated Output Voltage	120	480	V
Rated Output Current	0	100	A
Width x Height x Depth	110		Ah
Safety Features	DC Voltage • DC Undervoltage • DC Overcurrent Overtemperature • Power Electronic Fault		
Monitors	Voltage • Currents • Temperature		
Communication	Ethernet • CAN		

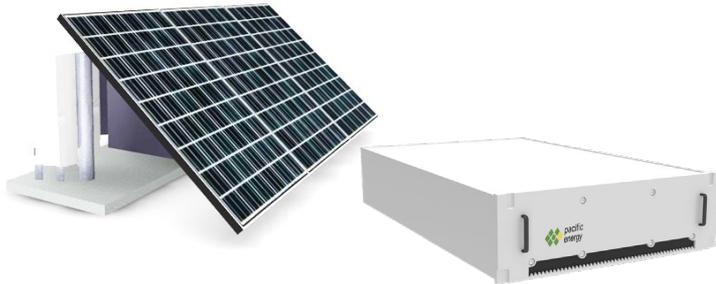
Controller Specifications

Specification	Min	Nom.	Max	Units
Supply Power			100	VDC
Supply Voltage		24		
Interface	TCP/IP • CAN			

Environmental Specifications

Specification	Min	Nom.	Max	Units
Supply Voltage	10		16	VDC
Supply Current		250		mA
Operating Temperature	-40		80	°C

*: other temperature ranges available on request

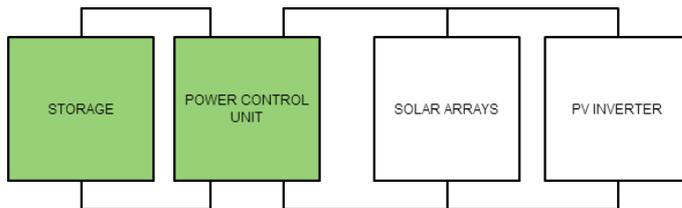


◆ GridOptimizer™

Demand Response Application Example

The Grid Optimizer operates as an add-on to a system which includes an inverter and photovoltaic (PV) solar panels. The diagram below shows the Grid Optimizer tied to the inverter and PV. The power control unit of the GridOptimizer is connected to the PV and the inverter. The PV generates DC power and supplies power to the inverter and the power control unit of the GridOptimizer.

Energy storage can be coupled with an existing photovoltaic (PV) system to greatly reduce power costs. While PV production is based solely on the weather, energy storage power can be controlled. Using energy storage to save energy during the sunny hours and deliver that same energy during peak cost hours can reduce electricity bills substantially. The system would monitor the user's load, and if it begins to go above a certain peak threshold the energy storage would activate, serving some of the load, and reducing this peak, which in turn would result in lower peak demand charges.



Utility Application Example

The increasing integration of distributed renewable energy has increased stress on the power grid. By their very nature, photovoltaic (PV) energy fluctuates dramatically with weather. This fluctuating power output from these renewable sources can cause line regulators, tap changers, and switched capacitors to switch much faster than before. PV and inverter instabilities can also contribute to transients, harmonics, and instability in the distribution system. For example, if a PV string was generating 100 kW and a cloud passed over the array, this power could drop to under 50kW in less than 30 seconds. This can be very disruptive to the stability of the grid. Adding energy storage to an existing PV system is one way to reduce these harmful effects. As can be seen above in figure 1, the Pacific Energy system can be added on to existing systems. The energy storage can buffer the output of the PV, reducing weather anomalies. The energy storage can also be used to level peaks in demand, create custom daily power outputs, and optimize the time at which the solar energy is sold for maximum profit.