PCM-100

- ✓ *Robust and Reliable Energy Storage Control*
- ✓ *Ethernet Communication*
- ✓ *High Efficiency DC*
- ✓ *Fast Response Time*

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Energy Storage Power Control Unit

Bidirectional Buck/Boost Converter

Lithium Ion energy storage is a DC source, and as such needs a DC power electronics converter to control its rate of charge and discharge. The Pacific Energy Controller is a bidirectional buck/boost converter capable of precisely controlling Lithium Ion, PV, or any other DC source/load robustly, safely, and efficiently.

General Specifications

Specification	Min	Nom	Max	Units
Rated Power Output	0		100	kW
Rated Output Voltage	290		584	V
Rated Output Current	0		350	A
Safety Listings and Certifications		UL 1741 Pending		

Controller Specifications

Specification	Min	Nom	Max	Units
Supply Power			100	W
Supply Voltage		24		V
Interface		TCP/IP CAN		

Environmental Specifications

Specification	Min	Nom	Max	Units
Temperature	0		45	C
Cooling (provided)		Forced Air Convection		
Rated Max Elevation			6000	Ft
Enclosure Rating		Type 3R		

System Operation

Specification	
Control	Ethernet
Monitors	Voltages Currents
Safety Features	DC Overvoltage DC Undervoltage DC Overcurrent Overtemperature Power Electronics Fault
Communication	Ethernet CAN

The Energy Storage Controller is specially designed to work with Pacific Energy's Advanced Energy Storage modules and can communicate with the storage modules in order to control battery state of charge (SoC), monitor cell health, and control charge/discharge rate. The controller can monitor and control multiple energy storage units, allowing for scalable energy storage.

Demand Response Application Example

The GO system operates as an add-on to a system which includes an inverter and photovoltaic (PV) solar panels. The diagram below shows the GO system tied to the inverter and PV. The power control unit of the GO system 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 GO system.

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 monitors 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.

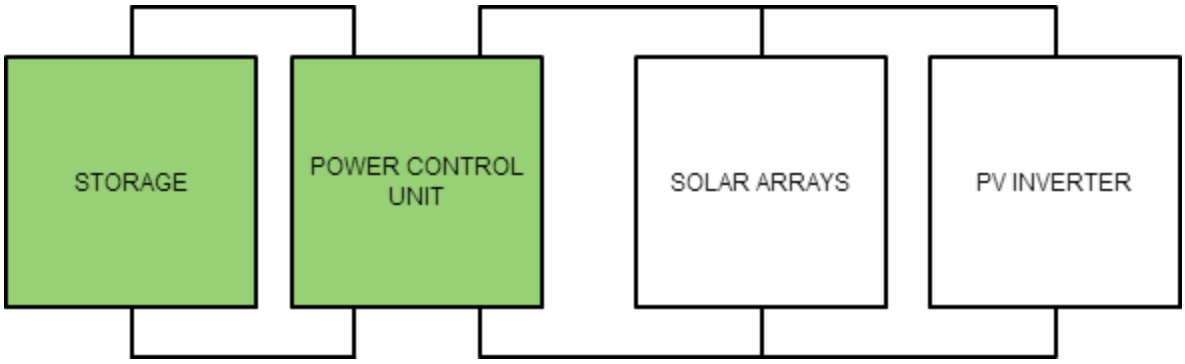


Figure 1. Block Diagram

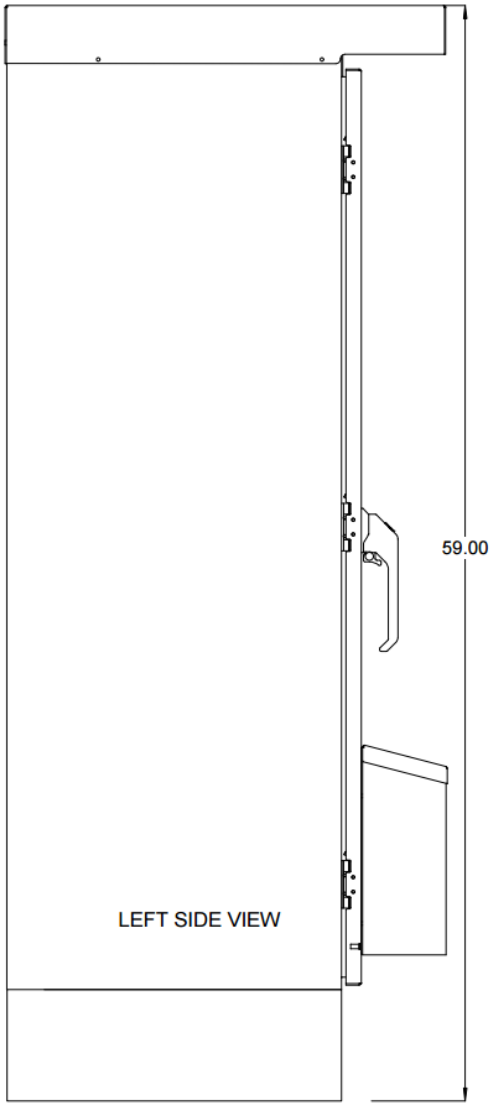
Utility Application Example

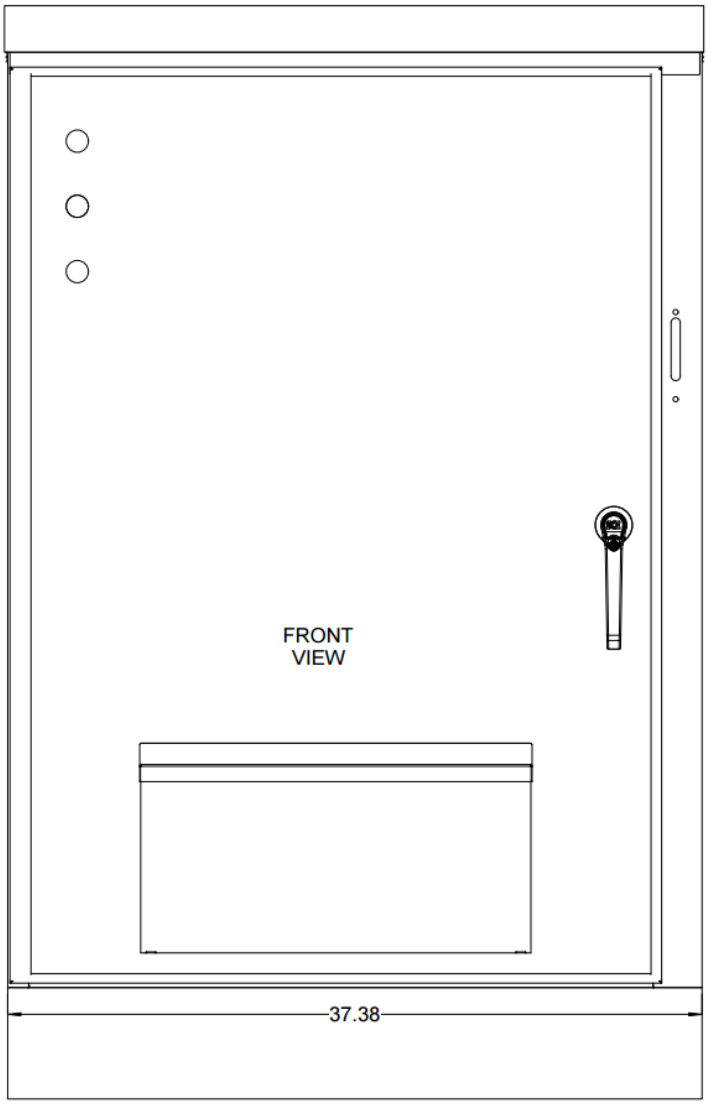
The increasing integration of distributed renewable energy has increased stress on the power grid. By their very nature, photovoltaic (PV) energy fluctuates dramatically with weather. This fluctuating power output from these renewable sources can cause line regulators, tap changers, and switched capacitors 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.

Dimensions

Power Converter Unit (measurements in inches)





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Specifications subject to change without notice, contact Pacific Energy for updated information.