

## Customer Motivation:

Seeking a reliable and efficient backup power solution to continuously monitor and charge the battery bank as needed at a remotely located solar powered railroad crossing in Northern Maine during times of limited solar production.

## Solution:

Powered by readily available, easily transportable and low cost propane, the P250i Solid Oxide Fuel Cell (SOFC) provides a reliable source of DC power by converting chemical energy into electricity. The P250i is capable of providing extended-run backup power protection to this remotely located solar powered railroad crossing by continuously monitoring battery bank voltage and charging batteries as needed.

## Basic Operation:

The solar array, solar controller, solid oxide fuel cell and batteries all work together as a “hybrid” system.

## How It Works?

The solar array converts sunlight into electricity. The batteries are charged by the solar controller assembly. If the batteries are fully charged and being maintained above a certain predetermined threshold voltage by the solar array, the P250i fuel cell is idle. When the batteries dip below the lower threshold voltage level, the P250i will automatically turn-on and after a 25-30 minute warmup period, will begin charging the batteries and powering the load. Once the batteries reach a predetermined upper threshold voltage, the fuel cell will automatically begin to cool-down and return to standby mode.

## Cold Weather Performance

The P250i utilizes a ceramic electrolyte which is not susceptible to freezing and thawing cycles common among other fuel cell types including PEM (hydrogen) fuel cells. The P250i’s robust design allows it to reliably operate in virtually any climate -40°F to +158°F with no supplemental heating needed.

## Zero Maintenance

The P250i needs no oil changes, has no moving parts and requires no routine maintenance over the life of the system.



## \*Fuel Efficiency\*

The P250i efficiently uses 1/4 lb LPG/hr and can provide 130-160 hours of runtime on two (2) BBQ style propane tanks compared to gas/diesel generators that need refueled every 8-10 hours!