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PV 101

- Inverters

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Types of Inverters

- What is an Inverter?
- Inverter Types:
  - Stand-Alone
  - Utility-Interactive

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Inverter Basics

- How does an Inverter work? (DC to AC)
- Typical Cost of an Inverter: approx. $.50 to $.75 per watt (less with scale)
- No maintenance is required – no service contract
- Available from 0.2 to nearly 12 KW AC for residential
- Almost all inverters have max. power point tracking and built in DC ground fault protection
- Single big inverter is typically better than 2 small – cost wise

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More About Inverters

- Residential: 120 V or 240 V AC
- 240 V usually requires 2 breaker spaces
- Larger than 12 KW are typically for 3 phase commercial power (208 V or 480 V AC)
- Typically 1 to 4 strings of modules feed the inverter
- Inverters range between 92-99% efficiency
- Temperature affects inverter performance
- Best to be as close to main service as possible
- Some inverters have built-in AC and DC disconnects

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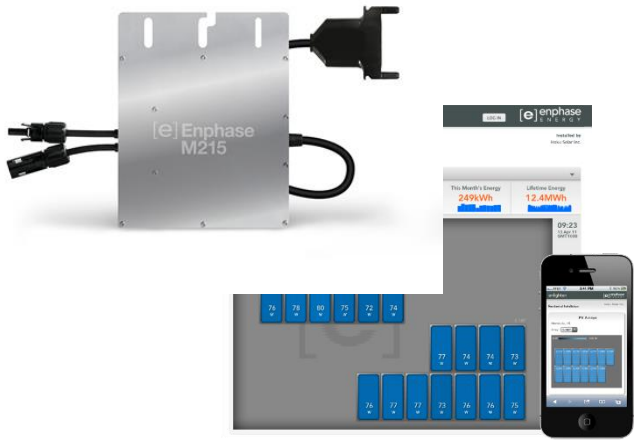
Common Inverter Brands

- SMA
- Fronius
- Outback
- SolarEdge – String Optimizer
- Enphase – Micro Inverter



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Installing Inverters

- Location – cool, convenient, safe
- Mounting – In studs, possible back plate
- Connections – use EMT, Liquid Tight, and/or Raceway
- Aesthetics important

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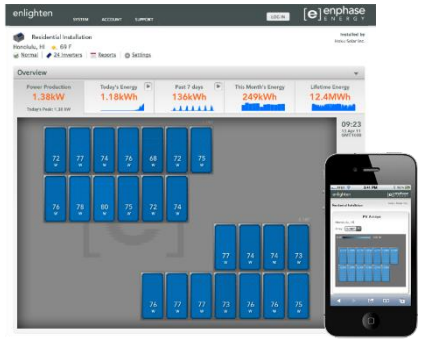
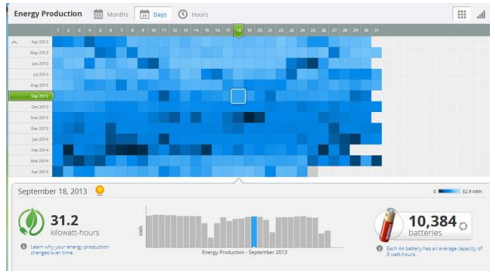
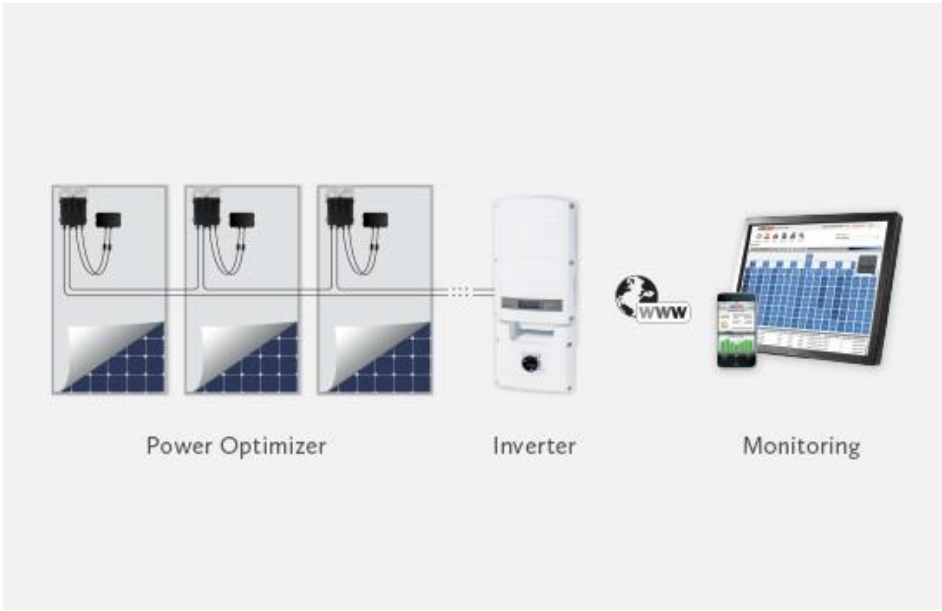
Monitoring

- String Inverters
- Micro Inverters and Power (String) Optimizers







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String Inverter

- The inverters prime purpose is to convert DC power from the array to utility compliant AC power.
- The inverter conditions the power to match the 60 hertz wave form of the grid and is considered a “power conditioning unit”.
- Many inverters perform Maximum Power Point Tracking (MPPT) with efficiencies approaching 99%.
- Grid tied inverters have an anti islanding feature which turns them off in the event of a grid outage.
- Hybrid inverters allow for battery or generator backup.

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Integrated String Inverters

Disconnects,
Combiner, & Inverter
in One Box

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Micro Inverters

No Extra Equipment,
converts DC to AC at Each Module

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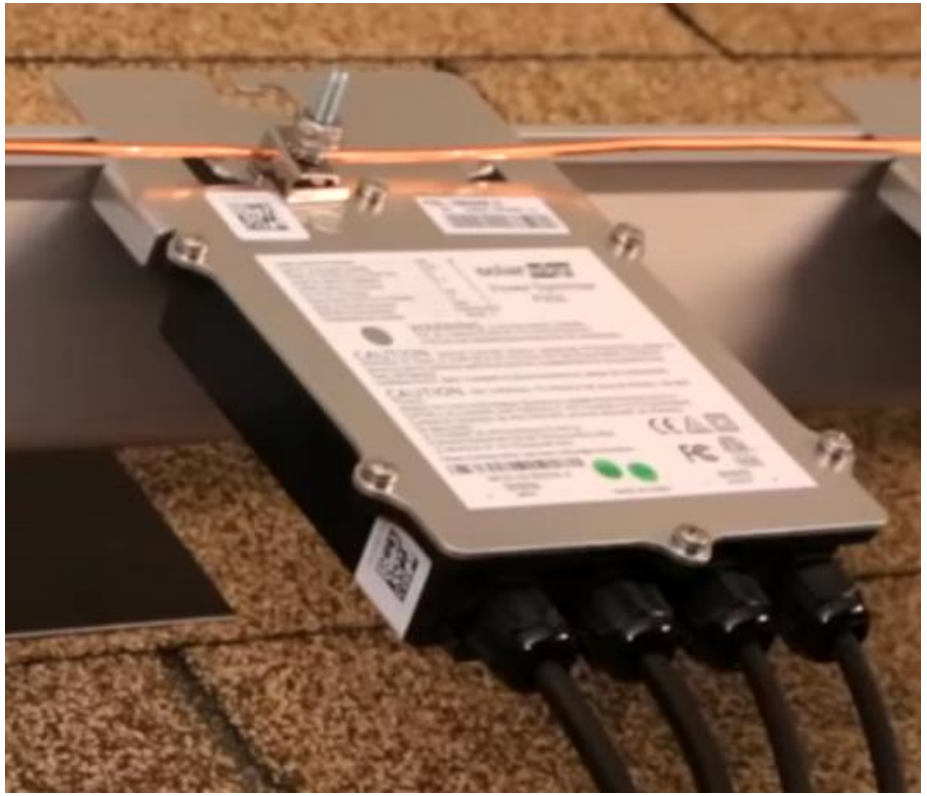
Power Optimizers



Optimizers increase energy output from PV systems by constantly tracking the maximum power point (MPPT) of each module individually.

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Thank You

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