

My Solar Project V1

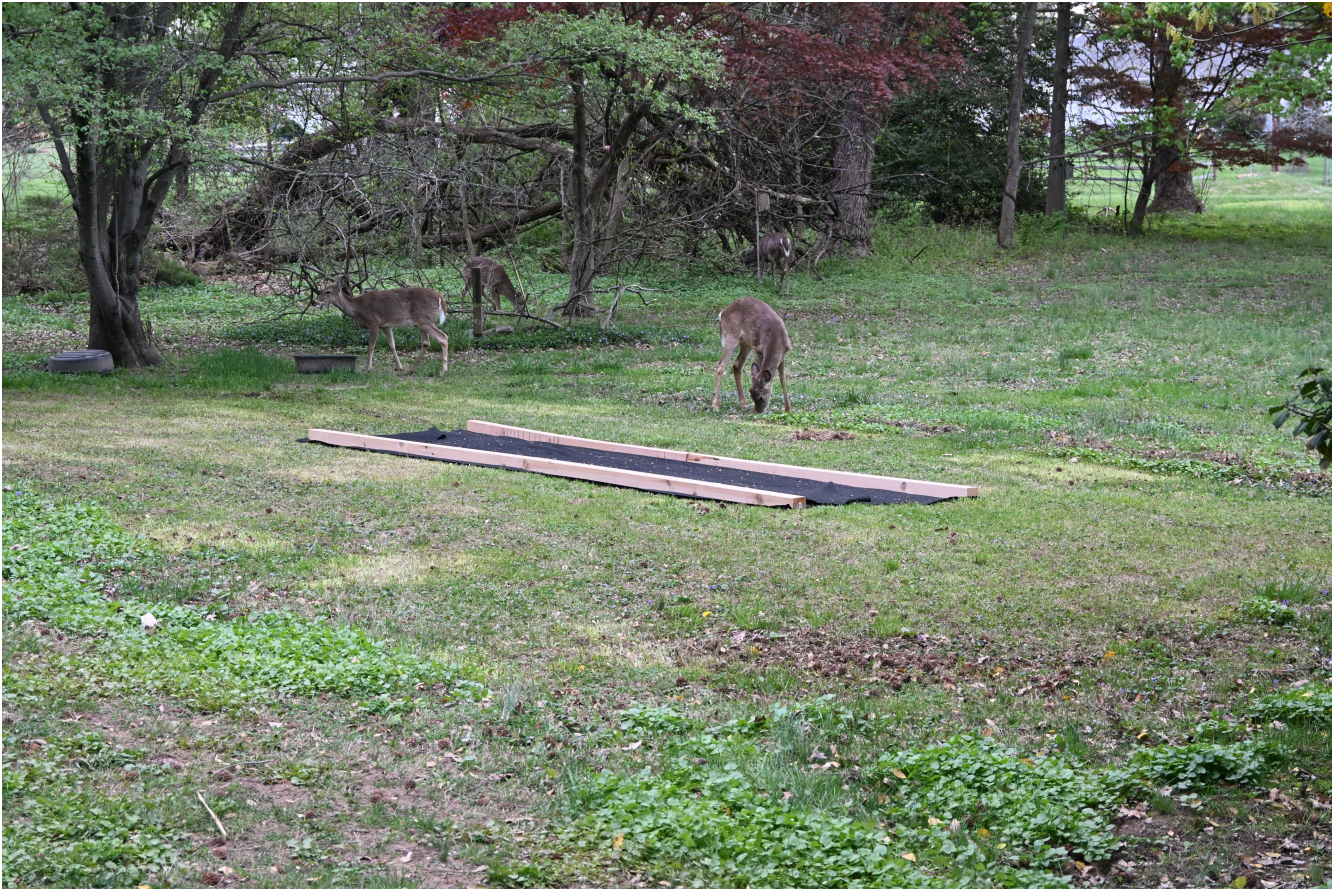
In the fall of 2025 I was researching solar panels and came across a local seller on Ebay. They were located in a warehouse about four miles away in an adjacent town. They were 400 watt bifacial panels and were offered for \$100 each. I also purchased four microinverters from the same seller. These were stored in my barn over the winter.

As soon as the weather broke in early spring 2026 I started on the project. It involved a combination of ordering the needed materials and surveying where to put the panels. I have 4 acres but lots of trees. The only option here is to ground mount. The best location would be in my backyard but it would be difficult to bring the wiring into the house from there. So I decided to ground mount them in front of the house in a location that gives me full sun from about 11AM to 3 PM in June.

First was laying out the location, cutting the grass very low, and putting down heavy landscape fabric and a four 4X4X8 wood base. You can see this in this photo.



4X4X8 on top of landscape fabric. Total length eight feet and width about 2.5 feet

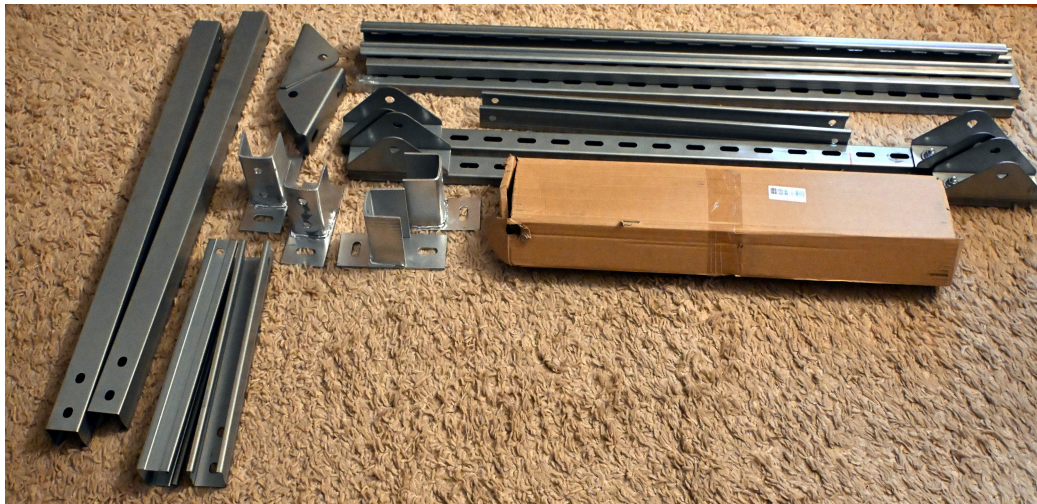


A little help from some onlookers!

I ordered mounting hardware from Amazon. I ended up ordering three of these mounts. My panels were fairly large at 83X42 inches. I planned to mount them in portrait mode. It was important to me that the mounting be sturdy. I did not mount them as instructed by the mounting hardware. I wanted to have each panel supported in the center as you will see in the following photos.

The mounting hardware is Amazon <https://www.amazon.com/dp/B0831DDS9W> Although the manufacturers photo shows four panels they are much smaller panels. In the end I needed 3 of these to make the mount to support my larger four panels.

This was kind of a design as you go project but I would have to say I was pleased with the final results.



An example of one kit of parts. I used three in the final design.

It is very important to anchor the base to the ground. These panels are like sails and unless you want to find them halfway across your yard or in neighbors yard in a heavy wind a firm anchoring system is required. I used standard ground anchors that are used for tents or outbuildings.



These anchors are inserted using a electric drill then the drill attachment is removed and the metal loop shown in the left photo upper right is screwed on and then bolted to the side (center position) of each 4X4. Two centered in the front 4X4's and two centered on the back two 4X4's.

The 4X4's are secured lengthwise and at several points of the width.



The panels are fix mounted at 40 degrees. For fixed arrays this typically equals your latitude. The frame is assembled and mounted such that each panel is centered on the support arms/ 2X4's are cut to pad the rear height/ The front height was lowered by about 7 inches. An angle grinder with a diamond blade works well for the cuts. The metal mounts are and bolted to the wood frame. the wood frame is liberally secured with deck screws.





It is very important to ground the structure locally with a ground rod and connected to the house ground via a green #10 run to the house. This is in a ½" conduit along with the feed wires, a red and black #10. More on that later. Here is a photo of the 8 foot ground rod. I am taking a break driving it in. The iron pipe on the top is for protection of the copper rod and gives a wider area to hit with the sledge hammer. It eventually got to about one foot above ground.

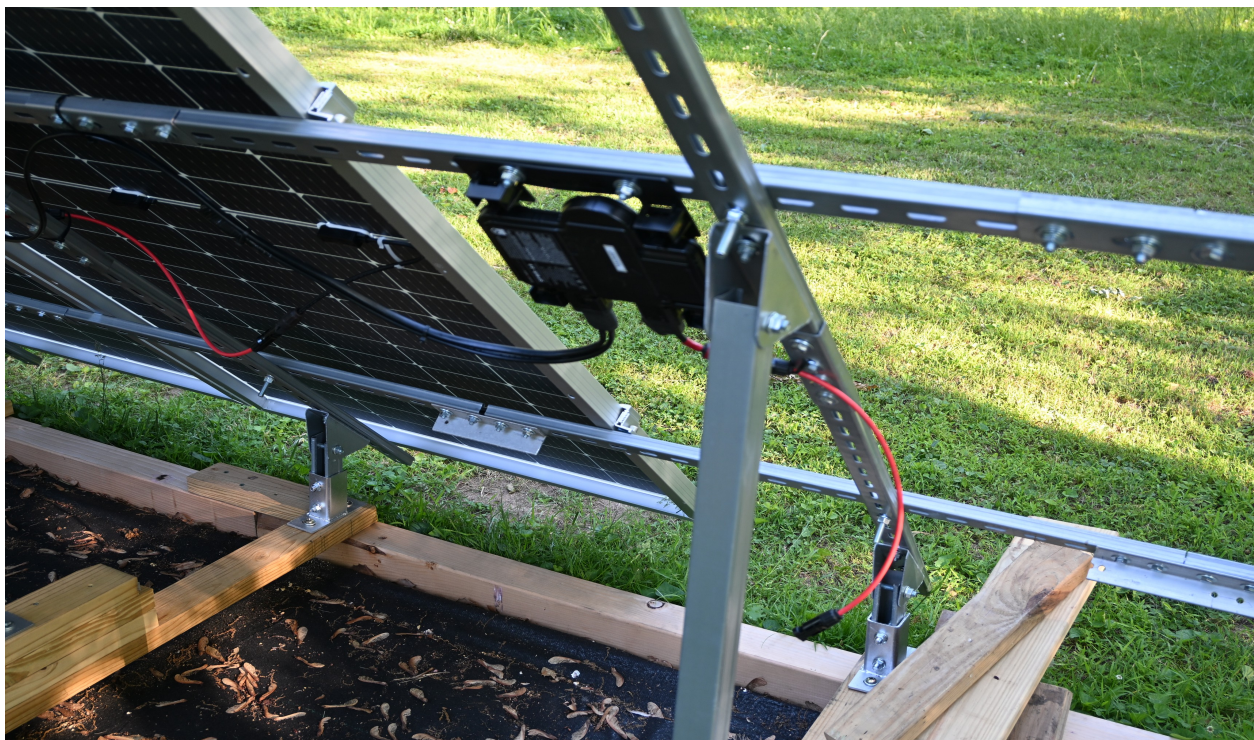




The finished frame. Typically they only use two cross rails but I decided to use three. When this is all bolted down tight it makes a very secure frame. Now lets start adding some panels.

I got three installed but had to wait until the next day to install the fourth. Each panel is connected to a single micro-inverter. The 240VAC output of the micro-inverters are paralleled and fed back to the house.

Here is a photo of a micro-inverter mounted to the frame before the last panel is installed. Typically a maximum of 16 micro-inverters can be installed on one parallel circuit so I have room to expand.



The right connector has the MC4 connections to the panel and the connector on the left is the AC out. This is daisy-chained to each micro-inverter and finally to the junction box for connection to the lines to the house.



Two views with all four panels installed.



A view of the rear. Feed trench to the left.



This photo shows the trench run (about 70 feet) back to the house. It was at two heights transcending a three foot stonewall midway.



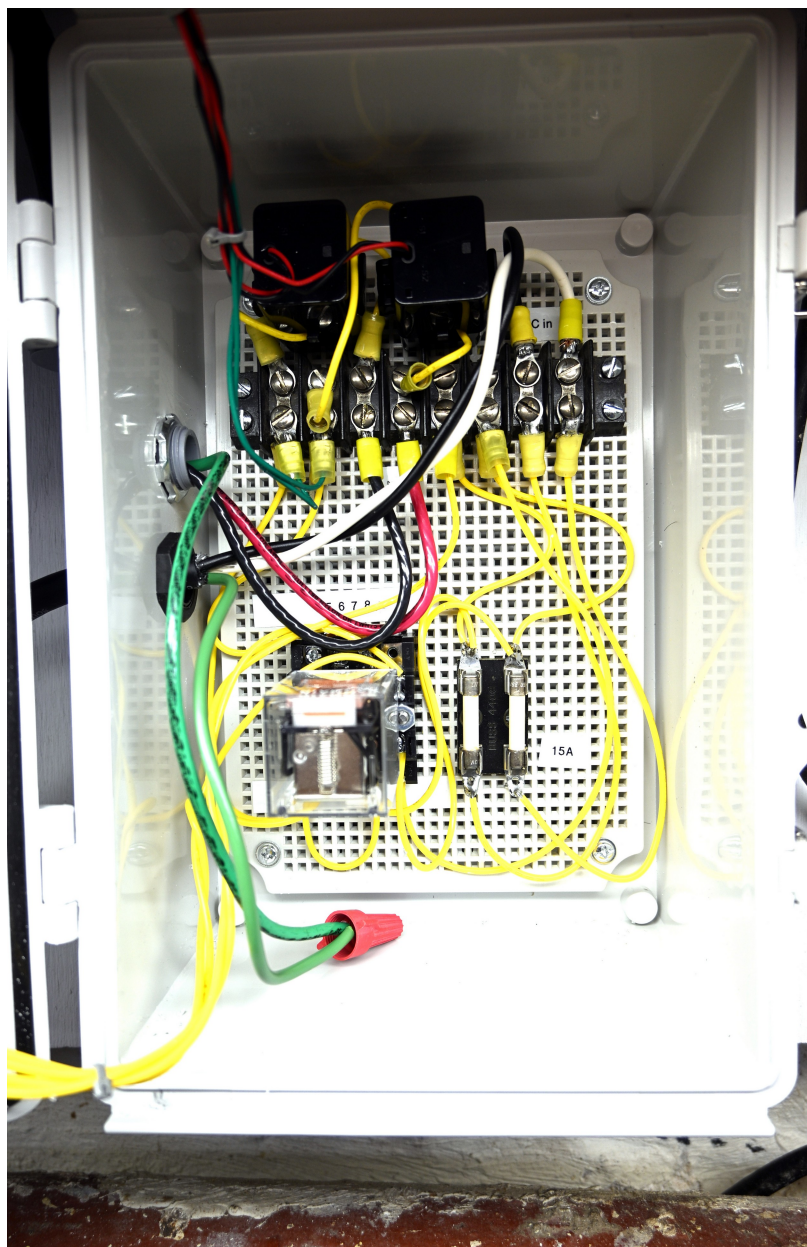
Control box located in the basement. This will disconnect the panels in the rare event of a power failure protecting my natural gas 20KW generator.



Here is an example of one of the displays. There are two, one on each side of the 240VAV line.

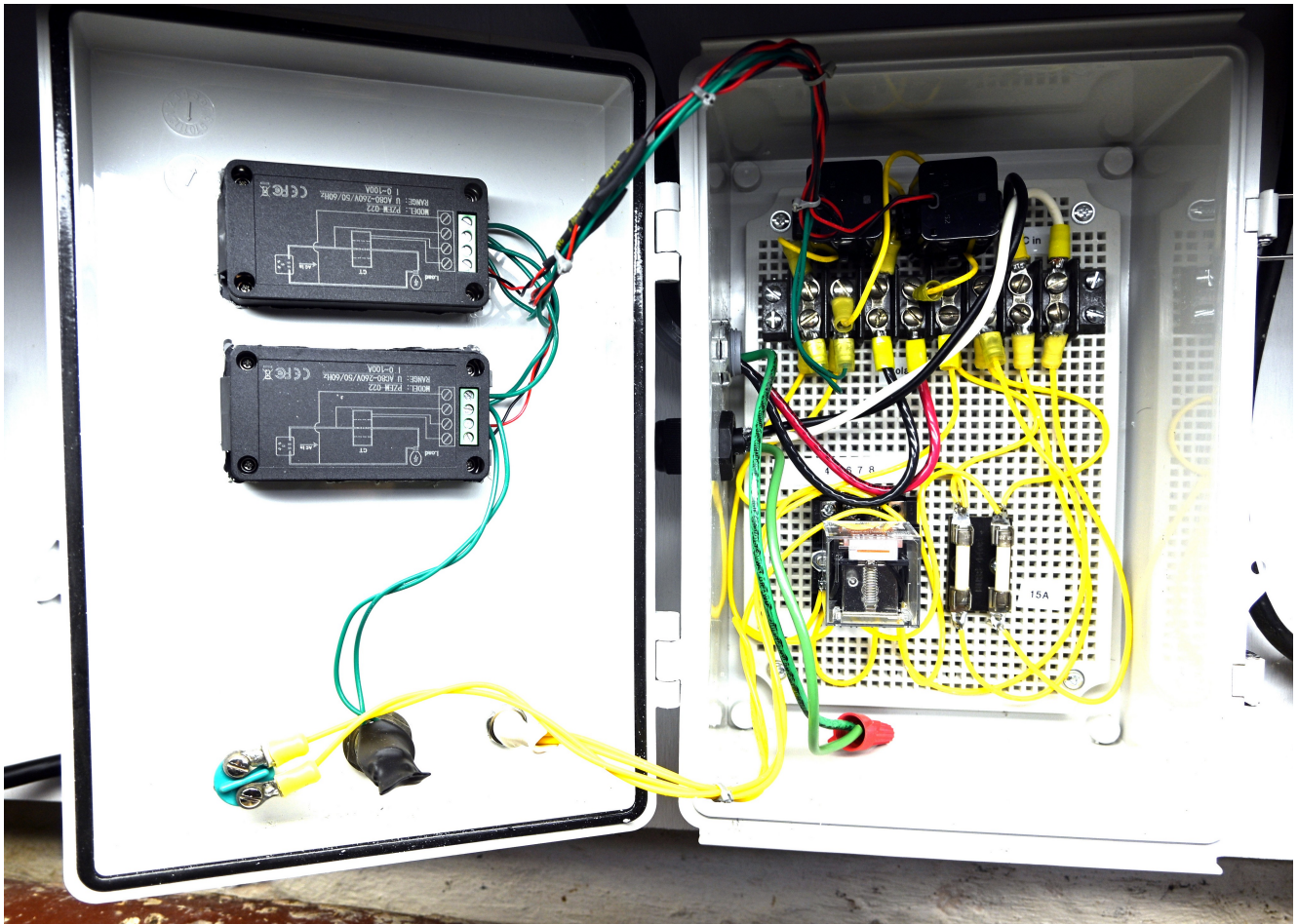
They should read exactly the same but there is some slight variance in the displays.

This shows a 1.28KW input from the panels or 5.3A @246 volts. I have seen it as high as 1.45KW.



Inside the control box. To the lower left is a 3 pole double throw relay which is wired as a latching relay. The front panel start switch closes the relay assuming there is utility voltage.

The fuses are 15A in each leg. At the top are the two current transformers to drive the displays.



The control panel is built in a box from Amazon.



This is “plug in” solar. The output of the control box goes to a 240VAC plug and to my main panel and a 240VAC 15A double breaker.

The theory behind the control box is to eliminate the possibility of the solar panels back-feeding my generator in the event of a power failure. Micro-inverters will not put out power unless they are fed power from the utility. They would not be able to distinguish between grid power and generator power. In the event of a power failure the micro-inverter would immediately shutdown so for a few seconds there would be no power and the latched relay would open. It would not close again until manually triggered by the start button.

Enphase micro-inverters are well engineered and I have detected no EMI from this system.

List of materials

4 – 4X4 treated

several 2X4's

Ground mount kit (3) - <https://www.amazon.com/dp/B0831DDS9W>

Ground Anchor kit of four - <https://www.amazon.com/dp/B0CPJ648V4>

Heavy duty subsoiler - <https://www.amazon.com/dp/B0CBBSFKBF>

2" trailer hitch receiver - <https://www.amazon.com/dp/B0DNYSDXWR>

waterproof junction box - <https://www.amazon.com/dp/B0DZ6JPG4C>

Extra heavy duty landscape fabric - <https://www.amazon.com/dp/B086MQLC4G>

3 pole double throw relay - <https://www.amazon.com/dp/B0C8N7GN5H>

digital monitor meter (2) - <https://www.amazon.com/dp/B0CC51H1B8>

MC4 connector kit - <https://www.amazon.com/dp/B0BWRHMHY9>

Red and Black solar panel wire - <https://www.amazon.com/dp/B09BYR7H57>

The mounting kits come with securing hardware for the panels but I had to order a different securing hardware because my panels were thicker.

Panel mounting hardware - <https://www.amazon.com/dp/B0FFH199QJ>

The panels (400 watt bifacial) came from a eBay provider that had a local warehouse.
The micro-inverters came from the same location.

Connectors for the micro-inverter if not provided

Enphase IQ series DCC-2 DC connectors to MC4 to each panel

<https://www.ebay.com/itm/198270865059>

Enphase Q-12-17-240 240V 60 Cell Landscape Trunk Cable - Black

You buy the number of connections and they are cut with that number of connectors plus wire length at each end.

<https://www.ebay.com/itm/116529245265>

I hope you found this presentation helpful in your solar journey. If you have any questions I would be glad to answer them.

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