

CPMesh
SOLAR BUILD

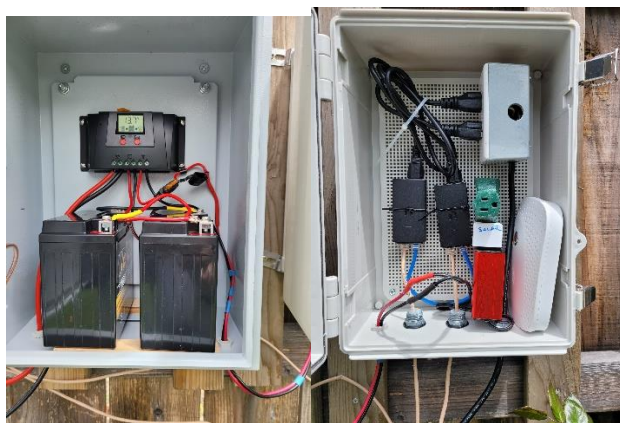
I have had the node that links my station to W9PCI and the rest of the mesh network on commercial power while I gathered all the parts to build a proper solar system to power the node. I do not have much space or the best view of the sun but was able to attach two 50W Renology panels to give me the charging capability needed to charge the batteries for 24/7 operation of the node.



The panels were originally mounted separately and pointed in slightly different directions to gather as much sun as possible throughout the day, but I built a single mount for them and will see if that is better. Winter will be the test.

The two black battery boxes at the bottom of the photo are not part of this build.

Next, I installed two boxes, one to house batteries and solar charger and the other for inverter and POEs for nodes.



Prior to connecting everything to the solar system I powered everything by commercial power from my home. This was temporary to see if my boxes would be large enough for solar and commercial power as a back-up. Commercial power was provided by an extension cord and not ideal.

The left box houses two 12ah batteries in series along with the charge controller. The 150W inverter is the red colored item in the box on the right. I left the electrical outlet box in the container on the right as stated in the text box above. The white plastic item under the outlet box is a small moisture absorber

used in safes. As moisture is detrimental to electronics in an outside environment, I wanted to reduce as much moisture as possible. The absorber was in the box for about 3 weeks with no change in color of moisture indicator. It is probably not needed at this point, but I will leave it in place for a while. (If I see any moisture in the boxes I will seal connections with dielectric grease.)

I also added a small switch to the inverter to allow a re-boot of nodes should I need to do that to gain access to one or both nodes powered by the solar system.

Once in awhile nodes get confused and may not be accessible until they are rebooted. The switch is accessible on my WiFi network, and I can turn it off or on from my recliner rebooting my nodes.

Parts used in this build

1. Two Renology 50W solar panels
2. Two 12AH AGM batteries
3. Small 30A solar charger with LCD screen
4. One 150w inverter and tri-plug adapter.
5. Two Ubiquiti POEs
6. One remote switch
7. One steel box for batteries
8. One plastic box for POE and inverter/associated hardware
9. Solar panel wire connectors and 10ga wire.
10. Electrical feed-through for solar wire and connecting hardware in boxes
11. The pole is a 25FT telescoping flagpole where the LHG is mounted.

Power requirements for nodes

1. Ubiquiti NSM2 = 8W
2. Mikrotik LHG5 XL =7W
3. Ubiquiti Injectors= 0.3W X2
4. Inverter=0.3W (?)

Problems Encountered

There were not any major problems encountered except not all solar wire connectors are the same. I had two different brands of connectors and they would not mate to each other, so I wasted a couple of connectors getting everything to work. So, find a connector you like and stick with it.

The next few months will be the test if everything is sized right for the system.

Additional Thoughts

I will try powering the radios with POEs but can convert the inverter and POE configuration to a step-up power adapter, 12V-24V, and a passive POE to reduce the power drain some. I checked the battery consumption on 06/7/22 before sun came up and they were at 12.5V. Yesterday

when the sun went down, they were at 13.8. So, a loss of 1.3V over night is not too shabby! Will wait and see if I need to reduce the power consumption for the winter so the panels can keep up or increase the number of batteries.

Approximate Cost of build

Plastic box = \$59.00

Steel box = \$139.00

Solar Panels = \$75.00 EA. ?

Charge controller = \$25.00

Batteries = \$45.00 EA

Hardware = \$25.00?

1. wire
2. Solar panel "Y" s
3. Solar wire connectors
4. Box feed throughs

I'm sure the build could have been put together for less of an investment, but I chose the parts I wanted and did not want to compromise on quality. The only thing I did compromise on was the charge controller, but I had used this one in another application and it seemed to work very well so I continued with the one I had.

I hope you will enjoy your solar design and build as much as I have building mine.

de, KL7VK