



## **Powerfly: A Plug-and-Play Solar Monitoring Device Technical Assistance Request**

The Powerfly is a fully plug-and-play embedded solar monitor. It features a cellular uplink to the cloud, and is capable of instant over-the-air configuration, updates, and Sunspec-compliant monitoring and control. The Powerfly is self-powered via its current transformers (CTs) and a backup battery. At this point, we have built a prototype, shown below, that demonstrates the cellular connectivity and CT harvesting. We would like to issue a request for assistance in our next goals, including extensive testing, product development, and customer outreach.

We seek the assistance in extensive testing from the American-Made Network (AMN), national labs, and solar installers or interested installation sites. While it is important to test the Powerfly's software and confirm Sunspec compliance, the main testing will focus on the accuracy and reliability of the data transfer to the cloud. We will also need to confirm that the Powerfly can remain powered throughout the winter in a variety of climate zones since the energy harvest will vary depending on the weather. We will also want to subject the Powerfly to extremes in temperature to estimate its life span. All of these tests will require a small amount of space next to an inverter for a long period of time. Ideally, we can use a variety of different types of inverters.



We also seek technical assistance in product development. First, we would like to request help from an electrical engineer or team that has skills in PCB design for embedded systems. The electrical engineer's role would be to help design a single PCB that integrates all the crucial electrical elements from the prototype. These include the main processor (currently from a Raspberry Pi), the cellular chip, and the battery management system with energy harvesting. In addition, we could use assistance in setting up the appropriate pick-and-place manufacturing channels. Finally, some mechanical engineering support will be needed when it comes to overall system design and physical characteristics.

We could also use some non-technical assistance in market research and outreach. We would greatly benefit from knowledge about the solar monitoring SaaS business models in the industry so we can offer something better than the existing solutions.